DRAFT

Initial Study and Mitigated Negative Declaration

Xenia Multi-Family Residential Project

Beaumont, California

Lead Agency:

City of Beaumont
550 East 6th Street
Beaumont, California 92223

Prepared for:

Beaumont Land Partners, LLC
556 South Fair Oaks Avenue, Suite 337
Pasadena, California 91105

Prepared by:

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

2681 Pullman Street
Santa Ana, California 92705

May 2023

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DRAFT MITIGATED NEGATIVE DECLARATION

Lead Agency: City of Beaumont

Project Proponent: Beaumont Land Partners, LLC

Project Location: The Project Site is located near the southeast corner of Xenia Avenue and 8th Street in the City of Beaumont. The 10.93-acre Project Site is currently vacant.

Project Description: The Proposed Project consists of constructing 16 apartment buildings, totaling 192 multi-family residential dwelling units, on approximately 10.93 acres. The residential structures would be two stories in height, of wood-framed construction, utilizing conventional shallow foundations and slab-on-grade. The Proposed Project would provide ancillary amenities such as a pool/recreation area, community club, and dog park. The Project also includes a water quality basin, parking/drive areas, underground utilities, and other improvements. The Project includes actions necessary to annex approximately 9.08 acres of the 10.93-acre Project Site to the Beaumont-Cherry Valley Water District (BCVWD) via the Riverside Local Agency Formation Commission (LAFCO).

Mitigation Measures Incorporated into the Project to Avoid Significant Effects:

Biological Resources

BIO-1: **Burrowing Owl Pre-Construction Surveys and Avoidance:** The Project Area was determined to be suitable for burrowing owl due to the presence of suitable habitat and recent records of the species that have been recorded near the Project Site. Prior to ground disturbing activities, a qualified wildlife biologist (i.e., a wildlife biologist with previous burrowing owl survey experience) shall conduct pre-construction surveys of the Project Site, plus a 500-foot buffer, to locate active breeding or wintering burrowing owls and burrowing owl burrows between 30 and 14 days prior to construction. The survey methodology will be consistent with the methods outlined in the CDFW *Staff Report on Burrowing Owl Mitigation* (CDFG 2012) and will consist of walking parallel transects 20 – 60 feet apart, adjusting for vegetation height and density as needed, and noting any potential burrows with fresh burrowing owl sign or presence of burrowing.

A qualified biologist shall conduct an additional pre-construction survey of the Project Site plus an approximately 500-foot buffer no more than 24-hours prior to the start of ground-disturbing activities associated with construction activities to identify any additional

burrowing owls or burrows necessitating avoidance, minimization, or mitigation measures. The results of the survey should be submitted to the City and CDFW within five days of survey completion.

If no burrowing owls are observed during the survey, Project site preparation and construction activities may begin, and no further action is necessary. If burrowing owls are found to be present, then avoidance or minimization measures shall be undertaken in consultation with the City and CDFW. CDFW shall be sent written notification within 48 hours of detection of burrowing owls. If active burrowing owl burrows are detected, the Project Applicant shall not commence activities until no sign is present that the burrows are being used by adult or juvenile owls or following CDFW approval of a Burrowing Owl Plan as described below. If owl presence is difficult to determine, a qualified biologist shall monitor the burrows with motion-activated trail cameras for at least 24 hours to evaluate burrow occupancy. The onsite qualified biologist will verify the nesting effort has finished according to methods identified in the Burrowing Owl Plan.

The Burrowing Owl Plan shall be prepared in accordance with guidelines in the CDFG *Staff Report on Burrowing Owl* (March 2012) and MSHCP. The qualified biologist and Project Applicant shall coordinate with the City, CDFW, and USFWS to develop a Burrowing Owl Plan to be approved by the City, CDFW, and USFWS prior to commencing Project activities. The Burrowing Owl Plan shall describe proposed avoidance, relocation, monitoring, minimization, and/or mitigation actions. The Burrowing Owl Plan shall include the number and location of occupied burrow sites and details on proposed buffers if avoiding the burrowing owls or information on the adjacent or nearby suitable habitat available to owls for relocation. If no suitable habitat is available nearby for relocation, details regarding the creation and funding of artificial burrows (numbers, location, and type of burrows) and management activities for relocated owls shall also be included in the Burrowing Owl Plan. The City and Project Applicant shall implement the Burrowing Owl Plan following CDFW and USFWS review and approval.

If burrowing owls are observed within Project site during Project implementation and construction, the Project Applicant shall notify CDFW immediately in writing within 48 hours of detection. A Burrowing Owl Plan shall be submitted to CDFW for review and approval within two weeks of detection and no Project activity shall continue within 1,000 feet of the burrowing owls until CDFW approves the Burrowing Owl Plan. The City and the Project Applicant shall be responsible for implementing appropriate avoidance and mitigation measures, including burrow avoidance, passive or active relocation, or other appropriate mitigation measures as identified in the Burrowing Owl Plan.

If ground-disturbing activities occur but the Project Site is left undisturbed for more than 30 days, a preconstruction survey for burrowing owl shall be conducted and reported to CDFW as described above. If a burrowing owl is found, the same coordination described above shall be necessary.

A final letter report shall be prepared by the qualified biologist documenting the results of the passive relocation. The letter shall be submitted to CDFW prior to the start of Project activities.

BIO-2: **Biological Monitoring:** A qualified biologist shall be present to monitor all initial ground disturbing and vegetation-clearing activities conducted for the Project. During each monitoring day, the biological monitor shall perform clearance survey "sweeps" at the start of each workday that vegetation clearing takes place to minimize impacts on special-status species with potential to occur. The monitor will be responsible for ensuring that impacts to special-status species, nesting birds, and active nests will be avoided to the greatest extent possible. Biological monitoring shall take place until the Project Site has been completely cleared of any vegetation. If an active nest is identified, the biological monitor shall establish an appropriate disturbance limit buffer around the nest using flagging or staking. Construction activities shall not occur within any disturbance limit buffer zones until the nest is deemed no longer active by the biologist. If special-status wildlife species are detected during biological monitoring activities, then consultation with the USFWS and/or CDFW shall be conducted, and a mitigation plan shall be developed to avoid and offset impacts to these species. Mitigation measures may consist of work restrictions or additional biological monitoring activities after ground-disturbing activities are complete.

BIO-3: **Pre-construction Survey for Nesting Birds:** Regardless of the time of year, the Project Applicant shall ensure a nesting bird survey is completed prior to the start of any development activities (such as ground disturbance, construction activities, and/or removal of trees and vegetation) within the Project Site. This will avoid violations of the MBTA and California Fish and Game Code Sections 3503, 3503.5, and 3513. The pre-construction nesting bird survey shall include the Project Site and adjacent areas where Project activities have the potential to cause nest failure.

The survey results shall be provided to the City's Planning Department. The Project Applicant shall adhere to the following:

- Applicant shall designate a qualified biologist experienced in: identifying local and migratory bird species of special concern; conducting bird surveys using appropriate survey methodology; nesting surveying techniques, recognizing breeding and nesting behaviors, locating nests and breeding territories, and identifying nesting stages and nest success; determining/establishing appropriate avoidance and minimization measures; and monitoring the efficacy of implemented avoidance and minimization measures.
- Pre-construction surveys shall be conducted at the appropriate time of day/night, during appropriate weather conditions, no more than 3 days prior to the initiation of Project activities. Surveys shall encompass all suitable areas including trees, shrubs, bare ground, burrows, cavities, and structures. Survey duration shall take into consideration the size of the Project Site; density, and complexity of the habitat;

number of survey participants; survey techniques employed; and shall be sufficient to ensure the data collected is complete and accurate.

If no nesting birds are observed during the survey, Project Site preparation and construction activities may begin. If nesting birds (including nesting raptors) are found to be present, then avoidance or minimization measures shall be undertaken in consultation with the City and CDFW. Measures shall include immediate establishment of an appropriate buffer zone to be established by a qualified biologist, based on their best professional judgement and experience. The buffer around the nest shall be delineated and flagged, and no construction activity shall occur within the buffer area until a qualified biologist determines nesting species have fledged and the nest is no longer active, or the nest has failed. The qualified biologist shall monitor the nest at the onset of Project activities, and at the onset of any changes in such Project activities (e.g., increase in number or type of equipment, change in equipment usage, etc.) to determine the efficacy of the buffer. If the qualified biologist determines that such project activities may be causing an adverse reaction, the qualified biologist shall adjust the buffer accordingly or implement alternative avoidance and minimization measures, such as redirecting or rescheduling construction or erecting sound barriers. All work within these buffers will be halted until the nesting effort is finished (i.e., the juveniles are surviving independent from the nest) or failed. The onsite qualified biologist will review and verify compliance with these nesting avoidance buffers and will verify the nesting effort has finished. Work can resume within these avoidance areas when no other active nests are found.

Upon completion of the survey and nesting bird monitoring, a report shall be prepared and submitted to the City for mitigation monitoring compliance record keeping.

Cultural Resources

CUL-1: If subsurface deposits believed to be cultural or human in origin are discovered during construction, all work must halt within a 100-foot radius of the discovery. A qualified professional archaeologist, meeting the Secretary of the Interior's Professional Qualification Standards for pre-contact and historic archaeologist, shall be retained to evaluate the significance of the find, and shall have the authority to modify the no-work radius as appropriate, using professional judgment. The following notifications shall apply, depending on the nature of the find:

- If the professional archaeologist determines that the find does not represent a cultural resource, work may resume immediately, and no agency notifications are required.
- If the professional archaeologist determines that the find does represent a cultural resource from any time period or cultural affiliation, the archaeologist shall immediately notify the lead federal agency, the lead CEQA agency, and landowner. The agencies shall consult on a finding of eligibility and implement appropriate treatment measures, if the find is determined to be a Historical Resource under

CEQA, as defined in Section 15064.5(a) of the CEQA Guidelines or a historic property under Section 106 of the National Historic Preservation Act (NHPA), if applicable. Work may not resume within the no-work radius until the lead agencies, through consultation as appropriate, determine that the site either: 1) is not a Historical Resource under CEQA or a Historic Property under Section 106; or 2) that the treatment measures have been completed to their satisfaction.

- If the find includes human remains, or remains that are potentially human, they shall ensure reasonable protection measures are taken to protect the discovery from disturbance (AB 2641) by maintaining at least 50 feet of buffer in all directions. The archaeologist shall notify the County Coroner (per Section 7050.5 of the Health and Safety Code). The provisions of Section 7050.5 of the California Health and Safety Code, Section 5097.98 of the California PRC, and AB 2641 will be implemented. If the Coroner determines the remains are Native American and not the result of a crime scene, the Coroner will notify the NAHC, which then will designate a Native American Most Likely Descendant (MLD) for the Project (Section 5097.98 of the PRC). The designated MLD will have 48 hours from the time access to the property is granted to make recommendations concerning treatment of the remains. If the landowner does not agree with the recommendations of the MLD, the NAHC can mediate (Section 5097.94 of the PRC). If no agreement is reached, the landowner must rebury the remains where they will not be further disturbed (Section 5097.98 of the PRC). This will also include either recording the site with the NAHC or the appropriate Information Center; using an open space or conservation zoning designation or easement; or recording a reinternment document with the county in which the property is located (AB 2641). Work may not resume within the no-work radius until the lead agencies, through consultation as appropriate, determine that the treatment measures have been completed to their satisfaction.

CUL-2: At the onset of construction, a Worker Environmental Awareness Program (WEAP) will be developed by the qualified professional archaeologist. A qualified professional archaeologist with experience with sensitive cultural resources in the region will present the WEAP to all personnel working in the Project Area (either temporarily or permanently) prior to the start of project activities. The WEAP may be videorecorded and used to train newly hired workers or those not present for the initial WEAP. The WEAP could include, but will not be limited to: discussions of the sensitive cultural resources associated with the project, project-specific measures to avoid or eliminate impacts to these resources, consequences for not complying with project permits and agreements, and contact information for the lead archaeologist. Logs of personnel who have taken the training will be kept on the site at the construction or project office.

Geology and Soils

GEO-1: The Project Applicant shall implement the Conclusions and Recommendations as listed in the final site-specific geotechnical report (Updated Geotechnical and Infiltration Evaluation for Proposed Multi-Family Residential Development: Xenia Apartment Project East of Xenia Avenue and about 200 Feet South of East 8th Street Beaumont, Riverside County, California, GeoTek 2022) or most recent site-specific geotechnical evaluation.

GEO-2: A qualified paleontological professional, as defined by the Society of Vertebrate Paleontology (2010) standards, will be retained by the Contractor. The qualified paleontological professional will draft the PRMP outlining protocols to be implemented during ground disturbance in case of discoveries. This mitigation and monitoring program shall be in place prior to any ground disturbance, based on the Western Science Center's findings and recommendations. The qualified paleontological professional will be present to monitor during ground disturbance activities to ensure the protection of paleontological resources, if any. If paleontological resources are discovered during construction, all work must halt within a 100-foot radius of the discovery. The on-site qualified paleontological professional shall notify the contractor and Project Applicant. They shall evaluate the significance of the find and shall have the authority to modify the no-work radius as appropriate, using professional judgement. The qualified paleontological professional will evaluate the significance of the find and recommend appropriate measures for the disposition of the site (e.g., fossil recovery, curation, data recovery, and/or monitoring). Construction activities may continue on other parts of the construction site while evaluation and treatment of the paleontological resource takes place.

Tribal Cultural Resources

TCR-1: **Unanticipated Discovery of Tribal Cultural Resources.** If potential TCRs are discovered during ground disturbing construction activities, all work shall cease within 100 feet of the find. A Native American Representative from traditionally and culturally affiliated Native American Tribes shall be immediately contacted and invited to assess the significance of the find and make recommendations for further evaluation and treatment, as necessary. If deemed necessary by the City, a qualified cultural resources specialist meeting the Secretary of Interior's Standards and Qualifications for Archaeology, may also assess the significance of the find in joint consultation with Native American Representatives to ensure that Tribal values are considered. Work at the discovery location cannot resume until the City, in consultation as appropriate and in good faith, determines that the discovery is either not a TCR, or has been subjected to treatment directed by the City.

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LIST OF ACRONYMS AND ABBREVIATIONS

Term	Definition
AB	Assembly Bill
ADA	Americans with Disabilities Act
AF	Acre-Foot/Feet
AFY	Acre-Feet per Year
amsl	Above Mean Sea Level
APN	Assessor's Parcel Number
AQMP	2016 Air Quality Management Plan
ASTM	American Society for Testing and Materials

Term	Definition
BANL	Baseline Ambient Noise Levels
BCVWD	Beaumont-Cherry Valley Water District
BMC	Beaumont Municipal Code
BMPs	Best Management Practices
BPD	Beaumont Police Department
BSU	Beaumont Groundwater Storage Unit
BUSD	Beaumont Unified School District
BWTP	Beaumont Water Treatment Plant
CAAQS	California Ambient Air Quality Standards
CalEPA	California Environmental Protection Agency
CalEEMod	California Emissions Estimator Model
CAL FIRE	California Department of Forestry and Fire Protection
CalRecycle	California Department of Resources Recycling and Recovery
Caltrans	California Department of Transportation
CAP	Climate Action Plan
CARB	California Air Resources Board
CBC	California Building Code
CCR	California Code of Regulations
CDFG	California Department of Fish and Game
CDFW	California Department of Fish and Wildlife
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CH_4	Methane
CHP	California Highway Patrol
City	City of Beaumont
CIWMP	Countywide Integrated Waste Management Plan
CNDDB	California Natural Diversity Data Base
CNEL	Community Noise Equivalent Level
CNPS	California Native Plant Society
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide Equivalent
CPUC	California Public Utilities Commission
dB	Decibel
dBA	A-weighted decibel
DDE	Dichlorodiphenyldichloroethylene
DHS	California Department of Health Services
DOC	Department of Conservation
DPM	Diesel Particulate Matter
DTSC	Department of Toxic Substances Control
EIR	Environmental Impact Report
ESA	Environmental Site Assessment
ESSW	Earth Systems Southwest
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
GHG	Greenhouse Gas
HCM-6	Highway Capacity Manual Sixth Edition

Term	Definition
HRA Guidelines	Guidance Manual for Preparation of Health Risk Assessments
HVAC	Heating, Ventilation and Air Conditioning
I-10	Interstate 10
IS	Initial Study
kWh	Kilowatt Hours
LAFCO	Local Agency Formation Commission
LID	Low-Impact Development
L_{eq}	Equivalent Noise Level
LOS	Level of Service
LST	Localized Significance Threshold
MBTA	Migratory Bird Treaty Act
mg/kg	Milligrams Per Kilogram
MLD	Most Likely Descendent
MND	Mitigated Negative Declaration
MRZs	Mineral Resource Zones
MSHCP	Multiple Species Habitat Conservation Plan
$MTCO_2e$	Metric Tons of Carbon Dioxide Equivalent
N_2O	Nitrous Oxide
NAAQS	National Ambient Air Quality Standards
NAHC	Native American Heritage Commission
NEPSSA	Narrow Endemic Plant Species Survey Area
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NHPA	National Historic Preservation Act
NPDES	National Pollutant Discharge Elimination System
NO_x	Nitrogen Oxides
NRCS	Natural Resources Conservation Service
O_3	Ozone
OCP	Organochlorine Pesticides
$PM_{2.5}$	Particulate matter with a diameter of 2.5 microns or less
PM_{10}	Particulate matter with a diameter of 10 microns or less
PPV	Peak Particle Velocity
Project	Xenia Multi-Family Residential Project
PRC	Public Resources Code
PRG	Preliminary Remediation Goals
RCA	Regional Conservation Authority's
RCDWR	Riverside County Department of Waste Resources
RCFD	Riverside County Fire Department
RCTLMA	Riverside County Transportation and Land Management Agency
RWQCB	Regional Water Quality Control Board
SB	Senate Bill 100
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SCE	Southern California Edison
SF	Square Foot/Feet
SGPWA	San Gorgonio Pass Water Agency
SIP	State Implementation Plan
SMARA	Surface Mining and Reclamation Act of 1975

Term	Definition
SoCAB	South Coast Air Basin
SoCalGas	Southern California Gas Company
SOI	Sphere of Influence
SR	State Route
SRRE	Source Reduction and Recycling Element
Sustainable Beaumont	*Sustainable Beaumont: The City's Roadmap to Greenhouse Gas Reductions*
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TCRs	Tribal Cultural Resources
TTLC	Total Threshold Limit Concentration
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
UST	Underground Storage Tank
UWMP	Urban Water Management Plan
VHFHSZ	Very High Fire Hazard Severity Zone
VMT	Vehicle Miles Traveled
VOC	Volatile Organic Compound
WQMP	Water Quality Management Plan
WRCOG	Western Riverside Council of Governments
WWTP	Wastewater Treatment Plant

1.0 BACKGROUND

1.1 Summary

Project Title:	Xenia Multi-Family Residential Project
Lead Agency Name and Address:	City of Beaumont (City) 550 East 6th Street Beaumont, CA 92223
Contact Person and Phone Number:	Carole Kendrick, Planner Manager City of Beaumont 951-769-8520
Project Location:	The Project Site comprises 10.93 acres located east of Xenia Avenue and about 200 feet south of East 8th Street in the City of Beaumont (Assessor's Parcel Numbers (APN): 419-160-005, -024, 419-170-016, -017, -018, -022 and -027)
General Plan Designation:	Multi-Family Residential
Zoning:	Downtown Residential Multi-Family

1.2 Introduction

The City of Beaumont is the Lead Agency for this California Environmental Quality Act (CEQA) Initial Study (IS). This Initial Study has been prepared to identify and assess the anticipated environmental impacts of the Xenia Multi-Family Residential Project (Project) to satisfy CEQA (Public Resources Code [PRC], Section 21000 et seq.) and state CEQA Guidelines (Title 14, California Code of Regulations [CCR] 15000 et seq.). CEQA requires that all state and local government agencies consider the environmental consequences before approving those projects. The City of Beaumont will use this CEQA Initial Study to determine which CEQA document is appropriate for the Project: Negative Declaration, Mitigated Negative Declaration (MND), or Environmental Impact Report (EIR).

In accordance with CEQA, this Initial Study/Mitigated Negative Declaration (IS/MND) will be circulated for a 30-day public review and comment period. Written comments on the Draft IS/MND should be submitted to:

Carole Kendrick, Planner Manager
City of Beaumont
550 East 6th Street
Beaumont, CA 92223
ckendrick@beaumontca.gov

1.3 Surrounding Land Uses/Environmental Setting

The City of Beaumont is located in the westernmost portion of Riverside County and is bounded on the west by the City of Calimesa and unincorporated areas, on the north by unincorporated County areas (e.g., Cherry Valley), on the south by unincorporated County areas and the City of San Jacinto, and on the east by the City of Banning. The Project, as depicted on the U.S. Geological Survey Beaumont 7.5-minute topographic quadrangle, is located within Section 11, Township 3 South, Range 1 West.

Major transportation routes through the City include Interstate 10 (I-10), State Route (SR)-60, and SR-79. The City covers an area of 30.6 square miles and the Sphere of Influence (SOI) covers an additional 11.2 square miles. Urban land uses predominate in the City, while open space and protected habitat areas are located to the south and west of the City and within the SOI. The City is located at the peak of the San Gorgonio Pass, between San Bernardino and Palm Springs, with an elevation range of approximately 2,500 to 3,000 feet above sea level (City of Beaumont 2020a).

The Project Site comprises 10.93 acres, located east of Xenia Avenue and about 200 feet south of East 8th Street. The property consists of vacant land; however, the site was used as agricultural land in the 1990s and earlier. The property has a relatively flat terrain with elevations ranging from 2,607 feet Above Mean Sea Level (amsl) toward the north portion of the site to 2,600 feet amsl in the south portion. Surface drainage is generally to the south, with some minor local variations (Figures 1 and 2). The Project Site has not been previously graded or compacted.

The Project Site and its immediate vicinity is within the 6th Street Corridor Planning Area of the City General Plan, approved in March 2007. Development in this area is largely commercial and industrial in character with many single- and multifamily residences located between commercial parcels. The Project Site is bounded on the north by existing single-family residences; on the west by Xenia Avenue with apartment homes beyond; on the south by commercial properties and vacant land; and on the east by an apartment complex. The zoning designation for the site is Downtown Residential Multi-Family in the City of Beaumont Zoning Map. The City of Beaumont General Plan land use map designates the Project Site as Multi-Family Residential.

Table 1.3-1. Surrounding Land Uses

Location	General Plan Land Use Designations	Zoning Classifications
Site	Multi-Family Residential	Downtown Residential Multi-Family
North	Multi-Family Residential	Downtown Residential Multifamily
South	General Commercial	Sixth Street Mixed Use
East	Multi-Family Residential	Downtown Residential Multifamily
West	Multi-Family Residential	Downtown Residential Multifamily Residential Single Family

Source: City of Beaumont General Plan Land Use Map, City of Beaumont - Zoning Map Final



Location: N:\2021\2021-301 Xenia Apartments\MAPS\Location_Vicinity\Xenia_Vicinity.mxd (TR)-trotellini 8/5/2022

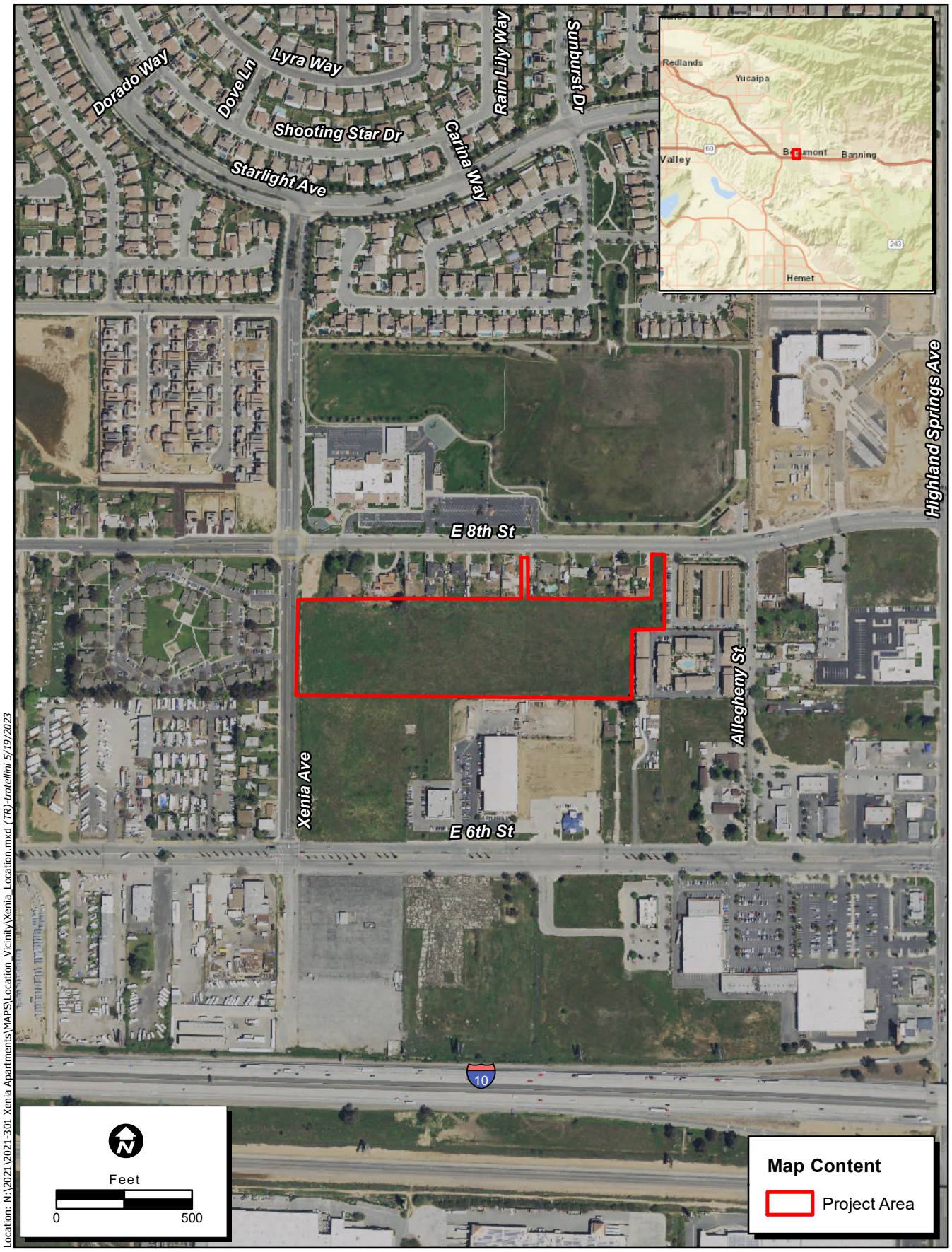
Map Date: 8/5/2022

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

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ENVIRONMENTAL CONSULTANTS

Figure 1. Project Vicinity

2021-301 Xenia Apartments



Location: N:\2021\2021-301 Xenia Apartments\MAPS\Location_Vicinity\Xenia_Location.mxd (TR)-trotellini 5/19/2023

Map Date: 8/5/2022

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community Photo Source: NAIP

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Figure 2. Project Location

2021-301 Xenia Apartments

2.0 PROJECT DESCRIPTION

2.1 Project Characteristics

2.1.1 Residential Units

The Proposed Project consists of constructing 16 apartment buildings, totaling 192 multi-family residential dwelling units, on approximately 10.93 acres (Figures 3 and 4). The proposed residential units would be a mix of one- and two-bedroom units. The residential buildings would be two stories in height, of wood-framed construction, utilizing conventional shallow foundations and slab-on-grade. The Proposed Project would not provide any low income or affordable housing.

2.1.2 Amenities

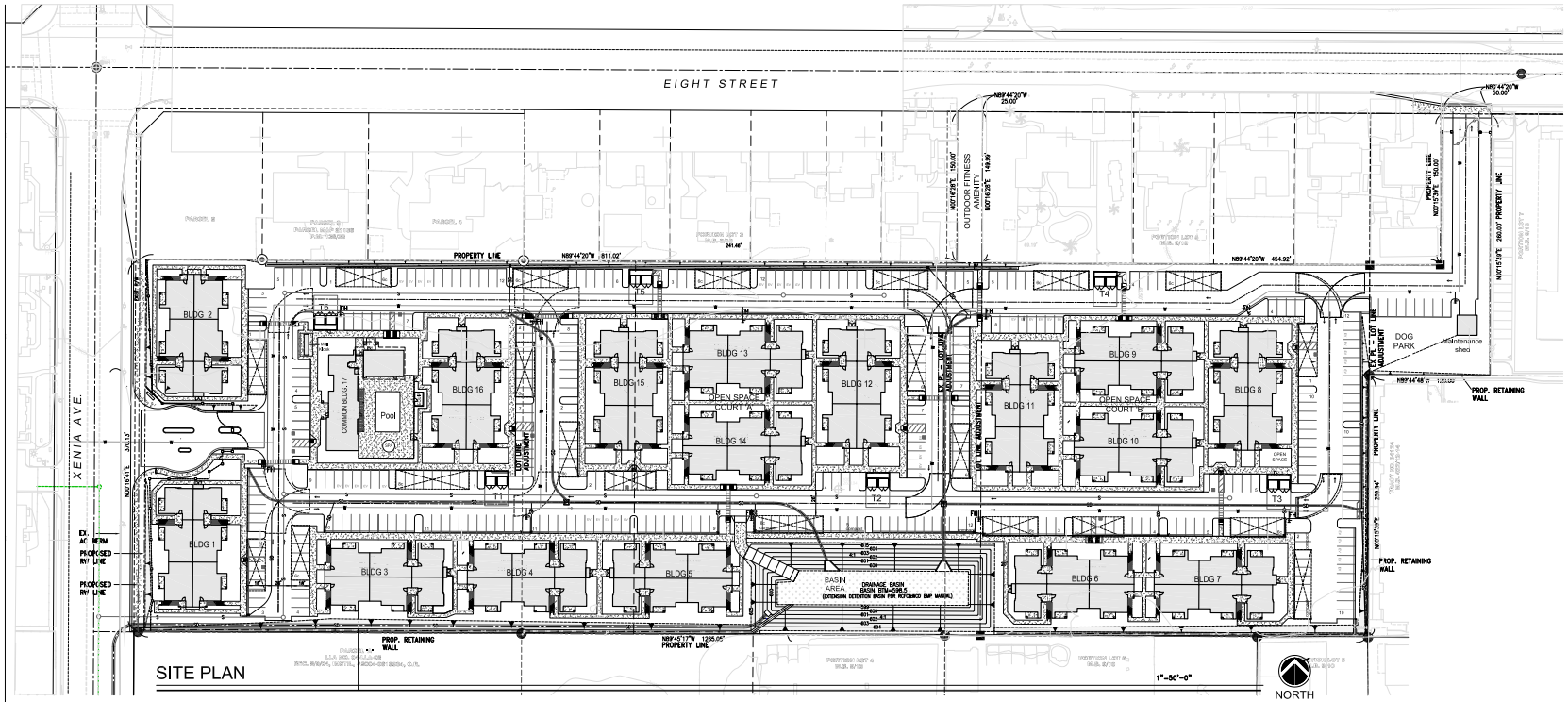
The Proposed Project would provide ancillary amenities such as a pool/recreation area, a 3,760 Square Foot (SF) community club, a 1,040-SF outdoor fitness center, and dog park. The preliminary plan for the outdoor exercise area includes: a yoga/stretching area and a variety of different pieces of outdoor fitness equipment (squats, inner thigh adductor, triceps press, rower, shoulder press, ab toner and stepper). The outdoor fitness equipment would be located over rubberize surfacing on the ground. The community building would provide space for a leasing office and business center. The Project would provide 92,617 SF of open space. The Project also includes a water quality basin, parking/drive areas, carports, underground utilities, and other improvements. The Project would construct a 6-foot masonry wall on the north, south, and west side of the Project Site, which will be installed after the grading, storm drain, and sewer improvements have been installed. After construction, the Project would retain the 6-foot noise barrier wall along the northern, eastern, and southern Project perimeter and a wrought iron fence is proposed along the western Project Site perimeter.

2.1.3 Parking and Circulation

The Project includes 413 parking spaces including 259 open stalls, 19 compact open stalls, six Americans with Disabilities Act (ADA) accessible stalls, 110 carports, 16 compact carports, and four ADA-accessible carports. Vehicular access for the Project is planned via the two gated-accessed ways: one full access unsignalized driveway along Xenia Avenue and one full access unsignalized driveway along 8th Street.

2.1.4 Earthwork and Grading

The site is currently vacant and is not expected to require demolition of any structures or hardscape. The Project is anticipated to require import of approximately 65,000 cubic yards of earthwork material during the grading phase. The water quality basin is planned to be constructed near the south property line and would be excavated to a depth of about five feet. Minor earthwork would be required for utility trench construction and backfill.



PROJECT DATA	APPLICABLE CODES:
SITE ADDRESSES: XXX XENIA AVE. BEAUMONT, CA.	Building: 2019 California Building Code (CBC) Plumbing: 2019 California Plumbing Code Mechanical: 2019 California Mechanical Code Electrical: 2019 California Electrical Code Fire: 2019 California Fire Code (CFC) Accessibility: 2019 California Building Code (Title 24, Part 2) Energy: 2019 California Energy Code (Title 24, Part 6) Sustainability: 2019 CALGreen Code
OWNER: BEAUMONT LAND PARNERS LLC ATTN: EDWARD RATINOFF 16133 VENTURA BLVD, SUITE 633 ENCINO, CA 91436	CODE ANALYSIS A-3 OCCUPANCY (COMMUNITY BUILDING) CONST. TYPE V-B SPRINKLERS YES TABLE 504.3: BASIC ALLOWABLE HEIGHT: S(w/o INCREASES) 60 FEET TABLE 504.4: BASIC ALLOWABLE STORY: 2-STORY TABLE 506.2 BASIC ALLOWABLE AREA FACTOR: 24,000 SQ. FT. (SI) R-2 OCCUPANCY (MULTI FAMILY) CONST. TYPE V-B SPRINKLERS YES (NFPA-13R) TABLE 504.3: BASIC ALLOWABLE HEIGHT: 40 FEET TABLE 504.4: BASIC ALLOWABLE STORY: 2-STORY TABLE 506.2 BASIC ALLOWABLE AREA FACTOR: 7,000 SQ. FT. (S13R) U OCCUPANCY (CARPORTS) CONST. TYPE V-B SPRINKLERS NO TABLE 504.3: BASIC ALLOWABLE HEIGHT: 40 FEET TABLE 504.4: BASIC ALLOWABLE STORY: 1-STORY TABLE 506.2 BASIC ALLOWABLE AREA FACTOR: 5,500 SQ. FT.
APN 419-180-005, 024, 419-170-016, 017, 018, 022 & 027	
AREAS GROSS AREA: 10.931 AC (476,164 SF) NET AREA: 10.676 NET (475,743 SF)	
LEGAL DESCRIPTION BEING A SURVEY OF PARCEL 1 OF PARCEL MAP NO. 21136 AS SHOWN ON MAP ON FILE IN BOOK 138, PAGE 33 OF PARCEL MAPS IN THE OFFICE OF THE COUNTY RECORDER OF THE COUNTY OF RIVERSIDE, STATE OF CALIFORNIA AND PORTIONS OF LOTS 2,5 AND 7 IN BLOCK 5 OF THE SUBDIVISION OF SECTIONS 11, TOWNSHIP 3 SOUTH, RANGE 1 WEST, SAN BERNARDINO BASE AND MERIDIAN AS SHOWN BY MAP ON FILE IN BOOK 9, PAGE 10 OF MAPS, RECORDS OF THE COUNTY OF SAN BERNARDINO IN THE COUNTY OF RIVERSIDES, STATE OF CALIFORNIA	
EXISTING ZONING & LAND USE GENERAL PLAN LAND USE: DOWNTOWN MIXED USE (DMU) ZONING DOWNTOWN MULTIPLE FAMILY RESIDENTIAL (DMF) MAX. DENSITY 22 DWELLING UNITS PER AC	
PROPOSED USE: APARTMENTS / R-2 OCCUPANCY COMMUNITY BLDG / A-3 OCCUPANCY CARPORTS / 'U' OCCUPANCY MISC: MAIL KIOSK MAINTENANCE SHED	

BUILDING / UNIT MIX COUNT

BUILDING No.	1BR/1BA		2BR/2BA		2BR/2BA		DWELLING UNIT CT.
	A1	A2	B1	B2	C1	C2	
BLDG 1	2	2	2	2	2	2	12
BLDG 2	2	2	2	2	2	2	12
BLDG 3	2	2	2	2	2	2	12
BLDG 4	2	2	2	2	2	2	12
BLDG 5	2	2	2	2	2	2	12
BLDG 6	2	2	2	2	2	2	12
BLDG 7	2	2	2	2	2	2	12
BLDG 8	2	2	2	2	2	2	12
BLDG 9	2	2	2	2	2	2	12
BLDG 10	2	2	2	2	2	2	12
BLDG 11	2	2	2	2	2	2	12
BLDG 12	2	2	2	2	2	2	12
BLDG 13	2	2	2	2	2	2	12
BLDG 14	2	2	2	2	2	2	12
BLDG 15	2	2	2	2	2	2	12
BLDG 16	2	2	2	2	2	2	12
SUB TOTAL	32	32	32	32	32	32	192
TOTAL	64		64		64		
%	33%		67%				100%

TOTAL DWELLING UNITS PER AC = 192/10.93 = 17.5 D.U. PER AC

OPEN SPACE REQUIREMENTS

FOR MULTIFAMILY DEVELOPMENTS OF 20 OR MORE UNITS, EACH UNIT SHALL HAVE A MIN OF 200 SF OF USABLE OPEN SPACE

TOTAL 192 D.U x 200 = 38,400 SF REQUIRED OPEN SPACE

TOTAL OPEN SPACE PROVIDED
PATIO / BALCONY
EACH DWELLING UNIT HAS 70sf OF OPEN SPACE WHICH WE CAN MULTIPY BY 1.25 FOR OPEN SPACE
= 70x1.25 = 87.5sf
= 192 D.U. X 87.5 = 16,800sf

COMMUNITY BUILDING
POOL AND DECK AREA = 4,462 sf
FITNESS CENTER = 1,040 sq. ft.
LANDSCAPE OPEN SPACE MIN 6 FOOT WIDTH
OPEN SPACE COURT 'A' = 5,693 sq. ft. (AT BLDG 12,13,14,&15)
OPEN SPACE COURT 'B' = 5,693 sq. ft. (AT BLDG 8,9,10&11)
DOG PARK = 5,732 sq. ft.
FITNESS AMENITIES = 5,777 sq. ft.

TOTAL OPEN SPACE PROVIDED = 44,197 sq. ft.

BUILDING AREA TYPE I - 2 STORY (12 DWELLING UNITS)
TYPE VB CONST. SPRINKLERED 13R

FIRST FLOOR AREAS (HABITABLE SPACE)

UNIT TYPE	DESCRIPTION	LIVING AREA		QTY. DU	DU x SUB TOTAL
UNIT A1	1BR/1BA	774 sf		2	1,548 sf
UNIT B1	2BR/2BA	1042 sf		2	2,084 sf
UNIT C1	2BR/2BA	1074 sf		2	2,148 sf
TOTAL 1st FLOOR HABITABLE BUILDING AREAS				6	5,780 sf

AUXILIARY AREA (NON CONDITIONED SPACE)

UNIT TYPE	DESCRIPTION	PATIO-BALCONY	COVERED ENTRY	WH	SUB TOTAL	QTY. DU	DU x SUB TOTAL
UNIT A1	1BR/1BA	72 sf	41 sf	18 sf	131 sf	2	262 sf
UNIT B1	2BR/2BA	72 sf	41 sf	18 sf	131 sf	2	262 sf
UNIT C1	2BR/2BA	72 sf	41 sf	18 sf	131 sf	2	262 sf
TOTAL 1st FLOOR AUXILIARY AREA (NON CONDITIONED SPACE)						6	786 sf
TOTAL 1st FLOOR HABITABLE & NON CONDITIONED BUILDING AREAS							6,566 sf

SECOND FLOOR AREAS (HABITABLE SPACE)

UNIT TYPE	DESCRIPTION	LIVING AREA		QTY. DU	DU x SUB TOTAL
UNIT A1	1BR/1BA	774 sf		2	1,548 sf
UNIT B1	2BR/2BA	1042 sf		2	2,084 sf
UNIT C1	2BR/2BA	1074 sf		2	2,148 sf
TOTAL 2ND FLOOR HABITABLE BUILDING AREAS				6	5,780 sf

AUXILIARY AREA (NON CONDITIONED SPACE)

UNIT TYPE	DESCRIPTION	PATIO-BALCONY	COVERED ENTRY	WH	SUB TOTAL	QTY. DU	DU x SUB TOTAL
UNIT A1	1BR/1BA	72 sf	41 sf	18 sf	131 sf	2	262 sf
UNIT B1	2BR/2BA	72 sf	41 sf	18 sf	131 sf	2	262 sf
UNIT C1	2BR/2BA	72 sf	41 sf	18 sf	131 sf	2	262 sf
TOTAL 2ND FLOOR AUXILIARY AREA (NON CONDITIONED SPACE)						6	786 sf
TOTAL 2ND FLOOR HABITABLE & NON CONDITIONED BUILDING AREAS							6,566 sf
TOTAL BUILDING AREA (HABITABLE SPACE)						12	11,560 sf
TOTAL BUILDING HABITABLE AREA & NON CONDITIONED SPACE							13,132 sf

COMMUNITY BUILDING - 1 STORY		COVERED PARKING AREAS	
DESCRIPTION	DESCRIPTION	DESCRIPTION	DESCRIPTION
COMMUNITY BUILDING AREA	+/- 3,760sf	5 ADA STALL (50'x 18')	900sf
MAIL BOX KIOSK	95sf	5 VAN ADA STALL (55'x 18')	954sf
MAINTENANCE BLDG	400sf	6 STALL (54'x 18')	972sf
TRASH ENCLOSURES	442sf x (6)	8 STALL (72'x 18')	1,296sf

PARKING REQUIRED

UNIT TYPES	UNITS	RATIO	QTY.
1 BRDM	64	1.25	80
2 BRDM	128	2	256
TOTAL UNITS	192		
TOTAL PARKING REQ'D			336

REQ'D COVERED PARKING

UNIT TYPES	NO. OF UNITS	QTY.
ZERO FOR 1BR UNITS	64 D.U.	0
(1) STALL FOR 2BR UNITS	128 D.U.	128
TOTAL COVERED PARKING REQ'D		128

REQ'D ACCESSIBLE PKG

PER CBC SECTION 1109A.4 PER SECTION

1109A.4 "ASSIGNED PARKING" AT LEAST 2% OF THE ASSIGNED PARKING SPACES SHALL BE ACCESSIBLE IN EACH TYPE OF PARKING FACILITY. AT LEAST 1 SPACE OF EACH TYPE OF PARKING FACILITY SHALL BE MADE ACCESSIBLE PROVIDED 2% ACCESSIBLE PARKING OF EACH TYPE:

UNIT TYPES	NO. OF UNITS
OPEN STALLS	280 x .04 = 6 STALLS MIN
COVERED STALLS	128 x .02 = 3 MIN STALLS

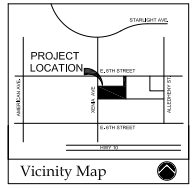
REQ'D FUTURE EV STALLS

PER CALGREEN 2019 TABLE 5.106.5.3.3
TOTAL NUMBER OF STALLS 201 AND OVER SHALL REQUIRE 10% OF NUMBER OF STALLS TO BE IDENTIFIED FOR FUTURE EV STALLS

TOTAL STALLS PROVIDED 408 x10% = 41 EV STALLS

PARKING PROVIDED

PARKING TYPE	%	QTY.
OPEN STALLS		
OPEN STANDARD STALLS (18'x9')		255
OPEN COMPACT STALLS (16'x8'-6")		19
ADA OPEN STALLS		6
TOTAL OPEN STALLS PARKING	68%	280
CARPORTS		
STANDARD CARPORTS (16)18'x9'		108
COMPACT CARPORTS (2)16'x8'-6"		16
ADA CARPORTS (4) 18'x9'		4
TOTAL CARPORT PARKING	31%	128
TOTAL PARKING	100%	408
PARKING TO UNIT RATIO		2.15 /DU



SJA Design Group
1915 Carolina Ave.
Clovis CA 93611
PH: 559. 593.9692

Mulit-Family Project
XXX XENIA AVE.
Beaumont, CA

Janice K. Elder
C22169
Renewal Date: 08/26/23

Date: 09.13.22
Drawn By: Susan Jones
Project # 20024

Overall
Site Plan

Revisions
1 x

SHEET No.
A1.0

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Figure 3. Project Site Plan
2021-301.01 Xenia Multi-Family Residential Project







ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Figure 4. Apartment Building Elevations
2021-301.01 Xenia Multi-Family Residential Project

2.1.5 Beaumont-Cherry Valley Water District Annexation

As of September 2022, the BCVWD service area covers approximately 28 square miles, virtually all of which is in Riverside County and includes the City of Beaumont and the community of Cherry Valley. The Project Site is within the BCVWD SOI boundaries but outside of the water service area boundaries. The Project Site would be serviced by BCVWD after annexation.

The Proposed Project's discretionary approvals includes actions necessary to annex approximately 9.08 acres of the Project Site to the BCVWD via the Riverside LAFCO. A water main would be extended onto the Project Site from an existing line in 8th Street and a sewer main would be extended onto the Project Site from an existing line in Xenia Avenue. The following parcels would be annexed into the BCVWD:

- Parcel 1: APN: 419-170-022-6
- Parcel 1: Portion of APN: 419-170-027-1
- Parcel 2: APN: 419-170-016-1
- Parcel 3: APN: 419-170-017-2
- Parcel 4: APN: 419-170-018-3
- Parcel 5: APN: 419-160-005-0
- Parcel 6: APN: 419-160-024-7

2.2 Project Construction Timing

Construction of the Project is estimated to begin in the year 2023 and last approximately 18 months. Construction activities are expected to consist of site preparation, grading, building construction, paving, and architectural coating. The Project is expected to be operational in the year 2024 (RK Engineering Group, Inc. 2022a).

2.3 Regulatory Requirements, Permits, and Approvals

The Proposed Project would require the following approvals and regulatory permits:

- Statewide Construction General Permit by the State Water Resources Control Board (SWRCB)
- Project approval by the City of Beaumont
- Issuance of building permits by the City of Beaumont
- Annexation of portions of the 10.93-acre Project Site to the BCVWD

2.4 Consultation With California Native American Tribe(s)

In accordance with Assembly Bill 52, the City contacted ten culturally affiliated Native American tribes in November 7, 2022 to extend the opportunity to consult on the project's potential effects to tribal cultural resources. The Augustine Band of Cahuilla Indians and the Agua Caliente Band of Cahuilla Indians

responded and did not request consultation. Because neither tribe requested consultation, the City examined other lines of evidence to assess the impacts to tribal cultural resources.

3.0 ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED AND DETERMINATION

3.1 Environmental Factors Potentially Affected

The environmental factors checked below would be potentially affected by the Project, involving at least one impact that is a *Potentially Significant Impact,* as indicated by the checklist on the following pages.

☐ Aesthetics	☐ Hazards/Hazardous Materials	☐ Recreation
☐ Agriculture and Forestry Resources	☐ Hydrology/Water Quality	☐ Transportation
☐ Air Quality	☐ Land Use and Planning	☐ Tribal Cultural Resources
☐ Biological Resources	☐ Mineral Resources	☐ Utilities and Service Systems
☐ Cultural Resources	☐ Noise	☐ Wildfire
☐ Energy	☐ Paleontological Resources	☐ Mandatory Findings of Significance
☐ Geology and Soils	☐ Population and Housing	
☐ Greenhouse Gas Emissions	☐ Public Services	

Determination

On the basis of this initial evaluation:

I find that the Project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.	☐
I find that although the Project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the Project have been made by or agreed to by the Project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.	☒
I find that the Project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.	☐
I find that the Project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.	☐
I find that although the Project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the Project, nothing further is required.	☐

Carole Kendrick — 9.08.2023

Carole Kendrick
Planner Manager

Date

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4.0 ENVIRONMENTAL CHECKLIST AND DISCUSSION

4.1 Aesthetics

4.1.1 Environmental Setting

4.1.1.1 State Scenic Highways

The California Scenic Highway Program protects and enhances the scenic beauty of California's highways and adjacent corridors. The California Department of Transportation (Caltrans) can designate a highway as scenic based on how much natural beauty can be seen by users of the highway, the quality of the scenic landscape, and if development impacts the enjoyment of the view.

There are no State Scenic Highways in the City of Beaumont or in the vicinity of the Project Site (Caltrans 2019). The nearest eligible State Scenic Highway is SR-243 approximately 3.8 miles southeast of the Project Site.

4.1.1.2 General Plan

The City of Beaumont is located in north-central Riverside County, at the summit of the San Gorgonio Pass. Beaumont is bounded on the west by the City of Calimesa, on the north by the unincorporated community of Cherry Valley; on the south by I-10; and on the east by the City of Banning. Beaumont is located approximately 70 miles east of downtown Los Angeles, 21 miles northeast of the City of Riverside; and 21 miles southeast of the City of San Bernardino.

The City is located in the San Gorgonio Pass, which serves as a link from the central Inland Empire to the west with the Coachella Valley desert to the east. Primary vistas of the Pass area are the San Gorgonio Mountains and the San Bernardino Mountains to the north and the San Jacinto Mountains to the southeast. Intermittent views of the mountains can be seen along major thoroughfares in the area. An open space area referred to as the *Badlands* is located within the southwestern portion of the City. The Badlands is topographically characterized by deeply dissected ravines with intervening ridgeline (City of Beaumont 2020a; 2020b). The San Timoteo Badlands area is considered a scenic vista according to the City's General Plan; therefore development proposals within the Badlands area will be given special attention by the City.

4.1.1.3 Visual Character of the Project Site

The Project Site comprises 10.93 acres located east of Xenia Avenue and about 200 feet south of East 8th Street. The property consists of vacant land; however, the site was used for agriculture in the 1980s and earlier (West Coast Environmental and Engineering 2006). The property has a relatively flat terrain with elevations ranging from 2,607 feet amsl toward the north portion of the site to 2,600 feet amsl in the south portion. Surface drainage is generally to the south, with some minor local variations. The Project Site has been repeatedly disturbed through repeated mechanical disturbance for weed abatement as well as off-road vehicle use and trash dumping. There are no standing structures on the Project Site. A

concrete foundation approximately 20 feet long by 10 feet wide is located near the northern boundary of the Project Site. This foundation is approximately eight inches above the ground surface and is not visible from public viewpoints on East 8th Street because it is behind the existing houses on East 8th Street. The foundation is more than 350 feet from the nearest public viewpoints on Xenia Avenue and is not generally visible due to its low profile.

Near the Project Site, Xenia Avenue offers distant views of the San Bernardino Mountains to the north and San Jacinto Mountains to the southeast. These distant views are partially obscured by intervening structures, landscaping, and above-ground utilities.

4.1.2 Aesthetics (I) Environmental Checklist and Discussion

Except as provided in Public Resources Code Section 21099, would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) have a substantial adverse effect on a scenic vista?	☐	☐	☒	☐

Less than Significant Impact.

The Project Site has a General Plan designation of Multi-Family Residential. Given the nature of the Proposed Project as a multi-family residential development, the Proposed Project would be consistent with the General Plan designation.

The Project Site is surrounded by vacant land to the south and residential uses to the north, west, and east. Xenia Avenue offers distant views of the San Bernardino Mountains to the north and San Jacinto Mountains to the southeast. These distant views are partially obscured by intervening structures, landscaping, and above-ground utilities. The existing foundation on the Project Site is not a scenic resource and its removal would not adversely affect a scenic vista. The Project Site is approximately 10 miles southeast of the San Timoteo Badlands; implementation of the Proposed Project would not have an effect on this scenic resource.

The proposed two-story residential units would reach a maximum of 29 feet 10 inches in height, which would be comparable to the residential developments in the vicinity of the Project Site, including two- -story townhomes located east of the Project Site, and two-story apartment buildings located to the west. Therefore, the Proposed Project is not anticipated to significantly obstruct natural scenic views or vistas. A less than significant impact would occur and no mitigation measures are required.

Except as provided in Public Resources Code Section 21099, would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☒

No Impact.

The Project is not located within or near a state scenic highway. Therefore, no impact would occur.

Except as provided in Public Resources Code Section 21099, would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
c) In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the Project is in an urbanized area, would the Project conflict with applicable zoning and other regulations governing scenic quality?	☐	☐	☐	☒

No Impact.

The Project is in an urbanized area and the site is currently zoned for Downtown Multi-Family Residential use and designated in the General Plan for Multi-Family Residential. The surrounding area includes single family and multifamily uses including townhomes and apartments. The Project would alter the vacant character of the Project Site by developing two-story apartment buildings, a pool/recreation area, community club, dog park, and parking areas. The Proposed Project would maintain similar aesthetics and building design as the surrounding land uses and would be consistent with the City General Plan designation. Therefore, no significant adverse impacts are identified or anticipated and no mitigation measures are required.

Except as provided in Public Resources Code Section 21099, would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
d) Would the Project create a new source of substantial light or glare, which would adversely affect day or nighttime views in the area?	☐	☐	☒	☐

Less than Significant Impact.

The Project Site is currently undeveloped and therefore contains no sources of existing light or glare. The site is surrounded by residential uses to the north, west and east that produce ambient nighttime light. Street lighting is located along the northern side of 8th Street, north of the Project Site.

Construction Lighting

No construction would occur at nighttime. Therefore, there would be no impact related to lighting during construction.

Operational Lighting

The Project would introduce new sources of light and glare to the site from lighting for residential units, community building, parking lots, pedestrian pathways, landscaping, and signage. The amount of lighting proposed would be appropriate for a multi-family residential development, consistent with security purposes, and would be similar to ambient lighting produced by the surrounding residential neighborhoods. As a multifamily residential project, Project lighting is not expected to have a significant impact on the night sky, as it would only incrementally add to the existing background light levels as a result of surrounding residential development. The Proposed Project would comply with City regulations and design standards, including the use of shielding around light fixtures at the edge of the Project Site to minimize spillover effects on surrounding properties. Due to the developed nature of surrounding properties and the shielded design of proposed light fixtures on the site, impacts from lighting would be less than significant.

Construction and Operational Glare

The reflection of sunlight is the primary potential producer of glare from glass and metallic surfaces. New sources of glare would include glare from construction vehicles on site during Project construction. During Project operation, sources of glare include headlights from cars entering and leaving the site at night, as well as windows on cars and buildings, which could reflect sunlight during certain times of the day. Architectural glass with low glare characteristics, as well as fencing and landscaping around the perimeter of the Project Site, would minimize light and glare impacts on surrounding properties. Adherence to Beaumont Municipal Code (BMC) Chapter 8.50 Outdoor Lighting requirements would reduce light and glare impacts to a less than significant level.

4.1.3 Mitigation Measures

No significant impacts were identified; no mitigation measures are required.

4.2 Agriculture and Forestry Resources

4.2.1 Environmental Setting

Forest land, as defined by PRC Section 12220(g), is defined as follows:

> "…land that can support 10-percent native tree cover of any species, including hardwoods, under natural conditions, and that allows for management of one or more forest resources, including timber, aesthetics, fish and wildlife, biodiversity, water quality, recreation, and other public benefits."

Timberland, as defined by PRC Section 4526, is defined as follows:

> "…land, other than land owned by the federal government and land designated by the board as experimental forest land, which is available for, and capable of, growing a crop of trees of a commercial species used to produce lumber and other forest products,

including Christmas trees. Commercial species shall be determined by the board on a district basis."

Timberland zoned Timberland Production, as defined by PRC Section 51104(g), is defined as:

> "…an area which has been zoned pursuant to Section 51112 or 51113 and is devoted to and used for growing and harvesting timber, or for growing and harvesting timber and compatible uses, as defined in subdivision h."

According to the California Department of Conservation (DOC) Important Farmland Finder, the Project Site is classified as Urban and Built-Up Land. The site is neither located on or near Prime Farmland nor under a Williamson Act Contract (DOC 2022). The Project Site is zoned Downtown Residential Multi-Family and is not zoned as forest land or agriculture (City of Beaumont 2020a). The Project Site and surrounding properties are not currently used for agriculture or timberland production, as defined by the California PRC.

4.2.2 Agriculture and Forestry Resources (II) Environmental Checklist and Discussion

Would the Project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒

No Impact.

According to the Beaumont Land Use Plan, no land in the City is zoned for agricultural uses (City of Beaumont 2020a). The Project Site was historically used for agricultural uses, which may have included crops or livestock grazing, from approximately 1949 into the 1980s (West Coast Environmental and Engineering 2006). The Project Site is currently undeveloped and is surrounded by commercial, industrial, and residential uses. The California Mapping and Monitoring Program Important Farmlands Map lists the Project Site as Urban and Built-Up Land. Therefore, the Proposed Project would not convert Farmland, as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use. No impact would occur.

Would the Project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒

No Impact.

The Project Site is not located on land zoned for agricultural use. According to the California Important Farmland Finder, the Project Site is mapped as Urban and Built-Up Land and not an agricultural preserve subject to a Williamson Act contract (DOC 2022). The Proposed Project would not conflict with zoning for agricultural use or a Williamson Act contract. No impact would occur.

Would the Project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))?	☐	☐	☐	☒

No Impact.

The Project is located on vacant land surrounded by residential and commercial land uses. The Project Site is not located on land designated for forest land, timberland, or timberland zoned Timberland Production. No impact would occur.

Would the Project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒

No Impact.

The Project Site is not zoned for forest land, timberland, or Timberland Production (DOC 2022). Therefore, the Proposed Project would not result in the loss of forest land or conversion of forest land to non-forest use. No impact would occur.

Would the Project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
e) Involve other changes in the existing environment, which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒

No Impact.

The Project Site and surrounding properties are not designated for agriculture use. Areas to the north, east, south, and west of the Project Area are on land designated as Urban and Built-Up Land (DOC 2022). Development on the Project Site would not result in the conversion of farmland to non-agricultural use or conversion of forest land to non-forest use. No impact would occur.

4.2.3 Mitigation Measures

No significant impacts were identified; no mitigation measures are required.

4.3 Air Quality

4.3.1 Environmental Setting

This section is based in part on the results of the *Xenia Multifamily Residential Project Air Quality and Greenhouse Gas Impact Study* performed by RK Engineering Group, Inc. in December 2022 (RK Engineering 2022a; Appendix A). The purpose of that assessment was to estimate criteria air pollutants attributable to the Project and determine the level of impact the Project would have on the environment. The methodology follows the California Air Resources Board (CARB), the South Coast Air Quality Management District (SCAQMD), and City of Beaumont recommendations for quantification of emissions and evaluation of potential impacts.

The Project Site is located near the southeast corner of Xenia Avenue and East 8th Street, in the City of Beaumont. The Project Site is located within the South Coast Air Basin (SoCAB), the SCAQMD Banning Pass General Forecast Area, and the Banning Pass Area Air Monitoring Area-29. The SoCAB occupies the non-desert portions of Los Angeles, Riverside, and San Bernardino counties and all of Orange County. The air basin is on a coastal plain with connecting broad valleys and low hills and is bounded by the Pacific Ocean on the southwest, with high mountains forming the remainder of the perimeter. The mountain ranges to the east affect the diffusion of pollutants by inhibiting the eastward transport of pollutants. Air quality in the SoCAB generally ranges from fair to poor and is similar to air quality in most of coastal Southern California. The entire region experiences heavy concentrations of air pollutants during prolonged periods of stable atmospheric conditions.

Both the U.S. Environmental Protection Agency (USEPA) and CARB have established ambient air quality standards for common pollutants. These ambient air quality standards are levels of contaminants representing safe levels that avoid specific adverse health effects associated with each pollutant. The ambient air quality standards cover what are called *criteria pollutants* because the health and other effects of each pollutant are described in criteria documents. The six criteria pollutants are Ozone (O_3), Carbon Monoxide (CO), Particulate Matter (PM), Nitrogen Oxides (NO_x), Sulfur Dioxide (SO_2), and lead. Areas that meet ambient air quality standards are classified as attainment areas, while areas that do not meet these standards are classified as nonattainment areas. The portion of Riverside County encompassing the Project Site is designated as nonattainment areas for O_3 and fine particulate matter ($PM_{2.5}$) under the federal standards and O_3, course particulate matter (PM_{10}) and $PM_{2.5}$ under the state standards (CARB 2019).

The SCAQMD is the local air quality regulating authority in the Riverside County portion of the SoCAB. The SCAQMD's primary responsibility is ensuring that the National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS) are attained and maintained in the Riverside County and San Bernardino portions of the SoCAB. The SCAQMD is also responsible for adopting and enforcing rules and regulations concerning air pollutant sources, issuing permits for stationary sources of air pollutants, inspecting stationary sources of air pollutants, responding to citizen complaints, monitoring ambient air quality and meteorological conditions, awarding grants to reduce motor vehicle emissions, and conducting public education campaigns, as well as many other activities. All projects are subject to SCAQMD rules and regulations in effect at the time of construction.

The following is a list of noteworthy SCAQMD rules that are required of construction activities in the Project Area:

- **Rule 402 (Nuisance)** – This rule prohibits the discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health, or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property. This rule does not apply to odors emanating from agricultural operations necessary for the growing of crops or the raising of fowl or animals.
- **Rule 403 (Fugitive Dust)** – This rule requires fugitive dust sources to implement best available control measures for all sources, and all forms of visible PM are prohibited from crossing any property line. This rule is intended to reduce PM_{10} emissions from any transportation, handling, construction, or storage activity that has the potential to generate fugitive dust. PM_{10} suppression techniques are summarized below.
    a) Portions of a construction site to remain inactive longer than a period of three months will be seeded and watered until grass cover is grown or otherwise stabilized.
    b) All onsite roads will be paved as soon as feasible or watered periodically or chemically stabilized.
    c) All material transported offsite will be either sufficiently watered or securely covered to prevent excessive amounts of dust.
    d) The area disturbed by clearing, grading, earthmoving, or excavation operations will be minimized at all times.
    e) Where vehicles leave a construction site and enter adjacent public streets, the streets will be swept daily or washed down at the end of the workday to remove soil tracked onto the paved surface.
- **Rule 445** restricts wood burning devices from being installed into any new development and is intended to reduce the emissions of particulate matter for wood burning devices.

- **Rule 1113** governs the sale, use, and manufacturing of architectural coating and limits the Volatile Organic Compounds (VOC) content in paints and paint solvents. This rule regulates the VOC content of paints available during construction. Therefore, all paints and solvents used during construction and operation of project must comply with Rule 1113.
- **Rule 1143** governs the manufacture, sale, and use of paint thinners and solvents used in thinning of coating materials, cleaning of coating application equipment, and other solvent cleaning operations by limiting their VOC content. This rule regulates the VOC content of solvents used during construction. Solvents used during the construction phase must comply with this rule.
- **Rule 1186** limits the presence of fugitive dust on paved and unpaved roads and sets certification protocols and requirements for street sweepers that are under contract to provide sweeping services to any federal, state, county, agency or special district such as water, air, sanitation, transit, or school district.

4.3.2 Air Quality (III) Environmental Checklist and Discussion

Would the Project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☐	☒

No Impact.

As part of its enforcement responsibilities, the USEPA requires each state with nonattainment areas to prepare and submit a State Implementation Plan (SIP) that demonstrates the means to attain the federal standards. The SIP must integrate federal, state, and local plan components and regulations to identify specific measures to reduce pollution in nonattainment areas, using a combination of performance standards and market-based programs. Similarly, under state law, the California Clean Air Act requires an air quality attainment plan to be prepared for areas designated as nonattainment with regard to the NAAQS and CAAQS. Air quality attainment plans outline emissions limits and control measures to achieve and maintain these standards by the earliest practical date.

The Project Site is located within the Riverside County portion of the SoCAB, which is under the jurisdiction of the SCAQMD. The SCAQMD is required, pursuant to the federal Clean Air Act, to reduce emissions of criteria pollutants for which this region is in nonattainment. To reduce emissions for which the Riverside County portion of the SoCAB is in nonattainment, the SCAQMD has adopted the 2016 Air Quality Management Plan (AQMP). The 2016 AQMP establishes programs of rules and regulations directed at reducing air pollutant emissions and achieving the NAAQS and CAAQS. The Revised Draft 2022 AQMP is currently available as a public review draft; however, because it has not yet been adopted, the 2016 AQMP is the relevant AQMP for this analysis.

Pollutant control strategies are based on the latest scientific and technical information and planning assumptions, including the Southern California Association of Governments' (SCAG) latest Regional Transportation Plan/Sustainable Communities Strategy, updated emission inventory methodologies for various source categories, and SCAG's latest growth forecasts. SCAG's latest growth forecasts were defined in consultation with local governments and with reference to local general plans. According to the SCAQMD, in order to determine consistency with SCAQMD's air quality planning two main criteria must be addressed, which are detailed below.

4.3.2.1 Criterion 1

With respect to the first criterion, SCAQMD methodologies require that an air quality analysis for a project include forecasts of project emissions in relation to contributing to air quality violations and delay of attainment.

a) Would the project result in an increase in the frequency or severity of existing air quality violations or cause or contribute to new air quality violations?

As shown in Tables 4.3-1 and 4.3-2 (Threshold b) below), the Proposed Project would result in emissions that would be below the SCAQMD regional and localized thresholds during construction. The Proposed Project would not include the provision of new permanent stationary or significant mobile sources of criteria air pollutant emissions, and therefore, by its very nature, would not generate substantial criteria emissions from Project operations. Therefore, the Proposed Project would not result in an increase in the frequency or severity of existing air quality violations and would not have the potential to cause or affect a violation of the ambient air quality standards.

b) Would the project delay timely attainment of air quality standards or the interim emissions reductions specified in the AQMP?

As shown in Table 4.3-2, the Proposed Project would generate emissions below the SCAQMD regional thresholds for construction. Because the Project would result in less than significant regional emission impacts, it would not delay the timely attainment of air quality standards or AQMP emissions reductions.

4.3.2.2 Criterion 2

With respect to the second criterion for determining consistency with SCAQMD and SCAG air quality policies, it is important to recognize that air quality planning within the SoCAB focuses on attainment of ambient air quality standards at the earliest feasible date. Projections for achieving air quality goals are based on assumptions regarding population, housing, and growth trends. Thus, the SCAQMD's second criterion for determining Project consistency focuses on if the Proposed Project exceeds the assumptions utilized in preparing the forecasts presented its air quality planning documents. Determining if a project exceeds the assumptions reflected in the 2016 AQMP involves the evaluation of the three criteria outlined below. The following discussion provides an analysis of each of these criteria.

a) Would the project be consistent with the population, housing, and employment growth projections utilized in the preparation of the 2016 AQMP?

The Proposed Project consists of constructing 16 apartment buildings, totaling 192 multi-family residential dwelling units, on approximately 10.93 acres. The Project Site is located within the Downtown Residential Multi-Family zone. Multiple family apartments are a permitted use per *Table 17.19-1 Permitted Land Uses for Base Zone Districts in Downtown* of the BMC; thus the Project is consistent with land use projections in the City's General Plan. As such, the Project would not conflict with the land use assumptions or exceed the population or job growth projections used by SCAQMD to develop the 2016 AQMP.

b) Would the project implement all feasible air quality mitigation?

To further reduce emissions, the Project would be required to comply with emission reduction measures promulgated by the SCAQMD, such as SCAQMD Rules 402, 403, 445, 1113, and 1143. SCAQMD Rule 402 prohibits the discharge, from any source whatsoever, in such quantities of air contaminants or other material that cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or that endanger the comfort, repose, health, or safety of any such persons or the public, or that cause, or have a natural tendency to cause, injury or damage to business or property. SCAQMD Rule 403 requires fugitive dust sources to implement Best Available Control Measures for all sources, and all forms of visible PM are prohibited from crossing any property line. SCAQMD Rule 403 is intended to reduce PM_{10} emissions from any transportation, handling, or construction activity that has the potential to generate fugitive dust. As such, the Proposed Project meets this consistency criterion.

c) Would the project be consistent with the land use planning strategies set forth by SCAQMD air quality planning efforts?

The determination of AQMP consistency is primarily concerned with the long-term influence of a project on air quality. As shown in Tables 4.3-1 through 4.3-3, the Proposed Project would not exceed applicable SCAQMD thresholds of significance during construction or operation. The Proposed Project would not result in a long-term impact on the region's ability to meet state and federal air quality standards. The Proposed Project's long-term influence would also be consistent with the goals, objectives, and strategies of the SCAQMD's 2016 AQMP. The Project would be consistent with the emission-reduction goals of the 2016 AQMP and no impact would occur.

Would the Project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
b) Result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is non-attainment under an applicable federal or state ambient air quality standard?	☐	☐	☒	☐

Less than Significant Impact.

4.3.2.3 Construction Impacts

Daily air quality emissions include both on-site and off-site emissions associated with construction of the project. Regional daily emissions of criteria pollutants are compared to the SCAQMD thresholds of significance. As shown in Table 4.3-1, daily emissions of criteria pollutants are expected to be below the allowable thresholds of significance. California Emissions Estimator Model (CalEEMod) daily emissions outputs are provided in Appendix A.

Table 4.3-1. Daily Construction Emissions

Activity	Maximum Daily Emissions (lbs/day)[1]					
	VOC	NO_x	CO	SO_2	PM_{10}	$PM_{2.5}$
Site Preparation	0.53	2.06	21.53	0.04	7.78	3.98
Grading	1.43	32.00	41.19	0.21	9.02	3.19
Building Construction	1.09	4.39	24.35	0.05	2.71	0.77
Paving	0.82	1.25	17.81	0.02	0.21	0.08
Architectural Coating	62.51	0.21	3.18	0.01	0.48	0.13
Maximum[1]	**62.51**	**332.00**	**41.19**	**0.21**	**9.02**	**3.98**
SCAQMD Threshold	75	100	550	150	150	55
Exceeds Threshold	**No**	**No**	**No**	**No**	**No**	**No**

[1]Maximum daily emission during summer or winter; includes both on-site and off-site project emissions.

The Project must follow mandatory SCAQMD rules and requirements with regards to fugitive dust control, as described in Section 4.3.1. Compliance with the standard dust control measures is considered to be part of the conditions of approval for the project and built into the design features.

Table 4.3-1 shows that the Project's daily construction emissions would be below the applicable SCAQMD air quality standards and thresholds of significance. As a result, the Project would not contribute substantially to an existing or projected air quality violation.

Furthermore, by complying with the SCAQMD standards, the Project would not contribute to a cumulatively considerable net increase of any criteria pollutant for which the Project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors). Based on the analysis above, Project-related short-term (construction) air quality impacts are less than significant.

Localized Construction Emissions

As shown in Table 4.3-2, Project construction emissions would be below the SCAQMD thresholds of significance for localized construction emissions. The Project must follow all standard SCAQMD rules and

requirements with regards to fugitive dust control. Thus, the Project would result in less than significant localized construction emissions impacts.

Table 4.3-2. Localized Construction Emissions

LST Pollutants	Maximum Daily Emissions (lbs/day)1			
	NO_x (lbs/day)	CO (lbs/day)	PM_{10} (lbs/day)	$PM_{2.5}$ (lbs/day)
On-site Emissions1	3.30	33.00	7.58	3.93
SCAQMD Construction Threshold2	205.7	2,382.8	17.3	9.3
Exceeds Threshold:	**No**	**No**	**No**	**No**

[1]Maximum daily emission during summer or winter; includes on-site project emissions only.
[2]Reference 2006-2008 SCAQMD Mass Rate Localized Significant Thresholds for construction and operation. State Responsibility Area-29, Banning Airport, 4-acre site, receptor distance 25 meters.
LST=Localized Significance Threshold

4.3.2.4 Long-Term Operational Impacts

Daily Operational Impacts

Table 4.3-3 shows the daily operational emissions and compares the results to SCAQMD thresholds of significance. The Project is not expected to exceed any of the allowable daily emissions thresholds for criteria pollutants at the regional level. California Emissions Estimator Model (CalEEMod) daily emissions outputs are provided in Appendix A.

Table 4.3-3. Daily Operational Emissions

Activity	Maximum Daily Emissions (lbs/day)[1]					
	VOC	NO_x	CO	SO_2	PM_{10}	$PM_{2.5}$
Mobile Sources	4.94	5.26	48.50	0.10	11.29	3.05
Energy Sources	0.09	0.73	0.31	0.00	0.06	0.06
Area Sources	4.68	0.18	15.85	0.00	0.09	0.09
Total:	**9.71**	**6.17**	**64.66**	**0.11**	**11.43**	**3.20**
SCAQMD Threshold	*55*	*55*	*550*	*150*	*150*	*55*
Exceeds Threshold:	**No**	**No**	**No**	**No**	**No**	**No**

[1]Maximum daily emission during summer or winter; includes both on- and off-site Project emissions.
[2]Daily emissions reports are provided in Appendix A.

The Project's daily operational emissions will be below the applicable SCAQMD air quality thresholds of significance and the Project would not contribute substantially to an existing or projected air quality violation. Furthermore, by complying with the SCAQMD standards, the Project would not contribute to a cumulatively considerable net increase of any criteria pollutant for which the Project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing

emissions which exceed quantitative thresholds for ozone precursors). Based on this analysis, Project-related long-term (operational) air quality impacts are less than significant.

Localized Operational Emissions

As shown in Table 4.3-4, Project operational emissions would be below the SCAQMD thresholds of significance for localized operational emissions. Thus, the Project would result in less than significant localized operational emissions impacts.

Table 4.3-4. Localized Operational Emissions

LST Pollutants	Maximum Daily Emissions (lbs/day)[1]			
	NO_x (lbs/day)	CO (lbs/day)	PM_{10} (lbs/day)	$PM_{2.5}$ (lbs/day)
On-site Emissions[1]	1.18	18.59	0.7	0.3
SCAQMD Operation Threshold[2]	205.7	2,382.8	5.0	2.6
Exceeds Threshold:	**No**	**No**	**No**	**No**

[1]Maximum daily emission in summer or winter.
[2]Mobile source emissions include on-site vehicle emissions only. It is estimated that approximately 5% of mobile emissions will occur on the Project Site.
LST=Localized Significance Threshold

Would the Project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
c) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐

Less than Significant Impact.

4.3.2.5 Construction

Fugitive Dust

The Project is required to comply with regional rules that assist in reducing short-term air pollutant emissions associated with suspended particulate matter, also known as fugitive dust. Fugitive dust emissions are commonly associated with land-clearing activities, cut-and-fill grading operations, and exposure of soils to the air and wind. SCAQMD Rule 403 requires that fugitive dust be controlled with best-available control measures so that the presence of such dust does not remain visible in the atmosphere beyond the property line of the emission source. In addition, SCAQMD Rules 402 and 403 require implementation of dust suppression techniques to prevent fugitive dust from creating a nuisance off site.

To ensure full compliance with the applicable dust control standards, the following Project design features are recommended for the Project:

DF-1 The project must follow the standard SCAQMD rules and requirements with regards to fugitive dust control, which includes, but are not limited to the following:

1. All active construction areas shall be watered two times daily.
2. Speed on unpaved roads shall be reduced to less than 15 mph.
3. Any visible dirt deposition on any public roadway shall be swept or washed at the site access points within 30 minutes.
4. Any on-site stockpiles of debris, dirt or other dusty material shall be covered or watered twice daily.
5. All operations on any unpaved surface shall be suspended if winds exceed 15 mph.
6. Access points shall be washed or swept daily.
7. Construction sites shall be sandbagged for erosion control.
8. Apply nontoxic chemical soil stabilizers according to manufacturers' specifications to all inactive construction areas (previously graded areas inactive for 10 days or more).
9. Cover all trucks hauling dirt, sand, soil, or other loose materials, and maintain at least two feet of freeboard space in accordance with the requirements of California Vehicle Code Section 23114.
10. Pave or gravel construction access roads at least 100 feet onto the site from the main road and use gravel aprons at truck exits.
11. Replace the ground cover of disturbed areas as quickly possible.

Asbestos

Asbestos is a carcinogen and is categorized as a hazardous air pollutant by the USEPA. Asbestos fibers imbedded within construction materials become a health hazard once they are disturbed and rendered airborne, such as through physical contact like building renovation and demolition activities. Asbestos is regulated through the National Emissions Standards for Hazardous Air Pollutants (NESHAP) and SCAQMD is the local enforcement authority for asbestos. The Project would not require the demolition of existing building or structures; therefore, the potential risk from exposure to asbestos during construction is small.

Asbestos also occurs naturally in serpentine and ultramafic rock. Based on the *California Division of Mines and Geology General Location Guide for Ultramafic Rocks in California - Areas More Likely to Contain Naturally Occurring Asbestos*, naturally occurring asbestos has not been shown to occur within in the vicinity of the Project Site. Therefore, the potential risk for naturally occurring asbestos during Project construction is small (Appendix A).

In the event asbestos is found on the site, the Project would be required to comply with SCAQMD and NESHAP standards and protocols. SCAQMD Rule 1403 establishes the survey requirements, notification, and work practice requirements to prevent asbestos emissions during construction activities. By following the required asbestos abatement protocols, the Project impact from asbestos would be less than significant.

Diesel Particulate Matter

The Project would generate diesel particulate matter (DPM) during construction from off-road diesel equipment and trucks. The California Office of Environmental Health Hazard Assessment adopted the Guidance Manual for Preparation of Health Risk Assessments (HRA Guidelines) to provide procedures for use in the Air Toxics Hot Spots Program or for the permitting of existing, new, or modified stationary sources.

The HRA Guidelines provide risk factors based on exposure to toxic substances over a 30-year lifetime. The Proposed Project's construction activity is not expected to be a long-term (i.e., 30-year) source of toxic air contaminant emissions and short-term risk factors have not been developed. Due the significantly reduced risk from short-term exposure, SCAQMD does not typically require the evaluation of long-term cancer risk or chronic health impacts for construction operations from a project such as the one being proposed. Therefore, potential impacts from short-term exposure to DPM during project construction would be less than significant without the need for a detailed HRA study.

To help further reduce the potential health risks associated with DPM exposure during construction, the following project design features are recommended. Project design features include a recommendation for Tier 4 engines on all off-road diesel equipment. Tier 4 engines, along with the latest national fuel standards, have been shown to yield PM reductions of more than 95 percent from the typical Tier 2 and Tier 3 engines. Thus, ensuring the potential DPM exposure to adjacent sensitive receptors is reduced to the maximum extent feasible.

DF-2 All diesel construction equipment greater than 50 horsepower should have Tier 4 low emission "clean diesel" engines (OEM or retrofit) that include diesel oxidation catalysts and diesel particulate filters that meet the latest CARB best available control technology.

DF-3 Construction equipment should be maintained in proper tune.

DF-4 All construction vehicles should be prohibited from excessive idling. Excessive idling is defined as five minutes or longer.

DF-5 Minimize the simultaneous operation of multiple construction equipment units, to the maximum extent feasible.

DF-6 The use of heavy construction equipment and earthmoving activity should be suspended during Air Alerts when the Air Quality Index reaches the "Unhealthy" level.

DF-7 Establish an electricity supply to the construction site and use electric powered equipment instead of diesel-powered equipment or generators, where feasible.

DF-8 Establish staging areas for the construction equipment as far from adjacent residential homes, as feasible.

DF-9 Use haul trucks with on-road engines instead of off-road engines for on-site hauling.

4.3.2.6 Operation

Toxic Air Contaminants

The Project proposes residential land uses, which do not include major sources of toxic air contaminants emissions that would result in significant exposure of sensitive receptors to substantial pollutant concentrations. Therefore, the Project would have a less than significant impact in this regard.

Would the Project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	☐	☐	☒	☐

Less than Significant Impact.

4.3.2.7 Construction

Heavy-duty equipment in the Project Area during construction would emit odors; however, construction activity is temporary. The Project is required to comply with Rule 402 during construction, which states that a person shall not discharge from any source whatsoever such quantities of air contaminants or other materials which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property. Therefore, the Project impact from construction odor emissions is less than significant.

4.3.2.8 Operation

Land uses that commonly receive odor complaints include agricultural uses (i.e., farming and livestock), chemical plants, composting operations, dairies, fiberglass molding facilities, food processing plants, landfills, refineries, rail yards, and wastewater treatment plants. The Proposed Project does not contain land uses that would typically be associated with significant odor emissions.

Additionally, the Project would be required to comply with standard building code requirements related to exhaust ventilation, as well as comply with SCAQMD Rule 402, described above. Project related odors would be similar to those of existing residential development in the Project vicinity and as such, are not expected to meet the criteria of being a nuisance. Therefore, Project operation would result in less than significant odor impacts.

4.3.3 Mitigation Measures

No significant impacts were identified; no mitigation measures are required.

4.4 Biological Resources

This section is based on the analysis and recommendations presented in the *Biological Technical Report and MSHCP Consistency Analysis* prepared for the Proposed Project (ECORP 2023, Appendix B). ECORP biologists performed a literature review using the California Natural Diversity Data Base (CNDDB; California Department of Fish and Wildlife [CDFW] 2021) and the California Native Plant Society (CNPS) Electronic Inventory (CNPS 2022) to determine the special-status plant and wildlife species that have been documented in the vicinity of the Project Site. ECORP also performed a biological reconnaissance survey, a narrow endemic plant habitat assessment, California burrowing owl (*Athene cunicularia)* habitat assessment, and four protocol-level focused burrowing owl surveys (ECORP 2023; Appendix B).

4.4.1 Environmental Setting

4.4.1.1 Vegetation Communities and Land Cover Types

The Project Site is within a developed environment which is generally subjected to repeated and ongoing disturbance from human activities. Due to the Project Site's long history of repeated mechanical disturbance (discing), the Project Site did not contain any natural vegetation communities. The Project Site is better characterized as Disturbed. The Disturbed classification includes areas where the native vegetation community has been heavily influenced by human actions, such as grading, discing, trash dumping, and off-road use, but lacks development. Disturbed is not a vegetation classification, but rather a land cover type and is not typically restricted to a known elevation. The entire 10.93-acre Project Site was classified as Disturbed, and a review of historical aerial photographs show that the Project Site has been actively maintained for many years to be free of vegetation. What little vegetation that remained on the Project Site during surveys (ECORP 2023) was sparse and consisted primarily of nonnative species, such as ripgut brome (*Bromus diandrus*), cheatgrass (*Bromus tectorum*), Spanish brome *(Bromus madritensis*), and redstem filaree (*Erodium cicutarium*). The northwest portion of the Project Site contained a few isolated ornamental trees including a nonnative walnut (*Juglans* sp.), common persimmon (*Diospyros virginiana*), and Shamel ash (*Fraxinus uhdei*). One golden rain tree (*Koelreuteria bipinnata*) was also observed in the northeast corner of the Project Site.

4.4.1.2 Plants

Plant species observed on the Project Site were generally characteristic of disturbed urban areas. Dominant plant species observed on the Project Site were nonnative weedy and/or ruderal species including fiddleneck (*Amsinckia* sp.), ripgut brome, cheatgrass, Spanish brome, Bermuda grass (*Cynodon dactylon*), Russian thistle (*Salsola tragus*), and greater periwinkle (*Vinca major*). Native plants observed on the Project Site included fiddleneck (*Amsinckia* sp.), blueblossom (*Ceanothus thyrsiflorus)*, turkey mullein *(Croton setiger)*, and jimsonweed *(Datura wrightii).* A full list of plant species observed on or immediately adjacent to the Project Site is included in Appendix B.

4.4.1.3 Wildlife

The Project Site provided habitat for species adapted to disturbances and urban environments. A total of 23 bird species were observed during the reconnaissance survey and focused burrowing owl surveys, including, but not limited to, red-tailed hawk (*Buteo jamaicensis*), Anna's hummingbird (*Calypte anna*), house finch (*Haemorhous mexicanus*), and mourning dove (*Zenaida macroura*). Three mammal species were observed including California ground squirrel (*Otospermophilus beecheyi)*, Virginia opossum (*Didelphis virginiana*), domestic dog (*Canis lupus familiaris*). Two reptile species, side blotched lizard (*Uta stansburiana*) and western fence lizard (*Sceloporus occidentalis*), were also observed during the focused burrowing owl surveys. Additionally, California ground squirrel burrows, suitable for use by burrowing owl, were abundant on the Project Site. A full list of wildlife species observed on or immediately adjacent to the Project Site is included in Appendix B.

4.4.1.4 Soils

According to the Natural Resources Conservation Service (NRCS) Web Soil Survey Database, soils on the Project Site consists of Greenfield sandy loam, two to eight percent slopes, eroded, and Ramona sandy loam, two to five percent slopes, eroded (NRCS 2022).

4.4.1.5 Potential Waters of the U.S.

The Project Site does not include any state or federally protected wetlands or Waters of the U.S. (Appendix B). According to the NRCS, no mapped hydric soils are present on the Project Site.

4.4.1.6 Special-Status Plants

There were 20 special-status plant species that appeared in the literature review and database searches as occurring withing five miles of the Project Site (CDFW 2021, CNPS 2022). Of those, two are federally and/or state listed and ten are covered by the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP). A list generated from the results of the literature review and the Project Site was evaluated for suitable habitat that could support any of the special-status plant species on the list. Due to the isolated nature of the Project Site from other natural habitats, the fact that it is surrounded by development, the Project site's long history of disturbance, and the lack of mobility for plant species, the results of the literature review were limited to plant species occurring within five miles of the Project Site.

4.4.1.7 Special-Status Wildlife

The literature search documented 44 special-status wildlife species in the database search area, 13 of them are federally and/or state listed and/or candidates for state and/or federal listing, and 28 are species covered by the MSHCP (CDFW 2021). A list generated from the results of the literature review and the Project Site was evaluated for suitable habitat that could support any of the special-status wildlife species on the list. Mechanical disturbances on the Project Site, proximity to residential development, and the presence of anthropogenic influences on the Project Site likely preclude many of these species from occurring.

4.4.2 Biological Resources (IV) Environmental Checklist and Discussion

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	☒	☐	☐

Less than Significant with Mitigation Incorporated.

The Project Site, which consisted wholly of disturbed land, largely devoid of native vegetation, did not support any natural vegetation communities, as defined by *A Manual of California Vegetation*, 2nd Edition. The Project Site is better characterized as Disturbed. The Disturbed classification includes areas where the native vegetation community has been heavily influenced by human actions, such as grading, discing, trash dumping, and off-road use, but lacks development. Disturbed is not a vegetation classification, but rather a land cover type and is not typically restricted to a known elevation. The literature review and database searches identified 20 special-status plant species that occur within five miles of the Project Site. However, due to the isolated nature of the Project Site from natural habitats, the fact that it is surrounded by development, the Project site's long history of disturbance, and the lack of mobility for plant species, all of the 20 plant special-status plant species identified within five miles of the Project site were presumed absent due to lack of suitable habitat (including elevation, soils, and vegetation community associations) on the Project site. No special-status, rare or narrow endemic plant species are expected to occur on the Project Site and no impacts to special-status, rare, or narrow endemic species are expected with the development of the Project Site. Therefore, no additional surveys or mitigation measures for special-status plant species are recommended at this time.

Of the 44 special-status wildlife species identified in the literature search, one species was determined to have a high potential to occur, one was determined to have a low potential to occur, and the remaining 42 species were presumed absent. Burrowing owl was found to have a high potential to occur on the Project Site and the Project Site is located within a MSHCP-designated survey area for burrowing owl (Appendix B). The biological reconnaissance survey and habitat assessment determined that suitable burrowing owl habitat was present on the Project Site, including California ground squirrel burrows that provided suitable burrow habitat. Due to the presence of suitable burrowing owl habitat, focused breeding season surveys were required per the MSHCP. Four protocol-level focused surveys for burrowing owl were conducted by ECORP biologists on June 24, July 1, July 29, and August 2, 2022, within the Survey Area according to the MSHCP *Burrowing Owl Survey Instructions*. Although potentially suitable habitat was present in the Survey Area, no burrowing owls or occupied burrows (e.g., burrowing containing whitewash, pellets, feathers, bones of prey items) were observed during the protocol-level focused surveys for burrowing owl. A total of 15 potential burrowing owl burrows were recorded within the Survey Area; of those 15 potential burrows, 12 were located within the Project Site, and the remaining three were

located south of the Project Site within the 500-foot buffer. However, due to the mobile nature of the species, it is possible that burrowing owls could use the Project Site prior to the start of Project activities. If burrowing owls are present on the Project Site, direct impacts in the form of ground disturbance, vegetation removal, habitat loss, and mortality and indirect impacts from construction noise and vibrations may occur. Impacts to burrowing owl would be less than significant with the implementation of Mitigation Measures BIO-1 and BIO-2.

Loggerhead shrike (*Lanius ludovicianus*) was determined to have a low potential to occur due to the presence of suitable foraging and nesting habitat, and historical CNDDB occurrences within five miles of the Project Site. Limited foraging habitat for this species was present within the disturbed land and the presence of small trees could provide nesting habitat for the species. Direct impacts in the form of ground disturbance, vegetation removal, habitat loss, and mortality and indirect impacts from construction noise and vibrations may occur if loggerhead shrike is present on the Project Site. However, impacts to loggerhead shrike would be less than significant with the implementation of Mitigation Measures BIO-2 and BIO-3.

The trees and shrubs immediately adjacent to the Project Site, and the disturbed land on the Project Site could provide nesting habitat for nesting birds and raptors protected by the Migratory Bird Treaty Act (MBTA) and California Fish and Game Code. The timing of the nesting season varies greatly depending on several factors, such as the bird species, weather conditions in any given year, and long-term climate changes (e.g., drought, warming). and changing climate conditions may result in the nesting bird season occurring earlier and later in the year than historical nesting season dates. To ensure compliance with all applicable laws pertaining to nesting birds and to avoid take of nests, a nesting bird survey should be conducted prior to initial ground disturbance regardless of the time of year. If nesting birds are present on the Project Site, ground-disturbing construction activities could directly affect nesting birds and other birds protected by the MBTA and their nests through the removal of habitat on the Project site, and indirectly through increased noise, vibrations, and increased human activity. Impacts to nesting birds would be less than significant with the implementation of Mitigation Measure BIO-2 and BIO-3.

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	☐	☐	☒

No Impact.

The Project Site consists of disturbed land, which supported nonnative and ruderal species. The Project Site does not contain riparian habitat or other sensitive natural communities. No impacts to sensitive natural communities would result from the development of the Proposed Project.

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☐	☒

No Impact.

No federal or state jurisdictional waters or wetlands were observed on the Project Site during the biological reconnaissance survey and no federal or state jurisdictional waters or wetlands were identified on or immediately adjacent to the Project Site during the literature review (USFWS 2022). Therefore, it was determined that the Project Site does not include waters or wetlands that are potentially jurisdictional to the U.S. Army Corps of Engineers, CDFW, or Regional Water Quality Control Board (RWQCB). No impacts state or federally protected wetlands and/or water will result from the development of the Project.

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☐	☒

No Impact.

The Project Site is located adjacent to areas containing existing disturbances (e.g., roadways, commercial and residential developments). The Project Site could provide wildlife movement opportunities since it consists of open and unimpeded land. However, the Project Site would not be considered a corridor because it is bounded by residential developments to the north, west, and east and has a long history of anthropogenic disturbance. Additionally, there are no features on site that would facilitate wildlife movement and little to no cover for larger animals. No migratory wildlife corridors or native wildlife nursery sites were identified within the Project Site. No impacts to these resources are expected to occur during the development of the Project Site.

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☒	☐

Less than Significant Impact.

The MSHCP provides for the protection and preservation of important and significant biological resources consistent with local, state and federal regulations. As a local permittee, the City has adopted the MSHCP and complies with all applicable requirements when considering actions associated with the General Plan's implementation.

The City of Beaumont does not have a Tree Preservation Policy or Ordinance. Furthermore, there are no guidelines in the BMC that protect or maintain biological resources. Therefore, impacts would be less than significant and no mitigation is required.

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☒	☐	☐

Less than Significant with Mitigation Incorporated.

4.4.2.1 Habitat Conservation Plans and Natural Community Conservation Plans

The Project Site is located within the planning area for the Western Riverside MSHCP. The Project Site is not located within any Conservation Areas, Criteria Cells, or Subunit designations according to the MSHCP. The Project Site is located within a MSHCP-designated survey area for burrowing owl and two narrow endemic plant species (Yucaipa onion [Marvin's onion, *Allium marvinii*] and many-stemmed dudleya [*Dudleya multicaulis*]). The Project Site contained suitable habitat for burrowing owl, but no suitable habitat for Yucaipa onion or many-stemmed dudleya was present. Implementation of Mitigation Measure BIO-1 would be consistent with the MSHCP requirements, and as detailed below, is required to reduce potential impacts to burrowing owl to a less than significant level.

4.4.2.2 Western Riverside County MSHCP Consistency Analysis

The Project Site is located within the planning area for the MSHCP, but outside of any Cell Groups, Criteria Cells, and Subunit designations. Section 6.0 of the MSHCP requires assessment of the potential effects from the Project on biological resources including riparian/riverine areas, vernal pools, and fairy shrimp, burrowing owl, and narrow endemic plant species. In addition, the MSHCP requires an Urban/Wildlands Interface analysis be conducted to address the indirect effects associated with locating proposed development in proximity of MSHCP Conservation Areas. These resources were assessed during the reconnaissance survey and are discussed below in relation to the Project.

The Proposed Project consists of the construction of apartment building development which is a covered activity under the MSHCP for areas outside of Criteria Area (RCTLMA 2022). Since development of the Project site is a covered activity within the MSHCP (see section 7.1 for Covered Activities Outside Criteria

Area), it is an allowable use that has been contemplated within the MSHCP (RCTLMA 2022). However, projects that are covered still need to demonstrate compliance with Section 6.0 and other requirements of the MSHCP.

4.4.2.3 Riparian/Riverine, Vernal Pool, and Fairy Shrimp Habitat Assessment (MSHCP Section 6.1.2)

In accordance with Section 6.1.2 of the MSHCP, a habitat assessment was performed for riparian and riverine communities, vernal pools, and fairy shrimp. The Project Site contained neither vernal pool habitat nor suitable habitat for fairy shrimp. No riparian vegetation was observed and no defined channels or drainages were identified on the Project Site. Additionally, the Project Site did not contain any riverine resources. Therefore, no impacts to these resources are expected.

4.4.2.4 Narrow Endemic Plant Species (MSHCP Section 6.1.3)

The Regional Conservation Authority's (RCA) MSHCP Information Map was reviewed to determine whether the Project Site is located within a Narrow Endemic Plant Species Survey Area (NEPSSA), in accordance with Section 6.1.3 of the MSHCP. The Project Site is located within a NEPSSA for the following narrow endemic plant species: Yucaipa onion (Marvin's onion) and many-stemmed dudleya. Although the Project Site occurs within the appropriate elevation range for Yucaipa onion and records have been identified within five miles of the Project Site, Yucaipa onion was not observed during any of the surveys, and no chaparral habitat or clay soils suitable for the species were present on the Project Site. The soils on site consist of Greenfield sandy loam and Ramona sandy loam, which are not suitable for the species.

Although the Project Site is located within a designated MSHCP survey area for many-stemmed dudleya, this species was not observed during any of the surveys, and no suitable chaparral, coastal sage scrub, or grassland habitat with clay and/or cobbly clay soils exists on the Project site. The soils on site consist of Greenfield sandy loam and Ramona sandy loam, which are not suitable for the species. Additionally, no records of this species were identified within the database searches. The closest record of this species was from 1981 and was located approximately 27 miles southwest of the Project site near Lake Mathews.

4.4.2.5 Urban/Wildlands Interface Guidelines (MSHCP Section 6.1.4)

The requirements for Urban/Wildlands Interface for the management of edge factors do not apply to this Project Site because the Project Site is not situated adjacent to any MSHCP-designated conserved lands. The nearest MSHCP-designated conserved lands area is located approximately 2.0 miles south and 2.9 miles northeast of the Project Site. Therefore, there will be no net long-term increase of edge impacts occurring as a result of Project development.

4.4.2.6 Additional MSHCP Required Surveys (MSHCP Section 6.3.2)

The RCA MSHCP Information Map (2021) was reviewed to determine if the Project Site is located with any other MSHCP-designated survey areas. A review of the Information Map determined that the site is not located within an area where additional surveys are required for any amphibian, mammal, or other criteria

area species. However, the search identified that the Project Site is located within the burrowing owl survey area.

The Project Site contains suitable burrowing owl habitat within the disturbed open areas. The soils within the Project Site are also suitable for burrowing owl. California ground squirrel burrows, which could support burrowing owls, were present on the Project Site. Pursuant to MSHCP Section 6.3.2, burrowing owl surveys shall be conducted if the Project Site contains natural or manufactured structures that could potentially support burrowing owls or burrowing owls are observed during the habitat assessment. Due to the presence of suitable California ground squirrel burrows on the Project Site, focused burrowing owl surveys were required.

Four protocol-level focused surveys for burrowing owl were conducted by ECORP biologists on June 24, July 1, July 29, and August 2, 2022, within the survey area. Although potentially suitable habitat was present in the survey area, no burrowing owls or occupied burrows (e.g., burrowing containing whitewash, pellets, feathers, bones of prey items) were observed during the protocol-level focused surveys for burrowing owl. A total of 15 potential burrowing owl burrows were recorded within the Survey Area; of those 15 potential burrows, 12 were located within the Project Site and the remaining three were located south of the Project Site, within the 500-foot buffer. No burrowing owls or occupied burrowing owl burrows were observed or detected during the protocol-level focused surveys for burrowing owl.

Due to the mobile nature of the species, the previous documentation of potential burrows, identified occupied burrow complexes and burrows, and based on the presence of California ground squirrel activity, it is possible for burrowing owl to occupy the Project Site before the start of construction of the Project. Therefore, a pre-construction surveys for burrowing owl will be required prior to initial ground disturbance. The MSHCP *Burrowing Owl Survey Instructions* (RCTLMA 2006) required a pre-construction survey to be conducted within 30 days prior to ground disturbance activities. However, following the finalization of the MSHCP, CDFW published revised guidance within the CDFW *Staff Report on Burrowing Owl Mitigation* (California Department of Fish and Game [CDFG] 2012), which recommends two surveys be conducted. The first survey should be conducted between 30 and 14 days prior to initiating ground disturbance and the second survey should be conducted within 24 hours prior to ground disturbance.

The Project Site is also located within a NEPSSA for the following narrow endemic plant species: Yucaipa onion (Marvin's onion) and many-stemmed dudleya. However, no chaparral habitat or clay soils suitable for Yucaipa onion were present on the Project Site and no chaparral, coastal sage scrub, or grassland habitat with clay and/or cobbly clay soils suitable for many-stemmed dudleya were present on the Project Site. The soils on the Project Site consist of Greenfield sandy loam and Ramona sandy loam, which are not suitable for either of these species. Due to the lack of suitable habitat, these species are presumed absent, and no additional surveys will be required for narrow endemic plants.

4.4.3 Mitigation Measures

BIO-1: **Burrowing Owl Pre-Construction Surveys and Avoidance:** The Project Area was determined to be suitable for burrowing owl due to the presence of suitable habitat and recent records of the species that have been recorded near the Project Site. Prior to ground disturbing activities, a qualified wildlife biologist (i.e., a wildlife biologist with previous

burrowing owl survey experience) shall conduct pre-construction surveys of the Project Site, plus a 500-foot buffer, to locate active breeding or wintering burrowing owls and burrowing owl burrows between 30 and 14 days prior to construction. The survey methodology will be consistent with the methods outlined in the CDFW *Staff Report on Burrowing Owl Mitigation* (CDFG 2012) and will consist of walking parallel transects 20 to 60 feet apart, adjusting for vegetation height and density as needed, and noting any potential burrows with fresh burrowing owl sign or presence of burrowing.

A qualified biologist shall conduct an additional pre-construction survey of the Project Site plus an approximately 500-foot buffer no more than 24 hours prior to the start of ground-disturbing activities associated with construction activities to identify any additional burrowing owls or burrows necessitating avoidance, minimization, or mitigation measures. The results of the survey should be submitted to the City and CDFW within five days of survey completion.

If no burrowing owls are observed during the survey, Project Site preparation and construction activities may begin, and no further action is necessary. If burrowing owls are found to be present, then avoidance or minimization measures shall be undertaken in consultation with the City and CDFW. CDFW shall be sent written notification within 48 hours of detection of burrowing owls. If active burrowing owl burrows are detected, the Project Applicant shall not commence activities until no sign is present that the burrows are being used by adult or juvenile owls or following CDFW approval of a Burrowing Owl Plan as described below. If owl presence is difficult to determine, a qualified biologist shall monitor the burrows with motion-activated trail cameras for at least 24 hours to evaluate burrow occupancy. The onsite qualified biologist will verify the nesting effort has finished according to methods identified in the Burrowing Owl Plan.

The Burrowing Owl Plan shall be prepared in accordance with guidelines in the CDFG *Staff Report on Burrowing Owl* (March 2012) and MSHCP. The qualified biologist and Project Applicant shall coordinate with the City, CDFW, and USFWS to develop a Burrowing Owl Plan to be approved by the City, CDFW, and USFWS prior to commencing Project activities. The Burrowing Owl Plan shall describe proposed avoidance, relocation, monitoring, minimization, and/or mitigation actions. The Burrowing Owl Plan shall include the number and location of occupied burrow sites and details on proposed buffers if avoiding the burrowing owls or information on the adjacent or nearby suitable habitat available to owls for relocation. If no suitable habitat is available nearby for relocation, details regarding the creation and funding of artificial burrows (numbers, location, and type of burrows) and management activities for relocated owls shall also be included in the Burrowing Owl Plan. The City and Project Applicant shall implement the Burrowing Owl Plan following CDFW and USFWS review and approval.

If burrowing owls are observed within Project Site during Project implementation and construction, the Project Applicant shall notify CDFW immediately in writing within 48 hours of detection. A Burrowing Owl Plan shall be submitted to CDFW for review and approval

within two weeks of detection and no Project activity shall continue within 1,000 feet of the burrowing owls until CDFW approves the Burrowing Owl Plan. The City and the Project Applicant shall be responsible for implementing appropriate avoidance and mitigation measures, including burrow avoidance, passive or active relocation, or other appropriate mitigation measures as identified in the Burrowing Owl Plan.

If ground-disturbing activities occur but the Project Site is left undisturbed for more than 30 days, a preconstruction survey for burrowing owl shall be conducted and reported to CDFW as described above. If a burrowing owl is found, the same coordination described above shall be necessary.

A final letter report shall be prepared by the qualified biologist documenting the results of the passive relocation. The letter shall be submitted to CDFW prior to the start of Project activities.

BIO-2: **Biological Monitoring:** A qualified biologist shall be present to monitor all initial ground-disturbing and vegetation-clearing activities conducted for the Project. During each monitoring day, the biological monitor shall perform clearance survey "sweeps" at the start of each workday that vegetation clearing takes place to minimize impacts on special-status species with potential to occur. The monitor will be responsible for ensuring that impacts to special-status species, nesting birds, and active nests will be avoided to the greatest extent possible. Biological monitoring shall take place until the Project Site has been completely cleared of any vegetation. If an active nest is identified, the biological monitor shall establish an appropriate disturbance limit buffer around the nest using flagging or staking. Construction activities shall not occur within any disturbance limit buffer zones until the nest is deemed no longer active by the biologist. If special-status wildlife species are detected during biological monitoring activities, then consultation with the USFWS and/or CDFW shall be conducted, and a mitigation plan shall be developed to avoid and offset impacts to these species. Mitigation measures may consist of work restrictions or additional biological monitoring activities after ground-disturbing activities are complete.

BIO-3: **Pre-Construction Survey for Nesting Birds:** Regardless of the time of year, the Project Applicant shall ensure a nesting bird survey is completed prior to the start of any development activities (such as ground disturbance, construction activities, and/or removal of trees and vegetation) within the Project Site. This will avoid violations of the MBTA and California Fish and Game Code Sections 3503, 3503.5, and 3513. The pre-construction nesting bird survey shall include the Project Site and adjacent areas where Project activities have the potential to cause nest failure.

The survey results shall be provided to the City's Planning Department. The Project Applicant shall adhere to the following:

- Applicant shall designate a qualified biologist experienced in: identifying local and migratory bird species of special concern; conducting bird surveys using appropriate survey methodology; nesting surveying techniques, recognizing breeding and

nesting behaviors, locating nests and breeding territories, and identifying nesting stages and nest success; determining/establishing appropriate avoidance and minimization measures; and monitoring the efficacy of implemented avoidance and minimization measures.

- Pre-construction surveys shall be conducted at the appropriate time of day/night, during appropriate weather conditions, no more than three days prior to the initiation of Project activities. Surveys shall encompass all suitable areas including trees, shrubs, bare ground, burrows, cavities, and structures. Survey duration shall take into consideration the size of the Project Site; density, and complexity of the habitat; number of survey participants; survey techniques employed; and shall be sufficient to ensure the data collected is complete and accurate.

If no nesting birds are observed during the survey, Project Site preparation and construction activities may begin. If nesting birds (including nesting raptors) are found to be present, then avoidance or minimization measures shall be undertaken in consultation with the City and CDFW. Measures shall include immediate establishment of an appropriate buffer zone to be established by a qualified biologist, based on their best professional judgement and experience. The buffer around the nest shall be delineated and flagged, and no construction activity shall occur within the buffer area until a qualified biologist determines nesting species have fledged and the nest is no longer active, or the nest has failed. The qualified biologist shall monitor the nest at the onset of Project activities, and at the onset of any changes in such Project activities (e.g., increase in number or type of equipment, change in equipment usage, etc.) to determine the efficacy of the buffer. If the qualified biologist determines that such project activities may be causing an adverse reaction, the qualified biologist shall adjust the buffer accordingly or implement alternative avoidance and minimization measures, such as redirecting or rescheduling construction or erecting sound barriers. All work within these buffers will be halted until the nesting effort is finished (i.e., the juveniles are surviving independent from the nest) or failed. The onsite qualified biologist will review and verify compliance with these nesting avoidance buffers and will verify the nesting effort has finished. Work can resume within these avoidance areas when no other active nests are found.

Upon completion of the survey and nesting bird monitoring, a report shall be prepared and submitted to the City for mitigation monitoring compliance record keeping.

4.5 Cultural Resources

ECORP Consulting, Inc. prepared the *Cultural Resources Inventory and History Evaluation Report* (ECORP 2022; Appendix C) for the Proposed Project to determine if cultural resources were present in or adjacent to the Project Area and assess the sensitivity of the Project Area for undiscovered or buried cultural resources. Cultural resources include prehistoric archaeological sites, historic archaeological sites, and historic structures, and generally consist of artifacts, food waste, structures, and facilities made by people in the past. Prehistoric archaeological sites are places that contain the material remains of activities carried

out by the native population of the area (i.e., Native Americans) prior to the arrival of Europeans in Southern California. Places that contain the material remains of activities carried out by people during the period when written records were produced after the arrival of Europeans are considered historic archaeological sites. Historic structures include houses, garages, barns, commercial structures, industrial facilities, community buildings, and other structures and facilities that are more than 50 years old. Historic structures may also have associated archaeological deposits, such as abandoned wells, cellars, privies, refuse deposits, and foundations of former outbuildings.

4.5.1 Cultural Resources (V) Environmental Checklist and Discussion

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5?	☐	☒	☐	☐

Less Than Significant with Mitigation Incorporated.

The records search indicated that 33 previous cultural resource studies have been conducted within one mile of the Project Area, none of which encompass the Project Site. No resources have previously been recorded within the Project Area as a result of those studies. However, 15 historic-period resources have been recorded within one mile of the Project Area. These include eight single-family properties, two transmission lines, one highway/trail, one railroad, one water conveyance system, one area of landscaping with associated refuse scatter, and one cemetery (ECORP 2022).

As a result of the field survey, one historic-period resource was recorded on the Project Area: a historic-period concrete foundation with vault and a concrete pad measuring. The entire feature is approximately eight inches above ground surface. The site is disturbed from weed abatement and possible discing, and structures are no longer located in the Project Area. Historic maps and aerial photographs indicate the foundation was likely constructed between 1967 and 1972 as two structures are visible adjacent to the site. Although it is not clear in the aerial photographs to discern what the structures were used for, it is likely they were used for agricultural purposes. The structures were no longer visible by 2002 (ECORP 2022).

The historic-period concrete foundation with vault has been evaluated as not eligible for the National Register of Historic Places or the California Register of Historical Resources under any criteria (ECORP 2023b; Appendix C). No impact to known historical resources would occur; however, the potential always exists for ground-disturbing activities to reveal previously unknown archaeological deposits that may represent historical resources. Compliance with the unanticipated discovery procedures in Mitigation Measures CUL-1 and CUL-2 will reduce that impact to less than significant.

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☒	☐	☐

Less than Significant with Mitigation Incorporated.

The cultural resources inventory for the project (ECORP 2023b) resulted in the identification of one archaeological resource (historic-era concrete foundation and vault) that was evaluated for significance and found to be not a historical resource. Similarly, this resource does not constitute a unique archaeological resource, as defined in Section 21083.2 of the Public Resources Code.

In addition, ECORP received the results of the Sacred Lands File search by the Native American Heritage Commission (NAHC) on April 10, 2022. The search of the Scared Lands File was negative and failed to indicate the presence of Native American cultural resources in the Project Area. While the search of the Sacred Lands File failed to indicate the presence of sacred lands, the search results alone do not preclude the presence of resources of important to Native American groups in the vicinity and further data gathering efforts as part of tribal consultation were completed by the lead agency to ensure the potential sensitivity for Native American resources was understood. Correspondence between the NAHC and ECORP is included in Appendix C and information regarding the City's Native American outreach under Assembly Bill (AB) 52 and Tribal Cultural Resources is provided in Section 4.18.

The Project Area contains Pleistocene and Holocene sediments that can be contemporaneous with human occupation of the region. Although no precontact resources were identified during the field survey, due to the presence of Pleistocene and Holocene alluvial deposits within the Project Area, there exists a low to moderate potential for buried precontact archaeological sites within the Project Site. Implementation of mitigation measures CUL-1 and CUL-2 would ensure that impacts to archaeological resources would be less than significant.

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
c) Disturb any human remains, including those interred outside of dedicated cemeteries?	☐	☒	☐	☐

Less than Significant with Mitigation Incorporated.

No human remains or dedicated cemeteries were identified during the background research, field survey, and property significance evaluation. However, compliance with California Health and Safety Code Section 7050.5 governing the discovery, notification, disposition and treatment of discovered human remains and related grave goods would be adhered to during Project construction. The discovery of human remains would require handling in accordance with PRC 5097.98, which states that in the event that human remains are discovered during construction, construction activity shall be halted and the area shall be

protected until consultation and treatment can occur as prescribed by law. In the event that human remains are unearthed during construction or demolition activities, implementation of mitigation measures CUL-1 and CUL-1 would ensure that impacts to unanticipated human remains are less than significant.

4.5.2 Mitigation Measures

CUL-1: If subsurface deposits believed to be cultural or human in origin are discovered during construction, all work must halt within a 100-foot radius of the discovery. A qualified professional archaeologist, meeting the Secretary of the Interior's Professional Qualification Standards for pre-contact and historic archaeologist, shall be retained to evaluate the significance of the find, and shall have the authority to modify the no-work radius as appropriate, using professional judgment. The following notifications shall apply, depending on the nature of the find:

- If the professional archaeologist determines that the find does not represent a cultural resource, work may resume immediately, and no agency notifications are required.
- If the professional archaeologist determines that the find does represent a cultural resource from any time period or cultural affiliation, the archaeologist shall immediately notify the lead federal agency, the lead CEQA agency, and landowner. The agencies shall consult on a finding of eligibility and implement appropriate treatment measures, if the find is determined to be a Historical Resource under CEQA, as defined in Section 15064.5(a) of the CEQA Guidelines or a historic property under Section 106 of the National Historic Preservation Act (NHPA), if applicable. Work may not resume within the no-work radius until the lead agencies, through consultation as appropriate, determine that the site either: 1) is not a Historical Resource under CEQA or a Historic Property under Section 106; or 2) that the treatment measures have been completed to their satisfaction.
- If the find includes human remains, or remains that are potentially human, they shall ensure reasonable protection measures are taken to protect the discovery from disturbance (AB 2641) by maintaining at least 50 feet of buffer in all directions. The archaeologist shall notify the County Coroner (per Section 7050.5 of the Health and Safety Code). The provisions of Section 7050.5 of the California Health and Safety Code, Section 5097.98 of the California PRC, and AB 2641 will be implemented. If the Coroner determines the remains are Native American and not the result of a crime scene, the Coroner will notify the NAHC, which then will designate a Native American Most Likely Descendant (MLD) for the Project (Section 5097.98 of the PRC). The designated MLD will have 48 hours from the time access to the property is granted to make recommendations concerning treatment of the remains. If the landowner does not agree with the recommendations of the MLD, the NAHC can mediate (Section 5097.94 of the PRC). If no agreement is reached, the landowner must rebury the remains where they will not be further disturbed (Section 5097.98 of

the PRC). This will also include either recording the site with the NAHC or the appropriate Information Center; using an open space or conservation zoning designation or easement; or recording a reinternment document with the county in which the property is located (AB 2641). Work may not resume within the no-work radius until the lead agencies, through consultation as appropriate, determine that the treatment measures have been completed to their satisfaction.

CUL-2: At the onset of construction, a Worker Environmental Awareness Program (WEAP) will be developed by the qualified professional archaeologist. A qualified professional archaeologist with experience with sensitive cultural resources in the region will present the WEAP to all personnel working in the Project Area (either temporarily or permanently) prior to the start of project activities. The WEAP may be videorecorded and used to train newly hired workers or those not present for the initial WEAP. The WEAP could include, but will not be limited to: discussions of the sensitive cultural resources associated with the project, project-specific measures to avoid or eliminate impacts to these resources, consequences for not complying with project permits and agreements, and contact information for the lead archaeologist. Logs of personnel who have taken the training will be kept on the site at the construction or project office.

4.6 Energy

This section analyzes energy consumption due to the potential direct and indirect environmental impacts associated with the Project. Such impacts include the depletion of nonrenewable resources (e.g., oil, natural gas, coal) and emissions of pollutants during the construction and operational phases. The impact analysis below focuses on the four sources of energy that are relevant to the Proposed Project: electricity, natural gas, the equipment-fuel necessary for Project construction, and the automotive fuel necessary for Project operations.

4.6.1 Environmental Setting

4.6.1.1 Introduction

Energy usage includes both direct and indirect sources of emissions. Direct sources of emissions include onsite natural gas usage (non-hearth) for heating, while indirect emissions include electricity generated by offsite power plants. Natural gas use is measured in units of a thousand British thermal units per size metric for each land use subtype and electricity use is measured in Kilowatt Hours (kWh) per size metric for each land use subtype.

CalEEMod divides building electricity and natural gas use into uses that are subject to Title 24 standards and those that are not. Lighting electricity usage is also calculated as a separate category in CalEEMod. For electricity, Title 24 uses include the major building envelope systems covered by Part 6 (California Energy Code) of Title 24, such as space heating, space cooling, water heating, and ventilation. Non-Title 24 uses include all other end uses, such as appliances, electronics, and other miscellaneous plug-in uses.

CalEEMod makes lighting a separate category because some lighting is not considered as part of the building envelope energy budget.

For natural gas, uses are likewise categorized as Title 24 or Non-Title 24. Title 24 uses include building heating and hot water end uses. Non-Title 24 natural gas uses include cooking and appliances (including pool/spa heaters).

Electricity use is measured in kWh, and natural gas use is measured in therms. Vehicle fuel use is typically measured in gallons (e.g., of gasoline or diesel fuel), although energy use for electric vehicles is measured in kWh. The electricity consumption associated with all nonresidential uses in Riverside County from 2016 to 2020 is shown in Table 4.6-1. As indicated, the demand has increased since 2016.

Table 4.6-1. Residential Electricity Consumption in Riverside County 2016-2020

Year	Electricity Consumption (kilowatt hours)
2020	8,843,231,701
2019	7,681,424,150
2018	7,646,485,987
2017	7,636,566,993
2016	7,171,695,160

Source: California Energy Commission (CEC) 2021

The natural gas consumption associated with all nonresidential uses in Riverside County from 2016 to 2020 is shown in Table 4.6-2. As indicated, the demand has increased since 2016.

Table 4.6-2. Residential Natural Gas Consumption in Riverside County 2016-2020

Year	Natural Gas Consumption (therms)
2020	302,049,299
2019	304,776,599
2018	259,344,553
2017	254,095,676
2016	252,688,320

Source: CEC 2021

4.6.2 Energy (VI) Environmental Checklist and Discussion

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during Project construction or operation?	☐	☐	☒	☐

Less than Significant Impact.

The Project would be required to provide onsite renewable energy photovoltaic installations (solar panels), as required by the latest 2019 CA Energy Code requirements. The Energy Code requires all new residential construction to achieve net-zero emissions associated with electricity usage through the use of onsite renewable sources. However, this analysis is conservative and does not include emissions reductions from renewables (Appendix A). The three main types of energy expected to be consumed by the Project include electricity, natural gas, and petroleum products in the form of gasoline and diesel fuel. The California Emissions Estimator Model Version 2020.4.4 (CalEEMod) was used to calculate energy usage from project construction and operational activities (Refer to Appendix L for the CalEEMod calculations) (RK Engineering Group, Inc., 2023).

Electricity Consumption

Construction

Electricity usage during Project construction may include lighting, electric equipment, and mobile office uses, however, CalEEMod does not calculate electricity usage during construction. During construction electricity usage is anticipated to be short-term and relatively minor compared to the operational demand, and therefore electricity usage during this phase is not factored into this analysis (RK Engineering Group, Inc. 2023).

Operation

Electricity usage during Project operations would include building heating and cooling, lighting, appliances, electronics, mechanical equipment, parking lot lighting, and electric vehicle charging. Indirect electricity usage would also be utilized to supply, distribute, and treat water and wastewater. Electricity would be provided by Southern California Edison (RK Engineering Group, Inc. 2023).

Natural Gas Consumption

The Project would use natural gas for building heating and cooling and gas water heaters. Natural gas is not expected to be used during construction in any significant quantities and is not included in the overall calculation of the Project's natural gas consumption (RK Engineering Group, Inc. 2023).

Petroleum Consumption

The Project's consumption of energy from petroleum products is primarily from transportation-related activities, which include gasoline and diesel fuel usage for auto and truck trips during construction and operation and off-road equipment usage during construction. CalEEMod was used to estimate the Project's petroleum energy consumption.

Construction

Construction of the project is estimated to last approximately 18 months and include site preparation, grading, building construction, paving, and architectural coating phases. Construction activities would consume energy in the form of motor vehicle fuel (gasoline and diesel) for off-road construction equipment and on-road vehicle trips. Vehicle trips include workers, vendors, and haulers traveling to and from the Project Site (RK Engineering Group, Inc. 2023).

Table 6 in Appendix L shows the project's energy consumption for all off-road equipment during construction. All off-road equipment is assumed to run on diesel fuel. As shown in Table 6 the Project is anticipated to consume approximately 50,680 gallons of diesel fuel for construction off-road equipment usage. Table 7 in Appendix L shows the Project's energy consumption from on-road vehicle trips during construction, of which approximately 33,996 gallons would be gasoline consumption and approximately 683,702 gallons would be for diesel fuel usage (RK Engineering Group, Inc. 2023).

Operation

The Project would consume energy from auto and truck trips generated by the proposed land use. Operational vehicle trips are associated with workers, residents, and vendors/non-workers (i.e., delivery, service, maintenance vehicles, etc.) traveling to and from the Project Site. Table 8 in Appendix L shows the annual operational trips energy consumption data, which is estimated to be approximately 166,355 gallons of gasoline consumption and approximately 12,446 gallons of diesel consumption annually Analysis (RK Engineering Group, Inc. 2023.

Appendix L of this document provides a detailed breakdown of Project energy consumption for electricity usage, natural gas consumption, construction petroleum consumption, and operational petroleum consumption. Refer to Appendix L for the detailed tables. Table 4.6-1 provides a summary of the Project's estimated annual operational energy consumption.

Table 4.6-3. Total Operational Energy Consumption

Activity	Annual Energy Consumption (MBtu/yr)
Electricity	5,429.76
Natural Gas	2,904.17
Petroleum	21,743.78
Total Annual Energy Consumption	**30,077.71**

Source: Table 9 of the Energy Conservation Analysis (RK Engineering Group, Inc. 2023)

As shown in Table 4.6-3, the total operational energy consumption would be approximately 30,078 MBtu/year. The Project is required to comply with the mandatory requirements of California's Building Efficiency Standards (Title 24, Part 6) to reduce energy consumption. California's building standards are some of the strictest in the nation and the Project's compliance with the Building Code will ensure that the Project would not result in the wasteful, inefficient, or unnecessary consumption of energy. The California Building Code is designed to reduce the amount of energy used to heat or cool a building, reduce energy usage for lighting and appliances and promote usage of energy from renewable sources. Additionally, the Project would provide solar installations to satisfy the prescribed Energy Design Ratings from the Energy Code and in doing so would significantly reduce the Project's reliance on fossil fuels for building energy (RK Engineering Group, Inc, 2023).

Compliance with the California Green Building Standards Code would ensure that modern energy efficiency standards are met for the Project's energy-demanding components. In addition, *Sustainable Beaumont: The City's Roadmap to Greenhouse Gas Reductions* (Sustainable Beaumont), Goal 10, requires project applicants to demonstrate sufficient consistency with the City's Greenhouse Gas (GHG) reduction goals by way of energy efficiency, renewable energy use, and other options that provide predictable GHG reductions. Compliance with the California Green Building Standards Code and the City's GHG reduction plan would prevent wasteful, inefficient, or unnecessary consumption of energy resources. Therefore, impacts would be less than significant.

Petroleum fuel (such a diesel and gasoline) necessary for Project construction would be required for the operation and maintenance of construction equipment and the transportation of materials to the Project Site. The fuel expenditure necessary to construct the physical building and infrastructure would be temporary, lasting only as long as Project construction. As such, Project construction would have a nominal effect on local and regional energy supplies. No unusual Project characteristics would necessitate the use of construction equipment that would be less energy efficient than at comparable construction sites in the region or the state. Construction contractors would purchase their own gasoline and diesel fuel from local suppliers and would judiciously use fuel supplies to minimize costs due to waste and subsequently maximize profits. Additionally, construction equipment fleet turnover and increasingly stringent state and federal regulations on engine efficiency combined with state regulations limiting engine idling times and requiring recycling of construction debris, would further reduce the amount of transportation fuel demand during Project construction. For these reasons, it is expected that construction fuel consumption associated with the Project would not be any more inefficient, wasteful, or unnecessary than other similar development projects of this nature. Impacts would be less than significant.

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☐	☐	☒	☐

Less Than Significant Impact.

The Project would be required to comply with the mandatory requirements of the latest 2019 California Building Standards Code, including Title 24, Part 11, CALGreen and Title 24, Part 6, Energy Code. The purpose of the building standards is to reduce negative impacts on the environment through improved planning and design, energy efficiency, water efficiency and conservation and material and resource conservation. The California Building Standards were developed to help meet the requirements of the Global Warming Solutions Act (AB 32). Southern California Edison (SCE) would provide electricity for Project operations. SCE is subject to the requirements of California Senate Bill 100 (SB 100), which is the most stringent and current energy legislation in the state. SB 100 requires that renewable energy resources and zero-carbon resources supply 100 percent of retail sales of electricity to California end-use customers and 100 percent of electricity acquired to serve all state agencies by December 31, 2045 (RK Engineering Group, Inc. 2023).

Additionally, the Project would be designed in a manner that is consistent with relevant energy conservation plans designed to encourage development that results in the efficient use of energy resources. The Project would include solar panels for each building. Relevant energy conservation plans specific to Beaumont include *Sustainable Beaumont: The City's Roadmap to Greenhouse Gas Reductions*, which establishes goals and policies that incorporate environmental responsibility into daily management of community and municipal operations. The City has set a goal to reduce emissions to 1990 levels by the year 2020, and to 41.7 percent below 2012 levels by 2030 (City of Beaumont 2015). The specific *Sustainable Beaumont* goals listed in Table 4.6-4 below, require project applicants to demonstrate sufficient consistency with the City's GHG reduction goals by way of energy efficiency, renewable energy use, and other options.

Table 4.6-4. Compatibility with *Sustainable Beaumont* Goals

Goal	Project Compatibility
Goal 2: Increase Energy Efficiency in New Residential Development	**Compatible.** The Project will comply with the mandatory requirements of the California Building Standards Code, Title 24, Part 6 (Energy Code) and Part 11 (CALGreen), including, but not limited to: • Install low flow fixtures and toilets, water efficient irrigation systems, drought tolerant/native landscaping, and reduce the amount of turf. • Provide the necessary infrastructure to support electric vehicle charging. • Provide solar installations per the prescribed Energy Design Ratings.
Goal 5: Increase Energy Efficiency through Water Efficiency	**Compatible.** The Project will install low flow fixtures and toilets, water efficient irrigation systems, drought tolerant/native landscaping, and reduce the amount of turf.
Goal 8: Decrease Greenhouse Gas Emissions through Reducing Solid Waste Generation	**Compatible.** The Project will participate in the local waste management recycling and composting programs.

Table 4.6-4. Compatibility with *Sustainable Beaumont* Goals	
Goal	**Project Compatibility**
Goal 9: Decrease Greenhouse Gas Emissions through Increasing Clean Energy Use	**Compatible.** As part of the latest Energy Code requirements, the Project would be required to include rooftop solar panels, community solar panels, and/or other sources of onsite renewable energy capable of meeting the required California Energy Code Energy Design Rating.
Goal 10: Decrease GHG Emissions from New Development through Performance Standards	**Compatible.** In addition to the measures described above, the Project will encourage the property management company and landscape maintenance crews to use electric powered landscaping equipment for landscape maintenance. No wood-burning or natural gas fireplaces will be included in the Project.

Table 4.6-5 shows the applicable energy-related policies from the applicable elements of the City of Beaumont General Plan and how the Project would comply with those applicable policies.

Table 4.6-5. Applicable Energy-Related Policies from the City of Beaumont General Plan	
Energy-Related Policy from the City's General Plan	**Project Compatibility**
Conservation and Open Space Element	
Policy 8.1.5 Encourage new development to reduce building energy use by adopting passive solar techniques and heat island reduction strategies: • Maximizing interior daylighting. • Using cool exterior siding, cool roofing, and paving materials with relatively high solar reflectivity to reduce solar heat gain. • Planting shade trees on south- and west-facing sides of new buildings to reduce energy loads. • Installing water efficient vegetative cover and planting, substantial tree canopy coverage.	**Compatible.** As part of the latest Energy Code requirements, the Project would be required to include rooftop solar panels, community solar panels, and/or other sources of onsite renewable energy capable of meeting the required California Energy Code Energy Design Rating.
Policy 8.2.1 Promote the incorporation of alternative energy generation (e.g., solar, wind, biomass) in public and private development.	**Compatible.** As part of the latest Energy Code requirements, the Project would be required to include rooftop solar panels, community solar panels, and/or other sources of onsite renewable energy capable of meeting the required California Energy Code Energy Design Rating.
Policy 8.2.2 Establish clear guidance for new solar residential mandate established by the California Energy Commission as part of the 2019 California Building Code update.	**Compatible.** The Project will comply with the mandatory requirements of the California Building Standards Code, Title 24, Part 6 (Energy Code) and Part 11 (CALGreen), including, but not limited to: • Install low flow fixtures and toilets, water efficient irrigation systems, drought tolerant/native landscaping, and reduce

Table 4.6-5. Applicable Energy-Related Policies from the City of Beaumont General Plan	
Energy-Related Policy from the City's General Plan	**Project Compatibility**
	the amount of turf. • Provide the necessary infrastructure to support electric vehicle charging. • Provide solar installations per the prescribed Energy Design Ratings.

Compliance with the California Green Building Standards Code, he City's GHG reduction plan, and the City's General Plan demonstrates that the Project would be consistent with the energy efficiency strategies included in *Sustainable Beaumont*. The Project would not interfere with the City's GHG Reduction Strategy or the City's General Plan and would not conflict with or obstruct the state plan for renewable energy. Based on the analysis above, the Project would have a less than significant impact with regards to state or local plans for renewable energy or energy efficiency.

4.6.3 Mitigation Measures

No significant impacts were identified; no mitigation measures are required.

4.7 Geology and Soils

A site-specific geotechnical investigation was conducted for the Project by GeoTek, Inc. in July 2021 and revised on September 28, 2022 (GeoTek 2022; Appendix D). The report presents findings based on the results of field and laboratory programs, data review, and engineering analyses. The field exploration program consisted of drilling 10 exploratory borings to depths of 20 to 50 feet.

4.7.1.1 Geomorphic Setting

Beaumont is located along the northern boundary of the Peninsular Ranges in the San Gorgonio Pass. The City is located within a seismically active region at the junction of the Transverse Ranges and the Peninsular Ranges. The City could be affected by the San Jacinto Fault, the San Andreas Fault Zone in the San Gorgonio pass area, the Banning Fault, and Beaumont Plains Fault Zone. The City and its designated spheres of influence are mostly undeveloped; nearly one half of the City's land area consists of vacant land (City of Beaumont 2020a).

4.7.1.2 Regional Seismicity and Fault Zones

The California DOC, Division of Mines and Geology, defines an *active fault* as one that has been subjected to surface displacement within the last 11,000 years. A fault is considered *inactive* if it has not shown geologic evidence of surface displacement in the last 11,000 years.

The geologic structure of the entire Southern California area is dominated mainly by northwest-trending faults associated with the San Andreas system. The site is in a seismically active region. No active or

potentially active fault is presently known to exist at this site nor is the site situated within an *Alquist-Priolo* Earthquake Fault Zone. The County of Riverside has designated the site area as *not in fault zone*, *not in a fault line*, having a *low* potential for liquefaction, and *susceptible* to subsidence. According to the California Geological Survey 7.5-Minute Quadrangle, the nearest known active faults are the San Gorgonio Pass Fault Zone located 2.7 miles to the northeast of the site and the Banning Fault located 2.6 miles to the north of the site (GeoTek 2022).

4.7.1.3 Soils

The geotechnical explorations noted that the upper approximately one foot of soil is loose and disturbed due to the past agricultural activities at the site. The topsoil mostly consists of dry to slightly moist, light brown silty sand. According to the NRCS Web Soil Survey Database, soils on the Project Site consist of Greenfield sandy loam, two to eight percent slopes, eroded, and Ramona sandy loam, two to five percent slopes, eroded (NRCS 2022).

4.7.1.4 Paleontological Resources

In September 2022, ECORP requested a paleontological records search for the Proposed Project from the Western Science Center (2022) to determine if paleontological resources were present in or adjacent to the Project Area and assess the area for undiscovered paleontological resources. The paleontological database search included the paleontology locality and specimen collection records for the Project Area and surrounding area (one-mile radius). The records search is included as Appendix E.

4.7.2 Geology and Soils (VII) Environmental Checklist and Discussion

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Directly or indirectly cause substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☐	☒
ii) Strong seismic ground shaking?	☐	☐	☒	☐
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☐	☒
iv) Landslides?	☐	☐	☐	☒

No Impact.

i. The San Jacinto Fault, considered to be one of the most active faults in Southern California, crosses the southern portion of the City and SOI. The San Andreas Fault is approximately six miles northeast of the City. The branch of the Banning Fault closest to Beaumont is inactive. The Project Site is not within a state designated Alquist Priolo Earthquake Fault Zone (City of Beaumont 2020a; 2020b). The nearest fault zone is the Beaumont Plain Fault Zone, which is located approximately 1.5 miles west of the Project Site. The likelihood for onsite rupture is considered low due to the absence of known faults and fault zones within the vicinity. Therefore, no significant impacts are identified or anticipated and no mitigation measures are required.

Less than Significant Impact.

ii. The Project Site is in Southern California, which is prone to ground shaking during earthquakes. Therefore, due to its location is Southern California the Project Site is also subject to ground shaking during an earthquake, as is any other proposed development project. However, as detailed in Threshold i) directly above, the Project Site is not within a state designated Alquist Priolo Earthquake Fault Zone (City of Beaumont 2020a; 2020b). The nearest fault zone is the Beaumont Plain Fault Zone, which is located approximately 1.5 miles west of the Project Site. Additionally, the City of Beaumont adopted the Uniform Building Code, which requires that the construction of structures comply with the California Building Code (CBC) to reduce the hazard risks posed by earthquakes. Adhering to these codes would ensure that potential ground-shaking impacts are reduced to less than significant level. Therefore, impacts would be less than significant.

No Impact.

iii. Due to the anticipated depth to groundwater (greater than 200 feet), the potential for liquefaction at the site is extremely low (GeoTek 2022; Appendix D). No impact would occur.

No Impact.

iv. Landslides and slope failure can result from ground motion generated by earthquakes. The slopes within the San Timoteo Badlands are the most susceptible to landslides in the City. These slopes are approximately 10 miles northwest of the Project Site. The Project Site and its surrounding areas are relatively flat. The Project Site is not on or close to areas with existing landslides or with high susceptibility to seismically induced landslides and rockfalls. No impact would occur.

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐

Less than Significant Impact.

All excavation, grading, and construction activities would be conducted according to the CBC 2019. The Project would be required to comply with the National Pollutant Discharge Elimination System (NPDES) standards to ensure that pollutants are not discharged in the storm drain system. The applicant has submitted a Preliminary Water Quality Management Plan (WQMP, Appendix F) that incorporates the foregoing water quality treatment features and Low Impact Development (LID) site design, source control and treatment Best Management Practices (BMPs) to address the NPDES requirements as part of the review process. This plan is intended to bring the Project into compliance with Riverside County's Municipal Separate Storm Sewer System Ordinance and the Statewide NPDES. Examples of construction phase BMPs implemented with the Stormwater Pollution Prevention Plan (SWPPP) include sandbags, silt fences, and detention basins. Prior to the issuance of building permits, a final WQMP will have to be submitted by the applicant and approved by the City's Engineering Division, and strict adherence to the program will be required. All treatment proposals would be consistent with the *Riverside County Stormwater Quality Best Management Practice Design Handbook*.

Implementation of the SWPPP, including the use of storm water quality BMPs, would prevent erosion of soil from storm water runoff during Project construction (see Section 4.10 *Hydrology and Water Quality*). Once construction is completed, soils would be stabilized and monitored according to the SWPPP until a Notice of Termination for the NPDES construction permit is filed with the RWQCB. Consequently, the Proposed Project would not result in substantial erosion and/or unstable earth conditions from Project construction or operation. For these reasons, erosion-related impacts are considered to be less than significant.

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the Project, and potentially result in onsite or offsite landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☒	☐	☐

Less than Significant with Mitigation Incorporated.

Several factors impact earthwork balancing on the site, including shrinkage, subsidence, trench spoil from utilities and footing excavations, as well as the accuracy of topography. Shrinkage is primarily dependent upon the degree of compactive effort achieved during construction. For planning purposes, a shrinkage factor of approximately five to 15 percent may be considered for the materials requiring recompaction. Subsidence of up to 0.1 foot may occur (GeoTek 2022).

The site surficial soils possess *very low* expansion potential in accordance with American Society for Testing and Materials (ASTM) D 4829, as noted by the soils data and data by past consultants. However, verification testing should be performed after site remedial grading. The foundation elements for the

proposed structures should bear entirely in engineered fill soils and should be designed in accordance with the 2019 CBC (GeoTek 2022).

To address the potential for unstable soils that are prone to collapse or subsidence, the design and engineering of the Proposed Project would adhere to the applicable ordinances of the City of Beaumont/County of Riverside and CBC, and incorporate recommendations from the Proposed Project's site-specific geotechnical investigation. With Mitigation Measure GEO-1, impacts would be less than significant.

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?	☐	☒	☐	☐

Less than Significant with Mitigation Incorporated.

Expansive soils can shrink and swell with drying and wetting. The shrink-swell potential of expansive soils can result in differential movement beneath foundations. According to the site-specific Geotechnical and Infiltration Evaluation performed by GeoTek, the near-surface earth materials on the Project Site exhibit *very low* expansion potential (GeoTek 2022; Appendix D).

The Proposed Project would be required to comply with CBC requirements related to expansive soils. The Project's foundation and structural design would be required to incorporate measures prescribed in the CBC to address these design considerations and minimize related Project impacts. Appropriate construction plans would be reviewed by the City's Building Official for consistency with current building codes and implementation of the recommendations contained in the Project's geotechnical study. The geotechnical study includes recommendations for over excavation with pre-saturation of subgrade soil (Appendix D). With implementation of mitigation measure GEO-1, which includes standard design measures required in the CBC and inclusion of the recommendations contained in the Geotechnical and Infiltration Evaluation, impacts would be reduced to less than significant.

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☐	☒

No Impact.

The Project does not propose the use of septic tanks. The proposed structures would be connected to the existing sewer system for disposal and treatment of wastewater. No impact would occur.

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☒	☐	☐

Less than Significant with Mitigation Incorporated.

The Western Science Center conducted a thorough search of their paleontology collection and data for the Project Area. The geologic units underlying the Project Site are mapped entirely as alluvial sediments from San Gorgonio Pass, dating from the Pleistocene epoch (Western Science Center 2022; Appendix E). Pleistocene alluvial units are considered to be fossiliferous (fossil-containing) and highly paleontologically sensitive. The Western Science Center's records do not have any fossil localities within the Project Area or within a one-mile radius, although they do have localities from similarly mapped units from across Southern California.

Any fossil specimens recovered from the Project Site would be scientifically significant. Excavation activity associated with the development of the Project Site has the potential to impact the paleontologically sensitive Pleistocene units, and it is the recommendation of the Western Science Center that a paleontological resource mitigation program be put in place to monitor, salvage, and curate any recovered fossils from the study area. With the implementation of Mitigation Measure GEO-2, impacts would be less than significant.

4.7.3 Mitigation Measures

GEO-1: The Project Applicant shall implement the Conclusions and Recommendations as listed in the final site-specific geotechnical report (Updated Geotechnical and Infiltration Evaluation for Proposed Multi-Family Residential Development: Xenia Apartment Project East of Xenia Avenue and about 200 Feet South of East 8th Street Beaumont, Riverside County, California, GeoTek 2022) or most recent site-specific geotechnical evaluation.

GEO-2: A qualified paleontological professional, as defined by the Society of Vertebrate Paleontology (2010) standards, will be retained by the Contractor. The qualified paleontological professional will draft the PRMP outlining protocols to be implemented during ground disturbance in case of discoveries. This mitigation and monitoring program shall be in place prior to any ground disturbance, based on the Western Science Center's findings and recommendations. The qualified paleontological professional will be present to monitor during ground-disturbance activities to ensure the protection of paleontological resources, if any. If paleontological resources are discovered during construction, all work

must halt within a 100-foot radius of the discovery. The on-site qualified paleontological professional shall notify the contractor and Project Applicant. They shall evaluate the significance of the find and shall have the authority to modify the no-work radius as appropriate, using professional judgement. The qualified paleontological professional will evaluate the significance of the find and recommend appropriate measures for the disposition of the site (e.g., fossil recovery, curation, data recovery, and/or monitoring). Construction activities may continue on other parts of the construction site while evaluation and treatment of the paleontological resource takes place.

4.8 Greenhouse Gas Emissions

This section is based in part on the results of the Air Quality and Greenhouse Gas Impact Study conducted for the Project (RK Engineering 2022a; Appendix A). The methodology follows CARB, SCAQMD, and City of Beaumont recommendations for quantification of emissions and evaluation of potential impacts. This section presents regional and local existing conditions in addition to pertinent GHG emissions-related standards and regulations. The purpose of this assessment is to estimate Project-generated GHG emissions and to determine the level of impact the Project would have on the environment.

4.8.1 Environmental Setting

GHG emissions are released as byproducts of fossil fuel combustion, waste disposal, energy use, land use changes, and other human activities. This release of gases, such as carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and chlorofluorocarbons, creates a blanket around the earth that allows light to pass through but traps heat at the surface, preventing its escape into space. While this is a naturally occurring process known as the greenhouse effect, human activities have accelerated the generation of GHGs beyond natural levels. The overabundance of GHGs in the atmosphere has led to an unexpected warming of the earth and has the potential to severely impact the earth's climate system.

Each GHG differs in its ability to absorb heat in the atmosphere based on the lifetime, or persistence, of the gas molecule in the atmosphere. CH_4 traps more than 25 times more heat per molecule than CO_2, and N_2O absorbs 298 times more heat per molecule than CO_2. Often, estimates of GHG emissions are presented in carbon dioxide equivalents (CO_2e). Expressing GHG emissions in CO_2e takes the contribution of all GHG emissions to the greenhouse effect and converts them to a single unit equivalent to the effect that would occur if only CO_2 were being emitted.

The local air quality agency regulating the Riverside County portion of the SoCAB is the SCAQMD. To provide guidance to local lead agencies on determining significance for GHG emissions in CEQA documents, SCAQMD staff convened a GHG CEQA Significance Threshold Working Group. The Working Group was formed to assist the SCAQMD's efforts to develop a GHG significance threshold and is composed of a wide variety of stakeholders including the State Office of Planning and Research, CARB, the Attorney General's Office, a variety of city and county planning departments in the Basin, various utilities such as sanitation and power companies throughout the Basin, industry groups, and environmental and professional organizations. The GHG CEQA Significance Threshold Working Group recommended the options of a numeric *bright-line* threshold of 3,000 metric tons of CO_2e ($MTCO_2e$)

annually and an efficiency-based threshold of 3.0 $MTCO_2e$ per service population (defined as the people that congregate on the Project Site) per year in 2035. The numeric bright line and efficiency-based thresholds were developed to be consistent with CEQA requirements for developing significance thresholds, are supported by substantial evidence, and provide guidance to CEQA practitioners and lead agencies with regard to determining whether GHG emissions from a Proposed Project are significant.

In *Center for Biological Diversity v. Department of Fish and Wildlife* (2015) 62 Cal. 4th 2014, 213, 221, 227, following its review of various potential GHG thresholds proposed in an academic study [Crockett, *Addressing the Significance of Greenhouse Gas Emissions: California's Search for Regulatory Certainty in an Uncertain World* (July 2011), 4 Golden Gate U. Envtl. L. J. 203], the California Supreme Court identified the use of numeric bright-line thresholds as a potential pathway for compliance with CEQA GHG requirements. The study found numeric bright line thresholds designed to determine when small projects were so small as to not cause a cumulatively considerable impact on global climate change was consistent with CEQA. Specifically, PRC section 21003(f) provides it is a policy of the state that"

> "[a]ll persons and public agencies involved in the environmental review process be responsible for carrying out the process in the most efficient, expeditious manner in order to conserve the available financial, governmental, physical and social resources with the objective that those resources may be better applied toward the mitigation of actual significant effects on the environment."

The Supreme Court-reviewed study noted"

> "[s]ubjecting the smallest projects to the full panoply of CEQA requirements, even though the public benefit would be minimal, would not be consistent with implementing the statute in the most efficient, expeditious manner. Nor would it be consistent with applying lead agency's' scarce resources toward mitigating actual significant climate change impact" (Crockett, *Addressing the Significance of Greenhouse Gas Emissions: California's Search for Regulatory Certainty in an Uncertain World* (July 2011), 4 Golden Gate U. Envtl. L. J. 203, 221, 227.)

The significance of the Project's GHG emissions is evaluated consistent with CEQA Guidelines Section 15064.4(b)(2) by considering whether the Project complies with applicable plans, policies, regulations and requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions. For the Proposed Project, the SCAQMD's 3,000 $MTCO_2e$ per year threshold is used as the significance threshold in addition to the qualitative thresholds of significance set forth below from Section VII of CEQA Guidelines Appendix G. The 3,000 $MTCO_2e$ per year threshold represents a 90 percent capture rate (i.e., this threshold captures projects that represent approximately 90 percent of GHG emissions from new sources). The 3,000 $MTCO_2e$ per year value is typically used in defining small projects within this air basin that are considered less than significant because it represents less than one percent of future 2050 statewide GHG emissions target and the lead agency can provide more efficient implementation of CEQA by focusing its scarce resources on the top 90 percent. This threshold is correlated to the 90 percent capture rate for development projects within the air basin. Land use projects above the 3,000 $MTCO_2e$ per year level would fall within the percentage of largest projects that are worth mitigating without wasting

scarce financial, governmental, physical and social resources (Crockett 2011). As noted in the academic study, the fact that small projects below a numeric bright line threshold are not subject to CEQA-based mitigation, does not mean such small projects do not help the state achieve its climate change goals because even small projects participate in or comply with non-CEQA-based GHG reduction programs (Crockett 2011).

4.8.2 Greenhouse Gas Emissions (VIII) Environmental Checklist and Discussion

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☒	☐

Less than Significant Impact.

4.8.2.1 Greenhouse Gas Emission - Construction

Greenhouse gas emissions are estimated for on- and off-site construction activity using CalEEMod. Table 4.8-1 shows the construction greenhouse gas emissions, including equipment and worker vehicle emissions for all phases of construction. Construction emissions are averaged over 30 years and added to the long-term operational emissions, pursuant to SCAQMD recommendations. CalEEMod annual GHG output calculations are provided in Appendix A.

Table 4.8-1. Construction Greenhouse Gas Emissions

Activity	Emissions ($MTCO_2e$)[1]		
	Onsite	**Offsite**	**Total**
Site Preparation	16.86	0.77	17.63
Grading	82.46	229.20	311.66
Building Construction	349.82	386.89	736.71
Paving	20.18	1.23	21.41
Architectural Coating	2.56	3.41	5.97
Total	**471.88**	**621.50**	**1,093.38**
Amortized over 30 years[2]	**15.73**	**20.72**	**36.45**

[1]$MTCO_2e$ = metric tons of carbon dioxide equivalents (includes CO_2, O_3, N_2O, and/or hydrofluorocarbon).
[2]The emissions are amortized over 30 years and added to the operational emissions, pursuant to SCAQMD recommendations.

Because impacts from construction activities occur over a relatively short period of time, they contribute a relatively small portion of the overall lifetime Project GHG emissions. By itself, the construction activities

from this Project are less than significant when compared to the thresholds recommended by SCAQMD. However, SCAQMD recommends that construction emissions be amortized over a 30-year project lifetime and added to the overall project operational emissions. In doing so, construction GHG emissions are included in the overall contribution of the Project, as further discussed in the following section.

4.8.2.2 Greenhouse Gas Emission– - Operation

Greenhouse gas emissions are estimated for on- and off-site operational activity using CalEEMod. Greenhouse gas emissions from mobile sources, area sources and energy sources are shown in Table 4.8-2. CalEEMod annual GHG output calculations are provided in Appendix A.

Table 4.8-2. Operational Greenhouse Gas Emissions

Emission Source	GHG Emissions ($MTC0_2e$)[1]
Mobile Source	1,523.22
Energy Source	308.82
Area Source	3.32
Water	62.97
Waste	57.20
Construction (30-year average)	36.45
Total Annual Emissions	**1,991.97**
SCAQMD Tier 3 Screening Threshold[2]	3,000
Exceed Tier 3 Threshold?	**No**

[1]$MTCO_2e$ = metric tons of carbon dioxide equivalents
[2]Per South Coast Air Quality Management District (SCAQMD) Draft Guidance Document– - Interim CEQA Greenhouse Gas (GHG) Significance Threshold, October 2008

As shown in Table 4.8-2, the project GHG emissions are expected to be below the SCAQMD's Tier 3 approach, which limits GHG emissions to 3,000 $MTCO_2e$ for residential projects. The Project related long-term GHG impacts would be less than significant.

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☒	☐

Less than Significant Impact.

The City of Beaumont has adopted the *Sustainable Beaumont* Climate Action Plan (CAP) for the Building Energy Sector to reduce the energy and GHG footprint across the City. However, the CAP does not

establish quantified thresholds of significance for CEQA purposes. The CAP is focused on reduction strategies within the energy sector, specifically buildings. Hence, to ensure the Project is consistent with the City's CAP, the Project should incorporate building design features that reduce energy consumption.

The Project would be required to comply with the mandatory requirements of the latest 2019 California Building Standards Code, including Title 24, Part 11, CALGreen and Title 24, Part 6, Energy Code. The purpose of the building standards is to reduce negative impacts on the environment through improved planning and design, energy efficiency, water efficiency and conservation and material and resource conservation. The California Building Standards were developed to help meet the requirements of the Global Warming Solutions Act (AB 32).

As part of the latest Energy Code requirements, the Project would be required to include rooftop solar panels, community solar panels, and/or other sources of onsite renewable energy capable of meeting the required California Energy Code Energy Design Rating.

The following Project Operational Design Features would be implemented to ensure the Project is consistent with applicable GHG reduction standards:

DF-10 The project will comply with the mandatory requirements of the California Building Standards Code, Title 24, Part 6 (Energy Code) and Part 11 (CALGreen), including, but not limited to:

- Install low flow fixtures and toilets, water efficient irrigation systems, drought tolerant/native landscaping, and reduce the amount of turf.
- Provide the necessary infrastructure to support electric vehicle charging.
- Provide solar installations per the prescribed Energy Design Ratings.

DF-11 No wood-burning or natural gas fireplaces will be included in the Project.

DF-12 Participate in the local waste management recycling and composting programs.

DF-13 Encourage the property management company and landscape maintenance crews to use electric-powered landscaping equipment for landscape maintenance.

With the recommended Project Operational Design Features described here, the Project would not conflict with an applicable plan, policy or regulation for the purpose of reducing the emissions of greenhouse gases and the impact is considered less than significant.

4.8.3 Mitigation Measures

No significant impacts were identified, no mitigation measures are required.

4.9 Hazards and Hazardous Materials

4.9.1 Environmental Setting

A material is considered hazardous if it appears on a list of hazardous materials prepared by a federal, state, or local agency, or if it has characteristics defined as hazardous by such an agency. A hazardous material is defined by the California Health and Safety Code, Section 25501 as follows:

> *Hazardous material* means any material that, because of its quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment if released into the workplace or the environment. Hazardous materials include, but are not limited to, hazardous substances, hazardous waste, and any material that a handler or the administering agency has a reasonable basis for believing that it would be injurious to the health and safety of persons or harmful to the environment if released into the workplace or the environment.

A hazardous material is defined in 22 CCR Section 662601.10 as follows:

> A substance or combination of substances which, because of its quantity, concentration, or physical, chemical or infectious characteristics, may either (1) cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or (2) pose a substantial present or potential hazard to human health or environment when improperly treated, stored, transported or disposed of or otherwise managed.

Transporters of hazardous waste in California are subject to several federal and state regulations. They must register with the California Department of Health Services (DHS) and ensure that vehicle and waste container operators have been trained in the proper handling of hazardous waste. Vehicles used for the transportation of hazardous waste must pass an annual inspection by the California Highway Patrol (CHP). Transporters must allow the CHP or DHS to inspect its vehicles and must make certain required inspection records available to both agencies. The transport of hazardous materials that are not wastes is regulated by the U.S. Department of Transportation through national safety standards.

Under Government Code Section 65962.5, both the Department of Toxic Substances Control (DTSC) and the SWRCB are required to maintain lists of sites known to have hazardous substances present in the environment. Both agencies maintain up-to-date lists on their websites.

4.9.2 Historic Conditions

The site was historically devoted to agricultural uses which may have included crops and livestock grazing. Use of the Project Site for agricultural purposes indicates the potential for agricultural chemicals (e.g., pesticides, herbicides) to have been applied that may still be present in Project Site soils. Pesticide sampling did not identify any concentrations of concern. Debris and soil piles investigated on the site did not contain concentrations of concern of metals, pesticides or petroleum hydrocarbons (West Coast Environmental and Engineering 2006; Appendix G).

4.9.3 Phase I Environmental Site Assessment

Earth Systems Southwest (ESSW) completed a *Phase I Environmental Site Assessment* (ESA) of the site in December 2005 that identified several issues of potential concern, including the following:

1. Sixteen dirt piles and two excavations were observed northeast of the slab foundation, adjacent to the northern boundary. It was not clear whether the dirt piles originated onsite.

2. The site had been used for agriculture or grazing from at least 1949, the earliest historical reference available. Therefore, the potential exists for residues of presently banned Organochlorine Pesticides (OCP) such as Dichlorodiphenyltrichloroethane (DDT), to be present in soils at the site.

3. Based on an historical aerial photograph review, at least six buildings and/or sheds have been onsite. Four of the buildings/sheds were in the northwest quarter of the site; one building was within a fenced enclosure cast or the center of the site; and a shed was near the center of the south boundary. Rural residences and farms often have onsite fuel storage tanks, either above ground or underground (ASTs and Underground Storage Tank [USTs], respectively), The concern with USTs is that a release can occur and go unnoticed until the UST is removed.

West Coast Environmental and Engineering performed a Phase I ESA for the site in June 2006 to update the Phase I completed by ESSW, dated December 28, 2005, to meet the ASTM Practice E 1527-05 for Phase I ESAs (Appendix G). The assessment revealed no evidence of Recognized Environmental Conditions (REC) or historic RECs association with the property.

4.9.4 Phase II Investigation Report

In February 2006, ESSW prepared a Phase II Investigation to evaluate the issues stated above (ESSW 2006; Appendix H). Buried metallic objects were not identified during the geophysical survey. Other indications of USTs were not observed. Total Petroleum Hydrocarbons and OCPs were not detected in the samples from the dirt piles. Heavy metals were detected below the regulatory limits for hazardous waste (Total Threshold Limit Concentration [TTLC]) and residential Preliminary Remediation Goals (PRG). The heavy metals appear consistent with naturally occurring background concentrations. Trace concentrations of OCPs were detected in two of the agricultural area and building area samples. Chlordane was detected at 0.036 Milligrams Per Kilogram (mg/kg) in building area sample SS-10. Dichlorodiphenyldichloroethylene (DDE, a breakdown product of DDT) was detected at 0.002 mg/kg in agricultural area sample SS-112. These results are well below the TTLCs and PRGs. Issues beyond those identified during the Phase I Investigation were not observed. Further investigations were not warranted based on the activities and findings.

4.9.5 Hazards and Hazardous Materials (IX) Environmental Checklist and Discussion

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☒	☐

Less than Significant Impact.

4.9.5.1 Construction

Construction of the Project would involve the use of various products that contain materials classified as hazardous (e.g., gasoline/diesel fuel, oils and lubricants, solvents, adhesives and cements, certain paints, cleaning agents, and degreasers). No equipment maintenance or fueling would occur on the site. Project construction would be required to comply with applicable building, health, fire, and safety codes.

CCR Title 8 addresses workplace regulations involving the use, storage, and disposal of hazardous materials, and specific applications for construction workers. CCR Titles 22 and 26 set forth environmental health standards for hazardous materials management. California Health and Safety Code Chapter 6.95 sets forth enabling legislation for the application of CCR Titles 8, 22, and 26. Safety precautions for the prevention of fire hazards associated with the use and storage of hazardous materials are addressed in the Uniform Fire Code. Compliance with applicable federal, state, and local regulations including, but not limited to, CCR Titles 8 and 22, the Uniform Fire Code, and California Health and Safety Code Chapter 6.95 would ensure that the Project would not create a significant hazard to the public or to the environment through the routine transport, use, or disposal of hazardous materials. The Proposed Project would have a less than significant impact in this regard.

4.9.5.2 Operation

Operation of the Proposed Project would result in uses of hazardous materials associated with a multifamily apartment complex. It is likely that the Project would use small amounts of commercial cleaning materials, paints and solvents for building maintenance, pool chemicals, and pesticides/herbicides for Project landscaping could be considered hazardous materials. However, an apartment complex, such as the Proposed Project, would not use hazardous materials in a quantity great enough to cause significant hazard to the public or the environment. Nor would a project of this type, once operational, transport, or dispose of hazardous materials in an amount to cause significant hazard to the public or the environment.

The use, storage, and transportation of hazardous materials are subject to local, state, and federal regulations, the intent of which is to minimize the public's risk of exposure. Based on the uses that would be part of the Project and the existing regulatory structure related to these materials, the Proposed Project would not cause a threat to public safety during Project construction or operation. Therefore, because the transport, use, storage, and disposal of hazardous materials pertaining to the Project would

be relatively minor and subject to extensive regulatory oversight, this impact would be less than significant.

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☒	☐

Less than Significant Impact.

As discussed above, no vehicle maintenance or refueling would occur onsite. Construction BMPs shall be implemented to prevent construction and demolition pollutants and products from violating any water quality standard or waste discharge requirements. BMPs would consist of measures such as a stabilized construction entrance to avoid tracking soils offsite and straw wattles and silt filter bags to prevent offsite runoff onto public roadways or into drainage outlets. During operation, onsite uses would be typical of a multifamily apartment complex and would not include routine transport or maintenance of hazardous materials and vehicles . Impacts would be less than significant.

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☒	☐

Less Than Significant Impact.

The Project Site is located approximately 0.1 mile from Sundance Elementary School, located at 1520 East 8th Street. The Proposed Project would be required to comply with all federal, state, and local laws regulating the management and use of hazardous materials which would minimize or eliminate potential impacts to schools. The Proposed Project would adhere to all local ordinances with approval from the pertinent City departments.

Section 4.3 of this IS/MND shows that the Project's daily construction emissions (which would be temporary) and operational emissions would be below the applicable SCAQMD air quality standards and thresholds of significance. As a result, the Project would not contribute substantially to an existing or projected air quality violation that could affect the school.

Construction of the Project would involve the use of various products that contain materials classified as hazardous, however construction activities would be temporary in nature. Project construction would be required to comply with applicable building, health, fire, and safety codes. An apartment complex, such as

the Proposed Project, would not use hazardous materials in a quantity great enough to cause significant hazard to the public or the environment. Nor would a project of this type, once operational, transport, or dispose of hazardous materials in an amount to cause significant hazard to the public or the environment. Therefore, there would be a less than significant impact in this regard.

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☒	☒

Less than Significant Impact.

Government Code Section 65962.5 requires the DTSC, the State Department of Health Services, the SWRCB, and the California Integrated Waste Management Board to compile and annually update lists of hazardous waste sites and land designated as hazardous waste property throughout the state.

California Environmental Protection Agency's (CalEPA) Cortese List Data Resources records were reviewed to help determine whether hazardous materials have been handled, stored, or generated on the Project Site or the adjacent properties and businesses (CalEPA 2022). The list, although covering the requirements of Section 65962.5, has always been incomplete because it does not indicate if a specific site was at one time included in the abandoned site program.

The list is a compilation of the following five separate websites:

1. DTSC's EnviroStor – identifies waste or hazardous substances sites.
2. SWRCB's GeoTracker – identifies underground storage tanks for which an unauthorized release report was filed, cleanup sites, and all solid waste disposal facilities from which there is a mitigation of hazardous waste for which a regional board has notified DTSC.
3. A PDF of solid waste disposal sites identified by the SWRCB with waste constituents above hazardous waste levels outside the waste management unit.
4. A list of cease-and-desist orders and clean up and abatement orders.
5. A list of hazardous waste facilities subject to corrective action.

DTSC's EnviroStor indicated that that Project Site was not identified as a hazardous waste or substances site (DTSC 2022).

GeoTracker did not identify the site as an underground storage tank for which an unauthorized release report was filed, a cleanup site, or a solid waste disposal facility from which there is a mitigation of hazardous waste for which a regional board has notified DTSC (SWRCB 2022). The database indicates that the nearest hazardous site is an ARCO gas station located approximately 0.2 mile from the Project Site at

1696 6th Street. This gas station is the site of a former leaking underground storage tank. The cleanup status is complete and the case was closed in 1994.

A list of solid waste disposal sites with waste constitutes above hazardous waste levels outside the waste management unit was also checked. No records were listed.

The list of cease-and-desist orders and clean up and abatement orders did not include the Project Site.

The list of hazardous facilities subject to corrective action does not include the Project Site.

As the Proposed Project is not listed on one of the five websites provided to fulfill the Cortese List, the Proposed Project would not create a significant hazard to the public or the environment. There are no hazardous waste facilities and sites with known contamination, or sites where there may be reasons to investigate further located on the Project Site or in its vicinity.

The Phase I ESA and Phase II investigation for the Project Site indicated trace contaminants from previous agricultural operations. However, these trace materials were below the regulatory limits for hazardous waste (TTLC and PRG). Further investigations were not warranted based on the findings of these reports. Impacts would be less than significant.

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
e) For a Project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the Project result in a safety hazard for people residing or working in the Project Area?	☐	☐	☐	☒

No Impact.

The Project Site is located approximately 5.2 miles northwest of the Banning Municipal Airport. The Project Site is neither within an airport land use plan nor located within 2miles of a public airport or public use airport. The Proposed Project would not result in a substantial safety hazard related to airports. Therefore, no impacts are identified or anticipated.

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☒	☐

Less than Significant Impact.

Highland Springs Road is a major roadway identified as an evacuation route. This road is located approximately 1,000 feet east of the Project Site (Figure 2) and would be utilized by future residents in the event of an emergency. The Proposed Project does not include any alterations to this evacuation route. The Proposed Project would be required to comply with the City's Multi-Hazard Functional Plan, which outlines responsibilities and procedures to be followed in the event of an emergency or citywide disaster. The City and the Riverside County Fire Department (RCFD) established certain design standards to ensure that site planning and building design consider public safety and fire prevention; these standards include requirements governing emergency access. During construction, the contractor would be required to maintain adequate emergency access for emergency vehicles as required by the City. Site access for operations would be subject to approval of the Site Plan by the City.

Development facilitated by the Project would accommodate future population growth and would increase vehicle miles travelled in the City. This could lead to increased congestion during emergency evacuations. However, the City reviews and approves projects to ensure that emergency access meets City standards. This Project must comply with road standards and are reviewed by the City to ensure development would not interfere with evacuation routes and would not impede the effectiveness of evacuation plans. Therefore, the Project would not impair implementation of or physically interfere with evacuation or emergency response plans. Therefore, the Project would have a less than significant impact in this regard.

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	☐	☐	☒	☐

Less than Significant Impact.

Proposed development under the General Plan is subject to environmental and building permit review procedures to ensure adequate and appropriate site design and construction methods are implemented to reduce the risk of wildland fires. For new development, the creation of defensible areas around building structures, and use of fire-resistant building materials would provide protection from wildland fires. The Project Site is not located within a Very High Fire Hazard Severity Zone (VHFHSZ) and is not in an area considered a wildland fire risk (California Department of Forestry and Fire Protection [CAL FIRE] 2022a). Therefore, there would be a less than significant impact in this regard.

4.9.6 Mitigation Measures

No significant impacts were identified; no mitigation measures are required.

4.10 Hydrology and Water Quality

This section is partially based on the Project-specific WQMP for the Proposed Project (Stevenson, Porto & Pierce 2022a; Appendix F).

4.10.1 Environmental Setting

4.10.1.1 Regional Hydrology

According to the City General Plan, the City's water supply has been sourced from groundwater supplies within the Beaumont Groundwater Storage Unit (BSU). The BSU is part of the Beaumont Hydrologic Subarea of the San Timoteo Hydrologic Area and the northern portion of the Santa Ana River Hydrologic Unit. The City is serviced by the BCVWD. The BCVWD draws groundwater from shallow wells in Little San Gorgonio Canyon. The increase in urban runoff due to increasing urban/suburban growth has resulted in the degradation of the surface water quality. The Project Site is part of the Riverside County Flood Control and Water Conservation District Master Drainage Plan for the Beaumont Area (Zone 5) tributary to the Santa Ana River, located approximately 24 miles west of the Project Site (City of Beaumont 2020a).

4.10.1.2 Existing Site Hydrology and Onsite Drainage

The site is vacant and contains bare soil with sparse vegetation. The site's topography generally slopes from north to south with no definitive historical concentrated drainage paths. Under existing conditions, the runoff that leaves the Project Site flows through the neighboring properties along the south property line and eventually reaches the inlets along East 6th Street. These inlets connect to the City storm drain system within East 6th Street and proceeds eastward. The runoff from the northern properties sheet flows onto the Project Site with no discernable concentrated flow path towards the south to City storm drain system (Stevenson, Porto & Pierce 2022b; Appendix F).

4.10.2 Hydrology and Water Quality (X) Environmental Checklist and Discussion

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?	☐	☐	☒	☐

Less than Significant Impact.

The Proposed Project would disturb approximately 10.93 acres and is therefore subject to NPDES permit requirements. Construction activities covered under the State's General Construction permit include removal of vegetation, grading excavating, or any other activity that causes the disturbance of at least one acre. The General Construction permit requires recipients to reduce or eliminate non-storm water discharges into storm water systems, and to develop and implement a SWPPP.

The applicant has submitted a preliminary WQMP (Appendix F) that incorporates water quality treatment features and LID site design, source control and treatment BMPs to address the NPDES requirements as part of the review process. The WQMP is intended to comply with the requirements of the City of Beaumont, which includes the requirement for the preparation and implementation of a Project-Specific WQMP. The implementation of the WQMP is enforceable under the City of Beaumont Water Quality Ordinance. Review and approval of the WQMP by the City would ensure that all potential pollutants of concern are minimized or otherwise appropriately treated prior to being discharged from the Project Site.

The Project would be required to comply with the NPDES standards to ensure that pollutants are not discharged in the storm drain system. The applicant has submitted a preliminary WQMP that incorporates the foregoing water quality treatment features and LID site design, source control and treatment BMPs to address the NPDES requirements as part of the review process. Examples of construction phase BMPs implemented with the SWPPP include sandbags, silt fences, and detention basins. Prior to the issuance of building permits, a final WQMP will have to be submitted by the applicant and approved by the City's Engineering Division, and strict adherence to the program would be required. This plan is intended to satisfy the Riverside County Municipal Separate Storm Sewer System Ordinance and the Statewide NPDES.

No additional requirements are necessary with adherence to provisions of the NPDES, SWPPP, WQMP. No violations of water quality standards or waste discharge requirements would occur and impacts to surface and ground water quality would be less than significant.

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the Project may impede sustainable groundwater management of the basin?	☐	☐	☒	☐

Less than Significant Impact.

According to the City General Plan, the City of Beaumont historically has drawn from groundwater supplies available within the BSU, which underlies the City and surrounding areas. The BSU is within Area 4 of the Beaumont and Banning Hydrologic Subarea of the San Timoteo Hydrologic Area, and within the northern portion of the Santa Ana River Hydrologic Unit (City of Beaumont 2020a).

The BCVWD prepared an Urban Water Management Plan (UWMP) in 2020. This document accounts for water demands within the BCVWD service area. The Proposed Project includes actions necessary to annex portions of the 10.93-acre Project Site to the BCVWD. The BCVWD draws groundwater from shallow wells in Little San Gorgonio Canyon. The Beaumont Groundwater Basin has a large storage capacity for banked water. As of the end of 2020, BCVWD had 39,750 Acre-Feet (AF) of water banked in storage for use during dry years. During wet years, BCVWD can bank State Water Program water for dry years (BCVWD 2021).

The BCVWD projected water demand in the year 2025 would be 17,265 Acre-Feet Per Year (AFY). The 2020 UWMP water demand projections are based on a portion of a uniform per capita water use per day

(gpcd) of 162 gpcd (BCVWD 2021). Based on the water demand projection of 162 gpcd, the Project would consume approximately 112 AFY. This represents a 0.6 percent increase in BCVWD's annual demand for 2025.

The Project would also incorporate various features to reduce water demand onsite. Water-wise, California-friendly shrubs, grasses, and groundcovers would complement the architectural theme and also reduce overall water use in the landscape. An automatic irrigation system with low volume equipment would minimize water loss due to run-off. Groundcovers or bark mulch would help conserve water, lower the soil temperature, and reduce evapotranspiration. The Project would also comply with the Water Shortage Contingency Plan outlined in the UWMP. For example, limits may be applied to the number of days, frequency and duration of outdoor watering.

Water would be required during construction of the Project for dust suppression. Water usage for construction purposes would be temporary and would be considerably smaller than that required once facilities are operational. It is possible that reclaimed water could be used for dust suppression, reducing the quantity of potable water required. During Project operation, the Project would result in a nominal increase in water consumption. Impacts would be less than significant.

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner that would:				
i) result in substantial erosion or siltation onsite or offsite;	☐	☐	☒	☐
ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding onsite or offsite;	☐	☐	☒	☐
iii) create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff; or	☐	☐	☒	☐
iv) impede or redirect flood flows?	☐	☐	☐	☒

Less than Significant Impact.

i) The Project would be subject to the NPDES Construction Stormwater Permit and would implement a SWPPP, which would help minimize erosion and sedimentation from construction activity. The Project proposes a bioretention basin along the southern border to retain storm

water on the site. The Project would also implement a WQMP that would include construction and post-construction BMPs to further minimize erosion and sedimentation. In addition to the SWPPP and WQMP, the Project is also subject to the applicable federal, state, regional, and local regulatory framework concerning water quality. Therefore, with implementation of the SWPPP, WQMP, and applicable regulatory framework, the Project is not anticipated to result in substantial erosion or siltation. Thus, impacts would be less than significant.

Less than Significant Impact.

ii) In its developed condition, the Project would contribute additional peak flow runoff due to new impervious surfaces. However, the proposed onsite catch basin inlets, storm water conveyance pipeline, and storm water treatment basin are designed to mitigate the developed peak runoff via detention and a restricted outlet structure. As detailed in Appendix K, the stormwater treatment basin is designed to mitigate runoff to within 110% of the pre-developed peak 100-year runoff(Stevenson, Porto & Pierce, Inc. 2022b). The proposed on-site basin would hold a maximum (i.e., 100 year storm) amount of 1.35 AF (personal communication with Alexander Jaramillo 2023). The rate or volume of surface runoff would not increase in a manner which would result in flooding on- or offsite. A less than significant impact would occur.

Less than Significant Impact.

iii) In its developed condition, the Project Site would continue to accept and intercept the offsite run on via an interception channel and onsite inlets. The run on would comingle with the onsite runoff and would be diverted to the onsite detention basin, which is designed to mitigate the developed peak runoff via detention and a restricted outlet structure. The treated runoff from the basin would be conveyed to the proposed extension of a 30-inch storm drain to the existing City storm drain line at the intersection of Xenia and East 6th Street. Treatment of first flush waters from the development would be accomplished by routing them through the proposed water quality basins for each drainage area. These treatment proposals would be consistent with *Riverside County Stormwater Quality Best Management Practice Design Handbook*.

The Project Applicant has submitted a preliminary WQMP that incorporates water quality treatment features and LID site design, source control and treatment BMPs to address the NPDES requirements as part of the review process. These permanent and operational source control measures are outlined in Table G.1 of the WQMP. Measures include but are not limited to:

- Maintain landscaping using minimum or no pesticides.
- Provide Intergraded Pest Management information to owners, lessees, and operators.
- Provide an adequate number of refuse receptacles.
- Inspect receptacles regularly; repair or replace leaky receptacles.
- Keep receptacles covered.

- Prohibit/ prevent dumping of liquid or hazardous wastes.
- Post "no hazardous materials" signs.
- Inspect and pick-up spills immediately.
- Keep spill control materials available on-site.
- Maintain onsite storm drain inlets regularly, and provide educational material to residents (good practices and discharge prohibitions).
- Sweep sidewalks and streets regularly and prevent litter from accumulating (no cleaning agents or degreasers discharging to storm drain system).

With the incorporation of LID BMP measures listed above, the Project would not contribute runoff water, which would exceed the capacity of existing or planned storm water drainage systems, or provide substantial additional sources of polluted runoff. Impacts would be less than significant.

No Impact.

iv) The Project is located in the following Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map: Riverside County, California and incorporated areas, Panel 811 of 3805, on map number 06065C0812G, effective date 8/28/2002. Per these maps, the site is located entirely in Zone X *Area of Minimal Flood Hazard*. This area is determined to be outside the 0.2 percent annual chance floodplain (FEMA 2002). No impact would occur.

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to Project inundation?	☐	☐	☐	☒

No Impact.

A *seiche* is a standing wave in an enclosed or partially enclosed body of water. Seiches and seiche-related phenomena have been observed on lakes, reservoirs, swimming pools, bays, and seas. The key requirement for formation of a seiche is that the body of water be at least partially bounded, allowing the formation of the standing wave. The City of Beaumont is not subject to seiche because no significant water bodies exist within the City limits (City of Beaumont 2020a). No impact would occur regarding seiches.

A *tsunami* is a great sea wave, commonly referred to as a *tidal wave*, produced by a significant undersea disturbance such as tectonic displacement of a sea floor associated with large, shallow earthquakes. The Project Site is approximately 52 miles inland from the Pacific Ocean coastline and is therefore not subject to a tsunami. No impact would occur.

Furthermore, the Project Site is located on Zone X, which is outside of the 100- or 500-year floodplain (FEMA 2002). No impact would occur.

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☐	☒	☐

Less than Significant Impact.

Please refer to previous Response 4.10.2 a). The Project would be required to comply with the NPDES standards to ensure that pollutants are not discharged in the storm drain system. The applicant has submitted a preliminary WQMP that incorporates water quality treatment features and LID site design, source control and treatment BMPs to address the NPDES requirements as part of the review process. This plan is intended to satisfy Riverside County's Municipal Separate Storm Sewer System Ordinance and the Statewide NPDES. BMPs would be prepared for the Proposed Project and would be implemented to manage erosion and release of pollutants during construction-related activities. BMPs would consist of measures such as a stabilized construction entrance to avoid tracking soils offsite and straw wattles and silt filter bags to prevent offsite runoff onto public roadways or into drainage outlets. The Proposed Project's grading plan would also ensure that earthwork is designed to avoid soil erosion. Thus, the Project would not conflict with implementation of an applicable water quality control plan.

As the Project is consistent with the City of Beaumont General Plan, and the City's water supply projections that indicate there are sufficient water supplies to serve the Project within established safe yield amounts, the Project would not conflict with sustainability objectives of a groundwater management plan (City of Beaumont 2020a). Impacts would be less than significant.

4.10.3 Mitigation Measures

No significant impacts were identified; no mitigation measures are required.

4.11 Land Use and Planning

4.11.1 Environmental Setting

The Project Site and its immediate vicinity is within the 6th Street Corridor Planning Area of the City General Plan, approved in March 2007. Development in this area is largely commercial and industrial in character with many single-family and multifamily residences located between commercial parcels. The Project Site is bounded on the north by existing single-family residences, on the west by Xenia Avenue with apartment homes beyond, on the south by commercial properties and vacant land, and on the east by an apartment complex. The zoning designation for the site is Downtown Residential Multi-Family in the City of Beaumont Zoning Map. The City of Beaumont General Plan land use map designates the Project

Site as Multi-Family Residential. Multiple family apartments are a permitted use per Table 17.19-1 of the BMC.

Table 4.11-1. Surrounding Land Uses

Location	General Plan Land Use Designations	Zoning Classifications
Site	Multi-Family Residential	Downtown Residential Multi-Family
North	Multi-Family Residential	Downtown Residential Multifamily
South	General Commercial	Sixth Street Mixed Use
East	Multi-Family Residential	Downtown Residential Multifamily
West	Multi-Family Residential	Downtown Residential Multifamily Residential Single Family

Source: City of Beaumont– - General Plan Land Use Map, City of Beaumon– - Zoning Map Final

4.11.2 Land Use and Planning (XI) Environmental Checklist and Discussion

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Physically divide an established community?	☐	☐	☐	☒

No Impact.

Lands that surround the Project Site are developed with single- and multi-family residences to the north, east, and west. The Project would construct 192 multifamily apartment units and additional facilities including a clubhouse, a swimming pool and recreation area, dog park, and associated infrastructure. Although the Project Site is predominantly surrounded by residential development, no part of the Project would extend beyond the existing site boundaries, and no part of the Project would create a barrier within the established communities. Therefore, the Project would not physically divide an established community and no impact would occur.

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒

No Impact.

The Proposed Project Site is zoned Downtown Residential Multi-Family and it has a land use designation of Multi-Family Residential in the City of Beaumont General Plan. Appropriate uses in this designation include single-family attached townhouses, condominiums, and apartments. The Project would comply

with BMC requirements for the Downtown Multi-Family Residential zone including building heights, setbacks, and density. Thus, the Proposed Project would be consistent with the City's General Plan. No impact would occur.

4.11.3 Mitigation Measures

No significant impacts were identified; no mitigation measures are required.

4.12 Mineral Resources

4.12.1 Environmental Setting

Minerals are defined as any naturally occurring chemical elements or compounds formed by inorganic processes and organic substances. Minable minerals are defined as a deposit of ore or minerals having a value materially in excess of the cost of developing, mining, and processing the mineral and reclaiming the Project Area. The conservation, extraction, and processing of mineral resources is essential to meeting the needs of society.

The Surface Mining and Reclamation Act of 1975 (SMARA) states that cities and counties shall adopt ordinances "...that establish procedures for the review and approval of reclamation plans and financial assurances and the issuance of a permit to conduct surface mining operations.." (PRC Section 2774). The intent of this legislation is to ensure the prevention or mitigation of the adverse environmental impacts of mining, the reclamation of mined lands, and the production and conservation of mineral resources are consistent with recreation, watershed, wildlife, and public safety objectives (PRC Section 2712).

SMARA requires the State Geologist to classify land into Mineral Resource Zones (MRZs) according to the known or inferred mineral potential of that land. The process is based solely on geology, without regard to existing land use or land ownership. The primary goal of mineral land classification is to ensure that the mineral potential of land is recognized by local government decision makers and considered before land use decisions, which could preclude mining, are made. Areas subject to California mineral land classification studies are divided into the following MRZ categories that reflect varying degrees of mineral potential:

- MRZ-1: Areas of no mineral resource significance
- MRZ-2: Areas of identified mineral resource significance
- MRZ-3: Areas of undetermined mineral resource significance
- MRZ-4: Areas of unknown mineral resource significance

There have been no significant mineral deposits found in the City of Beaumont. There are no delineated sites or locations of mineral resources within the City. However, since much of the area is flat and characterized by alluvial materials, which eroded and washed down from the mountains, extracting aggregate resources from open spaces adjacent to the flood channel in the western portion of the City and its SOI may be possible. Also, there are likely accretions of aggregate along watercourses and drainage ways within the City or Sphere boundaries (City of Beaumont 2020a).

4.12.2 Mineral Resources (XII) Environmental Checklist and Discussion

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒

No Impact.

According to the California DOC, Mineral Land Classification map, the Project Site and its immediate vicinity are located within MRZ-3. There are no known or identified mineral resources of regional or Statewide importance within the General Plan Area (City of Beaumont 2020a). Development of the Proposed Project would not result in the loss of availability of a known mineral resource of value. Additionally, mineral resource mining would not be compatible with the surrounding land uses and the General Plan designation for the Project Site. Therefore, no impact would occur.

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☒

No Impact.

There are no delineated sites of mineral resources within the General Plan Area. Undeveloped parts of the General Plan Area may yield sand, gravel and aggregate that can be used for local construction activities as long as mineral extraction does not conflict with other policies or land uses. The Project Site has a zoning designation of Downtown Residential Multi-Family and a General Plan land use designation of Multi-Family Residential. Development of the Proposed Project would not result in the loss of availability of a locally-important mineral resource recovery site. Therefore, no impact would occur.

4.12.3 Mitigation Measures

No significant impacts were identified; no mitigation measures are required.

4.13 Noise

This section documents the results of a Project Noise Impact Study, prepared by RK Engineering in September 2022 (RK Engineering 2022b; Appendix I), as a comparison of predicted Proposed Project noise levels to noise standards promulgated by BMC. The City's Municipal Code (Title 9, Chapter 9.02) includes detailed noise regulations intended to protect the welfare of its residents from excessive,

unnecessary, or unusually loud noises by any and all sources in the community. The noise regulations in this chapter establish criteria and standards for the regulation of noise levels within the City.

The purpose of this section is to estimate Project-generated noise levels and determine the level of impact the Proposed Project would have on the environment. This section describes the existing environmental and regulatory conditions specific to noise and addresses the potential impact of the Proposed Project.

4.13.1 Environmental Setting

4.13.1.1 Noise Fundamentals

Noise is generally defined as sound that is loud, disagreeable, or unexpected. The selection of a proper noise descriptor for a specific source is dependent on the spatial and temporal distribution, duration, and fluctuation of the noise. The noise descriptors most often encountered when dealing with traffic, community, and environmental noise include the average hourly noise level (in L_{eq}) and the average daily noise levels/community noise equivalent level (in L_{dn}/CNEL). The L_{eq} is a measure of ambient noise, while the L_{dn} and CNEL are measures of community noise. Each is applicable to this analysis and defined as follows[1]:

- **Equivalent Noise Level (L_{eq})** is the sound level corresponding to a steady noise level over a given sample period with the same amount of acoustic energy as the actual time-varying noise level. The energy average noise level during the sample period.
- **Day-Night Average (L_{dn})** is a 24-hour average L_{eq} with a 10-dBA *weighting* added to noise during the hours of 10:00 p.m.. to 7:00 a.m. to account for noise sensitivity in the nighttime. The logarithmic effect of these additions is that a 60 dBA 24-hour L_{eq} would result in a measurement of 66.4 dBA L_{dn}.
- **Community Noise Equivalent Level (CNEL)** is the average equivalent A-weighted sound level during a 24-hour day, obtained after addition of five (5) decibels (dB) to sound levels in the evening from 7:00 to 10:00 p.m. and after addition of ten (10) decibels to sound levels in the night before 7:00 a.m. and after 10:00 p.m..

Noise can be generated by a number of sources, including mobile sources, such as automobiles, trucks and airplanes, and stationary sources, such as construction sites, machinery, and industrial operations.

Sound spreads (propagates) uniformly outward in a spherical pattern, and the sound level decreases (attenuates) at a rate of approximately six dB for each doubling of distance from a stationary or point source. Sound from a line source, such as a highway, propagates outward in a cylindrical pattern, often referred to as cylindrical spreading. Sound levels attenuate at a rate of approximately three dB for each doubling of distance from a line source, such as a roadway, depending on ground surface characteristics (Federal Highway Administration [FHWA] 2011). Soft surfaces, such as soft dirt or grass, can absorb sound,

[1] RK Engineering 2022b; Appendix H

so an excess ground-attenuation value of 1.5 dB per doubling of distance is normally assumed (FHWA 2011).

The manner in which older structures in California were constructed generally provides a reduction of exterior-to-interior noise levels of about 20 to 25 dBA with closed windows (Caltrans 2002). The exterior-to-interior reduction of newer structures is generally 30 dBA or more (Harris, Miller, Miller and Hansen 2006).

4.13.1.2 Human Response to Noise

The human response to environmental noise is subjective and varies considerably from individual to individual. Noise in the community has often been cited as a health problem, not in terms of actual physiological damage, such as hearing impairment, but in terms of inhibiting general well-being and contributing to undue stress and annoyance. The health effects of noise in the community arise from interference with human activities, including sleep, speech, recreation, and tasks that demand concentration or coordination. Hearing loss can occur at the highest noise intensity levels.

Noise environments and consequences of human activities are usually well represented by median noise levels during the day or night or over a 24-hour period. Environmental noise levels are generally considered low when the CNEL is below 60 dBA, moderate in the 60- to 70-dBA range, and high, above 70 dBA. Examples of low daytime levels are isolated, natural settings with noise levels as low as 20 dBA and quiet, suburban, residential streets with noise levels around 40 dBA. Noise levels above 45 dBA at night can disrupt sleep. Examples of moderate-level noise environments are urban residential or semi-commercial areas (typically 55 to 60 dBA) and commercial locations (typically 60 dBA). People may consider louder environments adverse, but most will accept the higher levels associated with noisier urban residential or residential-commercial areas (60 to 75 dBA) or dense urban or industrial areas (65 to 80 dBA). The following relationships should be noted in understanding this analysis regarding increases in dBA:

- Except in carefully controlled laboratory experiments, a change of 1.0 dBA cannot be perceived by humans.
- Outside of the laboratory, a 3.0-dBA change is considered a just-perceivable difference.
- A change in level of at least 5.0 dBA is required before any noticeable change in community response would be expected. An increase of 5.0 dBA is typically considered substantial.
- A 10.0-dBA change is subjectively heard as an approximate doubling in loudness and would almost certainly cause an adverse change in community response.

4.13.1.3 Noise Sensitive Land Uses

Noise-sensitive land uses are generally considered to include those uses where noise exposure could result in health-related risks to individuals, as well as places where quiet is an essential element of their intended purpose. Residential dwellings are of primary concern because of the potential for increased and prolonged exposure of individuals to both interior and exterior noise levels. Additional land uses such as

hospitals, historic sites, cemeteries, and certain recreation areas are considered sensitive to increases in exterior noise levels. Schools, churches, hotels, libraries, and other places where low interior noise levels are essential are also considered noise-sensitive land uses.

Several noise sensitive land use areas are present surrounding the Project Site, including;

- Existing single family residential uses located adjacent to the Project Site to the north, approximately 50 feet from the nearest building façade (Building 2).
- Existing multifamily residential uses located adjacent to the Project Site to the east, approximately 100 feet from the nearest building façade (Building 8).
- Existing multifamily residential uses located across Xenia Avenue approximately 149 feet to the west from the nearest building façade (Building 2).
- Existing Sundance Elementary School located across 8th Street approximately 250 feet to the north of the Project Site.

4.13.1.4 Vibration Fundamentals

Ground vibration can be measured several ways to quantify the amplitude of vibration produced. This can be through peak particle velocity (PPV) or root mean square velocity. These velocity measurements measure maximum particle at one point or the average of the squared amplitude of the signal, respectively.

Vibration impacts on people can be described as the level of annoyance and can vary depending on an individual's sensitivity. Generally, low-level vibrations may cause window rattling but do not pose any threats to the integrity of buildings or structures.

4.13.2 Noise (XIII) Environmental Checklist and Discussion

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Result in generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the Project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☒	☐

Less than Significant Impact.

4.13.2.1 Construction Noise Impacts

Temporary construction noise and vibration impacts have been assessed from the Project Site to the surrounding adjacent land uses. The degree of construction noise will vary depending on the type of construction activity taking place and the location of the activity relative to the surrounding properties.

The City of BMC Chapter 9.02 establishes City-wide standards regulating noise for residential zones, public places, and motor vehicles. BMC Chapter 9.02.110 states that no construction activities may occur within 0.25 mile from an occupied residential dwelling between the hours of 6:00 p.m. and 6:00 a.m. during the months of June through September, and between the hours of 6:00 p.m. and 7:00 a.m. between the months of October through May, unless such activities are permitted under written consent of the City's Building Official.

The site-specific noise impact study analyzes potential noise impacts during all expected phases of construction, including; site preparation, grading, building construction, paving, and architectural coating. Noise levels are calculated based on an average distance of equipment over an 8-hour period to the nearest adjacent property. The Project's estimated construction noise levels have been calculated using the FHWA's Roadway Construction Noise Model Version 1.1. Table 4.13-1 shows the noise level impacts to the receptor at 180 feet. Noise levels were projected at an average distance of 180 feet for equipment operating over an eight-hour period from to the nearest sensitive receptor property line. While some construction noise activity may occur closer than 180 feet from the property line, noise levels are averaged over an eight-hour period for purposes of assessing impacts.

Table 4.13-1. Project Construction Noise Levels – at 180 Feet

Phase	Equipment	Quantity	Equipment Noise Level at 180feet (dBA L_{eq})	Combined Noise Level (dBA L_{eq})
Site Preparation	Rubber Tired Dozers	3	70.6	80.5
	Tractors/Loaders/Backhoes	4	72.9	
Grading	Excavators	2	69.6	81.1
	Graders	1	73.9	
	Rubber Tired Dozers	1	70.6	
	Scrapers	2	72.5	
	Tractors/Loaders/Backhoes	2	72.9	
Building Construction	Cranes	1	69.5	79.3
	Forklifts	3	63.9	
	Generator Sets	1	69.5	
	Tractors/Loaders/Backhoes	3	72.9	
	Welders	1	62.9	
Paving	Cement and Mortar Mixer	2	67.7	74.5
	Pavers	2	66.1	
	Paving Equipment	2	66.1	
Architectural Coating	Air Compressors	1	66.6	66.6
Worst Case Construction Phase Noise L–vel - L_{eq} (dBA) – without wall				81.1
Worst Case Construction Phase Noise L–vel - L_{eq} (dBA) – with wall				70.8

As shown in Table 4.13-1, the Project is expected to generate noise levels of approximately 70.8 dBA at 180 feet with the proposed noise barrier wall. Construction noise calculation worksheets are provided in Appendix I.

Per the City of Beaumont Municipal Code Section 9.02.110(F), construction-related noise shall not exceed 55 dBA for more than 15 minutes per hour as measured in the interior of the nearest occupied residence or school. Based on the construction noise levels in Table 4.13-1 above, the Proposed Project may expose adjacent sensitive receptors to noise levels that exceed the City's maximum allowable standards for interior noise exposure. Therefore, to ensure that interior noise levels fall within allowable levels, the following preliminary interior noise analysis has been performed.

The preliminary interior noise analysis has been prepared for the nearest off-site sensitive receptor locations using a typical "windows closed" condition (Table 4.13-2). A minimum of 20 dBA noise reduction is assumed with the *windows closed* condition and standard California construction windows (Sound Transmission Class ≥25).

Based on the interior noise analysis, adjacent sensitive receptor locations will not experience interior noise levels greater than 55 dBA during project construction. Therefore, the construction noise-related impacts are considered less than significant.

Table 4.13-2. Interior Noise Analysis – Construction Noise

Receptor Location	Exterior Noise Level at Building Façade (dBA L_{eq})	Interior Noise Standard[1] (dBA L_{eq})	Interior Noise Level with "Windows Closed[2]" Conditions (dBA L_{eq})
Existing residential land uses located north of the Project Site	70.8	55.0	50.8

[1]Source: City of Beaumont Municipal Code Section 9.02.110(F).
[2]A minimum of 20 dBA noise reduction is assumed with *the windows closed* condition and standard California construction windows (Sound Transmission Class >25).

The following recommended design features are provided to help ensure the Project's noise levels remain less than significant and do not adversely impact the adjacent noise sensitive land uses. Design features are typically included in the conditions of approval for the Project and are not considered mitigation under CEQA.

DF-1 Prior to the issuance of building permits, the project shall demonstrate building construction will achieve the minimum interior noise standard of 45 dBA CNEL for all residential units, per the California Building Standards Code.

DF-2 The project shall comply with California Title 24 building insulation requirements for exterior walls, roofs and common separating assemblies (e.g.. floor/ceiling assemblies and demising walls).

DF-3 For proper acoustical performance, all exterior windows, doors, and sliding glass doors should have a positive seal and leaks/cracks must be kept to a minimum.

DF-4 All HVAC equipment shall be shielded behind parapet walls or enclosed from the line of sight of all adjacent residential properties.

DF-5 Deliveries, loading and unloading activities, and trash pick-up hours should be limited to daytime hours only (7 a.m. – 10 p.m.).

DF-6 Hours of operation for the pool and spa recreation area and dog park should be limited to daytime hours only (7 a.m. – 10 p.m.).

DF-7 Construct a six (6) foot high noise barrier wall along the property lines in the beginning phases of construction to provide shielding to the adjacent noise sensitive receptors. The designed noise screening will only be accomplished if the barrier's weight is at least 3.5 pounds per square foot of face area without decorative cutouts or line-of-site openings between the shielded areas and the Project Site. All gaps (except for weep holes) should be filled with grout or caulking to avoid flanking.

Noise control barrier may be constructed using one, or any combination of the following materials:

- Masonry block;
- Stucco veneer over wood framing (or foam core), or 1-inch-thick tongue and groove wood of sufficient weight per square foot;
- Transparent glass (3/8-inch-thick), acrylic, polycarbonate, or other transparent material with sufficient weight per square foot.

DF-8 All pool/spa equipment will be enclosed from line of sight behind a solid block wall.

DF-9 Prepare a construction management plan and obtain a construction work permit from the City of Beaumont prior to starting construction. The construction management plan shall ensure all contractors implement construction best management practices to reduce construction noise levels, such as:

- Construction activities shall not take place between the hours of 6:00 p.m. and 7:00 a.m. on weekdays, including Saturday, or at any time on Sunday or a Federal holiday.
- All construction equipment shall be equipped with muffles and other suitable noise attenuation devices (e.g., engine shields).
- Grading and construction contractors shall use quieter equipment as opposed to noisier equipment (such as rubber-tired equipment rather than track equipment), to the maximum extent feasible.

- If feasible, electric hook-ups shall be provided to avoid the use of generators. If electric service is determined to be infeasible for the site, only whisper-quiet generators shall be used (i.e., inverter generators capable of providing variable load.
- Use electric air compressors and similar power tools rather than diesel equipment, where feasible.
- Locate staging area, generators and stationary construction equipment as far from the adjacent residential homes as feasible.
- Construction-related equipment, including heavy-duty equipment, motor vehicles, and portable equipment, shall be turned off when not in use for more than five minutes.
- Provide notifications and signage in readily visible locations along the perimeter of construction sites that indicate the dates and duration of construction activities, as well as provide a telephone number where neighbors can enquire about the construction process and register complaints to a designated construction noise disturbance coordinator.

DF-10 No impact pile driving or blasting activities will be performed on the Project Site during construction.

4.13.2.2 Operational Noise Impacts

The Project is not expected to consist of significant sources of stationary noise. The main sources of potential stationary noise impacts from the Project would mainly include onsite noise from vehicular circulation, parking lot noise, outdoor fitness center, the dog park, and Heating, Ventilation and Air Conditioning (HVAC) units. The preliminary plan for the outdoor exercise area includes: a yoga/stretching area and a variety of different pieces of outdoor fitness equipment (squats, inner thigh adductor, triceps press, rower, shoulder press, ab toner and stepper).

The types of onsite noise from the Project are typically considered compatible with other adjacent residential uses and would not typically be categorized as loud, unnecessary, or unusual noise that disturbs the peace or quiet of any neighborhood, or that causes discomfort or annoyance to any person of normal sensitiveness. In particular, social activities and vehicular related noise are generally substantially less during the noise sensitive nighttime hours.

Mechanical HVAC would be located on the rooftop of each building and would be shielded behind parapet walls. The nearest noise sensitive receptors are existing single-family residential homes located approximately 50 feet away from the Building 2 façade. All other adjacent noise sensitive receptors are located farther than 50 feet from the nearest building façade. Therefore, this evaluation provides a worst-case assessment of HVAC noise impacts at 50 feet.

The dog park will be located at the northeast corner of the property. The nearest noise sensitive receptors are existing residential land uses located approximately 44 feet from the center of the proposed dog park. All other adjacent noise sensitive receptors are located farther than 44 feet from the center of the

proposed dog park. Therefore, this evaluation provides a worst-case assessment of dog park noise at 44 feet.

Onsite vehicular noise would occur from vehicle engine idling and exhaust, doors slamming, tires screeching, people talking, and the occasional horn honking. The vehicular noise would occur approximately 20 feet from the northern and eastern property line of the Project Site.

The Project will also include an on-site community club/swimming pool that is a potential source of operational noise. The club and swimming pool will be located near the center of the western end of the site, approximately 130 feet from the nearest property line, and will be blocked from sensitive receptors by the surrounding on-site buildings and equipment will be enclosed within an equipment room. Due to the location of the proposed on-site community club/swimming pool the noise impacts to adjacent properties surrounding the site would be less than significant.

The Project includes a six-foot noise barrier wall along the northern, southern, eastern and western property lines and the noise study has taken the applicable noise barrier shielding into account during the analysis.

It should be noted that the existing daytime noise levels at the Project Site and surrounding uses are approximately 59.6 dBA and currently exceeding the City of Beaumont Baseline Ambient Noise Levels (BANL) of 55 dBA for residential uses. Therefore, the daytime BANL threshold used in this analysis has been increased to the measured 59.6 dBA noise level. Because no noise measurements were taken during nighttime hours, nighttime noise impacts are analyzed using the City of Beaumont Nighttime Baseline Ambient Noise Levels of 45 dBA.

As shown in Table 4.13-3, operational noise levels generated by the Project are not expected to cause an increase in the Baseline Ambient Noise Level by more than five dBA. As a result, the Project would not exceed the City's daytime or nighttime noise standards at the nearest adjacent noise sensitive land uses and the impact is considered less than significant.

Table 4.13-3. Stationary Noise Impact Analysis		
Noise Source	**Exterior Noise Level (L_{eq}) dBA[1]**	
	Daytime 7:00 a.m. to 10:00 p.m.	**Nighttime 10:00 p.m. to 7:00 a.m.**
HVAC Unit	39.6	39.6
Dog Park	56.9	0.0[2]
Parking Lot	41.4	41.4
Base Ambient Noise Level (BANL)[3]	59.6	45.0
Combined Noise Level	**61.5**	**47.4**
Increase in BANL	1.9	2.4
Beaumont Noise Level Criteria	5 dBA above BANL	5 dBA above BANL
Noise Level Exceeds Standard:	**No**	**No**

[1]Stationary HVAC noise calculation worksheets are shown in Appendix I.
[2]The proposed dog park will not be permitted to run during nighttime hours. Therefore, there is assumed to be no nighttime noise impact.
[3]Daytime Baseline Ambient Noise Levels reflect ambient noise measurements performed by RK Engineering Group, Inc. Nighttime Baseline Ambient Noise Levels reflect the City of Beaumont standards.

4.13.2.3 Noise/Land Use Compatibility

The Project's noise/land use compatibility setting is evaluated to determine future noise levels to habitable exterior and interior areas on the Project Site, and is intended to satisfy the City of Beaumont General Plan Noise Element Objectives and Policies which help ensure resident's quality of life is not affected adversely by high noise levels. The Project's noise/land use compatibility is not necessarily applicable to CEQA, as recent court rulings have indicated that CEQA is primarily concerned with the project's impact of the environment, not the environment's impact on a project.

Based on the Beaumont General Plan Chapter 10: Noise, Figure 10.2 Future Noise Contours from Transportation, the Project Site is located within a 65-dBA CNEL noise contour. According to the City of Beaumont General Plan, the standard used for maximum outdoor noise levels in residential areas in California, and the City specifically, is a CNEL of 65 dBA. Therefore, the Project is considered compatible with the surrounding land use and noise environment. Impacts would be less than significant.

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
b) Result in generation of excessive ground-borne vibration or ground-borne noise levels?	☐	☐	☒	☐

Less than Significant Impact.

Table 4.13-4 shows the Project's construction-related vibration analysis at the nearest structures to the Project construction area. Construction impacts are assessed from the closest area on the Project Site to the nearest adjacent structure.

Table 4.13-4. Construction Vibration Impact Analysis

Construction Activity	Distance to Nearest Structure (feet)	Duration	Calculated Vibration Level PPV (inches/ second)	Damage Potential Level	Annoyance Criteria Level
Large Bulldozer	25	Continuous/Frequent	0.089	Extremely fragile historic buildings, ruins ancient monuments	Barely Perceptible
Vibratory Roller	25	Continuous/Frequent	0.210	Fragile Buildings	Distinctly Perceptible
Loaded Trucks	25	Continuous/Frequent	0.076	Extremely fragile historic buildings, ruins ancient monuments	Barely Perceptible

As shown in Table 4.13-4, Project related construction activity is not expected to cause any potential damage to the nearest structures. The annoyance potential of vibration from construction activities would range from *distinctly perceptible* to *barely perceptible*. Impacts would be less than significant.

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
c) For a Project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the Project expose people residing or working in the Project Area to excessive noise levels?	☐	☐	☒	☐

Less Than Significant Impact.

In addition to roadway noise, air traffic periodically contributes to the noise environment. There are no airports in the City of Beaumont. However, the Banning Municipal Airport is located approximately five miles east of the City's eastern boundary. Interstate 10 is a regularly traveled route for private aircraft to follow. Therefore, aircraft noise may intermittently affect noise-sensitive receptors in the City, but noise

levels would be outside of all identified 55-, 60-, and 65-dBA airport noise contours (Appendix I). A less than significant impact would occur.

4.13.3 Mitigation Measures

No significant impacts were identified; no mitigation measures are required.

4.14 Population and Housing

4.14.1 Environmental Setting

The City of Beaumont has seen tremendous demographic changes in the last several decades including a population that has more than quadrupled over the last 25 years, reaching over 48,000 in 2018. Younger people and families comprise a larger proportion of the community compared to the State of California, with median age 1.2 years below that of the state and an average household size of 3.21 people, larger than the state average of 2.97. Beaumont has a larger proportion of youth nine years old and younger (18 percent of the population) than Riverside County (15 percent) and the State (14 percent). The population of retirees (individuals 55 to 69 years of age) has increased most rapidly since 2000 and comprises approximately 15 percent of the population, slightly higher than state levels. Beaumont residents are attaining higher levels of education with 64 percent of those 25 years old and older having some college education or higher, an increase from 56 percent in 2010. Median household income has more than doubled over 15 years, from $29,721 in 2000 to $64,830 in 2015. As of 2018, there were 14,000 existing households in the City of Beaumont. Residential development is primarily found north of SR-60 and I-10 in the flatter areas of the City (City of Beaumont 2020a).

According to SCAG's 2020-2045 Regional Transportation Plan/Sustainable Communities Strategy, significant growth is anticipated to occur within the City as well as the County in the next two decades. Population in the City is forecasted to increase to 80,200 persons by 2045, an approximately 55.2 percent difference from 2016. Households within the City are forecasted to increase to 25,100 households by 2045, an approximately 55.4 percent difference from 2016. SCAG also forecasts that the number of jobs in the City will increase to 15,900 by 2045, an approximately 52.3 percentage difference.

4.14.2 Population and Housing (XIV) Environmental Checklist and Discussion

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☒	☐

Less than Significant Impact.

Induced growth is any growth that exceeds planned growth and results from new development that would not have taken place without implementation of the project. For example, development of a project may require additional housing, goods, and services associated with the population increase caused by, or attracted to, the new project. Growth induced from a project may result in significant adverse impacts if the growth is not consistent with the land use plans and growth management plans and policies for the area affected. Thus, it is important to assess the degree to which the growth accommodated by a project would conflict with any applicable land use plan, policy, or regulation.

According to the United States Census Bureau, the City's population was 55,280 in July 2021 (U.S. Census Bureau 2022) and the average household size is 3.21 persons (City of Beaumont 2020a). The Project proposes 192 dwelling units and associated features and facilities including a clubhouse, a pool/recreation area, parking, and associated infrastructure. Thus, the Project would increase the City's population by approximately 617 persons (a 1.1 percent increase). However, the population increase would be consistent with projections made by SCAG and the General Plan, as discussed above. The Proposed Project is consistent with land use designation in the City's General Plan and is surrounded by existing residential development. Therefore, the Project would not induce substantial unplanned population growth. Impacts would be less than significant.

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
b) Displace substantial numbers of people or existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

No Impact.

The Project Site consists of vacant land and would not displace persons or housing. Therefore, no impact would occur.

4.14.3 Mitigation Measures

No significant impacts were identified; no mitigation measures are required.

4.15 Public Services

4.15.1 Environmental Setting

4.15.1.1 Police Services

Police protection services in Beaumont are provided by the Beaumont Police Department (BPD). The Project Site is served by the BPD station located at 660 Orange Avenue approximately 1.3 miles west of the Project Site.

4.15.1.2 Fire Services

The City of Beaumont is contracted with the RCFD, in conjunction with CAL FIRE. Therefore, fire protection for the Project Site is provided by the RCFD. The nearest fire station to the Project Site is the City of Beaumont Fire Station 20 located at 1550 East Sixth Street, approximately 0.5 mile southeast of the Project Site.

4.15.1.3 Schools

The Project Site is within the Beaumont Unified School District (BUSD). BUSD operates 13 schools, including seven elementary schools, a K-8 school, two middle schools, two high schools, an independent study institute, and an adult education school (BUSD 2022). The Project Site is located approximately 0.1 mile from Sundance Elementary School, located at 1520 East 8th Street.

4.15.1.4 Parks

The City of Beaumont and Cherry Valley Recreation and Park District own and operate park facilities. The City has approximately 141 acres of parks consisting of neighborhood and community parks. The City has approximately 737 acres of private recreational uses, primarily comprised of private golf courses (City of Beaumont 2020a). The Sun Lakes Country Club is located approximately 0.7 mile southeast of the Project Site.

4.15.2 Public Services (XV) Environmental Checklist and Discussion

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
Fire Protection?	☐	☐	☒	☐
Police Protection?	☐	☐	☒	☐
Schools?	☐	☐	☒	☐
Parks?	☐	☐	☒	☐
Other Public Facilities?	☐	☐	☒	☐

According to the United States Census Bureau, the City's population was 55,280 in July 2021 (U.S. Census Bureau 2022) and the average household size is 3.21 persons (City of Beaumont 2020a). The Project proposes 192 dwelling units and associated features and facilities including a clubhouse, a pool/recreation area, parking, and associated infrastructure. Thus, the Project would increase the City's population by approximately 617 persons. As such, some additional demand for fire, police, school, and park services would occur due to the Project.

4.15.2.1 Fire and Police Services

Less than Significant Impact.

The Proposed Project would result in an increased demand for police and fire protection services resulting from the new residential community and an increase of vehicular traffic to the area. However, although the demands for public services would increase with the Proposed Project beyond existing conditions, the increase in population and housing would be consistent with assumptions in the General Plan, which provides the basis for future planning purposes. Development with modern materials and in accordance with current standards, inclusive of fire-resistant materials, fire alarms and detection systems, automatic fire sprinklers, would enhance fire safety and would support fire protection services. The BPD and RCFD would review the project plans and applications in coordination with the City to ensure services would not be significantly impacted. The RCFD and the BPD have sufficient resources to accommodate the Proposed Project and would not result in the need to construct new or physically alter existing fire or police protection facilities. Therefore, no significant impacts would occur related to fire or police services.

4.15.2.2 Schools

Less than Significant Impact.

The Project would increase the City's population by approximately 617 persons. The estimated student generation rates are listed below in Table 4.15-1. These numbers represent a conservative estimate and are likely to be less due to the potential for students to enroll at other BUSD schools located away from home attendance area. Additionally, this assumes all students attend public schools in the area and do not attend private schools or participate in home schooling.

Table 4.15-1. Estimated Student Generation Rates

School Site	Grade Level	Generation Rate	Anticipated Number of Students	Site Capacity	Current Enrollment[1]
Sundance Elementary	TK – 5th	0.2602	50	957	712
San Gorgonio Middle School	5th – 8th	0.1302	25	1,504	1,181
Beaumont High School	9th – 12th	0.1107	22	5,120	3,182

[1]Current enrollment information is for the most recent available data (2021-2022 school year) (DataQuest, 2023)
Source: Hendrix 2023

As shown in Table 4.15-1, Sundance Elementary School, San Gorgonio Middle School, and Beaumont High School would accept the new student population induced by the Proposed Project and the anticipated student population generated by the Project would not cause any of the schools to exceed their site capacity based on the most recent enrolment information. Education Code Section 17620 allows school districts to assess fees on new residential and commercial construction within their respective boundaries. These fees can be collected and used to fund the construction of school facilities necessitated by the impact of residential and commercial development activity. Therefore, payment of the applicable school fees to BUSD would allow BUSD to provide adequate school facilities to serve the community, including new or expanded facilities as may be necessary. Accordingly, with adherence to existing regulations, impacts to school facilities during Project operation would be considered less than significant.

4.15.2.3 Parks

Less than Significant Impact.

Any related increase in demand for City parks, or demand for other facilities resulting from Project implementation would also be consistent with the increased demand assumed in the General Plan. Therefore, impacts would be less than significant.

4.15.2.4 Other Public Facilities

Less than Significant Impact.

In accordance with City guidelines, development fees would be collected for the provision of public services. These fees would offset any Project-related demands on such public services; therefore impacts would be less than significant.

4.15.3 Mitigation Measures

No significant impacts were identified; no mitigation measures are required.

4.16 Recreation

4.16.1 Environmental Setting

Recreational amenities in the City of Beaumont include 17 city parks and other parks located within the Beaumont Cherry Valley Recreation and Park District. The City's unique location provides its residents with beautiful mountain views and abundant recreational opportunities. The City has approximately 141 acres of parks consisting of neighborhood and community parks, and approximately 737 acres of private recreational uses, which are primarily comprised of private golf courses (City of Beaumont 2020a). The Sun Lakes Country Club is located approximately 0.7 mile southeast of the Project Site.

According to the City's General Plan, new neighborhoods will be designed as complete communities with a mix of housing types well-connected with bicycle- and pedestrian-friendly streets to neighborhood retail and community and recreational amenities. The City will promote active open space corridors and

trails in protected open space areas that support natural vegetation, scenic vistas, and sensitive habitats as well as recreational opportunities.

4.16.2 Recreation (XVI) Materials Checklist

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☒	☐

Less than Significant Impact.

The Proposed Project is not expected to significantly impact the City's existing parks or recreational facilities. The Project would offer residents both active and passive recreational opportunities. Recreational amenities proposed onsite include clubhouse pools/spas, an outdoor fitness center, open space, and a dog park. The preliminary plan for the outdoor exercise area includes: a yoga/stretching area and a variety of different pieces of outdoor fitness equipment (squats, inner thigh adductor, triceps press, rower, shoulder press, ab toner and stepper). These amenities would not be available to the general public because the proposed development would be a private gated community. The majority of recreational needs of the residents would be met by the proposed on-site recreational amenities. Therefore, the Proposed Project would not substantially increase the use of existing neighborhood and regional parks such that substantial physical deterioration would not occur. In addition, the Applicant would be required to pay in-lieu fees prior to occupancy, pursuant to City requirements. This development fee would help reduce potential impacts of future development on parks and recreational facilities. Thus, the Project would have a less than significant impact in this regard.

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
b) Include recreational facilities or require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment?	☐	☐	☒	☐

Less than Significant Impact.

The Proposed Project would not require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment. The Project would offer both active and passive recreational opportunities within the private gated community. These amenities would not be available to the general public. However, the City's in-lieu fees collected prior to occupancy are intended to offset any potential demand for parks and recreational facilities. Impacts would be less than significant.

4.16.3 Mitigation Measures

No significant impacts were identified; no mitigation measures are required.

4.17 Transportation

4.17.1 Environmental Setting

RK Engineering prepared a site-specific traffic impact analysis to evaluate the Project from a traffic and circulation standpoint and to determine whether the Proposed Project would have a significant traffic impact on the environment (RK Engineering 2022c; Appendix J). A field review of the Study Area in March 2022 was conducted to determine the existing traffic controls and intersection geometrics for roadway facilities near the site.

4.17.1.1 Study Area

The traffic analysis evaluates the Proposed Project from a traffic and circulation standpoint in accordance with *the Western Riverside Council of Governments (WRCOG) Recommended Traffic Impact Analysis Guidelines for Vehicles Miles Traveled and Level of Service Assessment*, City of Beaumont guidelines, City of Banning General Plan Circulation Element, and CEQA. The study area consists of the following six intersections, which span the cities of Beaumont and Banning:

1. Xenia Avenue (NS) at 8th Street (EW) (Beaumont)
2. Xenia Avenue (NS) at 6th Street (EW) (Beaumont)
3. Highland Springs Avenue (NS) at 8th Street/Wilson Street (EW) (Beaumont/Banning);
4. Highland Springs Avenue (NS) at 6th Street/Ramsey Street (EW) (Beaumont/Banning);
5. Xenia Avenue (NS) at Project Access 1 (EW) (Beaumont); and
6. Project Access 2 (NS) at 8th Street (EW) (Beaumont).

4.17.1.2 Analysis Methodologies

In accordance with the *Western Riverside Council of Governments Recommended Traffic Impact Analysis Guidelines for Vehicles Miles Traveled and Level of Service Assessment*, updated January 2020, the Highway Capacity Manual Sixth Edition (HCM 6) is utilized as the technical guide in the evaluation of traffic operations. The HCM defines level of service as a qualitative measure which describes operational conditions within a traffic stream, generally in terms of factors such as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience, and safety. The criteria used to evaluate Level of Service (LOS) conditions vary based on the type of roadway and whether the traffic flow is considered interrupted or uninterrupted.

The analysis evaluates traffic conditions for the study intersections under the following scenarios:

- Existing Conditions;

- Project Opening Year (2024) Without Project Conditions; and
- Project Opening Year (2024) With Project Conditions.

4.17.2 Transportation (XVII) Environmental Checklist and Discussion

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	☐	☐	☐	☒

No Impact.

4.17.2.1 Project Trip Generation

Trip generation represents the amount of traffic that is attracted and produced by a development. Trip generation is typically estimated based on the trip generation rates from the latest Institute of Transportation Engineers Trip Generation Manual. Based on these trip generation rates, the Proposed Project is forecast to generate approximately 1,294 daily trips which include approximately 77 AM peak hour trips and approximately 98 PM peak hour trips.

4.17.2.2 Intersection Analysis

The intersection level of service analysis has been performed at six intersections within the vicinity of the site where the Project may contribute a significant amount of traffic. Project deficiencies have been evaluated within the Study Area based on peak hour level of service criteria.

All four existing study intersections are currently operating at an acceptable LOS (D or better) during the AM and PM peak hours.

All four existing study intersections are forecast to operate at an acceptable LOS (D or better) during the AM and PM peak hours for Project Opening Year (2024) Without Project Conditions.

All six study intersections are forecast to operate at an acceptable LOS (D or better) during the AM and PM peak hours for Project Opening Year (2024) With Project Conditions. As such, no improvements are required or recommended at any of the six study intersections.

4.17.2.3 Public Transportation, Bicycle, and Pedestrian Facilities

The Project Site does not currently have sidewalks or bike lanes. However, the Project would construct a sidewalk along the Project's frontage along Xenia Avenue. Additionally, the Project would provide bicycle parking spaces in compliance with the California Green Building Standards Code. Public transit provided by the City of Beaumont Transit System is available adjacent to the Project Site at the Xenia Avenue at Noble Creek bus stop and the 8th Street and Allegheny Street bus stop. These bus stops would provide

convenient public transportation access to residents of the proposed apartment complex. The Project would not involve construction or operational activities that would adversely affect public transit, bikeways, or pedestrian facilities, or otherwise substantially decrease the performance or safety of such facilities.

4.17.2.4 Conclusion

The Project does not propose elements or aspects that would conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities. As stated above, the traffic impact analysis has been conducted pursuant to WRCOG, City of Beaumont, City of Banning, and CEQA requirements. No impact would occur.

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
b) Conflict or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b)?	☐	☐	☒	☐

Less than Significant Impact.

The WRCOG guidelines have implemented project screening procedures to identify projects that may be presumed to have a less than significant impact on Vehicle Miles Traveled (VMT). The WRCOG guidelines indicate that projects located within a low VMT-generating area may be presumed to have a less than significant impact absent substantial evidence to the contrary and would be exempted from further project-level VMT assessment.

To identify if the project is in a low VMT-generating area, the WRCOG screening tool is used to compare the baseline (i.e., Opening Year 2024) project-generated VMT per service population to the lead agency's (City of Beaumont's) VMT per service population. Based on the results of the WRCOG VMT screening tool as shown in Appendix J of this Draft IS/MND, the Proposed Project's baseline VMT (i.e., Opening Year 2024) is calculated to be 30.2 VMT per service population. Because the Project's baseline VMT is less than the City of Beaumont's threshold of significance of 31.5 VMT per service population, the Proposed Project satisfies the Low VMT Area Screening procedure. The Project may be presumed to have a less than significant impact to VMT. Therefore, impacts would be less than significant.

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	☒

No Impact.

The Project includes a 26-foot driveway on 8th Street and a 38-foot driveway on Xenia Avenue. Based on the Project Site plan, it is expected that the projected two-vehicle queue at both Project access driveways can be accommodated and is not expected to spill onto the public roadway. Because the Project Access 2 driveway is not expected to serve visitors and no turnaround area is proposed, a *Residents Only* sign is recommended at the entrance to redirect visitors to utilize the main gate at the Project Access 1 driveway along Xenia Avenue (RK Engineering 2022c).

The Proposed Project does not include geometric design features or incompatible uses that would substantially increase hazards. The Project Site is almost perfectly rectangular and is not adjacent to winding roads. Furthermore, the 8th Street and Xenia Avenue intersection is a four-way stop, which decreases potential safety hazards resulting from implementation of the Proposed Project. No impact would occur.

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
d) Result in inadequate emergency access?	☐	☐	☐	☒

No Impact.

Construction activities, which may temporarily restrict vehicular traffic, would be required to implement adequate and appropriate measures to facilitate the passage of persons and vehicles through or around any required road closures. Therefore, Project construction would not alter response times or performance objectives. No impact would occur.

The Project includes a 26-foot driveway on 8th Street and a 38-foot driveway on Xenia Avenue. The driveways are wide enough to allow evacuation and emergency vehicles simultaneous access. The RCFD has the authority to inspect the Project Site as often as necessary to ensure that there are no hazards violating fire safety, such as inadequate emergency access. The Project design would be submitted to and approved by the RCFD and BPD prior the issuance of building permits. No policy or procedural changes to an existing risk management plan, emergency response plan, or evacuation plan would be required due to Project implementation. Therefore, Project operation would not alter response time or performance objectives. No impact would occur.

4.17.3 Mitigation Measures

No significant impacts were identified; no mitigation measures are required.

4.18 Tribal Cultural Resources

4.18.1 Environmental Setting

Effective July 1, 2015, AB 52 amended CEQA to require that: 1) a lead agency provide notice to those California Native American tribes that requested notice of projects proposed by the lead agency; and 2) for any tribe that responded to the notice within 30 days of receipt with a request for consultation, the

lead agency must consult with the tribe. Topics that may be addressed during consultation include Tribal Cultural Resources (TCRs), the potential significance of project impacts, type of environmental document that should be prepared, and possible mitigation measures and project alternatives.

Pursuant to AB 52, Section 21073 of the PRC defines California Native American tribes as "a Native American tribe located in California that is on the contact list maintained by the NAHC for the purposes of Chapter 905 of the Statutes of 2004." This includes both federally and non-federally recognized tribes.

Section 21074(a) of the PRC defines TCRs for the purpose of CEQA as:

1. Sites, features, places, cultural landscapes (geographically defined in terms of the size and scope), sacred places, and objects with cultural value to a California Native American tribe that are either of the following:

    a. included or determined to be eligible for inclusion in the California Register of Historical Resources; and/or

    b. included in a local register of historical resources as defined in subdivision (k) of Section 5020.1; and/or

    c. a resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Section 5024.1. In applying the criteria set forth in subdivision (c) of Section 5024.1 for the purposes of this paragraph, the lead agency shall consider the significance of the resource to a California Native American tribe.

Because criteria a and b also meet the definition of a historical resource under CEQA, a TCR may also require additional consideration as a historical resource. TCRs may or may not exhibit archaeological, cultural, or physical indicators.

Recognizing that California tribes are experts in their TCRs and heritage, AB 52 requires that CEQA lead agencies provide tribes that requested notification an opportunity to consult at the commencement of the CEQA process to identify TCRs. Furthermore, because a significant effect on a TCR is considered a significant impact on the environment under CEQA, consultation is used to develop appropriate avoidance, impact minimization, and mitigation measures.

4.18.2 AB 52 Consultation Summary

On November 7, 2022, the City sent Project notification letters with invitations to consult on the Project to representatives of the following tribes:

- Los Coyotes Band of Cahuilla and Cupeno Indians
- Soboba Band of Mission Indians
- Santa Rosa Band of Cahuilla Indians
- Agua Caliente Band of Cahuilla Indians

- Ramona Band of Cahuilla
- Morongo Band of Mission Indians
- Torres-Martinez Desert Cahuilla Indians
- Cahuilla Band of Indians
- Augustine Band of Cahuilla Mission Indians
- Cabazon Band of Mission Indians

The letters provided a brief description of the Proposed Project and its location, the lead agency contact information, and a notification that the tribe has 30 days to request consultation. The 30-day response period concluded on December 7, 2022.

On November 9, 2022, the Augustine Band of Cahuilla Indians sent a letter to the City, indicating that they are unaware of specific cultural resources that may be affected by the Project, but requested notification in the event of the discovery of any cultural resources during the development of the Project. In its letter, the tribe did not request consultation under AB 52.

On November 9, 2022, the Agua Caliente Band of Cahuilla Indians sent a letter to the City, indicating that while the Project Area is not located within the boundaries of the tribe's reservation, it is within the tribe's traditional use area. The tribe requested a copy of the cultural resources documentation, site records, and records search results for the project. In its letter, the tribe did not request consultation under AB 52. On February 21, 2023, the City transmitted a copy of the report to the tribe. No response has been received to date.

The balance of the tribes contacted by the City on November 7, 2022 did not respond within the required time frame. No additional consultation was required (PRC 21082.3(d)(3)).

Because no tribes requested consultation under AB 52 and no information about tribal cultural resources was provided to the City, information about potential impacts to TCRs was drawn from the ethnographic context (summarized in ECORP 2022b; Appendix C), the results of the cultural resources records search and field survey conducted by ECORP, and the results of a search of the Sacred Lands File of the NAHC, which were obtained by ECORP in April 2022.

The cultural resources records search and field survey conducted failed to identify any precontact or Native American archaeological sites. However, the presence of Pleistocene and Holocene age sediments in the Project Area means that there could exist buried archaeological sites that are not visible on the surface (ECORP 2022b). The Sacred Lands File failed to identify any sacred lands or tribal resources in or near the Project Area. No information could be located to indicate the presence of a tribal cultural resource within the Project Area.

4.18.3 Tribal Cultural Resources (XVIII) Environmental Checklist and Discussion

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:				
i) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k), or	☐	☒	☐	☐
ii) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American Tribe.	☐	☐	☐	☒

Less Than Significant Impact with Mitigation Incorporated.

AB 52 established that a substantial adverse change to a tribal cultural resource has a significant effect on the environment. In assessing substantial adverse change, the City must determine whether or not the project would adversely affect the qualities of the resource that convey its significance and take into account information provided by consulting tribes.

No information exists on tribal cultural resources within the Project Area, and therefore, no impact to known tribal cultural resources would occur; however, the potential always exists for ground-disturbing activities to reveal previously unknown archaeological deposits that may represent tribal cultural resources. Compliance with the unanticipated discovery procedures in Mitigation Measure TCR-1 will reduce that impact to less than significant.

4.18.4 Mitigation Measures

TCR-1: **Unanticipated Discovery of Tribal Cultural Resources.** If potential TCRs are discovered during ground disturbing construction activities, all work shall cease within 100 feet of the find. A Native American Representative from traditionally and culturally affiliated Native

American Tribes shall be immediately contacted and invited to assess the significance of the find and make recommendations for further evaluation and treatment, as necessary. If deemed necessary by the City, a qualified cultural resources specialist meeting the Secretary of Interior's Standards and Qualifications for Archaeology, may also assess the significance of the find in joint consultation with Native American Representatives to ensure that Tribal values are considered. Work at the discovery location cannot resume until the City, in consultation as appropriate and in good faith, determines that the discovery is either not a TCR, or has been subjected to treatment directed by the City.

4.19 Utilities and Service Systems

4.19.1.1 Water Service

The Project Site would be serviced by BCVWD after annexation. The BCVWD's present service area covers approximately 28 square miles, virtually all of which is in Riverside County and includes the City of Beaumont and the community of Cherry Valley. The BCVWD is a retail, urban water supplier that has more than 19,000 connections and delivers more than 12,000 AF per year (AFY) of potable water. BCVWD has a non-potable water system with an annual demand of approximately 1,500 AFY, which is supplemented by the potable water system. BCVWD has a single service area which includes the City of Beaumont, the unincorporated community of Cherry Valley in Riverside County, and a portion of San Bernardino County (BCVWD 2021). The projected BCVWD-wide water demands from 2025 to 2045 are shown in Table 4.19-1.

Table 4.19-1. Projected Future BCVWD Water Demand (AFY)

Customer Type	2025	2030	2035	2040	2045
Single Family Residential	9,302	10,047	10,849	11,479	12,041
Multifamily Residential	367	397	429	454	476
Commercial	214	231	249	264	276
Industrial	186	201	217	230	241
Institutional/Governmental	1,106	1,194	1,290	1,365	1,431
Agricultural Irrigation	55	60	64	68	72
Landscape (potable)	209	226	244	258	271
Other (potable)[1]	318	343	370	392	411
Other (non-potable)[2]	276	246	228	278	328
Groundwater Recharge[3]	1,500	1,200	1,000	1,000	1,000
Losses (estimated)	1,499	1,614	1,738	1,835	1,922
Subtotal	**15,032**	**15,759**	**16,678**	**17,623**	**18,469**
Recycled Water[4]	2,233	2,421	2,706	2,840	2,906
Total:	**17,265**	**18,180**	**19,384**	**20,463**	**21,375**

Source: Water Supply Assessment, 2021. Table 2-4, page 2-9.

Table 4.19-1. Projected Future BCVWD Water Demand (AFY)					
Customer Type	**2025**	**2030**	**2035**	**2040**	**2045**

Notes: From BCVWD 2020 UWMP, pp. 4-12, 4-14. Projected water use by sector based off of water demand distribution by sector for 2020. Groundwater recharge quantities are planned qualities to build and maintain 5-year supply per BCVWD Resolution no. 2014-05; landscape demand will be met with recycled water and supplemented with other non-potable water as needed.

[1]Metered construction and street sweeping water, etc.

[2]Raw Water to supplement non-potable water system (used for irrigation)

[3]Imported raw water banked for future extractions during dry periods. Does not include imported water to meet adjudication replacement obligations.

[4]The recycled water demand includes the forecast amount used on landscaping irrigated by the non-potable water system. Source of recycled water is the City of Beaumont. Also includes a portion of the golf course irrigation demands on 268 and 203 AFY for Tukwet Canyon and Oak Valley Greens, respectively.

Table 4.19.2 summarizes BCVWD's projected water supply for the years 2025, 2030, 2035, 2040, and 2045.

Table 4.19-2. Projected Future BCVWD Water Supply (AFY)

Water Supply	Additional Detail	Projected Water Supply (AFY)									
		2025		2030		2035		2040		2045	
		Reasonably Available Volume	Total Right or Safe Yield	Reasonably Available Volume	Total Right or Safe Yield	Reasonably Available Volume	Total Right or Safe Yield	Reasonably Available Volume	Total Right or Safe Yield	Reasonably Available Volume	Total Right or Safe Yield
Groundwater (not desalinated)	Little San Gorgonio Canyon	2,070	2,200	2,070	2,200	2,070	2,200	2,070	2,200	2,070	2,200
Groundwater (not desalinated)	Beaumont Basin (Reallocated unused overlier rights)	1,322		1,286		1,165		1,099		1,099	
Groundwater (not desalinated)	Beaumont Basin total forbearance water	471		547		1,387		1,542		1,542	
Groundwater (not desalinated)	Return flows	280		514		868		922		1,155	
Stormwater Use	Beaumont MDP Line 16	185		185		185		185		185	
Stormwater Use	Misc. Stormwater	0		350		350		350		350	
Purchased or Imported Water	From SGPWA for Replenishment of Beaumont Basin (Potable water)	8,868		9,300		9,966		10,717		11,281	
Recycled Water	From City of Beaumont for Landscaping	2,017		2,381		2,892		2,955		2,915	
Purchased or Imported Water	To supplement Non-Potable Water Supply (Purchased for Replenishment)	276		246		0		0		0	

Table 4.19-2. Projected Future BCVWD Water Supply (AFY)

Water Supply	Additional Detail	Projected Water Supply (AFY)									
		2025		2030		2035		2040		2045	
		Reasonably Available Volume	Total Right or Safe Yield	Reasonably Available Volume	Total Right or Safe Yield	Reasonably Available Volume	Total Right or Safe Yield	Reasonably Available Volume	Total Right or Safe Yield	Reasonably Available Volume	Total Right or Safe Yield
Groundwater (not desalinated)	Non-Potable Groundwater at Mouth of Edgar Canyon	0		0		300		300		300	
Groundwater (not desalinated)	Non-Potable Groundwater along San Timoteo Creek	0		0		600		600		600	
Purchased or Imported Water	From SGPWA for Banking	1,500		1,200		1,000		1,000		1,000	
Purchased or Imported Water	Additional Imported Water Available from SGPWA	1,572		396		2,389		2,994		3,769	
Total:		**18,561**	**2,200**	**18,475**	**2,200**	**23,172**	**2,200**	**24,734**	**2,200**	**26,266**	**2,200**
Total Imported Water Required:		**10,644**		**10,746**		**10,966**		**11,717**		**12,281**	
Total Imported Water Available to BCVWD from SGPWA		**12,216**		**11,142**		**13,355**		**14,711**		**16,050**	

Note: SGPWA = San Gorgonio Pass Water Agency

The Project Site is within the BCVWD SOI boundaries but outside of the water service area boundaries. As part of the Proposed Project, the Project Site would be annexed into the BCVWD water service area and water service infrastructure would be extended onto the Project Site from 8th Street.

4.19.1.2 Wastewater

The City of Beaumont would service the Project Site for wastewater delivery and treatment. There are three existing wastewater reclamation plants in the San Gorgonio Pass Area. Only the City of Beaumont's Wastewater Treatment Plant (WWTP) No. 1 is within BCVWD's service area. The WWTP is a tertiary treatment facility located at 715 West 4th Street.

Wastewater generally flows by gravity to WWTP No. 1, which receives and treats domestic and commercial/industrial wastewater generated by users within the City, in addition to approximately 850 connections outside City boundaries. As of 2020, the WWTP has the capacity to treat up to six million gallons per day (Santa Ana RWQCB 2020).

4.19.1.3 Solid Waste

Currently, Waste Management, Inc. provides waste collection and disposal services for business within the City. The City is in the service area of the Lamb Canyon Landfill, located just south of the City and operated by the Riverside County Department of Waste Resources (RCDWR). The remaining capacity at this landfill is 19,242,950 cubic yards (California Department of Resources Recycling and Recovery [CalRecycle] 2022). The RCDWR estimated that the County's disposal facilities will provide approximately 20 years of disposal capacity, based on current and future disposal estimates (City of Beaumont 2020b).

4.19.1.4 Electricity

Southern California Edison (SCE) is the main electricity provider within Beaumont. SCE provides electricity to more than 15 million people in 50,000 square miles of service area, encompassing 15 counties in central, coastal, and Southern California. SCE would extend electric service to the Project in accordance with rules and policies for extension of service on file with the California Public Utilities Commission (CPUC).

As reported by the CEC in Table 4.19-3, SCE consumed approximately 81.1 billion kWh in 2021, of which approximately 30 billion kWh were consumed by the residential sector.

Table 4.19-3. Electricity Consumption in SCE Service Area in 2021 (GWh)[1,2]

Agriculture and Water Pump	Commercial Building	Commercial Other	Industry	Mining and Construction	Residential	Street-light	Total
3,254	28,154	5,165	12,717	1,554	29,735	549	81,129

[1]Source: CEC 2021
[2]All values in kilowatt-hours (GWh) and rounded to the nearest whole number.

4.19.1.5 Natural Gas

The Southern California Gas Company (SoCalGas) provides basic residential and business gas services with no constraints to substantial future development. SoCalGas provides natural gas services to the Project area and would extend service to the Project Site at the time contractual arrangements are made in accordance with SoCalGas policies and extension rules on file with the CPUC.

Table 4.19-4. Natural Gas Consumption in SoCalGas Service Area in 2021 (millions of therms)[1,2]

Agriculture and Water Pump	Commercial Building	Commercial Other	Industry	Mining and Construction	Residential	Total Usage
84	844	94	1,650	169	2,261	5,101

[1]Source: CEC 2021
[2]All values in millions of therms and rounded to the nearest whole number

As shown in Table 4,19-4, SoCalGas consumed approximately 5.1 billion therms in 2021, of which approximately 2.3 billion therms were consumed by the residential sector.

4.19.2 Utilities and Service Systems (XIX) Environmental Checklist and Discussion

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	☐	☐	☒	☐

Less than Significant Impact.

4.19.2.1 Water Services

The Project Site would be serviced by BCVWD after annexation through LAFCO. As part of the Project, and as analyzed in this document, water services would be extended into and within the Project Site from Xenia Avenue as a part of the proposed improvements. Within the Project Site, all potable and recycled water delivery lines would be designed to the satisfaction of the City Engineer and BCVWD; and would be coordinated with existing water systems serving any neighboring development. All water systems constructed within the Project Site and connections to the municipal water system would comply with City-stipulated water system design, construction, and operational requirements. As discussed in threshold (b) below, BCVWD would have available supplies to meet demand for the next 20 years.

The BCVWD projected water demand in the year 2025 would be 17,265 AFY. The 2020 UWMP water demand projections are based on a portion of a uniform per capita water use per day of 162 gpcd. New state regulations as well as the increased use of water-efficient fixtures will result in lower indoor water

demands; therefore, the BCVWD estimate of water demand is conservative (BCVWD 2021). Based on the water demand projection of 162 gpcd, the Project would consume approximately 112 AFY. This represents a 0.6 percent increase in BCVWD's annual demand for 2025. The Proposed Project would not require or result in the relocation or construction of new/expanded water treatment facilities. Therefore, impacts would be less than significant.

4.19.2.2 Wastewater Services

Wastewater from the Project would be treated at WWTP No. 1, which receives and treats domestic and commercial/industrial wastewater generated from users within the City. As of 2020, the WWTP has the capacity to treat up to six million gallons per day (Santa Ana RWQCB 2020). The Project would create demand for an estimated 20.4 million gallons of water per year according to CalEEMod estimations (Appendix A). Assuming 100 percent of this water use would be treated as wastewater, the Project would generate approximately 0.056 million gallons per day (55,890 gallons per day). This increase would demand less than one percent of the available capacity at the Beaumont Water Treatment Plant (BWTP). The Project would not require the construction of new treatment facilities as the BWTP would have adequate capacity to treat the wastewater produced by the Proposed Project. The Proposed Project would not require or result in the relocation or construction of new/expanded wastewater treatment facilities. Therefore, impacts would be less than significant.

4.19.2.3 Storm Water Drainage

As discussed in Section 4.10, *Hydrology and Water Quality*, the Project would increase impervious surfaces onsite. The Project would be required to implement BMPs toward the goal of maintaining or replicating the site's pre-development hydrologic regime. The Project would also comply with NPDES Construction General Permit Requirements, which require a sediment and erosion control plan. The Proposed Project would neither require nor result in the relocation or construction of new/expanded offsite storm water drainage facilities. The Project would utilize a bioretention basin along the southern border of the Project Site to detain storm water runoff. Because the Project would be required to implement BMPs and to maintain storm water flow on the site, impacts to storm water drainage would be less than significant.

4.19.2.4 Electric Power, Natural Gas, and Telecommunications Facilities

As shown in Table 4.6-3, the annual electricity consumption due to operations would result in an imperceivable increase (0.000097 percent) in the typical annual electricity consumption attributable to all residential uses in Riverside County. The annual natural gas consumption due to operations would result in an imperceivable increase (0.0096 percent) in the typical annual natural gas consumption attributable to all residential uses in Riverside County. The Project is located near existing utilities infrastructure, due to residential and commercial developments adjacent to the site. Because the Project Site is near existing infrastructure and would comply with Beaumont Ordinance Code requirements for underground utilities, impacts related to these facilities would be less than significant.

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
b) Have sufficient water supplies available to serve the Project and reasonably foreseeable future development during normal, dry, and multiple dry years?	☐	☐	☒	☐

Less than Significant Impact.

Water service for the Project area would be provided by the BCVWD. With the ability to bank water and the large underground reservoir, BCVWD and its neighboring agencies can withstand extended periods of drought without severe restrictions. As of the end of 2020, BCVWD had 39,750 AF of water banked in storage for use during dry years (BCVWD 2021).

BCVWD's 2020 UWMP determined that the BCVWD can anticipate a surplus in supply over the next 25 years. Future water supply projects may include groundwater recharge and storm water capture sites, additional State Water Project purchases, recycled water distribution, new non-potable wells and increased groundwater banking. The 2020 UWMP concluded that future water demands within their service area will be met during any dry period of up to six consecutive dry years assuming future supply projects are implemented by the BCVWD (2021).

The BCVWD projected water demand in the year 2025 would be 17,265 AFY. The 2020 UWMP water demand projections are based on a portion of a uniform per capita water use per day of 162 gpcd. New state regulations as well as the increased use of water-efficient fixtures will result in lower indoor water demands; therefore, the BCVWD estimate of water demand is conservative (BCVWD 2021). Based on the water demand projection of 162 gpcd, the Project would consume approximately 112 AFY. This represents a 0.6 percent increase in BCVWD's annual demand for 2025.

Additionally, the Proposed Project would incorporate various features to reduce water demand onsite. Water-wise, California-friendly shrubs, grasses, and groundcovers would complement the architectural theme and reduce overall water use in the landscape. An automatic irrigation system with low volume equipment would minimize water loss due to run-off. Groundcovers or bark mulch would also help conserve water, lower the soil temperature, and reduce evapotranspiration. The Project would also comply with the Water Shortage Contingency Plan outlined in the UWMP. For example, limits may be applied to the number of days, frequency and duration of outdoor watering. The Project would also include low-flow toilets, faucets, and shower devices in compliance California Title 20 Water Efficiency Standards.

Water would be required during construction of the Project for dust suppression. Water usage for construction purposes would be temporary and would be considerably smaller than that required once facilities are operational. It is possible that reclaimed water could be used for dust suppression, reducing the quantity of potable water required. Therefore, the Project would not result in a demand for water that could not be met. Impacts would be less than significant.

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
c) Result in a determination by the wastewater treatment provider, which serves or may serve the Project that it has adequate capacity to serve the Project's projected demand in addition to the provider's existing commitments?	☐	☐	☒	☐

Less than Significant Impact.

As discussed above, wastewater from the Project would be treated at WWTP No. 1, which receives and treats domestic and commercial/industrial wastewater generated from users within the City. As of 2020, the WWTP has the capacity to treat up to six million gallons per day (Santa Ana RWQCB 2020). The Project would create demand for an estimated 99,954 gallons per day according to water demand projects outlined in the 2020 UWMP. Assuming 100 percent of this water use would be treated as wastewater, this increase would demand approximately 1.7 percent of the daily available capacity at the BWTP. The Project would not require the construction of new treatment facilities as the BWTP would have adequate capacity to treat the wastewater produced by the Proposed Project.

Project facilities would be designed and installed in conformance with the City stipulated wastewater system design, construction, and operational requirements. This would ensure wastewater collection facilities are properly designed, implemented, operated, and maintained; thereby furthering efficiency and adequacy of facilities while reducing facilities lifecycle costs. In addition, the Project Applicant would pay fees pursuant to the incumbent City of Beaumont Fee Schedule. These fees would cover the City's cost to fund plan review, coordination, and inspection of proposed wastewater collection system improvements. Impacts would be less than significant.

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
d) Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	☐	☐	☒	☐

Less than Significant Impact.

Construction of the Proposed Project would result in generation of waste construction materials, excess fill, and other similar materials. The construction contractor would be required to dispose of these materials in accordance with engineering practices and County regulations for disposal in sanitary landfills. In the operational phase, the apartment complex would generate household waste and be serviced by Waste Management for residential trash hauling.

Construction, demolition, and municipal waste from the Project Site would likely be disposed of at the Lamb Canyon Landfill in Beaumont, California. This landfill is permitted for 5,000 tons per day and has enough capacity to serve until 2032. The remaining capacity at this landfill is 19,242,950 cubic yards (CalRecycle 2022). Waste may also be disposed of at various landfills across San Bernardino, Los Angeles, Orange, and Riverside counties. Therefore, the Project is not anticipated to generate solid waste in excess of the capacity of local infrastructure.

Additionally, the Proposed Project would not interfere with implementation of existing solid waste disposal regulations. According to the CalRecycle Estimated Solid Waste Generation Rates, a multifamily residential unit may produce up to 8.6 pounds of solid waste per day. Using this estimate, the Project would generate approximately 2.65 tons of waste per day or 967.3 tons of waste per year (CalRecycle 2022). This estimate represents 0.053 percent of the landfill's daily permitted capacity.

Wastes generated under build-out conditions would be directed to landfills with available capacity, as determined by the County. The General Plan EIR concludes that, upon implementation of the General Plan, compliance with the City's adopted Source Reduction and Recycling Element (SRRE) target waste reduction and recycling goals, and proper management and disposal of waste streams would not result in a significant exceedance of permitted landfill capacities. Impacts would be less than significant.

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	☐	☐	☐	☒

No Impact.

The Riverside CIWMP was prepared in accordance with the California Integrated Waste Management Act of 1989 (AB 939). The SRRE is included in the CIWMP and analyzes the local waste stream to determine where to focus diversion efforts, including programs and funding. The City of Beaumont requires all development to adhere to all source reduction program set forth in the SRRE for all the disposal of solid waste including yard waste. The Project would adhere to the SRRE and comply with all other applicable local, state, and federal solid waste disposal standards. No impact would occur.

4.19.3 Mitigation Measures

No significant impacts were identified; no mitigation measures are required.

4.20 Wildfire

4.20.1 Environmental Setting

Government Code 51175-89 directs CAL FIRE to identify areas of very high fire hazard severity within Local Responsibility Areas. Mapping of these areas, referred to as VHFHSZs, is based on data and models of potential fuels over a 30- to 50-year time horizon and their associated expected fire behavior, and expected burn probabilities to quantify the likelihood and nature of vegetation fire exposure to buildings. According to the State of California Fire Hazard Severity Zones map, the Project Site is not located in a VHFHSZ (CAL FIRE 2022b).

4.20.2 Wildfire (XX) Environmental Checklist and Discussion

If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?	☐	☐	☒	☐

Less than Significant Impact.

Highland Springs Road is considered a major evacuation route. This road is located approximately 1,000 feet east of the Project Site and would be utilized by future residents in the event of an emergency. The Proposed Project does not require any significant alterations to this evacuation route. The City's General Plan Circulation Element provides for appropriate evacuation routes and circulation throughout the General Plan Area to facilitate rapid response to emergency situations. Moreover, the General Plan provides for public education related to emergency conditions and emergency preparedness, response, and evacuation plans.

Upon Project completion, vehicular access to the Project Site will be provided via two full-access entrances located on Xenia Avenue and 8th Street. During the City's required review of the Proposed Project's applications, the site plan would be reviewed to ensure that adequate access to and from the site and around the proposed buildings is provided for emergency vehicles. With adherence to City requirements for emergency vehicle access, impacts would be less than significant. Furthermore, the Proposed Project is not in or near a state responsibility area or VHFHSZ (CAL FIRE 2022b). Therefore, impacts to emergency response and evacuation plans would be less than significant.

If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose Project occupants to, pollutant concentrations from, a wildfire or the uncontrolled spread of a wildfire?	☐	☐	☐	☒

No Impact.

The Proposed Project would not substantially alter slope, wind patterns, or other factors that could exacerbate wildfire risks. The Project Site is located in a generally flat and urbanized area bordered by residential uses to the north and east, a commercial area to the south, and Xenia Avenue to the west. According to the CAL FIRE Fire Hazard Severity Zones map, the Project Site is not located in or near land classified as VHFHSZ; therefore, the Proposed Project is unlikely to expose occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire. No impact is anticipated.

If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	☐	☐	☐	☒

No Impact.

The Proposed Project is subject to environmental and building permit review procedures to reduce the risk of wildfires. The Project Site is relatively flat and varies between 2,600 to 2,607 feet in elevation. High winds are expected to cause potentially adverse effects within the General Plan Area. However, development of the Proposed Project would reduce the risk of wildfires from the site's existing nonnative grasses by removing the grasses and developing the site with buildings and landscaping. Moreover, the Project Site is surrounded by either vacant land, single family homes or commercial development and is not anywhere near an area of combustible vegetation. The risk of wildfires is low due to the lack of wildfire fuel factors. The Proposed Project is not located in or near land classified as VHFHSZ; therefore, the Proposed Project would not exacerbate fire risk resulting in temporary or ongoing impacts to the environment. No impact would occur.

If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	☐	☐	☐	☒

No Impact.

The Project Site and its immediate vicinity is relatively flat and is not subject to post-fire slope instability. The implementation of associated storm water BMPs would ensure that the Proposed Project appropriately conveys storm water runoff without affecting upstream or downstream drainage

characteristics. Construction of the Proposed Project would not require grading of slopes or creation of slopes. Accordingly, the Proposed Project would not expose people or structures to landslides or downstream flooding as a result of runoff, post-fire slope instability, or drainage changes. No impact would occur.

4.20.3 Mitigation Measures

No significant impacts were identified; no mitigation measures are required.

4.21 Mandatory Findings of Significance

4.21.1 Mandatory Findings of Significance (XXI) Environmental Checklist and Discussion

Does the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☒	☐	☐

Less than Significant Impact with Mitigation Incorporated.

Impacts to biological resources, cultural resources, geology and soils (paleontological resources), and tribal cultural resources are discussed in the respective sections of this IS. Impacts would be less than significant with implementation of Mitigation Measures BIO-1 through BIO-3, CUL-1 and CUL-2, GEO-2, and TCR-1.

Does the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
b) Have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	☐	☐	☐	☒

No Impact.

Impacts from the Proposed Project on transportation, air quality, greenhouse gas emissions and noise are discussed in corresponding sections of this IS. As discussed in their respective sections of this IS document, no significant impacts associated with transportation, air quality, greenhouse gas, or noise have been identified. No impact would occur.

Does the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
c) Have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☒	☐	☐

Less than Significant Impact with Mitigation Incorporated.

As identified in this Initial Study/Mitigated Negative Declaration, the impact categories of Hazards and Hazardous Materials, Noise, and tribal cultural resources may have adverse effects on human beings, either directly or indirectly. However, all of the Project's impacts on human beings, both direct and indirect, were identified and mitigated as necessary, to less than significant impact, or less than significant impact with mitigation. Direct and indirect impacts to human beings would be less than significant with the implementation of Mitigation Measures CUL-1 and CUL-2, GEO-1 and GEO-2 and TCR-1 outlined in this IS/MND.

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Xenia Multifamily Residential Project

Draft

Initial Study/
Mitigated Negative Declaration
SCH# TBD

Lead Agency:

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550 East 6th Street
Beaumont, California 92223

May 2023

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

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Initial Study and Mitigated Negative Declaration

Xenia Multi-Family Residential Project

Beaumont, California

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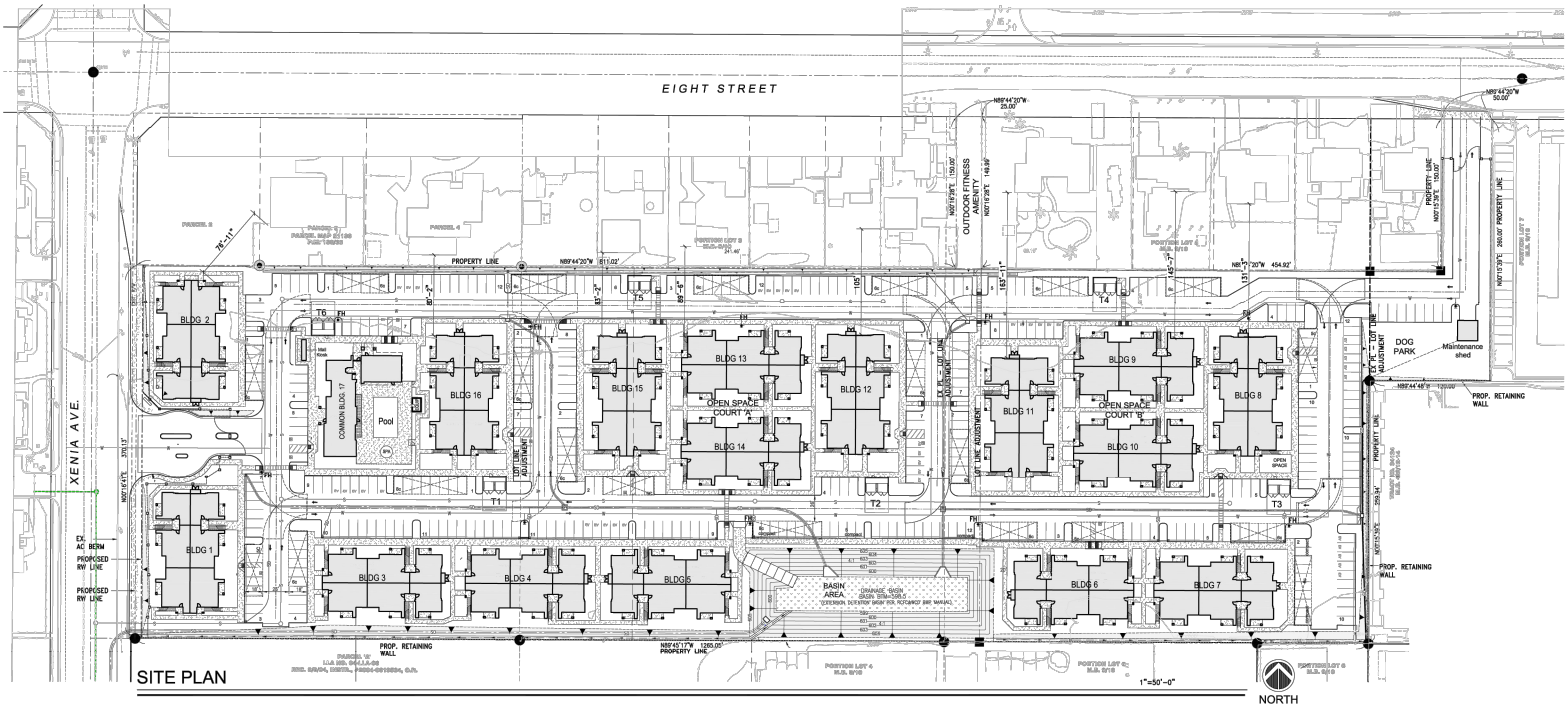
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Appendix A

Air Quality and Greenhouse Gas Impact Study
RK Engineering Group, Inc.
December 21, 2022

XENIA MULTIFAMILY RESIDENTIAL PROJECT
AIR QUALITY AND GREENHOUSE GAS IMPACT STUDY
City of Beaumont



XENIA MULTIFAMILY RESIDENTIAL PROJECT
AIR QUALITY AND GREENHOUSE GAS IMPACT STUDY
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1.0 Introduction

The purpose of this air quality and greenhouse gas (GHG) impact study is to determine whether the estimated criteria air pollutants and greenhouse gas emissions generated from the construction and operation of the proposed Xenia Multifamily Residential Project (hereinafter referred to as project) would cause significant impacts to air resources.

This assessment was conducted within the context of the California Environmental Quality Act (CEQA, California Public Resources Code Sections 21000, et seq.). The methodology follows the California Air Resources Board (CARB), the South Coast Air Quality Management District (SCAQMD), and City of Beaumont recommendations for quantification of emissions and evaluation of potential impacts.

1.1 Site Location

The proposed project site is located near the southeast corner of Xenia Avenue and Eighth Street, in the City of Beaumont.

The project site is located within the South Coast Air Basin (SCAB), the SCAQMD Banning Pass General Forecast Area, and the Banning Pass Area Air Monitoring Area-29.

The project site is currently zoned for Downtown Residential Multi-Family in the City of Beaumont Zoning Map. The City of Beaumont General Plan land use map designates the project site as Downtown Mixed Use.

The project location map is provided in Exhibit A.

1.2 Project Description

The project proposes to construct and operate 192 multifamily residential homes on an approximately 10.93 acre vacant site. The site plan used for this analysis, provided by SJA DESIGN GROUP, is illustrated in Exhibit B. Table 1 summarizes the proposed project land uses.

Table 1
Land Use Summary

Land Use	CalEEMod Land Use Category	Quantity	Metric
Multifamily Residential – Low Rise	Apartments Low-Rise	192	Dwelling Units
Swimming Pool	Recreational Swimming Pool	4,462.0	Square Feet
Paved Surfaces (On-site Parking and Drive Aisles)	Parking Lot	163,504.8	Square Feet

Construction of the project is estimated to begin in the year 2023 and last approximately 18 months. Construction activities are expected to consist of site preparation, grading, building construction, paving, and architectural coating.

The project site is currently vacant and is not expected to require any demolition. The project will require the import of approximately 65,000 cubic yards of earthwork material during the grading phase of construction. The project is expected to be operational in year 2024.

1.3 Sensitive Receptors

Sensitive receptors are considered land uses or other types of population groups that are more sensitive to air pollution exposure. Sensitive population groups include children, the elderly, the acutely and chronically ill, and those with cardio-respiratory diseases. For CEQA purposes, the SCAQMD considers a sensitive receptor to be a location where a sensitive individual could remain for 24-hours or longer, such as residences, hospitals, and schools (etc), as described in the Localized Significance Threshold Methodology (SCAQMD 2008a, page 3-2).

The nearest sensitive land uses to the project site include the following:

- Existing residential dwelling units located adjacent to the project site to the north and east of the project site.

- Existing residential dwelling units located to the west of the project site, west of Xenia Avenue.

1.4 Summary of Air Quality and Greenhouse Gas Impacts

Table 2 provides a summary of the CEQA air quality impact analysis results.

Table 2
CEQA Air Quality Impact Criteria

Air Quality Impact Criteria	Potentially Significant	Potentially Significant Unless Mitigated	Less Than Significant Impact	No Impact
Would the project:				
a) Conflict with, or obstruct implementation of, the applicable air quality plan?			X	
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable Federal or State ambient air quality standard?			X	
d) Expose sensitive receptors to substantial pollutant concentrations?			X	
e) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?			X	

Table 3 provides a summary of the CEQA GHG impact criteria analysis results.

Table 3
CEQA GHG Impact Criteria

GHG Impact Criteria	Potentially Significant	Potentially Significant Unless Mitigated	Less Than Significant Impact	No Impact
Would the project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?			X	
b) Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing emissions of greenhouse gases?			X	

1.5 Recommended Project Design Features

The following recommended project design features include standard dust control measures, construction best practices and building code requirements that are intended to reduce air quality and GHG emissions. Project design features should be included as part of the conditions of approval for the project but are not typically considered mitigation under CEQA.

Construction Design Features:

DF-1 The project must follow the standard SCAQMD rules and requirements with regards to fugitive dust control, which includes, but are not limited to the following:

1. All active construction areas shall be watered two (2) times daily.
2. Speed on unpaved roads shall be reduced to less than 15 mph.
3. Any visible dirt deposition on any public roadway shall be swept or washed at the site access points within 30 minutes.
4. Any on-site stockpiles of debris, dirt or other dusty material shall be covered or watered twice daily.
5. All operations on any unpaved surface shall be suspended if winds exceed 15 mph.
6. Access points shall be washed or swept daily.
7. Construction sites shall be sandbagged for erosion control.
8. Apply nontoxic chemical soil stabilizers according to manufacturers' specifications to all inactive construction areas (previously graded areas inactive for 10 days or more).
9. Cover all trucks hauling dirt, sand, soil, or other loose materials, and maintain at least 2 feet of freeboard space in accordance with the requirements of California Vehicle Code (CVC) section 23114.
10. Pave or gravel construction access roads at least 100 feet onto the site from the main road and use gravel aprons at truck exits.
11. Replace the ground cover of disturbed areas as quickly possible.

DF-2 All diesel construction equipment greater than 50 horsepower should have Tier 4 low emission "clean diesel" engines (OEM or retrofit) that include diesel oxidation catalysts and diesel particulate filters that meet the latest CARB best available control technology.

DF-3 Construction equipment should be maintained in proper tune.

DF-4 All construction vehicles should be prohibited from excessive idling. Excessive idling is defined as five (5) minutes or longer.

DF-5 Minimize the simultaneous operation of multiple construction equipment units, to the maximum extent feasible.

DF-6 The use of heavy construction equipment and earthmoving activity should be suspended during Air Alerts when the Air Quality Index reaches the "Unhealthy" level.

DF-7 Establish an electricity supply to the construction site and use electric powered equipment instead of diesel-powered equipment or generators, where feasible.

DF-8 Establish staging areas for the construction equipment that as far from adjacent residential homes, as feasible.

DF-9 Use haul trucks with on-road engines instead of off-road engines for on-site hauling.

Operational Design Features

DF-10 The project will comply with the mandatory requirements of the California Building Standards Code, Title 24, Part 6 (Energy Code) and Part 11 (CALGreen), including, but not limited to:

- Install low flow fixtures and toilets, water efficient irrigation systems, drought tolerant/native landscaping, and reduce the amount of turf.
- Provide the necessary infrastructure to support electric vehicle charging.
- Provide solar installations per the prescribed Energy Design Ratings.

DF-11 No wood-burning or natural gas fireplaces will be included in the project.

DF-12 Participate in the local waste management recycling and composting programs.

DF-13 Encourage the property management company and landscape maintenance crews to use electric powered landscaping equipment for landscape maintenance.

2.0 Air Quality Setting

The Federal Clean Air Act (§ 7602) defines air pollution as any agent or combination of such agents, including any physical, chemical, biological, or radioactive substance which is emitted into or otherwise enters the ambient air. Household combustion devices, motor vehicles, industrial facilities and forest fires are common sources of air pollution. Air pollution can cause disease, allergies and even death. It affects soil, water, crops, vegetation, manmade materials, animals, wildlife, weather, visibility, and climate. It can also cause damage to and deterioration of property, present hazards to transportation, and negatively impact the economy.

This section provides background information on criteria air pollutants, the applicable federal, state and local regulations concerning air pollution, and the existing physical setting of the project within the context of local air quality.

2.1 Description of Air Pollutants[1].

The following section describes the air pollutants of concern related to the project. Criteria air pollutants are defined as those pollutants for which the federal and state governments have established air quality standards for outdoor or ambient concentrations to protect public health. The following descriptions of criteria air pollutants have been provided by the SCAQMD.

- **Carbon Monoxide (CO)** is a colorless, odorless, toxic gas produced by incomplete combustion of carbon-containing fuels (e.g., gasoline, diesel fuel, and biomass). Sources include motor vehicle exhaust, industrial processes (metals processing and chemical manufacturing), residential wood burning, and natural sources. CO is somewhat soluble in water; therefore, rainfall and fog can suppress CO conditions. CO enters the body through the lungs, dissolves in the blood, and competes with oxygen, often replacing it in the blood, thus reducing the blood's ability to transport oxygen to vital organs in the body. The ambient air quality standard for carbon monoxide is intended to protect persons whose medical condition already compromises their circulatory system's ability to deliver oxygen. These medical conditions include certain heart ailments, chronic lung diseases, and anemia. Persons with these conditions have reduced exercise capacity even when exposed to relatively low levels of CO. Fetuses are at risk because their blood has an even greater affinity to bind with CO. Smokers are also at risk from ambient CO levels because smoking

[1] SCAQMD. Guidance Document for Addressing Air Quality Issues in General Plans and Local Planning (May 6, 2005)

increases the background level of CO in their blood. The South Coast basin has recently achieved attainment status for carbon monoxide by both USEPA and CARB.

- **Nitrogen Dioxide (NO_2)** is a byproduct of fuel combustion. The principal form of nitrogen oxide produced by combustion is nitric oxide (NO), but NO reacts quickly to form NO_2, creating the mixture of NO and NO_2 commonly called NO_x. NO_2 acts as an acute irritant and, in equal concentrations, is more injurious than NO. At atmospheric concentrations, however, NO_2 is only potentially irritating. There is some indication of a relationship between NO_2 and chronic pulmonary fibrosis. Some increase in bronchitis in young children has also been observed at concentrations below 0.3 parts per million (ppm). NO_2 absorbs blue light which results in a brownish red cast to the atmosphere and reduced visibility. Although NO_2 concentrations have not exceeded national standards since 1991 and the state hourly standard since 1993, NO_x emissions remain of concern because of their contribution to the formation of O_3 and particulate matter.

- **Ozone (O_3)** is one of several substances called photochemical oxidants that are formed when volatile organic compounds (VOC) and NO_x react in the presence of ultraviolet sunlight. O_3 concentrations in the South Coast basin are typically among the highest in the nation, and the damaging effects of photochemical smog, which is a popular name for a number of oxidants in combination, are generally related to the concentrations of O_3. Individuals exercising outdoors, children, and people with preexisting lung disease, such as asthma and chronic pulmonary lung disease, are considered to be the subgroups most susceptible to O_3 effects. Short-term exposures (lasting for a few hours) to O_3 at levels typically observed in southern California can result in breathing pattern changes, reduction of breathing capacity, increased susceptibility to infections, inflammation of the lung tissue, and some immunological changes. In recent years, a correlation between elevated ambient O_3 levels and increases in daily hospital admission rates, as well as mortality, has also been reported. The South Coast Air Basin is designated by the USEPA as an extreme non-attainment area for ozone. Although O_3 concentrations have declined substantially since the early 1990s, the South Coast basin continues to have peak O_3 levels that exceed both state and federal standards.

- **Fine Particulate Matter (PM_{10})** consists of extremely small, suspended particles or droplets 10 microns or smaller in diameter that can lodge in the lungs, contributing to respiratory problems. PM_{10} arises from such sources as re-entrained road dust, diesel soot, combustion products, tire and brake abrasion, construction operations, and fires. It is also formed in the atmosphere from NO_x and SO_2 reactions with ammonia. PM_{10} scatters light and significantly reduces visibility. Inhalable particulates

pose a serious health hazard, alone or in combination with other pollutants. More than half of the smallest particles inhaled will be deposited in the lungs and can cause permanent lung damage. Inhalable particulates can also have a damaging effect on health by interfering with the body's mechanism for clearing the respiratory tract or by acting as a carrier of an absorbed toxic substance. The South Coast basin has recently achieved federal attainment status for PM_{10}, but is non-attainment based on state requirements.

- **Ultra-Fine Particulate Matter ($PM_{2.5}$)** is defined as particulate matter with a diameter less than 2.5 microns and is a subset of PM_{10}. $PM_{2.5}$ consists mostly of products from the reaction of NO_x and SO_2 with ammonia, secondary organics, finer dust particles, and the combustion of fuels, including diesel soot. $PM_{2.5}$ can cause exacerbation of symptoms in sensitive patients with respiratory or cardiovascular disease, declines in pulmonary function growth in children, and increased risk of premature death from heart or lung diseases in the elderly. Daily fluctuations in $PM_{2.5}$ levels have been related to hospital admissions for acute respiratory conditions, school absences, and increased medication use in children and adults with asthma. The South Coast basin is designated as non-attainment for $PM_{2.5}$ by both federal and state standards.

- **Sulfur dioxide (SO_2)** is a colorless, pungent gas formed primarily by the combustion of sulfur-containing fossil fuels. Health effects include acute respiratory symptoms and difficulty in breathing for children. Individuals with asthma may experience constriction of airways with exposure to SO_2. Though SO_2 concentrations have been reduced to levels well below state and federal standards, further reductions in SO_2 emissions are needed because SO_2 is a precursor to sulfate and PM_{10}. The South Coast basin is considered a SO_2 attainment area by USEPA and CARB.

- **Lead (Pb)** is a toxic heavy metal that can be emitted into the air through some industrial processes, burning of leaded gasoline and past use of lead-based consumer products. Lead is a neurotoxin that accumulates in soft tissues and bones, damages the nervous system, and causes blood disorders. It is particularly problematic in children, in that permanent brain damage may result, even if blood levels are promptly normalized with treatment. Concentrations of lead once exceeded the state and federal air quality standards by a wide margin, but as a result of the removal of lead from motor vehicle gasoline, ambient air quality standards for lead have not been exceeded since 1982. Though special monitoring sites immediately downwind of lead sources recorded localized violations of the state standard in 1994, no violations have been recorded since. Consequently, the South Coast basin is designated as an attainment area for lead by both the USEPA and CARB. This report

does not analyze lead emissions from the project, as it is not expected to emit lead in any significant measurable quantity.

- **Volatile Organic Compounds (VOC),** although not actually a criteria air pollutant, VOCs are regulated by the SCAQMD because they cause chemical reactions which contribute to the formation of ozone. VOCs are also transformed into organic aerosols in the atmosphere, contributing to higher PM_{10} and lower visibility levels. Sources of VOCs include combustion engines, and evaporative emissions associated with fuel, paints and solvents, asphalt paving, and the use of household consumer products such as aerosols. Although health-based standards have not been established for VOCs, health effects can occur from exposures to high concentrations of VOC. Some hydrocarbon components classified as VOC emissions are hazardous air pollutants. Benzene, for example, is a hydrocarbon component of VOC emissions that are known to be a human carcinogen. The term reactive organic gases (ROG) are often used interchangeably with VOC.

- **Toxic Air Contaminants (TACs)** are defined as air pollutants which may cause or contribute to an increase in mortality or serious illness, or which may pose a hazard to human health, and for which there is no concentration that does not present some risk. This contrasts with the criteria pollutants, in that there is no threshold level for TAC exposure below which adverse health impacts are not expected to occur. The majority of the estimated health risk from TACs can be attributed to a relatively few compounds, the most common being diesel particulate matter (DPM) from diesel engine exhaust. In addition to DPM, benzene and 1,3-butadiene are also significant contributors to overall ambient public health risk in California.

2.2 Federal and State Ambient Air Quality Standards

The Federal Clean Air Act, which was last amended in 1990, requires the EPA to set National Ambient Air Quality Standards (NAAQS) for criteria pollutants considered harmful to public health and the environment. The State of California has also established additional and more stringent California Ambient Air Quality Standards (CAAQS) in addition to the seven criteria pollutants designated by the federal government.

AAQS are designed to protect the health and welfare of the populace with a reasonable margin of safety. The standards are divided into two categories, primary standards, and secondary standards. Primary standards are implemented to provide protection for the "sensitive" populations such as those with asthma, or the children and elderly. Secondary standards are to provide protection against visible pollution as well as damage to the surrounding environment, including animals, crops, and buildings.

Table 4 shows the Federal and State Ambient Air Quality Standards.

Table 4
Federal and State Ambient Air Quality Standards (AAQS)[1]

Air Pollutant	Averaging Time [2]	Federal Standard (NAAQS)[2]	California Standard (CAAQS)[2]
Ozone	1 Hour	--	0.09 ppm
	8 Hour	0.070 ppm	0.070 ppm
Carbon Monoxide (CO)	1 Hour	35 ppm	20 ppm
	8 Hour	9 ppm	9 ppm
Nitrogen Dioxide (NO_2)	1 Hour	0.100 ppm	0.18 ppm
	Annual	0.053 ppm	0.030 ppm
Sulfur Dioxide (SO_2)	1 Hour	0.075 ppm	0.25 ppm
	3 Hour	0.5 ppm[3]	--
	24 Hour	--	0.04 ppm
Particulate Matter (PM_{10})	24 Hour	150 $\mu g/m^3$	50 $\mu g/m^3$
	Mean	--	20 $\mu g/m^3$
Particulate Matter (PM2.5)	24 Hour	35 $\mu g/m^3$	--
	Annual	12 $\mu g/m^3$	12 $\mu g/m^3$
Lead	30-day	--	1.5 $\mu g/m$
	Quarter	1.5 $\mu g/m$	--
	3-month average	0.15 $\mu g/m$	--
Visibility reducing particles	8 Hour	--	0.23/km extinction coefficient. (10-mile visibility standard)
Sulfates	24 Hour	--	25 $\mu g/m$
Vinyl chloride	24 Hour	--	0.01 ppm
Hydrogen sulfide	24 Hour	--	0.03 ppm

[1] Source: USEPA: https://www.epa.gov/criteria-air-pollutants/naaqs-table and
CARB: https://ww2.arb.ca.gov/resources/california-ambient-air-quality-standards

[2] ppm = parts per million of air, by volume; µg/m3 = micrograms per cubic meter; Annual = Annual Arithmetic Mean; 30-day = 30-day average; Quarter = Calendar quarter.

[3] Secondary standards

Several pollutants listed in Table 4 are not addressed in this analysis. Lead is not included because the project is not anticipated to emit lead. Visibility-reducing particles are not explicitly addressed in this analysis because particulate matter is addressed. The project is not expected to generate or be exposed to vinyl chloride because proposed project uses do not utilize the chemical processes that create this pollutant and there are no such uses in the project vicinity. The proposed project is not expected to cause exposure to hydrogen sulfide because it would not generate hydrogen sulfide in any substantial quantity.

2.3 Attainment Status

The Clean Air Act requires states to prepare a State Implementation Plan (SIP) to ensure air quality meets the NAAQS. The California Air Resources Board (CARB) provides designations of attainment for air basins where AAQS are either met or exceeded. If the AAQS are met, the area is designated as being in "attainment", if the air pollutant concentrations exceed the AAQS, than the area is designated as being "nonattainment". If there is inadequate or inconclusive data to make a definitive attainment designation, the area is considered "unclassified."

National nonattainment areas are further designated as marginal, moderate, serious, severe, or extreme as a function of deviation from standards. Each standard has a different definition, or 'form' of what constitutes attainment, based on specific air quality statistics. For example, the Federal 8-hour CO standard is not to be exceeded more than once per year; therefore, an area is in attainment of the CO standard if no more than one 8-hour ambient air monitoring values exceeds the threshold per year. In contrast, the federal annual $PM_{2.5}$ standard is met if the three-year average of the annual average $PM_{2.5}$ concentration is less than or equal to the standard.

When a state submits a request to the EPA to re-designate a nonattainment area to attainment, the Clean Air Act (CAA) section 175A(a) requires that the state (or states, if the area is a multi-state area) submit a maintenance plan ensuring the area can maintain the air quality standard for which the area is to be re-designated for at least 10 years following the effective date of re-designation.

Table 5 lists the attainment status for the criteria pollutants in the South Coast Air Basin (SCAB).

Table 5
South Coast Air Basin Attainment Status[1]

Pollutant	State Status	National Status
Ozone	Nonattainment	Nonattainment (Extreme)[2]
Carbon monoxide	Attainment	Attainment (Maintenance)
Nitrogen dioxide	Attainment	Attainment (Maintenance)
PM_{10}	Nonattainment	Attainment (Maintenance)
$PM_{2.5}$	Nonattainment	Nonattainment
Lead	Attainment	Nonattainment (Partial)[3]

[1] Source: California Air Resources Board. http://www.arb.ca.gov/desig/adm/adm.htm
[2] 8-Hour Ozone.
[3] Partial Nonattainment designation – Los Angeles County portion of Basin only.

2.4 South Coast Air Quality Management District (SCAQMD)

The agency responsible for air pollution control for the South Coast Air Basin (SCAB) is the South Coast Air Quality Management District (SCAQMD). SCAQMD is responsible for controlling emissions primarily from stationary sources. SCAQMD maintains air quality monitoring stations throughout the SCAB. SCAQMD, in coordination with the Southern California Association of Governments, is also responsible for developing, updating, and implementing the Air Quality Management Plan (AQMP) for the SCAB. An AQMP is a plan prepared and implemented by an air pollution district for a county or region designated as nonattainment of the federal and/or California ambient air quality standards. The term nonattainment area is used to refer to an air SCAB where one or more ambient air quality standards are exceeded.

The AQMP is in the process of being updated to its 2022 version and is currently out for public review. Because the 2022 AQMP has not yet been officially adopted, this analysis is based on the 2016 AQMP. The 2016 AQMP is a regional blueprint for achieving the federal air quality standards and healthful air. While air quality has dramatically improved over the years, the SCAB still exceeds federal public health standards for both ozone and particulate matter (PM) and experiences some of the worst air pollution in the nation. The 2016 AQMP includes both stationary and mobile source strategies to ensure that rapidly approaching attainment deadlines are met, that public health is protected to the maximum extent feasible, and that the region is not faced with burdensome sanctions if the Plan is not approved or if the NAAQS are not met on time.

According to the 2016 AQMP, the most significant air quality challenge in the SCAB is to reduce nitrogen oxide (NOx) emissions sufficiently to meet the upcoming ozone standard

deadlines. Based on the inventory and modeling results, 522 tons per day (tpd) of total SCAB NOx 2012 emissions are projected to drop to 255 tpd and 214 tpd in the 8-hour ozone attainment years of 2023 and 2031 respectively, due to continued implementation of already adopted regulatory actions ("baseline emissions"). The analysis suggests that total SCAB emissions of NOx must be reduced to approximately 141 tpd in 2023 and 96 tpd in 2031 to attain the 8-hour ozone standards. This represents an additional 45 percent reduction in NOx in 2023, and an additional 55 percent NOx reduction beyond 2031 levels.[2]

2.4.1 SCAQMD Rules and Regulations

The SCAQMD establishes a program of rules and regulations to obtain attainment of the state and federal standards in conjunction with the AQMP. Several of the rules and regulations that may be applicable to this project include, but are not limited to, the following:

- **SCAQMD Rule 402** prohibits a person from discharging from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property.

- **SCAQMD Rule 403** governs emissions of fugitive dust during construction and operation activities. Compliance with this rule is achieved through application of standard Best Management Practices, such as application of water or chemical stabilizers to disturbed soils, covering haul vehicles, restricting vehicle speeds on unpaved roads to 15 miles per hour, sweeping loose dirt from paved site access roadways, cessation of construction activity when winds exceed 25 mph, and establishing a permanent ground cover on finished sites.

- **SCAQMD Rule 445** restricts wood burning devices from being installed into any new development and is intended to reduce the emissions of particulate matter for wood burning devices.

- **SCAQMD Rule 1113** governs the sale, use, and manufacturing of architectural coating and limits the VOC content in paints and paint solvents. This rule regulates the VOC content of paints available during construction. Therefore, all paints and

[2] SCAQMD. Final 2016 Air Quality Management Plan. http://www.aqmd.gov/home/air-quality/clean-air-plans/air-quality-mgt-plan/final-2016-aqmp

solvents used during construction and operation of project must comply with Rule 1113.

- **SCAQMD Rule 1143** governs the manufacture, sale, and use of paint thinners and solvents used in thinning of coating materials, cleaning of coating application equipment, and other solvent cleaning operations by limiting their VOC content. This rule regulates the VOC content of solvents used during construction. Solvents used during the construction phase must comply with this rule.

- **SCAQMD Rule 1186** limits the presence of fugitive dust on paved and unpaved roads and sets certification protocols and requirements for street sweepers that are under contract to provide sweeping services to any federal, state, county, agency or special district such as water, air, sanitation, transit, or school district.

2.5 Local Climate and Meteorology

The project is located in the South Coast Air Basin (SCAB). Climatological data from the nearest weather station to the project site is summarized in Table 6.

Table 6
Meteorological Summary[1]

Month	Temperature (˚F)			Mean Precipitation (inches)
	Max.	Min.	Mean	
January	60.2	35.7	47.9	3.52
February	61.4	36.6	49.0	3.73
March	62.9	37.5	50.4	3.52
Total	69.6	40.1	55.4	2.13
May	75.1	44.2	59.6	0.87
June	83.4	51.1	67.3	0.24
July	93.1	58.5	75.8	0.20
August	92.9	59.3	76.1	0.25
September	87.5	54.8	71.1	0.43
October	79.1	48.4	63.7	1.10
November	67.9	41.1	54.5	1.76
December	61.0	36.3	48.7	3.15
Annual	**74.5**	**45.3**	**60.0**	**20.89**

[1] Source: Western Regional Climate Center. Beaumont Pumping Plant (040607).

2.6 Local Air Quality

The air quality at any site is dependent on the regional air quality and local pollutant sources. Regional air quality is determined by the release of pollutants throughout the air basin. Estimates of the existing emissions in the Basin provided in the Final 2016 Air Quality Management Plan, prepared by SCAQMD, March 2017, indicate that collectively, mobile sources account for 60 percent of the VOC, 90 percent of the NOx emissions, 95 percent of the CO emissions and 34 percent of directly emitted PM2.5, with another 13 percent of PM2.5 from road dust.

The SCAQMD has divided the SCAB into fourteen general forecasting areas and thirty eight Source Receptor Areas (SRA) for monitoring and reporting local air quality. The SCAQMD provides daily reports of the current air quality conditions in each general forecast area and SRA. The monitoring areas provide a general representation of the local meteorological, terrain, and air quality conditions within the SCAB.

The project is located within the Banning Pass Area general forecasting area and San Gorgonio Pass / Banning Pass air monitoring area (SRA-29).

Table 7 summarizes the published air quality monitoring for the most recent 3-year period available. These pollutant levels were used to comprise a "background" for the project location and existing local air quality. For criteria pollutants not monitored near the site, data from the Metropolitan Riverside County – 1 monitoring station were used.

Table 7
Local Air Quality

Air Pollutant Location	Averaging Time	Item	2019	2020	2021
Carbon Monoxide -- Metropolitan Riverside County 1	1 Hour	Max 1-Hour (ppm)	1.5	1.9	2.1
		Exceeded State Standard (20 ppm)	No	No	No
		Exceeded National Standard (35 ppm)	No	No	No
	8 Hour	Max 8 Hour (ppm)	1.2	1.4	1.8
		Days > State Standard (9 ppm)	No	No	No
		Days >National Standard (9 ppm)	No	No	No
Ozone -- San Gorgonio Pass / Banning Pass Area	1 Hour	Max 1-Hour (ppm)	0.119	0.150	0.139
		Days > State Standard (0.09 ppm)	24.0	29.0	41.0
	8 Hour	Max 8 Hour (ppm)	0.096	0.115	0.116
		Days > State Standard (0.070 ppm)	59	68	82
		Days >National Standard (0.070 ppm)	59	68	80
Nitrogen Dioxide -- San Gorgonio Pass / Banning Pass Area	1 Hour	Max 1-Hour (ppm)	0.056	0.051	0.057
		Exceeded State Standard (0.18 ppm)	No	No	No
	Annual	Annual Average (ppm)	0.008	0.009	0.009
		Exceeded State Standard (0.030 ppm)	No	No	No
		Exceeded National Standard (0.053 ppm)	No	No	No
Sulfur Dioxide -- Metropolitan Riverside County 1	1 Hour	Max 1 Hour (ppm)	0.0018	0.0022	0.0021
		Exceeded State Standard (0.25 ppm)	No	No	No
		Exceeded National Standard (0.075 ppm)	No	No	No
Suspended Particles (PM10) -- San Gorgonio Pass / Banning Pass Area	24 Hour	Max 24-Hour ($\mu g/m^3$)	63	46	48
		Days > State Standard (50 $\mu g/m^3$)	2	0	0
		Days >National Standard (150 $\mu g/m^3$)	0	0	0
	Annual	Annual Average ($\mu g/m^3$)	17.90	19.20	20.70
		Exceeded State Standard (20 $\mu g/m^3$)	No	No	Yes
Fine Particulates (PM2.5) -- Metropolitan Riverside County 1	24 Hour	Max 24-Hour ($\mu g/m^3$)	46.70	41.00	82.10
		Days >National Standard (35 $\mu g/m^3$)	4	4	10
	Annual	Annual Average ($\mu g/m^3$)	11.13	12.63	12.58
		Exceeded State Standard (12 $\mu g/m^3$)	No	Yes	Yes
		Exceeded National Standard (15 $\mu g/m^3$)	No	No	No

Source : https://www.aqmd.gov/home/air-quality/historical-air-quality-data/historical-data-by-year
$\mu g/m^3$ = micrograms per cubic meter
ARB = California Air Resource Board
EPA= Environmental Protection Agency
ppm = part per million
(- -) = Data not provided

3.0 Global Climate Change Setting

Global climate change is the change in the average weather of the earth that is measured by such things as alterations in temperature, wind patterns, storms, and precipitation. Current data shows that the recent period of warming is occurring more rapidly than past geological events. The average global surface temperature has increased by approximately 1.4° Fahrenheit since the early 20th Century. 1.4° Fahrenheit may seem like a small change, but it's an unusual event in Earth's recent history, and as we are seeing, even small changes in temperature can cause enormous changes in the environment.

The planet's climate record, preserved in tree rings, ice cores, and coral reefs, shows that the global average temperature has been stable over long periods of time. For example, at the end of the last ice age, when the Northeast United States was covered by more than 3,000 feet of ice, average global temperatures were only 5° to 9° Fahrenheit cooler than today. The Intergovernmental Panel on Climate Change (IPCC), which includes more than 1,300 scientists from the United States and other countries, forecasts a temperature rise of 2.5° to 10° Fahrenheit over the next century. Therefore, significant changes to the environment are expected in the near future.

The consequences of global climate change include more frequent and severe weather, worsening air pollution by increasing ground level ozone, higher rates of plant and animal extinction, more acidic and oxygen depleted oceans, strain on food and water resources, and threats to densely populated coastal and low lying areas from sea level rise.

The impacts of climate change are already visible in the Southwest United States. In California, the consequences of climate change include;

- A rise in sea levels resulting in the displacement of coastal businesses and residencies
- A reduction in the quality and supply of water from the Sierra snowpack
- Increased risk of large wildfires
- Exacerbation of air quality problems
- Reductions in the quality and quantity of agricultural products
- An increased temperature and extreme weather events
- A decrease in the health and productivity of California's forests

3.1 Greenhouse Gases

GHGs comprise less than 0.1 percent of the total atmospheric composition, yet they play an essential role in influencing climate. Greenhouse gases include naturally occurring compounds such as carbon dioxide (CO_2), methane (CH_4), water vapor (H_2O), and nitrous oxide (N_2O), while others are synthetic. Man-made GHGs include the chlorofluorocarbons (CFCs), hydrofluorocarbons (HFCs) and Perfluorocarbons (PFCs), as well as sulfur hexafluoride (SF_6). Different GHGs have different effects on the Earth's warming. GHGs differ from each other in their ability to absorb energy (their "radiative efficiency") and how long they stay in the atmosphere, also known as the "lifetime".

The Global Warming Potential (GWP) was developed to allow comparisons of the global warming impacts of different gases. Specifically, it is a measure of how much energy the emissions of 1 ton of a gas will absorb over a given period of time, relative to the emissions of 1 ton of CO_2. The larger the GWP, the more that a given gas warms the Earth compared to CO_2 over that time period. The time period usually used for GWPs is 100 years. GWPs provide a common unit of measure, which allows analysts to add up emissions estimates of different gases and allows policymakers to compare emissions reduction opportunities across sectors and gases.

Table 8 lists the 100-year GWP of GHGs from the Intergovernmental Panel on Climate Change (IPCC) fifth assessment report (AR5).

Table 8
Global Warming Potential of Greenhouse Gases[1, 2]

Gas Name	Formula	Lifetime (years)	GWP
Carbon Dioxide	CO_2		1
Methane	CH_4	12	28
Nitrous Oxide	N_2O	114	265
Sulphur Hexafluoride	SF_6	3200	23,500
Nitrogen Trifluoride	NF_3	740	16,100
Hexafluoroethane (PFC-116)	C_2F_6	10,000	11,100
Octafluoropropane (PFC-218)	C_3F_8	2,600	8,900
Octafluorocyclobutane (PFC-318)	C_4F_8	3,200	9,540
Tetrafluoromethane (PFC-14)	CF_4	50,000	6,630
Hydrofluorocarbon 125	HFC-125	29	3,170
Hydrofluorocarbon 134a	HFC-134a	14	1,300
Hydrofluorocarbon 143a	HFC-143a	52	4,800
Hydrofluorocarbon 152a	HFC-152a	1	138
Hydrofluorocarbon 227ea	HFC-227ea	34	3,350
Hydrofluorocarbon 23	HFC-23	270	12,400
Hydrofluorocarbon 236fa	HFC-236fa	240	8,060
Hydrofluorocarbon 245fa	HFC-245fa	8	858
Hydrofluorocarbon 32	HFC-32	5	677
Hydrofluorocarbon 365mfc	HFC-365mfc	9	804
Hydrofluorocarbon 43-10mee	HFC-43-10mee	16	1,650

[1] Source: IPCC Fifth Assessment Report (AR5)
https://www.ipcc.ch/site/assets/uploads/2018/02/WG1AR5_Chapter08_FINAL.pdf
[2] GWPs are used to convert GHG emission values to "carbon dioxide equivalent" (CO_2e) units

3.2 GHG Regulatory Setting – State of California

The State of California has been a leader in climate change legislation and has passed numerous bills to reduce greenhouse gas emissions across all sectors of the economy. Some of the key climate legislation in the State include the following:

- **Assembly Bill (AB) 32, California Global Warming Solutions Act of 2006.** AB 32 set the stage for the State's transition to a sustainable, low-carbon future. AB 32 was the first program in the country to take a comprehensive, long-term approach to addressing climate change.[3]

- **Senate Bill (SB) 375, Sustainable Communities & Climate Protection Act of 2008.** SB 375 requires the Air Resources Board to develop regional greenhouse gas emission reduction targets for passenger vehicles GHG reduction targets for 2020 and 2035 for each region covered by the State's 18 metropolitan planning organizations.[4]

- **Senate Bill (SB) 100, California Renewables Portfolio Standard Program.** SB 100 established a landmark policy requiring renewable energy and zero-carbon resources supply 100 percent of electric retail sales to end-use customers by 2045.[5]

3.3 GHG Emissions Inventory

Table 9 shows the latest GHG emission inventories at the national, state, regional and local levels.

Table 9
GHG Emissions Inventory[1]

United States (2019)[2]	State of California (2018)[3]	SCAG (2020)[4]	City of Beaumont (2020)[5]
6,558 $MMTCO_2e$	425 $MMTCO_2e$	216.4 $MMTCO_2e$	0.13 $MMTCO_2e$

[1] $MMTCO_2e$ = Million Metric Tons of Carbon Dioxide Equivalent
[2] https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks
[3] https://ww3.arb.ca.gov/cc/inventory/pubs/reports/2000_2018/ghg_inventory_trends_00-18.pdf.
[4] http://www.scag.ca.gov/programs/Pages/GreenhouseGases.aspx. Projected Emission from SACG - Regional GHG Inventory and Reference Case Projections, 1990-2035, dated May 30, 2012.
[5] Climate Action Plan for the Building Energy Sector, City of Beaumont. Baseline GHG Inventory and BAU Emissions Projections

[3] California Air Resources Board. AB 32 Global Warming Solutions Act of 2006. https://ww2.arb.ca.gov/resources/fact-sheets/ab-32-global-warming-solutions-act-2006
[4] California Air Resources Board. Sustainable Communities and Climate Protection Program. https://ww2.arb.ca.gov/our-work/programs/sustainable-communities-climate-protection-program/about
[5] California Energy Commission. SB 100 Joint Agency Report. https://www.energy.ca.gov/sb100

4.0 Modeling Parameters and Assumptions

The California Emissions Estimator Model Version 2020.4.0 (CalEEMod) was used to calculate criteria air pollutants and GHG emissions from the construction and operation of the project. CalEEMod is a statewide land use emissions computer model designed to provide a uniform platform for government agencies, land use planners, and environmental professionals to quantify criteria air pollutant and GHG emissions.

The model quantifies direct emissions from construction and operation activities (including vehicle use), as well as indirect emissions, such as GHG emissions from off-site energy generation, solid waste disposal, vegetation planting and/or removal, and water use. The model also identifies design features to reduce criteria pollutant and GHG emissions. The model was developed for the California Air Pollution Control Officers Association (CAPCOA) in collaboration with the California air districts.

The project proposes to construct and operate a 192-unit multifamily residential complex on a 10.93-acre site. The project will also provide ancillary amenities such as a community club and swimming pool. Because swimming pools generate unique emissions, the pool and community building have been analyzed as a separate land use in CalEEMod. A summary of the CalEEMod land use inputs is provided in the table below.

Table 10
CalEEMod Land Use Inputs

Land Use	CalEEMod Land Use Category	Quantity	Metric
Multifamily Residential – Low Rise	Apartments Low-Rise	192	Dwelling Units
Swimming Pool	Recreational Swimming Pool	4,462.0	Square Feet
Paved Surfaces (On-site Parking and Drive Aisles)	Parking Lot	163,504.8	Square Feet

4.1 Construction Assumptions

Construction of the project is estimated to begin in the year 2023 and last approximately 18 months. Construction activities are expected to consist of site preparation, grading, building construction, paving, and architectural coating. The project is expected to be operational in the year 2024. For purposes of this analysis, construction phases are not expected to overlap.

The project is currently vacant and is not expected to require demolition of any structures or hardscape. The project is expected to require an import of approximately 65,000 cubic yards of earthwork material during the grading phase.

The CalEEMod default construction equipment list is based on survey data and the size of the site. The parameters used to estimate construction emissions, such as the worker and vendor trips and trip lengths, utilize the CalEEMod defaults. The construction equipment list is shown in Table 11.

The project will be required to comply with several standard fugitive dust control measures, per SCAQMD Rule 403. The following key inputs are utilized in CalEEMod and are based upon data provided from SCAQMD[6]:

- Utilize soil stabilizers - 30% PM_{10} and $PM_{2.5}$ reduction.
- Replace ground cover - 15% PM_{10} and $PM_{2.5}$ reduction.
- Water exposed areas 2x per day.
- Unpaved road moisture content – 25%.
- Unpaved road vehicle speed – 15 mph.

[6] SCAQMD. Fugitive Dust Mitigation Measures. http://www.aqmd.gov/home/rules-compliance/ceqa/air-quality-analysis-handbook/mitigation-measures-and-control-efficiencies/fugitive-dust

Table 11
Construction Equipment Assumptions[1]

Phase	Equipment	Number	Hours Per Day	Soil Disturbance Rate (Acres/ 8hr-Day)	Off-Road Equipment Daily Disturbance Footprint (Acres)	Total Daily Disturbance Footprint (Acres)
Site Preparation	Rubber Tired Dozers	3	8	0.5	1.50	3.5
	Tractors/Loaders/Backhoes	4	8	0.5	2.00	
Grading	Excavators	2	8	0.0	0.00	4.0
	Graders	1	8	0.5	0.50	
	Rubber Tired Dozers	1	8	0.5	0.50	
	Scrapers	2	8	1.0	2.00	
	Tractors/Loaders/Backhoes	2	8	0.5	1.00	
Building Construction	Cranes	1	8	0.0	0.00	1.1
	Forklifts	3	7	0.0	0.00	
	Generator Sets	1	8	0.0	0.00	
	Tractors/Loaders/Backhoes	3	6	0.5	1.13	
	Welders	1	8	0.0	0.00	
Paving	Pavers	2	8	0.0	0.00	0.0
	Paving Equipment	2	8	0.0	0.00	
	Rollers	2	8	0.0	0.00	
Architectural Coating	Air Compressors	1	6	0.0	0.00	0.0

[1] CalEEMod Defaults

4.2 Localized Construction Analysis Modeling Parameters

CalEEMod calculates construction emissions based on the number of equipment hours and the maximum daily disturbance activity possible for each piece of equipment. This report identifies the following parameters in the project design or applicable mitigation measures in order to compare CalEEMod reported emissions against the localized significance threshold lookup tables:

1) The off-road equipment list (including type of equipment, horsepower, and hours of operation) assumed for the day of construction activity with maximum emissions.
2) The maximum number of acres disturbed on the peak day.
3) Any emission control devices added onto off-road equipment.

4) Specific dust suppression techniques used on the day of construction activity with maximum emissions.

4.3 Operational Assumptions

Operational emissions occur over the life of the project and are considered "long-term" sources of emissions. Operational emissions include both direct and indirect sources. This section briefly describes the operational sources of emissions analyzed for the project.

4.3.1 Mobile Source Emissions

Mobile source emissions are the largest source of long-term air pollutants from the operation of the project. Mobile sources are direct sources of project emissions that are primarily attributed to tailpipe exhaust and road dust (tire, brake, clutch, and road surface wear) from motor vehicles traveling to and from the site.

Estimates of mobile source emissions require information on four parameters: trip generation, trip length, vehicle/fleet mix, and emission factors (quantity of emission for each mile traveled or time spent idling by each vehicle).

The trip generation rates, trip length and trip percentages for this project are based on the CalEEMod defaults.

Trip summary information is shown in Table 12.

Table 12
Trip Generation Rates

Land Use	ITE Code	Units[1]	Daily Trip Rate[2]		
			Weekday	Saturday	Sunday
Multifamily Housing – Low Rise	220	DU	7.32	8.14	6.28

[1] DU = Dwelling Unit; TSF = Thousand Square Feet
[2] Source: ITE Trip Generation Manual 10th Edition

The California Emission Factors 2017 model (EMFAC2017) is used to estimate mobile source emissions. The option in CalEEMod to apply adjustments factors to account for the SAFE Vehicle Rule has been selected. No other adjustments have been made to the default emission factors.

The project's total vehicle miles traveled estimated by CalEEMod is shown in the Table 13 for this project.

Table 13
Operational Vehicle Miles Traveled[1]

Land Use	Annual Vehicle Miles Traveled (VMT)
Condo/Townhomes	4,781,982

[1] CalEEMod defaults.

The operational vehicle fleet mix has been adjusted to reflect vehicle types used for typical residential home-based trips generated by the project. The Southern California Association of Governments (SCAG) regional travel demand model does not include heavy-duty trucks, buses or other large vehicles that would require passenger car equivalent (PCE) adjustments for residential home-based trips. The project does not consist of land uses that would typically require PCE adjustments to account for large trucks, such as warehousing.

To be conservative, the Air Quality/GHG analysis has assumed that 2% of the total residential home-based trips will include trucks with a gross vehicle weight rating (GVWR) of 10,000 pound or greater. This includes LHD2, MHD, HHD, OBUS, UBUS, and SBUS vehicles. The 2% mix is also consistent with the default Highway Capacity Manual (HCM) assumptions. The adjusted vehicle mix is proportioned according to the default CalEEMod vehicle mix.

Table 14 summarizes vehicle mix used for this project.

Table 14
Operational Vehicle Mix[1]

YUY	Vehicle Mix (%)
Light Duty Automobile (LDA)	54.88%
Light Duty Truck (LDTI)	5.75%
Light Duty Truck (LDT2)	17.71%
Medium Duty Truck (MDV)	14.47%
Light Heavy Truck (LHD1)	2.73%
Light Heavy Truck (LHD2)	0.33%
Medium Heavy Truck (MHD)	0.51%
Heavy Heavy Truck (HHD)	0.83%
Other Bus (OBUS)	0.03%
Urban Bus (UBUS)	0.01%
Motorcycle (MCY)	2.47%
School Bus (SBUS)	0.05%
Motor Home (MH)	0.24%
Total	**100.0%**

[1] Adjusted fleet mix to include 2% total trucks over 10,000 lbs. GVWR. (LHD2, MHD, HHD, OBUS, UBUS, SBUS, MH)

4.3.2 Energy Source Emissions

Energy usage includes both direct and indirect sources of emissions. Direct sources of emissions include on-site natural gas usage (non-hearth) for heating, while indirect emissions include electricity generated by offsite power plants. Natural gas use is measured in units of a thousand British Thermal Units (kBTU) per size metric for each land use subtype and electricity use is measured in kilowatt hours (kWh) per size metric for each land use subtype.

CalEEMod divides building electricity and natural gas use into uses that are subject to Title 24 standards and those that are not. Lighting electricity usage is also calculated as a separate category in CalEEMod. For electricity, Title 24 uses include the major building envelope systems covered by Part 6 (California Energy Code) of Title 24, such as space heating, space cooling, water heating, and ventilation. Non-Title 24 uses include all other end uses, such as appliances, electronics, and other miscellaneous plug-in uses. Because some lighting is not considered as part of the building envelope energy budget, and since a

separate mitigation measure is applicable to this end use, CalEEMod makes lighting a separate category.

For natural gas, uses are likewise categorized as Title 24 or Non-Title 24. Title 24 uses include building heating and hot water end uses. Non-Title 24 natural gas uses include cooking and appliances (including pool/spa heaters).

The baseline values are based on the California Energy Commission (CEC) sponsored California Commercial End Use Survey (CEUS) and Residential Appliance Saturation Survey (RASS) studies.

The project will be required to provide on-site renewable energy photovoltaic installations (solar panels), as required by the latest 2019 CA Energy Code requirements. The Energy Code requires all new residential construction to achieve net-zero emissions associated with electricity usage through the use of on-site renewable sources. However, this analysis is conservative and does not include emissions reductions from renewables.

Table 15 shows the total annual expected electricity and natural gas usage for the proposed project.

Table 15
Electricity and Natural Gas Usage

Land Use	Electricity Usage[1] (KWhr/yr)[2]	Natural Gas Usage[1] (KBTU/yr)[2]
Multifamily Housing – Low Rise	800,630.00	2,904,170.00
Recreational Swimming Pool	0.00	0.00
Parking Lot	57,226.70	0.00
Total	**857,856.70**	**2,904,170.00**

[1] CalEEMod default estimates.

[2] KWhr/yr = Kilowatt Hours per Year
KBTU/yr = Thousand British Thermal Units per Year

4.3.3 Area Source Emissions

Area source emissions are direct sources of emissions that fall under four categories: hearths, consumer products, architectural coatings, and landscaping equipment. Per SCAQMD rule 445, no wood burning devices are allowed in new developments; therefore,

no wood hearths are included in this project. Natural gas hearths are not included in this study, as multi-family homes typically do not have them.

Consumer products are various solvents used in non-industrial applications which emit ROGs during their product use. These typically include cleaning supplies, kitchen aerosols, cosmetics and toiletries.

4.3.4 Other Sources of Operational Emissions

Water. Greenhouse gas emissions are generated from the upstream energy required to supply and treat the water used on the project site. Indirect emissions from water usage are counted as part of the project's overall impact. The estimated water usage for the project is reported in Table 16 and recommendations to reduce water usage are discussed in Section 6.0.

Waste. CalEEMod calculates the indirect GHG emissions associated with waste that is disposed of at a landfill. The program uses annual waste disposal rates from the California Department of Resources Recycling and Recovery (CalRecycle) data for individual land uses. The program quantifies the GHG emissions associated with the decomposition of the waste which generates methane based on the total amount of degradable organic carbon.

The estimated waste generation by the project is reported in Table 16 and recommendations to reduce waste generation in landfills are discussed in Section 6.0

Table 16
Operational Water Usage and Waste Generation

Land Use	Water Usage (gallons/year)			Waste Generation (tons/year)[1]
	Indoor	Outdoor	Total	
Multifamily Housing – Low Rise	12,509,600.00	7,886,470.00	20,396,070.00	88.32
Recreational Swimming Pool	263,778.00	161,671.00	425,449.00	25.42
Total	**12,773,378.00**	**8,048,141.00**	**20,821,519.00**	**113.74**

[1] CalEEMod default estimates.

5.0 Significance Thresholds

5.1 Air Quality Significance Thresholds

The SCAQMD has established air quality emissions thresholds for criteria air pollutants for the purposes of determining whether a project may have a significant effect on the environment per Section 15002(g) of the Guidelines for implementing CEQA. By complying with the thresholds of significance, the project would be in compliance with the SCAQMD Air Quality Management Plan (AQMP) and the federal and state air quality standards.

Table 17 lists the air quality significance thresholds for the six air pollutants analyzed in this report. Lead is not included as part of this analysis as the project is not expected to emit lead in any significant measurable quantity.

Table 17
SCAQMD Air Quality Significance Thresholds

Pollutant	Construction (lbs/day)	Operation (lbs/day)
NO_X	100	55
VOC	75	55
PM_{10}	150	150
$PM_{2.5}$	55	55
SO_X	150	150
CO	550	550

[1] Source: http://www.aqmd.gov/docs/default-source/ceqa/handbook/scaqmd-air-quality-significance-thresholds.pdf

5.2 Air Quality Localized Significance Thresholds

Air quality emissions were analyzed using the SCAQMD's Mass Rate Localized Significant Threshold (LST) Look-up Tables.

Table 18 lists the Localized Significance Thresholds (LST) used to determine whether a project may generate significant adverse localized air quality impacts. LSTs represent the maximum emissions from a project that are not expected to cause or contribute to an exceedance of the most stringent applicable federal or state ambient air quality standard.

LSTs are developed based on the ambient concentrations of four applicable air pollutants for source receptor area (SRA) 29 – Banning Airport.

The nearest existing sensitive receptors are located along the northern and eastern property line of the site, less than 25 meters from potential areas of on-site construction and operational activity. Although receptors are located closer than 25 meters to the site, SCAQMD LST methodology states that projects with boundaries located closer than 25 meters to the nearest receptor should use the LSTs for receptors located at 25 meters.

The daily disturbance area is calculated to be 4 acres, however LST thresholds are only based on 1, 2 and 5-acre sites. A linear progression trend has been used to calculate the LST threshold for 4-acre disturbance area.

Table 18
SCAQMD Localized Significance Thresholds[1] (LST)

Pollutant	Construction (lbs/day)	Operation (lbs/day)
NO_X	205.7	205.7
CO	2,382.8	2,382.8
PM_{10}	17.3	5.0
$PM_{2.5}$	9.3	2.6

[1] Source: SCAQMD Mass Rate Localized Significance Thresholds for 4-acre site in SRA-29 at 25 meters

5.3 GHG Significance Thresholds

5.3.1 SCAQMD Recommended GHG Thresholds

For quantifiable analysis purposes, the project GHG emissions are also compared to the SCAQMD *Interim CEQA Greenhouse Gas (GHG) Significance Thresholds, December 2008.* The purpose of the SCAQMD thresholds of significance is to assist local agencies with determining the impact of a project for CEQA. SCAQMD's objective in providing the GHG guidelines is to establish a performance standard that will ultimately contribute to reducing GHG emissions below 1990 levels, and thus achieve the requirements of the California Global Warming Solutions Act (AB 32). The SCAQMD has held several GHG Significance Thresholds Stakeholder Working Group meetings where staff has presented updated recommendations that serve in addendum to the interim document.

The SCAQMD describes a five-tiered approach for determining GHG Significance Thresholds.

- **Tier 1 -** If a project is exempt from CEQA, project-level and cumulative GHG emissions are less than significant.

- **Tier 2 -** If the project complies with a GHG emissions reduction plan or mitigation program that avoids or substantially reduces GHG emissions in the project's geographic area (i.e., city or county), project-level and cumulative GHG emissions are less than significant.

For projects that are not exempt or where no qualifying GHG reduction plans are directly applicable, SCAQMD requires an assessment based on the following tiers.

- **Tier 3 -** Consists of screening values that are intended to capture 90 percent of the GHG emissions from projects. If a project's emissions are under the screening thresholds, then the project is less than significant. SCAQMD has presented two options that lead agencies could choose for screening values. Option #1 sets the thresholds for residential projects to 3,500 $MTCO_2e$/year, commercial projects to 1,400 $MTCO_2e$/year), and the mixed use to 3,000 $MTCO_2e$/year. Option #2 sets a single numerical threshold for all non-industrial projects of 3,000 $MTCO_2e$/year. The current staff recommendation is to use option #2, but allows lead agencies to choose option #1 if they prefer. Regardless of which option a lead agency chooses to follow, it is recommended that the same option is consistently used for all projects.

Table 19 shows the screening levels described in option #2, which has been used previously in the City of Beaumont

Table 19
SCAQMD Tier 3 GHG Screening Values

Land Use	Screening Value
Industrial Projects	10,000 $MTCO_2e$/Yr
Residential/Commercial Projects	3,000 $MTCO_2e$/Yr

6.0 Air Quality Impact Analysis

Consistent with CEQA and the State CEQA Guidelines, a significant impact related to air quality would occur if the proposed project is determined to:

a) Conflict with or obstruct implementation of the applicable air quality plan.

b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable Federal or State ambient air quality standard.

c) Expose sensitive receptors to substantial pollutant concentrations.

d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

6.1 Short Term Air Quality Impacts - Construction

6.1.1 Daily Emissions - Construction

Daily air quality emissions include both on-site and off-site emissions associated with construction of the project. Regional daily emissions of criteria pollutants are compared to the SCAQMD thresholds of significance.

As shown in Table 20, daily emissions of criteria pollutants are expected to be below the allowable thresholds of significance.

CalEEMod daily emissions outputs are provided in Appendix A.

Table 20
Daily Construction Emissions

Maximum Daily Emissions (lbs/day)[1]						
Activity	**VOC**	**NO_x**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**
Site Preparation	0.53	2.06	21.53	0.04	7.78	3.98
Grading	1.43	32.00	41.19	0.21	9.02	3.19
Building Construction	1.09	4.39	24.35	0.05	2.71	0.77
Paving	0.82	1.25	17.81	0.02	0.21	0.08
Architectural Coating	62.51	0.21	3.18	0.01	0.48	0.13
Maximum[1]	**62.51**	**32.00**	**41.19**	**0.21**	**9.02**	**3.98**
SCAQMD Threshold	75	100	550	150	150	55
Exceeds Threshold (?)	**No**	**No**	**No**	**No**	**No**	**No**

[1] Maximum daily emission during summer or winter; includes both on-site and off-site project emissions.

The project must follow mandatory SCAQMD rules and requirements with regards to fugitive dust control, as described in Section 6.1.3. Compliance with the standard dust control measures is considered to be part of the conditions of approval for the project and built into the design features.

Table 20 shows that the project's daily construction emissions will be below the applicable SCAQMD air quality standards and thresholds of significance. As a result, the project would not contribute substantially to an existing or projected air quality violation.

Furthermore, by complying with the SCAQMD standards, the project would not contribute to a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable Federal or State ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors).

The project's short-term construction impact on air quality emissions is less than significant.

6.1.2 Localized Emissions - Construction

Table 21 illustrates the construction related localized emissions and compares the results to SCAQMD LST thresholds. As shown in Table 21, the emissions will be below the SCAQMD thresholds of significance for localized construction emissions. The project must follow all

standard SCAQMD rules and requirements with regards to fugitive dust control, as described in Section 6.1.3. Compliance with the dust control is considered a standard requirement and included as part of the project's design features, not mitigation.

The project's short-term construction impact to localized air emissions is less than significant.

Table 21
Localized Construction Emissions

Maximum Daily Emissions (lbs/day)[1]				
Activity	**NOx**	**CO**	**PM_{10}**	**$PM_{2.5}$**
On-site Emissions	3.30	33.00	7.58	3.93
SCAQMD Construction Threshold[2]	205.7	2,382.8	17.3	9.3
Exceeds Threshold (?)	**No**	**No**	**No**	**No**

[1] Maximum daily emission during summer or winter; includes on-site project emissions only.
[2] Reference 2006-2008 SCAQMD Mass Rate Localized Significant Thresholds for construction and operation. SRA-29, Banning Airport, 4-acre site, receptor distance 25 meters.

6.1.3 Fugitive Dust - Construction

The Project is required to comply with regional rules that assist in reducing short-term air pollutant emissions associated with suspended particulate matter, also known as fugitive dust. Fugitive dust emissions are commonly associated with land clearing activities, cut-and-fill grading operations, and exposure of soils to the air and wind. SCAQMD Rule 403 requires that fugitive dust is controlled with best-available control measures so that the presence of such dust does not remain visible in the atmosphere beyond the property line of the emission source. In addition, SCAQMD Rules 402 and 403 require implementation of dust suppression techniques to prevent fugitive dust from creating a nuisance off site.

To ensure full compliance with the applicable dust control standards, the following project design are recommended for the project:

DF-1 The project must follow the standard SCAQMD rules and requirements with regards to fugitive dust control, which includes, but are not limited to the following:

1. All active construction areas shall be watered two (2) times daily.
2. Speed on unpaved roads shall be reduced to less than 15 mph.

3. Any visible dirt deposition on any public roadway shall be swept or washed at the site access points within 30 minutes.
4. Any on-site stockpiles of debris, dirt or other dusty material shall be covered or watered twice daily.
5. All operations on any unpaved surface shall be suspended if winds exceed 15 mph.
6. Access points shall be washed or swept daily.
7. Construction sites shall be sandbagged for erosion control.
8. Apply nontoxic chemical soil stabilizers according to manufacturers' specifications to all inactive construction areas (previously graded areas inactive for 10 days or more).
9. Cover all trucks hauling dirt, sand, soil, or other loose materials, and maintain at least 2 feet of freeboard space in accordance with the requirements of California Vehicle Code (CVC) section 23114.
10. Pave or gravel construction access roads at least 100 feet onto the site from the main road and use gravel aprons at truck exits.
11. Replace the ground cover of disturbed areas as quickly possible.

6.1.4 Odors - Construction

Heavy-duty equipment in the project area during construction will emit odors; however, the construction activity would cease to occur after individual construction is completed. The project is required to comply with Rule 402 during construction, which states that a person shall not discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property. No other sources of objectionable odors have been identified for the proposed Project.

Therefore, the project impact from odor emissions is less than significant.

6.1.5 Asbestos - Construction

Asbestos is a carcinogen and is categorized as a hazardous air pollutant by the Environmental Protection Agency (EPA). Asbestos fibers imbedded within construction materials become a health hazard once they are disturbed and rendered airborne, such as through physical contact like building renovation and demolition activities. Asbestos is

regulated through the National Emissions Standards for Hazardous Air Pollutants (NESHAP) and SCAQMD is the local enforcement authority for asbestos.

The project is not expected to require the demolition of existing building or structures. Therefore, the potential risk from exposure to asbestos during construction is small.

Asbestos also occurs naturally in serpentine and ultramafic rock. Based on the California Division of Mines and Geology General Location Guide for Ultramafic Rocks in California - Areas More Likely to Contain Naturally Occurring Asbestos, naturally occurring asbestos has not been shown to occur within in the vicinity of the project site. Therefore, the potential risk for naturally occurring asbestos (NOA) during project construction is small.

In the event asbestos is found on the site, the project will be required to comply with SCAQMD and NESHAP standards and protocols. SCAQMD Rule 1403 establishes the survey requirements, notification, and work practice requirements to prevent asbestos emissions during construction activities. By following the required asbestos abatement protocols, the project impact from asbestos would be less than significant.

6.1.6 Diesel Particulate Matter - Construction

The project will generate diesel particulate matter (DPM) during construction from off-road diesel equipment and trucks. The California Office of Environmental Health Hazard Assessment (OEHHA) adopted the Guidance Manual for Preparation of Health Risk Assessments (HRA Guidelines) to provide procedures for use in the Air Toxics Hot Spots Program or for the permitting of existing, new, or modified stationary sources.[7]

The HRA Guidelines provide risk factors based on exposure to toxic substances over a 30-year lifetime span. The proposed project's construction activity is not expected to be a long-term (i.e., 30 years) source of toxic air contaminant emissions and short-term risk factors have not been developed. Due the significantly reduced risk from short-term exposure, SCAQMD does not typically require the evaluation of long-term cancer risk or chronic health impacts for construction operations from a project such as the one being proposed.

Hence, the impacts from short-term exposure to DMP during project construction may be presumed to be less than significant without the need for a detailed HRA study.

[7] OEHHA. Air Toxics Hot Spots Program. Risk Assessment Guidelines. Guidance for Preparation of Health Risk Assessments. February 2015.

To help further reduce the potential health risks associated with DPM exposure during construction, the following project design features are recommended. Project design features include a recommendation for Tier 4 engines on all off-road diesel equipment. Tier 4 engines, along with the latest national fuel standards, have been shown to yield PM reductions of over 95% from the typical Tier 2 and Tier 3 engines.[8] Thus ensuring the potential DPM exposure to adjacent sensitive receptors is reduced to the maximum extent feasible.

DF-2 All diesel construction equipment greater than 50 horsepower should have Tier 4 low emission "clean diesel" engines (OEM or retrofit) that include diesel oxidation catalysts and diesel particulate filters that meet the latest CARB best available control technology.

DF-3 Construction equipment should be maintained in proper tune.

DF-4 All construction vehicles should be prohibited from excessive idling. Excessive idling is defined as five (5) minutes or longer.

DF-5 Minimize the simultaneous operation of multiple construction equipment units, to the maximum extent feasible.

DF-6 The use of heavy construction equipment and earthmoving activity should be suspended during Air Alerts when the Air Quality Index reaches the "Unhealthy" level.

DF-7 Establish an electricity supply to the construction site and use electric powered equipment instead of diesel-powered equipment or generators, where feasible.

DF-8 Establish staging areas for the construction equipment that as far from adjacent residential homes, as feasible.

DF-9 Use haul trucks with on-road engines instead of off-road engines for on-site hauling.

[8] EPA. Control of Emissions of Air Pollution from Nonroad Diesel Engines and Fuel; Final Rule. (40 CFR Parts 9, 69, et al.)

6.2 Long Term Air Quality Impacts - Operation

6.2.1 Daily Emissions - Operation

Long-term operational air pollutant impacts from the project are shown in Table 22. The project is not expected to exceed any of the allowable daily emissions thresholds for criteria pollutants at the regional level. CalEEMod daily emissions outputs are provided in Appendix A.

The project's daily operational emissions will be below the applicable SCAQMD air quality thresholds of significance and the project would not contribute substantially to an existing or projected air quality violation. Furthermore, by complying with the SCAQMD standards, the project would not contribute to a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable Federal or State ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors).

The project related long-term air quality impacts are less than significant.

Table 22
Daily Operational Emissions

Maximum Daily Emissions (lbs/day)[1]						
Activity	**VOC**	**NO_x**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**
Mobile Sources	4.94	5.26	48.50	0.10	11.29	3.05
Energy Sources	0.09	0.73	0.31	0.00	0.06	0.06
Area Sources	4.68	0.18	15.85	0.00	0.09	0.09
Total	**9.71**	**6.17**	**64.66**	**0.11**	**11.43**	**3.20**
SCAQMD Threshold	55	55	550	150	150	55
Exceeds Threshold (?)	**No**	**No**	**No**	**No**	**No**	**No**

[1] Maximum daily emission during summer or winter; includes both on-site and off-site project emissions.
[2] Daily emissions reports are provided in Appendix A.

6.2.2 Localized Emissions - Operation

Table 23 shows the localized operational emissions and compares the results to SCAQMD LST thresholds of significance. As shown in Table 23, the emissions will be below the SCAQMD thresholds of significance for localized operational emissions. **The project will result in less than significant localized operational emissions impacts.**

Table 23
Localized Operational Emissions

Maximum Daily Emissions (lbs/day)[1]				
LST Pollutants	NOx (lbs/day)	CO (lbs/day)	PM_{10} (lbs/day)	$PM_{2.5}$ (lbs/day)
On-site Emissions[1]	1.18	18.59	0.7	0.3
SCAQMD Operation Threshold[2]	205.7	2,382.8	5.0	2.6
Exceeds Threshold (?)	**No**	**No**	**No**	**No**

[1] Maximum daily emission in summer or winter.
[2] Mobile source emissions include on-site vehicle emissions only. It is estimated that approximately 5% of mobile emissions will occur on the project site.
[3] Reference: 2006-2008 SCAQMD Mass Rate Localized Significant Thresholds for construction and operation Table C-1 through C-6; SRA 29, Banning Airport disturbance area of 4-acre and receptor distance of 25 meters.

6.2.3 Odors - Operation

Land uses that commonly receive odor complaints include agricultural uses (farming and livestock), chemical plants, composting operations, dairies, fiberglass molding facilities, food processing plants, landfills, refineries, rail yards, and wastewater treatment plants. The proposed project does not contain land uses that would typically be associated with significant odor emissions.

The project will be required to comply with standard building code requirements related to exhaust ventilation, as well as comply with SCAQMD Rule 402. Rule 402 requires that a person may not discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property. Project related odors are not expected to meet the criteria of being a nuisance. **The project's operation would result in less than significant odor impacts.**

6.2.4 Toxic Air Contaminants - Operations

The project would consist of residential land uses. These types of projects do not include major sources of toxic air contaminants (TAC) emissions that would result in significant exposure of sensitive receptors to substantial pollutant concentrations. Therefore, **the project impact is considered less than significant.**

7.0 Greenhouse Gas Impact Analysis

Consistent with CEQA Guidelines, a significant impact related to greenhouse gas would occur if the proposed project is determined to:

a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.

b) Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing emissions of greenhouse gases.

7.1 Greenhouse Gas Emissions - Construction

Greenhouse gas emissions are estimated for on-site and off-site construction activity using CalEEMod. Table 24 shows the construction greenhouse gas emissions, including equipment and worker vehicle emissions for all phases of construction. Construction emissions are averaged over 30 years and added to the long-term operational emissions, pursuant to SCAQMD recommendations.

CalEEMod annual GHG output calculations are provided in Appendix B.

Table 24
Construction Greenhouse Gas Emissions

Activity	Emissions ($MTCO_2e$)[1]		
	On-site	Off-site	Total
Site Preparation	16.86	0.77	17.63
Grading	82.46	229.20	311.66
Building Construction	349.82	386.89	736.71
Paving	20.18	1.23	21.41
Architectural Coating	2.56	3.41	5.97
Total	**471.88**	**621.50**	**1,093.38**
Amortized over 30 years[2]	**15.73**	**20.72**	**36.45**

[1] $MTCO_2e$ = metric tons of carbon dioxide equivalents (includes carbon dioxide, methane, nitrous oxide, and/or hydrofluorocarbon).
[2] The emissions are amortized over 30 years and added to the operational emissions, pursuant to SCAQMD recommendations.

Because impacts from construction activities occur over a relatively short-term period of time, they contribute a relatively small portion of the overall lifetime project GHG emissions. By itself, the construction activities from this project are less than significant when compared to the thresholds recommended by SCAQMD. However, SCAQMD recommends that construction emissions be amortized over a 30-year project lifetime and added to the overall project operational emissions. In doing so, construction GHG emissions are included in the overall contribution of the project, as further discussed in the following section.

7.2 Greenhouse Gas Emissions - Operation

Greenhouse gas emissions are estimated for on-site and off-site operational activity using CalEEMod. Greenhouse gas emissions from mobile sources, area sources and energy sources are shown in Table 25. CalEEMod annual GHG output calculations are provided in Appendix B.

Table 25
Operational Greenhouse Gas Emissions

Emission Source	GHG Emissions ($MTCO_2e$)[1]
Mobile Source	1,523.22
Energy Source	308.82
Area Source	3.32
Water	62.97
Waste	57.20
Construction (30 year average)	36.45
Total Annual Emissions	**1,991.97**
SCAQMD Tier 3 Screening Threshold[2]	3,000
Exceed Tier 3 Threshold?	No

[1] $MTCO_2e$ = metric tons of carbon dioxide equivalents

[2] Per South Coast Air Quality Management District (SCAQMD) Draft Guidance Document - Interim CEQA Greenhouse Gas (GHG) Significance Threshold, October 2008

As shown in Table 25, the project GHG emissions are expected to be below the SCAQMD's Tier 3 approach, which limits GHG emissions to 3,000 $MTCO_2e$ for residential projects.

The project related long-term GHG impacts are less than significant.

7.3 Project Consistency With GHG Reduction Plans

The City of Beaumont has adopted the Climate Action Plan (CAP) for the Building Energy Sector to reduce the energy and GHG footprint across the City. However, the CAP does not establish quantified thresholds of significance for CEQA purposes. The CAP is focused on reduction strategies within the energy sector—specifically buildings. Hence, in order to ensure the project is consistent with the City's CAP, the project should incorporate building design features that reduce energy consumption.

The project will be required to comply with the mandatory requirements of the latest 2019 California Building Standards Code, including Title 24, Part 11, CALGreen and Title 24, Part 6, Energy Code. The purpose of the building standards is to reduce negative impacts on the environment through improved planning and design, energy efficiency, water efficiency and conservation and material and resource conservation. The California Building Standards were developed to help meet the requirements of the Global Warming Solutions Act (AB 32).

As part of the latest Energy Code requirements, the project will be required to include rooftop solar panels, community solar panels, and/or other sources of on-site renewable energy capable of meeting the required California Energy Code Energy Design Rating.

With the recommended project design features described in this report, the project will not conflict with an applicable plan, policy or regulation for the purpose of reducing the emissions of greenhouse gases and the impact is considered less than significant.

The following project design features will be implemented to ensure the project is consistent with applicable GHG reduction standards.

DF-10 The project will comply with the mandatory requirements of the California Building Standards Code, Title 24, Part 6 (Energy Code) and Part 11 (CALGreen), including, but not limited to:

- Install low flow fixtures and toilets, water efficient irrigation systems, drought tolerant/native landscaping, and reduce the amount of turf.
- Provide the necessary infrastructure to support electric vehicle charging.
- Provide solar installations per the prescribed Energy Design Ratings.

DF-11 No wood-burning or natural gas fireplaces will be included in the project.

DF-12 Participate in the local waste management recycling and composting programs.

DF-13 Encourage the property management company and landscape maintenance crews to use electric powered landscaping equipment for landscape maintenance.

Exhibits

Exhibit A

Location Map

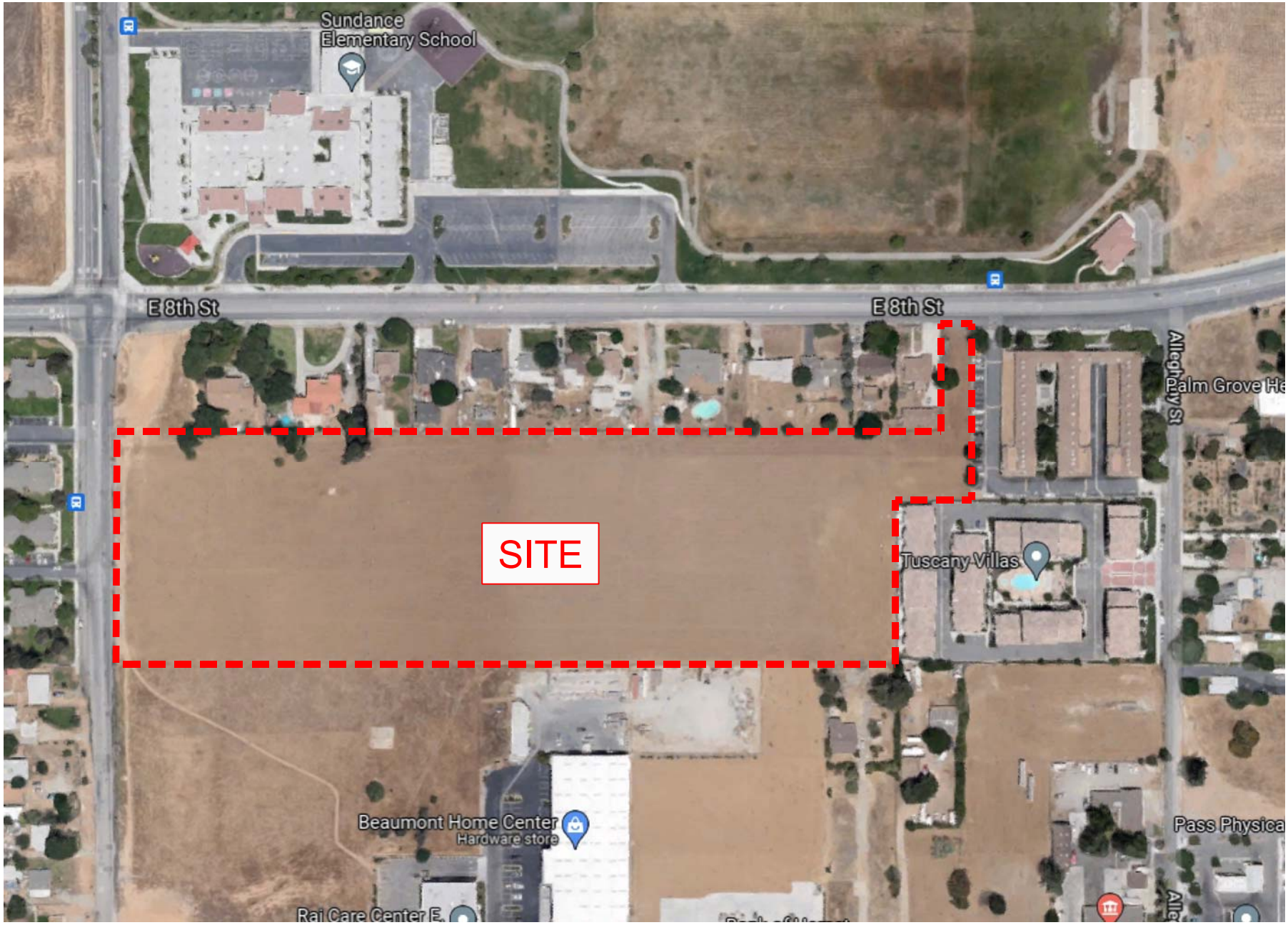
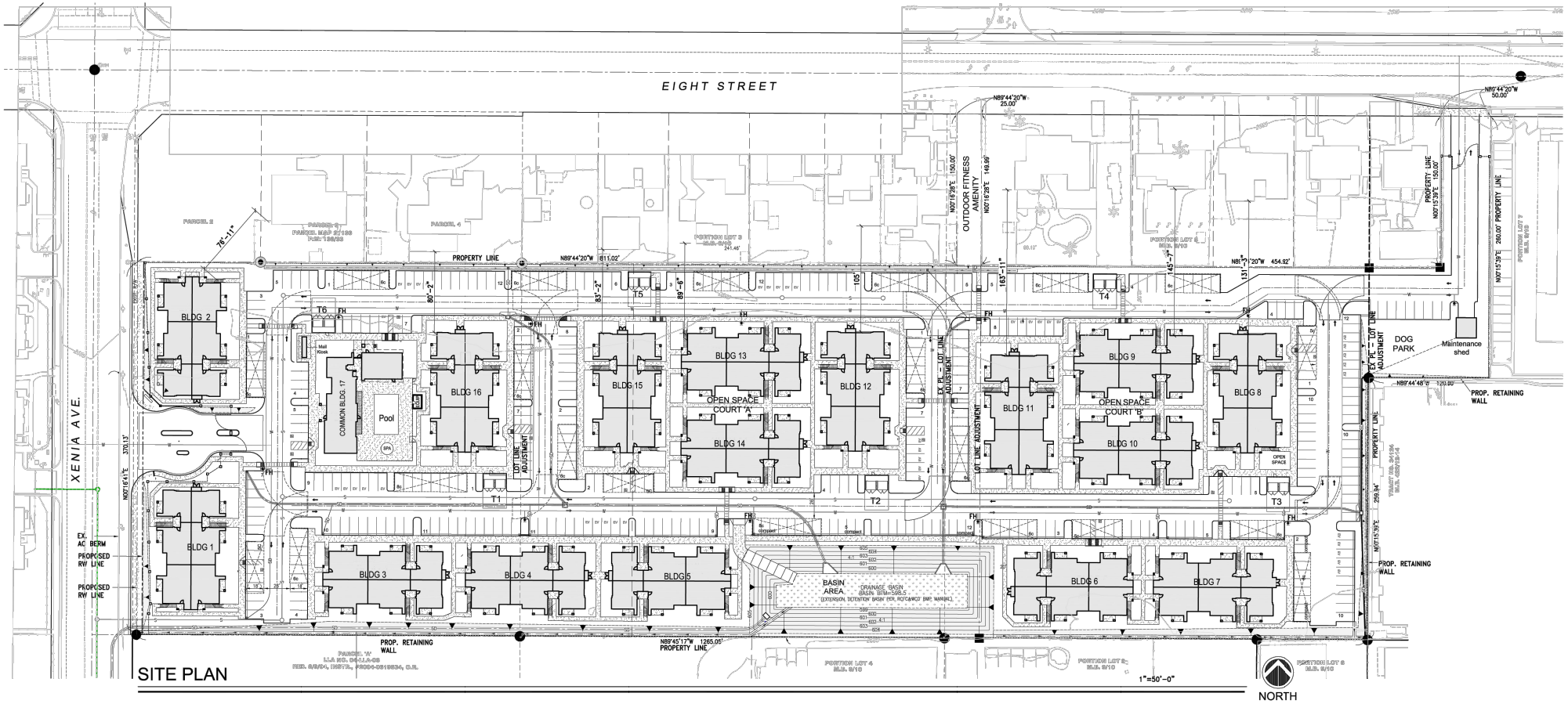


Exhibit B

Site Plan



N

Appendices

Appendix A

Daily Emissions Calculations Output
(CalEEMod)

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Xenia and Eight Street Multifamily Residential Project

Riverside-South Coast County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	163.50	1000sqft	3.75	163,504.80	0
Apartments Low Rise	192.00	Dwelling Unit	7.18	192,000.00	549
Recreational Swimming Pool	4.46	1000sqft	0.10	4,462.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.4	**Precipitation Freq (Days)**	28
Climate Zone	10			**Operational Year**	2024
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	390.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - The project is proposing to build 192 multifamily apartment homes and a swimming pool, and pave approximately 163,504.8 Square Feet as a part of on-site street improvement and parking lot.

Construction Phase - The site is currently vacant and requires no demolition.

Grading - The project is expected to import approximately 65,000 cubic yard of earthwork materials

Woodstoves - Per SCAQMD Rule 445, no wood-burning devices will be allowed. Project will not include natural gas hearths.

Construction Off-road Equipment Mitigation - Project will be required to comply with SCAQMD Rule 403 regarding fugitive dust control. Construction equipment will have Tier 4 "clean diesel" engines.

Fleet Mix - Operational fleet mix adjusted to equal 2% trucks with GVWR > 10,000 lbs.

Vehicle Trips - The project swimming pool is not expected to generate any additional trips.

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadMoistureContent	0	12
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	9.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
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tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

tblFireplaces	NumberGas	163.20	0.00
tblFireplaces	NumberNoFireplace	19.20	192.00
tblFireplaces	NumberWood	9.60	0.00
tblFleetMix	HHD	0.02	8.3400e-003
tblFleetMix	LDA	0.54	0.55
tblFleetMix	LDT1	0.06	0.06
tblFleetMix	LDT2	0.17	0.18
tblFleetMix	LHD1	0.03	0.03
tblFleetMix	LHD2	7.1910e-003	3.2610e-003
tblFleetMix	MCY	0.02	0.02
tblFleetMix	MDV	0.14	0.14
tblFleetMix	MH	5.1890e-003	2.4390e-003
tblFleetMix	MHD	0.01	5.0530e-003
tblFleetMix	OBUS	6.1100e-004	2.7500e-004
tblFleetMix	SBUS	1.0970e-003	4.9100e-004
tblFleetMix	UBUS	3.0900e-004	1.4100e-004
tblGrading	MaterialImported	0.00	65,000.00
tblLandUse	LandUseSquareFeet	163,505.00	163,504.80
tblLandUse	LandUseSquareFeet	4,460.00	4,462.00
tblLandUse	LotAcreage	12.00	7.18
tblVehicleTrips	ST_TR	9.10	0.00
tblVehicleTrips	SU_TR	13.60	0.00
tblVehicleTrips	WD_TR	28.82	0.00
tblWoodstoves	NumberCatalytic	9.60	0.00
tblWoodstoves	NumberNoncatalytic	9.60	0.00

2.0 Emissions Summary

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2023	3.9875	61.6072	36.2223	0.2129	19.8582	1.7520	21.1252	10.1558	1.6238	11.3214	0.0000	22,105.1014	22,105.1014	2.1742	2.5089	22,907.1159
2024	2.2367	15.4326	23.9845	0.0551	2.6436	0.6374	3.2809	0.7081	0.5995	1.3076	0.0000	5,483.5179	5,483.5179	0.7171	0.1747	5,552.0225
2025	62.6477	8.6087	15.0582	0.0242	0.4695	0.4192	0.5869	0.1245	0.3857	0.4302	0.0000	2,350.4254	2,350.4254	0.7165	8.5400e-003	2,369.2476
Maximum	**62.6477**	**61.6072**	**36.2223**	**0.2129**	**19.8582**	**1.7520**	**21.1252**	**10.1558**	**1.6238**	**11.3214**	**0.0000**	**22,105.1014**	**22,105.1014**	**2.1742**	**2.5089**	**22,907.1159**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2023	1.4273	30.3917	41.1703	0.2129	8.5890	0.4290	9.0180	3.9176	0.4148	3.9805	0.0000	22,105.1014	22,105.1014	2.1742	2.5089	22,907.1159
2024	1.0930	4.2235	25.2779	0.0551	2.6436	0.0648	2.7084	0.7081	0.0634	0.7715	0.0000	5,483.5179	5,483.5179	0.7171	0.1747	5,552.0225
2025	62.5065	1.2424	17.7759	0.0242	0.4695	0.0381	0.4754	0.1245	0.0381	0.1303	0.0000	2,350.4254	2,350.4254	0.7165	8.5400e-003	2,369.2476
Maximum	**62.5065**	**30.3917**	**41.1703**	**0.2129**	**8.5890**	**0.4290**	**9.0180**	**3.9176**	**0.4148**	**3.9805**	**0.0000**	**22,105.1014**	**22,105.1014**	**2.1742**	**2.5089**	**22,907.1159**

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**5.58**	**58.13**	**-11.90**	**0.00**	**49.06**	**81.06**	**51.18**	**56.77**	**80.21**	**62.61**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	4.6788	0.1826	15.8507	8.4000e-004		0.0878	0.0878		0.0878	0.0878	0.0000	28.5588	28.5588	0.0275	0.0000	29.2454
Energy	0.0858	0.7333	0.3120	4.6800e-003		0.0593	0.0593		0.0593	0.0593		936.0757	936.0757	0.0179	0.0172	941.6383
Mobile	4.9420	4.9521	48.4997	0.1048	11.2162	0.0692	11.2854	2.9833	0.0646	3.0479		10,830.5682	10,830.5682	0.5263	0.4084	10,965.4163
Total	**9.7066**	**5.8679**	**64.6625**	**0.1104**	**11.2162**	**0.2163**	**11.4325**	**2.9833**	**0.2117**	**3.1950**	**0.0000**	**11,795.2027**	**11,795.2027**	**0.5717**	**0.4255**	**11,936.3000**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	4.6788	0.1826	15.8507	8.4000e-004		0.0878	0.0878		0.0878	0.0878	0.0000	28.5588	28.5588	0.0275	0.0000	29.2454
Energy	0.0858	0.7333	0.3120	4.6800e-003		0.0593	0.0593		0.0593	0.0593		936.0757	936.0757	0.0179	0.0172	941.6383
Mobile	4.9420	4.9521	48.4997	0.1048	11.2162	0.0692	11.2854	2.9833	0.0646	3.0479		10,830.5682	10,830.5682	0.5263	0.4084	10,965.4163
Total	**9.7066**	**5.8679**	**64.6625**	**0.1104**	**11.2162**	**0.2163**	**11.4325**	**2.9833**	**0.2117**	**3.1950**	**0.0000**	**11,795.2027**	**11,795.2027**	**0.5717**	**0.4255**	**11,936.3000**

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	9/1/2023	9/14/2023	5	10	
2	Grading	Grading	9/15/2023	10/26/2023	5	30	
3	Building Construction	Building Construction	10/27/2023	12/19/2024	5	300	
4	Paving	Paving	12/20/2024	1/16/2025	5	20	
5	Architectural Coating	Architectural Coating	1/17/2025	2/13/2025	5	20	

Acres of Grading (Site Preparation Phase): 15

Acres of Grading (Grading Phase): 90

Acres of Paving: 3.75

Residential Indoor: 388,800; Residential Outdoor: 129,600; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 9,810 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	8,125.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	209.00	48.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	42.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Use Soil Stabilizer

Replace Ground Cover

Water Exposed Area

Water Unpaved Roads

Reduce Vehicle Speed on Unpaved Roads

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.2 Site Preparation - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					19.6570	0.0000	19.6570	10.1025	0.0000	10.1025			0.0000			0.0000
Off-Road	2.6595	27.5242	18.2443	0.0381		1.2660	1.2660		1.1647	1.1647		3,687.3081	3,687.3081	1.1926		3,717.1219
Total	**2.6595**	**27.5242**	**18.2443**	**0.0381**	**19.6570**	**1.2660**	**20.9230**	**10.1025**	**1.1647**	**11.2672**		**3,687.3081**	**3,687.3081**	**1.1926**		**3,717.1219**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0658	0.0406	0.6603	1.7700e-003	0.2012	9.4000e-004	0.2021	0.0534	8.7000e-004	0.0542		181.1165	181.1165	4.1400e-003	4.2200e-003	182.4783
Total	**0.0658**	**0.0406**	**0.6603**	**1.7700e-003**	**0.2012**	**9.4000e-004**	**0.2021**	**0.0534**	**8.7000e-004**	**0.0542**		**181.1165**	**181.1165**	**4.1400e-003**	**4.2200e-003**	**182.4783**

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.2 Site Preparation - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					7.5188	0.0000	7.5188	3.8642	0.0000	3.8642			0.0000			0.0000
Off-Road	0.4656	2.0175	20.8690	0.0381		0.0621	0.0621		0.0621	0.0621	0.0000	3,687.3081	3,687.3081	1.1926		3,717.1219
Total	**0.4656**	**2.0175**	**20.8690**	**0.0381**	**7.5188**	**0.0621**	**7.5809**	**3.8642**	**0.0621**	**3.9263**	**0.0000**	**3,687.3081**	**3,687.3081**	**1.1926**		**3,717.1219**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0658	0.0406	0.6603	1.7700e-003	0.2012	9.4000e-004	0.2021	0.0534	8.7000e-004	0.0542		181.1165	181.1165	4.1400e-003	4.2200e-003	182.4783
Total	**0.0658**	**0.0406**	**0.6603**	**1.7700e-003**	**0.2012**	**9.4000e-004**	**0.2021**	**0.0534**	**8.7000e-004**	**0.0542**		**181.1165**	**181.1165**	**4.1400e-003**	**4.2200e-003**	**182.4783**

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.3 Grading - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.4780	0.0000	9.4780	3.6953	0.0000	3.6953			0.0000			0.0000
Off-Road	3.3217	34.5156	28.0512	0.0621		1.4245	1.4245		1.3105	1.3105		6,011.4777	6,011.4777	1.9442		6,060.0836
Total	**3.3217**	**34.5156**	**28.0512**	**0.0621**	**9.4780**	**1.4245**	**10.9025**	**3.6953**	**1.3105**	**5.0058**		**6,011.4777**	**6,011.4777**	**1.9442**		**6,060.0836**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.5927	27.0465	7.4374	0.1488	4.7401	0.3264	5.0665	1.2995	0.3123	1.6118		15,892.3831	15,892.3831	0.2254	2.5042	16,644.2787
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0731	0.0452	0.7337	1.9700e-003	0.2236	1.0500e-003	0.2246	0.0593	9.7000e-004	0.0603		201.2406	201.2406	4.5900e-003	4.6900e-003	202.7537
Total	**0.6658**	**27.0916**	**8.1711**	**0.1508**	**4.9636**	**0.3275**	**5.2911**	**1.3588**	**0.3133**	**1.6721**		**16,093.6237**	**16,093.6237**	**0.2300**	**2.5089**	**16,847.0324**

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.3 Grading - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					3.6253	0.0000	3.6253	1.4135	0.0000	1.4135			0.0000			0.0000
Off-Road	0.7616	3.3000	32.9991	0.0621		0.1015	0.1015		0.1015	0.1015	0.0000	6,011.4777	6,011.4777	1.9442		6,060.0836
Total	**0.7616**	**3.3000**	**32.9991**	**0.0621**	**3.6253**	**0.1015**	**3.7269**	**1.4135**	**0.1015**	**1.5150**	**0.0000**	**6,011.4777**	**6,011.4777**	**1.9442**		**6,060.0836**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.5927	27.0465	7.4374	0.1488	4.7401	0.3264	5.0665	1.2995	0.3123	1.6118		15,892.3831	15,892.3831	0.2254	2.5042	16,644.2787
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0731	0.0452	0.7337	1.9700e-003	0.2236	1.0500e-003	0.2246	0.0593	9.7000e-004	0.0603		201.2406	201.2406	4.5900e-003	4.6900e-003	202.7537
Total	**0.6658**	**27.0916**	**8.1711**	**0.1508**	**4.9636**	**0.3275**	**5.2911**	**1.3588**	**0.3133**	**1.6721**		**16,093.6237**	**16,093.6237**	**0.2300**	**2.5089**	**16,847.0324**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.4 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5728	14.3849	16.2440	0.0269		0.6997	0.6997		0.6584	0.6584		2,555.2099	2,555.2099	0.6079		2,570.4061
Total	**1.5728**	**14.3849**	**16.2440**	**0.0269**		**0.6997**	**0.6997**		**0.6584**	**0.6584**		**2,555.2099**	**2,555.2099**	**0.6079**		**2,570.4061**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0541	1.5682	0.6457	8.3900e-003	0.3074	0.0137	0.3211	0.0885	0.0131	0.1016		889.3008	889.3008	9.0700e-003	0.1314	928.6883
Worker	0.7636	0.4718	7.6673	0.0206	2.3361	0.0110	2.3471	0.6196	0.0101	0.6296		2,102.9643	2,102.9643	0.0480	0.0490	2,118.7760
Total	**0.8177**	**2.0400**	**8.3130**	**0.0289**	**2.6436**	**0.0246**	**2.6682**	**0.7081**	**0.0232**	**0.7312**		**2,992.2651**	**2,992.2651**	**0.0571**	**0.1804**	**3,047.4643**

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.4 Building Construction - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.3278	2.2347	17.4603	0.0269		0.0408	0.0408		0.0408	0.0408	0.0000	2,555.2099	2,555.2099	0.6079		2,570.4061
Total	**0.3278**	**2.2347**	**17.4603**	**0.0269**		**0.0408**	**0.0408**		**0.0408**	**0.0408**	**0.0000**	**2,555.2099**	**2,555.2099**	**0.6079**		**2,570.4061**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0541	1.5682	0.6457	8.3900e-003	0.3074	0.0137	0.3211	0.0885	0.0131	0.1016		889.3008	889.3008	9.0700e-003	0.1314	928.6883
Worker	0.7636	0.4718	7.6673	0.0206	2.3361	0.0110	2.3471	0.6196	0.0101	0.6296		2,102.9643	2,102.9643	0.0480	0.0490	2,118.7760
Total	**0.8177**	**2.0400**	**8.3130**	**0.0289**	**2.6436**	**0.0246**	**2.6682**	**0.7081**	**0.0232**	**0.7312**		**2,992.2651**	**2,992.2651**	**0.0571**	**0.1804**	**3,047.4643**

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.4 Building Construction - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.4716	13.4438	16.1668	0.0270		0.6133	0.6133		0.5769	0.5769		2,555.6989	2,555.6989	0.6044		2,570.8077
Total	**1.4716**	**13.4438**	**16.1668**	**0.0270**		**0.6133**	**0.6133**		**0.5769**	**0.5769**		**2,555.6989**	**2,555.6989**	**0.6044**		**2,570.8077**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0533	1.5683	0.6383	8.2500e-003	0.3074	0.0136	0.3210	0.0885	0.0130	0.1015		875.5948	875.5948	9.3900e-003	0.1292	914.3286
Worker	0.7119	0.4205	7.1794	0.0199	2.3361	0.0105	2.3466	0.6196	9.6400e-003	0.6292		2,052.2242	2,052.2242	0.0435	0.0456	2,066.8862
Total	**0.7651**	**1.9888**	**7.8177**	**0.0281**	**2.6436**	**0.0240**	**2.6676**	**0.7081**	**0.0226**	**0.7307**		**2,927.8190**	**2,927.8190**	**0.0529**	**0.1747**	**2,981.2148**

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.4 Building Construction - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.3278	2.2347	17.4603	0.0270		0.0408	0.0408		0.0408	0.0408	0.0000	2,555.6989	2,555.6989	0.6044		2,570.8077
Total	**0.3278**	**2.2347**	**17.4603**	**0.0270**		**0.0408**	**0.0408**		**0.0408**	**0.0408**	**0.0000**	**2,555.6989**	**2,555.6989**	**0.6044**		**2,570.8077**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0533	1.5683	0.6383	8.2500e-003	0.3074	0.0136	0.3210	0.0885	0.0130	0.1015		875.5948	875.5948	9.3900e-003	0.1292	914.3286
Worker	0.7119	0.4205	7.1794	0.0199	2.3361	0.0105	2.3466	0.6196	9.6400e-003	0.6292		2,052.2242	2,052.2242	0.0435	0.0456	2,066.8862
Total	**0.7651**	**1.9888**	**7.8177**	**0.0281**	**2.6436**	**0.0240**	**2.6676**	**0.7081**	**0.0226**	**0.7307**		**2,927.8190**	**2,927.8190**	**0.0529**	**0.1747**	**2,981.2148**

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Paving - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9882	9.5246	14.6258	0.0228		0.4685	0.4685		0.4310	0.4310		2,207.5472	2,207.5472	0.7140		2,225.3963
Paving	0.4913					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.4794**	**9.5246**	**14.6258**	**0.0228**		**0.4685**	**0.4685**		**0.4310**	**0.4310**		**2,207.5472**	**2,207.5472**	**0.7140**		**2,225.3963**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0511	0.0302	0.5153	1.4300e-003	0.1677	7.5000e-004	0.1684	0.0445	6.9000e-004	0.0452		147.2888	147.2888	3.1200e-003	3.2700e-003	148.3411
Total	**0.0511**	**0.0302**	**0.5153**	**1.4300e-003**	**0.1677**	**7.5000e-004**	**0.1684**	**0.0445**	**6.9000e-004**	**0.0452**		**147.2888**	**147.2888**	**3.1200e-003**	**3.2700e-003**	**148.3411**

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Paving - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.2805	1.2154	17.2957	0.0228		0.0374	0.0374		0.0374	0.0374	0.0000	2,207.5472	2,207.5472	0.7140		2,225.3963
Paving	0.4913					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.7717**	**1.2154**	**17.2957**	**0.0228**		**0.0374**	**0.0374**		**0.0374**	**0.0374**	**0.0000**	**2,207.5472**	**2,207.5472**	**0.7140**		**2,225.3963**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0511	0.0302	0.5153	1.4300e-003	0.1677	7.5000e-004	0.1684	0.0445	6.9000e-004	0.0452		147.2888	147.2888	3.1200e-003	3.2700e-003	148.3411
Total	**0.0511**	**0.0302**	**0.5153**	**1.4300e-003**	**0.1677**	**7.5000e-004**	**0.1684**	**0.0445**	**6.9000e-004**	**0.0452**		**147.2888**	**147.2888**	**3.1200e-003**	**3.2700e-003**	**148.3411**

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Paving - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9152	8.5816	14.5780	0.0228		0.4185	0.4185		0.3850	0.3850		2,206.7452	2,206.7452	0.7137		2,224.5878
Paving	0.4913					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.4064**	**8.5816**	**14.5780**	**0.0228**		**0.4185**	**0.4185**		**0.3850**	**0.3850**		**2,206.7452**	**2,206.7452**	**0.7137**		**2,224.5878**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0478	0.0271	0.4802	1.3800e-003	0.1677	7.1000e-004	0.1684	0.0445	6.6000e-004	0.0451		143.6803	143.6803	2.8100e-003	3.0500e-003	144.6598
Total	**0.0478**	**0.0271**	**0.4802**	**1.3800e-003**	**0.1677**	**7.1000e-004**	**0.1684**	**0.0445**	**6.6000e-004**	**0.0451**		**143.6803**	**143.6803**	**2.8100e-003**	**3.0500e-003**	**144.6598**

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Paving - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.2805	1.2154	17.2957	0.0228		0.0374	0.0374		0.0374	0.0374	0.0000	2,206.7452	2,206.7452	0.7137		2,224.5878
Paving	0.4913					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.7717**	**1.2154**	**17.2957**	**0.0228**		**0.0374**	**0.0374**		**0.0374**	**0.0374**	**0.0000**	**2,206.7452**	**2,206.7452**	**0.7137**		**2,224.5878**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0478	0.0271	0.4802	1.3800e-003	0.1677	7.1000e-004	0.1684	0.0445	6.6000e-004	0.0451		143.6803	143.6803	2.8100e-003	3.0500e-003	144.6598
Total	**0.0478**	**0.0271**	**0.4802**	**1.3800e-003**	**0.1677**	**7.1000e-004**	**0.1684**	**0.0445**	**6.6000e-004**	**0.0451**		**143.6803**	**143.6803**	**2.8100e-003**	**3.0500e-003**	**144.6598**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.6 Architectural Coating - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	62.3431					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1709	1.1455	1.8091	2.9700e-003		0.0515	0.0515		0.0515	0.0515		281.4481	281.4481	0.0154		281.8319
Total	**62.5139**	**1.1455**	**1.8091**	**2.9700e-003**		**0.0515**	**0.0515**		**0.0515**	**0.0515**		**281.4481**	**281.4481**	**0.0154**		**281.8319**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1337	0.0758	1.3445	3.8600e-003	0.4695	2.0000e-003	0.4715	0.1245	1.8400e-003	0.1264		402.3048	402.3048	7.8800e-003	8.5400e-003	405.0474
Total	**0.1337**	**0.0758**	**1.3445**	**3.8600e-003**	**0.4695**	**2.0000e-003**	**0.4715**	**0.1245**	**1.8400e-003**	**0.1264**		**402.3048**	**402.3048**	**7.8800e-003**	**8.5400e-003**	**405.0474**

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.6 Architectural Coating - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	62.3431					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0297	0.1288	1.8324	2.9700e-003		3.9600e-003	3.9600e-003		3.9600e-003	3.9600e-003	0.0000	281.4481	281.4481	0.0154		281.8319
Total	**62.3728**	**0.1288**	**1.8324**	**2.9700e-003**		**3.9600e-003**	**3.9600e-003**		**3.9600e-003**	**3.9600e-003**	**0.0000**	**281.4481**	**281.4481**	**0.0154**		**281.8319**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1337	0.0758	1.3445	3.8600e-003	0.4695	2.0000e-003	0.4715	0.1245	1.8400e-003	0.1264		402.3048	402.3048	7.8800e-003	8.5400e-003	405.0474
Total	**0.1337**	**0.0758**	**1.3445**	**3.8600e-003**	**0.4695**	**2.0000e-003**	**0.4715**	**0.1245**	**1.8400e-003**	**0.1264**		**402.3048**	**402.3048**	**7.8800e-003**	**8.5400e-003**	**405.0474**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	4.9420	4.9521	48.4997	0.1048	11.2162	0.0692	11.2854	2.9833	0.0646	3.0479		10,830.5682	10,830.5682	0.5263	0.4084	10,965.4163
Unmitigated	4.9420	4.9521	48.4997	0.1048	11.2162	0.0692	11.2854	2.9833	0.0646	3.0479		10,830.5682	10,830.5682	0.5263	0.4084	10,965.4163

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Low Rise	1,405.44	1,562.88	1205.76	4,781,982	4,781,982
Parking Lot	0.00	0.00	0.00		
Recreational Swimming Pool	0.00	0.00	0.00		
Total	1,405.44	1,562.88	1,205.76	4,781,982	4,781,982

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Low Rise	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3
Parking Lot	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0
Recreational Swimming Pool	16.60	8.40	6.90	33.00	48.00	19.00	52	39	9

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Low Rise	0.548752	0.057478	0.177127	0.144672	0.027288	0.003261	0.005053	0.008340	0.000275	0.000141	0.024682	0.000491	0.002439
Parking Lot	0.537845	0.056225	0.173186	0.138405	0.025906	0.007191	0.011447	0.018769	0.000611	0.000309	0.023821	0.001097	0.005189
Recreational Swimming Pool	0.537845	0.056225	0.173186	0.138405	0.025906	0.007191	0.011447	0.018769	0.000611	0.000309	0.023821	0.001097	0.005189

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0858	0.7333	0.3120	4.6800e-003		0.0593	0.0593		0.0593	0.0593		936.0757	936.0757	0.0179	0.0172	941.6383
NaturalGas Unmitigated	0.0858	0.7333	0.3120	4.6800e-003		0.0593	0.0593		0.0593	0.0593		936.0757	936.0757	0.0179	0.0172	941.6383

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Low Rise	7956.64	0.0858	0.7333	0.3120	4.6800e-003		0.0593	0.0593		0.0593	0.0593		936.0757	936.0757	0.0179	0.0172	941.6383
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0858**	**0.7333**	**0.3120**	**4.6800e-003**		**0.0593**	**0.0593**		**0.0593**	**0.0593**		**936.0757**	**936.0757**	**0.0179**	**0.0172**	**941.6383**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Low Rise	7.95664	0.0858	0.7333	0.3120	4.6800e-003		0.0593	0.0593		0.0593	0.0593		936.0757	936.0757	0.0179	0.0172	941.6383
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0858**	**0.7333**	**0.3120**	**4.6800e-003**		**0.0593**	**0.0593**		**0.0593**	**0.0593**		**936.0757**	**936.0757**	**0.0179**	**0.0172**	**941.6383**

6.0 Area Detail

6.1 Mitigation Measures Area

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	4.6788	0.1826	15.8507	8.4000e-004		0.0878	0.0878		0.0878	0.0878	0.0000	28.5588	28.5588	0.0275	0.0000	29.2454
Unmitigated	4.6788	0.1826	15.8507	8.4000e-004		0.0878	0.0878		0.0878	0.0878	0.0000	28.5588	28.5588	0.0275	0.0000	29.2454

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.3416					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	3.8595					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.4777	0.1826	15.8507	8.4000e-004		0.0878	0.0878		0.0878	0.0878		28.5588	28.5588	0.0275		29.2454
Total	**4.6788**	**0.1826**	**15.8507**	**8.4000e-004**		**0.0878**	**0.0878**		**0.0878**	**0.0878**	**0.0000**	**28.5588**	**28.5588**	**0.0275**	**0.0000**	**29.2454**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.3416					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	3.8595					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.4777	0.1826	15.8507	8.4000e-004		0.0878	0.0878		0.0878	0.0878		28.5588	28.5588	0.0275		29.2454
Total	**4.6788**	**0.1826**	**15.8507**	**8.4000e-004**		**0.0878**	**0.0878**		**0.0878**	**0.0878**	**0.0000**	**28.5588**	**28.5588**	**0.0275**	**0.0000**	**29.2454**

7.0 Water Detail

7.1 Mitigation Measures Water

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Xenia and Eight Street Multifamily Residential Project

Riverside-South Coast County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	163.50	1000sqft	3.75	163,504.80	0
Apartments Low Rise	192.00	Dwelling Unit	7.18	192,000.00	549
Recreational Swimming Pool	4.46	1000sqft	0.10	4,462.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.4	**Precipitation Freq (Days)**	28
Climate Zone	10			**Operational Year**	2024
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	390.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - The project is proposing to build 192 multifamily apartment homes and a swimming pool, and pave approximately 163,504.8 Square Feet as a part of on-site street improvement and parking lot.

Construction Phase - The site is currently vacant and requires no demolition.

Grading - The project is expected to import approximately 65,000 cubic yard of earthwork materials

Woodstoves - Per SCAQMD Rule 445, no wood-burning devices will be allowed. Project will not include natural gas hearths.

Construction Off-road Equipment Mitigation - Project will be required to comply with SCAQMD Rule 403 regarding fugitive dust control. Construction equipment will have Tier 4 "clean diesel" engines.

Fleet Mix - Operational fleet mix adjusted to equal 2% trucks with GVWR > 10,000 lbs.

Vehicle Trips - The project swimming pool is not expected to generate any additional trips.

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadMoistureContent	0	12
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	9.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

tblFireplaces	NumberGas	163.20	0.00
tblFireplaces	NumberNoFireplace	19.20	192.00
tblFireplaces	NumberWood	9.60	0.00
tblFleetMix	HHD	0.02	8.3400e-003
tblFleetMix	LDA	0.54	0.55
tblFleetMix	LDT1	0.06	0.06
tblFleetMix	LDT2	0.17	0.18
tblFleetMix	LHD1	0.03	0.03
tblFleetMix	LHD2	7.1910e-003	3.2610e-003
tblFleetMix	MCY	0.02	0.02
tblFleetMix	MDV	0.14	0.14
tblFleetMix	MH	5.1890e-003	2.4390e-003
tblFleetMix	MHD	0.01	5.0530e-003
tblFleetMix	OBUS	6.1100e-004	2.7500e-004
tblFleetMix	SBUS	1.0970e-003	4.9100e-004
tblFleetMix	UBUS	3.0900e-004	1.4100e-004
tblGrading	MaterialImported	0.00	65,000.00
tblLandUse	LandUseSquareFeet	163,505.00	163,504.80
tblLandUse	LandUseSquareFeet	4,460.00	4,462.00
tblLandUse	LotAcreage	12.00	7.18
tblVehicleTrips	ST_TR	9.10	0.00
tblVehicleTrips	SU_TR	13.60	0.00
tblVehicleTrips	WD_TR	28.82	0.00
tblWoodstoves	NumberCatalytic	9.60	0.00
tblWoodstoves	NumberNoncatalytic	9.60	0.00

2.0 Emissions Summary

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2023	3.9350	63.2205	36.2410	0.2129	19.8582	1.7524	21.1252	10.1558	1.6242	11.3214	0.0000	22,111.0571	22,111.0571	2.1719	2.5130	22,914.2177
2024	2.1901	15.5432	22.6593	0.0533	2.6436	0.6374	3.2810	0.7081	0.5996	1.3076	0.0000	5,293.3280	5,293.3280	0.7171	0.1762	5,362.2685
2025	62.6400	8.6097	14.9686	0.0241	0.4695	0.4192	0.5869	0.1245	0.3857	0.4302	0.0000	2,336.9905	2,336.9905	0.7165	8.7400e-003	2,355.8337
Maximum	**62.6400**	**63.2205**	**36.2410**	**0.2129**	**19.8582**	**1.7524**	**21.1252**	**10.1558**	**1.6242**	**11.3214**	**0.0000**	**22,111.0571**	**22,111.0571**	**2.1719**	**2.5130**	**22,914.2177**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2023	1.3748	32.0050	41.1890	0.2129	8.5890	0.4295	9.0184	3.9176	0.4153	3.9805	0.0000	22,111.0571	22,111.0571	2.1719	2.5130	22,914.2177
2024	1.0464	4.3341	23.9528	0.0533	2.6436	0.0649	2.7084	0.7081	0.0635	0.7715	0.0000	5,293.3280	5,293.3280	0.7171	0.1762	5,362.2685
2025	62.4989	1.2434	17.6863	0.0241	0.4695	0.0381	0.4754	0.1245	0.0381	0.1303	0.0000	2,336.9905	2,336.9905	0.7165	8.7400e-003	2,355.8337
Maximum	**62.4989**	**32.0050**	**41.1890**	**0.2129**	**8.5890**	**0.4295**	**9.0184**	**3.9176**	**0.4153**	**3.9805**	**0.0000**	**22,111.0571**	**22,111.0571**	**2.1719**	**2.5130**	**22,914.2177**

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**5.59**	**56.99**	**-12.13**	**0.00**	**49.06**	**81.04**	**51.18**	**56.77**	**80.20**	**62.61**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	4.6788	0.1826	15.8507	8.4000e-004		0.0878	0.0878		0.0878	0.0878	0.0000	28.5588	28.5588	0.0275	0.0000	29.2454
Energy	0.0858	0.7333	0.3120	4.6800e-003		0.0593	0.0593		0.0593	0.0593		936.0757	936.0757	0.0179	0.0172	941.6383
Mobile	4.2187	5.2558	42.7439	0.0967	11.2162	0.0693	11.2855	2.9833	0.0646	3.0479		9,988.6031	9,988.6031	0.5386	0.4190	10,126.9373
Total	**8.9833**	**6.1716**	**58.9067**	**0.1022**	**11.2162**	**0.2164**	**11.4326**	**2.9833**	**0.2117**	**3.1950**	**0.0000**	**10,953.2375**	**10,953.2375**	**0.5840**	**0.4362**	**11,097.8209**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	4.6788	0.1826	15.8507	8.4000e-004		0.0878	0.0878		0.0878	0.0878	0.0000	28.5588	28.5588	0.0275	0.0000	29.2454
Energy	0.0858	0.7333	0.3120	4.6800e-003		0.0593	0.0593		0.0593	0.0593		936.0757	936.0757	0.0179	0.0172	941.6383
Mobile	4.2187	5.2558	42.7439	0.0967	11.2162	0.0693	11.2855	2.9833	0.0646	3.0479		9,988.6031	9,988.6031	0.5386	0.4190	10,126.9373
Total	**8.9833**	**6.1716**	**58.9067**	**0.1022**	**11.2162**	**0.2164**	**11.4326**	**2.9833**	**0.2117**	**3.1950**	**0.0000**	**10,953.2375**	**10,953.2375**	**0.5840**	**0.4362**	**11,097.8209**

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	9/1/2023	9/14/2023	5	10	
2	Grading	Grading	9/15/2023	10/26/2023	5	30	
3	Building Construction	Building Construction	10/27/2023	12/19/2024	5	300	
4	Paving	Paving	12/20/2024	1/16/2025	5	20	
5	Architectural Coating	Architectural Coating	1/17/2025	2/13/2025	5	20	

Acres of Grading (Site Preparation Phase): 15

Acres of Grading (Grading Phase): 90

Acres of Paving: 3.75

Residential Indoor: 388,800; Residential Outdoor: 129,600; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 9,810 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	8,125.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	209.00	48.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	42.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Use Soil Stabilizer

Replace Ground Cover

Water Exposed Area

Water Unpaved Roads

Reduce Vehicle Speed on Unpaved Roads

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.2 Site Preparation - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					19.6570	0.0000	19.6570	10.1025	0.0000	10.1025			0.0000			0.0000
Off-Road	2.6595	27.5242	18.2443	0.0381		1.2660	1.2660		1.1647	1.1647		3,687.3081	3,687.3081	1.1926		3,717.1219
Total	**2.6595**	**27.5242**	**18.2443**	**0.0381**	**19.6570**	**1.2660**	**20.9230**	**10.1025**	**1.1647**	**11.2672**		**3,687.3081**	**3,687.3081**	**1.1926**		**3,717.1219**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0616	0.0422	0.5362	1.6000e-003	0.2012	9.4000e-004	0.2021	0.0534	8.7000e-004	0.0542		164.1079	164.1079	4.1200e-003	4.3200e-003	165.4988
Total	**0.0616**	**0.0422**	**0.5362**	**1.6000e-003**	**0.2012**	**9.4000e-004**	**0.2021**	**0.0534**	**8.7000e-004**	**0.0542**		**164.1079**	**164.1079**	**4.1200e-003**	**4.3200e-003**	**165.4988**

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.2 Site Preparation - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					7.5188	0.0000	7.5188	3.8642	0.0000	3.8642			0.0000			0.0000
Off-Road	0.4656	2.0175	20.8690	0.0381		0.0621	0.0621		0.0621	0.0621	0.0000	3,687.3081	3,687.3081	1.1926		3,717.1219
Total	**0.4656**	**2.0175**	**20.8690**	**0.0381**	**7.5188**	**0.0621**	**7.5809**	**3.8642**	**0.0621**	**3.9263**	**0.0000**	**3,687.3081**	**3,687.3081**	**1.1926**		**3,717.1219**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0616	0.0422	0.5362	1.6000e-003	0.2012	9.4000e-004	0.2021	0.0534	8.7000e-004	0.0542		164.1079	164.1079	4.1200e-003	4.3200e-003	165.4988
Total	**0.0616**	**0.0422**	**0.5362**	**1.6000e-003**	**0.2012**	**9.4000e-004**	**0.2021**	**0.0534**	**8.7000e-004**	**0.0542**		**164.1079**	**164.1079**	**4.1200e-003**	**4.3200e-003**	**165.4988**

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.3 Grading - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.4780	0.0000	9.4780	3.6953	0.0000	3.6953			0.0000			0.0000
Off-Road	3.3217	34.5156	28.0512	0.0621		1.4245	1.4245		1.3105	1.3105		6,011.4777	6,011.4777	1.9442		6,060.0836
Total	**3.3217**	**34.5156**	**28.0512**	**0.0621**	**9.4780**	**1.4245**	**10.9025**	**3.6953**	**1.3105**	**5.0058**		**6,011.4777**	**6,011.4777**	**1.9442**		**6,060.0836**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.5448	28.6581	7.5940	0.1491	4.7401	0.3269	5.0670	1.2995	0.3128	1.6123		15,917.2373	15,917.2373	0.2231	2.5082	16,670.2466
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0685	0.0469	0.5958	1.7800e-003	0.2236	1.0500e-003	0.2246	0.0593	9.7000e-004	0.0603		182.3421	182.3421	4.5800e-003	4.8000e-003	183.8876
Total	**0.6133**	**28.7049**	**8.1898**	**0.1508**	**4.9636**	**0.3279**	**5.2916**	**1.3588**	**0.3137**	**1.6725**		**16,099.5793**	**16,099.5793**	**0.2277**	**2.5130**	**16,854.1341**

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.3 Grading - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					3.6253	0.0000	3.6253	1.4135	0.0000	1.4135			0.0000			0.0000
Off-Road	0.7616	3.3000	32.9991	0.0621		0.1015	0.1015		0.1015	0.1015	0.0000	6,011.4777	6,011.4777	1.9442		6,060.0836
Total	**0.7616**	**3.3000**	**32.9991**	**0.0621**	**3.6253**	**0.1015**	**3.7269**	**1.4135**	**0.1015**	**1.5150**	**0.0000**	**6,011.4777**	**6,011.4777**	**1.9442**		**6,060.0836**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.5448	28.6581	7.5940	0.1491	4.7401	0.3269	5.0670	1.2995	0.3128	1.6123		15,917.2373	15,917.2373	0.2231	2.5082	16,670.2466
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0685	0.0469	0.5958	1.7800e-003	0.2236	1.0500e-003	0.2246	0.0593	9.7000e-004	0.0603		182.3421	182.3421	4.5800e-003	4.8000e-003	183.8876
Total	**0.6133**	**28.7049**	**8.1898**	**0.1508**	**4.9636**	**0.3279**	**5.2916**	**1.3588**	**0.3137**	**1.6725**		**16,099.5793**	**16,099.5793**	**0.2277**	**2.5130**	**16,854.1341**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.4 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5728	14.3849	16.2440	0.0269		0.6997	0.6997		0.6584	0.6584		2,555.2099	2,555.2099	0.6079		2,570.4061
Total	**1.5728**	**14.3849**	**16.2440**	**0.0269**		**0.6997**	**0.6997**		**0.6584**	**0.6584**		**2,555.2099**	**2,555.2099**	**0.6079**		**2,570.4061**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0501	1.6631	0.6674	8.4100e-003	0.3074	0.0137	0.3212	0.0885	0.0131	0.1016		891.5078	891.5078	8.8900e-003	0.1319	931.0213
Worker	0.7157	0.4896	6.2260	0.0186	2.3361	0.0110	2.3471	0.6196	0.0101	0.6296		1,905.4746	1,905.4746	0.0479	0.0502	1,921.6249
Total	**0.7658**	**2.1527**	**6.8935**	**0.0270**	**2.6436**	**0.0247**	**2.6682**	**0.7081**	**0.0232**	**0.7313**		**2,796.9824**	**2,796.9824**	**0.0568**	**0.1820**	**2,852.6462**

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.4 Building Construction - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.3278	2.2347	17.4603	0.0269		0.0408	0.0408		0.0408	0.0408	0.0000	2,555.2099	2,555.2099	0.6079		2,570.4061
Total	**0.3278**	**2.2347**	**17.4603**	**0.0269**		**0.0408**	**0.0408**		**0.0408**	**0.0408**	**0.0000**	**2,555.2099**	**2,555.2099**	**0.6079**		**2,570.4061**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0501	1.6631	0.6674	8.4100e-003	0.3074	0.0137	0.3212	0.0885	0.0131	0.1016		891.5078	891.5078	8.8900e-003	0.1319	931.0213
Worker	0.7157	0.4896	6.2260	0.0186	2.3361	0.0110	2.3471	0.6196	0.0101	0.6296		1,905.4746	1,905.4746	0.0479	0.0502	1,921.6249
Total	**0.7658**	**2.1527**	**6.8935**	**0.0270**	**2.6436**	**0.0247**	**2.6682**	**0.7081**	**0.0232**	**0.7313**		**2,796.9824**	**2,796.9824**	**0.0568**	**0.1820**	**2,852.6462**

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.4 Building Construction - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.4716	13.4438	16.1668	0.0270		0.6133	0.6133		0.5769	0.5769		2,555.6989	2,555.6989	0.6044		2,570.8077
Total	**1.4716**	**13.4438**	**16.1668**	**0.0270**		**0.6133**	**0.6133**		**0.5769**	**0.5769**		**2,555.6989**	**2,555.6989**	**0.6044**		**2,570.8077**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0493	1.6633	0.6600	8.2800e-003	0.3074	0.0136	0.3211	0.0885	0.0130	0.1015		877.7830	877.7830	9.2100e-003	0.1296	916.6397
Worker	0.6693	0.4361	5.8325	0.0180	2.3361	0.0105	2.3466	0.6196	9.6400e-003	0.6292		1,859.8461	1,859.8461	0.0434	0.0466	1,874.8212
Total	**0.7185**	**2.0994**	**6.4925**	**0.0263**	**2.6436**	**0.0241**	**2.6677**	**0.7081**	**0.0227**	**0.7307**		**2,737.6291**	**2,737.6291**	**0.0526**	**0.1762**	**2,791.4609**

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.4 Building Construction - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.3278	2.2347	17.4603	0.0270		0.0408	0.0408		0.0408	0.0408	0.0000	2,555.6989	2,555.6989	0.6044		2,570.8077
Total	**0.3278**	**2.2347**	**17.4603**	**0.0270**		**0.0408**	**0.0408**		**0.0408**	**0.0408**	**0.0000**	**2,555.6989**	**2,555.6989**	**0.6044**		**2,570.8077**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0493	1.6633	0.6600	8.2800e-003	0.3074	0.0136	0.3211	0.0885	0.0130	0.1015		877.7830	877.7830	9.2100e-003	0.1296	916.6397
Worker	0.6693	0.4361	5.8325	0.0180	2.3361	0.0105	2.3466	0.6196	9.6400e-003	0.6292		1,859.8461	1,859.8461	0.0434	0.0466	1,874.8212
Total	**0.7185**	**2.0994**	**6.4925**	**0.0263**	**2.6436**	**0.0241**	**2.6677**	**0.7081**	**0.0227**	**0.7307**		**2,737.6291**	**2,737.6291**	**0.0526**	**0.1762**	**2,791.4609**

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Paving - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9882	9.5246	14.6258	0.0228		0.4685	0.4685		0.4310	0.4310		2,207.5472	2,207.5472	0.7140		2,225.3963
Paving	0.4913					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.4794**	**9.5246**	**14.6258**	**0.0228**		**0.4685**	**0.4685**		**0.4310**	**0.4310**		**2,207.5472**	**2,207.5472**	**0.7140**		**2,225.3963**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0480	0.0313	0.4186	1.2900e-003	0.1677	7.5000e-004	0.1684	0.0445	6.9000e-004	0.0452		133.4818	133.4818	3.1200e-003	3.3500e-003	134.5565
Total	**0.0480**	**0.0313**	**0.4186**	**1.2900e-003**	**0.1677**	**7.5000e-004**	**0.1684**	**0.0445**	**6.9000e-004**	**0.0452**		**133.4818**	**133.4818**	**3.1200e-003**	**3.3500e-003**	**134.5565**

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Paving - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.2805	1.2154	17.2957	0.0228		0.0374	0.0374		0.0374	0.0374	0.0000	2,207.5472	2,207.5472	0.7140		2,225.3963
Paving	0.4913					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.7717**	**1.2154**	**17.2957**	**0.0228**		**0.0374**	**0.0374**		**0.0374**	**0.0374**	**0.0000**	**2,207.5472**	**2,207.5472**	**0.7140**		**2,225.3963**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0480	0.0313	0.4186	1.2900e-003	0.1677	7.5000e-004	0.1684	0.0445	6.9000e-004	0.0452		133.4818	133.4818	3.1200e-003	3.3500e-003	134.5565
Total	**0.0480**	**0.0313**	**0.4186**	**1.2900e-003**	**0.1677**	**7.5000e-004**	**0.1684**	**0.0445**	**6.9000e-004**	**0.0452**		**133.4818**	**133.4818**	**3.1200e-003**	**3.3500e-003**	**134.5565**

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Paving - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9152	8.5816	14.5780	0.0228		0.4185	0.4185		0.3850	0.3850		2,206.7452	2,206.7452	0.7137		2,224.5878
Paving	0.4913					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.4064**	**8.5816**	**14.5780**	**0.0228**		**0.4185**	**0.4185**		**0.3850**	**0.3850**		**2,206.7452**	**2,206.7452**	**0.7137**		**2,224.5878**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0450	0.0281	0.3906	1.2500e-003	0.1677	7.1000e-004	0.1684	0.0445	6.6000e-004	0.0451		130.2454	130.2454	2.8200e-003	3.1200e-003	131.2459
Total	**0.0450**	**0.0281**	**0.3906**	**1.2500e-003**	**0.1677**	**7.1000e-004**	**0.1684**	**0.0445**	**6.6000e-004**	**0.0451**		**130.2454**	**130.2454**	**2.8200e-003**	**3.1200e-003**	**131.2459**

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Paving - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.2805	1.2154	17.2957	0.0228		0.0374	0.0374		0.0374	0.0374	0.0000	2,206.7452	2,206.7452	0.7137		2,224.5878
Paving	0.4913					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.7717**	**1.2154**	**17.2957**	**0.0228**		**0.0374**	**0.0374**		**0.0374**	**0.0374**	**0.0000**	**2,206.7452**	**2,206.7452**	**0.7137**		**2,224.5878**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0450	0.0281	0.3906	1.2500e-003	0.1677	7.1000e-004	0.1684	0.0445	6.6000e-004	0.0451		130.2454	130.2454	2.8200e-003	3.1200e-003	131.2459
Total	**0.0450**	**0.0281**	**0.3906**	**1.2500e-003**	**0.1677**	**7.1000e-004**	**0.1684**	**0.0445**	**6.6000e-004**	**0.0451**		**130.2454**	**130.2454**	**2.8200e-003**	**3.1200e-003**	**131.2459**

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.6 Architectural Coating - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	62.3431					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1709	1.1455	1.8091	2.9700e-003		0.0515	0.0515		0.0515	0.0515		281.4481	281.4481	0.0154		281.8319
Total	**62.5139**	**1.1455**	**1.8091**	**2.9700e-003**		**0.0515**	**0.0515**		**0.0515**	**0.0515**		**281.4481**	**281.4481**	**0.0154**		**281.8319**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1261	0.0786	1.0937	3.5000e-003	0.4695	2.0000e-003	0.4715	0.1245	1.8400e-003	0.1264		364.6871	364.6871	7.8900e-003	8.7400e-003	367.4885
Total	**0.1261**	**0.0786**	**1.0937**	**3.5000e-003**	**0.4695**	**2.0000e-003**	**0.4715**	**0.1245**	**1.8400e-003**	**0.1264**		**364.6871**	**364.6871**	**7.8900e-003**	**8.7400e-003**	**367.4885**

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.6 Architectural Coating - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	62.3431					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0297	0.1288	1.8324	2.9700e-003		3.9600e-003	3.9600e-003		3.9600e-003	3.9600e-003	0.0000	281.4481	281.4481	0.0154		281.8319
Total	**62.3728**	**0.1288**	**1.8324**	**2.9700e-003**		**3.9600e-003**	**3.9600e-003**		**3.9600e-003**	**3.9600e-003**	**0.0000**	**281.4481**	**281.4481**	**0.0154**		**281.8319**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1261	0.0786	1.0937	3.5000e-003	0.4695	2.0000e-003	0.4715	0.1245	1.8400e-003	0.1264		364.6871	364.6871	7.8900e-003	8.7400e-003	367.4885
Total	**0.1261**	**0.0786**	**1.0937**	**3.5000e-003**	**0.4695**	**2.0000e-003**	**0.4715**	**0.1245**	**1.8400e-003**	**0.1264**		**364.6871**	**364.6871**	**7.8900e-003**	**8.7400e-003**	**367.4885**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	4.2187	5.2558	42.7439	0.0967	11.2162	0.0693	11.2855	2.9833	0.0646	3.0479		9,988.6031	9,988.6031	0.5386	0.4190	10,126.9373
Unmitigated	4.2187	5.2558	42.7439	0.0967	11.2162	0.0693	11.2855	2.9833	0.0646	3.0479		9,988.6031	9,988.6031	0.5386	0.4190	10,126.9373

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Low Rise	1,405.44	1,562.88	1205.76	4,781,982	4,781,982
Parking Lot	0.00	0.00	0.00		
Recreational Swimming Pool	0.00	0.00	0.00		
Total	1,405.44	1,562.88	1,205.76	4,781,982	4,781,982

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Low Rise	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3
Parking Lot	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0
Recreational Swimming Pool	16.60	8.40	6.90	33.00	48.00	19.00	52	39	9

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Low Rise	0.548752	0.057478	0.177127	0.144672	0.027288	0.003261	0.005053	0.008340	0.000275	0.000141	0.024682	0.000491	0.002439
Parking Lot	0.537845	0.056225	0.173186	0.138405	0.025906	0.007191	0.011447	0.018769	0.000611	0.000309	0.023821	0.001097	0.005189
Recreational Swimming Pool	0.537845	0.056225	0.173186	0.138405	0.025906	0.007191	0.011447	0.018769	0.000611	0.000309	0.023821	0.001097	0.005189

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0858	0.7333	0.3120	4.6800e-003		0.0593	0.0593		0.0593	0.0593		936.0757	936.0757	0.0179	0.0172	941.6383
NaturalGas Unmitigated	0.0858	0.7333	0.3120	4.6800e-003		0.0593	0.0593		0.0593	0.0593		936.0757	936.0757	0.0179	0.0172	941.6383

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Low Rise	7956.64	0.0858	0.7333	0.3120	4.6800e-003		0.0593	0.0593		0.0593	0.0593		936.0757	936.0757	0.0179	0.0172	941.6383
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0858**	**0.7333**	**0.3120**	**4.6800e-003**		**0.0593**	**0.0593**		**0.0593**	**0.0593**		**936.0757**	**936.0757**	**0.0179**	**0.0172**	**941.6383**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Low Rise	7.95664	0.0858	0.7333	0.3120	4.6800e-003		0.0593	0.0593		0.0593	0.0593		936.0757	936.0757	0.0179	0.0172	941.6383
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0858**	**0.7333**	**0.3120**	**4.6800e-003**		**0.0593**	**0.0593**		**0.0593**	**0.0593**		**936.0757**	**936.0757**	**0.0179**	**0.0172**	**941.6383**

6.0 Area Detail

6.1 Mitigation Measures Area

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	4.6788	0.1826	15.8507	8.4000e-004		0.0878	0.0878		0.0878	0.0878	0.0000	28.5588	28.5588	0.0275	0.0000	29.2454
Unmitigated	4.6788	0.1826	15.8507	8.4000e-004		0.0878	0.0878		0.0878	0.0878	0.0000	28.5588	28.5588	0.0275	0.0000	29.2454

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.3416					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	3.8595					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.4777	0.1826	15.8507	8.4000e-004		0.0878	0.0878		0.0878	0.0878		28.5588	28.5588	0.0275		29.2454
Total	**4.6788**	**0.1826**	**15.8507**	**8.4000e-004**		**0.0878**	**0.0878**		**0.0878**	**0.0878**	**0.0000**	**28.5588**	**28.5588**	**0.0275**	**0.0000**	**29.2454**

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.3416					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	3.8595					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.4777	0.1826	15.8507	8.4000e-004		0.0878	0.0878		0.0878	0.0878		28.5588	28.5588	0.0275		29.2454
Total	**4.6788**	**0.1826**	**15.8507**	**8.4000e-004**		**0.0878**	**0.0878**		**0.0878**	**0.0878**	**0.0000**	**28.5588**	**28.5588**	**0.0275**	**0.0000**	**29.2454**

7.0 Water Detail

7.1 Mitigation Measures Water

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Appendix B

Annual Emissions Calculations Output
(CalEEMod)

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Xenia and Eight Street Multifamily Residential Project

Riverside-South Coast County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	163.50	1000sqft	3.75	163,504.80	0
Apartments Low Rise	192.00	Dwelling Unit	7.18	192,000.00	549
Recreational Swimming Pool	4.46	1000sqft	0.10	4,462.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.4	**Precipitation Freq (Days)**	28
Climate Zone	10			**Operational Year**	2024
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	390.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - The project is proposing to build 192 multifamily apartment homes and a swimming pool, and pave approximately 163,504.8 Square Feet as a part of on-site street improvement and parking lot.

Construction Phase - The site is currently vacant and requires no demolition.

Grading - The project is expected to import approximately 65,000 cubic yard of earthwork materials

Woodstoves - Per SCAQMD Rule 445, no wood-burning devices will be allowed. Project will not include natural gas hearths.

Construction Off-road Equipment Mitigation - Project will be required to comply with SCAQMD Rule 403 regarding fugitive dust control. Construction equipment will have Tier 4 "clean diesel" engines.

Fleet Mix - Operational fleet mix adjusted to equal 2% trucks with GVWR > 10,000 lbs.

Vehicle Trips - The project swimming pool is not expected to generate any additional trips.

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadMoistureContent	0	12
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	9.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

tblFireplaces	NumberGas	163.20	0.00
tblFireplaces	NumberNoFireplace	19.20	192.00
tblFireplaces	NumberWood	9.60	0.00
tblFleetMix	HHD	0.02	8.3400e-003
tblFleetMix	LDA	0.54	0.55
tblFleetMix	LDT1	0.06	0.06
tblFleetMix	LDT2	0.17	0.18
tblFleetMix	LHD1	0.03	0.03
tblFleetMix	LHD2	7.1910e-003	3.2610e-003
tblFleetMix	MCY	0.02	0.02
tblFleetMix	MDV	0.14	0.14
tblFleetMix	MH	5.1890e-003	2.4390e-003
tblFleetMix	MHD	0.01	5.0530e-003
tblFleetMix	OBUS	6.1100e-004	2.7500e-004
tblFleetMix	SBUS	1.0970e-003	4.9100e-004
tblFleetMix	UBUS	3.0900e-004	1.4100e-004
tblGrading	MaterialImported	0.00	65,000.00
tblLandUse	LandUseSquareFeet	163,505.00	163,504.80
tblLandUse	LandUseSquareFeet	4,460.00	4,462.00
tblLandUse	LotAcreage	12.00	7.18
tblVehicleTrips	ST_TR	9.10	0.00
tblVehicleTrips	SU_TR	13.60	0.00
tblVehicleTrips	WD_TR	28.82	0.00
tblWoodstoves	NumberCatalytic	9.60	0.00
tblWoodstoves	NumberNoncatalytic	9.60	0.00

2.0 Emissions Summary

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2023	0.1260	1.4646	1.1764	4.6400e-003	0.3746	0.0493	0.4239	0.1424	0.0459	0.1882	0.0000	430.8039	430.8039	0.0489	0.0380	443.3497
2024	0.2799	2.0115	2.9764	6.9100e-003	0.3309	0.0828	0.4137	0.0888	0.0779	0.1666	0.0000	623.1995	623.1995	0.0783	0.0204	631.2347
2025	0.6350	0.0639	0.1196	2.1000e-004	5.6100e-003	3.0500e-003	8.6600e-003	1.4900e-003	2.8500e-003	4.3400e-003	0.0000	18.6752	18.6752	4.1100e-003	1.0000e-004	18.8073
Maximum	**0.6350**	**2.0115**	**2.9764**	**6.9100e-003**	**0.3746**	**0.0828**	**0.4239**	**0.1424**	**0.0779**	**0.1882**	**0.0000**	**623.1995**	**623.1995**	**0.0783**	**0.0380**	**631.2347**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2023	0.0480	0.5893	1.2917	4.6400e-003	0.2261	8.2600e-003	0.2344	0.0769	8.0100e-003	0.0850	0.0000	430.8037	430.8037	0.0489	0.0380	443.3495
2024	0.1319	0.5547	3.1513	6.9100e-003	0.3309	8.3900e-003	0.3393	0.0888	8.2100e-003	0.0970	0.0000	623.1992	623.1992	0.0783	0.0204	631.2343
2025	0.6298	9.5600e-003	0.1361	2.1000e-004	5.6100e-003	2.9000e-004	5.8900e-003	1.4900e-003	2.9000e-004	1.7700e-003	0.0000	18.6752	18.6752	4.1100e-003	1.0000e-004	18.8072
Maximum	**0.6298**	**0.5893**	**3.1513**	**6.9100e-003**	**0.3309**	**8.3900e-003**	**0.3393**	**0.0888**	**8.2100e-003**	**0.0970**	**0.0000**	**623.1992**	**623.1992**	**0.0783**	**0.0380**	**631.2343**

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**22.22**	**67.41**	**-7.18**	**0.00**	**20.88**	**87.47**	**31.51**	**28.12**	**86.96**	**48.86**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**9-1-2023**	**11-30-2023**	1.3858	0.5732
2	**12-1-2023**	**2-29-2024**	0.5890	0.1760
3	**3-1-2024**	**5-31-2024**	0.5813	0.1754
4	**6-1-2024**	**8-31-2024**	0.5806	0.1747
5	**9-1-2024**	**11-30-2024**	0.5756	0.1742
6	**12-1-2024**	**2-28-2025**	0.8640	0.6842
		Highest	1.3858	0.6842

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.8264	0.0228	1.9813	1.0000e-004		0.0110	0.0110		0.0110	0.0110	0.0000	3.2385	3.2385	3.1100e-003	0.0000	3.3164
Energy	0.0157	0.1338	0.0569	8.5000e-004		0.0108	0.0108		0.0108	0.0108	0.0000	307.1150	307.1150	0.0158	4.4000e-003	308.8208
Mobile	0.6951	0.8647	7.2044	0.0160	1.7975	0.0113	1.8088	0.4787	0.0105	0.4892	0.0000	1,502.6312	1,502.6312	0.0795	0.0624	1,523.2158
Waste						0.0000	0.0000		0.0000	0.0000	23.0882	0.0000	23.0882	1.3645	0.0000	57.2000
Water						0.0000	0.0000		0.0000	0.0000	4.0524	45.3538	49.4062	0.4201	0.0103	62.9743
Total	**1.5372**	**1.0213**	**9.2427**	**0.0170**	**1.7975**	**0.0331**	**1.8306**	**0.4787**	**0.0323**	**0.5110**	**27.1406**	**1,858.3384**	**1,885.4790**	**1.8829**	**0.0771**	**1,955.5273**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.8264	0.0228	1.9813	1.0000e-004		0.0110	0.0110		0.0110	0.0110	0.0000	3.2385	3.2385	3.1100e-003	0.0000	3.3164
Energy	0.0157	0.1338	0.0569	8.5000e-004		0.0108	0.0108		0.0108	0.0108	0.0000	307.1150	307.1150	0.0158	4.4000e-003	308.8208
Mobile	0.6951	0.8647	7.2044	0.0160	1.7975	0.0113	1.8088	0.4787	0.0105	0.4892	0.0000	1,502.6312	1,502.6312	0.0795	0.0624	1,523.2158
Waste						0.0000	0.0000		0.0000	0.0000	23.0882	0.0000	23.0882	1.3645	0.0000	57.2000
Water						0.0000	0.0000		0.0000	0.0000	4.0524	45.3538	49.4062	0.4201	0.0103	62.9743
Total	**1.5372**	**1.0213**	**9.2427**	**0.0170**	**1.7975**	**0.0331**	**1.8306**	**0.4787**	**0.0323**	**0.5110**	**27.1406**	**1,858.3384**	**1,885.4790**	**1.8829**	**0.0771**	**1,955.5273**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	9/1/2023	9/14/2023	5	10	
2	Grading	Grading	9/15/2023	10/26/2023	5	30	
3	Building Construction	Building Construction	10/27/2023	12/19/2024	5	300	

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

4	Paving	Paving	12/20/2024	1/16/2025	5	20	
5	Architectural Coating	Architectural Coating	1/17/2025	2/13/2025	5	20	

Acres of Grading (Site Preparation Phase): 15

Acres of Grading (Grading Phase): 90

Acres of Paving: 3.75

Residential Indoor: 388,800; Residential Outdoor: 129,600; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 9,810 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	8,125.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	209.00	48.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	42.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Use Soil Stabilizer

Replace Ground Cover

Water Exposed Area

Water Unpaved Roads

Reduce Vehicle Speed on Unpaved Roads

3.2 Site Preparation - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0983	0.0000	0.0983	0.0505	0.0000	0.0505	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0133	0.1376	0.0912	1.9000e-004		6.3300e-003	6.3300e-003		5.8200e-003	5.8200e-003	0.0000	16.7254	16.7254	5.4100e-003	0.0000	16.8606
Total	**0.0133**	**0.1376**	**0.0912**	**1.9000e-004**	**0.0983**	**6.3300e-003**	**0.1046**	**0.0505**	**5.8200e-003**	**0.0563**	**0.0000**	**16.7254**	**16.7254**	**5.4100e-003**	**0.0000**	**16.8606**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.2 Site Preparation - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.9000e-004	2.2000e-004	2.8300e-003	1.0000e-005	9.9000e-004	0.0000	9.9000e-004	2.6000e-004	0.0000	2.7000e-004	0.0000	0.7617	0.7617	2.0000e-005	2.0000e-005	0.7681
Total	**2.9000e-004**	**2.2000e-004**	**2.8300e-003**	**1.0000e-005**	**9.9000e-004**	**0.0000**	**9.9000e-004**	**2.6000e-004**	**0.0000**	**2.7000e-004**	**0.0000**	**0.7617**	**0.7617**	**2.0000e-005**	**2.0000e-005**	**0.7681**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0376	0.0000	0.0376	0.0193	0.0000	0.0193	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.3300e-003	0.0101	0.1043	1.9000e-004		3.1000e-004	3.1000e-004		3.1000e-004	3.1000e-004	0.0000	16.7253	16.7253	5.4100e-003	0.0000	16.8606
Total	**2.3300e-003**	**0.0101**	**0.1043**	**1.9000e-004**	**0.0376**	**3.1000e-004**	**0.0379**	**0.0193**	**3.1000e-004**	**0.0196**	**0.0000**	**16.7253**	**16.7253**	**5.4100e-003**	**0.0000**	**16.8606**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.2 Site Preparation - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.9000e-004	2.2000e-004	2.8300e-003	1.0000e-005	9.9000e-004	0.0000	9.9000e-004	2.6000e-004	0.0000	2.7000e-004	0.0000	0.7617	0.7617	2.0000e-005	2.0000e-005	0.7681
Total	**2.9000e-004**	**2.2000e-004**	**2.8300e-003**	**1.0000e-005**	**9.9000e-004**	**0.0000**	**9.9000e-004**	**2.6000e-004**	**0.0000**	**2.7000e-004**	**0.0000**	**0.7617**	**0.7617**	**2.0000e-005**	**2.0000e-005**	**0.7681**

3.3 Grading - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1422	0.0000	0.1422	0.0554	0.0000	0.0554	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0498	0.5177	0.4208	9.3000e-004		0.0214	0.0214		0.0197	0.0197	0.0000	81.8028	81.8028	0.0265	0.0000	82.4642
Total	**0.0498**	**0.5177**	**0.4208**	**9.3000e-004**	**0.1422**	**0.0214**	**0.1635**	**0.0554**	**0.0197**	**0.0751**	**0.0000**	**81.8028**	**81.8028**	**0.0265**	**0.0000**	**82.4642**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.3 Grading - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	8.5900e-003	0.4280	0.1125	2.2300e-003	0.0701	4.9000e-003	0.0750	0.0192	4.6900e-003	0.0239	0.0000	216.4020	216.4020	3.0500e-003	0.0341	226.6400
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.7000e-004	7.2000e-004	9.4200e-003	3.0000e-005	3.3000e-003	2.0000e-005	3.3100e-003	8.8000e-004	1.0000e-005	8.9000e-004	0.0000	2.5390	2.5390	6.0000e-005	7.0000e-005	2.5604
Total	**9.5600e-003**	**0.4287**	**0.1220**	**2.2600e-003**	**0.0734**	**4.9200e-003**	**0.0783**	**0.0201**	**4.7000e-003**	**0.0248**	**0.0000**	**218.9409**	**218.9409**	**3.1100e-003**	**0.0342**	**229.2004**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0544	0.0000	0.0544	0.0212	0.0000	0.0212	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0114	0.0495	0.4950	9.3000e-004		1.5200e-003	1.5200e-003		1.5200e-003	1.5200e-003	0.0000	81.8027	81.8027	0.0265	0.0000	82.4641
Total	**0.0114**	**0.0495**	**0.4950**	**9.3000e-004**	**0.0544**	**1.5200e-003**	**0.0559**	**0.0212**	**1.5200e-003**	**0.0227**	**0.0000**	**81.8027**	**81.8027**	**0.0265**	**0.0000**	**82.4641**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.3 Grading - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	8.5900e-003	0.4280	0.1125	2.2300e-003	0.0701	4.9000e-003	0.0750	0.0192	4.6900e-003	0.0239	0.0000	216.4020	216.4020	3.0500e-003	0.0341	226.6400
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.7000e-004	7.2000e-004	9.4200e-003	3.0000e-005	3.3000e-003	2.0000e-005	3.3100e-003	8.8000e-004	1.0000e-005	8.9000e-004	0.0000	2.5390	2.5390	6.0000e-005	7.0000e-005	2.5604
Total	**9.5600e-003**	**0.4287**	**0.1220**	**2.2600e-003**	**0.0734**	**4.9200e-003**	**0.0783**	**0.0201**	**4.7000e-003**	**0.0248**	**0.0000**	**218.9409**	**218.9409**	**3.1100e-003**	**0.0342**	**229.2004**

3.4 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0362	0.3309	0.3736	6.2000e-004		0.0161	0.0161		0.0151	0.0151	0.0000	53.3151	53.3151	0.0127	0.0000	53.6322
Total	**0.0362**	**0.3309**	**0.3736**	**6.2000e-004**		**0.0161**	**0.0161**		**0.0151**	**0.0151**	**0.0000**	**53.3151**	**53.3151**	**0.0127**	**0.0000**	**53.6322**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.4 Building Construction - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.2000e-003	0.0379	0.0151	1.9000e-004	6.9700e-003	3.1000e-004	7.2900e-003	2.0100e-003	3.0000e-004	2.3100e-003	0.0000	18.5749	18.5749	1.9000e-004	2.7500e-003	19.3980
Worker	0.0156	0.0116	0.1509	4.4000e-004	0.0528	2.5000e-004	0.0531	0.0140	2.3000e-004	0.0143	0.0000	40.6832	40.6832	1.0000e-003	1.0700e-003	41.0262
Total	**0.0168**	**0.0494**	**0.1660**	**6.3000e-004**	**0.0598**	**5.6000e-004**	**0.0604**	**0.0160**	**5.3000e-004**	**0.0166**	**0.0000**	**59.2580**	**59.2580**	**1.1900e-003**	**3.8200e-003**	**60.4242**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	7.5400e-003	0.0514	0.4016	6.2000e-004		9.4000e-004	9.4000e-004		9.4000e-004	9.4000e-004	0.0000	53.3150	53.3150	0.0127	0.0000	53.6321
Total	**7.5400e-003**	**0.0514**	**0.4016**	**6.2000e-004**		**9.4000e-004**	**9.4000e-004**		**9.4000e-004**	**9.4000e-004**	**0.0000**	**53.3150**	**53.3150**	**0.0127**	**0.0000**	**53.6321**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.4 Building Construction - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.2000e-003	0.0379	0.0151	1.9000e-004	6.9700e-003	3.1000e-004	7.2900e-003	2.0100e-003	3.0000e-004	2.3100e-003	0.0000	18.5749	18.5749	1.9000e-004	2.7500e-003	19.3980
Worker	0.0156	0.0116	0.1509	4.4000e-004	0.0528	2.5000e-004	0.0531	0.0140	2.3000e-004	0.0143	0.0000	40.6832	40.6832	1.0000e-003	1.0700e-003	41.0262
Total	**0.0168**	**0.0494**	**0.1660**	**6.3000e-004**	**0.0598**	**5.6000e-004**	**0.0604**	**0.0160**	**5.3000e-004**	**0.0166**	**0.0000**	**59.2580**	**59.2580**	**1.1900e-003**	**3.8200e-003**	**60.4242**

3.4 Building Construction - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1869	1.7074	2.0532	3.4200e-003		0.0779	0.0779		0.0733	0.0733	0.0000	294.4484	294.4484	0.0696	0.0000	296.1891
Total	**0.1869**	**1.7074**	**2.0532**	**3.4200e-003**		**0.0779**	**0.0779**		**0.0733**	**0.0733**	**0.0000**	**294.4484**	**294.4484**	**0.0696**	**0.0000**	**296.1891**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.4 Building Construction - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.5000e-003	0.2090	0.0823	1.0500e-003	0.0385	1.7300e-003	0.0402	0.0111	1.6500e-003	0.0128	0.0000	100.9855	100.9855	1.0700e-003	0.0149	105.4553
Worker	0.0805	0.0568	0.7806	2.3400e-003	0.2917	1.3300e-003	0.2931	0.0775	1.2200e-003	0.0787	0.0000	219.2594	219.2594	5.0200e-003	5.4700e-003	221.0153
Total	**0.0870**	**0.2659**	**0.8629**	**3.3900e-003**	**0.3303**	**3.0600e-003**	**0.3333**	**0.0886**	**2.8700e-003**	**0.0915**	**0.0000**	**320.2449**	**320.2449**	**6.0900e-003**	**0.0204**	**326.4706**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0416	0.2838	2.2175	3.4200e-003		5.1800e-003	5.1800e-003		5.1800e-003	5.1800e-003	0.0000	294.4480	294.4480	0.0696	0.0000	296.1887
Total	**0.0416**	**0.2838**	**2.2175**	**3.4200e-003**		**5.1800e-003**	**5.1800e-003**		**5.1800e-003**	**5.1800e-003**	**0.0000**	**294.4480**	**294.4480**	**0.0696**	**0.0000**	**296.1887**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.4 Building Construction - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.5000e-003	0.2090	0.0823	1.0500e-003	0.0385	1.7300e-003	0.0402	0.0111	1.6500e-003	0.0128	0.0000	100.9855	100.9855	1.0700e-003	0.0149	105.4553
Worker	0.0805	0.0568	0.7806	2.3400e-003	0.2917	1.3300e-003	0.2931	0.0775	1.2200e-003	0.0787	0.0000	219.2594	219.2594	5.0200e-003	5.4700e-003	221.0153
Total	**0.0870**	**0.2659**	**0.8629**	**3.3900e-003**	**0.3303**	**3.0600e-003**	**0.3333**	**0.0886**	**2.8700e-003**	**0.0915**	**0.0000**	**320.2449**	**320.2449**	**6.0900e-003**	**0.0204**	**326.4706**

3.5 Paving - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.9500e-003	0.0381	0.0585	9.0000e-005		1.8700e-003	1.8700e-003		1.7200e-003	1.7200e-003	0.0000	8.0106	8.0106	2.5900e-003	0.0000	8.0754
Paving	1.9700e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**5.9200e-003**	**0.0381**	**0.0585**	**9.0000e-005**		**1.8700e-003**	**1.8700e-003**		**1.7200e-003**	**1.7200e-003**	**0.0000**	**8.0106**	**8.0106**	**2.5900e-003**	**0.0000**	**8.0754**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Paving - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.8000e-004	1.3000e-004	1.7600e-003	1.0000e-005	6.6000e-004	0.0000	6.6000e-004	1.8000e-004	0.0000	1.8000e-004	0.0000	0.4956	0.4956	1.0000e-005	1.0000e-005	0.4996
Total	**1.8000e-004**	**1.3000e-004**	**1.7600e-003**	**1.0000e-005**	**6.6000e-004**	**0.0000**	**6.6000e-004**	**1.8000e-004**	**0.0000**	**1.8000e-004**	**0.0000**	**0.4956**	**0.4956**	**1.0000e-005**	**1.0000e-005**	**0.4996**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.1200e-003	4.8600e-003	0.0692	9.0000e-005		1.5000e-004	1.5000e-004		1.5000e-004	1.5000e-004	0.0000	8.0106	8.0106	2.5900e-003	0.0000	8.0754
Paving	1.9700e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**3.0900e-003**	**4.8600e-003**	**0.0692**	**9.0000e-005**		**1.5000e-004**	**1.5000e-004**		**1.5000e-004**	**1.5000e-004**	**0.0000**	**8.0106**	**8.0106**	**2.5900e-003**	**0.0000**	**8.0754**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Paving - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.8000e-004	1.3000e-004	1.7600e-003	1.0000e-005	6.6000e-004	0.0000	6.6000e-004	1.8000e-004	0.0000	1.8000e-004	0.0000	0.4956	0.4956	1.0000e-005	1.0000e-005	0.4996
Total	**1.8000e-004**	**1.3000e-004**	**1.7600e-003**	**1.0000e-005**	**6.6000e-004**	**0.0000**	**6.6000e-004**	**1.8000e-004**	**0.0000**	**1.8000e-004**	**0.0000**	**0.4956**	**0.4956**	**1.0000e-005**	**1.0000e-005**	**0.4996**

3.5 Paving - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	5.4900e-003	0.0515	0.0875	1.4000e-004		2.5100e-003	2.5100e-003		2.3100e-003	2.3100e-003	0.0000	12.0116	12.0116	3.8800e-003	0.0000	12.1087
Paving	2.9500e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**8.4400e-003**	**0.0515**	**0.0875**	**1.4000e-004**		**2.5100e-003**	**2.5100e-003**		**2.3100e-003**	**2.3100e-003**	**0.0000**	**12.0116**	**12.0116**	**3.8800e-003**	**0.0000**	**12.1087**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Paving - 2025

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.6000e-004	1.7000e-004	2.4700e-003	1.0000e-005	9.9000e-004	0.0000	9.9000e-004	2.6000e-004	0.0000	2.7000e-004	0.0000	0.7254	0.7254	2.0000e-005	2.0000e-005	0.7309
Total	**2.6000e-004**	**1.7000e-004**	**2.4700e-003**	**1.0000e-005**	**9.9000e-004**	**0.0000**	**9.9000e-004**	**2.6000e-004**	**0.0000**	**2.7000e-004**	**0.0000**	**0.7254**	**0.7254**	**2.0000e-005**	**2.0000e-005**	**0.7309**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.6800e-003	7.2900e-003	0.1038	1.4000e-004		2.2000e-004	2.2000e-004		2.2000e-004	2.2000e-004	0.0000	12.0115	12.0115	3.8800e-003	0.0000	12.1087
Paving	2.9500e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**4.6300e-003**	**7.2900e-003**	**0.1038**	**1.4000e-004**		**2.2000e-004**	**2.2000e-004**		**2.2000e-004**	**2.2000e-004**	**0.0000**	**12.0115**	**12.0115**	**3.8800e-003**	**0.0000**	**12.1087**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Paving - 2025

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.6000e-004	1.7000e-004	2.4700e-003	1.0000e-005	9.9000e-004	0.0000	9.9000e-004	2.6000e-004	0.0000	2.7000e-004	0.0000	0.7254	0.7254	2.0000e-005	2.0000e-005	0.7309
Total	**2.6000e-004**	**1.7000e-004**	**2.4700e-003**	**1.0000e-005**	**9.9000e-004**	**0.0000**	**9.9000e-004**	**2.6000e-004**	**0.0000**	**2.7000e-004**	**0.0000**	**0.7254**	**0.7254**	**2.0000e-005**	**2.0000e-005**	**0.7309**

3.6 Architectural Coating - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.6234					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.7100e-003	0.0115	0.0181	3.0000e-005		5.2000e-004	5.2000e-004		5.2000e-004	5.2000e-004	0.0000	2.5533	2.5533	1.4000e-004	0.0000	2.5567
Total	**0.6251**	**0.0115**	**0.0181**	**3.0000e-005**		**5.2000e-004**	**5.2000e-004**		**5.2000e-004**	**5.2000e-004**	**0.0000**	**2.5533**	**2.5533**	**1.4000e-004**	**0.0000**	**2.5567**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.6 Architectural Coating - 2025

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1900e-003	8.1000e-004	0.0115	4.0000e-005	4.6200e-003	2.0000e-005	4.6400e-003	1.2300e-003	2.0000e-005	1.2400e-003	0.0000	3.3851	3.3851	7.0000e-005	8.0000e-005	3.4109
Total	**1.1900e-003**	**8.1000e-004**	**0.0115**	**4.0000e-005**	**4.6200e-003**	**2.0000e-005**	**4.6400e-003**	**1.2300e-003**	**2.0000e-005**	**1.2400e-003**	**0.0000**	**3.3851**	**3.3851**	**7.0000e-005**	**8.0000e-005**	**3.4109**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.6234					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.0000e-004	1.2900e-003	0.0183	3.0000e-005		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005	0.0000	2.5533	2.5533	1.4000e-004	0.0000	2.5567
Total	**0.6237**	**1.2900e-003**	**0.0183**	**3.0000e-005**		**4.0000e-005**	**4.0000e-005**		**4.0000e-005**	**4.0000e-005**	**0.0000**	**2.5533**	**2.5533**	**1.4000e-004**	**0.0000**	**2.5567**

3.6 Architectural Coating - 2025

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1900e-003	8.1000e-004	0.0115	4.0000e-005	4.6200e-003	2.0000e-005	4.6400e-003	1.2300e-003	2.0000e-005	1.2400e-003	0.0000	3.3851	3.3851	7.0000e-005	8.0000e-005	3.4109
Total	**1.1900e-003**	**8.1000e-004**	**0.0115**	**4.0000e-005**	**4.6200e-003**	**2.0000e-005**	**4.6400e-003**	**1.2300e-003**	**2.0000e-005**	**1.2400e-003**	**0.0000**	**3.3851**	**3.3851**	**7.0000e-005**	**8.0000e-005**	**3.4109**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.6951	0.8647	7.2044	0.0160	1.7975	0.0113	1.8088	0.4787	0.0105	0.4892	0.0000	1,502.6312	1,502.6312	0.0795	0.0624	1,523.2158
Unmitigated	0.6951	0.8647	7.2044	0.0160	1.7975	0.0113	1.8088	0.4787	0.0105	0.4892	0.0000	1,502.6312	1,502.6312	0.0795	0.0624	1,523.2158

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Low Rise	1,405.44	1,562.88	1205.76	4,781,982	4,781,982
Parking Lot	0.00	0.00	0.00		
Recreational Swimming Pool	0.00	0.00	0.00		
Total	1,405.44	1,562.88	1,205.76	4,781,982	4,781,982

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Low Rise	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3
Parking Lot	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0
Recreational Swimming Pool	16.60	8.40	6.90	33.00	48.00	19.00	52	39	9

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Low Rise	0.548752	0.057478	0.177127	0.144672	0.027288	0.003261	0.005053	0.008340	0.000275	0.000141	0.024682	0.000491	0.002439
Parking Lot	0.537845	0.056225	0.173186	0.138405	0.025906	0.007191	0.011447	0.018769	0.000611	0.000309	0.023821	0.001097	0.005189

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Recreational Swimming Pool	0.537845	0.056225	0.173186	0.138405	0.025906	0.007191	0.011447	0.018769	0.000611	0.000309	0.023821	0.001097	0.005189

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	152.1371	152.1371	0.0128	1.5600e-003	152.9220
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	152.1371	152.1371	0.0128	1.5600e-003	152.9220
NaturalGas Mitigated	0.0157	0.1338	0.0569	8.5000e-004		0.0108	0.0108		0.0108	0.0108	0.0000	154.9778	154.9778	2.9700e-003	2.8400e-003	155.8988
NaturalGas Unmitigated	0.0157	0.1338	0.0569	8.5000e-004		0.0108	0.0108		0.0108	0.0108	0.0000	154.9778	154.9778	2.9700e-003	2.8400e-003	155.8988

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Low Rise	2.90417e+006	0.0157	0.1338	0.0569	8.5000e-004		0.0108	0.0108		0.0108	0.0108	0.0000	154.9778	154.9778	2.9700e-003	2.8400e-003	155.8988
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0157**	**0.1338**	**0.0569**	**8.5000e-004**		**0.0108**	**0.0108**		**0.0108**	**0.0108**	**0.0000**	**154.9778**	**154.9778**	**2.9700e-003**	**2.8400e-003**	**155.8988**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Low Rise	2.90417e+006	0.0157	0.1338	0.0569	8.5000e-004		0.0108	0.0108		0.0108	0.0108	0.0000	154.9778	154.9778	2.9700e-003	2.8400e-003	155.8988
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0157**	**0.1338**	**0.0569**	**8.5000e-004**		**0.0108**	**0.0108**		**0.0108**	**0.0108**	**0.0000**	**154.9778**	**154.9778**	**2.9700e-003**	**2.8400e-003**	**155.8988**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Low Rise	800630	141.9882	0.0120	1.4500e-003	142.7207
Parking Lot	57226.7	10.1489	8.6000e-004	1.0000e-004	10.2013
Recreational Swimming Pool	0	0.0000	0.0000	0.0000	0.0000
Total		**152.1371**	**0.0128**	**1.5500e-003**	**152.9220**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Low Rise	800630	141.9882	0.0120	1.4500e-003	142.7207
Parking Lot	57226.7	10.1489	8.6000e-004	1.0000e-004	10.2013
Recreational Swimming Pool	0	0.0000	0.0000	0.0000	0.0000
Total		**152.1371**	**0.0128**	**1.5500e-003**	**152.9220**

6.0 Area Detail

6.1 Mitigation Measures Area

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.8264	0.0228	1.9813	1.0000e-004		0.0110	0.0110		0.0110	0.0110	0.0000	3.2385	3.2385	3.1100e-003	0.0000	3.3164
Unmitigated	0.8264	0.0228	1.9813	1.0000e-004		0.0110	0.0110		0.0110	0.0110	0.0000	3.2385	3.2385	3.1100e-003	0.0000	3.3164

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0623					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.7044					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0597	0.0228	1.9813	1.0000e-004		0.0110	0.0110		0.0110	0.0110	0.0000	3.2385	3.2385	3.1100e-003	0.0000	3.3164
Total	**0.8264**	**0.0228**	**1.9813**	**1.0000e-004**		**0.0110**	**0.0110**		**0.0110**	**0.0110**	**0.0000**	**3.2385**	**3.2385**	**3.1100e-003**	**0.0000**	**3.3164**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0623					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.7044					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0597	0.0228	1.9813	1.0000e-004		0.0110	0.0110		0.0110	0.0110	0.0000	3.2385	3.2385	3.1100e-003	0.0000	3.3164
Total	**0.8264**	**0.0228**	**1.9813**	**1.0000e-004**		**0.0110**	**0.0110**		**0.0110**	**0.0110**	**0.0000**	**3.2385**	**3.2385**	**3.1100e-003**	**0.0000**	**3.3164**

7.0 Water Detail

7.1 Mitigation Measures Water

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	49.4062	0.4201	0.0103	62.9743
Unmitigated	49.4062	0.4201	0.0103	62.9743

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Low Rise	12.5096 / 7.88647	48.3948	0.4114	0.0101	61.6828
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	0.263778 / 0.161671	1.0114	8.6700e-003	2.1000e-004	1.2915
Total		**49.4062**	**0.4200**	**0.0103**	**62.9743**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Low Rise	12.5096 / 7.88647	48.3948	0.4114	0.0101	61.6828
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	0.263778 / 0.161671	1.0114	8.6700e-003	2.1000e-004	1.2915
Total		**49.4062**	**0.4200**	**0.0103**	**62.9743**

8.0 Waste Detail

8.1 Mitigation Measures Waste

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	23.0882	1.3645	0.0000	57.2000
Unmitigated	23.0882	1.3645	0.0000	57.2000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Low Rise	88.32	17.9282	1.0595	0.0000	44.4163
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	25.42	5.1600	0.3050	0.0000	12.7838
Total		**23.0882**	**1.3645**	**0.0000**	**57.2000**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Low Rise	88.32	17.9282	1.0595	0.0000	44.4163
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	25.42	5.1600	0.3050	0.0000	12.7838
Total		**23.0882**	**1.3645**	**0.0000**	**57.2000**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Appendix B

Biological Technical Report and MSHCP Consistency Analysis
ECORP Consulting, Inc.
April 2023

Biological Technical Report and MSHCP Consistency Analysis for the Xenia Apartment Development Project in Beaumont, California

Riverside County, California

Prepared For:

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Prepared By:



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April 2023

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1.0 INTRODUCTION

ECORP Consulting, Inc. conducted a biological reconnaissance survey at an approximately 10.93-acre property for the proposed Xenia Apartment Development Project (Project) located in the City of Beaumont in Riverside County. The survey was conducted to identify any potential biological resources that could be affected by the proposed Project, pursuant to the terms of the California Environmental Quality Act (CEQA) and for the purposes of identifying any biological constraints that would affect the proposed site plan for the Project. The surveys were conducted in accordance with the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP). The MSHCP provides information on plant and wildlife species of concern to the County of Riverside (*Planning Species*) and outlines goals for their conservation. Information on the MSHCP can be found at www.rctlma.org (Riverside County Land Management Agency [RCTLMA] 2022). The Project will be subject to County, State, and federal regulations regarding compliance with the federal Endangered Species Act (ESA), California ESA, Migratory Bird Treaty Act (MBTA), and California Fish and Game Code.

1.1 Project Description and Location

The proposed Project would construct apartment buildings on approximately 10.93 acres (Assessor's Parcel Number [APN] 419-160-005, 419-160-024, 419-170-016, 419-170-017, 419-170-018, 419-170-022, and 419-170-027) in the City of Beaumont. The proposed Project does not include any temporary impacts, and it is assumed the entire 10.93-acre Project site will be permanently impacted. The Project site is located north of Interstate 10 (I-10) within the City of Beaumont (Figure 1). The Project site is located north of Sixth Street, south of Eighth Street, east of Xenia Avenue, and West of Allegheny Street (Figure 2). The Project, as depicted on the U.S. Geological Survey (USGS) Beaumont 7.5-minute topographic quadrangle, is located within Section 11, Township 3 South, Range 1 West. Elevation at the Project site is approximately 2,600 feet above mean sea level (msl).

2.0 FEDERAL AND STATE REGULATIONS

The biological reconnaissance survey was conducted to identify potential constraints to development and to ensure compliance with state and federal regulations regarding listed, protected, and sensitive species. The regulations are detailed below.

2.1 Federal Regulations

2.1.1 The Federal Endangered Species Act

The federal Endangered Species Act (ESA) protects plants and animals that are listed as endangered or threatened by the United States Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service. Section 9 of the ESA prohibits the taking of endangered wildlife, where taking is defined as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in such conduct" (50 Code of Federal Regulations [CFR] 17.3).



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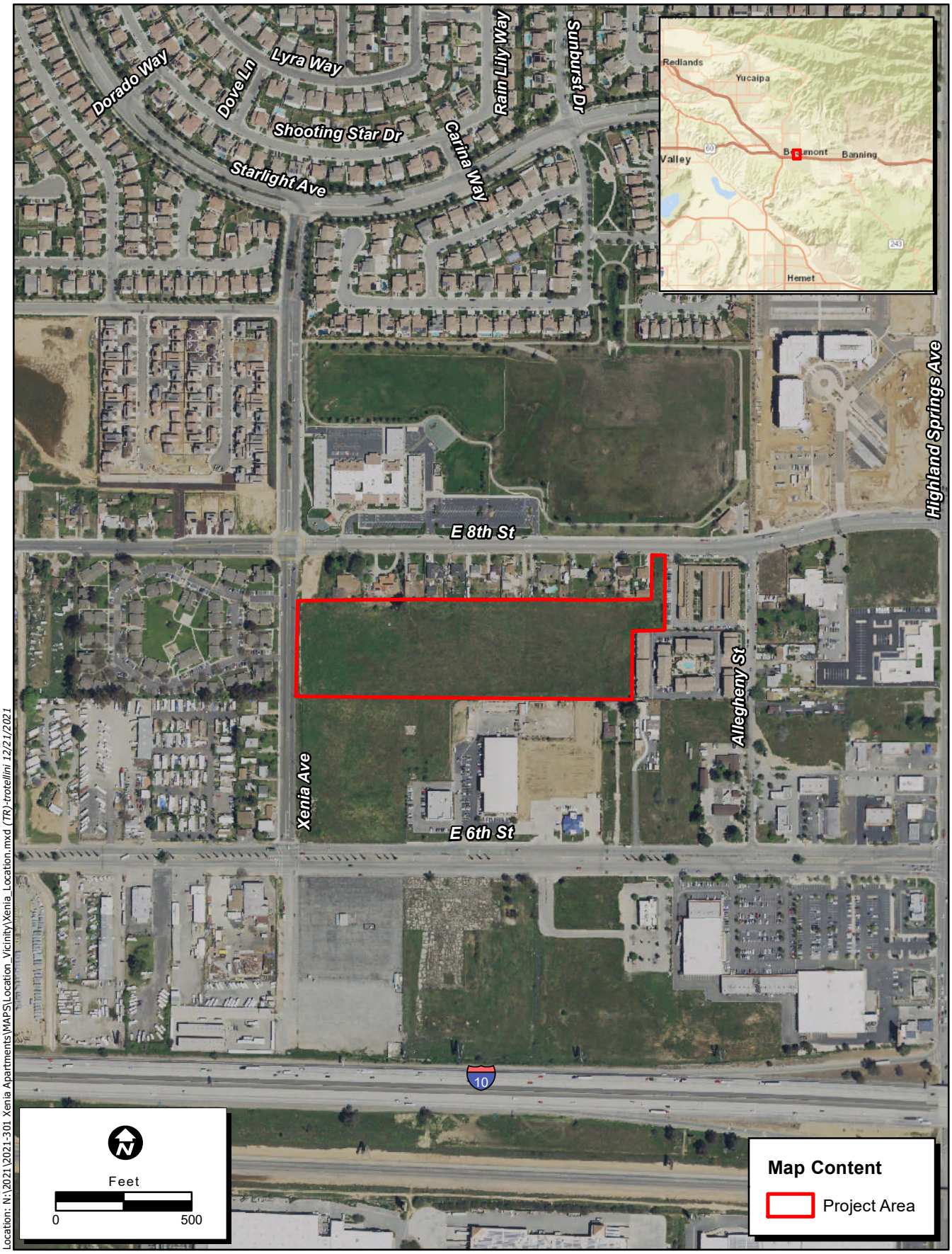
Map Date: 12/21/2021

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

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Figure 1. Project Vicinity

2021-301 Xenia Apartments



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Map Date: 12/21/2021

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community Photo Source: NAIP

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Figure 2. Project Location

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For plants, this statute governs removing, possessing, maliciously damaging, or destroying any endangered plant on federal land and removing, cutting, digging up, damaging, or destroying any endangered plant on non-federal land in knowing violation of state law (16 U.S. Code 1538). Under Section 7 of the ESA, federal agencies are required to consult with the USFWS if their actions, including permit approvals or funding, could adversely affect a listed (or proposed) species (including plants) or its critical habitat. Through consultation and the issuance of a biological opinion, the USFWS may issue an incidental take statement allowing take of the species that is incidental to an otherwise authorized activity provided the activity will not jeopardize the continued existence of the species. Section 10 of the ESA provides for issuance of incidental take permits where no other federal actions are necessary provided a habitat conservation plan (HCP) is developed.

2.1.2 Migratory Bird Treaty Act

The federal Migratory Bird Treaty Act (MBTA) implements international treaties between the United States and other nations devised to protect migratory birds, any of their parts, eggs, and nests from activities such as hunting, pursuing, capturing, killing, selling, and shipping, unless expressly authorized in the regulations or by permit. As authorized by the MBTA, the USFWS issues permits to qualified applicants for the following types of activities: falconry, raptor propagation, scientific collecting, special purposes (rehabilitation, education, migratory game bird propagation, and salvage), take of depredating birds, taxidermy, and waterfowl sale and disposal. The regulations governing migratory bird permits can be found in 50 CFR Part 13 General Permit Procedures and 50 CFR Part 21 Migratory Bird Permits. The State of California has incorporated the protection of birds of prey in Sections 3800, 3513, and 3503.5 of the California Fish and Game Code.

2.1.3 Federal Clean Water Act

Tiering off of the Rivers and Harbors Act of 1899, which primarily pertains to discharge of fill into navigable waters, the purpose of the federal Clean Water Act (CWA) is to "restore and maintain the chemical, physical, and biological integrity of the nation's waters." The USACE regulates discharge of dredged or fill material into Waters of the U.S. under Section 404 of the CWA. "Discharges of fill material" is defined as the addition of fill material into Waters of the U.S., including, but not limited to the following: placement of fill necessary for the construction of any structure, or impoundment requiring rock, sand, dirt, or other material for its construction; site-development fills for recreational, industrial, commercial, residential, and other uses; causeways or road fills; and fill for intake and outfall pipes, and subaqueous utility lines [33 CFR § 328.2(f)]. In addition, Section 401 of the CWA (33 USC 1341) requires any applicant for a federal license or permit to conduct any activity that may result in a discharge of a pollutant into Waters of the U.S. to obtain a certification that the discharge will comply with the applicable effluent limitations and water quality standards.

Substantial impacts to wetlands, more than 0.5 acre of impact, may require an individual permit. Projects that only minimally affect wetlands, less than 0.5 acre of impact, may meet the conditions of one of the existing Nationwide Permits. A Water Quality Certification or waiver pursuant to Section 401 of the CWA is required for Section 404 permit actions; this certification or waiver is issued by the local Regional Water Quality Control Board (RWQCB) under the authority of the State Water Resources Control Board. For this Project, the Santa Ana RWQCB has jurisdiction.

A new ruling called the Navigable Waters Protection Rule came into effect June 22, 2020. Under this ruling, the definition of the term "waters of the United States" encompasses:

- the territorial seas and traditional navigable waters;
- perennial and intermittent tributaries that contribute surface water flow to such waters;
- certain lakes, ponds, and impoundments of jurisdictional waters; and
- wetlands adjacent to other jurisdictional waters.

This latest Rule also excludes several waters and other features not mentioned in the above definition, including "ephemeral features that flow only in direct response to precipitation, including ephemeral streams, swales, gullies, rills, and pools."

2.2 State and Local Regulations

2.2.1 California Endangered Species Act

The California ESA generally parallels the main provisions of the ESA but, unlike its federal counterpart, the California ESA applies the take prohibitions to species proposed for listing (called *candidates* by the State). Section 2080 of the California Fish and Game Code prohibits the taking, possession, purchase, sale, and import or export of endangered, threatened, or candidate species, unless otherwise authorized by permit or in the regulations. Take is defined in Section 86 of the California Fish and Game Code as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." The California ESA allows for take incidental to otherwise lawful development projects. State lead agencies are required to consult with CDFW to ensure that any action they undertake is not likely to jeopardize the continued existence of any endangered or threatened species or result in destruction or adverse modification of essential habitat.

2.2.2 Fully Protected Species

The State of California first began to designate species as *fully protected* prior to the creation of the federal and California ESAs. Lists of fully protected species were initially developed to provide protection to those animals that were rare or faced possible extinction, and included fish, amphibians and reptiles, birds, and mammals. Most fully protected species have since been listed as threatened or endangered under federal and/or California ESAs. The regulations that implement the Fully Protected Species Statute (California Fish and Game Code § 4700) provide that fully protected species may not be taken or possessed at any time. Furthermore, CDFW prohibits any state agency from issuing incidental take permits for fully protected species, except for necessary scientific research.

2.2.3 Native Plant Protection Act

The Native Plant Protection Act (NPPA) of 1977 (California Fish and Game Code §§ 1900-1913) was created with the intent to "preserve, protect and enhance rare and endangered plants in this State." The NPPA is administered by CDFW. The Fish and Wildlife Commission has the authority to designate native plants as *endangered* or *rare* and to protect endangered and rare plants from take. The California ESA of 1984

(California Fish and Game Code § 2050-2116) provided further protection for rare and endangered plant species, but the NPPA remains part of the California Fish and Game Code.

2.2.4 California Fish and Game Code

2.2.4.1 Streambed Alteration Agreement

Section 1602 of the California Fish and Game Code requires that a Notification of Lake or Streambed Alteration be submitted to CDFW for "any activity that may substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake." The CDFW reviews the proposed actions and, if necessary, submits to the Applicant a proposal for measures to protect affected fish and wildlife resources. The final proposal that is mutually agreed upon by CDFW and the Applicant is the Streambed Alteration Agreement (SAA). Often, projects that require an SAA also require a permit from the USACE under Section 404 of the CWA. In these instances, the conditions of the Section 404 permit and the SAA may overlap.

2.2.4.2 Migratory Birds

The CDFW enforces the protection of nongame native birds in §§ 3503, 3503.5, and 3800 of the California Fish and Game Code. Section 3513 of the California Fish and Game Code prohibits the possession or take of birds listed under the MBTA. These sections mandate the protection of California nongame native birds' nests and make it unlawful to take these birds. All raptor species are protected from *take* pursuant to California Fish and Game Code § 3503.5 and are also protected at the federal level by the MBTA of 1918 (USFWS 1918).

2.2.5 Western Riverside County Multiple Species Habitat Conservation Plan

The Western Riverside County MSHCP is a comprehensive, multi-jurisdictional habitat conservation plan (HCP) focusing on conservation of species and their associated habitats in western Riverside County. The MSHCP identified 146 species, referred to as *Covered Species*, for which the federal and California ESAs *take* authorization has been granted to signatories to the plan as long as they comply with its requirements. Of the 146 Covered Species within the MSHCP, 118 are considered to be *adequately conserved*. The remaining 28 Covered Species will be considered adequately conserved when certain landmark conservation requirements are met during the course of future development. The goal of the MSHCP is to maintain the biological and ecological diversity within a rapidly urbanizing region while also improving the future economic development in the county by providing an efficient, streamlined regulatory process through which development can proceed in an efficient way.

The approval of the MSHCP and execution of the Implementing Agreement (IA) by the wildlife agencies allows signatories of the IA to issue *take* authorizations for all species covered by the MSHCP, including state- and federally listed species, as well as other identified sensitive species and/or their habitats. Each city of local jurisdiction will impose a Development Mitigation Fee for projects within their jurisdiction. With payment of the mitigation fee to the County and compliance with the survey requirements of the MSHCP where required, full mitigation in compliance with CEQA, National Environmental Policy Act (NEPA), the California ESA, and the ESA will be granted. The Development Mitigation Fee varies according to project size and project

description and is dependent on development density (Riverside County Ordinance No. 810.2). Payment of the mitigation fee and compliance with the requirements of Section 6.0 of the MSHCP are intended to provide full mitigation under CEQA, NEPA, and the California and federal ESAs for impacts to the species and habitats covered by the MSHCP, pursuant to agreements with USFWS, CDFW, and/or any other appropriate participating regulatory agencies as set forth in the IA for the MSHCP.

2.2.6 CEQA Significance Criteria

Section 15064.7 of the CEQA Guidelines encourages local agencies to develop and publish the thresholds the agency uses in determining the significance of environmental effects caused by projects under its review. However, agencies may also rely upon the guidance provided by the expanded Initial Study checklist contained in Appendix G of the CEQA Guidelines. Appendix G provides examples of impacts that would normally be considered significant. Based on these examples, impacts to biological resources would normally be considered significant if the project would:

- have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by CDFW or USFWS;
- have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by CDFW or USFWS;
- have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, and coastal) through direct removal, filling, hydrological interruption, or other means;
- interfere substantially with the movement of any native resident or migratory fish or wildlife species, or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;
- conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; and
- conflict with the provisions of an adopted HCP, Natural Community Conservation Plan, or other approved local, regional, or state HCP.

An evaluation of whether an impact on biological resources would be substantial must consider both the resource itself and how that resource fits into a regional or local context. Substantial impacts would be those that would diminish, or result in the loss of, an important biological resource, or those that would obviously conflict with local, state, or federal resource conservation plans, goals, or regulations. Impacts are sometimes locally important but not significant according to CEQA. The reason for this is that although the impacts would result in an adverse alteration of existing conditions, they would not substantially diminish, or result in the permanent loss of an important resource on a population-wide or region-wide basis.

3.0 METHODS

3.1 Literature Review

Prior to conducting the biological reconnaissance survey, ECORP biologists performed a literature review using the CDFW California Natural Diversity Data Base (CNDDB; CDFW 2022) and the California Native Plant Society (CNPS) Electronic Inventory (CNPSEI; CNPS 2022) to determine the special-status plant and wildlife species that have been documented in the vicinity of the Project site. Wildlife species, especially birds and larger animals, are very mobile and can travel long distances in search of appropriate habitat, food, or mates. Due to the high mobility of wildlife species, the literature review and CNDDB records search of wildlife species was conducted within the Project site boundaries as depicted on USGS 7.5-minute "Beaumont" topographic quadrangle, and the surrounding eight topographic quadrangles: Yucaipa, Forest Falls, San Gorgonio Mountain, El Casco, Lake Cabazon, Lakeview, San Jacinto, and Lake Fulmor. Due to the isolated nature of the Project site, the fact that it is surrounded by development, the Project site's long history of disturbance, and the lack of mobility for plant species, the CNDDB and CNPSEI searches for special-status plant species were limited to plant species that have been documented within five miles of the Project site. CNDDB and CNPSEI contain records of reported occurrences of federally or state-listed endangered, threatened, proposed endangered or threatened species, California Species of Special Concern (SSC), and/or other special-status species or habitat that may occur within the database search area for the Project. Additional information was gathered from the following sources and includes, but is not limited to:

- U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS) *Web Soil Survey* (NRCS 2022);
- State and Federally Listed Endangered and Threatened Animals of California (CDFW 2022a);
- Special Animals List (CDFW 2022b);
- *The Jepson Manual: Vascular Plants of California* (Baldwin et al. 2012);
- *The Manual of California Vegetation*, 2nd Edition (Sawyer et al. 2009); and
- Various online websites (e.g., CalFlora 2022).

Using this information and observations in the field, a list of special-status plant and wildlife species that have potential to occur within the Project site was generated. For the purposes of this assessment, special-status species are defined as plants or animals that:

- have been designated as either rare, threatened, or endangered by CDFW, CNPS, or the USFWS, and/or are protected under either the federal or California ESAs;
- are candidate species being considered or proposed for listing under these same acts;
- are fully protected by the California Fish and Game Code, §§ 3511, 4700, 5050, or 5515;
- are of expressed concern to resource and regulatory agencies or local jurisdictions; and/or

Special-status species reported for the region in the literature review or for which suitable habitat occurs on the Project site were assessed for their potential to occur within the Project site based on the following guidelines:

Present: The species was observed on the Project site during a site visit or focused survey.

High: Habitat (including soils and elevation factors) for the species occurs within the Project site and a known occurrence has recently been recorded (within the last 20 years) within five miles of the area.

Moderate: Habitat (including soils and elevation factors) for the species occurs within the Project site and a documented observation occurs within the database search, but not within five miles of the area; a historic documented observation (more than 20 years old) was recorded within five miles of the Project site; or a recently documented observation occurs within five miles of the area and marginal or limited amounts of habitat occurs in the Project site.

Low: Limited or marginal habitat for the species occurs within the Project site and a recently documented observation occurs within the database search, but not within five miles of the area; a historic documented observation (more than 20 years old) was recorded within five miles of the Project site; or suitable habitat strongly associated with the species occurs on the Project site, but no records or only historic records were found within the database search.

Presumed Absent: Species was not observed during a Project site visit or focused surveys conducted in accordance with protocol guidelines at an appropriate time for identification; habitat (including soils and elevation factors) does not exist on the Project site; or the known geographic range of the species does not include the Project site.

Note: Location information on some special-status species may be of questionable accuracy or unavailable. Therefore, for survey purposes, the environmental factors associated with a species' occurrence requirements may be considered sufficient reason to give a species a positive potential for occurrence. In addition, just because a record of a species does not exist in the databases does not mean it does not occur. In many cases, records may not be present in the databases because an area has not been surveyed for that particular species.

A desktop review of the NRCS' Web Soil Survey (NRCS 2022) and the corresponding USGS topographic maps was also conducted to determine if there were any blue line streams or drainages that might potentially fall under the jurisdiction of either federal or state agencies were present on the Project site.

3.2 Western Riverside County MSHCP Consistency Analysis

Data regarding the Project site were reviewed to determine consistency with the MSHCP. The Western Riverside County Regional Conservation Authority (RCA) MSHCP Information Map was queried to determine requirements for habitat assessment(s), potential focused survey(s), or other issues related to biological resources that could exist on the Project site (RCA 2022).

Section 6.0 of the MSHCP also requires that an assessment of the Project site be completed to identify any potential Project-related effects on biological resources, including riparian/riverine areas, vernal pools, and

fairy shrimp, if applicable. In addition, the MSHCP requires that an Urban/Wildlands Interface analysis be conducted to address the indirect effects associated with locating proposed development in the proximity of MSHCP Conservation Areas.

3.3 Field Survey

3.3.1 Biological Reconnaissance Survey

The biological reconnaissance survey was conducted by walking the entire Project site and a 500-foot buffer to identify the vegetation communities and wildlife habitats on the Project site. Portions of the buffer that were not accessible due to unknown property ownership were surveyed from a distance with binoculars. The biologists documented the plant and wildlife species present on the Project site, and the location and condition of the Project site were assessed for the potential to provide habitat for special-status plant and wildlife species. Data were recorded on a Global Positioning System (GPS) unit, field notebooks, and/or maps. Photographs were taken during the survey to provide visual representation of the various vegetation communities within the Project site. The Project site was also examined to assess its potential to facilitate wildlife movement or function as a movement corridor for wildlife moving throughout the region. In addition, the biologists mapped the vegetation communities present on the Project site.

Plant and wildlife species, including any special-status species that were observed during the survey, were recorded. Plant nomenclature follows that of *The Jepson Manual: Vascular Plants of California* (Baldwin et al. 2012). Wildlife nomenclature follows Society for the Study of Amphibians and Reptiles (SSAR 2017), *Check-list of North American Birds* (Chesser et al. 2019), and the *Revised Checklist of North American Mammals North of Mexico* (Bradley et al. 2014).

In instances where a special-status species was observed, the species, location and habitat, and GPS coordinates were recorded.

3.3.2 Preliminary Aquatic Resources Delineation

A desktop review was conducted to identify potential streams and hydric soils within the Project Area. This entailed examination of the NRCS Soil Mapper (NRCS 2022), NWI Mapper (USFWS 2022), and the USGS topographic mapping of the Project Area to aid in assessing potential biological constraints due to aquatic resources. A preliminary aquatic resources delineation of the Project Area was conducted during the biological reconnaissance survey. The Project Area was walked to document signs of an Ordinary High-Water Mark, as defined by the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (Arid West Region Supplement) (USACE 2008). Boundaries of potential Waters of the U.S. and Waters of the State were identified through aerial photograph interpretation and standard field methods including identification of water sources and examination of topography. Boundaries of potential jurisdictional areas were not formally delineated.

3.3.3 Narrow Endemic Plant Species Habitat Assessment

Most of the Project site is located within a MSHCP designated narrow endemic plant survey area for the following plant species: Yucaipa onion (*Allium marvinii;* Marvin's onion), and many-stemmed dudleya (*Dudleya multicaulis*) (RCA 2022; Figure 3). To determine if suitable habitat is present, a narrow endemic plant habitat assessment was conducted concurrently with the biological reconnaissance survey. The Project site and a 500-foot buffer were walked to identify the presence of habitat suitable for narrow endemic plant species. Areas that were not accessible by foot were scanned using binoculars for suitable habitat.

3.3.4 Burrowing Owl Habitat Assessment

The Project site is located within a MSHCP designated burrowing owl (*Athene cunicularia*) survey area (Figure 3). Surveys for burrowing owl are required as part of the Project review process where suitable habitat is present (RCTLMA 2022). To determine if suitable habitat is present a burrowing owl habitat assessment was conducted concurrently with the biological reconnaissance survey. The Project site and a 500-foot buffer were walked to identify the presence of owl habitat. Areas that were not accessible by foot were scanned using binoculars for suitable habitat.

3.3.5 Focused Burrowing Owl Surveys

Four protocol-level burrowing owl surveys were conducted on four separate days: one in June, two in July, and one August 2022 by qualified biologist. The biologist walked pedestrian transects spaced 20-30 meters apart across the entire Project site and 500-foot buffer (survey area), where access was permissible. Surveys were conducted during the burrowing owl breeding season (February 1- August 31) and in accordance with the *Burrowing Owl Survey Instructions for the Western Riverside Multiple Species Habitat Conservation Plan Area* (RCTLMA 2006). In locations where the survey area was inaccessible due to unknown property ownership; biologists visually surveyed the area with binoculars. Prior to the start of a transect, biologists visually surveyed the transect and surrounding area. The biologists visually inspected any burrows, rocky areas, or man-made materials within the survey area for potential burrowing owl occupation. All burrows encountered were inspected for presence or sign of burrowing owl (e.g., whitewash, pellets, feathers, and/or prey remains) and classified according to the guidelines in the Staff Report (CDFG 2012).

Data collected for each burrow included the condition and size of the burrow, number of entrances, presence of burrowing owl sign near the burrow, and location. The location was marked using a Global Positioning System (GPS). Burrows were individually numbered and classified into two categories based on definitions found in the CDFG Staff Report (CDFG 2012): occupied burrow or potential burrow. Burrows classified as occupied showed definitive burrowing owl sign (consisting of whitewash, feathers, pellets, and/or bones of prey outside the burrow), indicating burrowing owl presence and/or use at some point in time. Potential burrows were defined as burrows that are large enough for a burrowing owl but do not show sign of use by the species. Data were recorded on survey sheets and photographs were taken.



Location: N:\2021\2021-301 Xenia Apartments\MAPS\Biological_Resources\Xenia_MSHCP.mxd (TR)-trotellini 1/20/2022

Map Date: 1/20/2022

Service Layer Credits: Photo Source: NAIP (2020)

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Figure 3. MSHCP Burrowing Owl and Narrow Endemic Plant Species Survey Areas

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Weather data was recorded at the time of the surveys (including time, temperature, cloud cover, and wind speed at the start and end of the survey). Surveys were not conducted during rain, high winds (over 20 mph), dense fog, or temperatures over 90 °F. The focused burrowing owl surveys were conducted in the morning one hour before sunrise and up to two hours after sunrise. Biologists also recorded the major plant and wildlife species observed or detected during the surveys:

4.0 RESULTS

The results of the literature review and field surveys, including Project site characteristics, vegetation communities, wildlife, special-status species, and special-status habitats (including any potential wildlife corridors) are summarized below.

4.1 Literature Review

4.1.1 Special-Status Plants and Wildlife

The CNDDB and CNPSEI searches were originally conducted on December 21, 2021, and then conducted again on December 8, 2022, prior to report revisions. The database searches identified 20 special-status plant species records within five miles of the Project site and 44 special-status wildlife species were identified in the nine-quadrangle search, that have could occur on and/or near the Project site. A list was generated from the results of the literature review and the site was evaluated for suitable habitat that could support any of the special-status plant or wildlife species on the list.

4.1.2 U.S. Fish and Wildlife Service-Designated Critical Habitat

The Project site is not located within any USFWS-designated critical habitat.

4.2 Biological Reconnaissance Survey

The biological reconnaissance survey was conducted on January 7, 2022, by ECORP biologist, Alden Lovaas. Summarized below are the results of the biological reconnaissance survey including Project site characteristics, plants and plant communities, wildlife, special-status species, and special-status habitats (including any potential wildlife corridors). Within the 500-foot buffer, areas of unknown property ownership or areas where no trespassing signs were posted were surveyed from a distance with binoculars. Weather conditions during the survey are summarized below in Table 1.

Table 1. Biological Reconnaissance Survey Weather Conditions

Date	Time		Temperature (˚F)		Cloud Cover (%)		Wind Speed (mph)	
	Start	End	Start	End	Start	End	Start	End
01/07/2022	0715	1100	50	63	0	0	1-3	1-5

4.2.1 Project Site Characteristics and Land Use

The Project site consists of a heavily disturbed undeveloped vacant lot composed of primarily nonnative vegetation. The entire Project site has evidence of mechanical disturbance (e.g., discing) with scattered trash throughout. Vehicle tracks were also observed throughout portions of the Project site. There are two soil types within the Project site, Greenfield sandy loam, with 2 to 8 percent slopes, eroded and Ramona sandy loam, with 2 to 5 percent slopes, eroded (Figure 4; NRCS 2022).

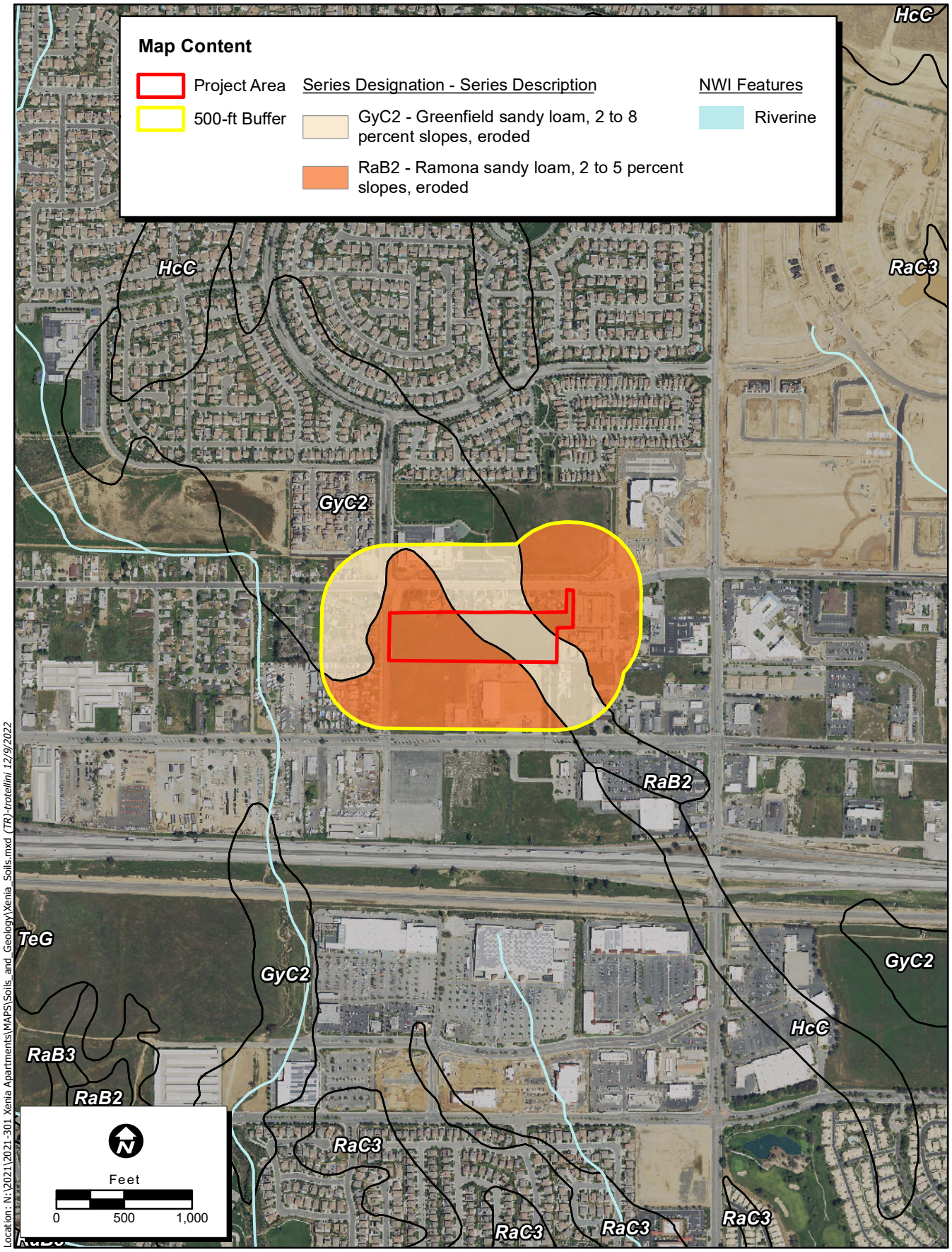
The Project site is bounded to the north, west, and east by residential properties, and to the south by commercial properties and an additional vacant lot. No aquatic resources were observed during the biological reconnaissance survey. Representative Project site photographs are included in Appendix A.

4.2.2 Vegetation Communities and Land Cover Types

The Project site is within a developed environment which is generally subjected to repeated and ongoing disturbance from human activities. Due to the Project site's long history of repeated mechanical disturbance (discing), the Project site did not contain any natural vegetation communities. The Project site is better characterized as disturbed. The disturbed classification includes areas where the native vegetation community has been heavily influenced by human actions, such as grading, discing, trash dumping, and off-road use, but lacks development. Disturbed is not a vegetation classification, but rather a land cover type and is not typically restricted to a known elevation. The entire 10.93-acre Project site was classified as disturbed, and a review of historical aerial photographs show that the Project site has been actively maintained for many years to be free of vegetation. What little vegetation that remained on the Project site was sparse and consisted primarily of nonnative species, such as ripgut brome (*Bromus diandrus*), cheatgrass (*Bromus tectorum*), Spanish brome (*Bromus madritensis*), and redstem filaree (*Erodium cicutarium*). The northwest portion of the Project site contained a few isolated ornamental trees including a nonnative walnut (*Juglans* sp.), common persimmon (*Diospyros virginiana*), Shamel ash (*Fraxinus uhdei*). One Goldenrain tree (*Koelreuteria bipinnata*) was also observed in the northeast corner of the Project site.

4.2.3 Plants

Plant species observed on the Project site were generally characteristic of disturbed urban areas. Dominant plant species observed on the Project site were nonnative weedy and/or ruderal species including fiddleneck (*Amsinckia* sp.), ripgut brome, cheatgrass, Spanish brome, Bermuda grass (*Cynodon dactylon*), Russian thistle (*Salsola tragus*), and greater periwinkle (*Vinca major*). Native plants observed on the Project site included fiddleneck (*Amsinckia* sp.), blueblossom (*Ceanothus thyrsiflorus)*, turkey mullein *(Croton setiger)*, and Jimson weed *(Datura wrightii)*. A full list of plant species observed on or immediately adjacent to the Project site is included in Appendix B.



Map Date: 12/9/2022

Service Layer Credits: Photo Source: NAIP (2020)

Figure 4. Natural Resources Conservation Service Soil Types

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4.2.4 Wildlife

The Project site provided habitat for species adapted to disturbances and urban environments. A total of 23 bird species were observed during the reconnaissance survey and focused burrowing owl surveys, including, but not limited to, red-tailed hawk (*Buteo jamaicensis*), Anna's hummingbird (*Calypte anna*), house finch (*Haemorhous mexicanus*), and mourning dove (*Zenaida macroura*). Three mammal species were observed including California ground squirrel (*Otospermophilus beecheyi)*, virginia opossum (*Didelphis virginiana*), domestic dog (*Canis lupus familiaris*) and two reptile species side-blotched lizard (*Uta stansburiana*) and western fence lizard (*Sceloporus occidentalis*), were also observed during the focused burrowing owl surveys. Additionally, California ground squirrel burrows, suitable for use by burrowing owl, were abundant on the Project site (Figure 5). A full list of wildlife species observed on or immediately adjacent to the Project site is included in Appendix C.

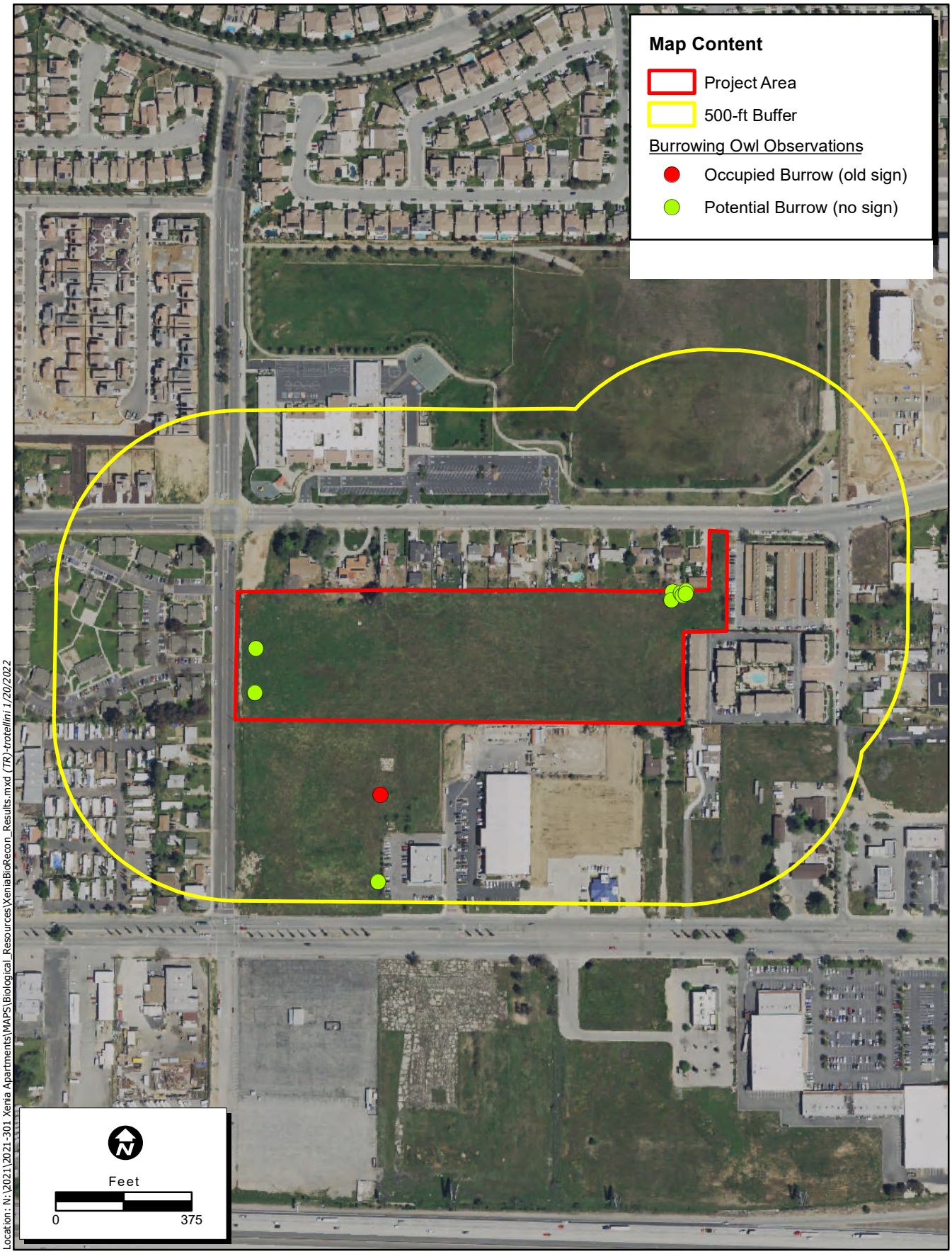
4.2.5 Potential for Special-Status Plant and Wildlife Species to Occur on the Project Site

The literature review and database search identified 20 special-status plant species that occur within five miles of the Project site and 44 special-status wildlife species were identified in the nine-quadrangle search, that have the potential to occur on or near the Project site. However, due to the current lack of suitable habitat for the special-status plant and wildlife species, many of the species have a low potential to occur or are presumed absent from the Project site.

4.2.5.1 Special-Status Plants

There were 20 special-status plant species that appeared in the literature review and database searches as occurring within five miles of the Project site (CDFW 2022, CNPS 2022). Of those, two are federally and/or state listed and 10 are covered by the MSHCP. A list was generated from the results of the literature review and the Project was evaluated for suitable habitat that could support any of the special-status plant species on the list.

Due to the isolated nature of the Project site, the fact that it is surrounded by development, the Project site's long history of disturbance, and the lack of mobility for plant species, the results of the literature review were limited to plant species occurring within five miles of the Project site. Descriptions of the CNPS designations can be found in Table 2. A Potential for Occurrence (PFO) table outlining each species and their designations can be found in Appendix D.



Location: N:\2021\2021-301 Xenia Apartments\MAPS\Biological_Resources\XeniaBioRecon_Results.mxd *(TR)-trotellini 1/20/2022*

Map Date: 1/20/2022

Service Layer Credits: Photo Source: NAIP (2020)

Figure 5. Biological Reconnaissance Survey Results

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Table 2. CNPS Status Designations	
List Designation	**Meaning**
1A	Plants Presumed Extirpated in California and Either Rare or Extinct Elsewhere
1B	Plants Rare, Threatened, or Endangered in California and Elsewhere
2A	Plants Presumed Extirpated in California, But Common Elsewhere
2B	Plants Rare, Threatened, or Endangered in California, But More Common Elsewhere
3	Plants about which we need more information; a review list
4	Plants of limited distribution; a watch list
List 1B, 2, and 4 extension meanings:	
.1	Seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat)
.2	Moderately threatened in California (20-80% occurrences threatened / moderate degree and immediacy of threat)

Note: According to CNPS (Skinner and Pavlik 1994), plants on Lists 1B and 2 meet definitions for listing as threatened or endangered under Section 1901, Chapter 10 of the California Fish and Game Code (CDFG 1984). This interpretation is inconsistent with other definitions.

4.2.5.2 Plant Species Presumed Absent

Due to the isolated nature of the Project site, the fact that it is surrounded by development, the Project site's long history of disturbance, and the lack of mobility for plant species, all of the 20 plant species identified within five miles of the Project site were presumed absent due to lack of suitable habitat (including elevation, soils, and vegetation community associations) on the Project site. A PFO table outlining each species and their designations can be found in Appendix D.

4.2.5.3 Special-Status Wildlife

The literature search documented 44 special-status wildlife species in the database search area for the Project site, 13 of them are federally and/or state listed and/or candidates for state and/or federal listing, and 28 are species covered by the MSHCP (CDFW 2022). A list was generated from the results of the literature review and the Project was evaluated for suitable habitat that could support any of the special-status wildlife species on the list. Mechanical disturbances on the Project site, proximity to residential development, and the presence of anthropogenic influences on the Project site likely preclude many of these species from occurring. A brief natural history and discussion of the special-status wildlife species found to be present onsite or to have a high potential to occur on the Project site is provided below. A PFO table outlining each species and their designations can be found in Appendix E.

4.2.5.4 Wildlife Species with a High Potential to Occur

The following one species have a high potential to occur on the Project site due to the presence of suitable habitat for the species occurring on the Project site and a known occurrence that has been recorded within five miles of the Project site.

Burrowing owl

Burrowing owl is an MSHCP-Covered Species and a CDFW SSC. Burrowing owls make use of mammal burrows and can also be found nesting in burrows made under concrete or other anthropogenic features and are often found near human activity. California ground squirrel, suitable for use by burrowing owl, were present throughout the Project site, as well as within the 500-foot buffer, which could provide burrow habitat for burrowing owls. Each burrow observed was checked for sign of burrowing owl (e.g., whitewash, feathers, pellets). During the biological reconnaissance survey, eight potential burrowing owl burrows (no sign) were observed on the Project site and one potential burrow was identified within the survey buffer (Figure 5). No sign of burrowing owl activity was observed at any of the potential burrows on the Project site during the biological reconnaissance survey. However, one burrow within the survey buffer was marked as potentially occupied due to the presence of whitewash near the burrow entrance, but no other sign (e.g., pellets, feathers, prey remains) was observed at the burrow (Figure 5; Appendix A, Photo 6). The potentially occupied burrow was located approximately 200 feet south of the southern border of the project site and was situated under a large tree (Figure 5). Due to the burrow's position under the tree, it's possible that the whitewash was from a bird perched in the tree above the burrow and not burrowing owl sign. Nonetheless, the burrow was marked as potentially occupied at the time of the biological reconnaissance survey, and further investigation was conducted during the focused burrowing owl surveys.

Although no burrowing owls or definitive sign of burrowing owl activity was identified during the biological reconnaissance survey, this species is mobile and relatively tolerant of disturbance and could occupy the Project site at any time due to the presence of suitable habitat (i.e., California ground squirrel burrows). The literature review identified numerous occurrences of burrowing owls within five miles of the Project site between 2005 and 2007 (CDFW 2022). Due to the presence of suitable habitat and multiple recent occurrences within five miles of the Project site, burrowing owls have a high potential to occur on the Project site.

4.2.5.5 Wildlife Species with a Low Potential to Occur

One species has a low potential to occur on the Project site because limited habitat for the species occurs on the Project site and a known occurrence was identified in the database search, but not within five miles of the Project site; or a historic documented observation (more than 20 years old) was recorded within five miles of the Project site; or suitable habitat strongly associated with the species occurs on the Project site, but no records were found in the database search.

- Loggerhead shrike (*Lanius ludovicianus*), CDFW SSC, MSHCP Covered;

4.2.5.6 Wildlife Species Presumed Absent

A total of 42 species were not present at the site during the biological reconnaissance survey and habitat for these species was not present or suitable on the Project site. For some species, there were historic or recent sightings recorded within the nine-quadrangle database search; however, due to the lack of suitable habitat within the Project site, these species are presumed absent. A PFO table outlining each species and their designations can be found in Appendix E.

4.2.6 Raptors and Migratory Birds

Potential nesting habitat for migratory birds and raptors protected by the MBTA and California Fish and Game Code was present in the trees on the Project site and within the 500-foot buffer. The Project site contained trees suitable for nesting, and the disturbed habitat present could be suitable for some ground nesting species (e.g., horned lark). Raptors typically breed between February and August, and songbirds and other passerines generally nest between March and August.

4.3 State or Federally Protected Wetlands and Waters

No federal or state jurisdictional waters or wetlands were observed on the Project site during the biological reconnaissance survey and no federal or state jurisdictional waters or wetlands were identified on or immediately adjacent to the Project site during the literature review (USFWS 2022). Therefore, it was determined that the Project site does not include waters or wetlands that are potentially jurisdictional to the USACE, CDFW, or RWQCB. The nearest NWI feature is Potrero Creek, located approximately 950 feet west of the Project site (Figure 4). According to the NRCS, there are also no mapped hydric soils present on the Project site (Figure 4; NRCS 2022).

4.4 Narrow Endemic Plant Habitat Assessment

The Project site falls within the narrow endemic plant survey areas for Yucaipa onion (or Marvin's onion), and many-stemmed dudleya. Due to the Project site's location within this survey area a habitat assessment was conducted to determine if the Project site could support these species. The narrow endemic plant habitat assessment was conducted concurrently with the biological reconnaissance survey on January 7, 2022, by ECORP biologist Alden Lovaas.

The Yucaipa onion is designated as a Group 3 species within the MSHCP due to its specialized habitat requirements and limited distribution (RCTLMA 2022). Yucaipa onion is dependent on clay openings within chaparral habitat at elevations between 2,493 and 3,494 feet above msl (RCTLMA 2022). The literature review and database searches identified four recent records of this species from 2010 to 2020 within five miles of the Project site (CDFW 2022). The closest record identified in the database searches was approximately 2.8 miles south of the Project site (CDFW 2022). Although the Project site occurs within the appropriate elevation range for this species and records have been identified within five miles of the Project site, no chaparral habitat or clay soils suitable for the species were present on the Project site. The soils on site consist of Greenfield sandy loam and Ramona sandy loam, which are not suitable for the species.

The many-stemmed dudleya is also designated as a Group 3 species within the MSHCP due to its limited geographic distribution in Riverside County and specialized habitat requirements (RCTLMA 2022). Several populations exist within western Riverside County; however, these are concentrated within the Santa Ana Mountains Bioregion and western portion of the Riverside Lowlands Bioregion, with the majority of the populations known from the Temescal Canyon, Gavilan Hills, and Alberhill areas and the Santa Ana Mountains, including the San Mateo Wilderness Area of the Cleveland National Forest (RCTLMA 2022). The many-stemmed dudleya is associated with openings in chaparral, coastal sage scrub, and grasslands with clay and cobbly clay soils of the following series: Altamont, Auld, Bosanko, Claypit, and Porterville (RCTLMA 2022). No records of this species were identified within the database searches. The closest record of this species was

from 1981 and was located approximately 27 miles southwest of the Project site near Lake Mathews. Although the Project site is located within a designated MSHCP survey area for many-stemmed dudleya, no suitable chaparral, coastal sage scrub, or grassland habitat with clay and/or cobbly clay soils exists on the Project site. The soils on site consist of Greenfield sandy loam and Ramona sandy loam, which are not suitable for the species.

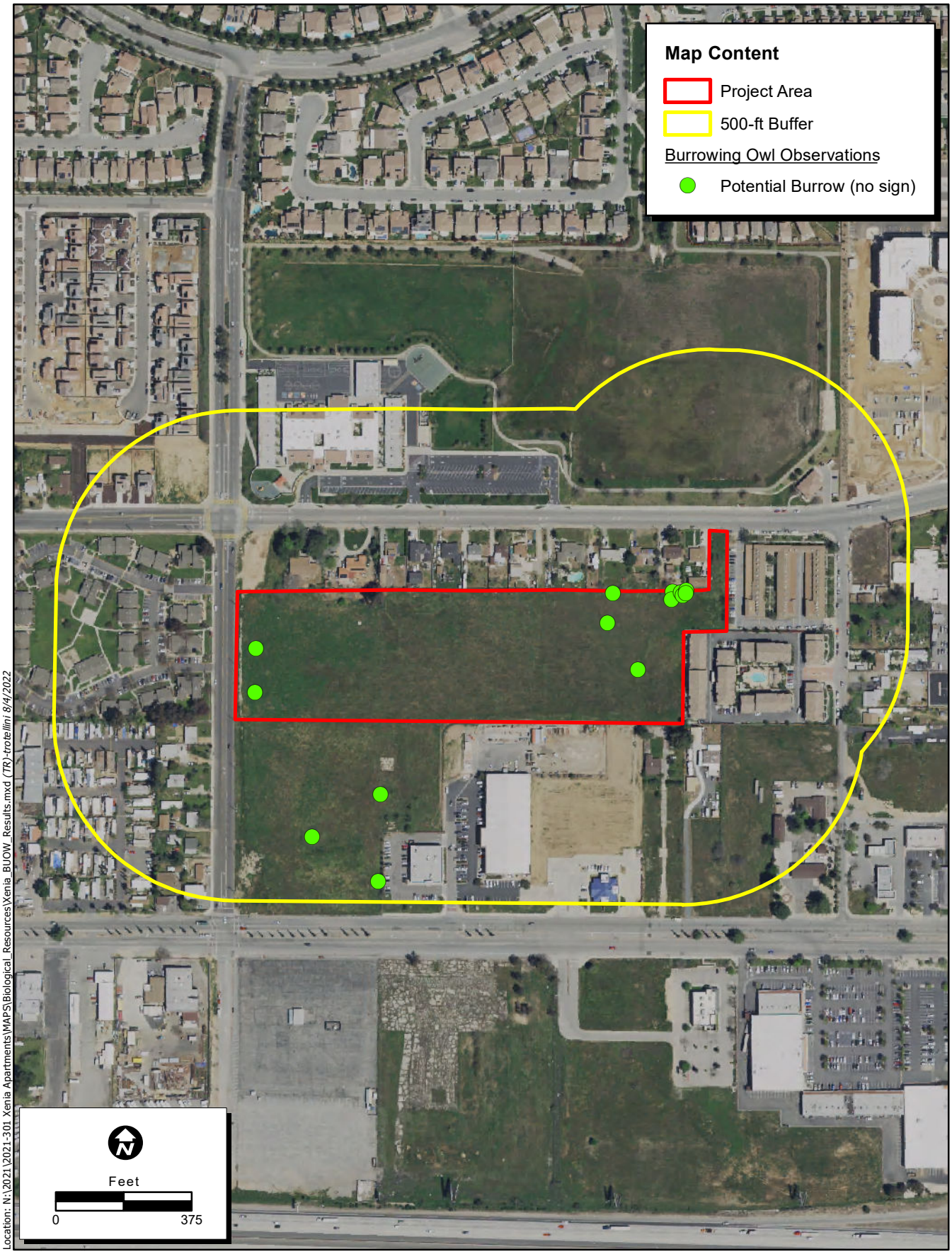
4.5 Burrowing Owl Habitat Assessment

The burrowing owl habitat assessment was conducted concurrently with the biological reconnaissance survey on January 7, 2022, by ECORP biologist, Alden Lovaas. The burrowing owl habitat assessment determined that California ground squirrel, suitable for use by burrowing owl, were present throughout the Project site, as well as within the 500-foot buffer, which could provide burrow habitat for burrowing owls. Each burrow observed was checked for sign of burrowing owl (e.g., whitewash, feathers, pellets). A total of eight potential burrowing owl burrows (no sign) were observed on the Project site and one potential burrow was identified within the survey buffer (Figure 5). No sign of burrowing owl activity was observed at any of the potential burrows on the Project site during the biological reconnaissance survey. However, one burrow within the survey buffer was marked as potentially occupied due to the presence of whitewash near the burrow entrance, but no other sign (e.g., pellets, feathers, prey remains) was observed at the burrow (Figure 5). The potentially occupied burrow was located approximately 200 feet south of the southern border of the project site and was situated under a large tree (Appendix A; Photo 6). Due to the burrow's position under the tree, it's possible that the whitewash was from another species of bird perched in the tree above the burrow and not burrowing owl sign. Nonetheless, the burrow was marked as potentially occupied at the time of the biological reconnaissance survey, and further investigation was conducted during the focused burrowing owl surveys.

Due to the presence of suitable habitat, additional focused burrowing owl surveys, conducted in accordance with the MSHCP *Burrowing Owl Survey Instructions*, were required to determine the presence of burrowing owls on the Project site during the breeding season. In addition to the focused burrowing owl surveys, a pre-construction survey will be required within 30-days prior to site disturbance (RCTLMA 2006). The results of the focused burrowing owl surveys are discussed in Section 4.6 and the pre-construction survey requirements are described in Section 6.0.

4.6 Focused Burrowing Owl Surveys

The focused burrowing owl surveys were conducted by ECORP biologist Alden Lovaas on June 24, July 1, July 29, and August 2, 2022. Surveyor information, start and stop times, and weather conditions during the surveys are provided in Table 3. During each of the focused surveys, the entire Project site and 500-ft was walked, and all burrows identified during the biological reconnaissance/burrowing owl habitat assessment or previous focused surveys were re-evaluated. Although, one potentially occupied burrow was identified during the biological reconnaissance survey/burrowing owl habitat assessment, this burrow no longer had any whitewash present, and no other burrowing owl sign was observed near the burrow. Therefore, this burrow was reclassified as a potential burrow during the focused burrowing owl surveys. In total 12 potential burrowing owl burrows (no sign present) were identified on the Project site and three potential burrowing owl burrows were identified within the survey buffer, south of the Project site (Figure 6).



Location: N:\2021\2021-301 Xenia Apartments\MAPS\Biological_Resources\Xenia_BUOW_Results.mxd (TR)-trotellini 8/4/2022

Map Date: 8/4/2022

Service Layer Credits: Photo Source: NAIP (2020)

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Figure 6. Focused Burrowing Owl Survey Results

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No burrowing owls or occupied burrowing owl burrows were observed or detected during the focused surveys for burrowing owl. Representative Project site photographs and Focused Burrowing Owl Survey Datasheets can be found in Appendix A and F, respectively.

Table 3. Burrowing Owl Survey Weather Conditions

Date	Surveyors	Time		Temperature (F)		Cloud Cover (%)		Wind Speed (mph)	
		Start	End	Start	End	Start	End	Start	End
6/24/22	Alden Lovaas	0530	0735	67.8	76.3	0	0	0-2	0-3
7/1/22	Alden Lovaas	0520	0700	67.3	70.3	30	40	0-3	0-2
7/29/22	Alden Lovaas	0610	0730	71.1	76.1	45	75	0-2	0-1
8/2/22	Alden Lovaas	0620	0740	75.7	78.8	70	30	0-1	0-1

4.7 Wildlife Movement Corridors, Linkages, and Significant Ecological Areas

The concept of habitat corridors addresses the linkage between large blocks of habitat that allow the safe movement of mammals and other wildlife species from one habitat area to another. The definition of a corridor is varied, but corridors may include such areas as greenbelts, refuge systems, underpasses, and biogeographic land bridges, for example. In general, a corridor is described as a linear habitat, embedded in a dissimilar matrix, which connects two or more large blocks of habitat. Wildlife movement corridors are critical for the survivorship of ecological systems for several reasons. Corridors can connect water, food, and cover sources, spatially linking these three resources with wildlife in different areas. In addition, wildlife movement between habitat areas provides for the potential of genetic exchange between wildlife species populations, thereby maintaining genetic variability and adaptability to maximize the success of wildlife responses to changing environmental conditions. This is especially critical for small populations subject to loss of variability from genetic drift and effects of inbreeding. Naturally, the nature of corridor use and wildlife movement patterns varies greatly among species.

The Project site was assessed for its ability to function as a wildlife corridor. The Project site likely provides wildlife movement opportunities since it consists of open and unimpeded land. However, the Project site would not be considered a corridor because it is bounded by residential developments to the north, west, and east and has a long history of anthropogenic disturbance. Additionally, there are no features on the Project site that would facilitate wildlife movement and little to no cover for larger animals. Therefore, the Project site would not need to be preserved as a wildlife movement corridor, linkage, or significant ecological area.

The MSHCP Conservation Area is comprised of a variety of existing and proposed cores, extensions of existing cores, linkages, constrained linkages, and non-contiguous habitat blocks. These features, generally referenced as cores and linkages and projects are required to evaluate if impacts to cores and linkages will occur as a result of project development. The Project site was evaluated with respect to cores and linkages, and it was determined that the Project site does not contain any existing and/or proposed cores, extensions of existing cores, linkages, constrained linkages and non-contiguous habitat blocks, as identified in the MSHCP. MSHCP cores and linkages features nearest to the Project site include Existing Core I, Proposed

Constrained Linkage 22 and 23, and Existing Non-Contiguous Habitat Block B. Existing Core I is associated with the San Bernardino Mountains and Banning Canyon, located approximately 4 miles northeast of the Project site (RCTLMA 2022). Proposed Constrained Linkage 22 is comprised of the portion of San Timoteo Creek extending west from I-10 to De Anza Cycle Park, located approximately 2.9 miles northwest of the Project site (RCTLMA 2022). Proposed Constrained Linkage 23 is an upland Linkage located in the vicinity of Cherry Valley, which provides a connection to Bogart County Park and San Timoteo Creek for certain species, located approximately 4.2 miles north of the Project site. Existing Non-Contiguous Habitat Block B consists of Bogart County Park, located approximately 3.2 miles north of the Project site. No impacts to MSHCP designated core and linkages will occur with the development of the Project.

5.0 IMPACT ANALYSIS

Impacts to sensitive biological resources resulting from construction activities are presented below.

5.1 Special-Status Species

The Project site, which consisted of wholly of disturbed land largely devoid of native vegetation, did not support any natural vegetation communities, as defined by the *The Manual of California Vegetation*, 2nd Edition (Sawyer et al. 2009). The literature review and database searches identified 20 special-status plant species that occur within five miles of the Project site. However, due to the isolated nature of the Project site, the fact that it is surrounded by development, the Project site's long history of disturbance, and the lack of mobility for plant species, all 20 of the special-status plant species identified within five miles of the Project site were presumed absent due to lack of suitable habitat (including elevation, soils, and vegetation community associations) on the Project site. No special-status, rare or narrow endemic plant species are expected to occur on the Project site and no impacts to special-status, rare, or narrow endemic species are expected with the development of the Project site. Therefore, no additional surveys or mitigation measures for special-status plant species are recommended at this time.

Of the 44 special-status wildlife species identified in the literature search, one species was determined to have a high potential to occur, one was determined to have a low potential to occur, and the remaining 42 species were presumed absent. Burrowing owl was found to have a high potential to occur on the Project site and the Project site is located within a MSHCP designated survey area for burrowing owl (RCA 2022). The biological reconnaissance survey and habitat assessment determined that suitable burrowing owl habitat was present on the Project site, including California ground squirrel burrows that provided suitable burrow habitat. Due to the presence of suitable burrowing owl habitat, focused breeding season surveys were required per the MSHCP. Four protocol-level focused surveys for burrowing owl were conducted by ECORP biologists on June 24, July 1, July 29, and August 2, 2022, within the survey area according to the MSHCH *Burrowing Owl Survey Instructions* (RCTLMA 2006). Although potentially suitable habitat was present in the survey area, no burrowing owls, or occupied burrows (e.g., burrowing containing whitewash, pellets, feathers, bones of prey items) were observed during the protocol-level focused surveys for burrowing owl. A total of 15 potential burrowing owl burrows were recorded within the survey area; of those 15 potential burrows, 12 of them were located within the Project site, and the remaining three were located south of the Project site, within the 500-foot buffer (Figure 6). However, due to the mobile nature of the species, it is possible that burrowing owls could use the Project site prior to the start of Project activities. If burrowing owls are present

on the Project site, direct impacts in the form of ground disturbance, vegetation removal, habitat loss, and mortality and indirect impacts from construction noise and vibrations may occur. Impacts to burrowing owl would be less than significant with the implementation of Mitigation Measure BIO-1 and BIO-2.

Loggerhead shrike was determined to have a low potential to occur due to the presence of suitable foraging and nesting habitat, and historical CNDDB occurrences within five miles of the Project site. Limited foraging habitat for this species was present within the disturbed land and the presence of small trees could provide nesting habitat for the species. If loggerhead shrike is present on the Project site, direct impacts in the form of ground disturbance, vegetation removal, habitat loss, and mortality and indirect impacts from construction noise and vibrations may occur. However, impacts to loggerhead shrike would be less than significant with the implementation of Mitigation Measure BIO-2 and BIO-3.

The trees and shrubs immediately adjacent to the Project site, and the disturbed land on the Project site could provide nesting habitat for nesting birds and raptors protected by the MBTA and California Fish and Game Code. The timing of the nesting season varies greatly depending on several factors, such as the bird species, weather conditions in any given year, and long-term climate changes (e.g., drought, warming, etc.). and changing climate conditions may result in the nesting bird season occurring earlier and later in the year than historical nesting season dates. To ensure compliance with all applicable laws pertaining to nesting birds and to avoid take of nests, a nesting bird survey should be conducted prior to initial ground disturbance regardless of the time of year. If nesting birds are present on the Project site, ground-disturbing construction activities could directly affect nesting birds and other birds protected by the MBTA and their nests through the removal of habitat on the Project site, and indirectly through increased noise, vibrations, and increased human activity. Impacts to nesting birds would be less than significant with the implementation of Mitigation Measure BIO-2 and BIO-3.

5.2 Sensitive Natural Communities

The Project site consists of disturbed land, which supported nonnative and ruderal species. The Project site does not contain riparian habitat or other sensitive natural communities. No impacts to sensitive natural communities will result from the development of this Project.

5.3 State or Federally Protected Wetlands and Waters

No federal or state jurisdictional waters or wetlands were observed on the Project site during the biological reconnaissance survey and no federal or state jurisdictional waters or wetlands were identified on or immediately adjacent to the Project site during the literature review (USFWS 2022). Therefore, it was determined that the Project site does not include waters or wetlands that are potentially jurisdictional to the USACE, CDFW, or RWQCB. No impacts state or federally protected wetlands and/or water will result from the development of the Project.

5.4 Wildlife Corridors and Nursery Sites

The Project site is located immediately adjacent to areas containing existing disturbances (e.g., roadways, commercial and residential developments). The Project site could provide wildlife movement opportunities since it consists of open and unimpeded land. However, the Project site would not be considered a corridor

because it is bounded by residential developments to the north, west, and east and has a long history of anthropogenic disturbance. Additionally, there are no features on the Project site that would facilitate wildlife movement and little to no cover for larger animals. No migratory wildlife corridors or native wildlife nursery sites were identified within the Project site. No impacts to these resources are expected to occur during the development of the Project site.

5.5 Habitat Conservation Plans and Natural Community Conservation Plans

The Project site is located within the planning area for the Western Riverside MSHCP. The Project site is not located within any Conservation Areas, Criteria Cells, or Subunit designations according to the MSHCP. The Project site is located within a MSHCP-designated survey area for burrowing owl and two narrow endemic plant species (Yucaipa onion and many-stemmed dudleya). The Project site did contain suitable habitat for burrowing owl but no suitable habitat for Yucaipa onion or many-stemmed dudleya was present. Implementation of Mitigation Measures BIO-1 would be consistent with the MSHCP requirements.

5.5.1 Western Riverside County MSHCP Consistency Analysis

The Project site is located within the planning area for the MSHCP, but outside of any Cell Groups, Criteria Cells, and Subunit designations. Section 6.0 of the MSHCP requires assessment of the potential effects from the Project on biological resources including riparian/riverine areas, vernal pools, and fairy shrimp, burrowing owl, and narrow endemic plant species. In addition, the MSHCP requires an Urban/Wildlands Interface analysis be conducted to address the indirect effects associated with locating proposed development in proximity of MSHCP Conservation Areas. These resources were assessed during the reconnaissance survey and are discussed below in relation to the Project.

The proposed Project consists of the construction of apartment building development which is a covered activity under the MSHCP for areas outside of Criteria Area (RCTLMA 2022). Since development of the Project site is a covered activity within the MSHCP (see section 7.1 for Covered Activities Outside Criteria Area), it is an allowable use that has been contemplated within the MSHCP (RCTLMA 2022). Additionally, the Project does not include the construction of, or improvements to, MSHCP Covered Roads or MSHCP Covered Public Access Activities, and the Project site does not contain any Public Quasi-Public Lands and no Public Quasi-Public Lands will be affected by the Project. However, projects that are covered still need to demonstrate compliance with Section 6.0 and other requirements of the MSHCP.

5.5.1.1 Riparian/Riverine, Vernal Pool, and Fairy Shrimp Habitat Assessment (MSHCP Section 6.1.2)

In accordance with Section 6.1.2 of the MSHCP, a habitat assessment was performed for riparian and riverine communities, vernal pools, and fairy shrimp. The Project site did not contain vernal pool habitat or suitable habitat for fairy shrimp. No riparian vegetation was observed on the Project site. No defined channels or drainages were identified on the Project site and the Project site did not contain any riverine resources; therefore, no impacts to these resources are expected.

5.5.1.2 Narrow Endemic Plant Species (MSHCP Section 6.1.3)

The RCA's MSHCP Information Map was reviewed to determine whether the Project site was located within a Narrow Endemic Plant Species Survey Area (NEPSSA), in accordance with Section 6.1.3 of the MSHCP. The Project site is located within a NEPSSA for the following narrow endemic plant species: Yucaipa onion (Marvin's onion) and many-stemmed dudleya.

Although the Project site occurs within the appropriate elevation range for Yucaipa onion and records have been identified within five miles of the Project site, Yucaipa onion was not observed during any of the surveys, and no chaparral habitat or clay soils suitable for the species were present on the Project site. The soils on site consist of Greenfield sandy loam and Ramona sandy loam, which are not suitable for the species.

Although the Project site is located within a designated MSHCP survey area for many-stemmed dudleya, this species was not observed during any of the surveys, and no suitable chaparral, coastal sage scrub, or grassland habitat with clay and/or cobbly clay soils exists on the Project site. The soils on site consist of Greenfield sandy loam and Ramona sandy loam, which are not suitable for the species. Additionally, no records of this species were identified within the database searches. The closest record of this species was from 1981 and was located approximately 27 miles southwest of the Project site near Lake Mathews.

No impacts to Yucaipa onion or many-stemmed dudleya will occur with the development of the Project.

5.5.1.3 Urban/Wildlands Interface Guidelines (MSHCP Section 6.1.4)

The requirements for Urban/Wildlands Interface for the management of edge factors do not apply to this Project site because the Project site is not situated adjacent to any MSHCP-designated conserved lands. The nearest MSHCP-designated conserved lands area located approximately 2.0 miles south and 2.9 miles northeast of the Project site. Therefore, there will be no net long-term increase of edge impacts occurring as a result of Project development.

5.5.1.4 Additional MSHCP Required Surveys (MSHCP Section 6.3.2)

The RCA MSHCP Information Map was reviewed to determine if the Project site was located with any other MSHCP-designated survey areas. A review of the Information Map determined that the Project site is not located within an area where additional surveys are required for any amphibian, mammal, or other criteria area species. However, the search did identify that the Project site is located within the burrowing owl survey area. A table summarizing the survey requirements for each parcel of the Project site is provided below in Table 4.

Table 4. MSHCP Parcel Information

APN	Cell Group	Criteria Area	MSHCP Designated Survey Areas					
			Amphibian	Burrowing Owl	Mammal	Narrow Endemic Plants	Criteria Species	Delhi Sands Flower-Loving Fly
419-160-005	Not in a Cell Group	Not in a Criteria Cell	No	No	No	No	No	No
419-160-024	Not in a Cell Group	Not in a Criteria Cell	No	Yes	No	ALMA, DUMU	No	No
419-170-016	Not in a Cell Group	Not in a Criteria Cell	No	Yes	No	ALMA, DUMU	No	No
419-170-017	Not in a Cell Group	Not in a Criteria Cell	No	Yes	No	ALMA, DUMU	No	No
419-170-018	Not in a Cell Group	Not in a Criteria Cell	No	Yes	No	ALMA, DUMU	No	No
419-170-022	Not in a Cell Group	Not in a Criteria Cell	No	Yes	No	ALMA, DUMU	No	No
419-170-027	Not in a Cell Group	Not in a Criteria Cell	No	Yes	No	ALMA, DUMU	No	No

ALMA = Yucaipa (Marvin's) Onion
DUMU = many-stemmed dudleya

The Project site contains suitable burrowing owl habitat within the disturbed open areas. The soils within the Project site are also suitable for burrowing and California ground squirrel burrows that could support burrowing owls were present. Pursuant to MSHCP Section 6.3.2, burrowing owl surveys shall be conducted if the Project site contains natural or man-made structures that could potentially support burrowing owls or burrowing owls are observed during the habitat assessment then a focused burrow survey and focused burrowing owl surveys will be required. Due to the presence of suitable California ground squirrel burrows on the Project site, focused burrowing owl surveys were required.

Four protocol-level focused surveys for burrowing owl were conducted by ECORP biologists on June 24, July 1, July 29, and August 2, 2022, within the survey area. Although potentially suitable habitat was present in the survey area, no burrowing owls, or occupied burrows (e.g., burrowing containing whitewash, pellets, feathers, bones of prey items) were observed during the protocol-level focused surveys for burrowing owl. A total of 15 potential burrowing owl burrows were recorded within the survey area; of those 15 potential burrows, 12 of them were located within the Project site, and the remaining three were located south of the Project site, within the 500-foot buffer (Figure 6).

Due to the mobile nature of the species, the previous documentation of potential burrows, identified occupied burrow complexes and burrows, and based on the presence of California ground squirrel activity, it is possible for burrowing owl to occupy the Project site before the start of construction of the Project. Therefore, a pre-construction surveys for burrowing owl will be required prior to initial ground disturbance. The MSHCP *Burrowing Owl Survey Instructions* (RCTLMA 2006) required a pre-construction survey to be conducted within 30 days prior to ground disturbance activities. However, following the finalization of the MSHCP, CDFW published revised guidance within the CDFW *Staff Report on Burrowing Owl Mitigation* (CDFW 2012), which recommends two surveys be conducted. The first survey should be conducted between 30 and 14 days prior to initiating ground disturbance and the second survey should be conducted within 24 hours prior to ground disturbance.

The Project site is also located within a NEPSSA for the following narrow endemic plant species: Yucaipa onion (Marvin's onion) and many-stemmed dudleya. However, no chaparral habitat or clay soils suitable for Yucaipa onion were present on the Project site and no chaparral, coastal sage scrub, or grassland habitat with clay and/or cobbly clay soils suitable for many-stemmed dudleya were present on the Project site. The soils on the Project site consist of Greenfield sandy loam and Ramona sandy loam, which are not suitable for either of these species. Due to the lack of suitable habitat, these species are presumed absent, and no additional surveys will be required for narrow endemic plants.

5.5.1.5 Species Not Adequately Conserved

Three species covered by the MSHCP but not adequately conserved were identified in the literature review and database searches, including Mojave tarplant (*Deinandra mohavensis*), San Bernardino flying squirrel (*Glaucomys sabrinus californicus*), and southern rubber boa (*Charina umbratical*). However, based on the location of the Project site and the available habitat and vegetation on the Project site, these species are presumed absent, and development of the Project is not expected to affect these species. For Mojave tarplant, the Project site lacks chaparral, coastal scrub, and riparian scrub habitats and no records occur within 5 miles of the Project site. For San Bernardino flying squirrel, the Project site is outside of the known geographic range for this species and the site lacks broadleaved upland forest and montane coniferous forest habitat, additionally there are no records within 5 miles. For southern rubber boa, although two historic records of this species have been documented within 5 miles of the Project site, the Project site is outside of the known geographic range for this species and no suitable habitat was present on the Project site.

6.0 MITIGATION MEASURES

The following mitigation measures would reduce impacts to sensitive biological resources to a less than significant level.

BIO-1 **Burrowing Owl Pre-Construction Surveys and Avoidance:** The Project Area was determined to be suitable for burrowing owl due to the presence of suitable habitat and recent records of the species that have been recorded near the Project site. Prior to ground disturbing activities, A qualified wildlife biologist (i.e., a wildlife biologist with previous burrowing owl survey experience) shall conduct pre-construction surveys of the Project site, plus a 500-foot buffer, to locate active breeding or wintering burrowing owls and burrowing owl burrows between 30 and

14 days prior to construction. The survey methodology will be consistent with the methods outlined in the CDFW *Staff Report on Burrowing Owl Mitigation* (CDFW 2012) and will consist of walking parallel transects 20 – 60 feet apart, adjusting for vegetation height and density as needed, and noting any potential burrows with fresh burrowing owl sign or presence of burrowing.

A qualified biologist shall conduct an additional pre-construction survey of the Project site plus an approximately 500-foot buffer no more than 24-hours prior to the start of ground-disturbing activities associated with construction activities to identify any additional burrowing owls or burrows necessitating avoidance, minimization, or mitigation measures. The results of the survey should be submitted to the City and CDFW within five days of survey completion.

If no burrowing owls are observed during the survey, Project site preparation and construction activities may begin, and no further action is necessary. If burrowing owls are found to be present, then avoidance or minimization measures shall be undertaken in consultation with the City and CDFW. CDFW shall be sent written notification within 48 hours of detection of burrowing owls. If active burrowing owl burrows are detected, the Project applicant shall not commence activities until no sign is present that the burrows are being used by adult or juvenile owls or following CDFW approval of a Burrowing Owl Plan as described below. If owl presence is difficult to determine, a qualified biologist shall monitor the burrows with motion-activated trail cameras for at least 24 hours to evaluate burrow occupancy. The onsite qualified biologist will verify the nesting effort has finished according to methods identified in the Burrowing Owl Plan.

The Burrowing Owl Plan shall be prepared in accordance with guidelines in the CDFW *Staff Report on Burrowing Owl* (March 2012) and MSHCP. The qualified biologist and Project Applicant shall coordinate with the City, CDFW, and USFWS to develop a Burrowing Owl Plan to be approved by the City, CDFW, and USFWS prior to commencing Project activities. The Burrowing Owl Plan shall describe proposed avoidance, relocation, monitoring, minimization, and/or mitigation actions. The Burrowing Owl Plan shall include the number and location of occupied burrow sites and details on proposed buffers if avoiding the burrowing owls or information on the adjacent or nearby suitable habitat available to owls for relocation. If no suitable habitat is available nearby for relocation, details regarding the creation and funding of artificial burrows (numbers, location, and type of burrows) and management activities for relocated owls shall also be included in the Burrowing Owl Plan. The City and Project applicant shall implement the Burrowing Owl Plan following CDFW and USFWS review and approval.

If burrowing owls are observed within Project site during Project implementation and construction, the Project applicant shall notify CDFW immediately in writing within 48 hours of detection. A Burrowing Owl Plan shall be submitted to CDFW for review and approval within two weeks of detection and no Project activity shall continue within 1000 feet of the burrowing owls until CDFW approves the Burrowing Owl Plan. The City and the Project applicant shall be responsible for implementing appropriate avoidance and mitigation measures, including burrow avoidance, passive or active relocation, or other appropriate mitigation measures as identified in the Burrowing Owl Plan.

If ground-disturbing activities occur but the Project site is left undisturbed for more than 30 days, a preconstruction survey for burrowing owl shall be conducted and reported to CDFW as described above. If a burrowing owl is found, the same coordination described above shall be necessary.

A final letter report shall be prepared by the qualified biologist documenting the results of the passive relocation. The letter shall be submitted to CDFW prior to the start of Project activities.

BIO-2 **Biological Monitoring:** A qualified biologist shall be present to monitor all initial ground-disturbing and vegetation-clearing activities conducted for the Project. During each monitoring day, the biological monitor shall perform clearance survey "sweeps" at the start of each workday that vegetation clearing takes place to minimize impacts on special-status species with potential to occur. The monitor will be responsible for ensuring that impacts to special-status species, nesting birds, and active nests will be avoided to the greatest extent possible. Biological monitoring shall take place until the Project site has been completely cleared of any vegetation. If an active nest is identified, the biological monitor shall establish an appropriate disturbance limit buffer around the nest using flagging or staking. Construction activities shall not occur within any disturbance limit buffer zones until the nest is deemed no longer active by the biologist. If special-status wildlife species are detected during biological monitoring activities, then consultation with the USFWS and/or CDFW shall be conducted, and a mitigation plan shall be developed to avoid and offset impacts to these species. Mitigation measures may consist of work restrictions or additional biological monitoring activities after ground-disturbing activities are complete.

BIO-3 **Pre-construction Survey for Nesting Birds:** Regardless of the time of year, the Project applicant shall ensure a nesting bird survey is completed prior to the start of any development activities (such as ground disturbance, construction activities, and/or removal of trees and vegetation) within the Project site. This will avoid violations of the Migratory Bird Treaty Act (MBTA) and California Fish and Game Code Sections 3503, 3503.5, and 3513. The pre-construction nesting bird survey shall include the Project site and adjacent areas where Project activities have the potential to cause nest failure.

The survey results shall be provided to the City's Planning Department. The Project Applicant shall adhere to the following:

1. Applicant shall designate a qualified biologist experienced in: identifying local and migratory bird species of special concern; conducting bird surveys using appropriate survey methodology; nesting surveying techniques, recognizing breeding and nesting behaviors, locating nests and breeding territories, and identifying nesting stages and nest success; determining/establishing appropriate avoidance and minimization measures; and monitoring the efficacy of implemented avoidance and minimization measures.

2. Pre-construction surveys shall be conducted at the appropriate time of day/night, during appropriate weather conditions, no more than 3 days prior to the initiation

of Project activities. Surveys shall encompass all suitable areas including trees, shrubs, bare ground, burrows, cavities, and structures. Survey duration shall take into consideration the size of the Project site; density, and complexity of the habitat; number of survey participants; survey techniques employed; and shall be sufficient to ensure the data collected is complete and accurate.

If no nesting birds are observed during the survey, Project site preparation and construction activities may begin. If nesting birds (including nesting raptors) are found to be present, then avoidance or minimization measures shall be undertaken in consultation with the City and CDFW. Measures shall include immediate establishment of an appropriate buffer zone to be established by a qualified biologist, based on their best professional judgement and experience. The buffer around the nest shall be delineated and flagged, and no construction activity shall occur within the buffer area until a qualified biologist determines nesting species have fledged and the nest is no longer active, or the nest has failed. The qualified biologist shall monitor the nest at the onset of Project activities, and at the onset of any changes in such Project activities (e.g., increase in number or type of equipment, change in equipment usage, etc.) to determine the efficacy of the buffer. If the qualified biologist determines that such project activities may be causing an adverse reaction, the qualified biologist shall adjust the buffer accordingly or implement alternative avoidance and minimization measures, such as redirecting or rescheduling construction or erecting sound barriers. All work within these buffers will be halted until the nesting effort is finished (i.e., the juveniles are surviving independent from the nest) or failed. The onsite qualified biologist will review and verify compliance with these nesting avoidance buffers and will verify the nesting effort has finished. Work can resume within these avoidance areas when no other active nests are found. Upon completion of the survey and nesting bird monitoring, a report shall be prepared and submitted to the City for mitigation monitoring compliance record keeping.

7.0 MSHCP STANDARD BEST MANAGEMENT PRACTICES

The following best management practices are also recommended in addition to the mitigation measures listed above:

1. A condition shall be placed on grading permits requiring a qualified biologist to conduct a training session for project personnel prior to grading. The training shall include a description of the species of concern and its habitats, the general provisions of the Endangered Species Act (Act) and the MSHCP, the need to adhere to the provisions of the Act and the MSHCP, the penalties associated with violating the provisions of the Act, the general measures that are being implemented to conserve the species of concern as they relate to the project, and the access routes to and project site boundaries within which the project activities must be accomplished.
2. Water pollution and erosion control plans shall be developed and implemented in accordance with RWQCB requirements.
3. The footprint of disturbance shall be minimized to the maximum extent feasible. Access to sites shall be via pre-existing access routes to the greatest extent possible.

4. The upstream and downstream limits of projects disturbance plus lateral limits of disturbance on either side of the stream shall be clearly defined and marked in the field and reviewed by the biologist prior to initiation of work.

5. Projects should be designed to avoid the placement of equipment and personnel within the stream channel or on sand and gravel bars, banks, and adjacent upland habitats used by target species of concern.

6. Projects that cannot be conducted without placing equipment or personnel in sensitive habitats should be timed to avoid the breeding season of riparian identified in MSHCP Global Species Objective No. 7.

7. When stream flows must be diverted, the diversions shall be conducted using sandbags or other methods requiring minimal instream impacts. Silt fencing of other sediment trapping materials shall be installed at the downstream end of construction activity to minimize the transport of sediments offsite. Settling ponds where sediment is collected shall be cleaned out in a manner that prevents the sediment from reentering the stream. Care shall be exercised when removing silt fences, as feasible, to prevent debris or sediment from returning to the stream.

8. Equipment storage, fueling, and staging areas shall be located on upland sites with minimal risks of direct drainage into riparian areas or other sensitive habitats. These designated areas shall be located in such a manner as to prevent any runoff from entering sensitive habitat. Necessary precautions shall be taken to prevent the release of cement or other toxic substances into surface waters. Project related spills of hazardous materials shall be reported to appropriate entities including but not limited to applicable jurisdictional city, FWS, and CDFG, RWQCB and shall be cleaned up immediately and contaminated soils removed to approved disposal areas.

9. Erodible fill material shall not be deposited into water courses. Brush, loose soils, or other similar debris material shall not be stockpiled within the stream channel or on its banks.

10. The qualified project biologist shall monitor construction activities for the duration of the project to ensure that practicable measures are being employed to avoid incidental disturbance of habitat and species of concern outside the project footprint.

11. The removal of native vegetation shall be avoided and minimized to the maximum extent practicable. Temporary impacts shall be returned to pre-existing contours and revegetated with appropriate native species.

12. Exotic species that prey upon or displace target species of concern should be permanently removed from the site to the extent feasible.

13. To avoid attracting predators of the species of concern, the project site shall be kept as clean of debris as possible. All food related trash items shall be enclosed in sealed containers and regularly removed from the site(s).

14. Construction employees shall strictly limit their activities, vehicles, equipment, and construction materials to the proposed project footprint and designated staging areas and routes of travel. The

construction area(s) shall be the minimal area necessary to complete the project and shall be specified in the construction plans. Construction limits will be fenced with orange snow screen. Exclusion fencing should be maintained until the completion of all construction activities. Employees shall be instructed that their activities are restricted to the construction areas.

15. The Permittee shall have the right to access and inspect any sites of approved projects including any restoration/enhancement area for compliance with project approval conditions including these BMPs.

8.0 CERTIFICATION

I hereby certify that the statements furnished above and in the attached exhibits present the data and information required for this biological evaluation, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief. Field work conducted for this assessment was performed by me or under my direct supervision. I certify that I have not signed a non-disclosure or consultant confidentiality agreement with the Project applicant or the applicant's representative and that I have no financial interest in the Project.

SIGNED: _____ DATE: 4/6/2023

Alden Lovaas
Associate Biologist
ECORP Consulting, Inc.

Under the direction of:

SIGNED: _____ DATE: 4/6/2023

Phillip Wasz
Senior Biologist
ECORP Consulting, Inc.

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LIST OF APPENDICES

Appendix A - Representative Site Photographs

Appendix B - Plant Species Observed

Appendix C - Wildlife Species Observed

Appendix D – Special Status Plant Species Potential to Occur

Appendix E – Special Status Wildlife Species Potential to Occur

APPENDIX A

Representative Site Photographs



Photo 1: Southwest corner of Project site, facing north; January 7, 2022.



Photo 2: Southwest corner of Project site, facing east; January 7, 2022.



Photo 3: Middle of southern perimeter of Project site, facing north; January 7, 2022.



Photo 4: Middle of Project site, disturbed soils; January 7, 2022.



Photo 5: Potential burrowing owl burrow; January 7, 2022.



Photo 6: Potentially occupied burrowing owl burrow (whitewash) in survey buffer; January 7, 2022.



Photo 7: Trees located in the northeast corner of the Project site, example of nesting habitat for bird species.



Photo 8: Middle of Project site, looking west during burrowing owl survey #1; June 24, 2022.



Photo 9: Disturbed soils on site during burrowing owl survey #1; June 24, 2022.



Photo 10: Southeast corner of Project site, facing northwest during burrowing owl survey #2; July 1, 2022.



Photo 11: Southeast corner, facing northwest during burrowing owl survey #3, July 29, 2022.



Photo 12: Representative photo of potential burrowing owl burrow on the Project site; July 29, 2022.



Photo 13: Southeast corner of Project site, facing northwest during burrowing owl survey #4; August 2, 2022.



Photo 14: Southwest corner of Project site, facing northeast during burrowing owl survey #4; August 2, 2022.

APPENDIX B

Plant Species Observed

SCIENTIFIC NAME	COMMON NAME
Ambrosia acanthicarpa	Annual burrweed
Acer sp.*	Maple
Amsinckia sp.	Fiddleneck
Avena sp.*	Wild oat
*Brassica nigra**	Black mustard
*Bromus diandrus**	Ripgut brome
*Bromus tectorum**	Cheatgrass
*Bromus madritensis**	Spanish brome
Ceanothus thyrsiflorus	Blueblossom
Croton setiger	Turkey mullein
Cucurbita palmata	Coyote melon
*Cynodon dactylon**	Bermuda grass
Datura wrightii	Jimson weed
*Diospyros virginiana**	Common persimmon
*Erodium cicutarium**	Redstem fillaree
Eucalyptus sp.*	Eucalyptus
*Fraxinus uhdei**	Shamel ash
Juglans sp.*	Walnut
*Koelreuteria bipinnata**	Goldenrain tree
*Nerium oleander**	Oleander
*Parkinsonia aculeata**	Mexican palo verde
*Salsola tragus**	Russian thistle
*Vinca major**	Greater periwinkle

*Nonnative species

APPENDIX C

Wildlife Species Observed

SCIENTIFIC NAME	COMMON NAME
REPTILA	REPTILES
Sceloporus occidentalis	Western fence lizard
Uta stansburiana	Side-blotched lizard
AVES	BIRDS
Artemisiospiza belli	Bell's sparrow
Buteo jamaicensis	Red-tailed hawk
Callipepla californica	California quail
Calypte anna	Anna's hummingbird
Charadrius vociferus	Killdeer
Colaptes auratus	Northern flicker
*Columba livia**	Rock pigeon
Corvus corax	Common raven
Dryobates nuttallii	Nuttall's woodpecker
Euphagus cyanocephalus	Brewer's blackbird
Haemorhous mexicanus	House finch
Melospiza melodia	Song sparrow
Melozone crissalis	California towhee
Mimus polyglottos	Northern mockingbird
*Passer domesticus**	House sparrow
Sayornis nigricans	Black phoebe
Sayornis saya	Say's Phoebe
*Streptopelia decaocto**	Eurasian collared dove
*Sturnus vulgaris**	European starling
Tyrannus verticalis	Western Kingbird
Tyrannus vociferans	Cassin's kingbird
Zenaida macroura	Mourning dove
Zonotrichia leucophrys	White-crowned sparrow
MAMMALIA	MAMMALS
*Canis lupus familiaris**	Domestic dog
*Didelphis virginiana**	Virginia opossum
Otospermophilus beecheyi	California ground squirrel

*Non-native species

APPENDIX D

Special Status Plant Species Potential to Occur

Scientific Name Common Name	**Status**		**Bloom Period & Elevation (feet)**	**Habitat Requirements**	**Potential for Occurrence**
Abronia villosa* var. *aurita Chaparral sand-verbena	Fed: Ca: CNPS: MSHCP:	none none 1B.1 none	(Jan) Mar-Sept 245-5250	Occurs in chaparral, coastal scrub, and desert habitats. Often found in sandy soil.	**Presumed Absent.** Although one recent record occurs within 5 miles of the Project site (Occ # 69), no suitable chaparral, coastal scrub, or desert habitat are present on the site.
Allium marvinii Yucaipa onion	Fed: Ca: CNPS: MSHCP:	none none 1B.2 COV	Apr-May 2495-3495	Occurs in chaparral. Often found in openings on clay soils.	**Presumed Absent:** Although four recent records occur within 5 miles of the Project site (Occ # 2, 36, 37, and 44), chaparral habitat does not occur on the Project site.
Astragalus hornii* var. *hornii Horn's milk-vetch	Fed: Ca: CNPS: MSHCP:	none none 1B.1 none	May-Oct 195-2790	Occurs in meadows and seeps and playas. Often found along lake margins in alkaline soils.	**Presumed Absent:** One historic record occurs 0.2 miles west of the site from over 100 years ago (Occ # 16), however the site lacks meadows, seeps, playas, or lake margins.
Astragalus lentiginosus* var. *borreganus Borrego milk-vetch	Fed: Ca: CNPS: MSHCP:	none none 4.3 none	Feb-May 100-2935	Occurs in creosote bush scrub	**Presumed Absent:** No suitable creosote bush scrub habitat occurs on the Project site.
Astragalus lentiginosus* var. *coachellae Coachella valley milk-vetch	Fed: Ca: CNPS: MSHCP:	**END** none 1B.2 none	Feb-May 130-2150	Occurs in creosote bush scrub	**Presumed Absent:** No suitable creosote bush scrub habitat occurs on the Project site.
Astragalus pachypus* var. *jaegeri Jaeger's milk-vetch	Fed: Ca: CNPS: MSHCP:	none none 1B.1 COV	Dec-Jun 1200-3200	Occurs in chaparral, cismontane woodland, coastal scrub, and valley and foothill grasslands.	**Presumed Absent:** Although the literature review revealed six historic records of this species within 5 miles, no suitable valley and foothill grassland habitat is present on the Project site. The closest occurrence (Occ # 16) was observed in 1897 approximately 0.17 miles west of the Project site. The most recent occurrence (Occ # 3) was observed in 1990 approximately 3.7 miles south of the Project site.
Calochortus plummerae Plummer's mariposa-lily	Fed: Ca: CNPS: MSHCP:	none none 4.2 COV	May-Jul 330-5580	Occurs in chaparral, cismontane woodland, coastal scrub, lower montane coniferous forest, and valley and foothill grassland. Often found in granitic, rocky soils.	**Presumed Absent:** Although the literature review revealed 9 records of this species within 5 miles of the Project site, no suitable woodland, scrub, grassland habitats were present on site. The closest occurrence (Occ # 200) was observed in 2008 approximately 2.0 miles south of the Project site. The most recent occurrence (Occ # 199) was also observed in 2008 approximately 3.2 miles north of the Project site.
Caulanthus simulans Payson's jewelflower	Fed: Ca: CNPS: MSHCP:	none none 4.2 COV	(Feb)Mar-May(Jun) 295-7220	Occurs in chaparral and coastal scrub in sandy, granitic soils.	**Presumed Absent:** Although one historical record occurs within 5 miles of the site (Occ # 35), the site lacks suitable chaparral and coastal scrub habitat.

Scientific Name Common Name	**Status**		**Bloom Period & Elevation (feet)**	**Habitat Requirements**	**Potential for Occurrence**
Centromadia pungens* ssp. *laevis Smooth tarplant	Fed: Ca: CNPS: MSHCP:	none none 1B.1 COV	Apr-Sep 0-2100	Occurs in shadscale scrub, alkali sink, valley grassland. Sometimes associated with riparian, meadows, and playas, but is equally likely to occur in wetlands and non-wetlan	**Presumed Absent:** No shadscale scrub, alkali sink, valley grassland habitat is present on or adjacent to the Project site. The Project site is slightly outside of this species known elevation range.
Chorizanthe parryi* var. *parryi Parry's spineflower	Fed: Ca: CNPS: MSHCP:	none none 1B.1 COV	Apr-Jun 900-4005	Occurs in chaparral, cismontane woodland, coastal scrub, and valley and foothill grassland habitat. Often found in sandy or rocky openings.	**Presumed Absent:** Although the literature review revealed 7 records of this species within 5 miles of the Project site, no chaparral, woodland, scrub, or grassland habitats are present on the Project site.The closest occurrence (Occ # 149) was observed in 2012 approximately 1.9 miles north of the Project site. The most recent occurrence (Occ # 78) was observed in 2015 approximately 3.1 miles north of the Project site.
Chorizanthe xanti* var. *leucotheca white-bracted spineflower	Fed: Ca: CNPS: MSHCP:	none none 1B.2 none	Apr-Jun 985-3935	Occurs in coastal scrub, Mojavean desert scrub, and pinyon and juniper woodland habitats. Often found in gravelly and sandy.	**Presumed Absent:** No suitable coastal scrub, Mojavean desert scrub, or pinyon and juniper woodland habitats occur on the Project site and no records occur within 5 miles.
Deinandra mohavensis Mojave tarplant	Fed: Ca: CNPS: MSHCP:	none **END** 1B.3 COV	Jun-Oct 2100-5250	Occurs in chaparral, coastal scrub, and riparian scrub habitats. Often found in mesic habitats.	**Presumed Absent:** The site lacks chaparral, coastal scrub, and riparian scrub habitats and no records occur within 5 miles of the Project site.
Delphinium parishii* ssp. *subglobosum Colorado Desert larkspur	Fed: Ca: CNPS: MSHCP:	none none 4.3 none	Mar-Jun 1970-5905	Occurs in creosote bush scrub, chaparral, and pinyon-juniper woodland	**Presumed Absent:** No suitable creosote bush scrub, chaparral, or pinyon-juniper habitat was present on the Project site.
Delphinium parryi ssp. purpureum Mt. Pinos larkspur	Fed: Ca: CNPS: MSHCP:	none none 4.3 none	May-June 3280-8530	Occurs in creosote bush scrub, chaparral, and pinyon-juniper woodland	**Presumed Absent:** No suitable creosote bush scrub, chaparral, or pinyon-juniper habitat was present on the Project site. The Project site is outside of the known elevation range for this species.
Dudleya multicaulis many-stemmed dudleya	Fed: Ca: CNPS: MSHCP:	none none 1B.2 COV	Apr-Jul 50-2590	Occurs in chaparral, coastal scrub, and valley and foothill grassland habitats. Often found in areas of clay soil.	**Presumed Absent:** No suitable chaparral, coastal scrub, or grassland habitats are present on site and there are no records of this species within 5 miles of the site.
Horkelia cuneata* var. *puberula mesa horkelia	Fed: Ca: CNPS: MSHCP:	None None 1B.1 none	Feb-Sep 230-2660	Occurs in maritime chaparral, cismontane woodland, and coastal scrub in sandy or gravelly soils. Often found in sandy or gravelly habitats.	**Presumed Absent:** The Project site lacks maritime chaparral, cismontane woodland, and coastal scrub habitat. Although one historical record occurs within 5 miles of the Project site (Occ # 1), it is more than 100 years old.
Juglans californica Southern California black walnut	Fed: Ca: CNPS: MSHCP:	none none 4.2 COV	Mar-Aug 165-2955	Occurs in chaparral, cismontane woodlands, coastal scrub, and riparian woodlands.	**Presumed Absent:** No suitable chaparral, woodland, or coastal scrub habitat occurs on the Project Site.

Scientific Name Common Name	**Status**		**Bloom Period & Elevation (feet)**	**Habitat Requirements**	**Potential for Occurrence**
Mentzelia tricuspis spiny-hair blazing star	Fed: Ca: CNPS: MSHCP:	none none 2B.1 none	Mar-May 490-4200	Found in sandy or gravelly slopes and washes especially in Mojavean desert scrub.	**Presumed Absent:** One historic record occurs 0.2 miles west of the site from over 100 years ago (Occ # 2), however the site lacks slopes and washes as well as Mojavean desert scrub.
Petalonyx linearis narrow-leaf sandpaper-plant	Fed: Ca: CNPS: MSHCP:	none none 2B.3 none	(Jan-Feb)Mar-May(Jun-Dec) -80-3660	Found in sandy or rocky canyons with Mojavean and Sonoran desert scrub. Often found in sandy or rocky canyons.	**Presumed Absent:** Although one historic record within 5 miles of the site, it is over 100 years old (Occ # 26) and the Project site lacks canyon, Mojavean desert scrub, and Sonoran desert scrub habitat.
Quercus engelmannii Engelmann oak	Fed: Ca: CNPS: MSHCP:	none none 4.2 COV	Mar-Jun 165-4265	Occurs in chaparral, cismontane woodland, riparian woodland, and valley and foothill grassland.	**Presumed Absent:** No suitable chaparral, woodland, or grassland habitats are present on site. No oak species were observed on the Project site.

Federal Designations:
(Federal Endangered Species Act, USFWS)
END: federally listed, endangered
THR: federally listed, threatened

State designations:
(California Endangered Species Act, CDFG)
END: state-listed, endangered
THR: state-listed, threatened
Rare: CDFW Rare

Other Designations
(Western Riverside MSHCP)
COV: Covered

Source: California Natural Diversity Data Base (CNDDB) California Native Plant Society Electronic Inventory (CNPSEI) Yucaipa, Forest Falls, San Gorgonion Mtn., El Casco, Beaumont, Cabazon, Lakeview, San Jacinto, and Lake Fulmor 7.5-minute topographic quadrangles.

APPENDIX E

Special Status Wildlife Species Potential to Occur

Scientific Name Common Name	Status		Habitat Requirements	Potential for Occurrence
INVERTEBRATES				
Bombus crotchii Crotch bumble bee	Fed: CA: MSHCP:	none **CAN** none	Typically occurs in a variety of habitats including open grasslands, shrublands, chaparral, desert margins including Joshua tree and creosote scrub.	**Presumed Absent:** No suitable grassland, shrubland, chaparral, or desert habitat is present on the Project site.
FISH				
***Oncorhynchus mykiss irideus* pop. 10** steelhead - southern California DPS	Fed: CA: MSHCP:	**END** **CAN** none	Typically occurs in slow water steams or rivers.	**Presumed Absent:** No aquatic habitat is present on the Project site and there are no records within 5 miles.
Rhinichthys osculus* ssp. *8 Santa Ana speckled dace	Fed: CA: MSHCP:	none SSC none	Permanent flowing creeks and streams with shallow gravel and cobble riffles.	**Presumed Absent:** No aquatic habitat is present on the Project site and there are no records within 5 miles.
AMPHIBIANS				
Rana mucosa southern mountain yellow-legged frog	Fed: CA: MSHCP:	**END** **END** COV	Ponds, streams, lakes, and isolated pools in southern Sierra Nevada Mountains and rocky streams within narrow canyons and the chaparral belt in Southern California mountains.	**Presumed Absent:** No ponds or streams are present on the Project site and there are no records within 5 miles.
Spea hammondii Western spadefoot	Fed: CA: MSHCP:	FC SSC COV	Prefers open areas with sandy or gravelly soils, including mixed woodlands, grasslands, coastal sage scrub, chaparral, sandy washes, lowlands, river floodplains, alluvial fans, playas, and alkali flats	**Presumed Absent:** No suitable habitat was present on the Project site.
REPTILES				
Anniella stebbinsi southern California legless lizard	Fed: CA: MSHCP:	none SSC none	Typically occurs in moist warm loose soil with plant cover in sparsely vegetated areas of beach dunes, chaparral, pine-oak woodlands, desert scrub, sandy washes, and stream terraces with sycamores, cottonwoods, or oaks.	**Presumed Absent:** No moist soil habitat is present on the Project site.
Arizona elegans occidentalis California glossy snake	Fed: CA: MSHCP:	none SSC none	Typically occurs in scrub or grassland habitat, often with loose or sandy soils.	**Presumed Absent:** The Project site is very disturbed and lacks loose, sandy soils. In addition, no records of this species were observed within 5 miles of the Project site.
Aspidoscelis tigris stejnegeri coastal whiptail	Fed: CA: MSHCP:	none SSC COV	Arid habitats including chaparral, woodlands, and dry riparian areas.	**Presumed Absent:** No suitable habitat was present on the Project site.
Charina umbratica southern rubber boa	Fed: CA: MSHCP:	None **THR** COV	Under rocks, woody debris, or in crevices in conifer or conifer-mixed semi-open forests and woodlands, patchy chaparral/shrublands, and meadows.	**Presumed Absent:** Although two historic records (Occ # 25 and 80) of this species were observed within 5 miles, the project site is outside of the known geographic range for this species and no suitable habitat was present on the Project site. The most recent record (Occ # 80) was observed in 1995 approximately 4.6 miles north of the Project site.
Crotalus ruber red-diamond rattlesnake	Fed: CA: MSHCP:	none SSC COV	Found in coastal chaparral, arid scrub, rocky grassland, oak and pine woodlands, desert mountain slopes and rocky desert flats.	**Presumed Absent:** No suitable scrub habitat is present on or adjacent to the Project site.

Scientific Name Common Name	**Status**		**Habitat Requirements**	**Potential for Occurrence**
Phrynosoma blainvillii coast horned lizard	Fed: CA: MSHCP:	none SSC COV	Open areas of valleys, foothills, and semiarid mountains with sandy soil and low vegetation including chaparral, woodlands, and grasslands.	**Presumed Absent:** No suitable habitat was present on the Project site.
Salvadora hexalepis virgultea coast patch-nosed snake	Fed: CA: MSHCP:	none SSC none	Coastal scrub and semi-arid brushy areas and chaparral in canyons, rocky hillsides, and plains. Brushy or shrubby vegetation in coastal Southern California. Require small mammal burrows for refuge and overwintering sites.	**Presumed Absent:** No suitable coastal scrub or chaparral habitat are present on the Project site and there are no records of this species within 5 miles.
Thamnophis hammondii two-striped gartersnake	Fed: CA: MSHCP:	none SSC none	Occur along aquatic habitats such as pools and creeks usually near chaparral, rocky areas, brushland, oak woodland, and conifer forests and hunts in water. Found from sea to about 7,000 ft elevation.	**Presumed Absent:** No aquatic habitat or oak woodlands are present on the Project site and there are no records of this species within 5 miles.
BIRDS				
Agelaius tricolor tricolored blackbird (nesting colony)	Fed: CA: MSHCP:	none **THR** COV	Freshwater marshes with dense cattails, bulrushes, sedges, and tule. Forages in open habitat such as cultivated fields and pastures.	**Presumed Absent:** Although there is one recent occurrence (Occ # 781) of this species observed in 2015 approximately 4.5 miles south of the Project site, no freshwater marshes for nesting are present on or adjacent to the Project site.
Aquila chrysaetos golden eagle (nesting & wintering)	Fed: CA: MSHCP:	none FP COV	Open country including prairies, sagebrush, savannah or sparse woodlands, and barren hills or mountainous areas. Nests on rocky cliff edges.	**Presumed Absent:** No suitable rocky, cliff habitat for nesting is present on or adjacent to the Project site. In addition, no records of this species were observed within 5 miles of the Project site
Athene cunicularia burrowing owl (burrow & some wintering sites)	Fed: CA: MSHCP:	none SSC COV	Open grasslands including prairies, plains, and savannah, or vacant lots and airports. Nests in abandoned dirt burrows.	**High:** Suitable foraging and burrow habitat are present throughout the disturbed non-native grasses and abandoned burrows on the Project site. In addition, the literature review revealed three recent occurrences (Occ # 931, 1079, and 1096) of this species within 5 miles of the Project site. The closest and most recent occurrence (Occ # 931) was observed in 2006 approximately 4.0 miles south of the Project site.
Buteo swainsoni Swainson's hawk (nesting)	Fed: CA: MSHCP:	none **THR** COV	Open pine-oak woodland, savannah, and agricultural fields with scattered trees. Nests in large solitary trees	**Presumed Absent:** No suitable woodland or savannah habitat with large trees for nesting is present on the Project site and there are no records within 5 miles.
Campylorhynchus brunneicapillus sandiegensis coastal cactus wren	Fed: CA: MSHCP:	none SSC COV	Coastal sage scrub with tall *Opuntia* cacti. Nests in opuntia cactus.	**Presumed Absent:** Suitable coastal sage scrub habitat with *Opuntia* cacti is not present on the Project site and there are no records within 5 miles.

Scientific Name Common Name	**Status**		**Habitat Requirements**	**Potential for Occurrence**
Coccyzus americanus occidentalis Western yellow-billed cuckoo	Fed: CA: MSHCP:	**THR** **END** COV	Occurs in riparian forest habitat. Nests along the broad (≥ 5 hectres) patches of multi-layered riparian woodland, often dominated by willows and cottonwoods of lower flood bottoms of larger river systems.	**Presumed Absent:** No suitable riparian habitat is present on the Project site and there are no records within 5 miles.
Cypseloides niger Black swift	Fed: CA: MSHCP:	none SSC COV	Occurs in the San Bernardino & San Jacinto mountains. Often breeds in small colonies on cliffs behind or adjacent to waterfalls in deep canyons and sea-bluffs above the surf; forages widely.	**Presumed Absent:** The Project site is outside of the known geographic range for this species and the site lacks cliffs and canyons suitable for breeding. In addition, there are no records within 5 miles.
Elanus leucurus white-tailed kite (nesting)	Fed: CA: MSHCP:	none FP COV	Open habitat in lowlands including savanna, open woodlands, marshes, and agricultural fields. Nests in tall trees within or on the edge of forested areas.	**Presumed Absent:** No nesting habitat is present adjacent to the Project site, as most of the trees are small and are not situated within or on the edge of forested areas, however, there are no records of this species within 5 miles.
Empidonax traillii extimus Southwestern willow flycatcher	Fed: CA: MSHCP:	**END** **END** COV	Occurs in riparian woodland habitat in Southern California. Nests in densest areas of riparian tree and shrub communities associated with rivers, swamps, and other wetlands, including lakes and reservoirs.	**Presumed Absent:** No suitable riparian habitat is present on the Project site and there are no records within 5 miles.
Icteria virens yellow-breasted chat (nesting)	Fed: CA: MSHCP:	none SSC COV	Riparian and upland thickets, and dry overgrown pastures. Prefers to nest in dense scrub along streams or at the edges of ponds or swamps.	**Presumed Absent:** No suitable riparian habitat is present on the Project site and there are no records within 5 miles.
Lanius ludovicianus loggerhead shrike (nesting)	Fed: CA: MSHCP:	none SSC COV	Open country, with scattered shrubs and trees or other perches for hunting; includes agricultural fields, deserts, grasslands, savanna, and chaparral.	**Low:** No suitable scrub habitat is present on or adjacent to the Project site. But Limited foraging habitat for this species was present within the disturbed land and the small trees on site could provide nesting habitat.
Polioptila californica californica coastal California gnatcatcher	Fed: CA: MSHCP:	**THR** SSC COV	Dry coastal slopes, washes, and mesas with areas of low vegetation and coastal sage scrub.	**Presumed Absent:** The Project site lacks coastal slopes, washes, and mesas with coastal sage scrub habitat and there are no records within 5 miles.
Progne subis purple martin	Fed: CA: MSHCP:	none SSC COV	Woodlands, broadleaved upland forest, and lower montane coniferous forest, particularly low elevation coniferous forest of Douglas-fir, ponderosa pine, and Monterey pine. Nests in old woodpecker cavities mostly and in human-made structures. Nest often located in tall, isolated tree/snag.	**Presumed Absent:** No woodland or coniferous forest habitat is present on or adjacent to the Project site. The literature review revealed one historic occurrence (Occ # 5) of this species observed in 1910 approximately 0.17 mile west of the Project site.

Scientific Name Common Name	**Status**		**Habitat Requirements**	**Potential for Occurrence**
Setophaga petechia yellow warbler	Fed: CA: MSHCP:	none SSC COV	Riparian plant associations in close proximity to water. Also nests in montane shrubbery in open conifer forests in Cascades and Sierra Nevada. Frequently found nesting and foraging in willow shrubs and thickets, and in other riparian plants including cottonwoods, sycamores, ash, and alders.	**Presumed Absent:** No suitable riparian or coniferous forest habitat is present on the Project site and there are no records within 5 miles.
Vireo bellii pusillus least Bell's vireo (nesting)	Fed: CA: MSHCP:	**END** **END** COV	Riparian woodlands and willow-cottonwood forests particularly with streamside thickets and dense brush.	**Presumed Absent:** No suitable riparian woodland or willow-cottonwood forest habitat is present on the Project site and there are no records within 5 miles.
Xanthocephalus xanthocephalus yellow-headed blackbird	Fed: CA: MSHCP:	none SSC none	Marshes, swamps, and wetlands. Frequently found nesting in freshwater emergent wetlands with dense vegetation and deep water. Often along borders of lakes or ponds.	**Presumed Absent:** No suitable riparian habitat is present on the Project site and there are no records within 5 miles.
MAMMALS				
Antrozous pallidus Pallid bat	Fed: CA: MSHCP:	none SSC none	Occurs in chaparral, coastal scrub, desert wash, Mojavean desert scrub, riparian woodland, Sonoran Desert scrub, upper montane coniferous forest, and valley & foothill grassland habitats. Most commonly found in open, dry habitats with rocky areas for roosting. Roosts must protect bats from high temperatures. Frequently roost in live trees and snags that have holes and cavities, or crevices formed by exfoliating bark.	**Presumed Absent:** Although the literature review revealed one recent occurrence (Occ # 437) of this species observed in 2011 approximately 2.3 miles south of the Project site, no suitable scrub or woodland habitat is present on the Project site and no tree cavities or snags were observed on the Project site.
Chaetodipus californicus femoralis Dulzura pocket mouse	Fed: CA: MSHCP:	none SSC none	Chaparral, coastal scrub, and desert grasslands in San Diego County along the U.S.-Mexico border.	**Presumed Absent:** Although the literature review revealed one historic record (Occ # 8) of this species, observed in 1995, approximately 3.4 miles east of the Project site, no suitable chaparral, coastal scrub, or desert grassland habitat is present on or adjacent to the Project site. In addition, there is evidence of significant mechanical ground disturbance such as discing.
Chaetodipus fallax fallax northwestern San Diego pocket mouse	Fed: CA: MSHCP:	none SSC COV	Coastal scrub, chaparral, sagebrush, and grasslands in western San Diego County.	**Presumed Absent:** No suitable scrub, chaparral, sagebrush, or grassland habitat is present on or adjacent to the Project site. In addition, there is evidence of significant mechanical ground disturbance such as discing.
Chaetodipus fallax pallidus Pallid San Diego pocket mouse	Fed: CA: MSHCP:	none SSC COV	Typically occurs in sandy herbaceous areas, usually in association with rocks or course gravel. Also, in arid coastal and desert border areas. Habitats include coastal scrub, chamise-redshank chaparral, mixed	**Presumed Absent:** No suitable coastal scrub, chamise-redshank chaparral, mixed chaparral, sagebrush, desert wash, desert scrub, desert succulent shrub, pinyon-juniper, and annual grassland habitats occur on the Project site.

Scientific Name Common Name	Status		Habitat Requirements	Potential for Occurrence
			chaparral, sagebrush, desert wash, desert scrub, desert succulent shrub, pinyon-juniper, and annual grassland.	
Corynorhinus townsendii Townsend's big-eared bat	Fed: CA: MSHCP:	none SSC none	Occurs in broadleaved upland forest, chaparral, chenopod scrub, Joshua tree woodland, lower montane coniferous forest, meadow and seep, Mojavean desert scrub, riparian forest, riparian woodland, upper montane coniferous forest, and valley & foothill grassland habitats. Most commonly found in mesic sites. Roosts in the open, hanging from walls and ceilings or in large basal hollows of old growth forest trees. Extremely sensitive to human disturbance.	**Presumed Absent:** No suitable forest or woodland habitat is present on or adjacent to the Project site. The literature review revealed one historic occurrence (Occ # 634) of this species observed in 1997 approximately 3.8 miles south of the Project site. No suitable roosting structures were observed on the Project site.
Dipodomys merriami parvus San Bernardino kangaroo rat	Fed: CA: MSHCP:	**END** **CAN** COV	Occurs in alluvial scrub vegetation on sandy loam substrates characteristic of alluvial fans and flood plains.	**Presumed Absent:** No suitable alluvial scrub habitat with sandy loam soils is present on or adjacent to the Project site. No records of this species were observed within 5 miles of the Project site. In addition, there is evidence of significant mechanical ground disturbance such as discing, which precludes the species.
Dipodomys stephensi Stephens' kangaroo rat	Fed: CA: MSHCP:	**THR** **THR** COV	Annual grasslands, coastal sage scrub with sparsely spaced vegetation, loose friable soils, and flat or slightly rolling terrain.	**Presumed Absent:** No suitable grassland and/or scrub habitat was present on the Project site. In addition, there is evidence of significant mechanical ground disturbance such as discing, which precludes the species.
Glaucomys oregonensis californicus San Bernardino flying squirrel	Fed: CA: MSHCP:	none SSC COV	Occurs in broadleaved upland forest and lower montane coniferous forest. Requires cavities in trees/snags for nests and cover and water nearby. Known from black oak or white fir dominated woodlands between 5200 - 8500 ft in the San Bernardino and San Jacinto ranges. May be extirpated from San Jacinto range.	**Presumed Absent:** The Project site is outside of the known geographic range for this species and the site lacks broadleaved upland forest and montane coniferous forest habitat. In addition, there are no records within 5 miles.
Lasiurus xanthinus western yellow bat	Fed: CA: MSHCP:	none SSC none	Found in valley foothill riparian, desert riparian, desert wash, and palm oasis habitats. Roosts in trees, particularly palms. Forages over water and among trees.	**Presumed Absent:** Although there has been one historic occurrence (Occ # 51) of this species approximately 2.0 miles from the Project site, the occurrence is over 100 years old. In addition, no suitable riparian, desert wash, or palm oasis habitat is present on the Project site. No suitable palm trees for roosting were observed on the Project site.
Leptonycteris yerbabuenae lesser long-nosed bat	Fed: CA: MSHCP:	DL SSC none	Roosts in caves and mines. Occurs in arid regions including desert grasslands and shrub lands. Requires suitable concentration of	**Presumed Absent:** No suitable roosting habitat is present within the vicinity of the site and the site lacks desert grassland and arid shrub land habitat with suitable food sources

Scientific Name Common Name	Status		Habitat Requirements	Potential for Occurrence
			columnar cacti and agave food sources.	for this species. There are no records within 5 miles of the site.
Neotoma lepida intermedia San Diego desert woodrat	Fed: CA: MSHCP:	none SSC COV	Coastal scrub of Southern California from San Diego County to San Luis Obispo County. Moderate to dense canopies preferred. They are particularly abundant in rock outcrops & rocky cliffs & slopes.	**Presumed Absent:** No suitable scrub habitat is present on the Project site and the site lacks rocky habitats. In addition, there are no records within 5 miles.
Onychomys torridus ramona southern grasshopper mouse	Fed: CA: MSHCP:	none SSC none	Low, semi-open, and open scrub habitats with flat, sandy valley floors. Habitats include coastal and mixed chaparral, coastal sage scrub, riparian scrub, low sagebrush, and grasslands with interspaced shrubs.	**Presumed Absent:** No suitable habitat is present on or adjacent to the Project site and no records of this species observed within 5 miles of the Project site. In addition, there is evidence of significant mechanical ground disturbance such as discing, which precludes the species.
Perognathus longimembris brevinasus Los Angeles pocket mouse	Fed: CA: MSHCP:	none SSC COV	Habitats with sandy and fine soils, including grasslands, coastal sage scrub, and alluvial sage scrub.	**Presumed Absent:** No suitable habitat or sandy, fine soils were present on or adjacent to the Project site. In addition, there is evidence of significant mechanical ground disturbance such as discing, which precludes the species.
Taxidea taxus American badger	Fed: CA: MSHCP:	none SSC none	Low, semi-open, and open scrub habitats with flat, sandy valley floors. Habitats include coastal and mixed chaparral, coastal sage scrub, riparian scrub, low sagebrush, and grasslands with interspaced shrubs.	**Presumed Absent:** Although there has been one historic occurrence (Occ # 205) of this species approximately 3.1 miles east of the Project site, the occurrence was observed in 1908 and is over 100 years old. In addition, no suitable scrub or chaparral habitat is present on or adjacent to the Project site.
Xerospermophilus tereticaudus chlorus Palm Springs round-tailed ground squirrel	Fed: CA: MSHCP:	none SSC none	Restricted to the Coachella Valley. Prefers desert succulent scrub, desert wash, desert scrub, alkali scrub, and levees with fine-textured, sandy soil.	**Presumed Absent:** The Project site is outside of the known geographic range for this species and the site lacks desert habitat. Additionally, there are no records within 5 miles of the site.

Federal Designations:
(Federal Endangered Species Act, USFWS)
END: Federally listed, Endangered
THR: Federally listed, Threatened
FC: Federal Candidate Species
DL: Federally-delisted

State designations:
(California Endangered Species Act, CDFW)
END: State-listed, Endangered
THR: State-listed, Threatened
SSC: California Species of Special Concern
CAN: State Candidate Species
FP: Fully Protected Species
WL: Watch List Species

Other Designations
COV: Covered under the Western Riverside MSHCP

Source: California Natural Diversity Data Base (CNDDB) Yucaipa, Forest Falls, San Gorgonio Mtn., El Casco, Beaumont, Cabazon, Lakeview, San Jacinto, and Lake Fulmor 7.5-minute quads.

APPENDIX F

Focused Burrowing Owl Survey Datasheet

Date: 6/24/22
Survey Season: Summer
Survey #: 1
GPS File Name: 2021-301 Xenia Apartments Bio

Burrowing Owl Survey

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Project #: 2021-301.01
Client:

General Information	Weather Data				
Observers: Alden Lovaas		AM		PM	
	Time (24 hr)	Start: 0530	End: 0735	Start:	End:
	Temp* (°F) 6" above ground in shade	Start: 67.8	End: 76.3	Start:	End:
	Wind (mph)	Start: 0-2	End: 0-3	Start:	End:
	% Cloud Cover	Start: 0	End: 0	Start:	End:

Site Information

Project Name: Xenia Apartments
Location: Beaumont
County: Riverside
Photos Taken? (Y) [N]
Area Surveyed: Project area + 500ft buffer (where accessible)

Physical Characteristics

Elevation: ~ 2600 ft	Soils:
Land Form*:	Other:
* e.g. mesa, bajada, wash	
Land Uses:	
N: Residential	S: Residential
E: Residential	W: Ruderal / disced vacant lot

Disturbances on Site: [e.g. tracks (vehicle, human, livestock); trash; dump sites; blading; other]
Recent discing of site, Vehicle tracks, old irrigation pipes/lines, trash
Transect Width: 10-(20) meters

Field Observations

Vegetation Communities: Ruderal

Plants

Jimpson weed, Mustard, wild oat, AMBATH, Amsinkia, SALTRA

Animals: [include: B - burrow, S - scat, O - observed, T - tracks, C - carcass, or Other (specify)]

MODO WEKI HOFI NOMO CORA EUST Side blotch lizard
HOSP CALT CA ground Squirrel BRBL BLPH W. fence lizard
ANHU ROPI

Comments

- Sunrise @ 0538
- Survey done per Western Riverside MSHCP Protocol
- Walked 20 Meter transects N/S direction (on Line)

Date: 6/24/22
Survey Season: Summer
Survey #: 1
GPS File Name: 2021-301 Xenia Apartments B:U

Burrowing Owl Survey

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Project #: 2021-301.01
Client: _____

★ = new burrows observed

Burrowing Owl Sign

Sign	# features	Location (UTM Northing/Easting)	Comments (aspect, dimensions, etc.)
Burrow - No Sign	1	33.931548, -116.954648	Previously Recorded ID: 010721B07AL
			Contains spider webs ← Not in great condition
			No Sign observed
★ Burrow - no Sign	1	33.930121, -116.954126	New burrow observed ID: 06242022Brow1AL
			dimensions: 3in(L) x 4in(w) x 12in(d),
			One entrance, N aspect. No sign observed
Burrow - no Sign	1	33.929785, -116.953521	Previously Recorded ID: 010721B09AL
			no Sign observed
Burrow - no new Sign	1	33.930331, -116.953363	Previously Recorded ID: 010721B010AL, no new
			Sign observed, No new White wash observed
			Only Previously Recorded white wash very faint
★ Burrow - No Sign	1	33.931981, -116.951404	New burrow observed ID: 06242022Brow2AL
			dimensions: 4in(L) x 5in(w) x 20in(d)
			One entrance, SW Aspect, No Sign observed,
			appears to be used by squirrels currently
★ Burrow - no Sign	2	33.931754, -116.951452	New Burrow observed ID: 06242022Brow3AL
			dimensions: S Aspect entrance: 4in(L) x 4in(w) x 24in(d)
			N Aspect entrance: 4in(L) x 5in(w) x 20in(d)
			Two entrances one S Aspect & One N Aspect
			No Sign observed, appear to be used by
			Squirrels currently.
Burrows no Sign	6	33.931970, -116.950764	Six Previously Recorded burrows in similar area
			ID: -
			010721B01AL - No Sign observed
			- Appears occupied by Squirrels
			010721B02AL - No Sign observed
			- Appears occupied by Squirrels
			010721B03AL - No Sign observed
			- Appears occupied by Squirrels
			010721B04AL - Possibly collapsed?
		large debris pile of sticks	010721B05AL - Possibly collapsed
		and branches in this area	010721B06AL - Possibly collapsed
		Unable to determine if	
		burrows are	
		Still present	→ But would now be unsuitable for Brow w/ Sticks & debris

Comments:

Previously Recorded burrow ID: 010721B08AL is collapsed and no longer exists

Date: 7/1/22
Survey Season: Summer
Survey #: 2
GPS File Name: 2021-301 Xenia Apartments Bio

Burrowing Owl Survey

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Project #: 2021-301.01
Client:

General Information	Weather Data		
Observers: Alden Lovaas		AM	PM
	Time (24 hr)	Start: 0520 End: 0700	Start: ____ End: ____
	Temp* (°F) 6" above ground in shade	Start: 67.3 End: 70.3	Start: ____ End: ____
	Wind (mph)	Start: 0-3 End: 0-2	Start: ____ End: ____
	% Cloud Cover	Start: 30 End: 40	Start: ____ End: ____

Site Information

Project Name: Xenia Apartments
Location: Beaumont
County: Riverside
Photos Taken? (Y) [N]
Area Surveyed: Project Area +500 ft (where accessible)

Physical Characteristics

Elevation: ~ 2600 ft	Soils:
Land Form*:	Other:
* e.g. mesa, bajada, wash	
Land Uses:	
N: Residential	S: Residential
E: Residential	W: Ruderal / disced

Disturbances on Site: [e.g. tracks (vehicle, human, livestock); trash; dump sites; blading; other]
discing, vehicles/tracks, trash
Transect Width: 10-(20) meters

Field Observations

Vegetation Communities: Ruderal

Plants

SALTRA
Jimpson Weed
Mustard spp
Wild oat
AMBATH
Amsinkia
CROSET

Animals: [include: B - burrow, S - scat, O - observed, T - tracks, C - carcass, or Other (specify)]

MODO
WEKI
HoFI
NOMO
CORA
EUST
HOSP
BRBL
ANHU
CAKI
SAPH
ROPI
BLPH
EUCD
CA ground squirrel

Comments

- Sunrise @ 0540
- Survey done according to Western Riverside MSHCP Protocol
- Walked 20 meter transects E/W (on line)

Date: 7/1/22
Survey Season: Summer
Survey #: 2
GPS File Name: 2021-301 Xenia Apartments B.io

Burrowing Owl Survey

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Project #: 2021-301.01
Client: _____

Burrowing Owl Sign ID:

Sign	# features	Location (UTM Northing/Easting)	Comments (aspect, dimensions, etc.)
Burrow no sign	1	0624 2022 Burw 2 AL	Previously Recorded - no change / no sign
Burrow no sign	1	010721 BO 2 AL	Previously Recorded - no change / no sign
Burrow no sign	1	010721 BO 1 AL	Previously Recorded - no change / no sign
Burrow no sign	1	010721 Bo 3 AL	Previously Recorded - no change / no sign
Burrow no sign	1	010721 BO 4 AL	Previously Recorded - no change / no sign
Burrow no sign	1	010721 BO 6 AL	Previously Recorded - no Change / still Covered w/ leaves
Burrow no sign	1	010721 Bo 5 AL	Previously Recorded - no change / no sign
Burrow no sign	2	0624 2022 Burw 3 AL	Previously Recorded - no change / no sign
Burrow no sign	1	010721 BO 7 AL	Previously Recorded - no change / no sign
Burrow no sign	1	010721 BO 8 AL	Previously Recorded, Collapsed on 6/24/22, Still collapsed
Burrow no sign	1	0624 2022 Burw 1 AL	Previously Recorded - no change / no sign
Burrow no sign	1	010721 BO 9 AL	Previously Recorded - no change / no sign
Burrow no sign	1	010721 BO 10 AL	Previously Recorded - no change / no sign

Comments:

NO new Burrows observed

Date: 7/29/22
Survey Season: Summer
Survey #: 3
GPS File Name: 2021-301 Xenia Apartments Bio

Burrowing Owl Survey

ECORP Consulting, Inc. ENVIRONMENTAL CONSULTANTS

Project #: 2021-301.01
Client:

General Information	Weather Data			
Observers: Alden Lovaas		AM		PM
	Time (24 hr)	Start: 0610 End: 0730	Start:	End:
	Temp* (°F) 6" above ground in shade	Start: 71.1 °F End: 76.1 °F	Start:	End:
	Wind (mph)	Start: 0-2 mph End: 0-1 mph	Start:	End:
	% Cloud Cover	Start: 45 End: 75	Start:	End:

Site Information

Project Name: Xenia Apartments
Location: Beaumont
County: Riverside
Photos Taken? [Y] [N]
Area Surveyed: Project Area + 500 ft (where accessable)

Physical Characteristics

Elevation: ~ 2600 ft	Soils:
Land Form*:	Other:
* e.g. mesa, bajada, wash	
Land Uses:	
N: Residential	S: Residential
E: Residential	W: Ruderal / disturbed / disced

Disturbances on Site: [e.g. tracks (vehicle, human, livestock); trash; dump sites; blading; other]
discing, vehicles/trucks, trash (new trash dumping)
Transect Width: 10-20 meters

Field Observations

Vegetation Communities: Ruderal

Plants

SALTRA	wildoat	CROSET
Jimpson weed	AMBATH	
Mustard spp	Amsinkia	

Animals: [include: B - burrow, S - scat, O - observed, T - tracks, C - carcass, or Other (specify)]

MODO	BRBL	EUCD
HOFI	ANHU	KILL
NOMO	CAKI	side blotch liz
CORA	ROPI	CA ground squirrel
HOSP	SAPH	
		OPOSSUM (C)

Comments

- Sunrise at 0558
- Survey done in accordance w/ Western Riverside MSHCP Protocol
- walked 20 Meter transects N/S (in between lines)

Date: 7/29/22
Survey Season: Summer
Survey #: 3
GPS File Name: 2021-301 Xerces Apartments Bio

Burrowing Owl Survey

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Project #: 2021-301.01
Client: _____

New Burrow

Burrowing Owl Sign			
Sign	# features	Location (UTM Northing/Easting)	Comments (aspect, dimensions, etc.)
Burrow no sign	1	010721 B07 AL	Previously Recorded - no change in Condition
Burrow no sign	1	06242022 Burrow1 AL	Previously Recorded - no change in Condition
Burrow no sign	1	010721 B09 AL	Previously Recorded - no change in condition
Burrow no sign	1	010721 B010 AL	Previously Recorded - no change in Condition
Burrow no sign	2	06242022 Burrow3 AL	Previously Recorded - no change in Condition
Burrow no sign	1	33.931401, -116.951173	New burrow observed ID: 0728 B1 AL No sign observed
Burrow no sign	1	010721 B03 AL	Previously Recorded - No change in Condition
Burrow no sign	1	010721 B04 AL	Previously Recorded - no change in Condition
Burrow no sign	1	010721 B05 AL	Previously Recorded - no change in Condition
Burrow no sign	1	010721 B06 AL	Previously Recorded - no change in condition
Burrow no sign	1	010721 B01 AL	Previously Recorded - no change in condition
Burrow no sign	1	010721 B02 AL	Previously Recorded - no change in Condition

Comments:

- ONE new burrow observed ID: 0728B1AL
- NO sign observed at any burrows

Date: 8/1/22
Survey Season: Summer
Survey #: 4
GPS File Name: 2021-301 Xenia Apartments

Burrowing Owl Survey

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Project #: 2021-301.01
Client:

General Information	Weather Data		
Observers: Alden Lovaas		AM	PM
	Time (24 hr)	Start: 0620 End: 0740	Start: ____ End: ____
	Temp* (°F) 6" above ground in shade	Start: 75.7 End: 78.8	Start: ____ End: ____
	Wind (mph)	Start: 0-1 End: 0-1	Start: ____ End: ____
	% Cloud Cover	Start: 70 End: 30	Start: ____ End: ____

Site Information

Project Name: Xenia Apartments
Location: Beaumont
County: Riverside
Photos Taken? [Y] [N]
Area Surveyed: Project Area + 500 feet (where accessible)

Physical Characteristics

Elevation: ~2600 ft	Soils:
Land Form*:	Other:
* e.g. mesa, bajada, wash	
Land Uses:	
N: Residential	S: Residential
E: Residential	W: Ruderal / disturbed / disced

Disturbances on Site: [e.g. tracks (vehicle, human, livestock); trash; dump sites; blading; other]
discing, vehicle tracks, trash
Transect Width: 10-20 meters

Field Observations

Vegetation Communities: Ruderal

Plants

SALTRA Jimpson weed Mustard spp. Wild oat AMBATH Amsinkia CROSET

Animals: [include: B - burrow, S - scat, O - observed, T - tracks, C - carcass, or Other (specify)]

MODO HOFI NOMO CORA HOSP CAKI ROPI SAPH EUCO KILL

CA ground Squirrel

Comments

- Sunrise @ 0600
- Survey done in accordance w/ Western Riverside MSHCP Protocol
- walked 20 meter transects E/W (in between lines)

Date: 8/2/22
Survey Season: Summer
Survey #: 4
GPS File Name: 2021-301 Xenia Apartments Bio

Burrowing Owl Survey

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Project #: 2021-301.01
Client: _____

Burrowing Owl Sign

Sign	# features	Location (UTM Northing/Easting)	Comments (aspect, dimensions, etc.)
Burrow no Sign	2	06242022 Burow 3AL	No change in Burrow Condition
Burrow no Sign	1	06242022 Burow 2AL	No change in Burrow Condition
Burrow no Sign	1	010721 BO1 AL	No change in burrow condition
Burrow no Sign	1	010721 BO2AL	no change in burrow condition
Burrow no Sign	1	010721 BO3AL	No change in burrow Condition
Burrow no Sign	1	010721 BO4AL	No change in burrow condition
Burrow no Sign	1	010721 BO5AL	No change in burrow Condition
Burrow no Sign	1	010721 Bo6AL	No change in burrow Condition
Burrow no Sign	1	0728B1AL	No change in burrow Condition
Burrow no Sign	1	010721 BO10AL	NO change in burrow condition
Burrow no Sign	1	06242022 Burow1AL	no change in burrow condition
Burrow no Sign	1	010721 BO9AL	NO change in burrow Condition
Burrow no Sign	1	010721 Bo8AL	No change in burrow Condition - Still collapsed
Burrow no Sign	1	010721 Bo 7AL	No change in burrow Condition

Comments:

- no new burrows observed
- no sign observed at any burrows

Appendix C

Cultural Resources Inventory and Evaluation Report
ECORP Consulting, Inc.
April 2022

Cultural Resources Inventory and Evaluation Report for the Xenia Apartments Project

Riverside County, California

Prepared For:

Beaumont Land Partners, LLC
556 S. Fair Oaks Avenue #337
Pasadena, California 91105

Prepared By:



215 North 5th Street
Redlands, California 92374

April 2022

MANAGEMENT SUMMARY

Beaumont Land Partners, LLC retained ECORP Consulting, Inc. in 2021 to conduct a cultural resources inventory for the Proposed Xenia Apartments Project (Project or Proposed Project) in Riverside County, California. Beaumont Land Partners, LLC proposed to construct an apartment complex on approximately 10.7 acres in the City of Beaumont. The inventory included a records search, literature review, and field survey.

The records search indicated that 33 previous cultural resource studies have been conducted within one mile of the Project Area, none of which encompass the Project Area. As a result of those studies, no resources have previously been recorded within the Project Area. However, 15 historic-period resources have been recorded within one mile of the Project Area. These include eight single family properties, two transmission lines, one highway/trail, one railroad, one water conveyance system, one area of landscaping with associated refuse scatter, and one cemetery.

ECORP requested a search of the Sacred Lands File at the Native American Heritage Commission. The results were negative and failed to indicate the presence of Native American cultural resources in the Project Area.

As a result of the field survey, one historic-period resource was recorded inside of the Project Area: XA-001, a concrete foundation consisting of a pad and vault. This resource has been evaluated as not eligible for the National Register of Historic Places (NRHP) or the California Register of Historical Resources (CRHR) under any criteria.

Due to the presence of Pleistocene and Holocene sediments within the Project Area, there is a low to moderate potential for the discovery of subsurface deposits or eligible sites within the Project Area. Recommendations for the management of unanticipated discoveries are provided.

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LIST OF ACRONYMS AND ABBREVIATIONS

Term	Description
AB	Assembly Bill
APE	Area of Potential Effects
BLM	Bureau of Land Management
BP	Before present
Caltrans	California Department of Transportation
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CHRIS	California Historical Resources Information System
CRHR	California Register of Historical Resources
DPR	Department of Parks and Recreation
ECORP	ECORP Consulting, Inc.
EIC	Eastern Information Center
GLO	General Land Office
MLD	Most Likely Descendant
NAHC	Native American Heritage Commission
NHPA	National Historic Preservation Act
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
OHP	Office of Historic Preservation
OHV	Off-highway vehicle
PRC	Public Resources Code
RPA	Registered Professional Archaeologist
SOI	Secretary of the Interior
SHPO	State Historic Preservation Officer
USC	U.S. Code
USGS	U.S. Geological Survey

1.0 INTRODUCTION

Beaumont Land Partners, LLC retained ECORP Consulting, Inc. in 2021 to conduct a cultural resources inventory for the Proposed Xenia Apartments Project (Project or Proposed Project) in Riverside County, California. A survey of the property was required to identify potentially eligible cultural resources (i.e., archaeological sites and historic buildings, structures, and objects) that could be affected by the Project.

1.1 Project Location and Description

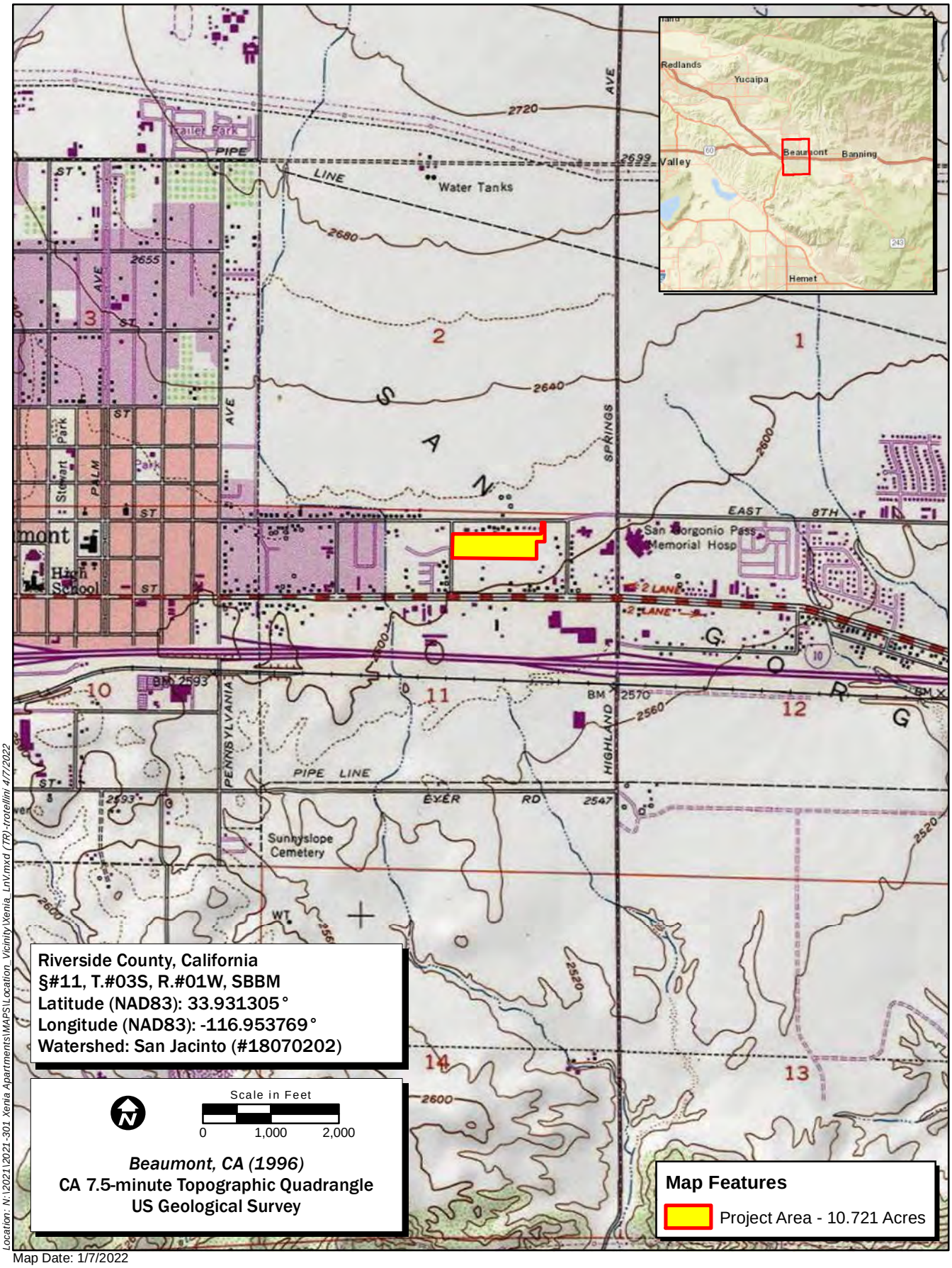
The Project Area consists of approximately 10.7 acres of property located in the northwestern quarter of the northeastern quarter of Section 11, of Township 3 South, Range 1 West, San Bernardino Base and Meridian as depicted on the 1996 Beaumont, California U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle map (Figure 1-1). It is also known as Assessor Parcel Numbers 419-160-005, 419-160-024, 419-170-016, 419-170-017, 419-170-018, 419-170-022, and 419-170-027. The Project Area is an undeveloped area bounded east of Xenia Avenue, west of Allegheny Street, south by Sixth Street, and north by Eighth Street. Commercial buildings are located to the south and residential properties are located to the north and east. The Proposed Project includes the construction of an apartment complex.

1.2 Area of Potential Effects

The Area of Potential Effects (APE) consists of the horizontal and vertical limits of a project and includes the area within which significant impacts or adverse effects to Historical Resources or Historic Properties could occur as a result of the project. The APE is defined for projects subject to regulations implementing Section 106 (federal law and regulations). For projects subject to the California Environmental Quality Act (CEQA), the term *Project Area* is used rather than *APE*. The terms *Project Area* and *APE* are interchangeable for the purpose of this document.

The horizontal APE consists of all areas where activities associated with a project are proposed and, in the case of the current Project, equals the Project Area subject to environmental review under the National Environmental Policy Act and CEQA. This includes areas proposed for construction, vegetation removal, grading, trenching, stockpiling, staging, paving, and other elements described in the official Project description. The horizontal APE is illustrated on Figure 1-1 and also represents the survey coverage area. It measures approximately 0.26 mile in length by 0.1 mile in width.

The vertical APE is described as the maximum depth below the surface to which excavations for Project foundations and facilities will extend. Therefore, the vertical APE includes all subsurface areas where archaeological deposits could be affected. The subsurface vertical APE varies across the Project. This study assumes the depth of ground disturbance will not exceed 15 feet.



Location: N:\2021\2021-301 Xenia Apartments\MAPS\Location_Vicinity\Xenia_LnV.mxd (TR)-krotellini 4/7/2022

Map Date: 1/7/2022

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community, Copyright:© 2013 National Geographic Society, i-cubed

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Figure 1-1. Project Location and Vicinity

2021-301 Xenia Apartments

The vertical APE also is described as the maximum height of structures that could impact the physical integrity and integrity of setting of cultural resources, including districts and traditional cultural properties. This study assumes the maximum height for structures will not exceed 30 feet.

1.3 Regulatory Context

This cultural resources investigation was conducted pursuant to the provisions for the treatment of cultural resources contained within Section 106 of the National Historic Preservation Act (NHPA) and in CEQA (Public Resources Code [PRC] Section 21000 et seq.) to meet the regulatory requirements of this Project. The goal of NHPA and CEQA is to develop and maintain a high-quality environment that serves to identify the significant environmental effects of the actions of a proposed project and to either avoid or mitigate those significant effects where feasible. CEQA pertains to all proposed projects that require state or local government agency approval, including the enactment of zoning ordinances, the issuance of conditional use permits, and the approval of development project maps. The NHPA pertains to projects that entail some degree of federal funding or permit approval.

The NHPA and CEQA (Title 54 U.S. Code [USC] Section 100101 et seq and Title 14, California Code of Regulations [CCR], Article 5, Section 15064.5) apply to cultural resources of the historical and precontact periods. Any project with an effect that may cause a substantial adverse change in the significance of a cultural resource, either directly or indirectly, is a project that may have a significant effect on the environment. As a result, such a project would require avoidance or mitigation of impacts to those affected resources. Significant cultural resources must meet at least one of four criteria that define eligibility for listing on either the California Register of Historical Resources (CRHR; PRC Section 5024.1, Title 14 CCR, Section 4852) or the National Register of Historic Places (NRHP; 36 Code of Federal Regulations [CFR] 60.4). Cultural resources eligible for listing on the NRHP are considered Historic Properties under 36 CFR Part 800 and are automatically eligible for the CRHR. Resources listed on or eligible for inclusion in the CRHR are considered Historical Resources under CEQA.

Tribal Cultural Resources are defined in Section 21074 of the California PRC as sites, features, places, cultural landscapes (geographically defined in terms of the size and scope), sacred places, and objects with cultural value to a California Native American tribe that are either included in or determined to be eligible for inclusion in the CRHR, or are included in a local register of historical resources as defined in subdivision (k) of Section 5020.1, or are a resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Section 5024.1. Section 1(b)(4) of Assembly Bill (AB) 52 established that only California Native American tribes, as defined in Section 21073 of the California PRC, are experts in the identification of Tribal Cultural Resources and impacts thereto. Because ECORP does not meet the definition of a California Native American tribe, this report only addresses information for which ECORP is qualified to identify and evaluate, and that which is needed to inform the cultural resources section of CEQA documents. This report, therefore, does not identify or evaluate Tribal Cultural Resources. Should California Native American tribes ascribe additional importance to or interpretation of archaeological resources described herein, or provide information about non-archaeological Tribal Cultural Resources, that information is documented separately in the AB 52 tribal consultation record between the tribe(s) and lead agency, and summarized in the Tribal Cultural Resources section of the CEQA document, if applicable.

1.4 Report Organization

The following report documents the study and its findings and was prepared in conformance with the California Office of Historic Preservation's (OHP) *Archaeological Resource Management Reports: Recommended Contents and Format.* Appendix A contains the results of the CHRIS records search. Appendix B contains the documentation of a search of the Sacred Lands File. Appendix C presents photographs of the Project Area, and Appendix D contains confidential cultural resource site locations and site records, which has been redacted.

Sections 6253, 6254, and 6254.10 of the California Code authorize state agencies to exclude archaeological site information from public disclosure under the Public Records Act. In addition, the California Public Records Act (Government Code Section 6250 et seq.) and California's open meeting laws (The Brown Act, Government Code Section 54950 et seq.) protect the confidentiality of Native American cultural place information. Under Exemption 3 of the federal Freedom of Information Act (5 USC 5), because the disclosure of cultural resources location information is prohibited by the Archaeological Resources Protection Act of 1979 (16 USC 470hh) and Section 307103 of the NHPA, it is also exempted from disclosure under the Freedom of Information Act. Likewise, the Information Centers of the California Historical Resources Information System (CHRIS) maintained by the OHP prohibit public dissemination of records search information.

2.0 SETTING

2.1 Environmental Setting

The Project Area is open land bounded by residential and commercial properties to the east, north, and south, and by Xenia Avenue to the west. The Project Area is located in the City of Beaumont. It is located approximately 2.9 miles south of the foothills of San Gorgonio, 0.27 miles north of the I-10 Freeway, 18 miles west of the Coachella Valley, and 3.5 miles east of San Timoteo Canyon. Elevations range from 2,607 to 2,612 feet above mean sea level.

2.2 Geology and Soils

Sediments within the Project Area consist of older Quaternary (Pleistocene and Holocene) surficial sediments (Qf) described as alluvial fan sand and gravel of plutonic and gneissic detritus (Dibblee and Minch 2003). Pleistocene and Holocene sediments can be contemporaneous with human occupation of the region.

According to the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS) Web Soil Survey website (NRCS 2022), two soil types are located within the Project Area: Ramona sandy loam, well drained, 2 to 5 percent slopes, found in interior valleys; and Greenfield series coarse sandy loam, 0 to 30 percent slopes, deep well drained soils formed in alluvium.

2.3 Vegetation and Wildlife

The dominant plant community within the Project Area is a disturbed ruderal grassland environment comprised of walnut (*Juglans* sp.), common persimmon (*Diospyros virginiana*), Shamel ash (*Fraxinus uhdei*).

Wildlife species that may occur in the Project Area include red-tailed hawk (*Buteo jamaicensis*), Anna's hummingbird (*Calypte anna*), house finch (*Haemorhous mexicanus*), and mourning dove (*Zenaida macroura*); mammal species may include California ground squirrel (*Otospermophilus beecheyi)* and domestic dog (*Canis lupus familiaris*).

3.0 CULTURAL CONTEXT

3.1 Regional Precontact History

3.2 Paleo-Indian Period/Terminal Pleistocene (12,000 Before Present [BP] to 10,000 BP)

The first inhabitants of Southern California were big-game hunters and gatherers exploiting extinct species of Pleistocene megafauna (e.g., mammoth and other Rancholabrean fauna). Local "fluted point" assemblages, composed of large spear points or knives, are stylistically and technologically similar to the Clovis Paleo-Indian cultural tradition dated to this period elsewhere in North America (Moratto 1984). Archaeological evidence for this period in Southern California is limited to a few small temporary camps with fluted points found around late Pleistocene lake margins in the Mojave Desert and around Tulare Lake in the southern San Joaquin Valley. Single points are reported from Ocotillo Wells and Cuyamaca Pass in eastern San Diego County and from the Yuha Desert in Imperial County (Rondeau et al. 2007).

3.3 Early Archaic Period/Early Holocene (10,000 BP to 8,500 BP)

Approximately 10,000 years ago, at the beginning of the Holocene, warming temperatures and the extinction of the megafauna resulted in changing subsistence strategies with an emphasis on hunting smaller game and increasing reliance on plant gathering. Previously, Early Holocene sites were represented by only a few sites and isolates from the Lake Mojave and San Dieguito complexes found along former lakebeds and grasslands of the Mojave Desert and in inland San Diego County. More recently, Southern California Early Holocene sites have been found along the Santa Barbara Channel (Erlandson 1994), in western Riverside County (Goldberg 2001; Grenda 1997), and along the San Diego County coast (Gallegos 1991; Koerper et al. 1991; Warren 1967).

The San Dieguito Complex was defined based on material found at the Harris site (CA-SDI-149) on the San Dieguito River near Lake Hodges in San Diego County. San Dieguito artifacts include large leaf-shaped points; leaf-shaped knives; large ovoid, domed, and rectangular end and side scrapers; engraving tools; and crescentics (Koerper et al. 1991). The San Dieguito Complex at the Harris site dates to 9,000 BP to 7,500 BP (Gallegos 1991). However, sites from this time period in coastal San Diego County have yielded artifacts and subsistence remains characteristic of the succeeding Encinitas Tradition, including manos, metates, core-cobble tools, and marine shell (Gallegos 1991; Koerper et al. 1991).

3.3.1 Encinitas Tradition or Milling Stone Period/Middle Holocene (8,500 BP to 1,250 BP)

The Encinitas Tradition and the Milling Stone Period refer to a long period of time during which small mobile bands of people foraged for a wide variety of resources, including hard seeds, berries, and roots/tubers (yucca in inland areas), rabbits and other small animals, and shellfish and fish in coastal areas. Sites from the Encinitas Tradition consist of residential bases and resource acquisition locations with no evidence of overnight stays. Residential bases have hearths and fire-affected rock, indicating overnight

stays and food preparation. Residential bases along the coast have large amounts of shell and are often termed shell middens ((Warren 1968; Wallace 1955).

The Encinitas Tradition as originally defined applied to all of the non-desert areas of Southern California. Recently, four patterns within the Encinitas Tradition have been proposed that apply to different regions of Southern California. The Topanga Pattern includes archaeological material from the Los Angeles Basin and Orange County. The Greven Knoll Pattern pertains to southwestern San Bernardino County and western Riverside County. Each of the patterns is divided into temporal phases. The Topanga I phase extends from 8,500 BP to 5,000 BP and Topanga II runs from 5,000 BP to 3,500 BP. The Topanga Pattern ended about 3,500 BP with the arrival of Takic speakers, except in the Santa Monica Mountains where the Topanga III phase lasted until about 2,000 BP (Warren 1968; Sutton and Gardner 2010).

The Encinitas Tradition in inland areas east of the Topanga Pattern (southwestern San Bernardino County and western Riverside County) is the Greven Knoll Pattern. Greven Knoll I (9,400 BP to 4,000 BP) has abundant manos and metates. Projectile points are few and are mostly Pinto points. Greven Knoll II (4,000 BP to 3,000 BP) has abundant manos, metates, and core tools. Projectile points are mostly Elko points. The Elsinore site on the east shore of Lake Elsinore was occupied during Greven Knoll I and Greven Knoll II. During Greven Knoll I, faunal processing (butchering) took place at the lakeshore and floral processing (seed grinding), cooking, and eating took place farther from the shore. The primary foods were rabbit meat and seeds from grasses, sage, and ragweed. A few deer, waterfowl, and reptiles were consumed. The recovered archaeological material suggests that a highly mobile population visited the site at a specific time each year. It is possible that their seasonal rounds included the ocean coast at other times of the year. These people had an unspecialized technology as exemplified by the numerous crescents, a multi-purpose tool. The few projectile points suggest that most of the small game was trapped using nets and snares. During Greven Knoll II, which included a warmer drier climatic episode known as the Altithermal, it is thought that populations in interior Southern California concentrated at oases and that Lake Elsinore was one of them. The Elsinore site (CA-RIV-2798) is one of five known Middle Holocene residential sites around Lake Elsinore. Tools were mostly manos, metates, and hammerstones. Scraper planes were absent. Flaked-stone tools consisted mostly of utilized flakes used as scrapers. The Elsinore site during the Middle Holocene was a recurrent extended encampment, which could have been occupied during much of the year (Sutton and Gardner 2010; Grenda 1997).

The Encinitas Tradition lasted longer in inland areas (until circa 1,000 BP) Greven Knoll III (3,000 BP to 1,000 BP) is present at the Liberty Grove site in Cucamonga and at sites in Cajon Pass that were defined as part of the Sayles Complex. Greven Knoll III sites have a large proportion of manos, metates, and core tools, as well as scraper planes. Kowta (1969) suggested the scraper planes may have been used to process yucca and agave. The faunal assemblage consists of large quantities of lagomorphs (rabbits and hares) and lesser quantities of deer, rodents, birds, carnivores, and reptiles ((Kowta 1969; Salls 1983).

3.3.2 Palomar Tradition (1,250 BP to 150 BP)

The material culture of the inland areas — where Takic languages, which form a branch or subfamily of the Uto-Aztecan language family, were spoken at the time of Spanish contact — is part of the Palomar Tradition (Sutton 2011). San Luis Rey I Phase (1,000 BP to 500 BP) and San Luis Rey II Phase (500 BP to 150

BP) pertain to the area occupied by the Luiseño at the time of Spanish contact. The Peninsular I (1,000 BP to 750 BP), Peninsular II (750 BP to 300 BP), and Peninsular III (300 BP to 150 BP) phases are used in the areas occupied by the Cahuilla and Serrano (Sutton 2011).

San Luis Rey I is characterized by Cottonwood Triangular arrow points, use of bedrock mortars, stone pendants, shell beads, quartz crystals, and bone tools. San Luis Rey II sees the addition of ceramics, including ceramic cremation urns, red pictographs on boulders in village sites, and steatite arrow straighteners. San Luis Rey II represents the archaeological manifestation of the antecedents of the historically known Luiseño. During San Luis Rey I, there were a series of small permanent residential bases at water sources, each occupied by a kin group (probably a lineage). During San Luis Rey II, people from several related residential bases moved into a large village located at the most reliable water source. Each village had a territory that included acorn harvesting camps at higher elevations. Villages have numerous bedrock mortars, large dense midden areas with a full range of flaked and ground stone tools, rock art, and a cemetery (Goldberg 2001:I-43; Waugh 1986).

3.4 Ethnohistory

Ethnographic accounts of Native Americans indicate that the Project Area lies predominantly within the original territory of the Cahuilla. The Cahuilla spoke a Takic language. The Takic group of languages is part of the Uto-Aztecan language family. The Cahuilla occupied a territory ranging from the San Bernardino Mountains in the north to the Chocolate Mountains and Borrego Springs in the south, and from the Colorado Desert in the east to Palomar Mountain in the west. They engaged in trade, marriage, shared rituals, and war with other groups of Native Americans, primarily the Serrano and Gabrielino, whose territories they overlapped (Bean 1978, 1972; Kroeber 1925).

Cahuilla subsistence consisted of hunting, gathering, and fishing. Villages were often located near water sources, most commonly in canyons or near drainages on alluvial fans. Major villages were fully occupied during the winter, but during other seasons task groups made periodic forays to collect various plant foods, with larger groupings from several villages organizing for the annual acorn harvest (Bean and Saubel 1972). Bean and Saubel (1972) have recorded the use of several hundred species of plants used for food, building/artifact materials, and medicines. The major plant foods included acorns, pinyon nuts, and various seed-producing legumes. These were complemented by agave, wild fruits and berries, tubers, cactus bulbs, roots and greens, and seeds.

Hunting focused on both small- to medium-sized mammals, such as rodents and rabbits, and large mammals, such as pronghorn antelope, mountain sheep, and mule deer. Hunters used the throwing stick or the bow and arrow, though nets and traps were also used for small animals (Bean 1972). Cahuilla buildings consisted of dome-shaped or rectangular houses, constructed of poles covered with brush and aboveground granaries (Bean 1978; Strong 1929). Other material culture included baskets, pottery, and grinding implements; stone tools, arrow shaft straighteners and bows; clothing (loincloths, blankets, rope, sandals, skirts, and diapers); and various ceremonial objects made from mineral, plant, and animal substances (Bean 1972).

As many as 10,000 Cahuilla may have existed at the time of European contact in the 18th century (Bean 1978). Circa 1900, Cahuilla lived in the settlements of La Mesa, Toro, and Martinez on the Augustin and

Toro Indian Reservations east and southeast of the Project Area (USGS Indio Quad 1904). As of 1974, approximately 900 people claimed Cahuilla ancestry (Bean 1978).

There was no substantial Euro-American settlement in the Coachella Valley until the Southern Pacific Railroad completed its line from Los Angeles to Indio (then known as Indian Wells) in 1876. The railroad was completed to Yuma in 1877, linking Southern California with Arizona and points east. Wells to supply water for the steam locomotives were dug at Indio, Coachella (originally named Woodspur), Thermal (originally named Kokell), and Mecca (originally named Walters). Settlement began around these wells and railroad stations, forming the nucleus of today's Coachella Valley towns (Roberston 1998).

3.5 Regional History

The first European to visit California was Spanish maritime explorer Juan Rodriguez Cabrillo in 1542. The Viceroy of New Spain (Mexico) sent Cabrillo north to look for the Northwest Passage. Cabrillo visited San Diego Bay, Catalina Island, San Pedro Bay, and the northern Channel Islands. The English adventurer Francis Drake visited the Miwok Native American group at Drake's Bay or Bodega Bay in 1579. Sebastian Vizcaíno explored the coast as far north as Monterey in 1602. He reported that Monterey was an excellent location for a port (Castillo 1978). Vizcaíno also named San Diego Bay to commemorate Saint Didacus. San Diego began to appear on European maps of the New World by 1624 (Gudde 1998).

Colonization of California by Euro-Americans began with the Spanish Portolá land expedition. The expedition, led by Captain Gaspar de Portolá of the Spanish army and Father Junipero Serra, a Franciscan missionary, explored the California coast from San Diego to the Monterey Bay area in 1769. As a result of this expedition, Spanish missions to convert the native population, *presidios* (forts), and towns were established. The Franciscan missionary friars established 21 missions in Alta California (the area north of Baja California), beginning with Mission San Diego in 1769 and ending with the mission in Sonoma established in 1823. The purpose of the missions and presidios was to establish Spanish economic, military, political, and religious control over the Alta California territory. Mission San Gabriel Archangel was founded in 1771, east of what is now Los Angeles, to convert the Tongva or Gabrielino. Mission San Luis Rey was established in 1798 on the San Luis Rey River (in what is now northern San Diego County) to convert the Luiseño (Castillo 1978). Some missions later established outposts in inland areas. An *asistencia* (mission outpost) of Mission San Luis Rey, known as San Antonio de Pala, was built in Luiseño territory along the upper San Luis Rey River near Mount Palomar in 1810 (Pourade 1961). A chapel administered by Mission San Gabriel Archangel was established in the San Bernardino area in 1819 (Bean and Smith 1978). The present *asistencia* within the western outskirts of present-day Redlands was built circa 1830 (Haenszel and Reynolds 1975).

The missions sustained themselves through cattle ranching and traded hides and tallow for supplies brought by ship. Large cattle ranches were established by Mission San Luis Rey at Temecula and San Jacinto (Gunther 1984). The Spanish also constructed *presidios*, or forts, at San Diego and Santa Barbara, and established a *pueblo*, or town, at Los Angeles. The Spanish period in California began in 1769 with the Portolá expedition and ended in 1821 with Mexican independence.

After Mexico became independent from Spain in 1821, what is now California became the Mexican province of Alta California. The Mexican government closed the missions in the 1830s and former mission

lands were granted to retired soldiers and other Mexican citizens for use as cattle ranches. Much of the land along the coast and in the interior valleys became part of Mexican land grants or "ranchos" (Robinson 1948). The rancho owners lived in an adobe house on the rancho. The Mexican period includes the years 1821 to 1848.

The American period began when Mexico and the U.S. signed the Treaty of Guadalupe Hidalgo in 1848 that ended the Mexican-American War. As a result of the treaty, Alta California became part of the U.S. as the territory of California. Rapid population increase occasioned by the Gold Rush of 1849 allowed California to become a state in 1850. Most Mexican land grants were confirmed to the grantees by U.S. courts, but usually with more restricted boundaries, which were surveyed by the U.S. Surveyor General's office. Land that was not part of a land grant was owned by the U.S. government until it was acquired by individuals through purchase or homesteading. Floods and drought in the 1860s greatly reduced the cattle herds on the ranchos, making it difficult to pay the new American taxes on the thousands of acres they owned. Many Mexican-American cattle ranchers borrowed money at usurious rates from newly arrived Anglo-Americans. The resulting foreclosures and land sales transferred most of the land grants into the hands of Anglo-Americans (Cleland 1941).

3.6 Project Area History

In 1845 Pauline Weaver and Isaac Williams applied to Mexican Governor Pio Pico to grant them the Johnson and San Gorgonio ranchlands. The two men however took possession of the land before their legal claim was accepted and their claim to the land was not valid. Weaver occupied an adobe, which is in what is now Cherry Valley (Beaumont Library 2021). On October 10, 1853, Isaac William Smith purchased a third of the San Gorgonio Rancho from Williams without realizing that the deed was invalid (Beaumont Library 2021). On December 18, 1859, William F. Edgar Purchased William's homeplace and later began buying government land that had been part of the San Gorgonio Rancho. On April 30, 1868, Edgar purchased what remained of the San Gorgonio Ranch after it had passed through various owners (Beaumont Library 2021). Edgar then bought one half of Weaver's interest in the rancho, establishing a farm and winery nearby (Beaumont Library 2021). In 1875 a railroad depot and telegraph office was established in the area by the Southern Pacific Railroad (Beaumont Library 2021; Lech 2018).

On August 21, 1879, a post office was established at the Summit Southern Pacific Railroad Station in San Gorgonia (misspelled by Washington D.C.), but it was later closed in 1881 (Beaumont Library 2021). In 1884 George C. Egan purchased land from the Southern Pacific Railroad around its Summit Station and established the town of San Gorgonio. Egan soon established a post office and became the town's first postmaster. On September 8, 1886, the post office officially changed its name to Beaumont which means *beautiful mountain* in French (Beaumont Library 2021). On August 12, 1911, the Beaumont Township was made a library district by a two-to-one vote and was officially incorporated in 1902 (Beaumont Library 2021). Today Beaumont is known as an affordable residential community for persons looking to commute from San Diego and Los Angeles Counties (Kamin 2019).

4.0 METHODS

4.1 Personnel Qualifications

All phases of the cultural resources investigation were supervised by Registered Professional Archaeologist (RPA) John O'Connor, Ph.D., who meets the Secretary of the Interior's Professional Qualifications Standards for prehistoric and historical archaeology. Fieldwork was conducted by Staff Archaeologist Robert Cunningham. Julian Acuña, M.A., RPA served as primary author of this report with assistance from Sonia Sifuentes, M.S., RPA. Lisa Westwood, RPA provided technical report review and quality assurance.

John O'Connor, RPA has over 12 years of archaeological experience in North America and the Pacific Islands, experience that includes cultural resources management, academic research, museum collections management, and university teaching. Dr. O'Connor meets the Secretary of the Interior's Professional Qualifications Standards for prehistoric and historic archaeology. He is well versed in the evaluation of impacts to cultural resources for CEQA and NHPA projects, and he has written or otherwise contributed to numerous environmental compliance documents. Dr. O'Connor serves as the Southern California Cultural Resources Manager for ECORP.

Robert Cunningham is a Staff Archaeologist for ECORP and has more than 13 years of experience in cultural resources management, primarily in southern California. He holds a B.A. in Anthropology and has participated in and supervised numerous surveys, test programs, and data recovery excavations for both prehistoric and historical sites; and has cataloged, identified, and curated thousands of artifacts. He has conducted evaluations of cultural resources for eligibility for the NRHP and CRHR.

Julian Acuña, RPA, is an Associate Archaeologist with over six years of experience in cultural resources management. Mr. Acuña holds an M.A. in Applied Archaeology and a B.A. Cum Laude in Anthropology from California State University, San Bernardino. He meets the Secretary of the Interior's Professional Qualifications Standards for prehistoric and historic archaeology. He has participated in various aspects of archaeological fieldwork including survey, test excavations, construction monitoring, the recording of both pre-contact and historic-period archaeological sites, and laboratory work for the analysis and cataloging of artifacts from multi-component sites.

Sonia Sifuentes, RPA is a Senior Archaeologist at ECORP and has more than 14 years of experience in cultural resources management, primarily in southern California. Ms. Sifuentes holds a M.S. in Archaeology of the North and has participated in and supervised numerous surveys, test programs, and data recovery excavations for both prehistoric and historical sites; and has cataloged, identified, and curated thousands of artifacts. She has conducted evaluations of cultural resources for eligibility for the NRHP and CRHR. Ms. Sifuentes is experienced in the organization and execution of field projects in compliance with Section 106 of the National Historic Preservation Act (NHPA) and CEQA. She has contributed to and authored numerous cultural resources technical reports, research designs, and cultural resources management plans.

Lisa Westwood, RPA meets the Secretary of the Interior's Professional Qualifications Standards for prehistoric and historic archaeology with 26 years of experience. She holds a B.A. in Anthropology and an M.A. in Anthropology (Archaeology). She is the Director of Cultural Resources for ECORP.

4.2 Records Search Methods

ECORP requested a records search for the property at the Eastern Information Center (EIC) of the CHRIS at University of California, Riverside on January 10, 2022. The purpose of the records search was to determine the extent of previous surveys within a 1-mile (1,600-meter) radius of the Proposed Project location, and whether previously documented pre-contact or historic archaeological sites, architectural resources, or traditional cultural properties exist within this area.

In addition to the official records and maps for archaeological sites and surveys in Riverside County, the following historic references were also reviewed: Built Environment Resources Directory for Riverside County (OHP 2022); *The National Register Information System* (National Park Service [NPS] 2021); *Office of Historic Preservation, California Historical Landmarks* (OHP 2019); *California Historical Landmarks* (OHP 2019 and updates); and *Caltrans Local Bridge Survey* (Caltrans 2019).

Other references examined include historic GLO land patent records (Bureau of Land Management [BLM] 2022). Historic maps reviewed include the following.

- 1942 USGS Banning, California topographic quadrangle map (1:62,500 scale),
- 1943 USGS Banning, California topographic quadrangle map (1:62,500 scale),
- 1953 USGS Beaumont, California topographic quadrangle map (1:24,000 scale),
- 1956 USGS Banning, California topographic quadrangle map (1:62,500 scale),
- 1959 USGS Santa Ana, California topographic quadrangle map (1:250,000 scale),
- 1965 USGS Santa Ana, California topographic quadrangle map (1:250,000 scale), and
- 1984 USGS Palm Springs, California topographic quadrangle map (1:100,000 scale).

Historic aerial photos taken in 1966, 1967, 1972, 1996, 2002, 2005, 2009, 2010, 2012, 2014, 2016, and 2018 (NETROnline 2022) were also reviewed for any indications of property usage and built environment.

4.3 Sacred Lands File Coordination Methods

In addition to the record search, ECORP contacted the California Native American Heritage Commission (NAHC) on January 10, 2022, to request a search of the Sacred Lands File for the APE. (Attachment A). This search will determine whether or not Sacred Lands have been recorded by California Native American tribes within the APE, because the Sacred Lands File is populated by members of the Native American community with knowledge about the locations of tribal resources. In requesting a search of the Sacred Lands File, ECORP solicited information from the Native American community regarding Tribal cultural resources, but the responsibility to formally consult with the Native American community lies exclusively

with the federal and local agencies under applicable state and federal law. ECORP was not delegated authority by the lead agencies to conduct tribal consultation.

4.4 Field Methods

On March 21, 2022, ECORP subjected the APE to an intensive pedestrian survey under the guidance of the *Secretary of the Interior's Standards for the Identification of Historic Properties* (NPS 1983) using 15-meter transects. At that time, the ground surface was examined for indications of surface or subsurface cultural resources. The general morphological characteristics of the ground surface were inspected for indications of subsurface deposits that may be manifested on the surface, such as circular depressions or ditches. Whenever possible, the locations of subsurface exposures caused by such factors as rodent activity, water or soil erosion, or vegetation disturbances were examined for artifacts or for indications of buried deposits. No subsurface investigations or artifact collections were undertaken during the pedestrian survey.

All cultural resources encountered during the survey were recorded using Department of Parks and Recreation (DPR) 523-series forms approved by the California OHP. The resources were photographed, mapped using a handheld Global Positioning System receiver, and sketched as necessary to document their presence using appropriate DPR forms.

5.0 RESULTS

5.1 Records Search

ECORP requested a records search of the CHRIS from the EIC on January 10, 2022. EIC provided the CHRIS results to ECORP on March 17, 2022 (Appendix A).

5.1.1 Previous Research

Thirty-three previous cultural resource investigations have been conducted within one mile of the property, covering less than 10 percent of the total area surrounding the property within the record search radius (Table 5-1). The previous studies were conducted between 1981 and 2019.

Table 5-1. Previous Cultural Studies In or Within One Mile of the Project Area

Report Number	Author(s)	Report Title	Year	Includes Portion of the Project Area?
RI-01432	Scientific Resource Surveys, Inc.	Archaeological Report on Grading Monitoring Activities at Stewart Ranch, Riverside County, California	1986	No
RI-01433	Scientific Resource Surveys, Inc.	An Historical Study of Stewart Ranch in Riverside County, California	1985	No
RI-01434	Scientific Resource Surveys, Inc.	Cultural Resources Report on 900 Acres Parcel (Portions of the Old Stewart Ranch) Located in the Banning/Beaumont Area, Riverside County, California	1981	No
RI-01830	Sutton, Mark Q.	An Archaeological Assessment of Parcel 18132, Beaumont Area of Riverside County, California	1984	No
RI-02203	Drover, C. E.	An Archaeological Assessment of the Hovchild Property, Riverside County, California	1984	No
RI-02210	Underwood, J., Cleland, J., Wood, C. M., and Apple, R.	Preliminary Cultural Resources Survey Report for the US Telecom Fiber Optic Cable Project, From San Timoteo Canyon to Socorro, Texas: The California Segment	1986	No
RI-02917	Davis, McMillan	Cultural Resources Survey of the Proposed Sewer System for the City of Beaumont California	189	No
RI-03002	Drover, Christopher E.	Environmental Impact Evaluation: An Archaeological Assessment of Seneca Springs Project, Riverside County Beaumont, California	1990	No
RI-03421	Brown, Joan and Juanita Shinn	Cultural Resources Literature Review for the 1,162 Acre Deutsch Specific Plan Project, Located in the City of Beaumont, Riverside County, California	1989	No

Table 5-1. Previous Cultural Studies In or Within One Mile of the Project Area

Report Number	Author(s)	Report Title	Year	Includes Portion of the Project Area?
RI-03852	Whitney-Desautels, Nancy	Cultural Resource Assessment of the San Gorgonio Pass Water Agency Water Importation Project, Riverside and San Bernardino Counties, California	1993	No
RI-03997	Shepard, Richard S. and Jeanette A. McKenna	A Phase I Cultural Resource Investigation of a 3-Acre Parcel and Associated Pipeline, Beaumont, Riverside County, California	1996	No
RI-04840	Demak, Carol R.	Report of Phase I Archaeological Assessment of a 23-Acre Parcel in Beaumont, Riverside County	2002	No
RI-05136	Archer, Gavin H. and Marian L. Kearin	Cultural Resource Inventory and Paleontological Assessment Hovchild Property, City of Beaumont, County of Riverside, California	2003	No
RI-06722	Brunzell, David	Cultural Resources Assessment and Historic Evaluations: Deutsch Property Specific Plan, City of Banning, Riverside County, California	2006	No
RI-07055	Tang, Bai and Michael Hogan	Historical/Archaeological Resources Survey Report: Assessor's Parcel Number 419-170-031, in the City of Beaumont, Riverside County, California	2007	Yes
RI-07288	Mariam Dahdul, Daniel Ballester, and Laura H. Shaker	Identification and Evaluation of Historic Properties Recycled Water System in and Near the Cities of Beaumont and Calimesa, Riverside County, California	2007	No
RI-07364	Crews, Rachel G. and Jay K. Sander	Archaeological and Paleontological Monitoring of a 29.7-Acre Project Area at the Northwest Corner of the First Street and Commerce Way Beaumont, Riverside County, California	2007	No
RI-08027	Carla Allred	Letter Report: Proposed Cellular Tower Project(s) in Riverside County, California, Site Number(s)/Name(s): IE-04965A/Beaumont Health Center TCNS# 47154	2009	No
RI-08449	Bai "Tom" Tang, Michael Hogan, Josh Smallwood, and Terri Jacquemain	Cultural Resources Technical Report City of Banning General Plan	2004	No
RI-08977	Matthew M. DeCarlo and William T. Eckhardt	Cultural Resources Inventory of Three Construction Yards and the Desert Center DC-2 Yard Distribution Alignment of the Southern California Edison (SCE) Devers-Palo Verde 2 (DPV2) Project, Riverside County, California	2011	No

Table 5-1. Previous Cultural Studies In or Within One Mile of the Project Area

Report Number	Author(s)	Report Title	Year	Includes Portion of the Project Area?
RI-09167	Roderic, McLean, Natalie Brodie, Jacqueline Hall, Shannon Carmack, Phil Fulton, Ingri Quon, Erin Martinelli, Richard Erickson, and Jay Michalski	Cultural Resources Assessment and Class III Inventory Volume I West of Devers Project San Bernardino and Riverside Counties, California	2013	No
RI-09385	Matthew M. DeCarlo and Diane L. Winslow	Engineering Refinement Survey and Recommendation of Eligibility for Cultural Resources with Southern California Edison Company's West of Devers Upgrade Project, Riverside and San Bernardino Counties, California	2015	No
RI-09460	Bai "Tom" Tang and Michael Hogan	Phase I Historical/Archaeological Resource Survey Seasons at Beaumont Project City of Beaumont Riverside, California	2015	No
RI-09570	Matthew M. DeCarlo, Diane L. Winslow, Audry Williams, and Andy Belcourt	Cultural Resource Impact Assessment and Evaluation Status Report for Southern California Edison Company's West of Devers Upgrade Project, Riverside and San Bernardino Counties, California	2015	No
RI-09669	Carrie D. Wills, Sarah A. Williams, and Kathleen A. Crawford	Cultural Resources Records Search for Cellco Partnership and their Controlled Affiliates as Verizon Wireless Candidate "Lotus", 40 Pennsylvania Avenue, Beaumont, Riverside County, California	2015	No
RI-10157	Audry Williams and Andrew Belcourt	Archival Research Evaluation Results of 33 Cultural Resources for Southern California Edison Company's West of Devers Upgrade Project, Riverside and San Bernardino Counties, Volume 1	2014	No
RI-10219	Heather R. Puckett	Letter Report: Cultural Resources Summary for the Proposed Verizon Wireless Inc Property at the Potrero Site, 81 Highland Springs Avenue, Beaumont, Riverside County, California 92223	2015	No
RI-10449	Gabriel Ocampo	Archaeological Sensitivity Assessment RV91XSB14A/ 9CAB012642A, E. 6th Street & Palm Avenue, Beaumont, Riverside County, California 92223, EBI Project Number: 6117007121, TCNS Number 165348	2018	No

Table 5-1. Previous Cultural Studies In or Within One Mile of the Project Area

Report Number	Author(s)	Report Title	Year	Includes Portion of the Project Area?
RI-10461	William T. Eckhardt, Matthew M. DeCarlo, Doug Mengers, Sherri Andrews, Don Laylander, and Tony Quach	Archaeological Investigations and Monitoring for the Construction of the Devers-Palo Verde No. 2 Transmission Line Project, Riverside County, California	2015	No
RI-10478	Jeanette A. McKenna	A Phase I CEQA/Class III NEPA (NHPA Section 106) Investigation for the 6th/Maple Septic Conversion Project in the City of Beaumont, Riverside Co., California	2018	No
RI-10502	Kathleen Crawford	Direct APE Historic Architectural Assessment for the Cellco Partnership and its Controlled Affiliates Doing Business as Verizon Wireless Candidate 'Lotus', 40 Pennsylvania Avenue, Beaumont, Riverside County, California	2015	No
RI-10754	Andrew J. Garrison and Brian F. Smith	A Class III Historic Resource Study for Phase 3 of the Atwell Project for Section 106 Compliance, SPL- Banning, California	2019	No
RI-10766	Andrew J. Garrison and Brian F. Smith	A Class III Historic Resource Study for Phase 2 of the Atwell Project for Section 106 Compliance, SPL-, Banning, California	2018	No

The results of the records search indicate that none of the property has been previously surveyed for cultural resources, and therefore, a pedestrian survey of the APE was warranted.

The records search also determined that 15 previously recorded historic-period cultural resources are located within one mile of the Project Area (Table 5-2). These resources consist of eight single family properties, two transmission lines, one water conveyance system, one railroad, one area of landscaping with associated refuse scatter, one highway/trail, and one cemetery. There are no previously recorded cultural resources within or adjacent to the Project Area.

Table 5-2. Previously Recorded Cultural Resources In or Within One Mile of the Project Area

Site Number CA-RIV-	Primary Number P-33-	Recorder and Year	Age/ Period	Site Description	Within Project Area?
--	006195	Gwen Bronson (1983)	Historic	Single family property	No
--	006200	Jim Warner (1983)	Historic	Single family property	No

Table 5-2. Previously Recorded Cultural Resources In or Within One Mile of the Project Area

Site Number CA-RIV-	Primary Number P-33-	Recorder and Year	Age/ Period	Site Description	Within Project Area?
--	006201	Jim Warner (1983)	Historic	Single family property	No
--	006202	Gwen Bronson (1983)	Historic	Single family property	No
--	006203	Gwen Bronson (1983)	Historic	Single family property	No
--	006204	Gwen Bronson (1983)	Historic	Single family property	No
--	006220	Gwen Bronson (1983)	Historic	Single family property	No
--	006227	Gwen Bronson (1983)	Historic	Single family property	No
006381	009498	Ashkar, S., Jones & Stokes (1966); Carrie Chasteen (2003); Taniguchi, Christeen (2005); Wilson, S. and K. Chimel (2009); Scott Kremkau (2012); T. Baurley and J.M. Sanka (2015); Daniel Leonard (2016); P. Moloney, R. Elder, W. Blodgett (2017)	Historic	Union Pacific/Southern Pacific Railroad segment(s)	No
--	013829	Harris, N (2004)	Historic	Landscaping and refuse scatter	No
007997	015033	Brunzell, David (2006); (J. Miller, C. Morgan, R. Goodwin, J. Hall (2013)	Historic	Water conveyance system	No
013001	015035	J. Brock (1998); Brunzell, David (2006); S. Justus, B. Wilson, A. Giacinto (2010); L. Davidson, R. Goodwin, B. Smith (2012); L. Davidson, R. Goodwin, B. Smith (2012); Wendy L. Tinsley Becker, Steven Treffers (2013); Wendy L. Tinsley Becker, Steven Treffers (2014); S. Kremkau (2015)	Historic	Engineering structure/Transmission Line	No
--	023484	LSA (2013); Audry Williams (2014)	Historic	Engineering structure/Transmission Line	No
--	028614	McKenna et al. (2018)	Historic	Highway/Trail	No
--	028622	K.A. Crawford (2015)	Historic	Cemetery	No

5.1.2 Records

The Built Environment Resources Directory for Riverside County (OHP 2022) lists 13 properties within one mile of the Project Area (Table 5-3). Four properties are listed as evaluated as 6Y – determined ineligible for the NRHP by consensus through Section 106 process. The remaining nine properties are evaluated as 5S2 – determined individually eligible for local listing or designation.

Table 5-3. Built Environment Resources In or Within One Mile of the Project Area

Street Number	Street Name	City	Evaluation Code	Within Project Area?
1320	East 8th Street	Beaumont	6Y	No
1104	East 8th Street	Beaumont	5S2	No
674	Chestnut	Beaumont	5S2	No
690	Chestnut	Beaumont	6Y	No
1035	East 12th Street	Beaumont	5S2	No
683	Michigan Avenue	Beaumont	6Y	No
1017	Michigan Avenue	Beaumont	5S2	No
552	Palm Avenue	Beaumont	5S2	No
556	Palm Avenue	Beaumont	5S2	No
638	Palm Avenue	Beaumont	5S2	No
825	Palm Avenue	Beaumont	6Y	No
752	Pennsylvania Avenue	Beaumont	5S2	No
889	Pennsylvania Avenue	Beaumont	5S2	No

The National Register Information System (NPS 2022) failed to reveal any eligible or listed properties within the Project Area. The nearest National Register property is located 3.2 miles east of the Project Area in Banning.

Resources listed as *California Historical Landmarks* (OHP 2019) and by the OHP (OHP 2020) were reviewed on January 7, 2022. There are no landmarks listed within the Project Area.

Historic GLO land patent records from the BLM's patent information database revealed that the northeastern quarter of Section 1 was patented to the Southern Pacific Railroad Co on January 9, 1885. The federal government granted lands to aid in the construction of railroad and telegraph lines from the Midwest to pacific coast (Table 5-4; BLM 2022).

Table 5-4. GLO Land Patent Records

Patentee	Patent Date	Serial Number	Patent Type/Authority	Location
Southern Pacific Railroad Co	1/9/1885	CACAAA 072905	Grant-RR-Atlantic and Pacific (14 Stat. 292)	California

The Caltrans Bridge Local and State Inventories (Caltrans 2019) did not list any bridges within one mile of the Project Area.

5.1.3 Map Review and Aerial Photographs

The review of historical aerial photographs and maps of the Project Area provide information on the past land uses of the property and potential for buried archaeological sites. Based on this information, the property was undeveloped. Following is a summary of the review of historical maps and photographs.

The 1942 and 1943 USGS Banning, California (1:62,500) topographic quadrangle map shows the Project Area as undeveloped. In the vicinity roads bound the property. The 1953 USGS Beaumont, California (1:24,000) topographic quadrangle map shows the Project Area unchanged. Structures are visible adjacent to the Project Area on the north, south, and east. Maps from 1956 to present are not clear enough to show any changes within the Project Area (NETROnline 2022).

Aerial photography from 1966 shows the property as undeveloped. The Project Area is bounded by undeveloped land and residential properties. On 1967 aerial photographs, the Project Area remains largely unchanged. An undeveloped dirt track, which is shaped like an infinity symbol, is visible in the 1967 photograph in the northeast corner of the Project Area, likely used for recreational activities. On 1972 aerial photographs, structures are visible in the west and east of the Project Area, although their use in unintelligible. On 1996 aerial photographs, the previous structures are no longer visible. In the vicinity, more residential and commercial properties are present. Conditions remain unchanged to present day (Nationwide Environmental Title Research 2022).

5.2 Sacred Lands File Results

ECORP received the results of the Sacred Lands File search by the NAHC on April 10, 2022. The search of the Scared Lands File was negative and failed to indicate the presence of Native American cultural resources in the Project Area. While the search of the Sacred Lands File failed to indicate the presence of sacred lands, the search results alone doesn't preclude the presence of resources of important to Native American groups in the vicinity and further data gathering efforts as part of tribal consultation were completed by the lead agency to ensure the potential sensitivity for Native American resources was understood.

Correspondence between the NAHC and ECORP is included in Appendix B. Any additional comments received after the submission of this report will be forwarded to the Lead Agency for further consideration and appropriate action.

5.3 Field Survey Results

ECORP surveyed the entire Project Area for cultural resources on March 21, 2022 (Appendix C). Ground visibility in the Project Area was approximately 10 to 15 percent. Disturbances include past weed abatement, OHV tracks, modern refuse, and animal burrows.



Figure 5-1. Project Area overview from southwestern (view east; March 21, 2022).



Figure 5-2. Project Area overview from northwestern corner (view east; March 21, 2022).



Figure 5-3. Overview of modern disturbance (view east; March 21, 2022).

5.3.1 Cultural Resources

As a result of the field survey, one newly identified cultural resource was recorded within the Project Area. XA-001 is a historic-period site composed of a concrete foundation. The western half of the foundation is a concrete pad, and the eastern half is a vault.

Site descriptions follow, and confidential DPR site records are provided in Appendix D, which as been redacted.

5.3.1.1 XA-001

The site is a historic-period concrete foundation with vault measuring 20 feet east/west by 10 feet, 1 inch north/south. The west half of the foundation is a concrete pad measuring 10 feet, 2 inches east/west by 10 feet, 2 inches north/south. The east half is a vault measuring 9 feet,10 inches east/west by 10 feet, 1 inch north/south. The entire feature is approximately 8 inches above ground surface. The site is located near the northern boundary of the Project Area. Although structures in the same location are visible on historic aerial photographs in this area, their use is unknown.

The site is disturbed from weed abatement and possible discing, and structures are no longer present in the Project Area. Historic maps and aerial photographs indicate the foundation was likely constructed between 1967 and 1972 as two structures are visible adjacent to the site (NETROnline 2022). Although it is not clear in the aerial photographs to discern what the structures were used for, it is likely they were used for agricultural purposes. By 2002, the structures are no longer visible. Structures during this time period were all equipped with indoor plumbing and trash collection services or municipal dumps were widely available. As such, there is a very low likelihood that these structures had privies, cellars, or other features that could lead to sources of archaeological data. No subsurface archaeological testing was warranted, as a result.

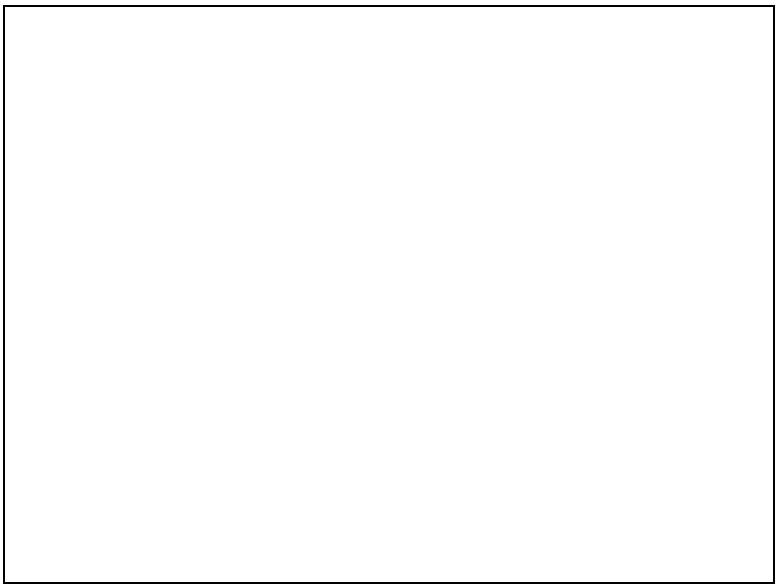


Figure 5-4. REDACTED XA-001: Historic-period concrete foundation and vault (March 21, 2022).

6.0 EVALUATION CRITERIA

6.1 Federal Evaluation Criteria

The resources were evaluated using the NRHP eligibility criteria following the regulations implementing Section 106 of the NHPA (36 CFR Part 800). The eligibility criteria for the NRHP are as follows (36 CFR 60.4):

> The quality of significance in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects of state and local importance that possess aspects of integrity of location, design, setting, materials, workmanship, feeling, association, and
>
> (A) Is associated with events that have made a significant contribution to the broad patterns of our nation's history and cultural heritage;
>
> (B) Is associated with the lives of persons important in our past;
>
> © Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or
>
> (D) Has yielded, or may be likely to yield, information important in prehistory or history.

In addition, the resource must be at least 50 years old, except in exceptional circumstances (36 CFR 60.4).

Historical buildings, structures, and objects are usually eligible under Criteria A, B, and C based on historical research and architectural or engineering characteristics. Archaeological sites are usually eligible under Criterion D, the potential to yield information important in prehistory or history. The lead federal agency makes the determination of eligibility and seeks concurrence from the State Historic Preservation Officer (SHPO).

Effects to NRHP-eligible resources (historic properties) are adverse if the Project may alter, directly or indirectly, any of the characteristics of a Historic Property that qualify the property for inclusion in the NRHP in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association.

6.2 State Evaluation Criteria

Under State law (CEQA), cultural resources are evaluated using CRHR eligibility criteria in order to determine whether any of the resources are Historical Resources, as defined by CEQA. CEQA requires that impacts to Historical Resources be identified and, if the impacts would be significant, that mitigation measures to reduce the impacts be applied.

A Historical Resource is a resource that:

1. is listed in or has been determined eligible for listing in the CRHR by the State Historical Resources Commission;
2. is included in a local register of historical resources, as defined in PRC 5020.1(k);
3. has been identified as significant in a historical resources survey, as defined in PRC 5024.1(g); or
4. is determined to be historically significant by the CEQA lead agency CCR Title 14, Section 15064.5(a)]. In making this determination, the CEQA lead agency usually applies the CRHR eligibility criteria.

The eligibility criteria for the CRHR (CCR Title 14, Section 4852(b)) state that a resource is eligible if:

1. it is associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the U.S.;
2. it is associated with the lives of persons important to local, California, or national history.
3. it embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master or possesses high artistic values; or
4. it has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California, or the Nation.

In addition, the resource must retain integrity. Integrity is evaluated with regard to the retention of location, design, setting, materials, workmanship, feeling, and association (CCR Title 14, Section 4852(c)).

Historical buildings, structures, and objects are usually eligible under Criteria 1, 2, and 3 based on historical research and architectural or engineering characteristics. Archaeological sites are usually eligible under Criterion 4, the potential to yield information important in prehistory or history. The CEQA lead agency makes the determination of eligibility. Cultural resources determined eligible for the NRHP by a federal agency are automatically eligible for the CRHR.

Impacts to a Historical Resource (as defined by CEQA) are significant if the resource is demolished or destroyed or if the characteristics that made the resource eligible are materially impaired (CCR Title 14, Section 15064.5(a)).

Lastly, a Tribal Cultural Resource, as defined in Section 21074 of the California PRC, can only be identified and evaluated by culturally-affiliated California Native American tribes through government-to-government consultation. As such, only the consultation record of the CEQA lead agency, and not this technical report, addresses Tribal Cultural Resources.

7.0 EVALUATION

This section provides an evaluation of the significance of the historic-period archaeological find located within the Project Area relative to eligibility criteria set forth in the NRHP and the CRHR.

7.1 Site XA-001

XA-001 is a historic-period concrete foundation. This site consists of a singular foundation divided into a concrete pad and vault. As stated above, historic maps and aerial photographs indicate the foundation was likely constructed between 1967 and 1972 as two structures are visible adjacent to the site. Although it is not clear in the aerial photographs to discern what the structures were used for, it is likely they were used for agricultural purposes. By 2002, the structures are no longer visible (NETROnline 2022).

This site dates to the late 1960's to the early 1970's and is not associated with any important historical event and is otherwise disconnected from the human activity that produced it and does not contribute to the broad patterns of history and therefore does not meet eligibility criteria under NRHP Criterion A/CRHR Criterion 1. Similarly, archival research indicated the site cannot be associated with a person or group of people important in history and the site is likely a ubiquitous feature found in agricultural properties. Therefore, this site does not meet eligibility criteria under NRHP Criterion B/CRHR Criterion 2. XA-001 does not convey any discernable architectural style, method of construction, and does not represent the work of a master or important creative individual and is therefore not eligible under NRHP Criterion C/CRHR Criterion 3. Lastly, this site does not provide important information in history and its data potential lies in the historic record. The structures that were associated with this site have been removed and there is no indication of a subsurface deposit with the potential to yield additional important information in prehistory or history and is therefore not eligible under NRHP Criterion D/CRHR Criterion 4.

XA-001 is evaluated as not eligible for listing in the NRHP and CRHR under any criteria and is neither considered to be a Historic Property for the purpose of Section 106 NHPA, nor Historical Resources under CEQA.

8.0 MANAGEMENT CONSIDERATIONS

8.1 Conclusions

As a result of the field survey, one historic-period site (XA-001) was identified on the property. XA-001 has been evaluated as not eligible for listing in the NRHP or CRHR under any criteria. Therefore, this find is not considered a Historical Resource under CEQA or Historic Property under Section 106 NHPA (if applicable).

8.2 Likelihood for Subsurface Cultural Resources

The Project Area contains Pleistocene and Holocene sediments can be contemporaneous with human occupation of the region. Although no precontact resources were identified during the field survey, due to the presence of Pleistocene and Holocene alluvial deposits within the Project Area, there exists a low to moderate potential for buried precontact archaeological sites within the Project Area.

8.3 Recommendations

Site XA-001 was evaluated for eligibility under NRHP and CRHR eligibility criteria and recommended not eligible under any criteria. Regardless, in all cases, the lead agency will require that any unanticipated (or post-review) discoveries found during Project construction be managed through a procedure designed to assess and treat the find as quickly as possible and in accordance with applicable state and federal law. However, no ground-disturbing activity or demolition should occur until the lead agencies concur with the identification and evaluation of eligibility of cultural resources, including archaeological sites, standing structures.

To assist with the identification of potential finds and to manage potential impacts to resources, ECORP recommends the following:

- At the onset of construction, a Worker Environmental Awareness Program (WEAP) will be developed by the qualified professional archaeologist. A qualified professional archaeologist with experience with sensitive cultural resources in the region will present the WEAP to all personnel working in the Project Area (either temporarily or permanently) prior to the start of project activities. The WEAP may be videorecorded and used to train newly hired workers or those not present for the initial WEAP. The WEAP could include, but will not be limited to: discussions of the sensitive cultural resources associated with the project, project-specific measures to avoid or eliminate impacts to these resources, consequences for not complying with project permits and agreements, and contact information for the lead archaeologist. Logs of personnel who have taken the training will be kept on the site at the construction or project office.

8.4 Post-Review Discoveries

There always remains the potential for ground-disturbing activities to expose previously unrecorded cultural resources. Both CEQA and Section 106 of the NHPA require the lead agency to address any

unanticipated cultural resource discoveries during Project construction. Therefore, ECORP recommends the following mitigation measures be adopted and implemented by the lead agency to reduce potential adverse impacts to less than significant:

- If subsurface deposits believed to be cultural or human in origin are discovered during construction by contractors, the construction supervisor must ensure that all work halts within a 100-foot radius of the discovery. The lead agency shall ensure that a qualified professional archaeologist, meeting the Secretary of the Interior's Professional Qualification Standards for pre-contact and historic archaeologist, is retained (recommended prior to grading permit approval) to evaluate the significance of the find, and shall have the authority to modify the no-work radius as appropriate, using professional judgment. The following notifications shall apply, depending on the nature of the find:

    1. If the professional archaeologist determines that the find does not represent a cultural resource, work may resume immediately, and no agency notifications are required.

    2. If the professional archaeologist determines that the find does represent a cultural resource from any time period or cultural affiliation, the archaeologist shall immediately notify the lead federal agency, the lead CEQA agency, and landowner. The agencies shall consult on a finding of eligibility and implement appropriate treatment measures, if the find is determined to be a Historical Resource under CEQA, as defined in Section 15064.5(a) of the CEQA Guidelines or a historic property under Section 106 NHPA, if applicable. Work may not resume within the no-work radius until the lead agencies, through consultation as appropriate, determine that the site either: 1) is not a Historical Resource under CEQA or a Historic Property under Section 106; or 2) that the treatment measures have been completed to their satisfaction.

    3. If the find includes human remains, or remains that are potentially human, they shall ensure reasonable protection measures are taken to protect the discovery from disturbance (AB 2641) by maintaining at least 50 feet of buffer in all directions. The archaeologist shall notify the County Coroner (per Section 7050.5 of the Health and Safety Code). The provisions of Section 7050.5 of the California Health and Safety Code, Section 5097.98 of the California PRC, and AB 2641 will be implemented. If the Coroner determines the remains are Native American and not the result of a crime scene, the Coroner will notify the NAHC, which then will designate a Native American Most Likely Descendant (MLD) for the Project (Section 5097.98 of the PRC). The designated MLD will have 48 hours from the time access to the property is granted to make recommendations concerning treatment of the remains. If the landowner does not agree with the recommendations of the MLD, the NAHC can mediate (Section 5097.94 of the PRC). If no agreement is reached, the landowner must rebury the remains where they will not be further disturbed (Section 5097.98 of the PRC). This will also include either recording the site with the NAHC or the appropriate Information Center; using an open space or conservation zoning designation or easement; or recording a reinternment document with the county in which the property is located (AB 2641). Work may not resume within

the no-work radius until the lead agencies, through consultation as appropriate, determine that the treatment measures have been completed to their satisfaction.

The lead agency is responsible for ensuring compliance with these mitigation measures. Section 15097 of Title 14, Chapter 3, Article 7 of CEQA, *Mitigation Monitoring or Reporting*, "the public agency shall adopt a program for monitoring or reporting on the revisions which it has required in the Project and the measures it has imposed to mitigate or avoid significant environmental effects. A public agency may delegate reporting or monitoring responsibilities to another public agency or to a private entity which accepts the delegation; however, until mitigation measures have been completed the lead agency remains responsible for ensuring that implementation of the mitigation measures occurs in accordance with the program."

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LIST OF APPENDICES

Appendix A – CHRIS Information

Appendix B – Sacred Lands File Coordination

Appendix C – Project Area Photographs

Appendix D – **REDACTED** Cultural Resource Site Locations and Site Records

APPENDIX A

CHRIS Information

CHRIS Data Request Form

ACCESS AND USE AGREEMENT NO.: 34 **IC FILE NO.:** _____

To: Eastern Information Center

Print Name: Rob Cunningham Date: 1/10/2022

Affiliation: ECORP Consulting, Inc.

Address: 215 N. Fifth Street

City: Redlands State: CA Zip: 92374

Phone: (909) 307-0046 Fax: (909) 307-0056 Email: rjcunningham@ecorpconsulting.com

Billing Address (if different than above): _____

Billing Email: _____ Billing Phone: _____

Project Name / Reference: Xenia Apartments

Project Street Address: see map

County or Counties: San Bernardino

Township/Range/UTMs: T 3S, R 1W; SBBM (see maps)

USGS 7.5' Quad(s): Beaumont (1996)

PRIORITY RESPONSE (Additional Fee): yes ☐ / no ☐

TOTAL FEE NOT TO EXCEED: $ 1,000
(If blank, the Information Center will contact you if the fee is expected to exceed $1,000.00)

Special Instructions:

Information Center Use Only

Date of CHRIS Data Provided for this Request: _____

Confidential Data Included in Response: yes ☐ / no ☐

Notes: _____

CHRIS Data Request Form

Mark the request form as needed. Attach a PDF of your project area (with the radius if applicable) mapped on a 7.5' USGS topographic quadrangle to scale 1:24000 ratio 1:1 neither enlarged nor reduced and include a shapefile of your project area, if available. Shapefiles are the current CHRIS standard for submitting digital spatial data for your project area or radius. **Check with the appropriate IC for current availability of digital data products.**

- Documents will be provided in PDF format. Paper copies will only be provided if PDFs are not available at the time of the request or under specially arranged circumstances.
- Location information will be provided as a digital map product (Custom Maps or GIS data) unless the area has not yet been digitized. In such circumstances, the IC may provide hand drawn maps.
- In addition to the $150/hr. staff time fee, client will be charged the Custom Map fee when GIS is required to complete the request [e.g., a map printout or map image/PDF is requested and no GIS Data is requested, or an electronic product is requested (derived from GIS data) but no mapping is requested].

For product fees, see the CHRIS IC Fee Structure on the OHP website.

1. Map Format Choice:

Select One: Custom GIS Maps ☐ GIS Data ☐ Custom GIS Maps **and** GIS Data ☒ No Maps ☐

Any selection below left unmarked will be considered a "no. "

2. Location Information:

	Within project area	Within 1 mi. radius
ARCHAEOLOGICAL Resource Locations[1]	yes ☒ / no ☐	yes ☒ / no ☐
NON-ARCHAEOLOGICAL Resource Locations	yes ☒ / no ☐	yes ☒ / no ☐
Report Locations[1]	yes ☒ / no ☐	yes ☒ / no ☐
"Other" Report Locations[2]	yes ☒ / no ☐	yes ☐ / no ☒

3. Database Information:
(contact the IC for product examples, or visit the SSJVIC website for examples)

	Within project area	Within 1 mi. radius
ARCHAEOLOGICAL Resource Database[1]		
List (PDF format)	yes ☒ / no ☐	yes ☒ / no ☐
Detail (PDF format)	yes ☒ / no ☐	yes ☒ / no ☐
Excel Spreadsheet	yes ☒ / no ☐	yes ☒ / no ☐
NON-ARCHAEOLOGICAL Resource Database		
List (PDF format)	yes ☒ / no ☐	yes ☒ / no ☐
Detail (PDF format)	yes ☒ / no ☐	yes ☐ / no ☒
Excel Spreadsheet	yes ☐ / no ☒	yes ☐ / no ☒
Report Database[1]		
List (PDF format)	yes ☒ / no ☐	yes ☒ / no ☐
Detail (PDF format)	yes ☐ / no ☒	yes ☐ / no ☒
Excel Spreadsheet	yes ☐ / no ☒	yes ☐ / no ☒
Include "Other" Reports[2]	yes ☒ / no ☐	yes ☐ / no ☒

4. Document PDFs (paper copy only upon request)**:**

	Within project area	Within 1 mi. radius
ARCHAEOLOGICAL Resource Records[1]	yes ☒ / no ☐	yes ☐ / no ☐
NON-ARCHAEOLOGICAL Resource Records	yes ☒ / no ☐	yes ☒ / no ☐
Reports[1]	yes ☒ / no ☐	yes ☐ / no ☒
"Other" Reports[2]	yes ☒ / no ☐	yes ☐ / no ☒

CHRIS Data Request Form

5. Eligibility Listings and Documentation:

	Within project area	Within 1 mi. radius
OHP Built Environment Resources Directory[3]:		
Directory listing only (Excel format)	yes ☐ / no ☒	yes ☐ / no ☒
Associated documentation[4]	yes ☐ / no ☒	yes ☐ / no ☒
OHP Archaeological Resources Directory[1,5]:		
Directory listing only (Excel format)	yes ☒ / no ☐	yes ☒ / no ☐
Associated documentation[4]	yes ☒ / no ☐	yes ☐ / no ☒
***California Inventory of Historic Resources* (1976):**		
Directory listing only (PDF format)	yes ☒ / no ☐	yes ☐ / no ☒
Associated documentation[4]	yes ☒ / no ☐	yes ☐ / no ☒

6. Additional Information:

The following sources of information may be available through the Information Center. However, several of these sources are now available on the OHP website and can be accessed directly. The Office of Historic Preservation makes no guarantees about the availability, completeness, or accuracy of the information provided through these sources. Indicate below if the Information Center should review and provide documentation (if available) of any of the following sources as part of this request.

Caltrans Bridge Survey	yes ☐ / no ☒
Ethnographic Information	yes ☐ / no ☒
Historical Literature	yes ☐ / no ☒
Historical Maps	yes ☐ / no ☒
Local Inventories	yes ☐ / no ☒
GLO and/or Rancho Plat Maps	yes ☐ / no ☒
Shipwreck Inventory	yes ☐ / no ☒
Soil Survey Maps	yes ☐ / no ☒

---

[1] In order to receive archaeological information, requestor must meet qualifications as specified in Section III of the current version of the California Historical Resources Information System Information Center Rules of Operation Manual and be identified as an Authorized User or Conditional User under an active CHRIS Access and Use Agreement.

[2] "Other" Reports GIS layer consists of report study areas for which the report content is almost entirely non-fieldwork related (e.g., local/regional history, or overview) and/or for which the presentation of the study area boundary may or may not add value to a record search.

[3] Provided as Excel spreadsheets with no cost for the rows; the only cost for this component is IC staff time. Includes, but not limited to, information regarding National Register of Historic Places, California Register of Historical Resources, California State Historical Landmarks, California State Points of Historical Interest, and historic building surveys. Previously known as the HRI and then as the HPD, it is now known as the Built Environment Resources Directory (BERD). The Office of Historic Preservation compiles this documentation and it is the source of the official status codes for evaluated resources.

[4] Associated documentation will vary by resource. Contact the IC for further details.

[5] Provided as Excel spreadsheets with no cost for the rows; the only cost for this component is IC staff time. Previously known as the Archaeological Determinations of Eligibility, now it is known as the Archaeological Resources Directory (ARD). The Office of Historic Preservation compiles this documentation and it is the source of the official status codes for evaluated resources.

From: eickw .
To: Robert Cunningham
Subject: Option B results for the Xenia
Date: Thursday, March 17, 2022 3:20:11 PM

Hello,

Please note the files are being shared through Google Drive since it is a large size. Attached is the link to the requested files. Please note they are encrypted and password protected. You will need either 7-Zip (free software recommended to us by OHP) or WinZip. I will be sending the password in a separate email. You will have to download the file first, then right-click on the file, then choose what to open it with. This Link will only work for those emails who received this email. Trying to share or open the files with a different email will NOT work.

Client ST-6379.7

Best,

Eastern Information Center
atkins Hall Room 1313
c/o Department of Anthropology
University of California
9 University Avenue
Riverside, CA 92521- 41

"Maybe, it's not too late, to learn how to love, and forget how to hate..." Ozzy Osbourne

APPENDIX B

Sacred Lands File Coordination

Sacred Lands File & Native American Contacts List Request

Native American Heritage Commission
1550 Harbor Blvd, Suite 100
West Sacramento, CA 95691
916-373-3710
916-373-5471 – Fax
nahc@nahc.ca.gov

Information Below is Required for a Sacred Lands File Search

Project: 2021-301 Xenia Apartments

County: Riverside County

USGS Quadrangle Name: Beaumont, CA (1996)

Township: 03S **Range:** 01W **Section(s):** 1, 2, 3, 10, 11, 12

Company/Firm/Agency: ECORP Consulting, Inc.

Street Address: 215 North Fifth Street

City: Redlands **Zip:** 92374

Phone: (909) 307-0046

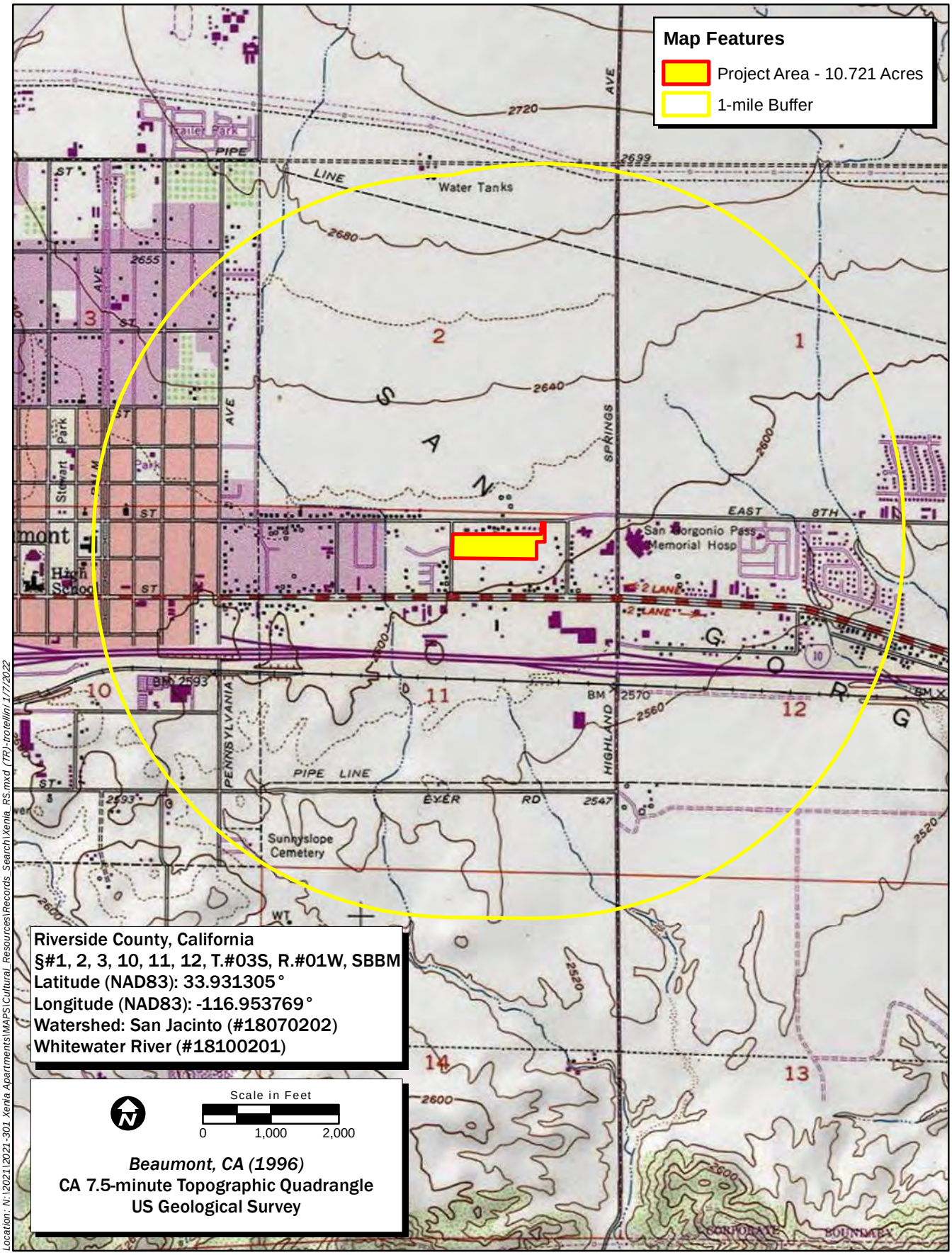
Fax: (909) 307-0056

Email:
rjcunningham@ecorpconsulting.com

Project Description: ECORP is requesting a Sacred Lands File search for the proposed construction of apartment buildings in a 10.6 acre area in Beaumont. I have attached a copy of the Sacred Lands File contact form above along with a map showing the project area. The results of this search can be sent to me at rjcunningham@ecorpconsulting.com. They can also be faxed to my attention at **(909) 307-0056**. Please reference the project number 2021-301 on all correspondence.

Please let me know if you have any questions or need any additional information.

Thanks,



Location: N:\2021\2021-301 Xenia Apartments\MAPS\Cultural Resources\Records Search\Xenia_RS.mxd (TR)-lrotellini 1/7/2022

Map Date: 1/7/2022

iService Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Records Search

2021-301 Xenia Apartments

NATIVE AMERICAN HERITAGE COMMISSION

CHAIRPERSON
Laura Miranda
Luiseño

VICE CHAIRPERSON
Reginald Pagaling
Chumash

PARLIAMENTARIAN
Russell Attebery
Karuk

SECRETARY
Sara Dutschke
Miwok

COMMISSIONER
William Mungary
Paiute/White Mountain Apache

COMMISSIONER
Isaac Bojorquez
Ohlone-Costanoan

COMMISSIONER
Buffy McQuillen
Yokayo Pomo, Yuki, Nomlaki

COMMISSIONER
Wayne Nelson
Luiseño

COMMISSIONER
Stanley Rodriguez
Kumeyaay

EXECUTIVE SECRETARY
Raymond C. Hitchcock
Miwok/Nisenan

NAHC HEADQUARTERS
1550 Harbor Boulevard
Suite 100
West Sacramento,
California 95691
(916) 373-3710
nahc@nahc.ca.gov
NAHC.ca.gov

April 13, 2022

Robert Cunningham
ECORP Consulting, Inc.

Via Email to: rjcunningham@ecorpconsulting.com

Re: 2021-301 Xenia Apartments Project, Riverside County

Dear Mr. Cunningham:

A record search of the Native American Heritage Commission (NAHC) Sacred Lands File (SLF) was completed for the information you have submitted for the above referenced project. The results were negative. However, the absence of specific site information in the SLF does not indicate the absence of cultural resources in any project area. Other sources of cultural resources should also be contacted for information regarding known and recorded sites.

Attached is a list of Native American tribes who may also have knowledge of cultural resources in the project area. This list should provide a starting place in locating areas of potential adverse impact within the proposed project area. I suggest you contact all of those indicated; if they cannot supply information, they might recommend others with specific knowledge. By contacting all those listed, your organization will be better able to respond to claims of failure to consult with the appropriate tribe. If a response has not been received within two weeks of notification, the Commission requests that you follow-up with a telephone call or email to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from tribes, please notify me. With your assistance, we can assure that our lists contain current information.

If you have any questions or need additional information, please contact me at my email address: Andrew.Green@nahc.ca.gov.

Sincerely,

Andrew Green

Andrew Green
Cultural Resources Analyst

Attachment

APPENDIX C

Project Area Photographs

PHOTOLOG

Project Name: Xenia Apartments

Project Number: 2021-301

Camera	Photo No.	Description	Facing	Date	Initials
	4302	Overview from southwest corner	East	3/21/22	RC
	4303	Overview from southwest corner	Northeast	3/21/22	RC
	4304	Overview from southwest corner	North	3/21/22	RC
	4305	Overview from west boundary	East	3/21/22	RC
	4306	Ground conditions	Ground	3/21/22	RC
	4307	Overview from northwest corner	South	3/21/22	RC
	4308	Overview from northwest corner	Southeast	3/21/22	RC
	4309	Overview from northwest corner	East	3/21/22	RC
	4310	Overview from north boundary	Southwest	3/21/22	RC
	4311	Overview from north boundary	South	3/21/22	RC
	4312	Overview from north boundary	Southeast	3/21/22	RC
	4313	Overview extension to 8th Street	South	3/21/22	RC
	4314	Overview extension to 8th Street	East	3/21/22	RC
	4315	No picture		3/21/22	RC
	4316	Overview extension to 8th Street	North	3/21/22	RC
	4317	Overview extension to 8th Street	North	3/21/22	RC
	4318	Overview extension to 8th Street	Northwest	3/21/22	RC
	4319	Overview extension to 8th Street	West	3/21/22	RC
	4320	Apartment complex eastern boundary	Ground	3/21/22	RC
	4321	Overview from southeast corner	North	3/21/22	RC
	4322	Overview from southeast corner	Northwest	3/21/22	RC
	4323	Overview from southeast corner	West	3/21/22	RC
	4324	Construction debris (concrete)	Ground	3/21/22	RC
	4325	Overview from southern boundary	East	3/21/22	RC
	4326	Overview from southern boundary	Northeast	3/21/22	RC
	4327	Overview from southern boundary	North	3/21/22	RC
	4328	Overview from southern boundary	Northwest	3/21/22	RC
	4329	Overview from southern boundary	West	3/21/22	RC
	4330	XA-001 foundation	East	3/21/22	RC
	4331	XA-001 foundation	North	3/21/22	RC
	4332	XA-001 foundation vault	North	3/21/22	RC
	4333	Heavy machine disturbance	North	3/21/22	RC
	4334	Vehicle disturbance	East	3/21/22	RC
	4335	Dumping	Southwest	3/21/22	RC















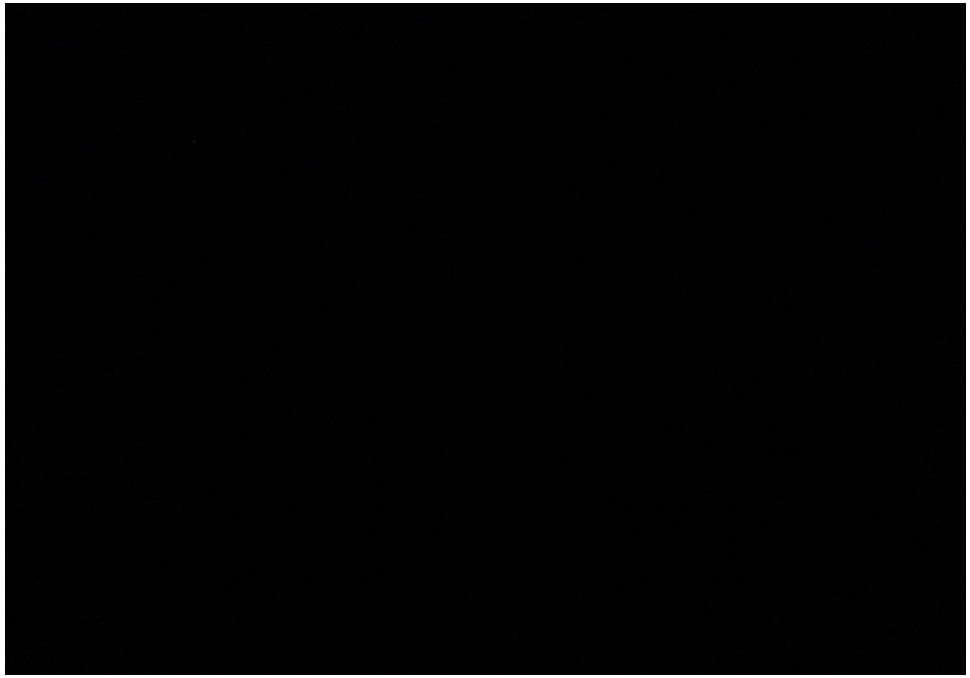















6UBN944








































IMG_4302


IMG_4303


IMG_4304


IMG_4305


IMG_4306


IMG_4307


IMG_4308


IMG_4309


IMG_4310


IMG_4311


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IMG_4333


IMG_4334


IMG_4335

REDACTED Cultural Resource Site Locations and Site Records

This Attachment contains information on the specific location of cultural resources. This information is not for publication or release to the general public. It is for planning, management, and research purposes only. Information on the specific location of pre-contact and historic sites is exempt from the Freedom of Information Act and California Public Records Act.

Appendix D

Updated Geotechnical and Infiltration Evaluation
GeoTek, Inc.
July 7, 2021, Revised September 28, 2022

UPDATED GEOTECHNICAL AND INFILTRATION EVALUATION

FOR

PROPOSED MULTI-FAMILY RESIDENTIAL DEVELOPMENT
XENIA APARTMENT PROJECT
EAST OF XENIA AVENUE AND ABOUT 200 FEET SOUTH OF EAST 8TH STREET
BEAUMONT, RIVERSIDE COUNTY, CALIFORNIA

PREPARED FOR

BEAUMONT LAND PARTNERS
556 SOUTH FAIR OAKS AVENUE
PASADENA, CALIFORNIA 91105

PREPARED BY

GEOTEK, INC.
1548 NORTH MAPLE STREET
CORONA, CALIFORNIA 92878

PROJECT NO. 2784-CR **JULY 7, 2021 (REV. SEPTEMBER 28, 2022)**

GEOTEK

GeoTek, Inc.
1548 North Maple Street, Corona, California 92878
(951) 710-1160 Office (951) 710-1167 Fax www.geotekusa.com

July 7, 2021
(Revised September 28, 2022)
Project No. 2784-CR

Beaumont Land Partners
556 South Fair Oaks Avenue
Pasadena, California 91105

Attention: Mr. Paul Onufer

Subject: Updated Geotechnical and Infiltration Evaluation
Proposed Multi-Family Residential Development
Xenia Apartment Project
Beaumont, Riverside County, California

Dear Mr. Onufer:

We are pleased to provide our updated geotechnical and infiltration report for proposed development at the subject property located in the city of Beaumont, Riverside County, California. This report presents a discussion of our evaluation and provides updated geotechnical recommendations for earthwork, foundation design, and construction.

In our opinion, site development appears feasible from a geotechnical viewpoint provided that the recommendations presented in this report are incorporated into the design and construction phases of the project.

The opportunity to be of service is sincerely appreciated. If you have any questions, please do not hesitate to call our office.

Respectfully submitted,
GeoTek, Inc.

Edward H. LaMont
CEG 1892, Exp. 07/31/24
Principal Geologist

REGISTERED GEOLOGIST
EDWARD H. LaMONT
No. 1892
Exp.
Certified Engineering Geologist
STATE OF CALIFORNIA

Gaby M. Bogdanoff
GE 3133, Exp. 06/30/24
Project Engineer

LICENSED PROFESSIONAL ENGINEER
GABY M. BOGDANOFF
NO. 3133
GEOTECHNICAL
STATE OF CALIFORNIA

Distribution: (1) Addressee via email (one PDF file)
G:\Projects\2751 to 2800\2784CR Beaumont Land Partners Xenia Apartment Project Beaumont\Updated Geo Report Sep 2022\2784-CR Updated Geotechnical and Infiltration Townhomes Xenia Street Beaumont.doc

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Figure 1 – Site Location Map
Figure 2 – Exploration Location Map

Appendix A – Logs of Borings by ESSW (2006)
Appendix B – Logs of Borings and Laboratory Test Results by Converse (2019)
Appendix C – Logs of Borings and CPT Soundings by GeoTek
Appendix D – Laboratory Test Results by GeoTek
Appendix E – Percolation/Infiltration Test Data
Appendix F – Seismic Settlement Analyses
Appendix G – General Grading Guidelines

1. PURPOSE AND SCOPE OF SERVICES

The purpose of this study was to evaluate the existing geotechnical conditions for the currently proposed development. Services provided for this study included the following:

- Research and review of readily available geologic data and past soil reports pertinent to the site,
- A site reconnaissance,
- Site exploration via two exploratory borings excavated to 20 feet below existing grade and four Cone Penetration Test (CPT) soundings to depths of about 50 feet each across the site,
- Testing of four percolation test borings to estimate the infiltration rate of the subsoils within a proposed site basin,
- Collection relatively undisturbed and bulk samples of the site soils for geotechnical and corrosion assessment,
- Review and evaluation of site seismicity,
- Engineering analyses, and;
- Compilation of this updated geotechnical and infiltration evaluation which presents our findings, conclusions, and recommendations for site development.

The intent of this report is to aid in the evaluation of the site for future proposed development from a geotechnical perspective. The professional opinions and geotechnical information contained in this report may need to be updated based upon our review of the final site development plans. Final site development plans should be provided to GeoTek for review when available.

2. SITE DESCRIPTION AND PROPOSED DEVELOPMENT

2.1 SITE DESCRIPTION

The project site comprises 10.9 acres located east of Xenia Avenue and about 200 feet south of East 8th Street in the city of Beaumont, Riverside County, California. The property consists of vacant land; however, the site was used as agricultural land in the 1990s and earlier. The property has a relatively flat terrain with elevations ranging from 2607 feet above mean sea level (amsl) toward the north portion of the site to 2600 feet amsl in the south portion. Surface drainage is generally to the south, with some minor local variations. At the time of our visit, the property had minor visible trash and was mostly void of vegetation.

The site is bounded on the north by existing single-family residences; on the west by Xenia Avenue with apartment homes beyond; on the south by commercial properties and vacant land; and on the east by an apartment complex. The general location of the site is shown in Figure 1.

2.2 PROPOSED DEVELOPMENT

According to the *Site Plan* prepared by SJA Design Group, Inc. and dated September 13, 2022, the site will be developed with 16 apartment buildings, a recreation building with a pool, a water quality basin, parking/drive areas, underground utilities, and other improvements. The residential structures are anticipated to be up to three stories in height, of wood-framed construction, utilizing conventional shallow foundations and slab-on-grade. A maximum wall load of about 3 kips per linear foot and a maximum column load of about 40 kips were assumed.

Proposed cuts and fills as well as slopes are anticipated to be minimal. The water quality basin is planned to be constructed near the center portion of the south property line and will be excavated to a depth of about five feet.

If site development differs from the information presented in this report, the recommendations should be subject to further review and evaluation by GeoTek. Final site development plans should be reviewed by GeoTek when they become available.

3. REVIEW OF PAST REPORTS

On May 9, 2006, Earth System Southwest (ESSW) issued a *Preliminary Geotechnical Engineering Report* for the project. The study indicated that six borings were drilled on the 11-acre site to depths ranging from 14 to 21.5 feet. ESSW stated that the borings encountered "very low" expansive silty sand and clayey sand. However, no results of laboratory testing were included in the ESSW report.

ESSW stated that groundwater was not encountered in any of their exploratory borings, and depth to groundwater was on the order of 300 feet. The potential for soil liquefaction at the site was considered negligible. However, no information regarding the potential for seismically induced settlement of dry sands was furnished.

ESSW recommended that the existing soils within the building pad and foundation areas be over-excavated to a minimum of three feet below existing grade or two feet below the footing level (whichever is lower). The over-excavation was recommended to extend five feet beyond the outer edges of the exterior footings. Garden and retaining wall areas were recommended to be prepared similar to building pads, but the lateral extent of the over-excavations should be at least two feet beyond the edges of the improvements.

Foundations were suggested to be designed using an allowable bearing capacity of 1,500 pounds per square foot (psf). Total static settlement of about one-inch and differential static settlement of less than 0.5-inch in 20 feet were predicted.

On September 27, 2019, Converse Consultants (Converse) completed a *Preliminary Geotechnical Investigation Report* for the site. The evaluation included the excavation of eight exploratory borings to 16.5 to 51.5 feet below grade. The excavations encountered native alluvial materials consisting of silty sand, sand, and silt.

Groundwater was not encountered in any of the borings by Converse to a maximum depth of 51.5 feet, and the risk of liquefaction was considered low. Converse also stated that the risk of seismically induced settlement was low due to the absence of unconsolidated granular sediments at the site.

The study stated that building areas should be over-excavated to at least five feet below proposed grade or two feet below the bottom of footings, whichever is deeper. The over-excavation was recommended to extend a minimum of five feet beyond the building footprint. Pavement areas were recommended to be supported on at least 12 inches of compacted fill.

Geotechnical design parameters for conventional foundations resting on "very low" expansive soils were provided by Converse. The study recommended the use of an allowable bearing pressure of 2,000 psf. Static settlement of less than one-inch total and less than 0.5-inch differential settlement over 40 feet were also estimated.

A shrinkage factor of about 10 to 15 percent for soil excavated and replaced as compacted fill, and a subsidence of about 0.10 to 0.15 feet were estimated for the project. The study also reported that soluble sulfate contents of two surface soil samples were negligible (0.0036 and 0.0038 percent) and a minimum concrete compressive strength of 2,500 psi was recommended. The minimum resistivity for surficial soil samples was found to be about 10,158 and 6,826 ohm-cm, and the soils were considered to have a "moderate" corrosive potential with respect to ferrous metal installations.

Logs of the exploratory borings reported by ESSW (2006) and Converse (2019) are included in Appendices A and B, respectively. The locations of these explorations are shown on the Exploration Location Map presented as Figure 2.

4. FIELD EXPLORATION, LABORATORY TESTING, AND PERCOLATION TESTING

4.1 FIELD EXPLORATION

GeoTek conducted a field exploration at the site on June 14, 2021 which consisted of excavating two exploratory borings and four CPT soundings across the property. The explorations were excavated to depths ranging from 21.5 to 50 feet. The borings were excavated with a truck-mounted drill rig, and the CPT soundings with a 30-ton CPT rig. The approximate locations of these excavations along with the borings reported by the ESSW (2006) and Converse (2019) are shown on Figure 2, Exploration Location Map. Logs of the excavations performed by GeoTek are included in Appendix C.

4.2 LABORATORY TESTING

Laboratory testing was performed on selected soil samples collected during our field exploration. The purpose of the laboratory testing was to confirm the field classification of the soil materials encountered and to evaluate the physical properties of the soils for use in the engineering design and analysis. Laboratory testing included in-situ dry density-moisture

content, proctor, remolded direct shear, collapse, expansion index, among other tests. Test results are presented in Appendix D.

4.3 PERCOLATION TESTING

GeoTek utilized the percolation test procedure (Riverside County, 2011) to estimate the infiltration rate of the subsurface materials encountered at the proposed site basin.

The percolation test borings (Borings I-1 through I-4) were excavated with a hollow-stem auger drill rig within the basin area as shown on the *Site Plan* (SJA Design Group, 2022). All test borings were drilled to depths of about five feet, which was the approximate depth of the proposed basin. The borings were approximately eight inches in diameter. A three-inch diameter perforated PVC pipe encapsulated in filter sock was inserted into each of the test holes. The annular space between the test hole sidewalls and PVC pipe was filled with gravel.

Native alluvial materials typically consisting of silty sand were encountered in our test holes. In addition to the test borings, Boring B-1 was drilled to 20 feet below grade within the basin area to confirm the absence of impermeable materials or groundwater. The cited boring encountered granular alluvial materials of silty sand. The logs of the borings are presented in Appendix C. The locations of the borings drilled within the basin area are shown on Figure 2.

After pre-soaking the test holes, percolation testing was performed in the lower 20 inches of each test hole by a representative from our firm. The percolation rates were converted to infiltration rates via the Porchet Method.

The infiltration rates, which do not include a factor of safety and were determined after the water levels had stabilized, are presented in the following table.

SUMMARY OF INFILTRATION FIELD RATES		
Basin	Boring No.	Infiltration Field Rate (inches per hour)
South-Central Area	I-1	2.4
	I-2	3.3
	I-3	1.1
	I-4	1.4

Detailed infiltration/percolation test data and Porchet conversion calculations are presented in Appendix E.

Over the lifetime of the basin systems, the infiltration rates may be affected by silt build up and biological activities, as well as local variations in near surface soil conditions. A suitable factor of safety should be applied to the field rates to design the infiltration system.

It should be noted that the infiltration rates provided above were performed in relatively undisturbed native materials. Infiltration rates will vary and are mostly dependent on the underlying consistency of the site soils and relative density. Infiltration rates will be impacted by weight of equipment travelling over the soils, placement of engineered fill and other various factors. GeoTek assumes no responsibility or liability for the ultimate design or performance of the storm water management system.

5. GEOLOGIC AND SOILS CONDITIONS

5.1 REGIONAL SETTING

The property is situated in the Peninsular Ranges geomorphic province. The Peninsular Ranges province is one of the largest geomorphic units in western North America. Basically, it extends from the point of contact with the Transverse Ranges geomorphic province, southerly to the tip of Baja California. This province varies in width from about 30 to 100 miles. It is bounded on the west by the Pacific Ocean, on the south by the Gulf of California, and on the east by the Colorado Desert Province.

The Peninsular Ranges are essentially a series of northwest-southeast oriented fault blocks. Several major fault zones are found in this province. The Elsinore Fault zone and the San Jacinto Fault zone trend northwest-southeast and are found near the middle of the province. The San Andreas Fault zone borders the northeasterly margin of the province.

More specific to the subject property, the site is located in an area geologically mapped to be underlain by alluvial fan deposits (Dibblee, T.W., and Minch, J.A., 2003). According the CGS 7.5-Minute Quadrangle, the nearest known active faults are the San Gorgonio Pass Fault Zone located 2.7 miles to the northeast of the site and the Banning Fault located 2.6 miles to the north of the site. No active faults are shown in the immediate site vicinity on the maps reviewed for the area.

5.2 SUBSURFACE SOIL CONDITIONS

A brief description of the earth materials reported to be on the site by ESSW (2006) and Converse (2019) and encountered during our field investigation is presented in the following sections.

5.2.1 Topsoil/Disturbed Soil (unmapped)

Our explorations noted that the upper one foot (±) of soil is loose and disturbed due to the past agricultural activities at the site. The topsoil mostly consists of dry to slightly moist, light brown silty sand.

5.2.2 Alluvial Fan Deposits

Our excavations encountered alluvial fan deposits below the topsoil. The alluvium was typically composed of silty sand and occasional gravel and was light brown to brown in color, slightly moist to moist, and medium dense to dense, as indicated by our blow counts and in-place density data. Tests performed on the most unfavorable samples of the alluvium (selected based on blow counts) suggest a slight potential for soil collapse (0.2 to 1.2 percent). This agrees with Converse's findings that the alluvium has slight to moderate potential for collapse (0.1 to 2.5 percent).

Results of expansion index tests show that the site surficial soils have a "very low" expansion potential (EI ≈ 5 to 10) which concurs with the findings by Converse and ESSW.

Detailed logs of the site explorations are included in Appendices A through C. The locations of the site explorations are shown on the Exploration Location Map, Figure 2.

5.3 SURFACE WATER AND GROUNDWATER

5.3.1 Surface Water

Surface water on this site is the result of precipitation or surface run-off from surrounding areas. Overall surface drainage is generally to the south.

5.3.2 Groundwater

The exploratory boring BH-5 by Converse (2019) and all of our CPT soundings excavated to a maximum depth of 50 feet did not encounter groundwater at the property.

The California Water Dara Library (https://wdl.water.ca.gov/waterdatalibrary/) shows a groundwater well located approximately one-quarter mile northeast from the site. Records of this well indicate that groundwater in the region is deeper than 200 feet.

5.4 FAULTING AND SEISMICITY

The geologic structure of the entire southern California area is dominated mainly by northwest-trending faults associated with the San Andreas system. The site is in a seismically active region. No active or potentially active fault is presently known to exist at this site nor is the site situated within an *"Alquist-Priolo"* Earthquake Fault Zone. The County of Riverside (https://countyofriverside.us/Residents/PropertyInformation.aspx) has designated the site area as "not in fault zone", "not in a fault line", having a "low" potential for liquefaction, and "susceptible" to subsidence. According the CGS 7.5-Minute Quadrangle, the nearest known active faults are the San Gorgonio Pass Fault Zone located 2.7 miles to the northeast of the site and the Banning Fault located 2.6 miles to the north of the site.

5.4.1 Seismic Design Parameters

The site is located at approximately 33.9315° Latitude and -116.9527° Longitude. Site spectral accelerations (S_a and S_1), for 0.2 and 1.0 second periods for a Class "D" site, was determined from the SEAOC/OSHPD web interface that utilizes the USGS web services and retrieves the seismic design data and presents that information in a report format. Using the ASCE 7-16 option on the SEAOC/OSHPD website results in the values for S_{M1} and S_{D1} reported as "null-See Section 11.4.8" (of ASCE 7-16). As noted in ASCE 7-16, Section 11.4.8, a site-specific ground motion procedure is recommended for Site Class "D" when the value S_1 exceeds 0.2. The value S_1 for the subject site exceeds 0.2.

For a site Class "D", an exception to performing a site-specific ground motion analysis is allowed in ASCE 7-16 where S_1 exceeds 0.2 provided the value of the seismic response coefficient, Cs, is conservatively calculated by Eq 12.8-2 of ASCE 7-16 for values of $T \leq 1.5T_s$ and taken as equal to 1.5 times the value computed in accordance with either Eq. 12.8-3 for $T_L \geq T > 1.5T_s$ or Eq. 12.8-4 for $T > T_L$.

The results, based on the 2015 NEHRP and the 2019 CBC, are presented in the following table and we have assumed that the exception as allowed in ASCE 7-16 is applicable. If the exception is deemed not appropriate, a site-specific ground motion analysis will be required.

SITE SEISMIC PARAMETERS	
Mapped 0.2 sec Period Spectral Acceleration, S_S	2.013g
Mapped 1.0 sec Period Spectral Acceleration, S_1	0.69g
Site Coefficient for Site Class "D", F_a	1.0
Site Coefficient for Site Class "D", F_v	1.7
Maximum Considered Earthquake Spectral Response Acceleration for 0.2 Second, S_{MS}	2.013g
Maximum Considered Earthquake Spectral Response Acceleration for 1.0 Second, S_{M1}	1.173g
5% Damped Design Spectral Response Acceleration Parameter at 0.2 Second, S_{DS}	1.342g
5% Damped Design Spectral Response Acceleration Parameter at 1 second, S_{D1}	0.782g
Peak Ground Acceleration Adjusted for Site Class Effects, PGA_M	0.903g
Seismic Design Category	D

Final selection of the appropriate seismic design coefficients should be made by the project structural engineer based upon the local practices and ordinances, expected building response and desired level of conservatism.

5.5 LIQUEFACTION AND SEISMICALLY INDUCED SETTLEMENT

Due to the anticipated depth to groundwater (greater than 200 feet), the potential for liquefaction at the site is nil.

However, loose to medium dense granular soils tend to density during strong earthquake shaking. The potential for seismically induced settlements of the upper 50 feet of dry sandy alluvial fan sediments at the property was assessed using the data of our CPT soundings with the aid of the computer program Cliq version 3.3.1.14 (Geologismiki, 2006). A mean magnitude weighted (Mw) seismic event of 7.13 obtained using the USGS deaggregation web application (based on a two percent exceedance in 50 years) and a PGA_M of 0.903g obtained from the USGS website were used in our assessment.

The results of the analyses indicated the presence of occasional layers of loose to medium dense sands and silty sands that would be prone to settlement. The following table summarizes the amount of total seismically induced settlement estimated at each CPT location:

ESTIMATED SEISMICALLY INDUCED TOTAL SETTLEMENT	
CPT Sounding	Total Settlement (in)
1	1.0
2	0.2
3	0.2
4	1.5

As noted above, a seismically induced settlement of up to about 1.5 inches total and 0.75 inches differential over a 40-foot span is estimated for the property. The results of the seismic settlement analyses are presented within Appendix F.

5.6 OTHER HAZARDS

Evidence of ancient landslides or slope instabilities at this site was not observed during our site reconnaissance. Thus, the potential for landslides is considered negligible for design purposes.

The potential for secondary seismic hazard such as a tsunami or a seiche is considered negligible due to site elevation and great distance to the ocean or a lake.

6. CONCLUSIONS AND RECOMMENDATIONS

6.1 GENERAL

The proposed development appears feasible from a geotechnical viewpoint provided that the following recommendations are incorporated into design and construction.

The site contains topsoil and loose surficial alluvium. These materials are unsuitable for foundation support and thus should be removed and replaced as engineered compacted fill.

Our analyses also indicate that site may be subject to densification of the upper dry sands during the design level earthquake. This could result in seismically induced settlement of up to about 1.5 inches total and 0.75-inch differential over a 40-foot span. Provided that the site is prepared as recommended in the following sections of this report, static settlement is estimated to be up to 0.5-inch total and up to 0.25-inch differential over a 40-foot span. The combined static plus seismic differential settlement of about 1 inch in 40 feet is anticipated to be tolerated by the residential buildings supported on conventional shallow footings.

6.2 EARTHWORK CONSIDERATIONS

Earthwork and grading should be performed in accordance with the applicable grading ordinances of the City of Beaumont/County of Riverside, the 2019 California Building Code (CBC), and recommendations contained in this report. The Grading Guidelines included in Appendix G outline general procedures and do not anticipate all site-specific situations. In the

event of conflict, the recommendations presented in the text of this report should supersede those contained in Appendix G.

6.2.1 Site Clearing

The site should be cleared of existing vegetation, roots, and debris. These materials should be properly disposed of off-site.

6.2.2 Remedial Grading

The upper five feet of existing soil or two feet below the base of footings, whichever is deeper, should be completely over-excavated from proposed building areas and areas to receive structural fill. Additional over-excavation may be recommended if unsuitable materials are exposed. The bottom of over-excavations should expose competent native materials which are defined as relatively uniform, no visually porous soils with an in-place compaction of at least 85 percent of the soil's maximum dry density as determined per ASTM D 1557. As a minimum over-excavations should extend down and away from foundation elements at a 1:1 (h:v) projection to the recommended removal depth or a minimum of 5 feet.

The upper two feet of existing soil or one foot below the pavement/flatwork subgrade, whichever is deeper, should be removed. The horizontal extent of over-excavations should extend at least two feet beyond the edge of the improvement.

The bottom of all removals should be scarified to a minimum depth of eight inches, brought to above the optimum moisture content, and then recompacted to at least 90 percent of the soil's maximum dry density per ASTM D 1557. The bottoms of remedial excavations should be observed by a GeoTek representative prior to scarification.

6.2.3 Excavation Characteristics

Excavation in the on-site soils is expected to be feasible utilizing heavy-duty grading equipment in good operating condition.

All temporary excavations for grading purposes and installation of underground utilities should be constructed in accordance with local and Cal-OSHA guidelines. Temporary vertical excavations within the on-site materials should be stable up to four feet with a 1:1 (h:v) cut above. Flatter inclinations may be needed depending on the field conditions. Temporary construction slopes should be periodically examined by a competent person, per Cal-OSHA requirements, to look of evidence of instability.

6.2.4 Engineered Fill

The onsite soils are considered suitable for reuse as engineered fill provided they are free from vegetation, debris, deleterious material, and hard lumps greater than six inches in maximum dimension.

Fill materials should be placed in horizontal lifts not exceeding six inches in loose thickness, moisture conditioned to at least the optimum moisture content, and compacted to a minimum relative compaction of 90 percent (ASTM D 1557).

Detailed recommendations pertaining to the placement of engineered fill are presented in Appendix G.

6.2.5 Slopes

Fill and cut slopes constructed at gradients of 2:1 (h:v) or flatter, in accordance with industry standards, are anticipated to be both grossly and surficially stable. Fill placed on slopes should be properly benched into competent soils per the geotechnical engineer's direction. Cut slopes should be observed by a geotechnical engineer/engineering geologist to approve the exposed conditions upon excavation.

The onsite soils are mostly granular and subject to erosion. Slopes should be landscaped shortly after construction.

6.2.6 Trench Excavation and Backfill

Trench excavations should conform to Cal-OSHA regulations. The contractor should have a competent person, per OSHA requirements, on site during construction to observe conditions and to make the appropriate recommendations.

Utility trench backfill should be compacted to at least 90 percent relative compaction (ASTM D 1557). Compaction should be achieved with a mechanical compaction device. Jetting of trench backfill is not recommended. If soils to be used as backfill have dried out, they should be thoroughly moisture conditioned prior to placement in trenches.

6.2.7 Shrinkage and Subsidence

Several factors will impact earthwork balancing on the site, including shrinkage, subsidence, trench spoil from utilities and footing excavations, as well as the accuracy of topography.

Shrinkage is primarily dependent upon the degree of compactive effort achieved during construction. For planning purposes, a shrinkage factor of approximately 5 to 15 percent may

be considered for the materials requiring recompaction. Subsidence of up to 0.1 feet may occur.

6.3 DESIGN RECOMMENDATIONS

6.3.1 Foundation Design Criteria

The site surficial soils possess "very low" (0≤EI≤20) expansion potential in accordance with ASTM D 4829, as noted by our soils data and data by past consultants. However, verification testing should be performed after site remedial grading.

The foundation elements for the proposed structures should bear entirely in engineered fill soils and should be designed in accordance with the 2019 CBC.

GEOTECHNICAL RECOMMENDATIONS FOR CONVENTIONALLY REINFORCED SHALLOW FOUNDATIONS	
Design Parameter	"Very Low" Expansion Potential (0≤EI≤20)
Foundation Depth or Minimum Perimeter Beam Depth (inches below lowest adjacent grade)	One- and Two-story – 12 Three-story - 18
Minimum Foundation Width (Inches)*	One- and Two-story – 12 Three-story - 15
Minimum Slab Thickness (actual)**	4 – Actual
Minimum Slab Reinforcing**	6" x 6" – W1.4/W1.4 welded wire fabric placed in middle of slab
Minimum Footing Reinforcement	Two No. 4 reinforcing bars, one placed near the top and one near the bottom
Effective Plasticity Index***	NA
Presaturation of Subgrade Soil (Percent of Optimum)	Minimum of 100% of the optimum moisture content to a depth of at least 12 inches prior to placing concrete

* Code minimums per Table 1809.7 of the 2019 CBC.
**Slab thickness and reinforcement should be determined by the structural engineer.
***Effective plasticity index should be verified at the completion of rough grading.

It should be noted that the criteria provided are based on soil support characteristics only. The structural engineer should design the slab and footing/beam reinforcement based on actual loading conditions.

The following criteria for design of foundations are preliminary and should be re-evaluated based on the results of additional laboratory testing of samples obtained near finish pad grade.

An allowable bearing capacity of 2,000 psf may be used for design of footings 12 inches deep and 12 inches wide. This value may be increased by 400 psf and 200 psf for each additional 12 inches in depth or width, respectively, to a maximum value of 3,000 psf. An increase of one-third may be applied when considering short-term live loads (e.g. seismic and wind loads).

For footings designed in accordance with the recommendations presented in this report, we would anticipate a maximum static settlement of less than 0.5-inch and a maximum differential static settlement of less than 0.25-inch in a 40-foot span. Seismic settlement is anticipated to be up to 1.5-inches total and 0.75-inch differential over a 40-foot span.

The passive earth pressure may be computed as an equivalent fluid having a density of 250 psf per foot of depth, to a maximum earth pressure of 2,500 psf for footings founded on engineered fill. A coefficient of friction between soil and concrete of 0.40 may be used with dead load forces. When combining passive pressure and frictional resistance, the passive pressure component should be reduced by one-third.

Moisture and vapor retarding systems are intended to provide a certain level of resistance to vapor and moisture transmission through the concrete, but do not eliminate it. The acceptable level of moisture transmission through the slab is to a large extent based on the type of flooring used and environmental conditions. Ultimately, the vapor retarding system should be comprised of suitable elements to limit migration of water and reduce transmission of water vapor through the slab to acceptable levels. The selected elements should have suitable properties (i.e., thickness, composition, strength, and permeability) to achieve the desired performance level. Consideration should be given to consulting with an individual possessing specific expertise in this area for additional evaluation.

Moisture retarders can reduce, but not eliminate, moisture vapor rise from the underlying soils up through the slab. Moisture retarders should be designed and constructed in accordance with applicable American Concrete Institute, Portland Cement Association, Post-Tensioning Concrete Institute, ASTM and California Building Code requirements and guidelines.

GeoTek does not practice in the field of moisture vapor transmission evaluation/mitigation, since this does not fall under the geotechnical disciplines. Therefore, we recommend that a qualified person, such as the flooring contractor, structural engineer, and/or architect be consulted to evaluate the general and specific moisture vapor transmission paths and any impact on the proposed construction. That person (or persons) should provide recommendations for mitigation of potential adverse impact of moisture vapor transmission on various components of the structures as deemed appropriate. In addition, the recommendations in this report and our services in general are not intended to address mold prevention, since we along with

geotechnical consultants in general, do no practice in areas of mold prevention. If specific recommendations are desired, a professional mold prevention consultant should be contacted.

6.3.2 Miscellaneous Foundation Recommendations

- To reduce moisture penetration beneath the slab on grade areas, utility trenches should be backfilled with engineered fill, lean concrete, or concrete slurry where they intercept the perimeter footing or thickened slab edge.
- Soils from the footing excavations should not be placed in the slab-on-grade areas unless properly compacted and tested. The excavations should be free of loose/sloughed materials and be neatly trimmed at the time of concrete placement.
- Under-slab utility trenches should be compacted to project specifications. Compaction should be achieved with a mechanical compaction device. If soils to be used as backfill have dried out, they should be thoroughly moisture conditioned prior to placement in trenches.

6.3.3 Foundation Setbacks

Minimum setbacks for all foundations should comply with the *2019 CBC* or City of Beaumont/County of Riverside requirements, whichever is more stringent. Improvements not conforming to these setbacks are subject to the increased likelihood of excessive lateral movements and/or differential settlements. If large enough, these movements can compromise the integrity of the improvements. The following recommendations are presented:

- The outside bottom edge of all footings should be set back a minimum of H/2 (where H is the slope height) from the face of any ascending slope. The setback should be at least 5 feet and need not to exceed 15 feet. Where a retaining wall is constructed at the toe of the slope, the height of the slope should be measured from top of the wall to the top of the slope.
- The outside bottom edge of all footings should be set back a minimum of H/3 from the face of any descending slope. The setback should be at least 7 feet and need not to exceed 40 feet.
- The bottom of any proposed foundations for structures should be deepened so as to extend below a 1:1 projection upward from the bottom of the nearest excavation.
- The bottom of all footings for new structures near retaining walls should be deepened so as to extend below a 1:1 projection upward from the bottom inside edge of the wall foundation.

6.3.4 Retaining Wall Design and Construction

6.3.4.1 General Design Criteria

Recommendations presented in this report apply to typical masonry or concrete vertical walls retaining up to six feet of compacted soils. These are typical design criteria and are not intended to supersede the design by the structural engineer.

Retaining wall foundations should be designed in accordance with Section 6.3.1 of this report. A minimum embedment of 12 inches into engineered compacted fill and a minimum footing width of 12 inches is recommended. Structural needs may govern and should be evaluated by the project structural engineer.

All earth retention structure plans, as applicable, should be reviewed by this office prior to finalization.

The backfill material placement for all earth retention structures should meet the requirement of Section 6.3.4.4 in this report.

In general, cantilever earth retention structures, which are designed to yield at least 0.001H, where H is equal to the height of the wall to the base of the footing, may be designed using the active condition. Rigid earth retention structures (including but not limited to rigid walls, and walls braced at top, such as typical basement walls) should be designed using the at-rest condition.

In addition to the design lateral forces due to retained earth, surcharges due to improvements, such as an adjacent building or traffic loading, should be considered in the design of the earth retention structures. Loads applied within a 1:1 (h:v) projection from the surcharge on the footing of the earth retention structure should be considered in the design.

Final selection of the appropriate design parameters should be made by the designer of the earth retention structures.

6.3.4.2 Cantilevered Walls

The recommendations presented below are for cantilevered retaining walls. Active earth pressure may be used for retaining wall design, provided the top of the wall is not restrained from minor deflections. An equivalent fluid pressure approach may be used to compute the horizontal pressure against the wall. Appropriate fluid unit weights are given below for specific

slope gradients of the retained material. These do not include other superimposed loading conditions such as traffic, structures, seismic events, or adverse geologic conditions.

ACTIVE EARTH PRESSURES	
Surface Slope of Retained Materials (h:v)	Equivalent Fluid Pressure (pcf) Native Backfill*
Level	41
2:1	64

* The design pressures assume the backfill material has an expansion index less than or equal to 20. Backfill zone includes area between the back of the wall and footing to a plane (1:1 h:v) up from the bottom of the wall foundation to the ground surface.

6.3.4.3 Restrained Retaining Walls

Retaining walls that will be restrained prior to placing and compacting backfill material, or that have reentrant or male corners, should be designed for an at-rest equivalent fluid pressure of 62 pcf, plus any applicable surcharge loading, for native backfill and level back slope condition. For areas of male or reentrant corners, the restrained wall design should extend a minimum distance of twice the height of the wall laterally from the corner, or a distance otherwise determined by the project structural engineer.

6.3.4.4 Retaining Wall Backfill and Drainage

Retaining wall backfill should consist of materials with expansion index (EI) ≤ 20 and free of deleterious and/or oversized materials. The wall backfill should also include a minimum one-foot wide section of ¾- to 1-inch clean crushed rock (or approved equivalent). The rock should be placed immediately adjacent to the back of wall and extend up from the back drain to within approximately 12 inches of finish grade. The upper 12 inches should consist of compacted onsite materials. Presence of other materials might necessitate revision to the parameters provided and modification of wall designs. The backfill materials should be placed in lifts no greater than 8-inches in thickness and compacted to a minimum of 90 percent relative compaction in accordance with ASTM Test Method D 1557. Proper surface drainage needs to be provided and maintained. Bracing of the walls during backfilling and compaction may also be necessary.

All earth retention structures should be provided with an adequate pipe and gravel back drain system to reduce the potential for hydrostatic pressure build up. As a minimum, backdrains should consist of a four-inch diameter perforated collector pipe (Schedule 40, SDR 35, or approved equivalent) embedded in a minimum of one cubic foot per lineal foot of ¾- to 1-inch

clean crushed rock or equivalent, wrapped in filter fabric (Mirafi 140N or approved equivalent). The drain system should be connected to a suitable outlet, as determined by the civil engineer. Drain outlets should be maintained over the life of the project and should not be obstructed or plugged by adjacent improvements. Waterproofing of site walls should be performed where moisture migration through the wall is undesirable.

Proper surface drainage needs to be provided and maintained. Water should not be allowed to pond behind retaining walls. Waterproofing of site walls should be performed where moisture migration through the wall is undesirable.

6.3.4.5 Other Design Considerations

- Retaining wall foundation elements should be designed in accordance with building code setback requirements.
- Wall design should consider the additional surcharge loads from superjacent slopes and/or footings, where appropriate.
- No backfill should be placed against concrete until minimum design strengths are evident by compression tests of cylinders.
- The retaining wall footing excavations, backcuts, and backfill materials should be approved by the project geotechnical engineer or their authorized representative.

6.3.5 Pool Design

The proposed swimming pool should derive support entirely from engineered fill. A minimum 12 inches of fill compacted to at least 90 percent of the soil's maximum dry density per ASTM D 1557 should be provided below the pool shell.

The pool walls should be designed for at-rest soil conditions using an equivalent fluid pressure of 62 pcf for at-rest conditions. Pool walls surcharged by adjacent structures should be designed for additional pressures. Alternatively, the pool walls may be designed as freestanding walls using the active soil state conditions provided that some lateral movement of the pool walls would be acceptable. If the active state is to be used, an equivalent fluid pressure of 41 pcf is considered suitable. These recommended pressures are based on drained conditions and using granular native fills with expansion index of less than 20. If a drain system adjacent/beneath the pool is not provided, the pool walls should then be designed for an equivalent fluid pressure of 98 pcf for the at-rest condition and 85 pcf for the active condition.

As noted above, the use of the lower (drained condition) at-rest or active soil pressures will require a subdrain system beneath/adjacent to the pool. A typical subdrain system includes a series of four-inch diameter perforated drain pipes encapsulated with at least one cubic foot of

free-draining material per linear foot of pipe. The free-draining material should be encapsulated within a geotextile to prevent migration of fines into the drainage medium. The drain pipes should be routed to an acceptable discharge location, as determined by the pool designer. If desired, GeoTek can review the subdrain system once designed to determine if additional measures are warranted.

Pool decking supported on grade should be separated from the pool bond beam by a full-depth, mastic construction joint. If it is desired to extend the pool deck over the bond beam, consideration should be given to designing the deck as a structural slab supported by the pool shell. This will reduce the possibility of deck cracking occurring along the outer edge of the bond beam. We also recommend that the pool decking subgrade be "pre-saturated" prior to concrete placement. The subgrade soils should be moisture conditioned to at least 100% of the soil's optimum moisture content to a depth of 12 inches, prior to concrete placement. Testing by the geotechnical engineer is recommended to confirm that the soils have been adequately moisture treated.

Pool decking may consist of 5-inch thick concrete and the use of reinforcement is suggested. A minimum of #3 bars spaced 24 inches or 6" x 6" – W1.4/W1.4 welded wire mesh placed on center may be used. Control joints should be placed in two directions and located a distance apart approximately equal to 24 to 36 times the slab thickness. The pool designer should provide final design recommendations.

It is our recommendation that Type V cement be used for the pool construction due to the chemicals associated with the pool water.

6.3.6 Soil Corrosivity

The soil corrosivity at this site was tested in the laboratory for two representative samples collected during our field exploration. The results of the saturated resistivity testing indicate that the soil samples are "moderately corrosive" and "mildly corrosive" to buried ferrous metals, based on the guidelines provided in *Corrosion Basics: An Introduction* (Roberge, 2000). Chloride concentrations were negligible (0.0006 percent). Consideration should be given to consulting with a corrosion engineer. The laboratory test results are provided in Appendix D.

6.3.7 Soil Sulfate Content

The sulfate content was determined in the laboratory for two representative soil samples collected during our field exploration. The results (0.0012 and 0.0016 percent) indicate that the water-soluble sulfate for the tested samples were negligible, per Table 4.2.1 of ACI 318. Based upon the test results, no special concrete mix design is required for sulfate attack resistance. The laboratory test results are provided in Appendix D.

6.3.8 Pavement Design Considerations

Pavement design for proposed on-site street improvements was conducted per Caltrans *Highway Design Manual* guidelines for flexible pavements. Based on traffic indices (TIs) of 5.0 and 6.0 generally associated with these types of projects and using a design R-value of 23 (Converse, 2019), the following preliminary sections were estimated:

PRELIMINARY PAVEMENT SECTIONS			
TI	R-Value	Thickness of Asphalt Concrete (inches)	Thickness of Aggregate Base (inches)
5.0	23	3	7
6.0	23	4	8

The TIs used in our pavement design are considered reasonable values for the proposed street areas and should provide a pavement life of approximately 20 years with a normal amount of flexible pavement maintenance. Irrigation adjacent to pavements, without a deep curb or other cutoff to separate landscaping from the paving may result in premature pavement failure. Traffic parameters used for design were selected based upon engineering judgment and not upon information furnished to us such as an equivalent wheel load analysis or a traffic study.

The recommended pavement sections provided are intended as a minimum guideline and final selection of pavement cross section parameters should be made by the project civil engineer, based upon the local laws and ordinates, expected subgrade and pavement response, and desired level of conservatism. If thinner or highly variable pavement sections are constructed, increased maintenance and repair could be expected. Final pavement design should be checked by testing of soils exposed at subgrade (the upper 12 inches) after final grading has been completed.

Asphalt concrete and aggregate base should conform to current Caltrans Standard Specifications Section 39 and 26-1.02, respectively. As an alternative, asphalt concrete can conform to Section 203-6 of the current Standard Specifications for Public Work (Green Book). Crushed aggregate base or crushed miscellaneous base can conform to Section 200-2.2 and 200-2.4 of the Green Book, respectively. Pavement base should be compacted to at least 95 percent of the ASTM D1557 laboratory maximum dry density (modified proctor).

All pavement installation, including preparation and compaction of subgrade, compaction of base material, placement and rolling of asphaltic concrete, should be done in accordance with the City of Beaumont specifications, and under the observation and testing of GeoTek and a

City Inspector where required. Jurisdictional minimum compaction requirements in excess of the aforementioned minimums may govern.

Deleterious material, excessive wet or dry pockets, oversized rock fragments, and other unsuitable yielding materials encountered during grading should be removed. Once existing compacted fill are brought to the proposed pavement subgrade elevations, the subgrade should be proof-rolled in order to check for a uniform and unyielding surface. The upper 12 inches of pavement subgrade soils should be scarified, moisture conditioned at or near optimum moisture content, and recompacted to at least 95 percent of the laboratory maximum dry density (ASTM D1557). If loose or yielding materials are encountered during construction, additional evaluation of these areas should be carried out by GeoTek. All pavement section changes should be properly transitioned.

6.3.9 Concrete Construction

6.3.9.1 General

Concrete construction should follow the 2019 CBC and ACI guidelines regarding design, mix placement, and curing of the concrete. If desired, we could provide quality control testing of the concrete during construction.

6.3.9.2 Concrete Mix Design

As indicated in Section 6.3.6, the site will not require a particular concrete mix design to resist sulfate attack.

6.3.9.3 Concrete Flatwork

Exterior concrete flatwork (sidewalks, driveways, patios, etc.) should have a minimum thickness of four inches. No specific reinforcement is required due to the non-structural nature. However, the use of some reinforcement should be considered. Some shrinkage and cracking of the concrete should be anticipated as a result of typical mix designs and curing practices commonly utilized in residential construction.

"Very low" expansive subgrade soils below exterior concrete flatwork should be pre-saturated to at least 100 percent of optimum moisture content. Minimum depth of pre-saturation should be 12 inches.

Sidewalks and driveways may be under the jurisdiction of the governing agency. If so, jurisdictional design and construction criteria would apply, if more restrictive than the recommendations presented in this report.

All concrete installation, including preparation and compaction of subgrade, should be done in accordance with the City of Beaumont/County of Riverside specifications, and under the observation and testing of GeoTek and a City/County inspector, if necessary.

6.3.9.4 Concrete Performance

Concrete cracks should be expected. These cracks can vary from sizes that are essentially unnoticeable to more than 0.125-inch in width. Most cracks in concrete, while unsightly, do not significantly impact long-term performance. While it is possible to take measures (proper concrete mix, placement, curing, control joints, etc.) to reduce the extent and size of cracks that occur, some cracking will occur despite the best efforts to minimize it. Concrete can also undergo chemical processes that are dependent upon a wide range of variables, which are difficult, at best, to control. Concrete, while seemingly a stable material, is subject to internal expansion and contraction due to external changes over time.

One of the simplest means to control cracking is to provide weakened control joints for cracking to occur along. These do not prevent cracks from developing; they simply provide a relief point for the stresses that develop. These joints are a widely accepted means to control cracks but are not always effective. Control joints are more effective the more closely spaced they are. GeoTek suggests that control joints be placed in two orthogonal directions and located a distance apart approximately equal to 24 to 36 times the slab thickness.

6.4 POST CONSTRUCTION CONSIDERATIONS

6.4.1 Landscape Maintenance and Planting

Water has been shown to weaken the inherent strength of soil, and slope stability is significantly reduced by overly wet conditions. Positive surface drainage away from graded slopes should be maintained and only the amount of irrigation necessary to sustain plant life should be provided for planted slopes. Controlling surface drainage and runoff and maintaining a suitable vegetation cover can minimize erosion. Plants selected for landscaping should be lightweight, deep-rooted types that require little water and are capable of surviving the prevailing climate.

Overwatering should be avoided. Care should be taken when adding soil amendments to avoid excessive watering. An abatement program to control ground-burrowing rodents should be implemented and maintained. This is critical as burrowing rodents can decrease the long-term performance of slopes.

It is common for planting to be placed adjacent to structures in planter or lawn areas. This will result in the introduction of water into the ground adjacent to the foundation. This type of landscaping should be avoided.

6.4.2 Drainage

The need to maintain proper surface drainage and subsurface systems cannot be overly emphasized. Positive site drainage should be maintained at all times. Drainage should not flow uncontrolled down any descending slope. Water should be directed away from foundations and not allowed to pond or seep into the ground adjacent to the footings. Roof leaders and downspouts should discharge onto paved surfaces sloping away from the structure or into a closed pipe system which outfalls to the street gutter pan or directly to the storm drain system. Pad drainage should be directed toward approved areas and not be blocked by other improvements.

It is the owner's responsibility to maintain and clean drainage devices on or contiguous to their lot. In order to be effective, maintenance should be conducted on a regular and routine schedule and necessary corrections made prior to each rainy season.

6.5 PLAN REVIEW AND CONSTRUCTION OBSERVATIONS

We recommend that foundation plans for the site be reviewed by this office prior to construction to check for conformance with the recommendations of this report. We also recommend that GeoTek representatives be present during construction of foundation and other improvements to observe and document proper implementation of the geotechnical recommendations. The owner/developer should verify that GeoTek representatives perform at least the following duties:

- Observe site clearing and grubbing operations for proper removal of unsuitable materials.
- Observe and test bottom of removals prior to fill placement.
- Evaluate the suitability of on-site and import materials for fill placement and collect soil samples for laboratory testing when necessary.
- Observe the fill for uniformity during placement including utility trenches.
- Test the fill for field density and relative compaction.
- Test the near-surface soils to verify proper moisture content.
- Observe and probe foundation excavations to confirm suitability of bearing materials.

If requested, a construction observation and compaction report can be provided by GeoTek, which can comply with the requirements of the governmental agencies having jurisdiction over the project.

7 INTENT

It is the intent of this report to aid in the design and construction of the proposed development. Implementation of the advice presented in this report is intended to reduce risk associated with construction projects. The professional opinions and geotechnical advice contained in this report are not intended to imply total performance of the project or guarantee that unusual or variable conditions will not be discovered during or after construction.

The scope of our report is limited to the boundaries of the subject property. This update does not and should in no way be construed to encompass any areas beyond the specific area of the proposed construction as indicated to us by our client. Further, no evaluation of any existing site improvements is included. The scope is based on our understanding of the project and the client's needs, our fee estimate (Proposal No. P-0507021-CR) date May 24, 2021 and geotechnical engineering standards normally used on similar projects in this locality at the present.

8 LIMITATIONS

Our findings are based on site conditions observed and the stated sources. Thus, our comments are professional opinions that are limited to the extent of the available data.

GeoTek has prepared this report in a manner consistent with that level of care and skill ordinarily exercised by members of the engineering and science professions currently practicing under similar conditions in the jurisdiction in which the services are provided, subject to the time limits and physical constraints applicable to this report.

Since our recommendations are based on the site conditions observed and encountered, and laboratory testing, our conclusions and recommendations are professional opinions that are limited to the extent of the available data. Observations during construction are important to allow for any change in recommendations found to be warranted. These opinions have been

derived in accordance with current standards of practice and no warranty of any kind is expressed or implied. Standards of care/practice are subject to change with time.

9 SELECTED REFERENCES

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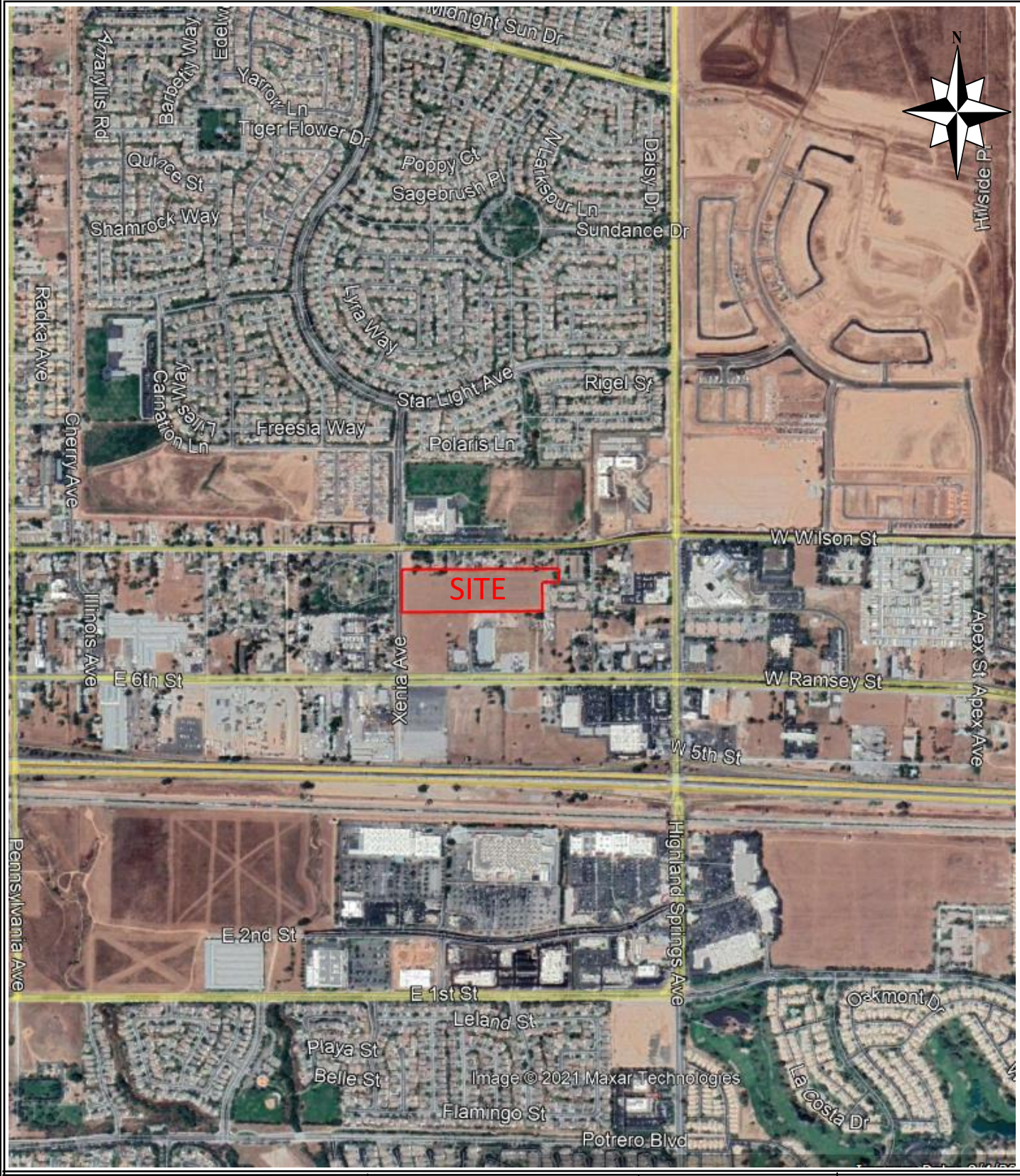
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Beaumont Land Partners
Xenia Apartment Project
Beaumont, Riverside County, California

Project No. 2784-CR

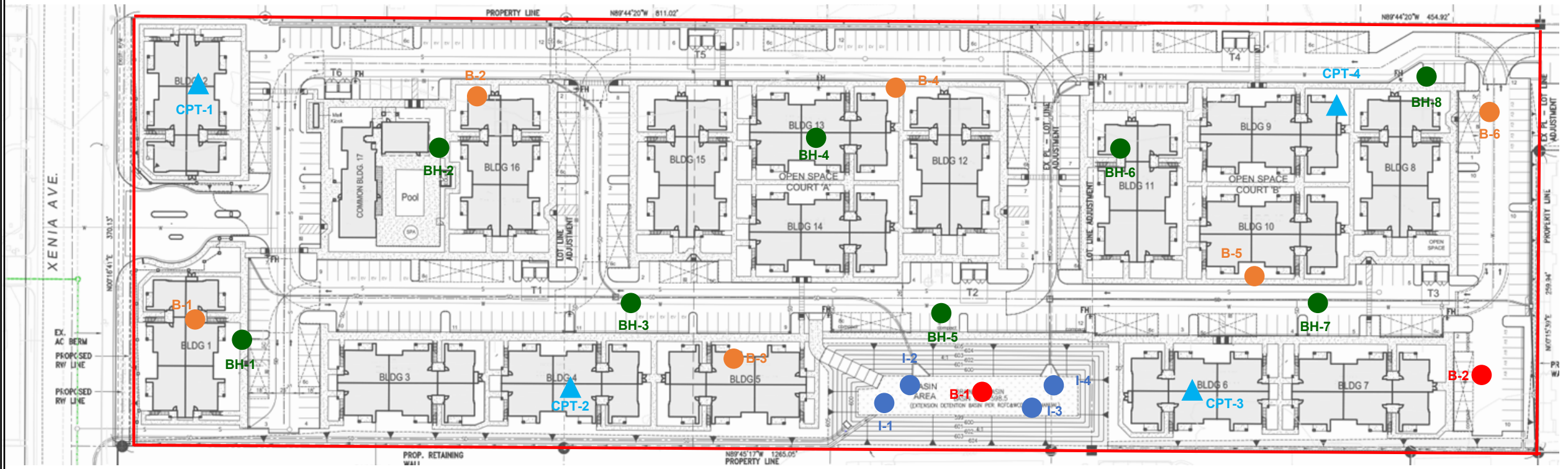
Scale:

0 0.2 mi

Figure 1

Site Location Map

GEOTEK



LEGEND

(Locations are approximate)

- B-6 — Exploratory Boring by ESSW (2006)
- B-2 — Exploratory Boring by GeoTek
- CPT-4 — CPT Sounding by GeoTek
- BH-8 — Exploratory Boring by Converse (2019)
- I-4 — Percolation Boring by GeoTek

Beaumont Land Partners
Xenia Apartment Project
Beaumont, Riverside County, California

Project No. 2784-CR

Scale:

0 — 210 ft

Figure 2

Exploration Location Map

GEOTEK

APPENDIX A

LOGS OF BORINGS BY ESSW (2006)

Updated Geotechnical and Infiltration Evaluation
Xenia Apartment Project, Beaumont, California
Project No. 2784-CR

GEOTEK

Earth Systems
Southwest
79-811 B Country Club Dirve, Bermuda Dunes, CA 92203
Phone (760) 345-1588, Fax (760) 345-7315

Boring No: B-1

Project Name: E. Side of Xenia Ave., Between 6th & 8th Sts., Beaumont, CA
File Number: 10437-03
Boring Location: See Figure 2

Drilling Date: April 21, 2006
Drilling Method: 8" Hollow Stem Auger
Drill Type: Williams CME 55 w/Auto Hammer
Logged By: Dirk Wiggins

Description of Units

Note: The stratification lines shown represent the approximate boundary between soil and/or rock types and the transition may be gradational.

Depth (Ft.)	Sample Type (Bulk / SPT / MOD Calif.)	Penetration Resistance (Blows/6")	Symbol	USCS	Dry Density (pcf)	Moisture Content (%)	Description of Units
0				SM			SILTY SAND: dark reddish brown, medium dense, damp, fine to medium grained, trace coarse grained
	MOD Calif.	7,6,7					
5							
	MOD Calif.	4,9,13		SC			CLAYEY SAND: dark reddish brown, stiff, damp, fine to medium grained
10							
	MOD Calif.	10,22,32					very stiff
15							
	MOD Calif.	9,12,21					dark reddish brown to light brown
20							Total Depth 19 feet No Groundwater Encountered
25							
30							
35							
40							

Graphic Trend: Blow Count / Dry Density

Earth Systems
Southwest
79-811 B Country Club Dirve, Bermuda Dunes, CA 92203
Phone (760) 345-1588, Fax (760) 345-7315

Boring No: B-2

Project Name: E. Side of Xenia Ave., Between 6th & 8th Sts., Beaumont, CA
File Number: 10437-03
Boring Location: See Figure 2

Drilling Date: April 21, 2006
Drilling Method: 8" Hollow Stem Auger
Drill Type: Williams CME 55 w/Auto Hammer
Logged By: Dirk Wiggins

Description of Units

Note: The stratification lines shown represent the approximate boundary between soil and/or rock types and the transition may be gradational.

Depth (Ft.)	Sample Type (Bulk / SPT / MOD Calif.)	Penetration Resistance (Blows/6")	Symbol	USCS	Dry Density (pcf)	Moisture Content (%)	Description of Units	Graphic Trend: Blow Count / Dry Density
0	Bulk			SC			CLAYEY SAND: light brown, stiff, damp, fine to medium grained, trace coarse grained	
5	MOD Calif.	5,10,11						
10	MOD Calif.	5,9,10						
15	MOD Calif.	12,16,20					light brown to white, very stiff, dry, fine to coarse grained	
20							Total Depth 14 feet No Groundwater Encountered	
25								
30								
35								
40								

Earth Systems
Southwest
79-811 B Country Club Dirve, Bermuda Dunes, CA 92203
Phone (760) 345-1588, Fax (760) 345-7315

Boring No: B-3

Project Name: E. Side of Xenia Ave., Between 6th & 8th Sts., Beaumont, CA
File Number: 10437-03
Boring Location: See Figure 2

Drilling Date: April 21, 2006
Drilling Method: 8" Hollow Stem Auger
Drill Type: Williams CME 55 w/Auto Hammer
Logged By: Dirk Wiggins

Description of Units

Note: The stratification lines shown represent the approximate boundary between soil and/or rock types and the transition may be gradational.

Depth (Ft.)	Sample Type (Bulk / SPT / MOD Calif.)	Penetration Resistance (Blows/6")	Symbol	USCS	Dry Density (pcf)	Moisture Content (%)	Description of Units
0				SC			CLAYEY SAND: moderate brown to light brown, stiff, damp, fine to medium grained, trace coarse grained
5	MOD Calif.	6,10,13					
10	MOD Calif.	7,11,15					light brown
15	MOD Calif.	6,21,26					light brown to moderate brown with white minerals, very stiff, dry, fine to coarse grained, trace fine gravel
20							Total Depth 16.5 feet No Groundwater Encountered
25							
30							
35							
40							

Graphic Trend
Blow Count Dry Density

Earth Systems
Southwest
79-811 B Country Club Dirve, Bermuda Dunes, CA 92203
Phone (760) 345-1588, Fax (760) 345-7315

Boring No: B-4

Project Name: E. Side of Xenia Ave., Between 6th & 8th Sts., Beaumont, CA
File Number: 10437-03
Boring Location: See Figure 2

Drilling Date: April 21, 2006
Drilling Method: 8" Hollow Stem Auger
Drill Type: Williams CME 55 w/Auto Hammer
Logged By: Dirk Wiggins

Depth (Ft.)	Sample Type (Bulk, SPT, MOD Calif.)	Penetration Resistance (Blows/6")	Symbol	USCS	Dry Density (pcf)	Moisture Content (%)	Description of Units
0		2,2,2		SM			SILTY SAND: dark reddish brown, loose, damp, fine to medium grained
5		4,6,8		SC			CLAYEY SAND: reddish light brown, stiff, damp, fine to medium grained, lenses of silty sand
10		6,12,14					light brown, trace coarse grained
15		6,10,12					
20		4,5,5		SM			SILTY SAND: light brown, medium dense, dry, fine to medium grained
25							Total Depth 21.5 feet No Groundwater Encountered
30							
35							
40							

Note: The stratification lines shown represent the approximate boundary between soil and/or rock types and the transition may be gradational.

Graphic Trend
Blow Count Dry Density

Earth Systems
Southwest
79-811 B Country Club Dirve, Bermuda Dunes, CA 92203
Phone (760) 345-1588, Fax (760) 345-7315

Boring No: B-5

Project Name: E. Side of Xenia Ave., Between 6th & 8th Sts., Beaumont, CA
File Number: 10437-03
Boring Location: See Figure 2

Drilling Date: April 21, 2006
Drilling Method: 8" Hollow Stem Auger
Drill Type: Williams CME 55 w/Auto Hammer
Logged By: Dirk Wiggins

Depth (Ft.)	Sample Type: Bulk	Sample Type: SPT	Sample Type: MOD Calif.	Penetration Resistance (Blows/6")	Symbol	USCS	Dry Density (pcf)	Moisture Content (%)	Description of Units	Graphic Trend: Blow Count / Dry Density
0						SM			SILTY SAND: light brown, medium dense, damp, fine to medium grained	
5			■	4,10,9						
						SC			CLAYEY SAND: reddish brown, firm, damp, fine to medium grained, trace coarse grained	
10		■		2,2,3						
		■		3,5,6					light brown to reddish brown, stiff	
15									Total Depth 14 feet No Groundwater Encountered	
20										
25										
30										
35										
40										

Description of Units

Note: The stratification lines shown represent the approximate boundary between soil and/or rock types and the transition may be gradational.

Earth Systems
Southwest
79-811 B Country Club Dirve, Bermuda Dunes, CA 92203
Phone (760) 345-1588, Fax (760) 345-7315

Boring No: B-6

Project Name: E. Side of Xenia Ave., Between 6th & 8th Sts., Beaumont, CA
File Number: 10437-03
Boring Location: See Figure 2

Drilling Date: April 21, 2006
Drilling Method: 8" Hollow Stem Auger
Drill Type: Williams CME 55 w/Auto Hammer
Logged By: Dirk Wiggins

Depth (Ft.)	Sample Type (Bulk / SPT / MOD Calif.)	Penetration Resistance (Blows/6")	Symbol	USCS	Dry Density (pcf)	Moisture Content (%)	Description of Units
0	Bulk			SC/SM			SILTY SAND TO CLAYEY SAND: light brown, medium dense, damp, fine to medium grained, interbedded
5	MOD Calif.	4,6,7		SC			CLAYEY SAND: light brown, stiff, damp, fine to medium grained, few coarse grained, organic matter, white minerals
10	MOD Calif.	4,6,9					
15	MOD Calif.	5,9,15					fine to coarse grained
20	MOD Calif.	22,37,41					very stiff, dry, trace fine gravel, less clay, more silt, lenses of silty sand
25							Total Depth 21.5 feet No Groundwater Encountered
30							
35							
40							

Note: The stratification lines shown represent the approximate boundary between soil and/or rock types and the transition may be gradational.

Graphic Trend
Blow Count Dry Density

APPENDIX B

LOGS OF BORINGS AND LABORATORY TEST RESULTS BY CONVERSE (2019)

Updated Geotechnical and Infiltration Evaluation
Xenia Apartment Project, Beaumont, California
Project No. 2784-CR

GEOTEK

Log of Boring No. BH-01

Dates Drilled: 8/4/2019 Logged by: William Buckley Checked By: Mehrab Jesmani

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 2610 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		ALLUVIUM **SILTY SAND (SM):** fine to medium-grained, brown.		■				se
5			■		7/14/17	7	102	col
			■		11/15/18	9	114	
10			■		10/14/16	13	112	
15			■		10/20/20	11	113	
		End of boring at 16.5 feet bgs. No groundwater encountered. Borehole backfilled with soil cuttings and compacted with an auger using the weight of the drill rig on 9/4/2019.						

Converse Consultants

Approximately 10.93-Acre Site
Southeast of Xenia Avenue and 8th Street
City of Beaumont, Riverside County, California
For: Pardee Homes

Project No. 19-81-237-01

Drawing No. A-2

Log of Boring No. BH-02

Dates Drilled: 8/4/2019 Logged by: William Buckley Checked By: Mehrab Jesmani

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 2612 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE	DRY UNIT WT. (pcf)	OTHER
		ALLUVIUM: **SILTY SAND (SM):** fine to medium-grained, brown.						
5			■	▨	11/10/12	8	103	ma
			■	▨	8/14/20	13	113	
10			■		10/12/15	13	113	
15		- fine to coarse-grained	■		10/18/21	6	109	
		End of boring at 16.5 feet bgs. No groundwater encountered. Borehole backfilled with soil cuttings and compacted with an auger using the weight of the drill rig on 9/4/2019.						

Converse Consultants

Approximately 10.93-Acre Site
Southeast of Xenia Avenue and 8th Street
City of Beaumont, Riverside County, California
For: Pardee Homes

Project No. 19-81-237-01

Drawing No. A-3

Log of Boring No. BH-03

Dates Drilled: 8/4/2019 Logged by: William Buckley Checked By: Mehrab Jesmani

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 2609 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE	DRY UNIT WT. (pcf)	OTHER
		ALLUVIUM: **SILTY SAND (SM):** fine to medium-grained, brown.		■				ca,er,max
5			■		8/8/11	12	114	
			■		6/8/15	10	118	ds
10		- fine to coarse grained	■		8/16/19	12	119	
15		- scattered gravel up to 0.5" in largest dimension	■		20/20/23	6	112	
		End of boring at 16.5 feet bgs. No groundwater encountered. Borehole backfilled with soil cuttings and compacted with an auger using the weight of the drill rig on 9/4/2019.						

Converse Consultants

Approximately 10.93-Acre Site
Southeast of Xenia Avenue and 8th Street
City of Beaumont, Riverside County, California
For: Pardee Homes

Project No. 19-81-237-01

Drawing No. A-4

Log of Boring No. BH-04

Dates Drilled: 8/4/2019 Logged by: William Buckley Checked By: Mehrab Jesmani

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 2612 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE	DRY UNIT WT. (pcf)	OTHER
		ALLUVIUM: **SILTY SAND (SM):** fine to medium-grained, brown.						
5			■	▨	8/8/12	11	117	ma
			■	▨	8/12/15	15	111	col
10			■		7/9/14	16	116	
15			■		8/9/12	13	116	
		End of boring at 16.5 feet bgs. No groundwater encountered. Borehole backfilled with soil cuttings and compacted with an auger using the weight of the drill rig on 9/4/2019.						

Converse Consultants

Approximately 10.93-Acre Site
Southeast of Xenia Avenue and 8th Street
City of Beaumont, Riverside County, California
For: Pardee Homes

Project No. 19-81-237-01

Drawing No. A-5

Log of Boring No. BH-05

Dates Drilled: 8/4/2019 Logged by: William Buckley Checked By: Mehrab Jesmani

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 2608 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		ALLUVIUM: **SILTY SAND (SM):** fine to medium-grained, brown.		■				r,ma
5			■		8/10/12	12	109	
10		- fine to coarse-grained, scattered gravel up to 0.5" in largest dimension	■		8/12/14	12	124	
15		- scattered gravel up to 1" in largest dimension	■		23/35/40	6	117	
20			☒		24/20/23			
25		- few gravel up to 1" in largest dimension, orangish-brown	■		20/50-5"	4	107	
30		- scattered gravel up to 0.5" in largest dimension	☒		17/18/16			

Converse Consultants

Approximately 10.93-Acre Site
Southeast of Xenia Avenue and 8th Street
City of Beaumont, Riverside County, California
For: Pardee Homes

Project No. 19-81-237-01

Drawing No. A-6a

Log of Boring No. BH-05

Dates Drilled: 8/4/2019 Logged by: William Buckley Checked By: Mehrab Jesmani

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 2608 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		ALLUVIUM: **SAND with SILT (SP-SM):** fine to medium-grained, light brown.	■		15/25/28	3	97	
40			☒		14/17/27			
45			■		27/35/40	4	103	
50			☒		14/20/25			
		End of boring at 51.5 feet bgs. No groundwater encountered. Borehole backfilled with soil cuttings and compacted with an auger using the weight of the drill rig on 9/4/2019.						

Converse Consultants

Approximately 10.93-Acre Site
Southeast of Xenia Avenue and 8th Street
City of Beaumont, Riverside County, California
For: Pardee Homes

Project No. 19-81-237-01

Drawing No. A-6b

Log of Boring No. BH-06

Dates Drilled: 8/4/2019 Logged by: William Buckley Checked By: Mehrab Jesmani

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 2611 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		ALLUVIUM: **SILTY SAND (SM):** fine to medium-grained, brown.		■				se
5			■		3/3/4	6	102	ds
10			■		9/12/15	8	107	
15			■		10/10/12	12	106	
		End of boring at 16.5 feet bgs. No groundwater encountered. Borehole backfilled with soil cuttings and compacted with an auger using the weight of the drill rig on 9/4/2019.						

Converse Consultants

Approximately 10.93-Acre Site
Southeast of Xenia Avenue and 8th Street
City of Beaumont, Riverside County, California
For: Pardee Homes

Project No. 19-81-237-01

Drawing No. A-7

Log of Boring No. BH-07

Dates Drilled: 8/4/2019 Logged by: William Buckley Checked By: Mehrab Jesmani

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 2607 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		ALLUVIUM: **SILTY SAND (SM):** fine to medium-grained, brown.						
5			■	▨	3/2/3	7	100	max
			■	▨	5/7/9	13	111	
10			■		8/12/14	14	116	
15			■		10/12/18	11	114	
		End of boring at 16.5 feet bgs. No groundwater encountered. Borehole backfilled with soil cuttings and compacted with an auger using the weight of the drill rig on 9/4/2019.						

Converse Consultants

Approximately 10.93-Acre Site
Southeast of Xenia Avenue and 8th Street
City of Beaumont, Riverside County, California
For: Pardee Homes

Project No. 19-81-237-01

Drawing No. A-8

Log of Boring No. BH-08

Dates Drilled: 8/4/2019 Logged by: William Buckley Checked By: Mehrab Jesmani

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 2609 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		ALLUVIUM: **SILTY SAND (SM):** fine to medium-grained, brown.		■				ca,er,ma
5			■		5/6/7	10	103	
10			■		6/10/20	13	123	
15		- fine to coarse-grained, scattered gravel up to 0.5" in largest dimension	■		8/16/24	11	123	
		End of boring at 16.5 feet bgs. No groundwater encountered. Borehole backfilled with soil cuttings and compacted with an auger using the weight of the drill rig on 9/4/2019.						

Converse Consultants

Approximately 10.93-Acre Site
Southeast of Xenia Avenue and 8th Street
City of Beaumont, Riverside County, California
For: Pardee Homes

Project No. 19-81-237-01

Drawing No. A-9

APPENDIX B

LABORATORY TESTING PROGRAM

Tests were conducted in our laboratory on representative soil samples for the purpose of classification and evaluation of their physical properties and engineering characteristics. The amount and selection of tests were based on the geotechnical parameters required for this project. Test results are presented herein and on the Logs of Borings, in Appendix A, *Field Exploration*. The following is a summary of the various laboratory tests conducted for this project.

In-Situ Moisture Content and Dry Density

Results of these tests performed on relatively undisturbed ring samples were used to aid in the classification and to provide quantitative measure of the *in situ* dry density and moisture content, (ASTM D2216). Data obtained from this test provides qualitative information on strength and compressibility characteristics of the site soils. For test results, see the Logs of Borings in Appendix A, *Field Exploration*.

Expansion Index

One sample was tested to evaluate the expansion potential of material encountered at the site. The test was conducted in accordance with ASTM Standard D4829. Test result is presented in the following table.

Table No. B-1, Summary of Expansion Index Test Result

Boring No.	Depth (feet)	Soil Description	Expansion Index	Expansion Potential
BH-05	0 to 5	Silty Sand (SM)	7	Very Low

Sand Equivalent

Two representative soil samples were tested in accordance with the ASTM D2419 test method to determine the sand equivalent. The test results are presented in the following table.

Table No. B-2, Sand Equivalent Test Results

Boring No.	Depth (feet)	Soil Description	Sand Equivalent
BH-01	0-5	Silty Sand (SM)	11
BH-06	0-5	Silty Sand (SM)	20

R-value

One representative bulk soil sample was tested for resistance value (R-value) in accordance with California Test Method CT301. This test is designed to provide a relative measure of soil strength for use in pavement design. The test result is shown in the following table.

Table No. B-3, R-Value Test Result

Boring No.	Depth (feet)	Soil Classification	Measured R-value
BH-05	0-5	Silty Sand (SM)	23

Soil Corrosivity Tests

Two representative soil samples were tested to determine minimum electrical resistivity, pH, and chemical content, including soluble sulfate and chloride concentrations. The purpose of the tests was to determine the corrosion potential of sites soils when placed in contact with common construction materials. The tests were performed by AP Engineering and Testing, Inc. (Pomona, CA) in accordance to Caltrans Test Methods 643, 422 and 417. Test results are presented in the following table.

Table No. B-4, Summary of Soil Corrosivity Test Results

Boring No.	Depth (feet)	pH	Soluble Sulfates (CA 417) (% by weight)	Soluble Chlorides (CA 422) (ppm)	Min. Resistivity (CA 643) (Ohm-cm)
BH-03	0-5	7.0	0.0038	35	10,158
BH-08	0-5	6.9	0.0036	35	6,826

Collapse Tests

To evaluate the moisture sensitivity (collapse/swell potential) of the encountered soils, two collapse tests were performed in accordance with the ASTM Standard D5333 laboratory procedure. The samples were loaded to approximately 2 kips per square foot (ksf), allowed to stabilize under load, and then submerged. The test results are presented in the following table.

Table No. B-5, Collapse Test Results

Boring No.	Depth (feet)	Soil Classification	Percent Swell (+) Percent Collapse (-)	Collapse Potential
BH-01	5.0-6.5	Silty Sand (SM)	-2.5	Moderate
BH-04	7.5-9.0	Silty Sand (SM)	-0.1	Slight

Grain-Size Analyses

To assist in classification of soils, mechanical grain-size analyses were performed on four select samples in accordance with the ASTM Standard D422 test method. Grain-size curves are shown in Drawing No. B-1, *Grain Size Distribution Results*.

Maximum Dry Density and Optimum Moisture Content Test

Laboratory maximum dry density-optimum moisture content relationship test were performed on two representative bulk samples. These tests were conducted in accordance with the ASTM Standard D1557 test method. The test results are presented in Drawing No. B-2, *Moisture-Density Relationship Results,* and is summarized in the following table.

Table No B-6, Summary of Moisture-Density Relationship Results

Boring No.	Depth (feet)	Soil Description	Optimum Moisture (%)	Maximum Density (lb/cft)
BH-03	0-5	Silty Sand (SM), Brown	7.5	133.5
BH-07	5-10	Silty Sand (SM), Brown	7.8	133.3

Direct Shear Test

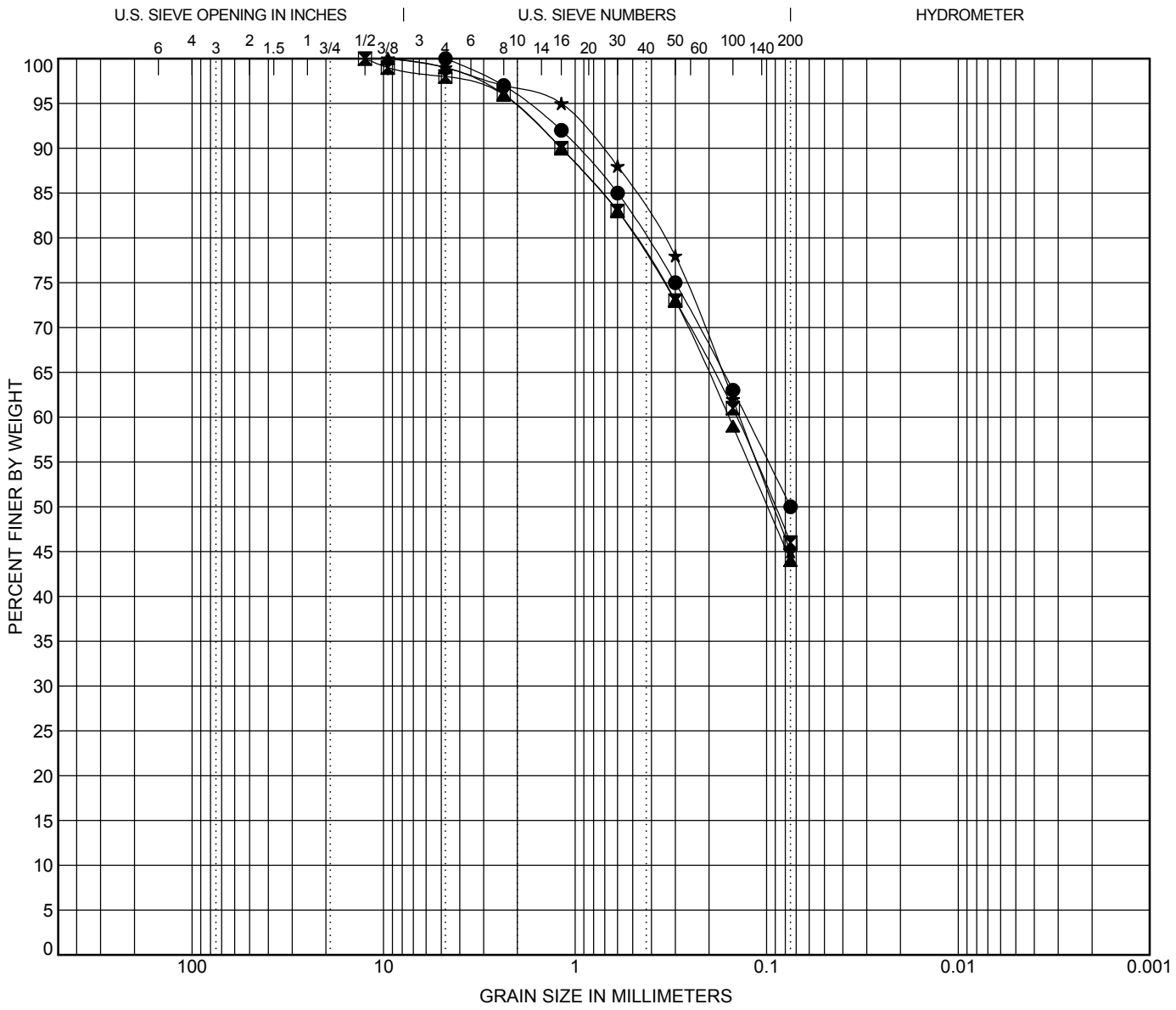
Two direct shear tests were performed on relatively undisturbed samples in soaked moisture condition in accordance with ASTM D3080. For these tests, three samples contained in brass sampler rings were placed, one at a time, directly into the test apparatus and subjected to a range of normal loads appropriate for the anticipated conditions. The samples were then sheared at a constant strain rate of 0.025 inch/minute. Shear deformation was recorded until a maximum of about 0.25-inch shear displacement was achieved. Ultimate strength was selected from the shear-stress deformation data and plotted to determine the shear strength parameters. For test data, including sample density and moisture content, see Drawings No. B-3 and B-4*, Direct Shear Test Results,* and the following table.

Table No. B-7, Summary of Direct Shear Test Results

Boring No.	Depth (feet)	Soil Description	Peak Strength Parameters	
			Friction Angle (degrees)	Cohesion (psf)
BH-03	7.5-9.0	Silty Sand (SM)	35	120
BH-06	5.0-6.5	Silty Sand (SM)	31	60

Sample Storage

Soil samples presently stored in our laboratory will be discarded 30 days after the date of this report, unless this office receives a specific request to retain the samples for a longer period.



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Boring No.	Depth (ft)	Description	LL	PL	PI	Cc	Cu
●	**BH-02**	**5-10**	**SILTY SAND (SM)**					
⊠	**BH-04**	**5-10**	**SILTY SAND (SM)**					
▲	**BH-05**	**0-5**	**SILTY SAND (SM)**					
★	**BH-08**	**0-5**	**SILTY SAND (SM)**					

	Boring No.	Depth (ft)	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**BH-02**	**5-10**	**4.75**	**0.128**			**0.0**	**50.0**	**50.0**	
⊠	**BH-04**	**5-10**	**12.5**	**0.143**			**2.0**	**52.0**	**46.0**	
▲	**BH-05**	**0-5**	**9.5**	**0.158**			**1.0**	**55.0**	**44.0**	
★	**BH-08**	**0-5**	**9.5**	**0.138**			**1.0**	**54.0**	**45.0**	

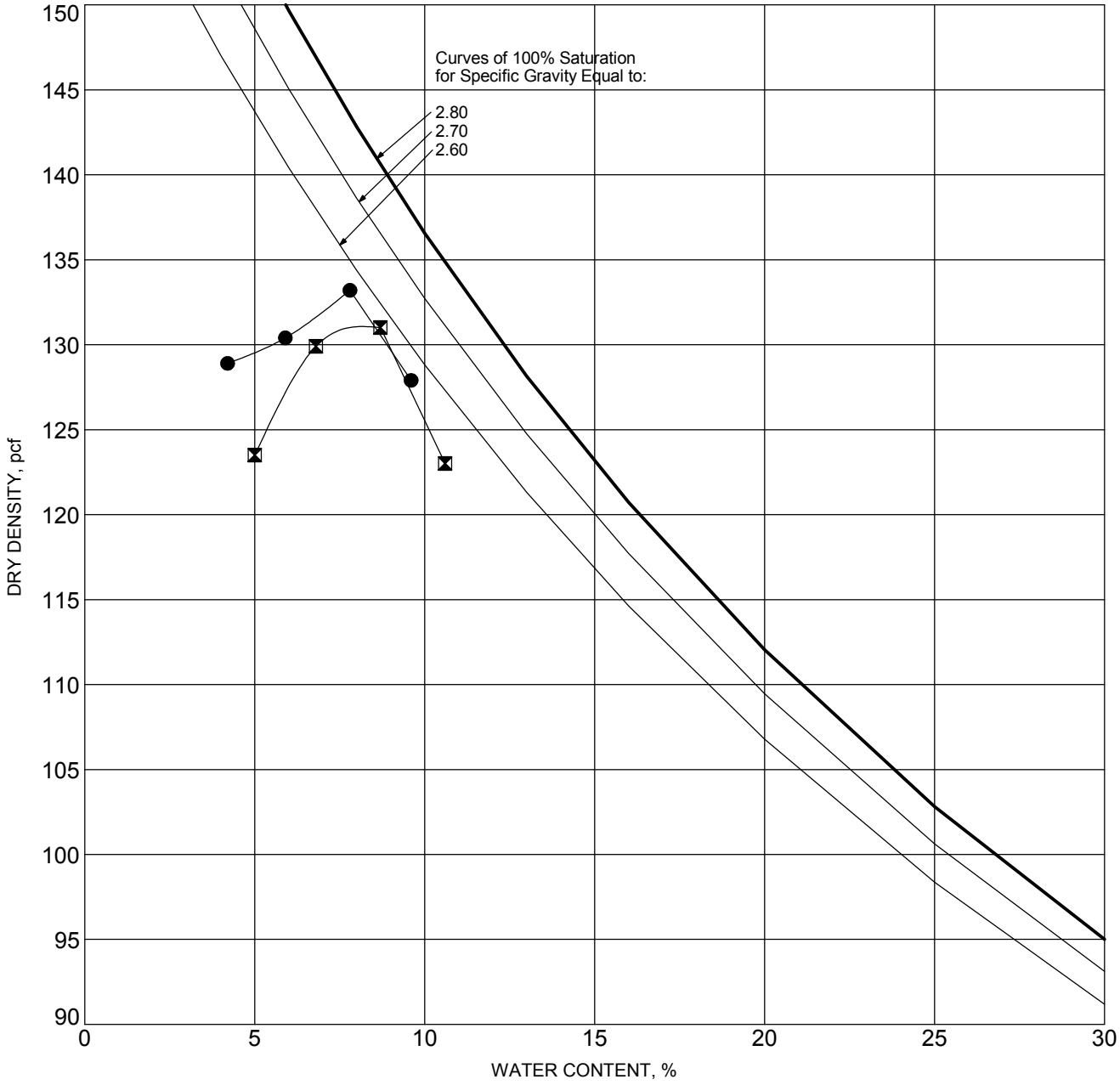
GRAIN SIZE DISTRIBUTION RESULTS

Converse Consultants

Approximately 10.93-Acre Site
Southeast of Xenia Avenue and 8th Street
City of Beaumont, Riverside County, California
For: Pardee Homes

Project No. **19-81-237-01**

Drawing No. **B-1**



SYMBOL	BORING NO.	DEPTH (ft)	DESCRIPTION	ASTM TEST METHOD	OPTIMUM WATER, %	MAXIMUM DRY DENSITY, pcf
●	**BH-03**	**0-5**	**SILTY SAND (SM), BROWN**	**D1557 - A**	**7.5**	**133.5**
⊠	**BH-07**	**5-10**	**SILTY SAND (SM), BROWN**	**D1557 - A**	**7.8**	**133.3**

MOISTURE-DENSITY RELATIONSHIP RESULTS

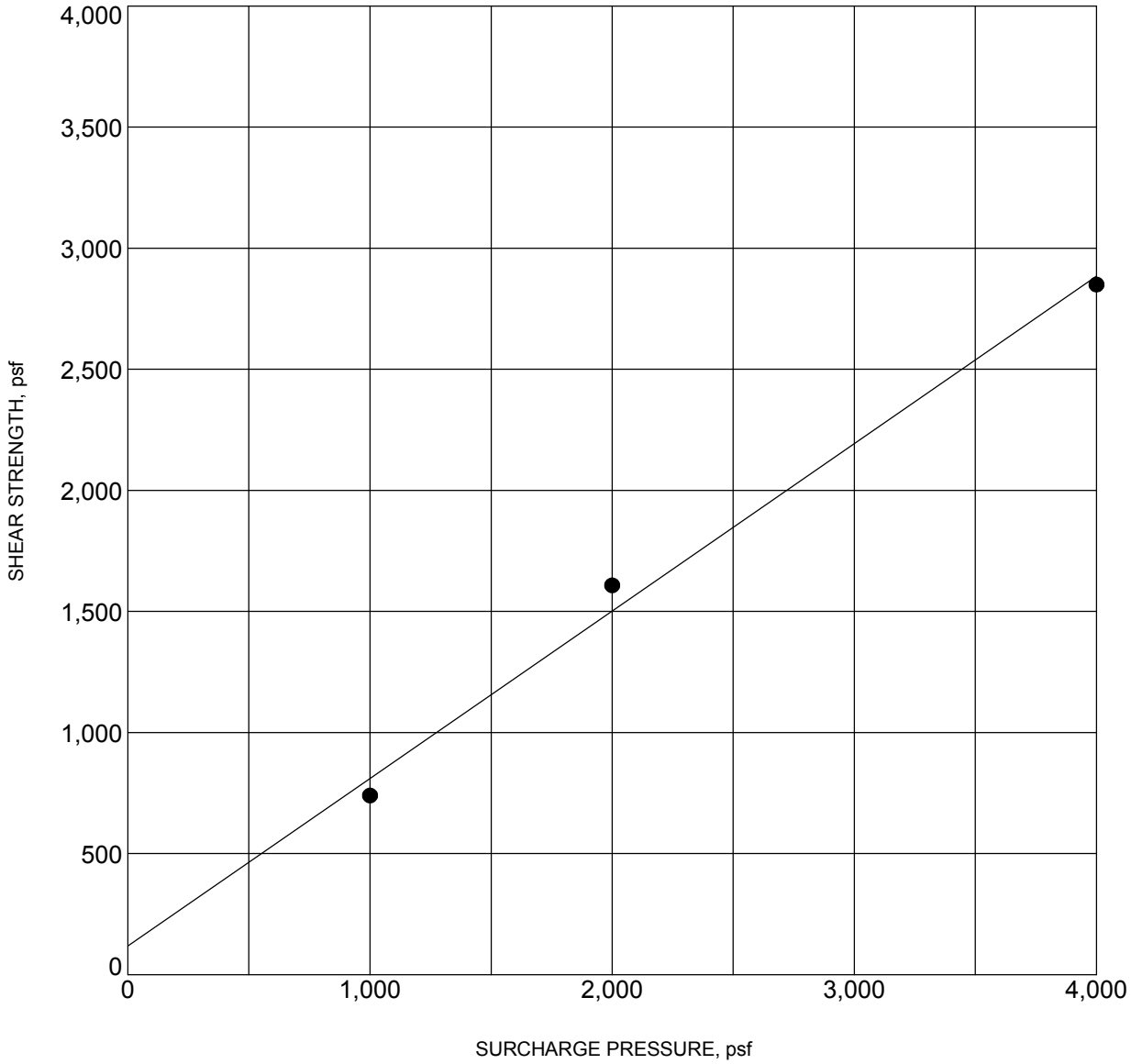
Converse Consultants

Approximately 10.93-Acre Site
Southeast of Xenia Avenue and 8th Street
City of Beaumont, Riverside County, California
For: Pardee Homes

Project No. **19-81-237-01**

Drawing No. **B-2**

Project ID: 19-81-237-01.GPJ; Template: COMPACTION



BORING NO.	:	**BH-03**	DEPTH (ft)	:	**7.5-9.0**
DESCRIPTION	:	**SILTY SAND (SM)**			
COHESION (psf)	:	**120**	FRICTION ANGLE (degrees):		**35**
MOISTURE CONTENT (%)	:	**10.0**	DRY DENSITY (pcf)	:	**118.0**

NOTE: Ultimate Strength.

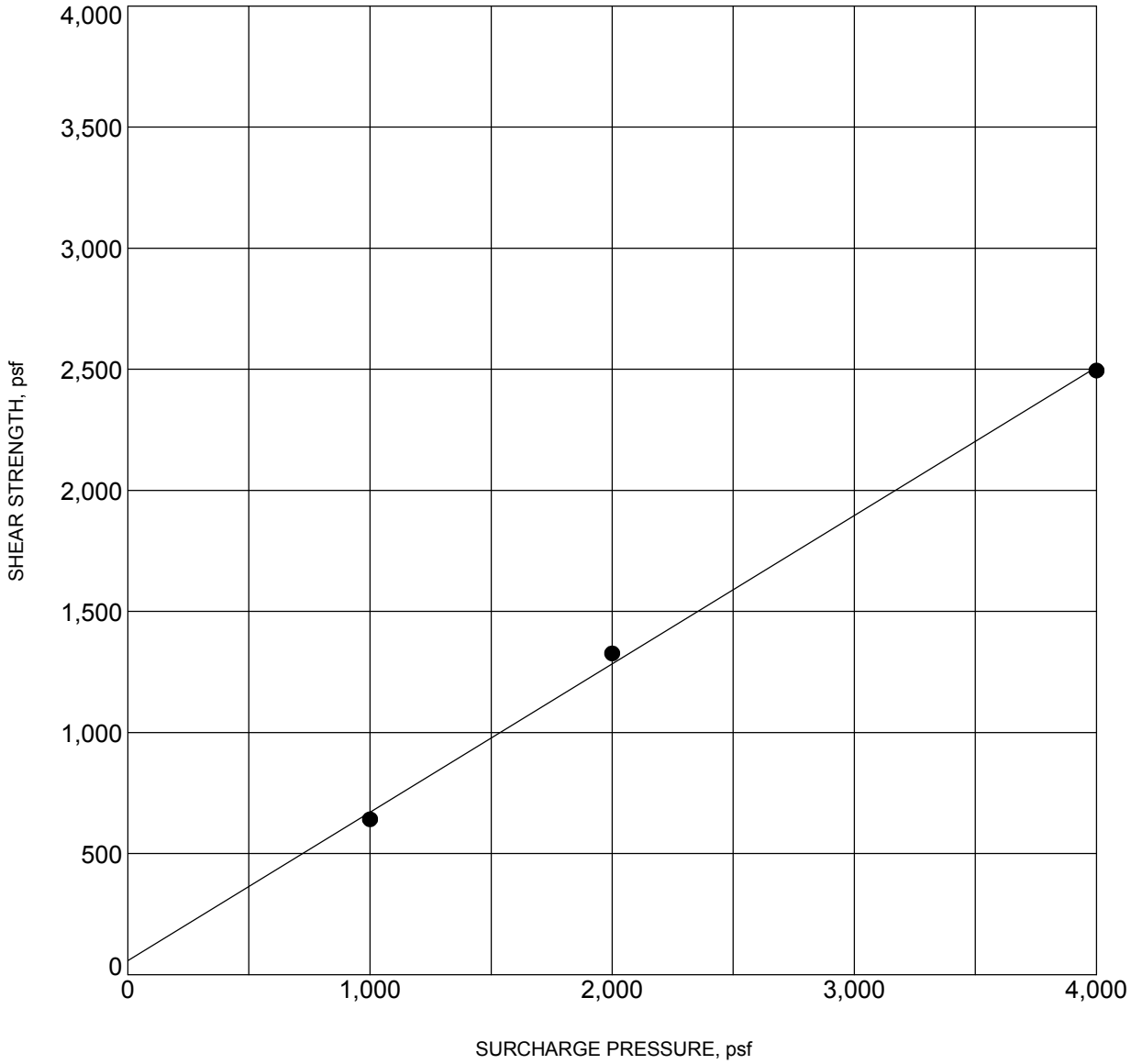
DIRECT SHEAR TEST RESULTS

Converse Consultants

Approximately 10.93-Acre Site
Southeast of Xenia Avenue and 8th Street
City of Beaumont, Riverside County, California
For: Pardee Homes

Project No. **19-81-237-01**

Drawing No. **B-3**



BORING NO.	:	**BH-06**	DEPTH (ft)	:	**5.0-6.5**
DESCRIPTION	:	**SILTY SAND (SM)**			
COHESION (psf)	:	**60**	FRICTION ANGLE (degrees):		**32**
MOISTURE CONTENT (%)	:	**6.0**	DRY DENSITY (pcf)	:	**102.0**

NOTE: Ultimate Strength.

DIRECT SHEAR TEST RESULTS

Converse Consultants

Approximately 10.93-Acre Site
Southeast of Xenia Avenue and 8th Street
City of Beaumont, Riverside County, California
For: Pardee Homes

Project No. **19-81-237-01**

Drawing No. **B-4**

APPENDIX C

LOGS OF BORINGS AND CPT SOUNDINGS BY GEOTEK

Updated Geotechnical and Infiltration Evaluation
Xenia Apartment Project, Beaumont, California
Project No. 2784-CR

GEOTEK

A - FIELD TESTING AND SAMPLING PROCEDURES

The Modified Split-Barrel Sampler (Ring)

The ring sampler is driven into the ground in accordance with ASTM Test Method D 3550. The sampler, with an external diameter of 3.0 inches, is lined with 1-inch long, thin brass rings with inside diameters of approximately 2.4 inches. The sampler is typically driven into the ground 12 or 18 inches with a 140-pound hammer free falling from a height of 30 inches. Blow counts are recorded for every 6 inches of penetration as indicated on the logs of borings. The samples are removed from the sample barrel in the brass rings, sealed, and transported to the laboratory for testing.

Bulk Samples (Large)

These samples are normally large bags of earth materials over 20 pounds in weight collected from the field by means of hand digging or exploratory cuttings.

Bulk Samples (Small)

These are plastic bag samples which are normally airtight and contain less than five pounds in weight of earth materials collected from the field by means of hand digging or exploratory cuttings. These samples are primarily used for determining natural moisture content and classification indices.

B – BORING

The following abbreviations and symbols often appear in the classification and description of soil and rock on the logs of borings:

SOILS

USCS	Unified Soil Classification System
f-c	Fine to coarse
f-m	Fine to medium

GEOLOGIC

B: Attitudes	Bedding: strike/dip
J: Attitudes	Joint: strike/dip
C: Contact line	
……..	Dashed line denotes USCS material change
———	Solid Line denotes unit / formational change
———	Thick solid line denotes end of boring

(Additional denotations and symbols are provided on the logs of borings).

GeoTek, Inc.

LOG OF EXPLORATORY BORING

CLIENT:	Beaumont Land Partners	**DRILLER:**	2R Drilling	**LOGGED BY:**	Franklin Sullivan
PROJECT NAME:	Xenia Apt Project	**DRILL METHOD:**	Hollow Stem	**OPERATOR:**	Adrian
PROJECT NO.:	2784-CR	**HAMMER:**	140#/30"	**RIG TYPE:**	CME 75
LOCATION:	Beaumont			**DATE:**	6/14/2021

Boring No.: B-1

Depth (ft)	SAMPLES: Sample Type	SAMPLES: Blows/ 6 in	SAMPLES: Sample Number	USCS Symbol	MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Others
0					**Alluvium:**			MD, EI, SH, SR
		7 9 11		SM	Silty f Sand, brown, slight moisture	6.0	111.9	
		10 12 17			becomes moist	9.0	115.3	
5		13 14 14				14.3	115.7	HC
		10 14 16				12.9	120.3	
10		21 42 43			contains trace gravel	7.2	126.7	
15		21 24 32				7.0	120.7	
20		23 50/6			**BORING TERMINATED AT 20 FEET** No groundwater encountered Boring backfilled with soil cuttings			
25								
30								

LEGEND

Sample type: ---Ring ---SPT ---Small Bulk ---Large Bulk ---No Recovery ---Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

GeoTek, Inc.

LOG OF EXPLORATORY BORING

CLIENT:	Beaumont Land Partners	**DRILLER:**	2R Drilling	**LOGGED BY:**	Franklin Sullivan
PROJECT NAME:	Xenia Apt Project	**DRILL METHOD:**	Hollow Stem	**OPERATOR:**	Adrian
PROJECT NO.:	2784-CR	**HAMMER:**	140#/30"	**RIG TYPE:**	CME 75
LOCATION:	Beaumont			**DATE:**	6/14/2021

Depth (ft)	SAMPLES: Sample Type	SAMPLES: Blows/ 6 in	SAMPLES: Sample Number	USCS Symbol	Boring No.: B-2 / MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Others
0					**Alluvium:**			EI, SR
		25 21 22		SM	Silty f-m Sand, light brown to brown, slight moisture	6.1	115.8	
		15 23 25			becomes moist, trace gravel	8.1	125.6	
5		9 11 12				6.8	117.7	
		7 9 12			contains trace clay	16.1	114.8	HC
10		11 17 18			Silty f Sand with clay, dark brown, moist	13.9	125.1	HC
15		9 17 22		ML	fine Sandy Silt, dark brown, slight moisture			
20		13 23 37		SM	Silty f-m Sand, medium brown, slight moisture	8.2	118.7	
					BORING TERMINATED AT 20 FEET No groundwater encountered Boring backfilled with soil cuttings			
25								
30								

LEGEND

Sample type: ---Ring ---SPT ---Small Bulk ---Large Bulk ---No Recovery ---Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

GeoTek, Inc.

LOG OF EXPLORATORY BORING

CLIENT:	Beaumont Land Partners	**DRILLER:**	2R Drilling	**LOGGED BY:**	Franklin Sullivan
PROJECT NAME:	Xenia Apt Project	**DRILL METHOD:**	Hollow Stem	**OPERATOR:**	Adrian
PROJECT NO.:	2784-CR	**HAMMER:**	140#/30"	**RIG TYPE:**	CME 75
LOCATION:	Beaumont			**DATE:**	6/15/2021

Depth (ft)	SAMPLES: Sample Type	SAMPLES: Blows/ 6 in	SAMPLES: Sample Number	USCS Symbol	Boring No.: I-1 / MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Others
0				SM	**Alluvium:** Silty f-m Sand, light brown to brown, slight moisture			
5					**BORING TERMINATED AT 5 FEET**			
10								
15								
20								
25								
30								

LEGEND

Sample type: ---Ring ---SPT ---Small Bulk ---Large Bulk ---No Recovery ---Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

GeoTek, Inc.

LOG OF EXPLORATORY BORING

CLIENT:	Beaumont Land Partners	**DRILLER:**	2R Drilling	**LOGGED BY:**	Franklin Sullivan
PROJECT NAME:	Xenia Apt Project	**DRILL METHOD:**	Hollow Stem	**OPERATOR:**	Adrian
PROJECT NO.:	2784-CR	**HAMMER:**	140#/30"	**RIG TYPE:**	CME 75
LOCATION:	Beaumont			**DATE:**	6/15/2021

Depth (ft)	SAMPLES: Sample Type	SAMPLES: Blows/ 6 in	SAMPLES: Sample Number	USCS Symbol	Boring No.: I-2 / MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Others
0				SM	**Alluvium:** Silty f-m Sand, light brown to brown, slight moisture			
5					**BORING TERMINATED AT 5 FEET**			
10								
15								
20								
25								
30								

LEGEND

Sample type: ---Ring ---SPT ---Small Bulk ---Large Bulk ---No Recovery ---Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

GeoTek, Inc.

LOG OF EXPLORATORY BORING

CLIENT:	Beaumont Land Partners	**DRILLER:**	2R Drilling	**LOGGED BY:**	Franklin Sullivan
PROJECT NAME:	Xenia Apt Project	**DRILL METHOD:**	Hollow Stem	**OPERATOR:**	Adrian
PROJECT NO.:	2784-CR	**HAMMER:**	140#/30"	**RIG TYPE:**	CME 75
LOCATION:	Beaumont			**DATE:**	6/15/2021

Depth (ft)	SAMPLES: Sample Type	SAMPLES: Blows/ 6 in	SAMPLES: Sample Number	USCS Symbol	Boring No.: I-3 / MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Others
0				SM	**Alluvium:** Silty f-m Sand, light brown to brown, slight moisture			
5					**BORING TERMINATED AT 5 FEET**			
10								
15								
20								
25								
30								

LEGEND

Sample type: ---Ring ---SPT ---Small Bulk ---Large Bulk ---No Recovery ---Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

GeoTek, Inc.

LOG OF EXPLORATORY BORING

CLIENT:	Beaumont Land Partners	**DRILLER:**	2R Drilling	**LOGGED BY:**	Franklin Sullivan
PROJECT NAME:	Xenia Apt Project	**DRILL METHOD:**	Hollow Stem	**OPERATOR:**	Adrian
PROJECT NO.:	2784-CR	**HAMMER:**	140#/30"	**RIG TYPE:**	CME 75
LOCATION:	Beaumont			**DATE:**	6/15/2021

Depth (ft)	SAMPLES: Sample Type	SAMPLES: Blows/ 6 in	SAMPLES: Sample Number	USCS Symbol	Boring No.: I-4 / MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Others
0				SM	**Alluvium:** Silty f-m Sand, light brown to brown, slight moisture			
5					**BORING TERMINATED AT 5 FEET**			
10								
15								
20								
25								
30								

LEGEND

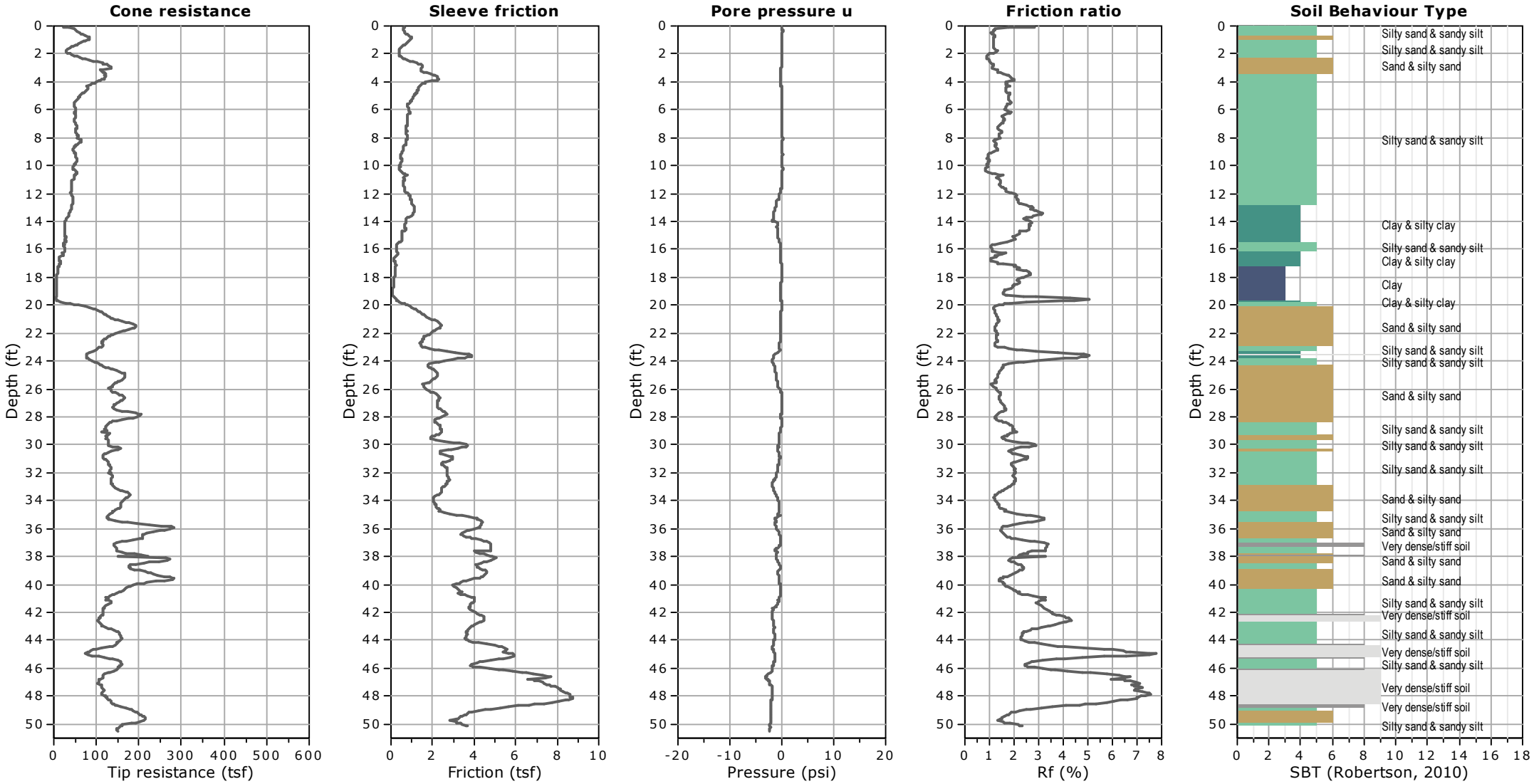
Sample type: ---Ring ---SPT ---Small Bulk ---Large Bulk ---No Recovery ---Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

Kehoe Testing and Engineering
714-901-7270
steve@kehoetesting.com
www.kehoetesting.com

Project: GeoTek / Xenia Site
Location: Beaumont, CA

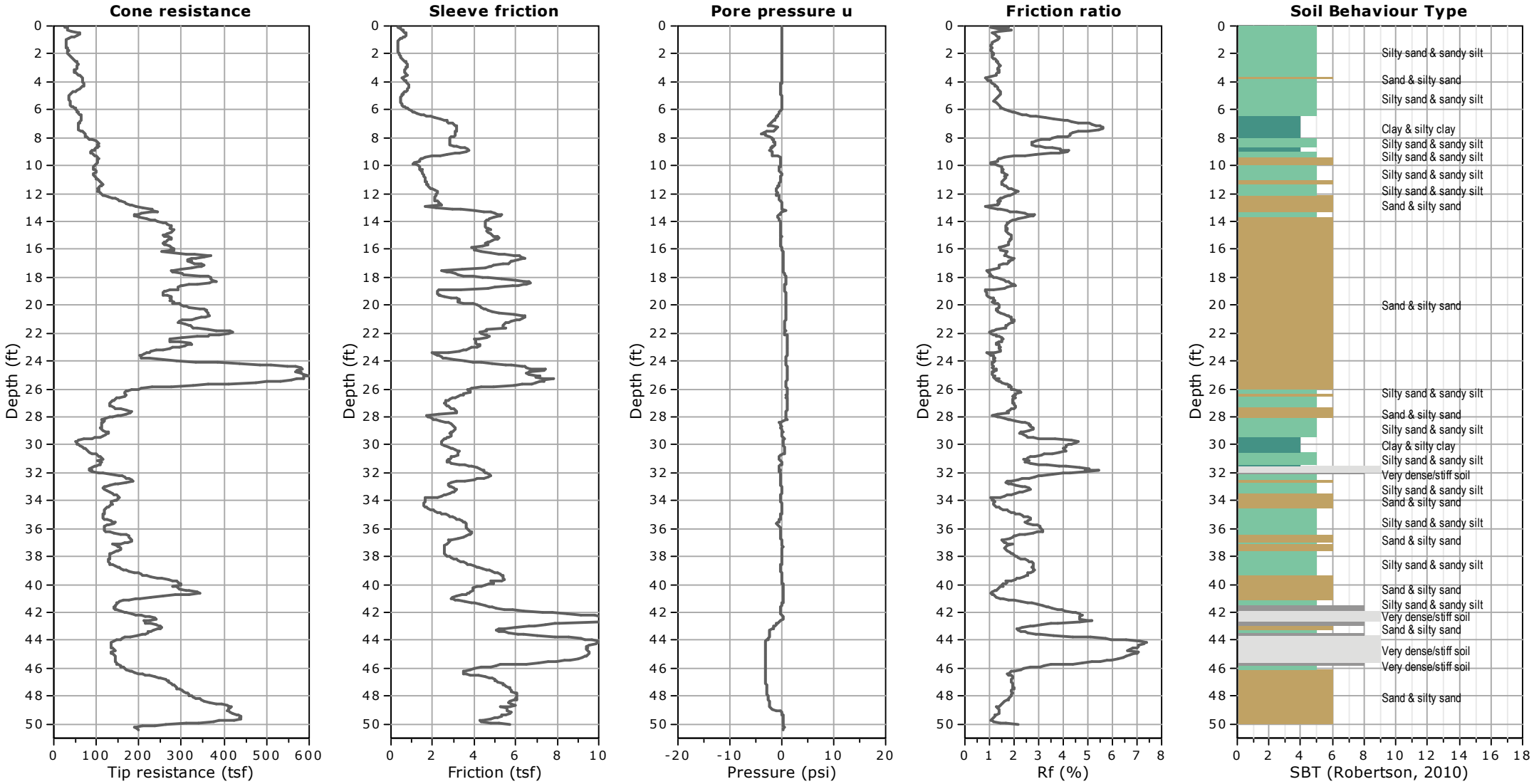
CPT-1
Total depth: 50.54 ft, Date: 6/15/2021



Kehoe Testing and Engineering
714-901-7270
steve@kehoetesting.com
www.kehoetesting.com

Project: **GeoTek / Xenia Site**
Location: **Beaumont, CA**

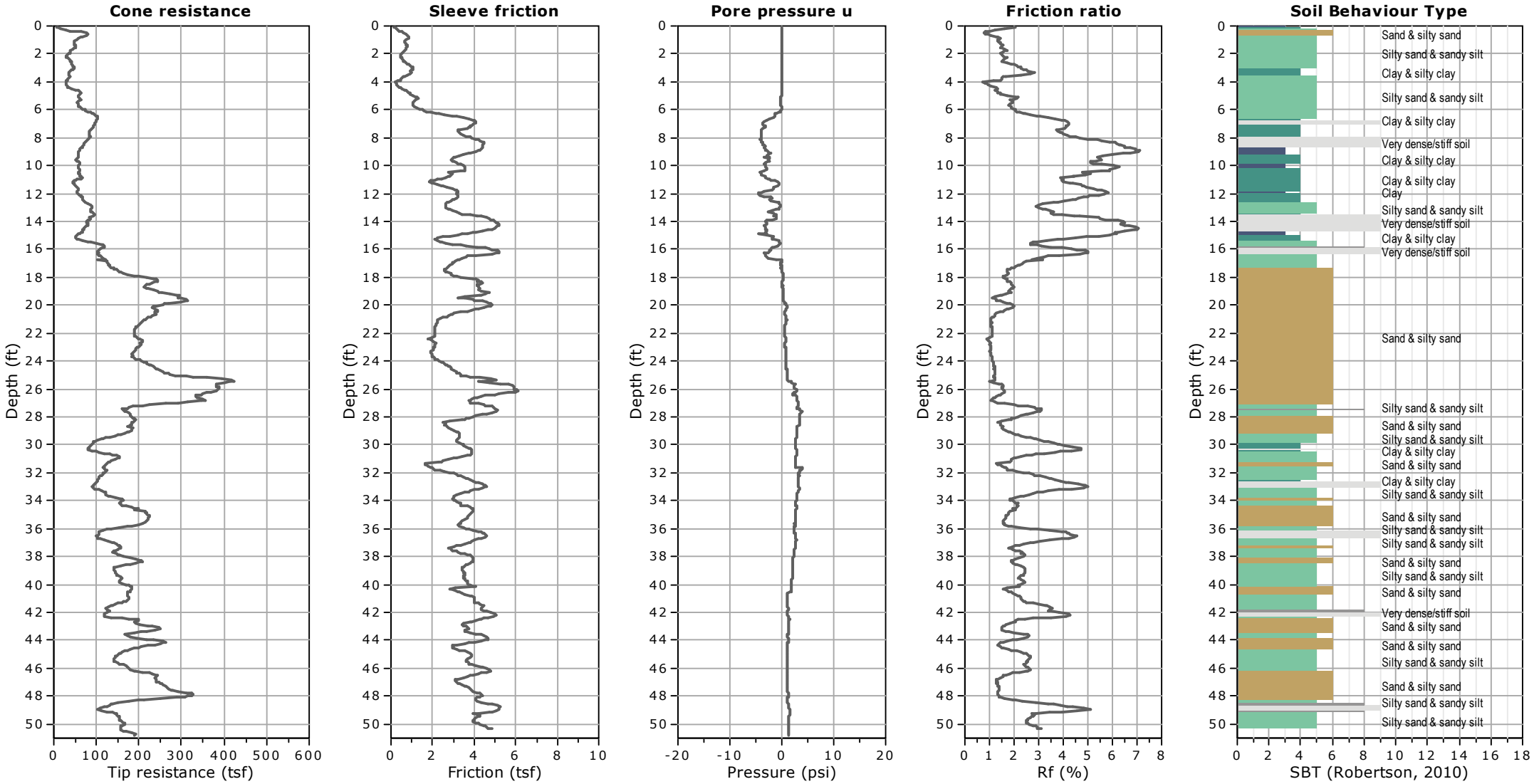
CPT-2
Total depth: 50.42 ft, Date: 6/15/2021



Kehoe Testing and Engineering
714-901-7270
steve@kehoetesting.com
www.kehoetesting.com

Project: GeoTek / Xenia Site
Location: Beaumont, CA

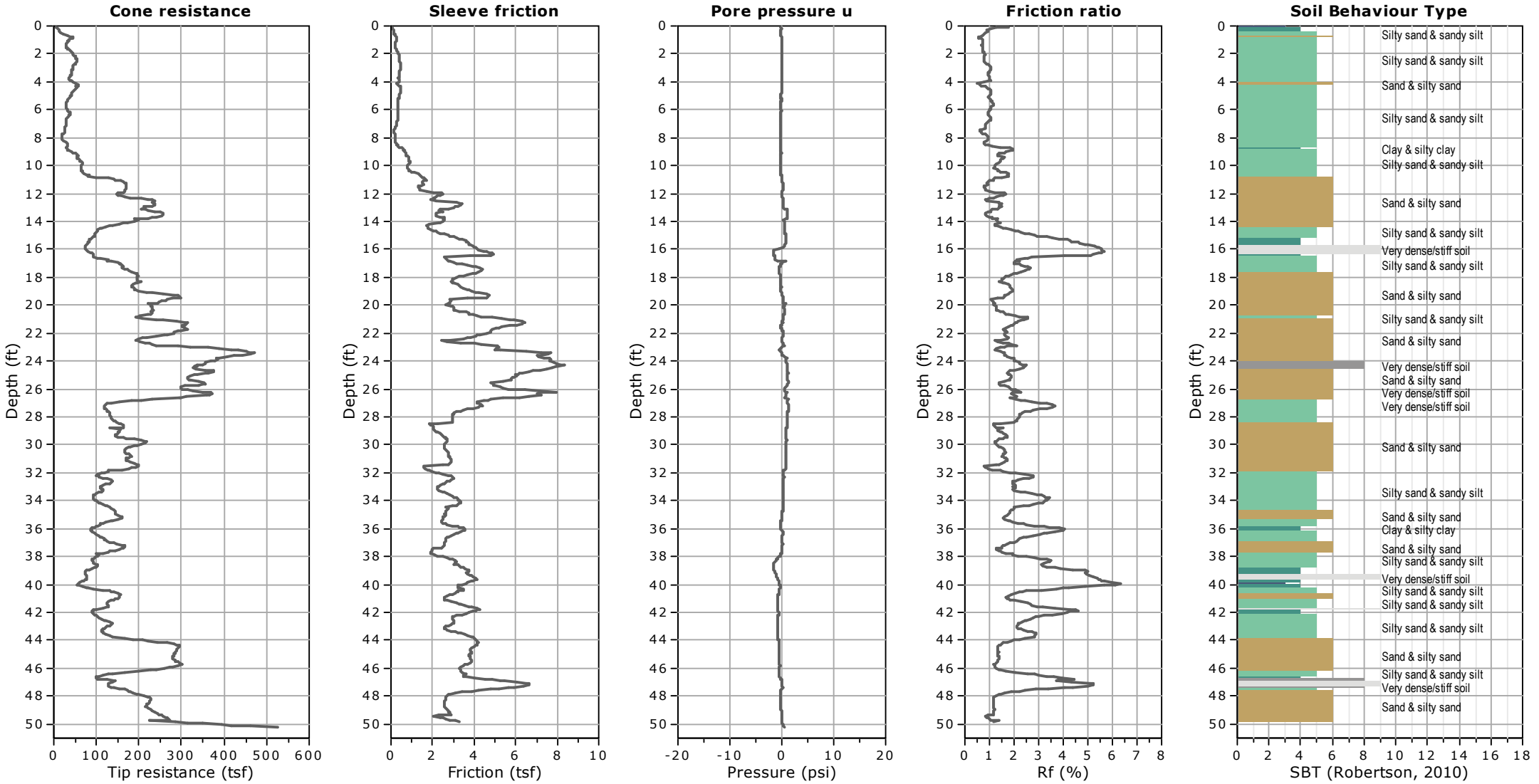
CPT-3
Total depth: 50.76 ft, Date: 6/15/2021



Kehoe Testing and Engineering
714-901-7270
steve@kehoetesting.com
www.kehoetesting.com

Project: GeoTek / Xenia Site
Location: Beaumont, CA

CPT-4
Total depth: 50.21 ft, Date: 6/15/2021



APPENDIX D

LABORATORY TEST RESULTS BY GEOTEK

Updated Geotechnical and Infiltration Evaluation
Xenia Apartment Project, Beaumont, California
Project No. 2784-CR

GEOTEK

SUMMARY OF LABORATORY TESTING

In Situ Moisture Content and Unit Weight

The field moisture content was measured in the laboratory on selected samples collected during the field investigation. The field moisture content is determined as a percentage of the dry unit weight. The dry density was measured in the laboratory on selected ring samples. The results are shown on the logs of exploratory borings in Appendix C.

Moisture-Density Relationship

Laboratory testing was performed on a selected sample collected during the subsurface exploration. The laboratory maximum dry density and optimum moisture content for the soil types were determined in general accordance with test method ASTM Test Procedure D 1557. The results are included herein.

Direct Shear

Direct shear testing was performed on remolded samples of the surficial soils according to ASTM Test Method D 3080. The test results are presented herein.

Expansion Index

Expansion Index testing was performed on a selected soil sample collected from the site. Testing was performed in general accordance with ASTM Test Method D 4829. The test results are presented herein.

Collapse

Collapse tests were conducted in accordance with ASTM D2435. The results of these tests are presented herein.

Sulfate Content, Resistivity and Chloride Content

Testing to determine the water-soluble sulfate content was performed by others in general accordance with ASTM D4327. Resistivity testing was completed by others in general accordance with ASTM G187. Testing to determine the chloride content was performed by others in general accordance with ASTM D4327. pH testing was completed by others in general accordance with ASTM D4972. The results of the testing are provided below.

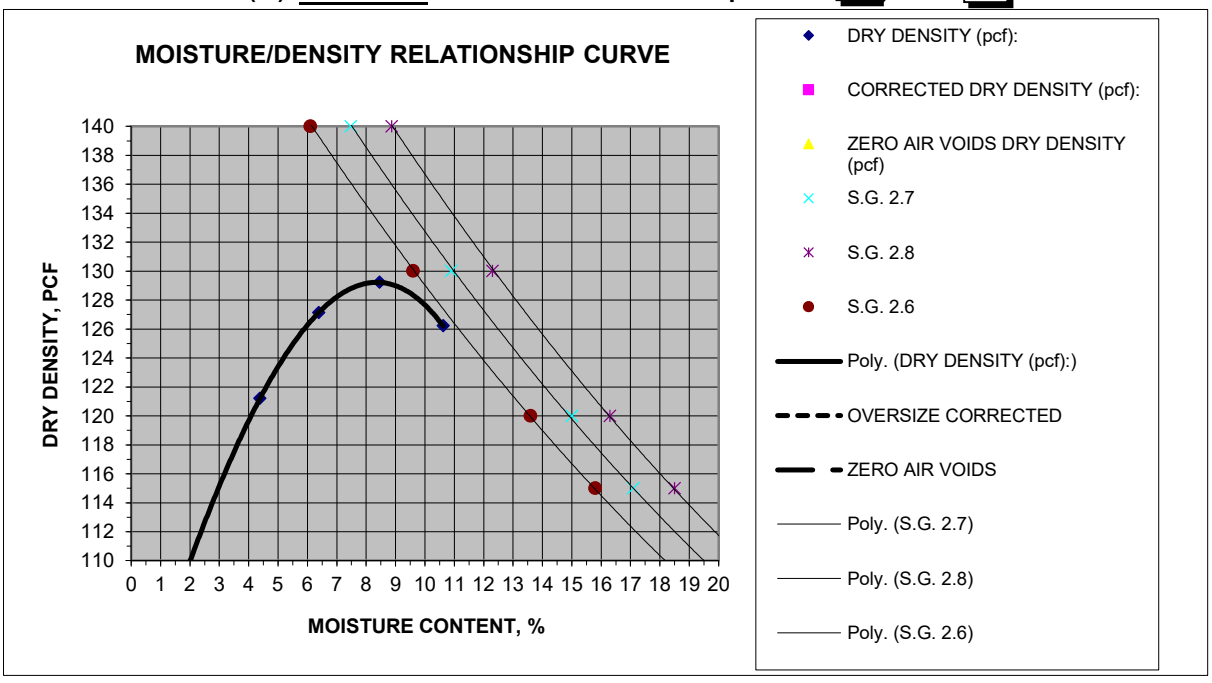
GEOTEK

MOISTURE/DENSITY RELATIONSHIP

Client:	Beaumont Land Partners	**Job No.:**	2784-CR
Project:	Xenia Apartments	**Lab No.:**	Corona
Location:	Beaumont		
Material Type:	Brown Silty Sand		
Material Supplier:	-		
Material Source:	-		
Sample Location:	B1 @ 0-5'		
	-		
Sampled By:	FS	**Date Sampled:**	6/14/2021
Received By:	RJ	**Date Received:**	6/14/2021
Tested By:	RL	**Date Tested:**	6/28/2021
Reviewed By:	RJ	**Date Reviewed:**	6/30/2021

Test Procedure: ASTM D1557 **Method:** A

Oversized Material (%): 3.9 **Correction Required:** [ ] yes [x] no



MOISTURE DENSITY RELATIONSHIP VALUES

Maximum Dry Density, pcf	129.5	**@ Optimum Moisture, %**	8.5
Corrected Maximum Dry Density, pcf		**@ Optimum Moisture, %**	

MATERIAL DESCRIPTION

Grain Size Distribution:

	% Gravel (retained on No. 4)
	% Sand (Passing No. 4, Retained on No. 200)
	% Silt and Clay (Passing No. 200)

Atterberg Limits:

	Liquid Limit, %
	Plastic Limit, %
	Plasticity Index, %

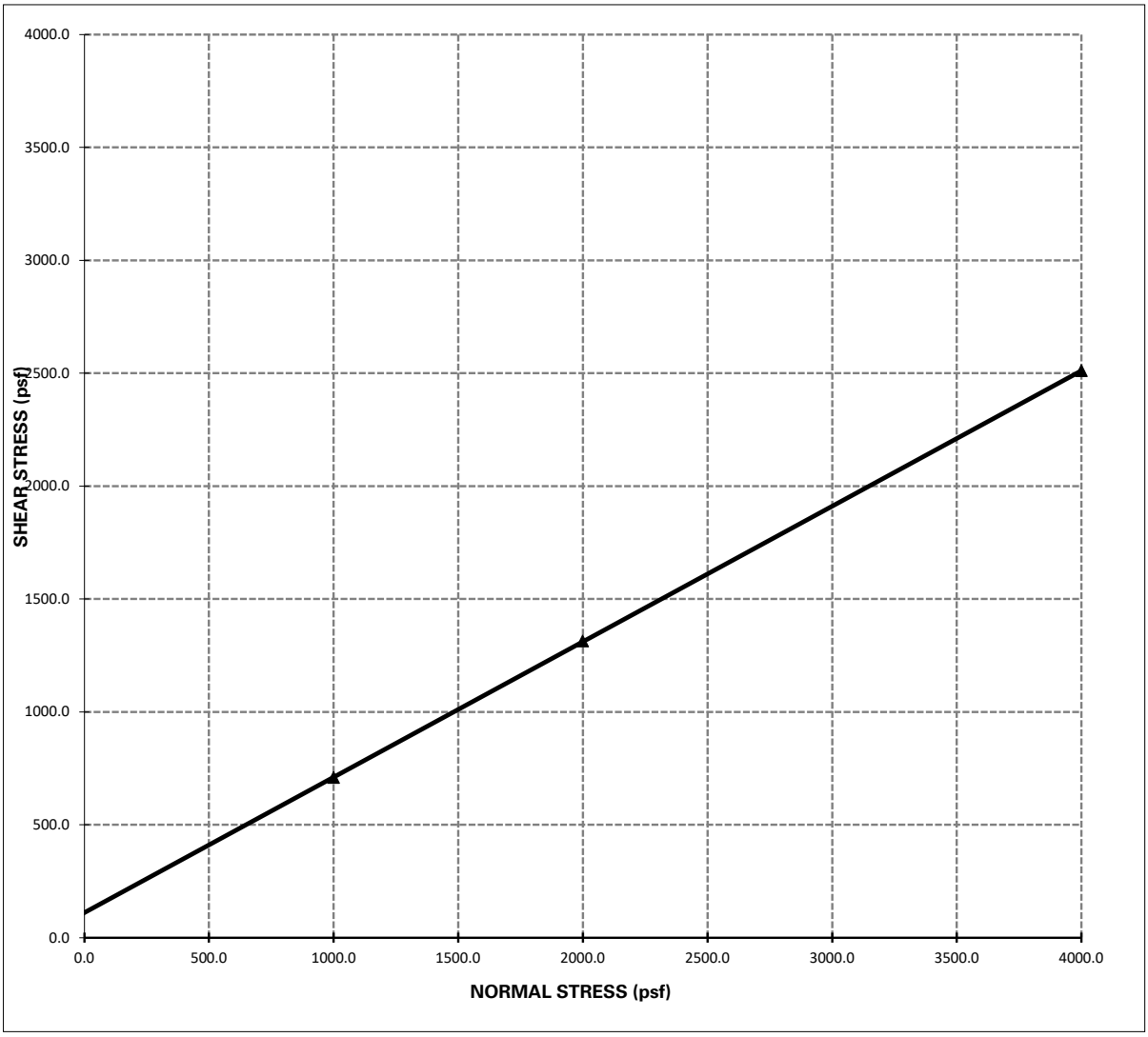
Classification:

Unified Soils Classification:

AASHTO Soils Classification:

DIRECT SHEAR TEST

Project Name:	Beaumont Land Partners	***Sample Location:***	B1 @ 0-5'
Project Number:	2784-CR	***Date Tested:***	7/1/2021



Shear Strength: Φ = 31 °, C = 111 psf

Notes:
1 - The soil specimen used in the shear box was a ring sample remolded to approximately 90% relative compaction from a bulk sample collected during the field investigation.
2 - The above reflect direct shear strength at saturated conditions.
3 - The tests were run at a shear rate of 0.035 in/min.

GEOTEK

EXPANSION INDEX TEST

(ASTM D4829)

Client:	Beaumont Land Partners	***Tested/ Checked By:***	CD Lab No Corona
Project Number:	2784-CR	***Date Tested:***	6/23/2021
Project Location:	Xenia Apartments Project	***Sample Source:***	B1 @ 0-5'
		Sample Description:	

Ring #:_____ Ring Dia. : 4.01" Ring Ht.1"

DENSITY DETERMINATION

A	Weight of compacted sample & ring (gm)	780.8
B	Weight of ring (gm)	365.5
C	Net weight of sample (gm)	**415.3**
D	Wet Density, lb / ft3 (C*0.3016)	**125.3**
E	Dry Density, lb / ft3 (D/1.F)	**115.0**

SATURATION DETERMINATION

F	Moisture Content, %	8.9
G	Specific Gravity, assumed	**2.70**
H	Unit Wt. of Water @ 20 °C, (pcf)	**62.4**
I	% Saturation	**51.7**

READINGS

DATE	TIME	READING	
6/23/2021		0.3410	Initial
6/23/2021		0.3390	10 min/Dry
6/24/2021		0.3440	Final

FINAL MOISTURE

Final Weight of wet sample & tare	% Moisture
804.3	**14.6**

EXPANSION INDEX = 5

GEOTEK

EXPANSION INDEX TEST

(ASTM D4829)

Client:	Beaumont Land Partners	***Tested/ Checked By:***	CD Lab No Corona
Project Number:	2784-CR	***Date Tested:***	6/24/2021
Project Location:	Xenia Apartments Project	***Sample Source:***	B2 @ 0-5'
		Sample Description:	

Ring #:_____ Ring Dia. : 4.01" Ring Ht. 1"

DENSITY DETERMINATION

A	Weight of compacted sample & ring (gm)	781.9
B	Weight of ring (gm)	365.4
C	Net weight of sample (gm)	**416.5**
D	Wet Density, lb / ft3 (C*0.3016)	**125.6**
E	Dry Density, lb / ft3 (D/1.F)	**115.5**

SATURATION DETERMINATION

F	Moisture Content, %	8.8
G	Specific Gravity, assumed	**2.70**
H	Unit Wt. of Water @ 20 °C, (pcf)	**62.4**
I	% Saturation	**51.7**

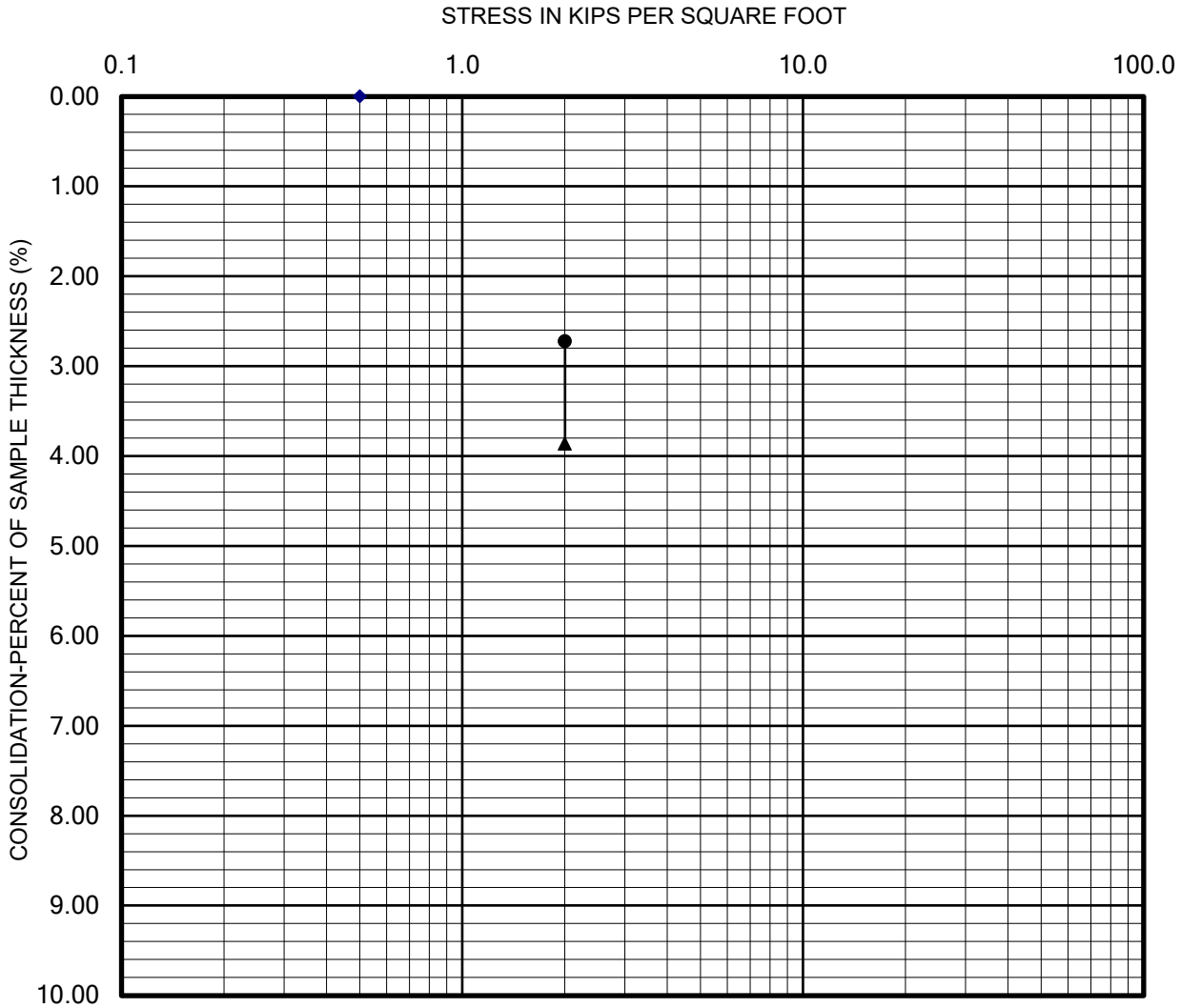
READINGS

DATE	TIME	READING	
6/24/2021		0.2290	Initial
6/24/2021		0.2290	10 min/Dry
6/25/2021		0.2390	Final

FINAL MOISTURE

Final Weight of wet sample & tare	% Moisture
810.3	**15.6**

EXPANSION INDEX = 10



Seating Cycle
Loading Prior to Inundation
Loading After Inundation
Rebound Cycle

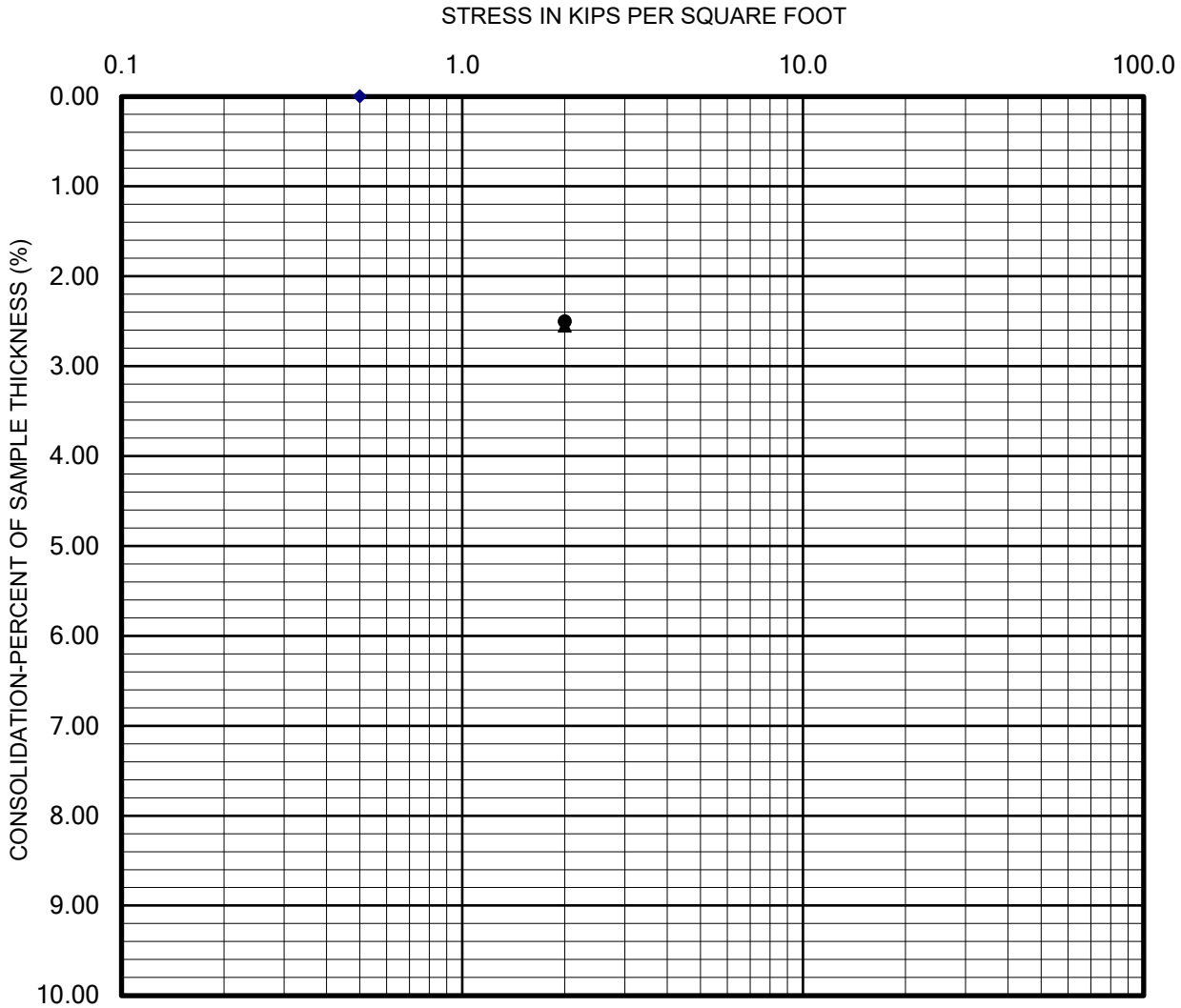
PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 4546

GEOTEK

COLLAPSE REPORT

Sample: B-1 @ 6 feet

CHECKED BY: RJ	Lab: Corona
PROJECT NO.: 2784-CR	Date: 7-1-21



Seating Cycle
Loading Prior to Inundation
Loading After Inundation
Rebound Cycle

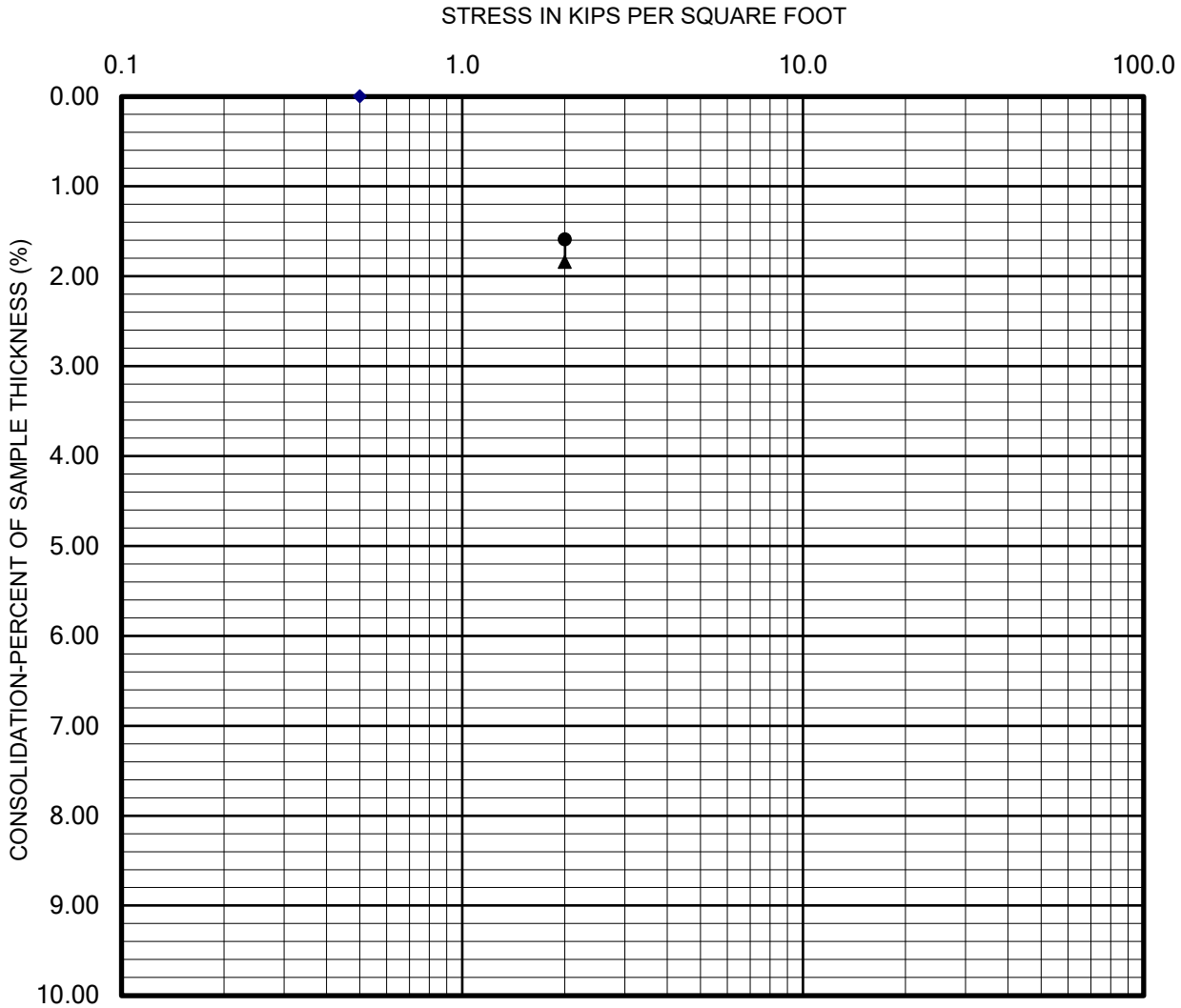
PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 4546

GEOTEK

COLLAPSE REPORT

Sample: B-2 @ 7 feet

CHECKED BY: RJ	Lab: Corona
PROJECT NO.: 2784-CR	Date:7-1-21



Seating Cycle
Loading Prior to Inundation
Loading After Inundation
Rebound Cycle

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 4546

GEOTEK

COLLAPSE REPORT

Sample: B-2 @ 10 feet

CHECKED BY: RJ	Lab: Corona
PROJECT NO.: 2784-CR	Date:7-1-21

Soil Analysis Lab Results

Client: GeoTek, Inc.
Job Name: Xenia Apartment Project, Beaumont
Client Job Number: 2484-CR Beaumont Land Project
Project X Job Number: S210701B
July 6, 2021

	Method	ASTM D4327		ASTM D4327		ASTM G187		ASTM D4972	ASTM G200	SM 4500-S2-D	ASTM D4327	ASTM D6919	ASTM D6919	ASTM D6919	ASTM D6919	ASTM D6919	ASTM D6919	ASTM D4327	ASTM D4327
Bore# / Description	**Depth**	**Sulfates** SO_4^{2-}		**Chlorides** Cl^-		**Resistivity** As Rec'd | Minimum		**pH**	**Redox**	**Sulfide** S^{2-}	**Nitrate** NO_3^-	**Ammonium** NH_4^+	**Lithium** Li^+	**Sodium** Na^+	**Potassium** K^+	**Magnesium** Mg^{2+}	**Calcium** Ca^{2+}	**Fluoride** F_2^{--}	**Phosphate** PO_4^{3-}
	(ft)	(mg/kg)	(wt%)	(mg/kg)	(wt%)	(Ohm-cm)	(Ohm-cm)		(mV)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
2784-CR B-1	0-5	12.2	0.0012	5.7	0.0006	40,200	9,380	7.2	118	<0.01	14.0	22.7	0.04	49.5	4.8	51.2	246.5	2.8	0.3
2784-CR B-2	0-5	16.4	0.0016	5.6	0.0006	66,330	12,730	8.3	175	<0.01	4.2	34.2	0.03	63.8	4.3	56.5	266.5	1.9	0.6

Cations and Anions, except Sulfide and Bicarbonate, tested with Ion Chromatography
mg/kg = milligrams per kilogram (parts per million) of dry soil weight
ND = 0 = Not Detected | NT = Not Tested | Unk = Unknown
Chemical Analysis performed on 1:3 Soil-To-Water extract
PPM = mg/kg (soil) = mg/L (Liquid)

APPENDIX E

PERCOLATION/INFILTRATION TEST DATA

Updated Geotechnical and Infiltration Evaluation
Xenia Apartment Project, Beaumont, California
Project No. 2784-CR

GEOTEK

Client:	**Beaumont Land Partners**
Project:	**Xenia Apartments**
Project No:	**2784-CR**
Date:	**7/7/2021**

Boring No. **I-1**

Infiltration Rate (Porchet Method)

Time Interval, Δt =	10	min
Final Depth to Water, D_F =	44.25	in
Test Hole Radius, r =	4	in
Initial Depth to Water, D_O =	40.25	in
Total Test Hole Depth, D_T =	60.25	in

Equation - $I_t = \dfrac{\Delta H\,(60r)}{\Delta t\,(r+2H_{avg})}$

$H_O = D_T - D_O$ =	20	in
$H_F = D_T - D_F$ =	16	in
$\Delta H = \Delta D = H_O - H_F$ =	4	in
$H_{avg} = (H_O+H_F)/2$ =	18	in

I_t = 2.4 **Inches per Hour**

GEOTEK

Client:	**Beaumont Land Partners**
Project:	**Xenia Apartments**
Project No:	**2784-CR**
Date:	**7/7/2021**

Boring No. **I-2**

Infiltration Rate (Porchet Method)

Time Interval, Δt =	10	min
Final Depth to Water, D_F =	45.75	in
Test Hole Radius, r =	4	in
Initial Depth to Water, D_O =	40.5	in
Total Test Hole Depth, D_T =	60.5	in

Equation - $I_t = \dfrac{\Delta H\,(60r)}{\Delta t\,(r+2H_{avg})}$

$H_O = D_T - D_O$ =	20	in
$H_F = D_T - D_F$ =	14.75	in
$\Delta H = \Delta D = H_O - H_F$ =	5.25	in
$H_{avg} = (H_O+H_F)/2$ =	17.375	in

I_t = 3.3 **Inches per Hour**

GEOTEK

Client:	**Beaumont Land Partners**
Project:	**Xenia Apartments**
Project No:	**2784-CR**
Date:	**7/7/2021**

Boring No. **I-3**

Infiltration Rate (Porchet Method)

Time Interval, Δt =	10	min
Final Depth to Water, D_F =	44.63	in
Test Hole Radius, r =	4	in
Initial Depth to Water, D_O =	42.75	in
Total Test Hole Depth, D_T =	62.75	in

Equation - $I_t = \dfrac{\Delta H\,(60r)}{\Delta t\,(r+2H_{avg})}$

$H_O = D_T - D_O$ =	20	in
$H_F = D_T - D_F$ =	18.12	in
$\Delta H = \Delta D = H_O - H_F$ =	1.88	in
$H_{avg} = (H_O+H_F)/2$ =	19.06	in

I_t = 1.1 **Inches per Hour**

GEOTEK

Client:	**Beaumont Land Partners**
Project:	**Xenia Apartments**
Project No:	**2784-CR**
Date:	**7/7/2021**

Boring No. **I-4**

Infiltration Rate (Porchet Method)

Time Interval, Δt =	10	min
Final Depth to Water, D_F =	46	in
Test Hole Radius, r =	4	in
Initial Depth to Water, D_O =	43.5	in
Total Test Hole Depth, D_T =	63.5	in

Equation - $I_t = \dfrac{\Delta H\,(60r)}{\Delta t\,(r+2H_{avg})}$

$H_O = D_T - D_O$ =	20	in
$H_F = D_T - D_F$ =	17.5	in
$\Delta H = \Delta D = H_O - H_F$ =	2.5	in
$H_{avg} = (H_O+H_F)/2$ =	18.75	in

I_t = 1.4 **Inches per Hour**

GEOTEK

Percolation Test Data Sheet

Project:	Xenia Apt Project, Beaumont	**Project No:**	2784-CR	**Date:**	6/16/21
Test Hole No:	I-1	**Tested By:**	F. Sullivan		
Depth of Test Hole, D_T:	5.02'	**USCS Soil Classification:**	SM		

Test Hole Dimensions (inches)			**Length**	**Width**	
Diameter (if round)=	8	**Sides (if rectangular)=**			

Sandy Soil Criteria Test*

Trial No.	Start Time	Stop Time	Time Interval, (min.)	Initial Depth to Water (in.)	Final Depth to Water (in.)	Change in Water Level (in.)	Greater than or Equal to 6"? (y/n)
1	9:00	9:25	25	40.25	50.25	10	Y
2	9:25	9:50	25	40.25	50	9.25	Y

*If two consecutive measurements show that six inches of water seeps away in less than 25 minutes, the test shall be run for an additional hour with measurements taken every 10 minutes. Other wise, pre-soak (fill) overnight. Obtain at least twelve measurements per hole over at least six hours (approximately 30 minute intervals) with a precision of at least 0.25".

Trial No.	Start Time	Stop Time	Δt Time Interval (min.)	D_o Initial Depth to Water (in.)	D_f Final Depth to Water (in.)	ΔD Change in Water Level (in.)	Percolation Rate (min./in.)
1	9:50	10:00	10	40.25	44.75	4.5	2.22
2	10:00	10:14	10	40.25	44.5	4.25	2.35
3	10:14	10:24	10	40.25	44.5	4.25	2.35
4	10:24	10:34	10	40.25	44.25	4.0	2.5
5	10:34	10:44	10	40.25	45.11	4.86	2.06
6	10:44	10:54	10	40.25	44.25	4.0	2.5
7							
8							
9							
10							
11							
12							
13							
14							
15							

COMMENTS:

Percolation Test Data Sheet

Project:	Xenia Apt Project, Beaumont	Project No:	2794-CR	Date:	6/16/21
Test Hole No:	I-2	Tested By:	F. Sullivan		
Depth of Test Hole, D_T:	5.04'	USCS Soil Classification:	SM		
Test Hole Dimensions (inches)				Length	Width
Diameter (if round)=	8	Sides (if rectangular)=			

Sandy Soil Criteria Test*

Trial No.	Start Time	Stop Time	Time Interval, (min.)	Initial Depth to Water (in.)	Final Depth to Water (in.)	Change in Water Level (in.)	Greater than or Equal to 6"? (y/n)
1	9:15	9:40	25	40.5	54.5	14.5	Y
2	9:40	10:05	25	40.5	53.5	13.0	Y

*If two consecutive measurements show that six inches of water seeps away in less than 25 minutes, the test shall be run for an additional hour with measurements taken every 10 minutes. Other wise, pre-soak (fill) overnight. Obtain at least twelve measurements per hole over at least six hours (approximately 30 minute intervals) with a precision of at least 0.25".

Trial No.	Start Time	Stop Time	Δt Time Interval (min.)	D_o Initial Depth to Water (in.)	D_f Final Depth to Water (in.)	ΔD Change in Water Level (in.)	Percolation Rate (min./in.)
1	10:05	10:15	10	40.5	46	5.5	1.82
2	10:15	10:25	10	40.5	45.75	5.25	1.90
3	10:25	10:35	10	40.5	46	5.5	1.82
4	10:35	10:45	10	40.5	45.75	5.25	1.90
5	10:45	10:55	10	40.5	45	4.5	2.22
6	10:55	11:05	10	40.5	45.75	5.25	1.90
7							
8							
9							
10							
11							
12							
13							
14							
15							

COMMENTS:

Percolation Test Data Sheet

Project:	Xenia Apt project, Beaumont	Project No:	2784-CR	Date:	6/16/21
Test Hole No:	I-3	Tested By:	F. Sullivan		
Depth of Test Hole, D_T:	5.23'	USCS Soil Classification:	SM		
Test Hole Dimensions (inches)			Length	Width	
Diameter (if round)=	8	Sides (if rectangular)=			

Sandy Soil Criteria Test*

Trial No.	Start Time	Stop Time	Time Interval, (min.)	Initial Depth to Water (in.)	Final Depth to Water (in.)	Change in Water Level (in.)	Greater than or Equal to 6"? (y/n)
1	10:48	11:13	25	42.75	49	6.25	Y
2	11:13	11:38	25	42.75	48.75	6.0	Y

*If two consecutive measurements show that six inches of water seeps away in less than 25 minutes, the test shall be run for an additional hour with measurements taken every 10 minutes. Other wise, pre-soak (fill) overnight. Obtain at least twelve measurements per hole over at least six hours (approximately 30 minute intervals) with a precision of at least 0.25".

Trial No.	Start Time	Stop Time	Δt Time Interval (min.)	D_o Initial Depth to Water (in.)	D_f Final Depth to Water (in.)	ΔD Change in Water Level (in.)	Percolation Rate (min./in.)
1	11:48	11:58	10	42.75	44.5	1.75	5.71
2	11:58	12:08	10	42.75	45.25	2.5	4.0
3	12:08	12:18	10	42.75	45.0	2.25	4.44
4	12:18	12:28	10	42.75	44.75	2.0	5.0
5	12:28	12:38	10	42.75	45.25	2.5	4.0
6	12:38	12:48	10	42.75	44.63	1.88	5.32
7							
8							
9							
10							
11							
12							
13							
14							
15							

COMMENTS:

Percolation Test Data Sheet

Project:	Xenia Apt Project, Beaumont	**Project No:**	2784-Cr	**Date:**	6/16/21
Test Hole No:	I-4	**Tested By:**	F. Sullivan		
Depth of Test Hole, D_f:	5.29'	**USCS Soil Classification:**	SM		
Test Hole Dimensions (inches)				**Length**	**Width**
Diameter (if round)=	8	**Sides (if rectangular)=**			

Sandy Soil Criteria Test*

Trial No.	Start Time	Stop Time	Time Interval, (min.)	Initial Depth to Water (in.)	Final Depth to Water (in.)	Change in Water Level (in.)	Greater than or Equal to 6"? (y/n)
1	12:16	12:41	25	43.5	50	6.5	Y
2	12:41	1:06	25	43.5	49.88	6.38	Y

*If two consecutive measurements show that six inches of water seeps away in less than 25 minutes, the test shall be run for an additional hour with measurements taken every 10 minutes. Other wise, pre-soak (fill) overnight. Obtain at least twelve measurements per hole over at least six hours (approximately 30 minute intervals) with a precision of at least 0.25".

Trial No.	Start Time	Stop Time	Δt Time Interval (min.)	D_o Initial Depth to Water (in.)	D_f Final Depth to Water (in.)	ΔD Change in Water Level (in.)	Percolation Rate (min./in.)
1	1:06	1:16	10	43.5	46.63	3.13	3.19
2	1:16	1:26	10	43.5	46.5	3.0	3.33
3	1:26	1:36	10	43.5	46.25	2.75	3.64
4	1:36	1:46	10	43.5	46.5	3	3.33
5	1:46	1:56	10	43.5	46.5	3	3.33
6	1:56	2:06	10	43.5	46.0	2.5	4
7							
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15							

COMMENTS:

APPENDIX F

SEISMIC SETTLEMENT ANALYSES

Updated Geotechnical and Infiltration Evaluation
Xenia Apartment Project, Beaumont, California
Project No. 2784-CR

GEOTEK

GeoTek, Inc.
1548 N. Maple Street
Corona, CA 92878
951-710-1160, www.geotekusa.com

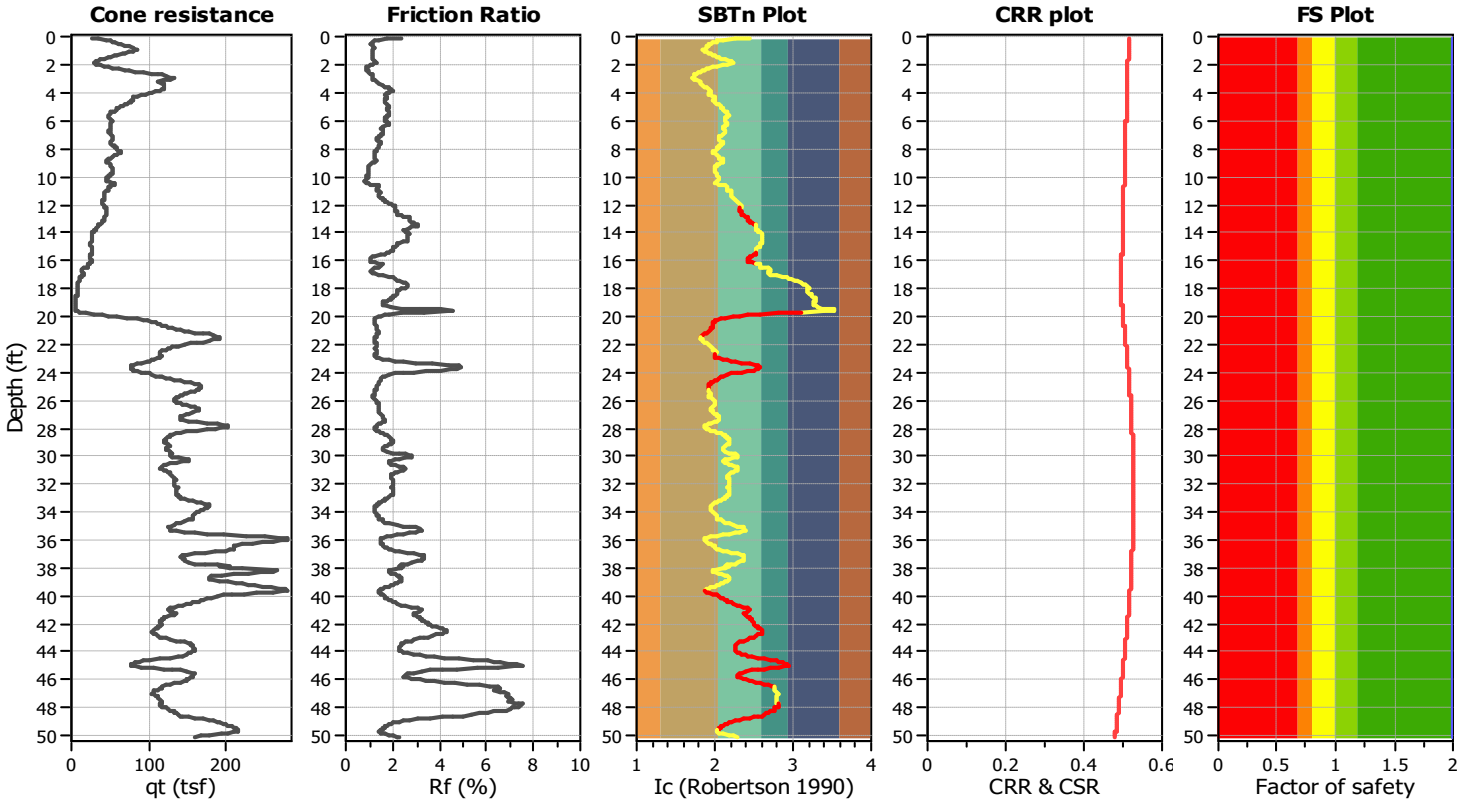
LIQUEFACTION ANALYSIS REPORT

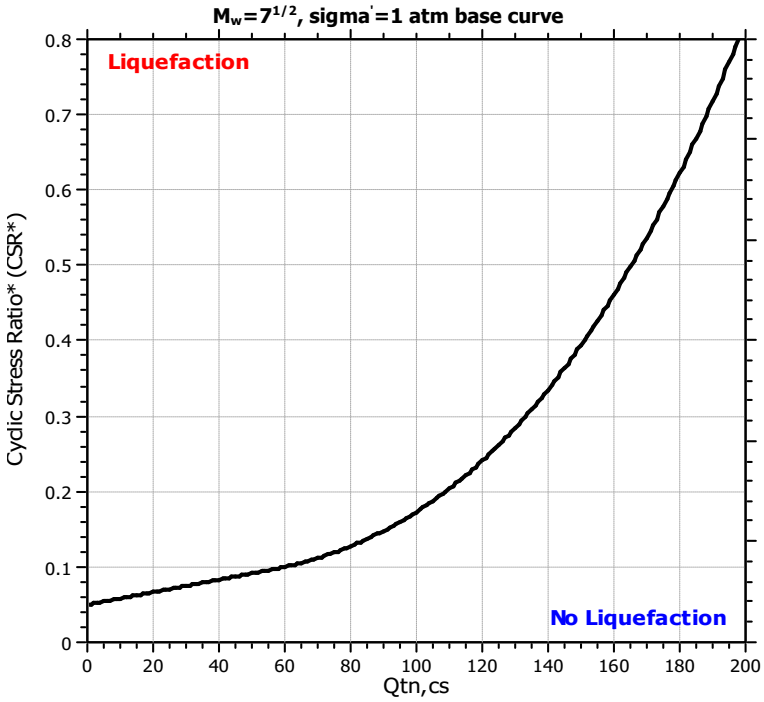
Project title : Xenia Site **Location : Beaumont, California**

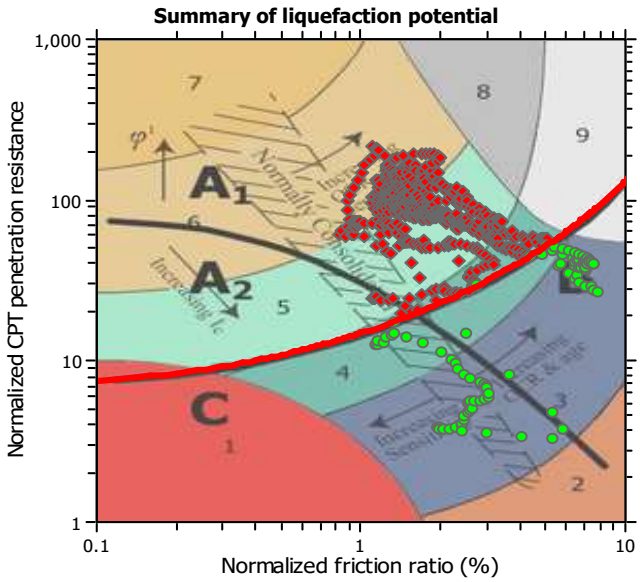
CPT file : CPT-1

Input parameters and analysis data

Analysis method:	NCEER (1998)	G.W.T. (in-situ):	100.00 ft	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	100.00 ft	Fill height:	N/A	Limit depth applied:	Yes
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	60.00 ft
Earthquake magnitude M_w:	7.13	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	0.90	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

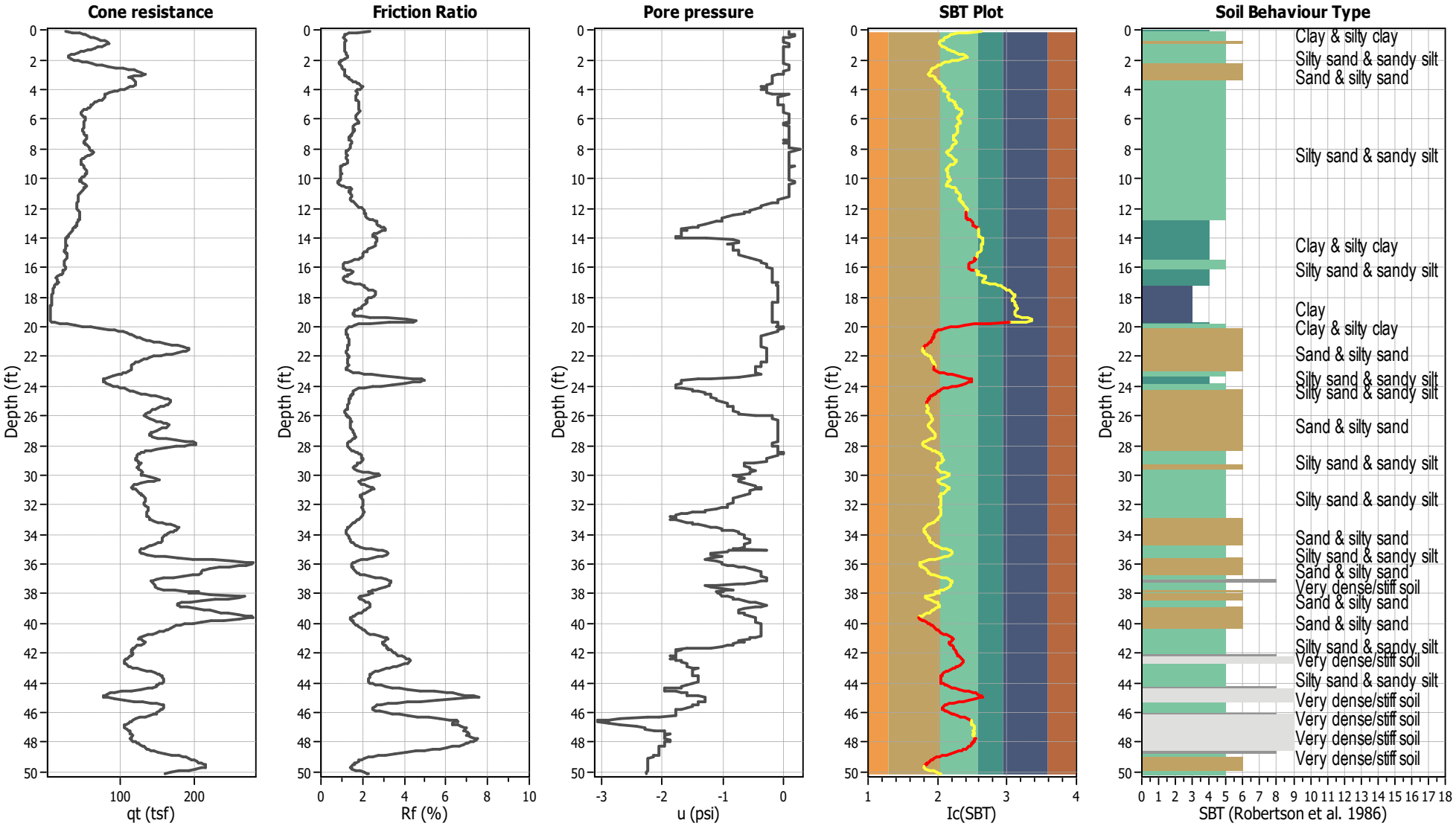






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plots



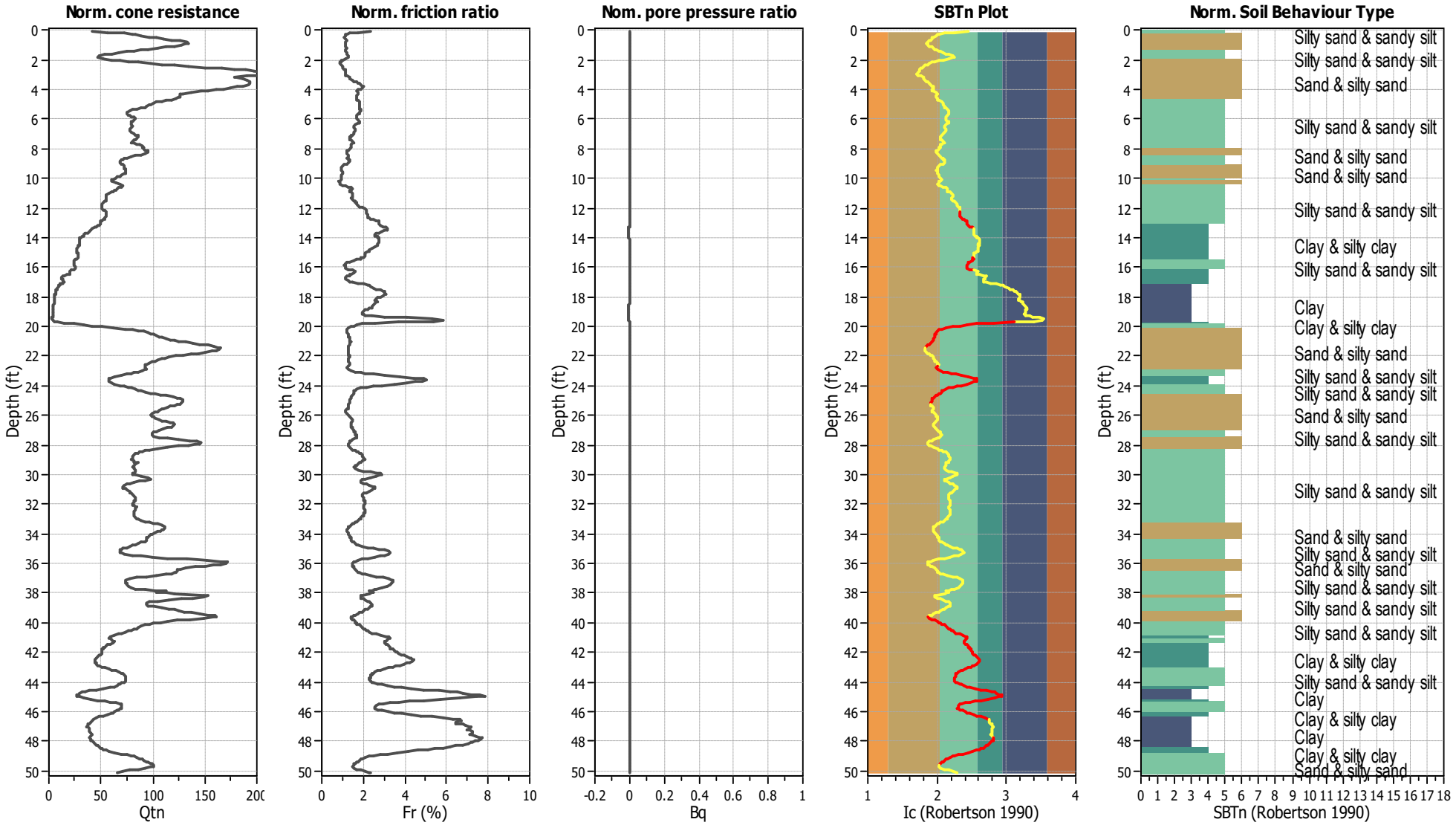
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	100.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.13	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.90	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	100.00 ft	Fill height:	N/A	Limit depth:	60.00 ft

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

CPT basic interpretation plots (normalized)



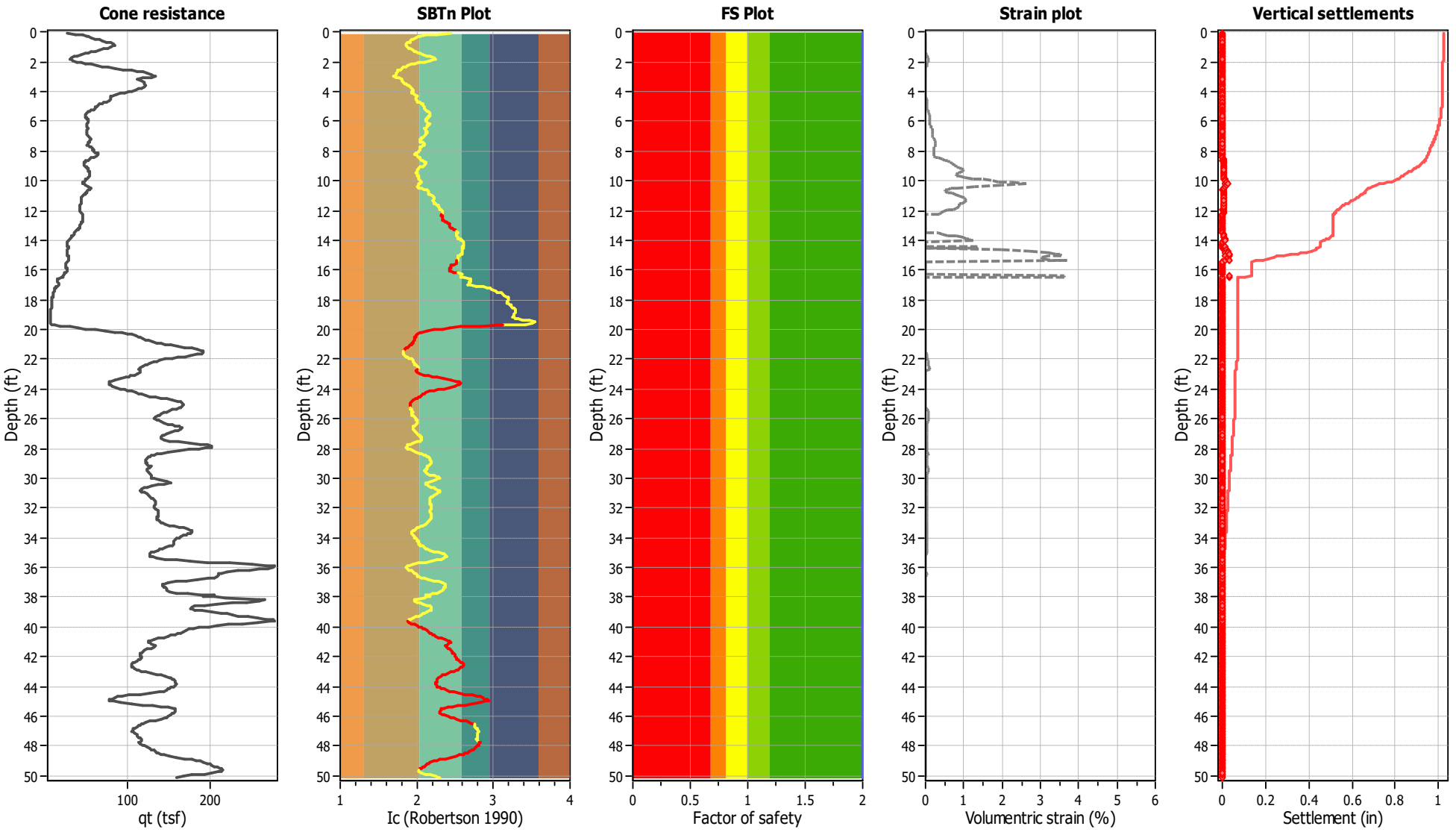
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	100.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.13	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.90	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	100.00 ft	Fill height:	N/A	Limit depth:	60.00 ft

SBTn legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

Estimation of post-earthquake settlements



Abbreviations

q_t:	Total cone resistance (cone resistance q_c corrected for pore water effects)
I_c:	Soil Behaviour Type Index
FS:	Calculated Factor of Safety against liquefaction
Volumentric strain:	Post-liquefaction volumentric strain

:: Post-earthquake settlement of dry sands ::

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
0.08	2.44	41.38	2.62	108.40	27	512	0.51	0.001	0.00	11.89	0.00	0.000
0.14	2.26	56.36	1.77	99.83	23	549	0.51	0.001	0.00	11.89	0.00	0.000
0.20	2.11	71.95	1.43	102.93	22	582	0.51	0.001	0.00	11.89	0.00	0.000
0.27	2.04	80.23	1.34	107.48	23	592	0.51	0.002	0.00	11.89	0.00	0.000
0.33	2.02	83.38	1.32	110.11	23	600	0.51	0.002	0.00	11.89	0.00	0.000
0.40	1.98	88.57	1.29	114.53	24	611	0.51	0.003	0.00	11.89	0.00	0.000
0.47	1.95	96.36	1.27	122.23	25	636	0.51	0.003	0.00	11.89	0.00	0.000
0.54	1.93	103.20	1.25	129.46	26	663	0.51	0.004	0.00	11.89	0.00	0.000
0.60	1.92	110.04	1.25	137.41	28	699	0.51	0.004	0.00	11.89	0.00	0.000
0.67	1.91	117.58	1.24	145.89	29	736	0.51	0.004	0.00	11.89	0.00	0.000
0.75	1.88	126.27	1.23	154.76	31	768	0.51	0.005	0.00	11.89	0.00	0.000
0.82	1.86	132.41	1.21	160.43	32	786	0.51	0.005	0.00	11.89	0.00	0.000
0.89	1.86	134.40	1.20	161.91	32	789	0.51	0.005	0.00	11.89	0.00	0.000
0.93	1.86	132.20	1.21	159.76	32	781	0.51	0.006	0.00	11.89	0.00	0.000
1.00	1.87	127.00	1.22	154.88	31	764	0.51	0.007	0.00	11.89	0.00	0.000
1.08	1.89	120.74	1.23	148.77	30	743	0.51	0.008	0.00	11.89	0.00	0.000
1.12	1.92	112.39	1.25	140.33	28	714	0.51	0.009	0.01	11.89	0.00	0.000
1.20	1.94	104.24	1.26	131.84	27	683	0.51	0.010	0.01	11.89	0.01	0.000
1.27	1.97	95.34	1.28	122.44	25	647	0.51	0.012	0.01	11.89	0.01	0.000
1.34	1.99	88.88	1.30	115.51	24	619	0.51	0.015	0.01	11.89	0.01	0.000
1.38	2.02	81.98	1.32	108.47	23	592	0.51	0.017	0.01	11.89	0.01	0.000
1.45	2.05	75.58	1.35	102.16	22	566	0.51	0.021	0.02	11.89	0.02	0.000
1.52	2.09	67.58	1.40	94.65	20	532	0.51	0.026	0.03	11.89	0.02	0.000
1.58	2.13	60.37	1.46	88.16	19	499	0.51	0.034	0.04	11.89	0.03	0.000
1.66	2.18	53.32	1.56	83.09	19	470	0.51	0.046	0.05	11.89	0.04	0.000
1.73	2.22	48.56	1.66	80.82	18	452	0.51	0.057	0.06	11.89	0.06	0.000
1.81	2.24	46.35	1.73	80.22	18	444	0.51	0.067	0.07	11.89	0.06	0.001
1.85	2.22	47.65	1.68	80.01	18	447	0.51	0.068	0.08	11.89	0.07	0.000
1.92	2.17	52.39	1.54	80.80	18	458	0.51	0.067	0.08	11.89	0.07	0.001
1.99	2.09	60.14	1.41	84.71	18	477	0.51	0.062	0.07	11.89	0.06	0.000
2.07	2.03	68.13	1.33	90.84	19	498	0.51	0.057	0.06	11.89	0.05	0.000
2.11	1.98	76.77	1.29	98.92	20	525	0.51	0.049	0.05	11.89	0.04	0.000
2.17	1.93	86.41	1.26	108.57	22	557	0.51	0.043	0.04	11.89	0.03	0.000
2.25	1.89	97.99	1.23	120.30	24	598	0.51	0.037	0.03	11.89	0.03	0.000
2.32	1.86	108.53	1.21	130.89	26	638	0.51	0.032	0.02	11.89	0.02	0.000
2.36	1.83	120.53	1.18	142.82	28	687	0.51	0.027	0.02	11.89	0.02	0.000
2.44	1.81	133.56	1.16	155.15	30	738	0.51	0.024	0.01	11.89	0.01	0.000
2.52	1.78	149.94	1.13	168.97	32	799	0.51	0.021	0.01	11.89	0.01	0.000
2.58	1.76	166.18	1.10	182.13	35	861	0.51	0.019	0.01	11.89	0.01	0.000
2.66	1.75	178.76	1.08	192.74	37	914	0.51	0.017	0.01	11.89	0.01	0.000
2.69	1.74	189.46	1.07	203.28	39	965	0.51	0.016	0.01	11.89	0.01	0.000
2.77	1.74	197.35	1.07	210.64	40	1001	0.51	0.015	0.01	11.89	0.01	0.000
2.84	1.73	206.49	1.04	215.41	41	1030	0.51	0.015	0.01	11.89	0.01	0.000
2.92	1.71	212.37	1.02	215.61	40	1041	0.51	0.015	0.01	11.89	0.01	0.000
2.96	1.70	215.16	1.00	215.16	40	1040	0.51	0.016	0.01	11.89	0.01	0.000
3.03	1.73	205.06	1.04	214.09	40	1024	0.51	0.017	0.01	11.89	0.01	0.000
3.10	1.77	190.46	1.11	212.21	41	1003	0.51	0.018	0.01	11.89	0.01	0.000
3.18	1.81	178.16	1.16	207.28	40	987	0.51	0.019	0.01	11.89	0.01	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
3.22	1.81	179.36	1.17	209.31	41	998	0.51	0.019	0.01	11.89	0.01	0.000
3.29	1.81	186.14	1.16	216.54	42	1031	0.51	0.019	0.01	11.89	0.01	0.000
3.36	1.82	191.13	1.18	224.82	44	1076	0.51	0.018	0.01	11.89	0.01	0.000
3.44	1.85	192.87	1.20	231.19	45	1121	0.51	0.017	0.01	11.89	0.01	0.000
3.51	1.87	193.12	1.22	234.67	46	1153	0.51	0.017	0.01	11.89	0.01	0.000
3.55	1.88	193.71	1.23	237.46	47	1179	0.51	0.016	0.01	11.89	0.00	0.000
3.63	1.90	193.66	1.23	238.92	48	1196	0.51	0.016	0.01	11.89	0.00	0.000
3.70	1.91	191.95	1.24	238.66	48	1207	0.51	0.016	0.01	11.89	0.00	0.000
3.77	1.93	187.19	1.25	234.81	48	1203	0.51	0.017	0.01	11.89	0.01	0.000
3.84	1.94	181.68	1.26	229.75	47	1190	0.51	0.018	0.01	11.89	0.01	0.000
3.88	1.95	175.03	1.27	222.26	45	1158	0.51	0.019	0.01	11.89	0.01	0.000
3.95	1.94	167.98	1.26	212.46	43	1101	0.51	0.021	0.01	11.89	0.01	0.000
4.03	1.93	160.87	1.26	202.57	41	1043	0.51	0.025	0.01	11.89	0.01	0.000
4.07	1.93	153.32	1.26	193.07	39	994	0.51	0.028	0.01	11.89	0.01	0.000
4.14	1.95	146.42	1.27	185.88	38	968	0.51	0.030	0.01	11.89	0.01	0.000
4.22	1.98	136.27	1.29	175.72	36	934	0.51	0.034	0.02	11.89	0.01	0.000
4.29	2.00	129.12	1.31	168.52	35	907	0.51	0.037	0.02	11.89	0.02	0.000
4.34	2.00	125.77	1.31	164.85	34	892	0.51	0.040	0.02	11.89	0.02	0.000
4.41	1.99	126.77	1.30	164.86	34	885	0.51	0.042	0.02	11.89	0.02	0.000
4.48	1.99	126.71	1.30	164.18	34	877	0.51	0.044	0.02	11.89	0.02	0.000
4.56	1.99	125.00	1.30	162.35	34	870	0.51	0.046	0.02	11.89	0.02	0.000
4.60	2.00	122.30	1.31	159.72	33	861	0.51	0.048	0.03	11.89	0.02	0.000
4.67	2.01	118.69	1.32	156.34	33	849	0.51	0.051	0.03	11.89	0.02	0.000
4.76	2.04	113.23	1.34	151.66	32	835	0.51	0.056	0.03	11.89	0.03	0.000
4.82	2.06	108.13	1.36	147.51	31	821	0.51	0.060	0.04	11.89	0.03	0.000
4.87	2.08	103.73	1.39	143.78	31	805	0.51	0.065	0.04	11.89	0.03	0.000
4.94	2.08	100.72	1.40	140.72	30	791	0.51	0.071	0.04	11.89	0.04	0.000
5.01	2.09	98.12	1.40	137.82	30	775	0.51	0.077	0.05	11.89	0.04	0.000
5.08	2.09	96.36	1.41	135.84	29	765	0.51	0.083	0.05	11.89	0.04	0.000
5.12	2.10	94.46	1.42	134.05	29	756	0.51	0.088	0.06	11.89	0.05	0.000
5.19	2.11	92.00	1.43	131.87	29	745	0.51	0.095	0.06	11.89	0.05	0.000
5.27	2.12	88.44	1.46	128.80	28	729	0.51	0.105	0.07	11.89	0.06	0.001
5.35	2.14	84.84	1.48	125.79	28	713	0.51	0.118	0.08	11.89	0.07	0.001
5.38	2.16	81.14	1.52	123.03	27	697	0.51	0.130	0.09	11.89	0.07	0.000
5.45	2.17	77.99	1.55	120.60	27	683	0.51	0.146	0.10	11.89	0.08	0.001
5.53	2.18	75.63	1.56	117.76	26	666	0.51	0.166	0.12	11.89	0.10	0.001
5.60	2.17	74.77	1.54	115.52	26	654	0.51	0.185	0.14	11.89	0.11	0.001
5.68	2.16	74.97	1.53	114.33	25	648	0.51	0.199	0.15	11.89	0.12	0.001
5.72	2.15	76.01	1.51	114.48	25	649	0.51	0.200	0.15	11.89	0.12	0.001
5.79	2.14	77.55	1.49	115.45	25	655	0.51	0.199	0.15	11.89	0.12	0.001
5.87	2.13	79.49	1.47	116.84	26	662	0.51	0.195	0.14	11.89	0.12	0.001
5.91	2.12	81.69	1.45	118.68	26	672	0.51	0.186	0.14	11.89	0.11	0.001
5.98	2.12	82.64	1.45	119.94	26	679	0.51	0.183	0.13	11.89	0.11	0.001
6.05	2.13	82.13	1.47	120.73	26	684	0.51	0.182	0.13	11.89	0.10	0.001
6.13	2.15	80.07	1.51	120.86	27	685	0.51	0.186	0.13	11.89	0.11	0.001
6.20	2.16	79.16	1.53	121.01	27	686	0.51	0.190	0.13	11.89	0.11	0.001
6.24	2.16	78.71	1.52	119.92	27	680	0.51	0.201	0.14	11.89	0.11	0.001
6.31	2.14	79.30	1.49	118.21	26	670	0.51	0.219	0.16	11.89	0.13	0.001

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
6.39	2.13	79.49	1.46	115.98	25	657	0.51	0.246	0.19	11.89	0.15	0.001
6.46	2.11	80.38	1.43	114.96	25	649	0.51	0.266	0.20	11.89	0.16	0.001
6.50	2.10	80.18	1.42	114.21	25	645	0.51	0.279	0.22	11.89	0.17	0.001
6.57	2.11	79.33	1.44	113.92	25	644	0.51	0.288	0.22	11.89	0.18	0.002
6.65	2.12	78.07	1.45	113.55	25	643	0.51	0.299	0.23	11.89	0.18	0.002
6.72	2.13	77.51	1.46	113.34	25	642	0.51	0.309	0.24	11.89	0.19	0.002
6.80	2.13	77.56	1.46	113.29	25	642	0.51	0.318	0.25	11.89	0.20	0.002
6.84	2.12	78.26	1.45	113.68	25	644	0.51	0.318	0.25	11.89	0.20	0.001
6.91	2.11	79.40	1.44	114.18	25	646	0.51	0.322	0.25	11.89	0.20	0.002
6.98	2.10	81.34	1.41	115.00	25	648	0.51	0.324	0.25	11.89	0.20	0.002
7.06	2.08	83.59	1.39	115.95	25	650	0.51	0.329	0.25	11.89	0.20	0.002
7.10	2.06	85.38	1.37	116.83	25	651	0.51	0.331	0.25	11.89	0.20	0.001
7.17	2.05	86.12	1.36	116.95	25	649	0.51	0.344	0.26	11.89	0.21	0.002
7.24	2.05	85.91	1.35	116.16	25	643	0.51	0.368	0.29	11.89	0.23	0.002
7.32	2.05	85.16	1.35	114.95	24	636	0.51	0.400	0.32	11.89	0.25	0.002
7.36	2.05	83.70	1.36	113.55	24	630	0.51	0.424	0.34	11.89	0.27	0.001
7.43	2.07	81.70	1.38	112.97	24	632	0.51	0.427	0.34	11.89	0.27	0.002
7.51	2.09	80.19	1.41	112.91	24	636	0.51	0.427	0.34	11.89	0.26	0.003
7.57	2.10	79.78	1.42	113.39	25	640	0.51	0.423	0.33	11.89	0.26	0.002
7.61	2.09	81.53	1.40	114.12	25	641	0.51	0.424	0.33	11.89	0.26	0.001
7.69	2.07	84.47	1.37	115.99	25	647	0.51	0.415	0.32	11.89	0.25	0.002
7.77	2.05	87.31	1.36	118.32	25	656	0.51	0.399	0.30	11.89	0.24	0.002
7.84	2.04	89.38	1.35	120.26	25	664	0.51	0.385	0.29	11.89	0.23	0.002
7.88	2.04	90.93	1.34	121.89	26	674	0.51	0.362	0.27	11.89	0.21	0.001
7.95	2.04	90.20	1.35	121.37	26	676	0.51	0.366	0.27	11.89	0.21	0.002
8.03	2.03	91.32	1.33	121.67	26	680	0.51	0.365	0.27	11.89	0.21	0.002
8.09	2.01	92.36	1.32	121.60	25	680	0.51	0.372	0.28	11.89	0.22	0.002
8.17	1.98	95.30	1.29	123.31	26	687	0.51	0.363	0.27	11.89	0.21	0.002
8.23	1.98	95.78	1.29	123.48	25	689	0.51	0.364	0.27	11.89	0.21	0.002
8.27	1.98	94.83	1.29	122.61	25	688	0.51	0.372	0.28	11.89	0.22	0.001
8.34	2.00	92.12	1.31	120.24	25	682	0.51	0.395	0.30	11.89	0.23	0.002
8.41	2.02	88.16	1.32	116.57	24	669	0.51	0.444	0.35	11.89	0.27	0.002
8.49	2.04	83.52	1.34	112.00	24	650	0.51	0.526	0.43	11.89	0.33	0.003
8.56	2.05	79.23	1.36	107.40	23	628	0.50	0.642	0.55	11.89	0.42	0.004
8.63	2.06	75.82	1.37	103.73	22	611	0.50	0.763	0.68	11.89	0.52	0.004
8.66	2.08	73.15	1.39	101.50	22	600	0.50	0.851	0.77	11.89	0.59	0.002
8.73	2.09	70.97	1.41	100.08	22	595	0.50	0.913	0.83	11.89	0.64	0.005
8.80	2.11	69.26	1.43	99.35	22	593	0.50	0.950	0.87	11.89	0.66	0.005
8.87	2.11	68.31	1.44	98.43	21	591	0.50	0.997	0.92	11.89	0.70	0.006
8.94	2.10	68.45	1.42	97.36	21	588	0.50	1.048	0.98	11.89	0.75	0.006
9.01	2.08	69.50	1.39	96.53	21	586	0.50	1.091	1.05	11.89	0.80	0.007
9.09	2.05	71.01	1.36	96.27	20	585	0.50	1.125	1.10	11.89	0.84	0.008
9.12	2.03	72.10	1.33	96.03	20	582	0.50	1.176	1.16	11.89	0.88	0.004
9.19	2.02	71.96	1.32	95.12	20	577	0.50	1.261	1.27	11.89	0.96	0.008
9.27	2.01	72.04	1.31	94.72	20	576	0.50	1.306	1.32	11.89	1.01	0.009
9.34	2.00	72.59	1.31	95.18	20	581	0.50	1.273	1.28	11.89	0.97	0.009
9.41	2.00	73.48	1.31	95.90	20	586	0.50	1.230	1.23	11.89	0.93	0.008
9.45	1.99	74.19	1.30	96.64	20	592	0.50	1.181	1.18	11.89	0.89	0.004

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
9.52	2.00	74.33	1.31	97.18	20	599	0.50	1.121	1.11	11.89	0.84	0.007
9.59	2.01	74.37	1.31	97.60	20	606	0.50	1.073	1.05	11.89	0.79	0.006
9.66	2.01	73.89	1.32	97.24	20	607	0.50	1.079	1.06	11.89	0.80	0.007
9.73	2.02	72.35	1.32	95.55	20	600	0.50	1.176	1.18	11.89	0.88	0.007
9.81	2.02	70.29	1.33	93.28	20	590	0.50	1.328	1.36	11.89	1.02	0.009
9.84	2.03	68.12	1.33	90.70	19	576	0.50	1.556	1.65	11.89	1.24	0.006
9.91	2.03	66.16	1.33	88.27	19	564	0.50	1.820	1.99	11.89	1.49	0.012
9.98	2.04	63.95	1.35	86.08	18	554	0.50	2.075	2.32	11.89	1.74	0.014
10.05	2.06	61.91	1.37	84.51	18	549	0.50	2.260	2.56	11.89	1.92	0.017
10.13	2.06	60.49	1.37	82.70	18	540	0.50	2.575	3.00	11.89	2.24	0.020
10.20	2.05	59.92	1.36	81.29	17	532	0.50	2.903	3.46	11.89	2.58	0.023
10.24	2.03	60.97	1.34	81.53	17	532	0.50	2.933	3.52	11.89	2.62	0.013
10.31	2.02	64.09	1.32	84.86	18	553	0.50	2.307	2.65	11.89	1.97	0.016
10.38	2.01	68.44	1.32	90.10	19	588	0.50	1.602	1.72	11.89	1.28	0.011
10.46	2.02	71.63	1.32	94.88	20	624	0.50	1.147	1.15	11.89	0.86	0.007
10.53	2.05	71.52	1.36	97.06	21	648	0.50	0.947	0.91	11.89	0.68	0.006
10.60	2.09	69.60	1.41	98.09	21	662	0.50	0.857	0.80	11.89	0.59	0.005
10.64	2.14	67.53	1.48	99.78	22	673	0.50	0.786	0.70	11.89	0.52	0.002
10.71	2.15	66.20	1.51	100.04	22	676	0.50	0.784	0.69	11.89	0.51	0.004
10.77	2.16	64.63	1.52	98.01	22	665	0.50	0.874	0.79	11.89	0.58	0.005
10.85	2.15	63.34	1.50	95.31	21	650	0.50	1.007	0.95	11.89	0.70	0.006
10.92	2.16	62.06	1.52	94.14	21	644	0.50	1.081	1.03	11.89	0.76	0.006
10.96	2.18	60.16	1.56	93.97	21	641	0.50	1.128	1.06	11.89	0.78	0.004
11.04	2.20	57.46	1.61	92.80	21	630	0.50	1.269	1.20	11.89	0.88	0.008
11.11	2.22	55.23	1.66	91.77	21	620	0.50	1.417	1.35	11.89	0.99	0.009
11.16	2.22	54.59	1.67	91.29	21	618	0.50	1.473	1.41	11.89	1.03	0.006
11.23	2.22	54.73	1.66	90.96	21	619	0.50	1.475	1.42	11.89	1.03	0.008
11.30	2.22	54.73	1.65	90.46	21	620	0.50	1.496	1.45	11.89	1.06	0.009
11.36	2.21	54.76	1.65	90.21	20	621	0.50	1.500	1.46	11.89	1.06	0.009
11.43	2.22	54.78	1.66	90.86	21	627	0.50	1.445	1.39	11.89	1.01	0.008
11.51	2.23	54.53	1.69	92.14	21	635	0.50	1.367	1.29	11.89	0.93	0.009
11.58	2.24	53.84	1.74	93.40	21	640	0.50	1.323	1.22	11.89	0.88	0.007
11.62	2.26	52.71	1.79	94.22	22	640	0.50	1.338	1.21	11.89	0.87	0.004
11.69	2.27	51.73	1.83	94.59	22	640	0.50	1.367	1.22	11.89	0.88	0.008
11.76	2.28	51.11	1.86	95.02	22	641	0.50	1.373	1.21	11.89	0.87	0.008
11.84	2.29	50.79	1.90	96.40	23	648	0.50	1.316	1.14	11.89	0.82	0.008
11.91	2.31	50.54	1.95	98.65	23	658	0.50	1.223	1.02	11.89	0.73	0.006
11.95	2.32	50.86	2.02	102.71	24	677	0.50	1.055	0.83	11.89	0.60	0.003
12.03	2.33	51.50	2.06	106.25	25	696	0.50	0.915	0.69	11.89	0.49	0.004
12.10	2.34	52.56	2.07	108.83	26	716	0.50	0.804	0.59	11.89	0.42	0.004
12.18	2.33	53.46	2.05	109.57	26	727	0.50	0.751	0.54	11.89	0.39	0.003
12.22	2.32	54.41	2.02	109.91	26	736	0.50	0.711	0.52	11.89	0.37	0.002
12.29	2.32	54.73	2.01	110.15	0	0	0.50	0.000	0.00	11.89	0.00	0.000
12.37	2.32	54.74	2.02	110.53	0	0	0.50	0.000	0.00	11.89	0.00	0.000
12.40	2.33	54.79	2.03	111.35	0	0	0.50	0.000	0.00	11.89	0.00	0.000
12.48	2.33	54.69	2.05	112.04	0	0	0.50	0.000	0.00	11.89	0.00	0.000
12.55	2.33	54.44	2.06	112.16	0	0	0.50	0.000	0.00	11.89	0.00	0.000
12.62	2.34	54.01	2.08	112.53	0	0	0.50	0.000	0.00	11.89	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
12.69	2.35	53.60	2.12	113.57	0	0	0.50	0.000	0.00	11.89	0.00	0.000
12.73	2.36	53.09	2.20	116.63	0	0	0.50	0.000	0.00	11.89	0.00	0.000
12.81	2.39	52.09	2.30	120.08	0	0	0.50	0.000	0.00	11.89	0.00	0.000
12.89	2.41	50.94	2.43	123.63	0	0	0.50	0.000	0.00	11.89	0.00	0.000
12.93	2.43	50.18	2.51	126.14	0	0	0.50	0.000	0.00	11.89	0.00	0.000
13.00	2.43	49.72	2.54	126.42	0	0	0.50	0.000	0.00	11.89	0.00	0.000
13.08	2.43	49.19	2.56	125.94	0	0	0.50	0.000	0.00	11.89	0.00	0.000
13.15	2.44	48.18	2.61	125.90	0	0	0.50	0.000	0.00	11.89	0.00	0.000
13.22	2.46	47.02	2.70	126.93	0	0	0.50	0.000	0.00	11.89	0.00	0.000
13.26	2.48	45.85	2.81	128.93	0	0	0.50	0.000	0.00	11.89	0.00	0.000
13.33	2.50	43.63	2.99	130.64	0	0	0.50	0.000	0.00	11.89	0.00	0.000
13.40	2.53	41.52	3.16	131.38	0	0	0.50	0.000	0.00	11.89	0.00	0.000
13.48	2.54	40.02	3.26	130.31	0	0	0.50	0.000	0.00	11.89	0.00	0.000
13.52	2.53	40.06	3.16	126.67	33	740	0.50	0.911	0.50	11.89	0.35	0.001
13.59	2.52	38.87	3.15	122.32	32	720	0.50	1.078	0.62	11.89	0.43	0.004
13.67	2.52	37.06	3.14	116.51	30	689	0.50	1.402	0.85	11.89	0.59	0.006
13.75	2.53	35.25	3.16	111.43	29	660	0.50	1.838	1.17	11.89	0.81	0.007
13.78	2.53	34.08	3.19	108.68	28	643	0.50	2.188	1.44	11.89	0.99	0.004
13.86	2.54	33.05	3.29	108.65	29	636	0.50	2.380	1.55	11.89	1.07	0.010
13.94	2.57	31.74	3.47	110.01	29	630	0.50	2.566	1.62	11.89	1.12	0.010
13.98	2.58	30.94	3.58	110.78	30	626	0.50	2.699	1.68	11.89	1.16	0.006
14.05	2.60	29.85	3.72	111.14	30	619	0.50	2.959	1.82	11.89	1.25	0.010
14.13	2.60	29.28	3.77	110.50	0	0	0.50	0.000	0.00	0.00	0.00	0.000
14.20	2.60	28.99	3.79	109.83	0	0	0.50	0.000	0.00	0.00	0.00	0.000
14.27	2.60	28.99	3.77	109.40	0	0	0.50	0.000	0.00	0.00	0.00	0.000
14.31	2.60	29.03	3.76	109.23	0	0	0.50	0.000	0.00	0.00	0.00	0.000
14.38	2.60	28.94	3.77	109.05	0	0	0.50	0.000	0.00	0.00	0.00	0.000
14.46	2.60	29.18	3.73	108.85	29	620	0.50	3.178	2.00	11.89	1.36	0.013
14.53	2.60	29.19	3.73	108.97	29	623	0.50	3.123	1.96	11.89	1.33	0.012
14.57	2.60	28.67	3.76	107.82	0	0	0.50	0.000	0.00	0.00	0.00	0.000
14.65	2.60	27.62	3.75	103.55	28	595	0.50	4.368	2.92	11.89	1.97	0.019
14.72	2.59	26.73	3.71	99.08	27	575	0.50	5.650	3.99	11.89	2.70	0.023
14.79	2.59	26.40	3.64	96.18	26	565	0.50	6.501	4.78	11.89	3.22	0.026
14.83	2.59	26.38	3.65	96.20	26	566	0.50	6.468	4.75	11.89	3.20	0.015
14.90	2.59	26.20	3.64	95.29	26	564	0.50	6.778	5.04	11.89	3.39	0.030
14.98	2.57	26.57	3.52	93.51	25	564	0.50	6.832	5.24	11.89	3.52	0.032
15.05	2.55	27.41	3.33	91.36	24	568	0.50	6.610	5.28	11.89	3.55	0.031
15.09	2.53	28.34	3.22	91.13	24	578	0.50	5.907	4.78	11.89	3.20	0.015
15.17	2.53	28.45	3.22	91.63	24	583	0.50	5.634	4.53	11.89	3.03	0.029
15.24	2.53	28.35	3.23	91.47	24	584	0.50	5.679	4.57	11.89	3.05	0.026
15.32	2.53	28.12	3.21	90.17	24	580	0.50	6.076	4.98	11.89	3.32	0.032
15.36	2.52	28.30	3.09	87.36	23	573	0.50	6.650	5.72	11.89	3.70	0.016
15.43	2.52	27.13	3.13	84.91	0	0	0.50	0.000	0.00	11.89	0.00	0.000
15.51	2.52	25.83	3.11	80.21	0	0	0.50	0.000	0.00	11.89	0.00	0.000
15.58	2.51	24.49	3.05	74.68	0	0	0.50	0.000	0.00	11.89	0.00	0.000
15.65	2.48	24.27	2.84	68.85	0	0	0.50	0.000	0.00	11.89	0.00	0.000
15.69	2.45	24.12	2.68	64.66	0	0	0.50	0.000	0.00	11.89	0.00	0.000
15.76	2.44	24.19	2.60	62.99	0	0	0.50	0.000	0.00	11.89	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
15.84	2.44	24.29	2.58	62.58	0	0	0.50	0.000	0.00	11.89	0.00	0.000
15.88	2.43	24.75	2.56	63.31	0	0	0.50	0.000	0.00	11.89	0.00	0.000
15.96	2.43	24.89	2.56	63.63	0	0	0.50	0.000	0.00	11.89	0.00	0.000
16.03	2.43	24.99	2.55	63.71	0	0	0.50	0.000	0.00	11.89	0.00	0.000
16.10	2.44	24.91	2.58	64.37	0	0	0.50	0.000	0.00	11.89	0.00	0.000
16.14	2.48	23.97	2.81	67.46	0	0	0.50	0.000	0.00	11.89	0.00	0.000
16.21	2.54	22.11	3.26	72.09	0	0	0.50	0.000	0.00	11.89	0.00	0.000
16.28	2.58	20.80	3.62	75.20	0	0	0.50	0.000	0.00	11.89	0.00	0.000
16.36	2.58	20.51	3.55	72.87	19	470	0.50	40.188	41.47	11.89	3.61	0.034
16.44	2.57	19.73	3.53	69.56	19	452	0.50	58.174	63.59	11.89	3.61	0.034
16.47	2.61	17.30	3.83	66.21	0	0	0.50	0.000	0.00	0.00	0.00	0.000
16.55	2.67	14.39	4.44	63.85	0	0	0.50	0.000	0.00	0.00	0.00	0.000
16.62	2.70	12.80	4.74	60.60	0	0	0.50	0.000	0.00	0.00	0.00	0.000
16.70	2.70	12.43	4.72	58.63	0	0	0.50	0.000	0.00	0.00	0.00	0.000
16.76	2.70	12.58	4.65	58.54	0	0	0.50	0.000	0.00	0.00	0.00	0.000
16.80	2.68	13.18	4.51	59.35	0	0	0.50	0.000	0.00	0.00	0.00	0.000
16.88	2.68	13.87	4.46	61.81	0	0	0.50	0.000	0.00	0.00	0.00	0.000
16.96	2.67	14.56	4.42	64.28	0	0	0.50	0.000	0.00	0.00	0.00	0.000
17.00	2.71	14.08	4.79	67.44	0	0	0.50	0.000	0.00	0.00	0.00	0.000
17.07	2.78	12.77	5.58	71.21	0	0	0.50	0.000	0.00	0.00	0.00	0.000
17.15	2.86	11.19	6.66	74.59	0	0	0.50	0.000	0.00	0.00	0.00	0.000
17.22	2.92	10.20	7.48	76.27	0	0	0.50	0.000	0.00	0.00	0.00	0.000
17.26	2.95	9.48	8.00	75.84	0	0	0.50	0.000	0.00	0.00	0.00	0.000
17.33	2.98	8.89	8.47	75.26	0	0	0.50	0.000	0.00	0.00	0.00	0.000
17.41	3.03	8.14	9.24	75.29	0	0	0.50	0.000	0.00	0.00	0.00	0.000
17.48	3.06	7.75	9.77	75.64	0	0	0.50	0.000	0.00	0.00	0.00	0.000
17.52	3.10	7.27	10.58	76.98	0	0	0.50	0.000	0.00	0.00	0.00	0.000
17.60	3.12	7.12	10.92	77.79	0	0	0.49	0.000	0.00	0.00	0.00	0.000
17.67	3.13	7.00	11.12	77.88	0	0	0.49	0.000	0.00	0.00	0.00	0.000
17.74	3.15	6.67	11.53	76.95	0	0	0.49	0.000	0.00	0.00	0.00	0.000
17.82	3.17	6.25	12.10	75.64	0	0	0.49	0.000	0.00	0.00	0.00	0.000
17.86	3.19	5.88	12.59	73.96	0	0	0.49	0.000	0.00	0.00	0.00	0.000
17.93	3.20	5.67	12.73	72.22	0	0	0.49	0.000	0.00	0.00	0.00	0.000
18.01	3.19	5.59	12.61	70.50	0	0	0.49	0.000	0.00	0.00	0.00	0.000
18.05	3.19	5.55	12.46	69.16	0	0	0.49	0.000	0.00	0.00	0.00	0.000
18.12	3.18	5.56	12.25	68.09	0	0	0.49	0.000	0.00	0.00	0.00	0.000
18.20	3.18	5.48	12.31	67.41	0	0	0.49	0.000	0.00	0.00	0.00	0.000
18.27	3.20	5.30	12.63	67.02	0	0	0.49	0.000	0.00	0.00	0.00	0.000
18.34	3.22	5.08	13.12	66.58	0	0	0.49	0.000	0.00	0.00	0.00	0.000
18.39	3.23	4.89	13.39	65.47	0	0	0.49	0.000	0.00	0.00	0.00	0.000
18.46	3.24	4.72	13.57	64.06	0	0	0.50	0.000	0.00	0.00	0.00	0.000
18.53	3.25	4.50	13.85	62.34	0	0	0.50	0.000	0.00	0.00	0.00	0.000
18.60	3.26	4.28	14.25	61.02	0	0	0.50	0.000	0.00	0.00	0.00	0.000
18.64	3.28	4.10	14.63	59.95	0	0	0.50	0.000	0.00	0.00	0.00	0.000
18.72	3.29	3.94	14.96	58.91	0	0	0.50	0.000	0.00	0.00	0.00	0.000
18.79	3.30	3.80	15.06	57.27	0	0	0.50	0.000	0.00	0.00	0.00	0.000
18.86	3.29	3.70	15.02	55.63	0	0	0.50	0.000	0.00	0.00	0.00	0.000
18.90	3.28	3.70	14.75	54.49	0	0	0.50	0.000	0.00	0.00	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
18.98	3.27	3.74	14.48	54.13	0	0	0.50	0.000	0.00	0.00	0.00	0.000
19.06	3.27	3.78	14.30	54.05	0	0	0.50	0.000	0.00	0.00	0.00	0.000
19.12	3.26	3.82	14.14	54.03	0	0	0.50	0.000	0.00	0.00	0.00	0.000
19.16	3.27	3.79	14.35	54.34	0	0	0.50	0.000	0.00	0.00	0.00	0.000
19.24	3.28	3.71	14.72	54.68	0	0	0.50	0.000	0.00	0.00	0.00	0.000
19.32	3.33	3.61	15.89	57.45	0	0	0.50	0.000	0.00	0.00	0.00	0.000
19.39	3.38	3.52	17.44	61.30	0	0	0.50	0.000	0.00	0.00	0.00	0.000
19.43	3.47	3.34	20.31	67.85	0	0	0.50	0.000	0.00	0.00	0.00	0.000
19.51	3.54	3.27	22.77	74.45	0	0	0.50	0.000	0.00	0.00	0.00	0.000
19.57	3.51	3.72	21.85	81.35	0	0	0.50	0.000	0.00	0.00	0.00	0.000
19.65	3.41	4.76	18.21	86.59	0	0	0.50	0.000	0.00	0.00	0.00	0.000
19.69	3.12	8.24	10.96	90.26	0	0	0.50	0.000	0.00	0.00	0.00	0.000
19.77	2.82	14.56	6.12	89.01	0	0	0.50	0.000	0.00	0.00	0.00	0.000
19.84	2.58	23.87	3.56	84.88	0	0	0.50	0.000	0.00	11.89	0.00	0.000
19.91	2.43	32.99	2.53	83.47	0	0	0.50	0.000	0.00	11.89	0.00	0.000
19.98	2.33	41.37	2.03	84.03	0	0	0.50	0.000	0.00	11.89	0.00	0.000
20.01	2.23	51.38	1.68	86.44	0	0	0.50	0.000	0.00	11.89	0.00	0.000
20.09	2.14	62.32	1.48	92.08	0	0	0.50	0.000	0.00	11.89	0.00	0.000
20.16	2.07	73.32	1.38	100.83	0	0	0.50	0.000	0.00	11.89	0.00	0.000
20.24	2.03	80.51	1.34	107.71	0	0	0.50	0.000	0.00	11.89	0.00	0.000
20.28	2.01	86.32	1.32	113.72	0	0	0.50	0.000	0.00	11.89	0.00	0.000
20.35	2.00	91.01	1.30	118.76	0	0	0.50	0.000	0.00	11.89	0.00	0.000
20.43	1.99	95.43	1.30	123.64	0	0	0.50	0.000	0.00	11.89	0.00	0.000
20.50	1.98	98.46	1.29	127.05	0	0	0.50	0.000	0.00	11.89	0.00	0.000
20.54	1.98	100.72	1.29	129.75	0	0	0.50	0.000	0.00	11.89	0.00	0.000
20.61	1.97	102.82	1.29	132.31	0	0	0.50	0.000	0.00	11.89	0.00	0.000
20.69	1.97	105.47	1.28	135.40	0	0	0.50	0.000	0.00	11.89	0.00	0.000
20.75	1.96	108.95	1.28	139.25	0	0	0.50	0.000	0.00	11.89	0.00	0.000
20.83	1.95	113.03	1.27	143.74	0	0	0.50	0.000	0.00	11.89	0.00	0.000
20.90	1.94	116.97	1.27	148.11	0	0	0.50	0.000	0.00	11.89	0.00	0.000
20.94	1.94	121.01	1.26	152.67	0	0	0.50	0.000	0.00	11.89	0.00	0.000
21.01	1.93	125.24	1.26	157.39	0	0	0.50	0.000	0.00	11.89	0.00	0.000
21.08	1.92	131.15	1.25	163.82	0	0	0.50	0.000	0.00	11.89	0.00	0.000
21.16	1.90	138.40	1.24	171.21	0	0	0.50	0.000	0.00	11.89	0.00	0.000
21.23	1.88	145.43	1.22	177.87	0	0	0.50	0.000	0.00	11.89	0.00	0.000
21.26	1.86	152.73	1.21	184.23	0	0	0.51	0.000	0.00	11.89	0.00	0.000
21.34	1.84	158.48	1.19	189.00	0	0	0.51	0.000	0.00	11.89	0.00	0.000
21.41	1.83	163.06	1.18	192.78	0	0	0.51	0.000	0.00	11.89	0.00	0.000
21.48	1.82	164.85	1.18	193.95	0	0	0.51	0.000	0.00	11.89	0.00	0.000
21.56	1.82	164.22	1.17	192.87	0	0	0.51	0.000	0.00	11.89	0.00	0.000
21.63	1.82	161.66	1.18	190.20	37	1703	0.51	0.099	0.05	11.89	0.03	0.000
21.67	1.83	157.17	1.18	186.07	36	1675	0.51	0.103	0.05	11.89	0.03	0.000
21.74	1.84	150.44	1.20	179.99	35	1638	0.51	0.110	0.06	11.89	0.03	0.000
21.81	1.86	143.55	1.21	173.55	34	1600	0.51	0.118	0.06	11.89	0.04	0.000
21.85	1.88	136.28	1.22	166.86	33	1564	0.51	0.126	0.07	11.89	0.04	0.000
21.92	1.90	129.07	1.24	160.08	32	1531	0.51	0.135	0.08	11.89	0.04	0.000
22.00	1.93	121.52	1.26	152.59	31	1491	0.51	0.147	0.09	11.89	0.05	0.000
22.08	1.94	115.92	1.27	146.73	30	1455	0.51	0.159	0.10	11.89	0.06	0.001

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
22.12	1.95	111.97	1.27	142.24	29	1420	0.51	0.172	0.11	11.89	0.06	0.000
22.19	1.96	108.64	1.27	138.39	28	1390	0.51	0.185	0.12	11.89	0.07	0.001
22.27	1.96	105.09	1.28	134.44	28	1362	0.51	0.199	0.14	11.89	0.08	0.001
22.34	1.97	102.15	1.29	131.38	27	1344	0.51	0.210	0.15	11.89	0.08	0.001
22.38	1.99	99.24	1.30	128.56	27	1329	0.51	0.219	0.16	11.89	0.09	0.000
22.45	2.00	96.35	1.31	125.92	26	1319	0.51	0.226	0.16	11.89	0.09	0.001
22.53	2.02	93.65	1.32	123.65	26	1312	0.51	0.232	0.17	11.89	0.09	0.001
22.61	2.02	92.64	1.32	122.57	26	1306	0.51	0.237	0.18	11.89	0.10	0.001
22.64	2.01	92.39	1.32	121.59	25	1290	0.51	0.249	0.19	11.89	0.10	0.000
22.72	2.00	92.72	1.31	121.21	25	1280	0.51	0.258	0.19	11.89	0.11	0.001
22.79	2.00	92.91	1.30	121.11	0	0	0.51	0.000	0.00	11.89	0.00	0.000
22.87	2.00	93.30	1.30	121.74	0	0	0.51	0.000	0.00	11.89	0.00	0.000
22.91	2.01	92.68	1.31	121.71	0	0	0.51	0.000	0.00	11.89	0.00	0.000
22.97	2.04	89.31	1.35	120.41	0	0	0.51	0.000	0.00	11.89	0.00	0.000
23.04	2.09	85.52	1.41	120.58	0	0	0.51	0.000	0.00	11.89	0.00	0.000
23.12	2.16	81.44	1.52	123.39	0	0	0.51	0.000	0.00	11.89	0.00	0.000
23.19	2.20	79.04	1.62	128.33	0	0	0.51	0.000	0.00	11.89	0.00	0.000
23.23	2.27	75.30	1.81	136.40	0	0	0.51	0.000	0.00	11.89	0.00	0.000
23.31	2.35	69.86	2.13	148.95	0	0	0.51	0.000	0.00	11.89	0.00	0.000
23.38	2.45	63.71	2.65	168.64	0	0	0.51	0.000	0.00	11.89	0.00	0.000
23.46	2.52	59.37	3.14	186.48	0	0	0.51	0.000	0.00	11.89	0.00	0.000
23.50	2.56	57.80	3.44	198.76	0	0	0.51	0.000	0.00	11.89	0.00	0.000
23.57	2.57	57.61	3.52	202.57	0	0	0.51	0.000	0.00	11.89	0.00	0.000
23.64	2.57	57.44	3.51	201.56	0	0	0.51	0.000	0.00	11.89	0.00	0.000
23.72	2.56	57.33	3.43	196.45	0	0	0.51	0.000	0.00	11.89	0.00	0.000
23.76	2.54	57.92	3.24	187.50	0	0	0.51	0.000	0.00	11.89	0.00	0.000
23.83	2.49	59.83	2.93	175.60	0	0	0.51	0.000	0.00	11.89	0.00	0.000
23.90	2.43	63.59	2.51	159.72	0	0	0.51	0.000	0.00	11.89	0.00	0.000
23.98	2.35	68.11	2.13	144.87	0	0	0.51	0.000	0.00	11.89	0.00	0.000
24.05	2.28	72.03	1.86	134.15	0	0	0.51	0.000	0.00	11.89	0.00	0.000
24.09	2.22	75.87	1.67	126.35	0	0	0.51	0.000	0.00	11.89	0.00	0.000
24.17	2.16	79.54	1.53	122.00	0	0	0.51	0.000	0.00	11.89	0.00	0.000
24.24	2.12	83.22	1.45	120.36	0	0	0.51	0.000	0.00	11.89	0.00	0.000
24.28	2.09	86.41	1.40	121.39	0	0	0.51	0.000	0.00	11.89	0.00	0.000
24.35	2.08	89.19	1.39	123.55	0	0	0.52	0.000	0.00	11.89	0.00	0.000
24.42	2.06	92.93	1.37	126.89	0	0	0.52	0.000	0.00	11.89	0.00	0.000
24.50	2.04	97.47	1.35	131.21	0	0	0.52	0.000	0.00	11.89	0.00	0.000
24.57	2.02	102.16	1.33	135.63	0	0	0.52	0.000	0.00	11.89	0.00	0.000
24.61	2.00	107.87	1.31	141.04	0	0	0.52	0.000	0.00	11.89	0.00	0.000
24.69	1.98	113.28	1.29	146.25	0	0	0.52	0.000	0.00	11.89	0.00	0.000
24.75	1.96	119.18	1.28	151.99	0	0	0.52	0.000	0.00	11.89	0.00	0.000
24.83	1.94	123.66	1.26	156.33	0	0	0.52	0.000	0.00	11.89	0.00	0.000
24.90	1.93	126.72	1.26	159.21	0	0	0.52	0.000	0.00	11.89	0.00	0.000
24.94	1.92	128.49	1.25	160.80	0	0	0.52	0.000	0.00	11.89	0.00	0.000
25.01	1.92	128.76	1.25	160.92	0	0	0.52	0.000	0.00	11.89	0.00	0.000
25.08	1.92	128.38	1.25	160.24	0	0	0.52	0.000	0.00	11.89	0.00	0.000
25.15	1.91	127.25	1.25	158.62	0	0	0.52	0.000	0.00	11.89	0.00	0.000
25.23	1.91	125.94	1.24	156.72	0	0	0.52	0.000	0.00	11.89	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
25.26	1.91	123.94	1.24	154.18	0	0	0.52	0.000	0.00	11.89	0.00	0.000
25.34	1.92	120.95	1.25	150.86	30	1601	0.52	0.155	0.09	11.89	0.05	0.000
25.41	1.93	117.19	1.25	146.91	30	1575	0.52	0.163	0.10	11.89	0.05	0.000
25.48	1.94	113.46	1.26	143.12	29	1554	0.52	0.171	0.11	11.89	0.06	0.000
25.56	1.94	110.64	1.27	140.12	29	1534	0.52	0.179	0.12	11.89	0.06	0.001
25.60	1.94	108.44	1.26	136.73	28	1488	0.52	0.198	0.13	11.89	0.07	0.000
25.67	1.93	106.35	1.26	133.75	27	1452	0.52	0.215	0.15	11.89	0.08	0.001
25.74	1.93	104.16	1.26	130.99	27	1424	0.52	0.231	0.16	11.89	0.08	0.001
25.81	1.95	102.12	1.27	129.58	26	1432	0.52	0.227	0.16	11.89	0.08	0.001
25.88	1.97	99.28	1.28	127.42	26	1437	0.52	0.226	0.16	11.89	0.08	0.001
25.95	1.98	98.43	1.29	127.08	26	1448	0.52	0.222	0.16	11.89	0.08	0.001
26.00	1.99	97.86	1.30	127.11	26	1462	0.52	0.215	0.15	11.89	0.08	0.000
26.06	1.99	99.42	1.30	129.15	27	1488	0.52	0.204	0.14	11.89	0.07	0.001
26.14	2.00	100.30	1.31	130.91	27	1520	0.52	0.192	0.13	11.89	0.07	0.001
26.20	2.00	102.61	1.31	134.17	28	1565	0.52	0.176	0.12	11.89	0.06	0.000
26.28	2.00	105.76	1.31	138.11	29	1611	0.52	0.162	0.11	11.89	0.05	0.000
26.35	1.99	109.06	1.30	141.86	29	1650	0.52	0.152	0.10	11.89	0.05	0.000
26.39	1.98	112.83	1.29	145.75	30	1681	0.52	0.145	0.09	11.89	0.04	0.000
26.45	1.97	116.39	1.28	149.28	31	1706	0.52	0.140	0.08	11.89	0.04	0.000
26.53	1.96	119.52	1.27	152.38	31	1729	0.52	0.135	0.08	11.89	0.04	0.000
26.60	1.95	121.17	1.27	154.02	31	1742	0.52	0.133	0.08	11.89	0.04	0.000
26.64	1.95	121.24	1.27	154.09	31	1744	0.52	0.133	0.08	11.89	0.04	0.000
26.72	1.96	119.87	1.27	152.69	31	1738	0.52	0.135	0.08	11.89	0.04	0.000
26.78	1.96	117.48	1.28	150.29	31	1726	0.52	0.138	0.08	11.89	0.04	0.000
26.85	1.98	114.14	1.29	147.07	30	1710	0.52	0.142	0.09	11.89	0.04	0.000
26.92	1.99	110.32	1.30	143.61	30	1697	0.52	0.146	0.09	11.89	0.04	0.000
26.99	2.01	106.30	1.32	140.19	29	1686	0.52	0.150	0.09	11.89	0.05	0.000
27.07	2.03	102.99	1.34	137.52	29	1678	0.52	0.152	0.10	11.89	0.05	0.000
27.14	2.04	100.81	1.35	135.78	29	1672	0.52	0.154	0.10	11.89	0.05	0.000
27.17	2.05	99.73	1.35	134.94	29	1670	0.52	0.155	0.10	11.89	0.05	0.000
27.25	2.05	99.13	1.36	134.60	29	1673	0.52	0.155	0.10	11.89	0.05	0.000
27.33	2.06	98.71	1.36	134.56	29	1681	0.52	0.154	0.10	11.89	0.05	0.000
27.36	2.06	99.19	1.37	135.52	29	1697	0.52	0.150	0.10	11.89	0.05	0.000
27.44	2.06	101.25	1.36	137.78	29	1724	0.52	0.144	0.09	11.89	0.04	0.000
27.51	2.04	106.25	1.34	142.43	30	1764	0.52	0.136	0.08	11.89	0.04	0.000
27.58	2.00	114.47	1.31	149.72	31	1810	0.52	0.128	0.07	11.89	0.04	0.000
27.65	1.96	125.33	1.27	159.61	33	1859	0.52	0.120	0.07	11.89	0.03	0.000
27.72	1.92	135.02	1.25	168.47	34	1898	0.52	0.114	0.06	11.89	0.03	0.000
27.76	1.89	142.73	1.23	175.29	35	1926	0.52	0.110	0.06	11.89	0.03	0.000
27.83	1.87	145.89	1.22	177.53	35	1927	0.52	0.110	0.06	11.89	0.03	0.000
27.91	1.86	145.56	1.21	176.34	35	1906	0.52	0.114	0.06	11.89	0.03	0.000
27.98	1.87	140.40	1.22	170.74	34	1858	0.52	0.122	0.06	11.89	0.03	0.000
28.05	1.88	133.62	1.23	163.86	33	1808	0.52	0.132	0.07	11.89	0.03	0.000
28.09	1.91	124.30	1.24	154.66	31	1749	0.52	0.144	0.08	11.89	0.04	0.000
28.17	1.95	114.57	1.27	145.38	30	1704	0.52	0.156	0.10	11.89	0.05	0.000
28.24	2.00	104.09	1.30	135.81	28	1664	0.52	0.168	0.11	11.89	0.05	0.000
28.32	2.04	97.09	1.34	130.17	27	1646	0.52	0.174	0.12	11.89	0.06	0.000
28.35	2.07	92.32	1.38	127.12	27	1641	0.52	0.176	0.12	11.89	0.06	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
28.43	2.10	89.35	1.41	126.12	27	1653	0.52	0.173	0.12	11.89	0.06	0.001
28.50	2.12	86.84	1.45	126.16	28	1672	0.52	0.168	0.11	11.89	0.05	0.000
28.58	2.14	85.35	1.48	126.61	28	1689	0.52	0.164	0.11	11.89	0.05	0.000
28.61	2.15	83.86	1.51	126.81	28	1698	0.52	0.162	0.11	11.89	0.05	0.000
28.69	2.17	82.13	1.54	126.21	28	1696	0.52	0.163	0.11	11.89	0.05	0.000
28.76	2.17	81.11	1.55	126.02	28	1697	0.52	0.164	0.11	11.89	0.05	0.000
28.84	2.18	80.04	1.57	125.86	28	1699	0.52	0.164	0.11	11.89	0.05	0.000
28.88	2.19	80.30	1.58	126.83	28	1713	0.52	0.160	0.11	11.89	0.05	0.000
28.95	2.18	81.07	1.57	127.49	29	1726	0.52	0.158	0.10	11.89	0.05	0.000
29.02	2.19	79.53	1.60	127.12	29	1723	0.52	0.159	0.10	11.89	0.05	0.000
29.09	2.17	81.50	1.55	126.70	28	1721	0.52	0.160	0.11	11.89	0.05	0.000
29.16	2.16	82.24	1.53	125.57	28	1707	0.52	0.165	0.11	11.89	0.05	0.000
29.22	2.13	85.36	1.47	125.10	27	1693	0.52	0.169	0.12	11.89	0.05	0.000
29.30	2.13	83.78	1.46	122.70	27	1664	0.52	0.179	0.13	11.89	0.06	0.001
29.34	2.13	81.90	1.47	119.98	26	1629	0.52	0.191	0.14	11.89	0.06	0.000
29.41	2.12	81.48	1.45	117.93	26	1598	0.52	0.203	0.15	11.89	0.07	0.001
29.49	2.11	81.00	1.44	116.25	25	1575	0.53	0.214	0.16	11.89	0.07	0.001
29.53	2.11	81.63	1.43	116.47	25	1576	0.53	0.214	0.16	11.89	0.07	0.000
29.60	2.11	82.19	1.44	118.37	26	1610	0.53	0.201	0.15	11.89	0.07	0.001
29.67	2.13	83.41	1.48	123.04	27	1687	0.53	0.176	0.12	11.89	0.05	0.000
29.75	2.17	83.65	1.55	129.96	29	1795	0.53	0.148	0.09	11.89	0.04	0.000
29.82	2.22	82.94	1.66	137.75	31	1902	0.53	0.127	0.07	11.89	0.03	0.000
29.86	2.26	81.87	1.78	145.72	34	1994	0.53	0.113	0.06	11.89	0.03	0.000
29.93	2.28	81.16	1.86	151.07	35	2052	0.53	0.106	0.05	11.89	0.02	0.000
30.01	2.29	80.92	1.90	154.14	36	2087	0.53	0.102	0.05	11.89	0.02	0.000
30.05	2.28	82.82	1.85	153.56	36	2094	0.53	0.102	0.05	11.89	0.02	0.000
30.13	2.24	87.97	1.72	151.01	35	2093	0.53	0.102	0.05	11.89	0.02	0.000
30.20	2.18	94.85	1.57	148.64	33	2078	0.53	0.104	0.06	11.89	0.02	0.000
30.27	2.14	98.65	1.48	145.77	32	2029	0.53	0.111	0.06	11.89	0.03	0.000
30.35	2.12	98.07	1.44	141.61	31	1963	0.53	0.120	0.07	11.89	0.03	0.000
30.38	2.12	93.25	1.45	134.80	29	1871	0.53	0.137	0.09	11.89	0.04	0.000
30.46	2.13	87.81	1.47	129.23	28	1806	0.53	0.151	0.10	11.89	0.04	0.000
30.54	2.16	81.91	1.52	124.63	28	1754	0.53	0.164	0.11	11.89	0.05	0.000
30.62	2.19	77.79	1.59	123.62	28	1747	0.53	0.167	0.11	11.89	0.05	0.000
30.65	2.22	74.81	1.67	125.02	28	1763	0.53	0.163	0.11	11.89	0.05	0.000
30.73	2.25	72.80	1.76	128.27	30	1799	0.53	0.155	0.10	11.89	0.04	0.000
30.80	2.28	71.33	1.86	132.54	31	1843	0.53	0.145	0.09	11.89	0.04	0.000
30.88	2.30	70.81	1.91	135.23	32	1873	0.53	0.140	0.08	11.89	0.03	0.000
30.91	2.29	71.80	1.90	136.37	32	1892	0.53	0.136	0.08	11.89	0.03	0.000
30.99	2.28	73.56	1.84	135.72	32	1900	0.53	0.135	0.08	11.89	0.03	0.000
31.06	2.26	75.64	1.77	134.05	31	1894	0.53	0.137	0.08	11.89	0.03	0.000
31.13	2.23	77.35	1.69	131.07	30	1868	0.53	0.142	0.09	11.89	0.04	0.000
31.20	2.21	78.34	1.64	128.17	29	1836	0.53	0.150	0.10	11.89	0.04	0.000
31.24	2.19	79.32	1.58	125.72	28	1804	0.53	0.157	0.10	11.89	0.04	0.000
31.31	2.18	80.01	1.56	124.69	28	1792	0.53	0.161	0.11	11.89	0.05	0.000
31.39	2.17	80.89	1.54	124.74	28	1795	0.53	0.161	0.11	11.89	0.05	0.000
31.46	2.17	81.61	1.54	125.66	28	1811	0.53	0.157	0.11	11.89	0.04	0.000
31.50	2.17	82.36	1.54	127.18	28	1835	0.53	0.152	0.10	11.89	0.04	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
31.57	2.17	82.84	1.55	128.37	29	1856	0.53	0.148	0.10	11.89	0.04	0.000
31.65	2.18	82.96	1.56	129.19	29	1872	0.53	0.145	0.09	11.89	0.04	0.000
31.72	2.18	82.67	1.57	129.42	29	1879	0.53	0.144	0.09	11.89	0.04	0.000
31.76	2.18	82.11	1.57	129.21	29	1878	0.53	0.145	0.09	11.89	0.04	0.000
31.84	2.19	81.36	1.58	128.82	29	1876	0.53	0.146	0.09	11.89	0.04	0.000
31.92	2.19	81.25	1.58	128.47	29	1874	0.53	0.146	0.09	11.89	0.04	0.000
31.97	2.19	80.49	1.59	128.12	29	1871	0.53	0.147	0.10	11.89	0.04	0.000
32.04	2.19	81.11	1.58	128.21	29	1876	0.53	0.147	0.10	11.89	0.04	0.000
32.11	2.18	81.78	1.57	128.39	29	1881	0.53	0.146	0.09	11.89	0.04	0.000
32.19	2.17	83.42	1.55	128.99	29	1892	0.53	0.145	0.09	11.89	0.04	0.000
32.23	2.17	83.93	1.54	129.42	29	1900	0.53	0.143	0.09	11.89	0.04	0.000
32.30	2.17	83.50	1.55	129.74	29	1909	0.53	0.142	0.09	11.89	0.04	0.000
32.37	2.18	82.96	1.57	130.17	29	1919	0.53	0.140	0.09	11.89	0.04	0.000
32.45	2.19	82.51	1.58	130.42	29	1927	0.53	0.139	0.09	11.89	0.04	0.000
32.49	2.19	82.44	1.58	130.32	29	1927	0.53	0.140	0.09	11.89	0.04	0.000
32.56	2.18	82.28	1.58	129.69	29	1921	0.53	0.141	0.09	11.89	0.04	0.000
32.64	2.18	82.01	1.57	128.83	29	1911	0.53	0.144	0.09	11.89	0.04	0.000
32.71	2.18	81.75	1.57	128.06	29	1903	0.53	0.146	0.09	11.89	0.04	0.000
32.75	2.18	81.90	1.56	127.44	28	1895	0.53	0.148	0.10	11.89	0.04	0.000
32.82	2.17	82.50	1.54	126.95	28	1889	0.53	0.149	0.10	11.89	0.04	0.000
32.89	2.15	83.52	1.51	126.35	28	1880	0.53	0.152	0.10	11.89	0.04	0.000
32.97	2.14	84.43	1.49	125.83	28	1870	0.53	0.154	0.10	11.89	0.04	0.000
33.01	2.13	85.81	1.46	125.61	28	1861	0.53	0.157	0.11	11.89	0.04	0.000
33.08	2.11	88.19	1.43	126.35	27	1861	0.53	0.157	0.11	11.89	0.04	0.000
33.16	2.08	92.07	1.39	128.27	28	1868	0.53	0.156	0.11	11.89	0.04	0.000
33.24	2.06	96.20	1.36	130.87	28	1877	0.53	0.155	0.10	11.89	0.04	0.000
33.28	2.03	100.63	1.33	134.15	28	1890	0.53	0.152	0.10	11.89	0.04	0.000
33.36	2.01	104.62	1.31	137.23	29	1899	0.53	0.151	0.10	11.89	0.04	0.000
33.43	1.98	108.47	1.29	140.17	29	1901	0.53	0.151	0.10	11.89	0.04	0.000
33.50	1.96	110.82	1.28	141.71	29	1891	0.53	0.153	0.10	11.89	0.04	0.000
33.54	1.95	111.92	1.27	142.04	29	1872	0.53	0.158	0.10	11.89	0.04	0.000
33.61	1.94	111.59	1.26	141.04	29	1847	0.53	0.164	0.11	11.89	0.04	0.000
33.68	1.94	110.35	1.26	139.14	28	1817	0.53	0.172	0.11	11.89	0.04	0.000
33.75	1.94	108.75	1.26	137.15	28	1794	0.53	0.179	0.12	11.89	0.05	0.000
33.79	1.94	106.77	1.26	135.04	27	1777	0.53	0.184	0.13	11.89	0.05	0.000
33.87	1.95	104.60	1.27	132.97	27	1769	0.53	0.187	0.13	11.89	0.05	0.000
33.94	1.97	101.99	1.28	130.62	27	1763	0.53	0.190	0.13	11.89	0.05	0.000
34.03	1.98	99.99	1.29	128.92	27	1763	0.53	0.190	0.14	11.89	0.05	0.001
34.07	1.99	98.24	1.30	127.59	26	1766	0.53	0.190	0.14	11.89	0.05	0.000
34.14	2.00	96.68	1.31	126.59	26	1776	0.53	0.188	0.13	11.89	0.05	0.000
34.22	2.01	95.25	1.32	125.74	26	1785	0.53	0.185	0.13	11.89	0.05	0.000
34.25	2.02	94.62	1.33	125.56	26	1795	0.53	0.182	0.13	11.89	0.05	0.000
34.33	2.02	94.52	1.33	125.64	26	1803	0.53	0.181	0.13	11.89	0.05	0.000
34.40	2.03	94.57	1.33	125.80	26	1809	0.53	0.180	0.13	11.89	0.05	0.000
34.47	2.03	93.70	1.34	125.41	26	1818	0.53	0.178	0.13	11.89	0.05	0.000
34.55	2.05	92.03	1.35	124.65	26	1830	0.53	0.175	0.12	11.89	0.05	0.000
34.59	2.08	89.14	1.39	123.54	26	1848	0.53	0.170	0.12	11.89	0.05	0.000
34.66	2.10	85.99	1.42	121.76	26	1846	0.53	0.171	0.12	11.89	0.05	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
34.74	2.12	83.07	1.45	120.31	26	1844	0.53	0.172	0.12	11.89	0.05	0.000
34.78	2.14	80.71	1.49	120.05	26	1856	0.53	0.170	0.12	11.89	0.04	0.000
34.86	2.18	78.14	1.56	122.06	27	1903	0.53	0.159	0.11	11.89	0.04	0.000
34.93	2.23	74.53	1.70	126.85	29	1977	0.53	0.144	0.09	11.89	0.03	0.000
35.01	2.28	71.61	1.86	133.05	31	2050	0.53	0.132	0.08	11.89	0.03	0.000
35.05	2.33	69.26	2.04	141.17	34	2133	0.53	0.120	0.06	11.89	0.02	0.000
35.12	2.36	68.54	2.16	148.22	36	2208	0.53	0.110	0.06	11.89	0.02	0.000
35.19	2.38	68.18	2.26	154.11	38	2271	0.53	0.104	0.05	11.89	0.02	0.000
35.27	2.38	68.54	2.29	156.93	38	2308	0.53	0.100	0.05	11.89	0.02	0.000
35.31	2.38	69.56	2.27	157.94	38	2331	0.53	0.098	0.04	11.89	0.02	0.000
35.38	2.36	73.01	2.16	157.82	38	2366	0.53	0.095	0.04	11.89	0.02	0.000
35.46	2.31	79.98	1.96	157.08	37	2418	0.53	0.091	0.04	11.89	0.02	0.000
35.53	2.26	88.45	1.78	157.02	36	2468	0.53	0.088	0.04	11.89	0.02	0.000
35.57	2.19	99.78	1.59	158.48	36	2511	0.53	0.085	0.04	11.89	0.02	0.000
35.64	2.11	114.13	1.44	163.87	36	2551	0.53	0.082	0.04	11.89	0.01	0.000
35.71	2.02	132.97	1.33	176.39	37	2596	0.52	0.080	0.04	11.89	0.01	0.000
35.78	1.95	151.49	1.27	192.03	39	2636	0.52	0.077	0.03	11.89	0.01	0.000
35.86	1.90	164.86	1.23	203.59	41	2663	0.52	0.076	0.03	11.89	0.01	0.000
35.93	1.87	171.42	1.22	208.76	41	2669	0.52	0.076	0.03	11.89	0.01	0.000
35.97	1.87	171.03	1.21	207.55	41	2641	0.52	0.078	0.03	11.89	0.01	0.000
36.05	1.87	165.74	1.22	201.81	40	2585	0.52	0.081	0.04	11.89	0.01	0.000
36.12	1.88	158.88	1.23	194.64	39	2522	0.52	0.085	0.04	11.89	0.01	0.000
36.16	1.90	150.20	1.24	185.96	37	2457	0.52	0.090	0.04	11.89	0.01	0.000
36.23	1.93	141.06	1.25	176.99	36	2403	0.52	0.095	0.05	11.89	0.02	0.000
36.30	1.96	131.77	1.27	167.93	34	2352	0.52	0.100	0.05	11.89	0.02	0.000
36.38	1.98	125.94	1.29	162.41	34	2326	0.52	0.102	0.06	11.89	0.02	0.000
36.42	1.99	123.58	1.30	160.48	33	2326	0.52	0.103	0.06	11.89	0.02	0.000
36.49	2.00	122.91	1.31	160.48	33	2348	0.52	0.101	0.05	11.89	0.02	0.000
36.57	2.01	122.09	1.32	160.90	34	2388	0.52	0.097	0.05	11.89	0.02	0.000
36.64	2.03	120.96	1.33	161.25	34	2431	0.52	0.094	0.05	11.89	0.02	0.000
36.68	2.05	118.27	1.36	160.72	34	2472	0.52	0.091	0.05	11.89	0.02	0.000
36.76	2.10	112.30	1.41	158.56	34	2507	0.52	0.088	0.05	11.89	0.02	0.000
36.83	2.16	102.94	1.52	156.31	35	2534	0.52	0.086	0.04	11.89	0.02	0.000
36.90	2.22	93.38	1.67	156.23	36	2547	0.52	0.086	0.04	11.89	0.01	0.000
36.94	2.29	84.55	1.88	158.60	37	2550	0.52	0.086	0.04	11.89	0.01	0.000
37.02	2.34	78.32	2.07	161.97	39	2553	0.52	0.086	0.04	11.89	0.01	0.000
37.10	2.37	74.38	2.21	164.74	40	2555	0.52	0.086	0.04	11.89	0.01	0.000
37.17	2.38	73.22	2.26	165.46	40	2556	0.52	0.086	0.04	11.89	0.01	0.000
37.21	2.37	73.56	2.24	165.04	40	2557	0.52	0.086	0.04	11.89	0.01	0.000
37.29	2.37	74.21	2.22	164.75	40	2564	0.52	0.086	0.04	11.89	0.01	0.000
37.36	2.36	75.13	2.19	164.40	40	2573	0.52	0.085	0.04	11.89	0.01	0.000
37.44	2.36	75.66	2.17	164.10	40	2579	0.52	0.085	0.04	11.89	0.01	0.000
37.48	2.36	75.70	2.17	163.95	40	2580	0.52	0.085	0.04	11.89	0.01	0.000
37.55	2.34	75.97	2.08	158.02	38	2517	0.52	0.089	0.04	11.89	0.01	0.000
37.62	2.30	79.00	1.93	152.26	36	2472	0.52	0.093	0.05	11.89	0.02	0.000
37.70	2.26	83.77	1.77	148.50	34	2449	0.52	0.095	0.05	11.89	0.02	0.000
37.74	2.21	92.47	1.64	151.95	34	2523	0.52	0.090	0.05	11.89	0.02	0.000
37.81	2.17	101.86	1.54	156.94	35	2602	0.52	0.084	0.04	11.89	0.01	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
37.88	2.12	113.00	1.45	163.87	36	2681	0.52	0.080	0.04	11.89	0.01	0.000
37.96	2.18	103.84	1.56	161.70	36	2692	0.52	0.079	0.04	11.89	0.01	0.000
37.99	2.14	112.14	1.49	166.90	37	2759	0.52	0.075	0.04	11.89	0.01	0.000
38.06	2.10	121.08	1.43	172.54	37	2813	0.52	0.073	0.03	11.89	0.01	0.000
38.12	1.99	148.33	1.30	192.89	40	2893	0.52	0.069	0.03	11.89	0.01	0.000
38.19	1.97	153.14	1.28	196.38	40	2880	0.52	0.070	0.03	11.89	0.01	0.000
38.27	1.97	149.22	1.29	191.86	40	2831	0.52	0.072	0.03	11.89	0.01	0.000
38.35	2.00	138.83	1.31	181.69	38	2762	0.52	0.076	0.04	11.89	0.01	0.000
38.42	2.04	126.89	1.35	170.90	36	2695	0.52	0.080	0.04	11.89	0.01	0.000
38.46	2.09	115.11	1.40	161.19	35	2623	0.52	0.084	0.04	11.89	0.01	0.000
38.53	2.13	105.13	1.47	154.04	34	2563	0.52	0.089	0.05	11.89	0.01	0.000
38.60	2.17	97.05	1.54	149.50	33	2519	0.52	0.092	0.05	11.89	0.02	0.000
38.68	2.18	94.23	1.58	148.47	33	2511	0.52	0.093	0.05	11.89	0.02	0.000
38.75	2.19	93.34	1.59	148.60	33	2519	0.52	0.092	0.05	11.89	0.02	0.000
38.79	2.19	94.04	1.59	149.65	34	2538	0.52	0.091	0.05	11.89	0.02	0.000
38.86	2.19	95.85	1.58	151.42	34	2571	0.52	0.089	0.05	11.89	0.01	0.000
38.93	2.16	101.20	1.53	154.90	34	2624	0.52	0.085	0.04	11.89	0.01	0.000
39.00	2.13	108.40	1.47	159.30	35	2677	0.52	0.082	0.04	11.89	0.01	0.000
39.07	2.10	115.38	1.42	163.78	35	2717	0.52	0.080	0.04	11.89	0.01	0.000
39.14	2.08	120.46	1.39	167.16	36	2739	0.52	0.079	0.04	11.89	0.01	0.000
39.18	2.06	124.95	1.36	170.09	36	2748	0.52	0.078	0.04	11.89	0.01	0.000
39.25	2.03	129.70	1.34	173.20	36	2748	0.52	0.078	0.04	11.89	0.01	0.000
39.33	2.00	136.96	1.30	178.55	37	2747	0.52	0.079	0.04	11.89	0.01	0.000
39.40	1.96	145.56	1.27	185.44	38	2745	0.52	0.079	0.04	11.89	0.01	0.000
39.47	1.92	153.32	1.25	191.79	39	2741	0.52	0.079	0.04	11.89	0.01	0.000
39.50	1.89	159.27	1.23	196.07	39	2717	0.52	0.081	0.04	11.89	0.01	0.000
39.57	1.87	161.00	1.22	196.20	39	2674	0.52	0.083	0.04	11.89	0.01	0.000
39.64	1.87	157.81	1.22	191.82	0	0	0.52	0.000	0.00	11.89	0.00	0.000
39.72	1.89	148.39	1.23	182.42	0	0	0.52	0.000	0.00	11.89	0.00	0.000
39.79	1.93	135.13	1.26	169.70	0	0	0.52	0.000	0.00	11.89	0.00	0.000
39.86	1.97	123.84	1.28	158.84	0	0	0.52	0.000	0.00	11.89	0.00	0.000
39.90	2.00	114.43	1.31	149.83	0	0	0.52	0.000	0.00	11.89	0.00	0.000
39.97	2.02	107.67	1.33	143.07	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.05	2.05	100.80	1.36	136.86	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.13	2.08	96.02	1.39	133.16	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.16	2.10	92.15	1.43	131.35	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.24	2.13	89.26	1.46	130.56	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.31	2.15	86.45	1.51	130.33	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.39	2.17	84.42	1.55	130.46	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.43	2.19	82.23	1.59	130.48	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.50	2.21	79.78	1.63	130.40	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.57	2.23	76.87	1.68	129.23	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.65	2.25	73.67	1.75	128.71	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.71	2.28	70.45	1.84	129.64	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.75	2.32	66.67	2.00	133.55	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.83	2.36	63.07	2.20	138.68	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.90	2.41	59.43	2.42	143.87	0	0	0.51	0.000	0.00	11.89	0.00	0.000
40.96	2.43	58.45	2.51	146.86	0	0	0.51	0.000	0.00	11.89	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
41.03	2.44	57.57	2.58	148.46	0	0	0.51	0.000	0.00	11.89	0.00	0.000
41.09	2.42	58.88	2.51	147.77	0	0	0.51	0.000	0.00	11.89	0.00	0.000
41.16	2.41	60.01	2.45	146.96	0	0	0.51	0.000	0.00	11.89	0.00	0.000
41.23	2.39	62.22	2.33	144.97	0	0	0.51	0.000	0.00	11.89	0.00	0.000
41.30	2.38	62.94	2.28	143.30	0	0	0.51	0.000	0.00	11.89	0.00	0.000
41.34	2.39	61.56	2.31	142.33	0	0	0.51	0.000	0.00	11.89	0.00	0.000
41.42	2.41	59.13	2.41	142.63	0	0	0.51	0.000	0.00	11.89	0.00	0.000
41.49	2.43	56.48	2.54	143.63	0	0	0.51	0.000	0.00	11.89	0.00	0.000
41.56	2.45	54.67	2.64	144.39	0	0	0.51	0.000	0.00	11.89	0.00	0.000
41.64	2.46	53.65	2.69	144.46	0	0	0.51	0.000	0.00	11.89	0.00	0.000
41.70	2.46	53.00	2.73	144.45	0	0	0.51	0.000	0.00	11.89	0.00	0.000
41.74	2.47	52.20	2.78	145.20	0	0	0.51	0.000	0.00	11.89	0.00	0.000
41.81	2.48	51.43	2.86	147.14	0	0	0.51	0.000	0.00	11.89	0.00	0.000
41.89	2.49	50.95	2.94	149.81	0	0	0.51	0.000	0.00	11.89	0.00	0.000
41.96	2.50	50.96	2.99	152.14	0	0	0.51	0.000	0.00	11.89	0.00	0.000
42.00	2.50	51.21	3.00	153.64	0	0	0.51	0.000	0.00	11.89	0.00	0.000
42.08	2.51	50.98	3.05	155.50	0	0	0.51	0.000	0.00	11.89	0.00	0.000
42.15	2.52	50.27	3.14	158.05	0	0	0.51	0.000	0.00	11.89	0.00	0.000
42.19	2.54	48.89	3.30	161.44	0	0	0.51	0.000	0.00	11.89	0.00	0.000
42.27	2.56	47.55	3.45	163.96	0	0	0.51	0.000	0.00	11.89	0.00	0.000
42.35	2.58	46.23	3.59	166.19	0	0	0.51	0.000	0.00	11.89	0.00	0.000
42.42	2.60	45.17	3.71	167.58	0	0	0.51	0.000	0.00	11.89	0.00	0.000
42.46	2.61	44.25	3.81	168.65	0	0	0.51	0.000	0.00	0.00	0.00	0.000
42.54	2.61	43.78	3.85	168.59	0	0	0.51	0.000	0.00	0.00	0.00	0.000
42.61	2.61	43.84	3.81	167.10	0	0	0.51	0.000	0.00	0.00	0.00	0.000
42.69	2.60	44.20	3.73	164.98	0	0	0.51	0.000	0.00	11.89	0.00	0.000
42.72	2.58	45.00	3.60	161.86	0	0	0.51	0.000	0.00	11.89	0.00	0.000
42.80	2.56	46.02	3.44	158.16	0	0	0.51	0.000	0.00	11.89	0.00	0.000
42.87	2.54	47.48	3.23	153.56	0	0	0.51	0.000	0.00	11.89	0.00	0.000
42.95	2.51	48.82	3.07	149.80	0	0	0.51	0.000	0.00	11.89	0.00	0.000
42.98	2.49	50.76	2.88	146.18	0	0	0.51	0.000	0.00	11.89	0.00	0.000
43.06	2.45	53.39	2.67	142.77	0	0	0.51	0.000	0.00	11.89	0.00	0.000
43.13	2.41	57.27	2.43	138.99	0	0	0.51	0.000	0.00	11.89	0.00	0.000
43.21	2.37	60.83	2.24	136.40	0	0	0.51	0.000	0.00	11.89	0.00	0.000
43.25	2.34	64.47	2.08	134.35	0	0	0.51	0.000	0.00	11.89	0.00	0.000
43.32	2.31	67.38	1.97	132.90	0	0	0.51	0.000	0.00	11.89	0.00	0.000
43.39	2.29	70.01	1.88	131.87	0	0	0.51	0.000	0.00	11.89	0.00	0.000
43.47	2.28	71.41	1.84	131.40	0	0	0.51	0.000	0.00	11.89	0.00	0.000
43.51	2.27	72.20	1.82	131.39	0	0	0.51	0.000	0.00	11.89	0.00	0.000
43.58	2.27	72.78	1.81	131.37	0	0	0.51	0.000	0.00	11.89	0.00	0.000
43.66	2.26	73.40	1.79	131.20	0	0	0.51	0.000	0.00	11.89	0.00	0.000
43.73	2.26	73.86	1.77	130.83	0	0	0.51	0.000	0.00	11.89	0.00	0.000
43.77	2.25	74.19	1.76	130.38	0	0	0.51	0.000	0.00	11.89	0.00	0.000
43.84	2.25	74.19	1.76	130.37	0	0	0.51	0.000	0.00	11.89	0.00	0.000
43.93	2.26	73.84	1.77	130.80	0	0	0.51	0.000	0.00	11.89	0.00	0.000
44.00	2.27	72.51	1.82	131.71	0	0	0.50	0.000	0.00	11.89	0.00	0.000
44.03	2.29	70.29	1.90	133.58	0	0	0.50	0.000	0.00	11.89	0.00	0.000
44.11	2.32	68.32	2.01	137.32	0	0	0.50	0.000	0.00	11.89	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
44.18	2.35	66.76	2.15	143.45	0	0	0.50	0.000	0.00	11.89	0.00	0.000
44.25	2.39	65.34	2.31	151.07	0	0	0.50	0.000	0.00	11.89	0.00	0.000
44.33	2.43	62.47	2.55	159.07	0	0	0.50	0.000	0.00	11.89	0.00	0.000
44.40	2.48	58.67	2.84	166.35	0	0	0.50	0.000	0.00	11.89	0.00	0.000
44.44	2.55	52.72	3.32	174.83	0	0	0.50	0.000	0.00	11.89	0.00	0.000
44.51	2.63	45.61	4.04	184.20	0	0	0.50	0.000	0.00	0.00	0.00	0.000
44.59	2.72	39.01	4.93	192.50	0	0	0.50	0.000	0.00	0.00	0.00	0.000
44.63	2.79	34.46	5.73	197.53	0	0	0.50	0.000	0.00	0.00	0.00	0.000
44.71	2.83	31.98	6.22	198.79	0	0	0.50	0.000	0.00	0.00	0.00	0.000
44.79	2.86	30.11	6.63	199.54	0	0	0.50	0.000	0.00	0.00	0.00	0.000
44.82	2.89	28.41	7.10	201.82	0	0	0.50	0.000	0.00	0.00	0.00	0.000
44.90	2.93	27.07	7.59	205.55	0	0	0.50	0.000	0.00	0.00	0.00	0.000
44.97	2.94	26.65	7.84	208.98	0	0	0.50	0.000	0.00	0.00	0.00	0.000
45.02	2.90	28.93	7.22	209.03	0	0	0.50	0.000	0.00	0.00	0.00	0.000
45.09	2.82	33.41	6.14	205.15	0	0	0.50	0.000	0.00	0.00	0.00	0.000
45.16	2.72	39.88	4.94	196.93	0	0	0.50	0.000	0.00	0.00	0.00	0.000
45.23	2.62	47.03	3.94	185.32	0	0	0.50	0.000	0.00	0.00	0.00	0.000
45.32	2.54	53.06	3.28	174.09	0	0	0.50	0.000	0.00	11.89	0.00	0.000
45.36	2.47	59.11	2.76	162.93	0	0	0.50	0.000	0.00	11.89	0.00	0.000
45.43	2.40	64.08	2.39	153.19	0	0	0.50	0.000	0.00	11.89	0.00	0.000
45.51	2.35	68.04	2.14	145.72	0	0	0.50	0.000	0.00	11.89	0.00	0.000
45.54	2.33	69.66	2.02	140.95	0	0	0.50	0.000	0.00	11.89	0.00	0.000
45.62	2.31	70.21	1.96	137.62	0	0	0.50	0.000	0.00	11.89	0.00	0.000
45.69	2.30	70.14	1.92	134.67	0	0	0.50	0.000	0.00	11.89	0.00	0.000
45.76	2.30	69.46	1.92	133.07	0	0	0.50	0.000	0.00	11.89	0.00	0.000
45.83	2.31	68.29	1.95	133.43	0	0	0.50	0.000	0.00	11.89	0.00	0.000
45.87	2.33	66.90	2.04	136.39	0	0	0.50	0.000	0.00	11.89	0.00	0.000
45.95	2.36	65.49	2.17	142.43	0	0	0.50	0.000	0.00	11.89	0.00	0.000
46.03	2.40	63.46	2.38	151.26	0	0	0.50	0.000	0.00	11.89	0.00	0.000
46.10	2.44	61.90	2.58	159.46	0	0	0.50	0.000	0.00	11.89	0.00	0.000
46.14	2.48	59.73	2.82	168.28	0	0	0.50	0.000	0.00	11.89	0.00	0.000
46.21	2.52	56.50	3.15	178.24	0	0	0.50	0.000	0.00	11.89	0.00	0.000
46.29	2.58	52.69	3.59	188.91	0	0	0.50	0.000	0.00	11.89	0.00	0.000
46.33	2.64	48.57	4.10	199.36	0	0	0.50	0.000	0.00	0.00	0.00	0.000
46.40	2.69	45.44	4.60	208.85	0	0	0.50	0.000	0.00	0.00	0.00	0.000
46.47	2.73	43.38	5.01	217.54	0	0	0.50	0.000	0.00	0.00	0.00	0.000
46.55	2.75	42.33	5.28	223.69	0	0	0.49	0.000	0.00	0.00	0.00	0.000
46.62	2.76	42.04	5.34	224.42	0	0	0.49	0.000	0.00	0.00	0.00	0.000
46.66	2.75	41.28	5.30	218.70	0	0	0.49	0.000	0.00	0.00	0.00	0.000
46.74	2.76	40.04	5.35	214.24	0	0	0.49	0.000	0.00	0.00	0.00	0.000
46.81	2.77	38.70	5.48	211.95	0	0	0.49	0.000	0.00	0.00	0.00	0.000
46.86	2.79	37.84	5.72	216.29	0	0	0.49	0.000	0.00	0.00	0.00	0.000
46.92	2.80	37.48	5.84	219.09	0	0	0.49	0.000	0.00	0.00	0.00	0.000
47.00	2.81	36.84	6.04	222.36	0	0	0.49	0.000	0.00	0.00	0.00	0.000
47.06	2.81	37.39	5.99	224.04	0	0	0.49	0.000	0.00	0.00	0.00	0.000
47.14	2.80	38.36	5.87	225.01	0	0	0.49	0.000	0.00	0.00	0.00	0.000
47.21	2.79	39.54	5.71	225.82	0	0	0.49	0.000	0.00	0.00	0.00	0.000
47.25	2.79	39.59	5.76	228.16	0	0	0.49	0.000	0.00	0.00	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
47.32	2.80	39.38	5.86	230.70	0	0	0.49	0.000	0.00	0.00	0.00	0.000
47.40	2.80	39.80	5.84	232.26	0	0	0.49	0.000	0.00	0.00	0.00	0.000
47.47	2.79	40.45	5.75	232.65	0	0	0.49	0.000	0.00	0.00	0.00	0.000
47.51	2.78	41.39	5.61	232.38	0	0	0.49	0.000	0.00	0.00	0.00	0.000
47.58	2.79	41.17	5.67	233.62	0	0	0.49	0.000	0.00	0.00	0.00	0.000
47.66	2.80	40.46	5.83	235.87	0	0	0.49	0.000	0.00	0.00	0.00	0.000
47.73	2.81	39.55	6.03	238.39	0	0	0.49	0.000	0.00	0.00	0.00	0.000
47.78	2.82	39.22	6.13	240.25	0	0	0.49	0.000	0.00	0.00	0.00	0.000
47.85	2.82	39.75	6.05	240.56	0	0	0.49	0.000	0.00	0.00	0.00	0.000
47.92	2.80	40.75	5.89	240.07	0	0	0.49	0.000	0.00	0.00	0.00	0.000
47.99	2.79	42.04	5.68	238.89	0	0	0.49	0.000	0.00	0.00	0.00	0.000
48.03	2.77	43.00	5.54	238.39	0	0	0.49	0.000	0.00	0.00	0.00	0.000
48.11	2.77	43.58	5.47	238.25	0	0	0.49	0.000	0.00	0.00	0.00	0.000
48.18	2.75	44.54	5.31	236.45	0	0	0.49	0.000	0.00	0.00	0.00	0.000
48.26	2.74	45.79	5.09	233.14	0	0	0.49	0.000	0.00	0.00	0.00	0.000
48.30	2.71	47.26	4.82	227.93	0	0	0.49	0.000	0.00	0.00	0.00	0.000
48.37	2.69	48.28	4.61	222.35	0	0	0.49	0.000	0.00	0.00	0.00	0.000
48.45	2.67	49.21	4.37	214.90	0	0	0.49	0.000	0.00	0.00	0.00	0.000
48.52	2.64	50.65	4.07	206.21	0	0	0.49	0.000	0.00	0.00	0.00	0.000
48.59	2.60	52.36	3.78	197.72	0	0	0.49	0.000	0.00	0.00	0.00	0.000
48.63	2.56	54.71	3.44	188.10	0	0	0.49	0.000	0.00	11.89	0.00	0.000
48.70	2.51	58.07	3.05	177.24	0	0	0.49	0.000	0.00	11.89	0.00	0.000
48.77	2.44	63.21	2.61	164.89	0	0	0.49	0.000	0.00	11.89	0.00	0.000
48.84	2.37	69.50	2.21	153.58	0	0	0.49	0.000	0.00	11.89	0.00	0.000
48.92	2.31	74.62	1.95	145.82	0	0	0.48	0.000	0.00	11.89	0.00	0.000
48.96	2.26	78.58	1.78	139.77	0	0	0.48	0.000	0.00	11.89	0.00	0.000
49.03	2.22	81.39	1.66	135.52	0	0	0.48	0.000	0.00	11.89	0.00	0.000
49.10	2.18	84.69	1.56	132.50	0	0	0.48	0.000	0.00	11.89	0.00	0.000
49.18	2.15	87.41	1.50	131.33	0	0	0.48	0.000	0.00	11.89	0.00	0.000
49.22	2.13	89.78	1.46	131.35	0	0	0.48	0.000	0.00	11.89	0.00	0.000
49.29	2.11	91.65	1.44	131.60	0	0	0.48	0.000	0.00	11.89	0.00	0.000
49.37	2.09	93.88	1.41	131.93	0	0	0.48	0.000	0.00	11.89	0.00	0.000
49.44	2.07	95.83	1.38	132.34	0	0	0.48	0.000	0.00	11.89	0.00	0.000
49.48	2.05	98.05	1.36	133.20	0	0	0.48	0.000	0.00	11.89	0.00	0.000
49.56	2.04	99.50	1.34	133.78	0	0	0.48	0.000	0.00	11.89	0.00	0.000
49.63	2.03	100.35	1.33	133.84	0	0	0.48	0.000	0.00	11.89	0.00	0.000
49.67	2.02	100.09	1.32	132.30	0	0	0.48	0.000	0.00	11.89	0.00	0.000
49.74	2.03	97.42	1.33	129.98	27	2435	0.48	0.117	0.08	11.89	0.01	0.000
49.82	2.06	92.91	1.36	126.50	27	2428	0.48	0.117	0.08	11.89	0.01	0.000
49.89	2.11	86.38	1.43	123.91	27	2475	0.48	0.113	0.08	11.89	0.01	0.000
49.97	2.18	77.44	1.56	120.69	27	2481	0.48	0.112	0.08	11.89	0.01	0.000
50.01	2.24	70.92	1.71	121.32	28	2512	0.48	0.109	0.07	11.89	0.01	0.000
50.09	2.28	66.05	1.86	123.07	29	2537	0.48	0.107	0.07	11.89	0.01	0.000
50.13	2.29	65.68	1.90	124.54	29	2563	0.48	0.105	0.07	11.89	0.01	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)

Total estimated settlement: 1.02

Abbreviations

Q_{tn}: Equivalent clean sand normalized cone resistance
K_c: Fines correction factor
$Q_{tn,cs}$: Post-liquefaction volumentric strain
G_{max}: Small strain shear modulus
CSR: Soil cyclic stress ratio
γ: Cyclic shear strain
$e_{vol(15)}$: Volumetric strain after 15 cycles
N_c: Equivalent number of cycles
e_v: Volumetric strain
Settle.: Calculated settlement

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Corona, CA 92878
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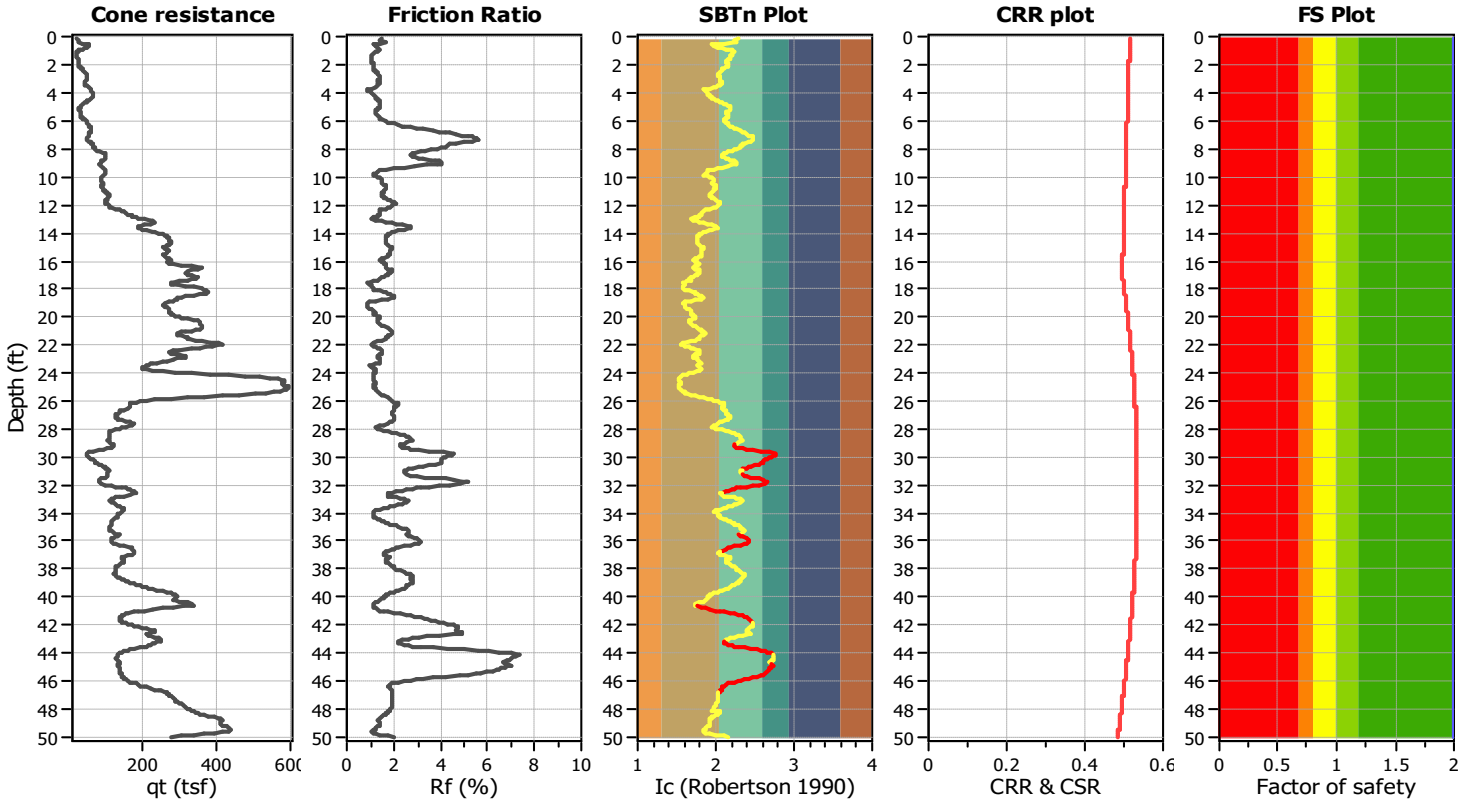
LIQUEFACTION ANALYSIS REPORT

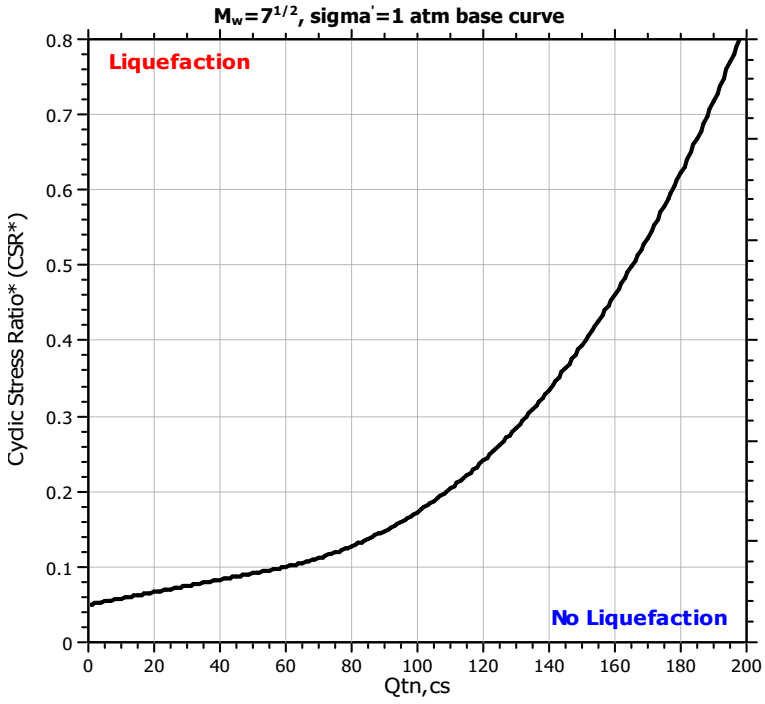
Project title : Xenia Site **Location : Beaumont, California**

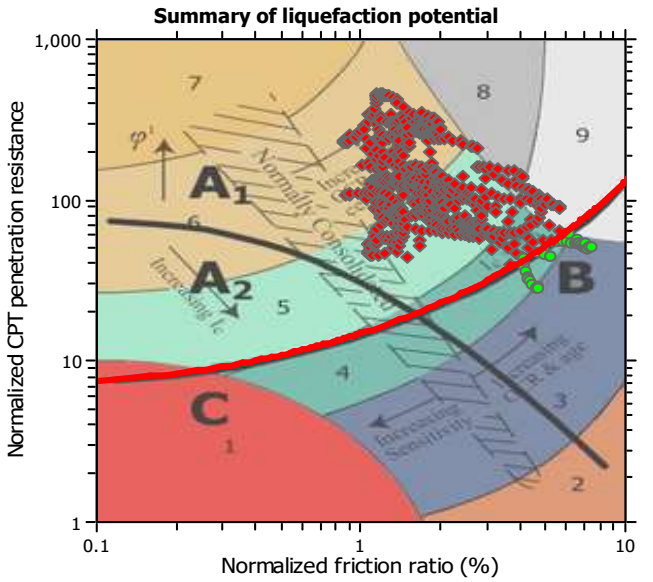
CPT file : CPT-2

Input parameters and analysis data

Analysis method:	NCEER (1998)	G.W.T. (in-situ):	100.00 ft	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	100.00 ft	Fill height:	N/A	Limit depth applied:	Yes
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	60.00 ft
Earthquake magnitude M_w:	7.13	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	0.90	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

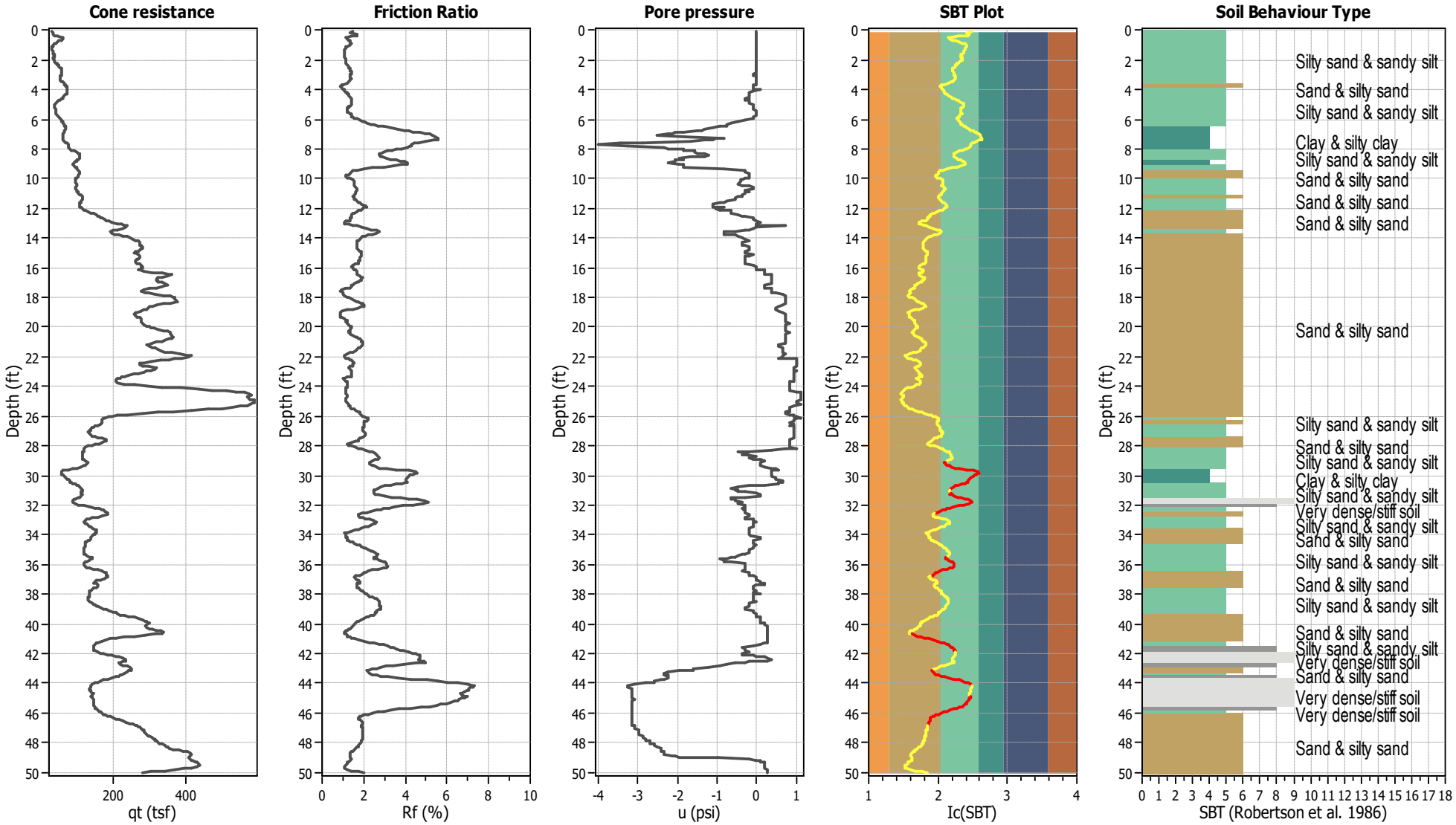






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plots



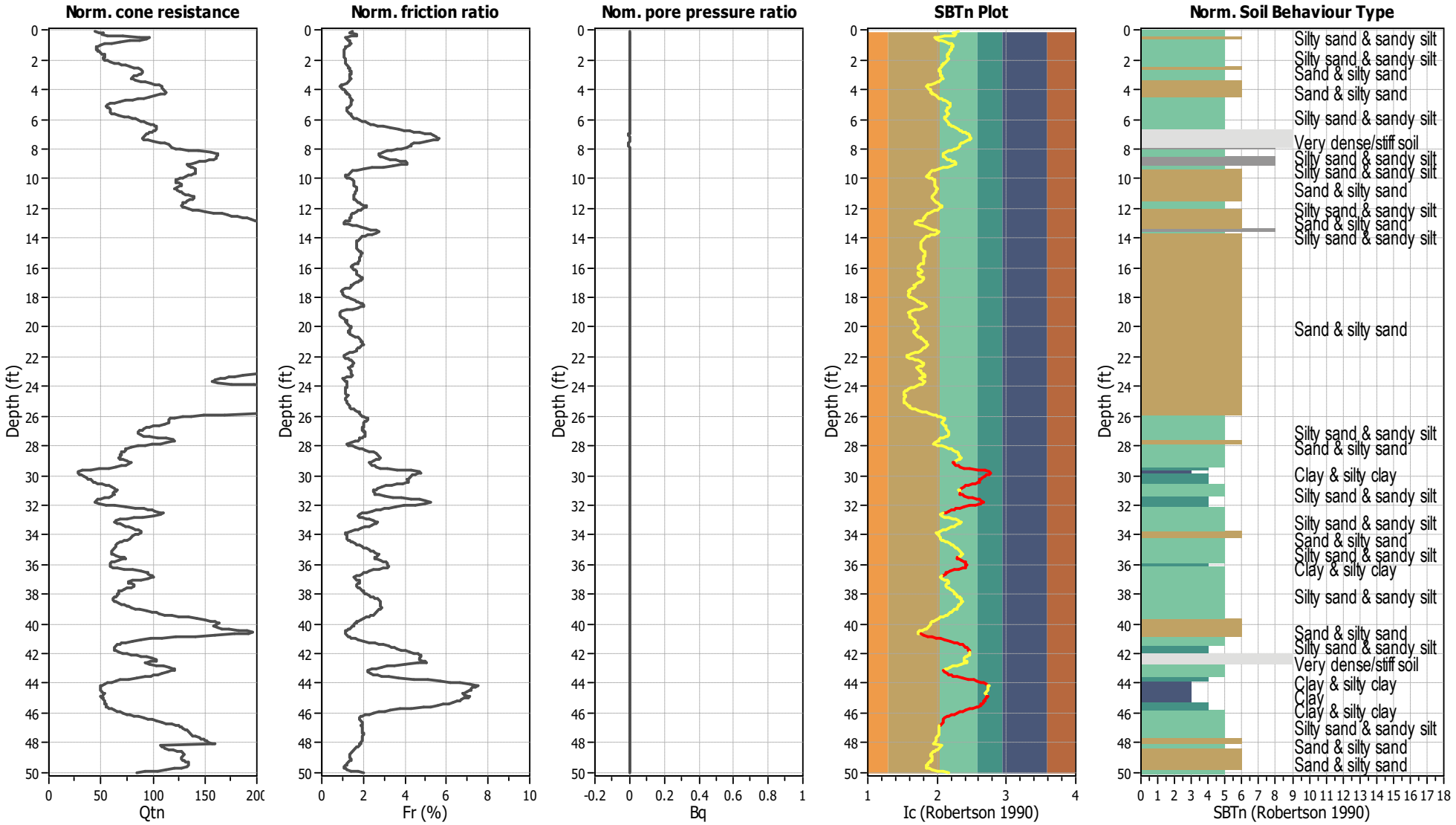
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	100.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.13	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.90	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	100.00 ft	Fill height:	N/A	Limit depth:	60.00 ft

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

CPT basic interpretation plots (normalized)



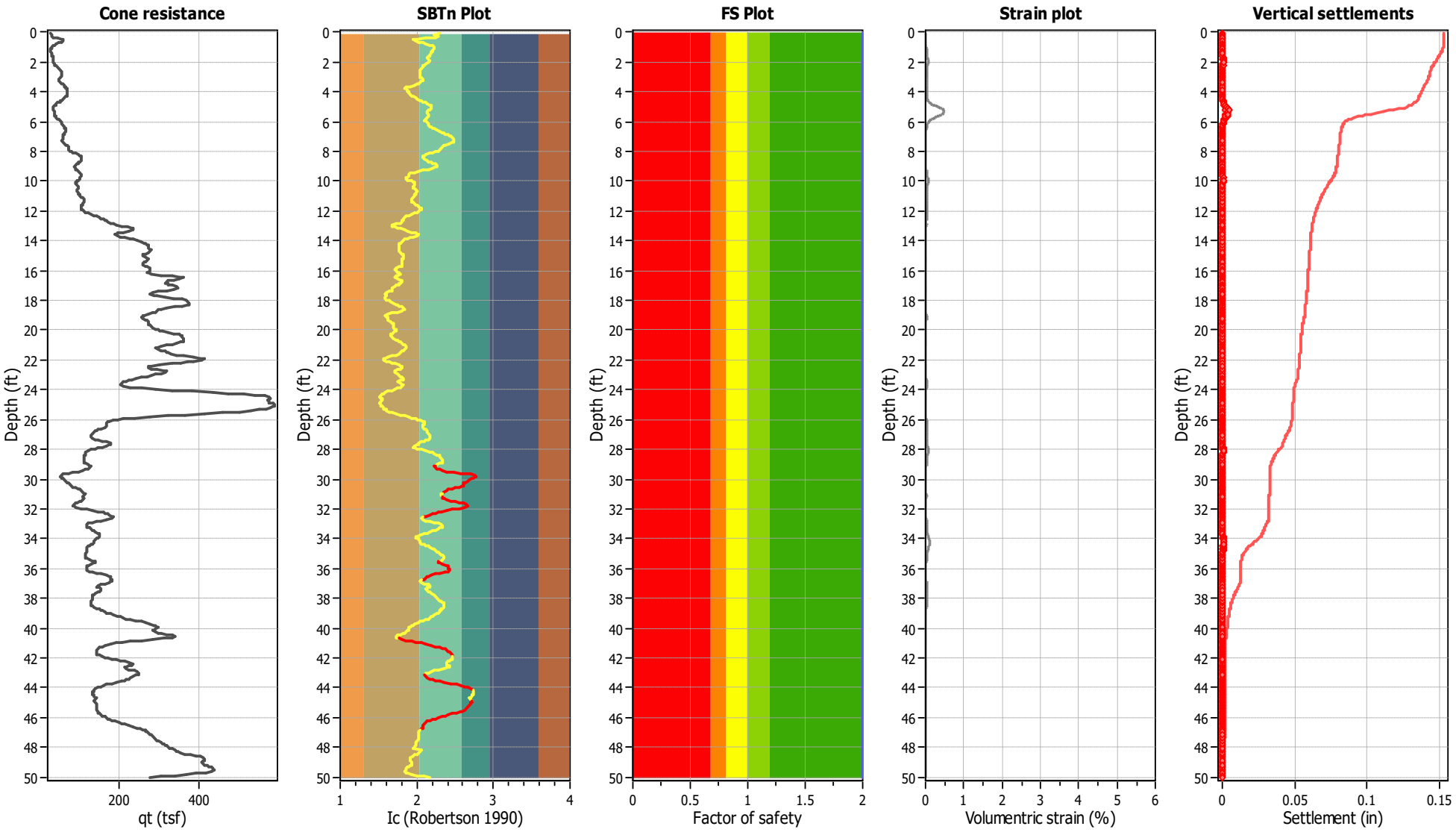
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	100.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.13	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.90	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	100.00 ft	Fill height:	N/A	Limit depth:	60.00 ft

SBTn legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

Estimation of post-earthquake settlements



Abbreviations

q_t:	Total cone resistance (cone resistance q_c corrected for pore water effects)
I_c:	Soil Behaviour Type Index
FS:	Calculated Factor of Safety against liquefaction
Volumentric strain:	Post-liquefaction volumentric strain

:: Post-earthquake settlement of dry sands ::

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
0.07	2.30	43.80	1.92	84.30	20	452	0.51	0.001	0.00	11.89	0.00	0.000
0.14	2.24	48.25	1.73	83.39	19	462	0.51	0.001	0.00	11.89	0.00	0.000
0.22	2.22	51.74	1.68	86.76	20	484	0.51	0.002	0.00	11.89	0.00	0.000
0.29	2.28	51.33	1.84	94.31	22	513	0.51	0.003	0.00	11.89	0.00	0.000
0.33	2.24	56.93	1.72	98.08	22	544	0.51	0.003	0.00	11.89	0.00	0.000
0.41	2.11	71.48	1.44	103.06	22	583	0.51	0.003	0.00	11.89	0.00	0.000
0.49	2.00	87.58	1.31	114.78	24	621	0.51	0.004	0.00	11.89	0.00	0.000
0.53	1.96	96.72	1.28	123.51	25	648	0.51	0.004	0.00	11.89	0.00	0.000
0.62	1.98	94.31	1.29	121.93	25	650	0.51	0.005	0.00	11.89	0.00	0.000
0.70	2.02	87.45	1.33	116.15	24	635	0.51	0.005	0.00	11.89	0.00	0.000
0.74	2.08	77.85	1.39	107.87	23	604	0.51	0.006	0.01	11.89	0.00	0.000
0.81	2.12	68.59	1.46	99.93	22	566	0.51	0.008	0.01	11.89	0.01	0.000
0.89	2.17	60.48	1.54	93.33	21	528	0.51	0.011	0.01	11.89	0.01	0.000
0.92	2.20	54.13	1.62	87.65	20	493	0.51	0.013	0.01	11.89	0.01	0.000
1.00	2.22	50.02	1.66	83.27	19	466	0.51	0.018	0.02	11.89	0.02	0.000
1.07	2.23	46.91	1.68	78.86	18	440	0.51	0.023	0.03	11.89	0.02	0.000
1.15	2.22	45.96	1.66	76.25	17	427	0.51	0.029	0.03	11.89	0.03	0.000
1.19	2.21	45.85	1.63	74.92	17	421	0.51	0.033	0.04	11.89	0.04	0.000
1.26	2.20	46.04	1.62	74.41	17	419	0.51	0.037	0.05	11.89	0.04	0.000
1.35	2.19	46.44	1.60	74.20	17	418	0.51	0.042	0.05	11.89	0.05	0.000
1.38	2.19	46.99	1.58	74.29	17	419	0.51	0.044	0.05	11.89	0.05	0.000
1.46	2.18	47.73	1.57	75.12	17	424	0.51	0.047	0.06	11.89	0.05	0.000
1.53	2.18	49.22	1.56	76.60	17	433	0.51	0.048	0.06	11.89	0.05	0.000
1.61	2.16	51.22	1.53	78.24	17	443	0.51	0.049	0.06	11.89	0.05	0.000
1.65	2.14	53.07	1.49	79.24	17	449	0.51	0.049	0.06	11.89	0.05	0.000
1.72	2.14	53.61	1.48	79.57	18	451	0.51	0.053	0.06	11.89	0.05	0.001
1.81	2.14	53.35	1.49	79.68	18	452	0.51	0.058	0.07	11.89	0.06	0.001
1.84	2.16	52.70	1.52	79.86	18	453	0.51	0.060	0.07	11.89	0.06	0.000
1.92	2.16	52.85	1.53	80.69	18	457	0.51	0.063	0.07	11.89	0.06	0.001
1.99	2.16	54.04	1.52	82.05	18	465	0.51	0.064	0.07	11.89	0.06	0.001
2.07	2.15	55.73	1.50	83.53	18	474	0.51	0.065	0.07	11.89	0.06	0.001
2.10	2.12	58.87	1.46	85.83	19	486	0.51	0.060	0.07	11.89	0.06	0.000
2.18	2.10	62.52	1.42	88.97	19	502	0.51	0.058	0.06	11.89	0.05	0.001
2.26	2.09	66.71	1.40	93.29	20	524	0.51	0.053	0.05	11.89	0.05	0.000
2.33	2.08	69.81	1.39	96.91	21	543	0.51	0.050	0.05	11.89	0.04	0.000
2.37	2.07	73.25	1.38	101.12	22	566	0.51	0.045	0.04	11.89	0.04	0.000
2.45	2.06	77.60	1.37	106.10	23	591	0.51	0.042	0.04	11.89	0.03	0.000
2.53	2.05	81.94	1.35	111.01	24	615	0.51	0.040	0.03	11.89	0.03	0.000
2.56	2.04	85.94	1.34	115.28	24	635	0.51	0.037	0.03	11.89	0.03	0.000
2.64	2.03	88.28	1.34	118.09	25	649	0.51	0.037	0.03	11.89	0.02	0.000
2.72	2.04	89.77	1.34	120.23	25	662	0.51	0.037	0.03	11.89	0.02	0.000
2.79	2.04	89.92	1.35	121.07	26	669	0.51	0.037	0.03	11.89	0.02	0.000
2.82	2.05	89.31	1.35	120.55	26	667	0.51	0.038	0.03	11.89	0.02	0.000
2.91	2.05	88.16	1.35	119.06	25	659	0.51	0.042	0.03	11.89	0.03	0.000
2.98	2.05	86.70	1.35	117.11	25	648	0.51	0.046	0.04	11.89	0.03	0.000
3.02	2.05	84.69	1.35	114.72	24	636	0.51	0.050	0.04	11.89	0.03	0.000
3.10	2.06	82.13	1.37	112.40	24	626	0.51	0.055	0.04	11.89	0.04	0.000
3.17	2.07	79.92	1.38	110.43	24	618	0.51	0.061	0.05	11.89	0.04	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
3.25	2.08	78.77	1.39	109.60	24	615	0.51	0.065	0.05	11.89	0.05	0.000
3.29	2.07	80.01	1.38	110.18	24	616	0.51	0.066	0.05	11.89	0.05	0.000
3.37	2.05	83.06	1.35	112.46	24	623	0.51	0.067	0.05	11.89	0.05	0.000
3.44	2.02	87.96	1.33	116.78	25	639	0.51	0.064	0.05	11.89	0.04	0.000
3.52	2.00	92.60	1.31	121.28	25	655	0.51	0.061	0.05	11.89	0.04	0.000
3.55	1.97	97.65	1.28	125.18	26	660	0.51	0.061	0.05	11.89	0.04	0.000
3.63	1.91	102.24	1.25	127.40	26	646	0.51	0.069	0.05	11.89	0.04	0.000
3.70	1.86	106.33	1.21	128.86	25	631	0.51	0.077	0.06	11.89	0.05	0.000
3.74	1.84	108.38	1.20	129.62	25	627	0.51	0.081	0.06	11.89	0.05	0.000
3.81	1.86	109.17	1.21	131.59	26	641	0.51	0.078	0.06	11.89	0.05	0.000
3.90	1.87	109.37	1.22	133.15	26	656	0.51	0.075	0.05	11.89	0.05	0.000
3.96	1.89	109.69	1.23	134.63	27	669	0.51	0.073	0.05	11.89	0.04	0.000
4.01	1.90	110.13	1.24	136.08	27	682	0.51	0.070	0.05	11.89	0.04	0.000
4.09	1.90	111.57	1.24	138.25	28	696	0.51	0.068	0.05	11.89	0.04	0.000
4.16	1.91	112.74	1.24	140.32	28	711	0.51	0.065	0.04	11.89	0.04	0.000
4.23	1.92	112.83	1.25	141.17	29	720	0.51	0.065	0.04	11.89	0.04	0.000
4.30	1.94	111.28	1.26	140.27	28	723	0.51	0.066	0.04	11.89	0.04	0.000
4.34	1.96	107.57	1.27	137.03	28	717	0.51	0.069	0.05	11.89	0.04	0.000
4.41	1.98	102.46	1.29	132.33	27	705	0.51	0.076	0.05	11.89	0.04	0.000
4.49	2.01	96.05	1.32	126.40	26	686	0.51	0.086	0.06	11.89	0.05	0.000
4.56	2.04	90.79	1.34	121.61	26	669	0.51	0.097	0.07	11.89	0.06	0.001
4.60	2.06	85.54	1.37	116.91	25	651	0.51	0.110	0.08	11.89	0.07	0.000
4.68	2.08	80.28	1.40	112.18	24	630	0.51	0.130	0.10	11.89	0.09	0.001
4.75	2.11	74.12	1.44	106.58	23	603	0.51	0.161	0.14	11.89	0.11	0.001
4.81	2.14	68.27	1.48	101.26	22	574	0.51	0.206	0.18	11.89	0.15	0.001
4.89	2.16	63.56	1.53	97.19	22	551	0.51	0.260	0.24	11.89	0.20	0.002
4.93	2.18	59.60	1.57	93.81	21	530	0.51	0.320	0.30	11.89	0.25	0.001
5.00	2.19	56.94	1.60	91.05	20	513	0.51	0.391	0.38	11.89	0.31	0.003
5.07	2.20	55.19	1.60	88.50	20	499	0.51	0.474	0.48	11.89	0.39	0.004
5.15	2.19	54.78	1.59	87.00	20	491	0.51	0.538	0.55	11.89	0.46	0.004
5.19	2.17	55.78	1.55	86.57	19	490	0.51	0.556	0.58	11.89	0.48	0.002
5.26	2.15	57.42	1.51	86.85	19	492	0.51	0.563	0.59	11.89	0.48	0.004
5.34	2.14	59.01	1.48	87.47	19	496	0.51	0.563	0.59	11.89	0.48	0.004
5.41	2.14	59.66	1.48	88.31	19	501	0.51	0.553	0.57	11.89	0.47	0.004
5.49	2.15	59.55	1.50	89.10	20	505	0.51	0.547	0.56	11.89	0.46	0.004
5.52	2.16	59.70	1.52	90.55	20	513	0.51	0.510	0.51	11.89	0.41	0.001
5.59	2.16	60.75	1.52	92.60	21	525	0.51	0.470	0.45	11.89	0.37	0.003
5.66	2.16	63.19	1.52	95.91	21	544	0.51	0.403	0.37	11.89	0.31	0.002
5.73	2.14	67.39	1.49	100.25	22	568	0.51	0.333	0.30	11.89	0.24	0.002
5.81	2.12	71.88	1.46	104.67	23	593	0.51	0.281	0.24	11.89	0.19	0.002
5.84	2.11	76.73	1.43	109.69	24	620	0.51	0.232	0.19	11.89	0.15	0.001
5.91	2.11	80.22	1.43	114.50	25	647	0.51	0.198	0.15	11.89	0.12	0.001
5.99	2.11	83.36	1.44	120.15	26	680	0.51	0.165	0.12	11.89	0.10	0.001
6.06	2.13	85.96	1.47	126.16	28	715	0.51	0.139	0.09	11.89	0.08	0.001
6.14	2.14	88.24	1.49	131.58	29	746	0.51	0.122	0.08	11.89	0.06	0.001
6.18	2.15	91.09	1.51	137.44	30	779	0.51	0.105	0.06	11.89	0.05	0.000
6.25	2.16	94.23	1.53	143.77	32	815	0.51	0.093	0.05	11.89	0.04	0.000
6.32	2.17	98.02	1.55	151.90	34	860	0.51	0.079	0.04	11.89	0.03	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
6.40	2.18	100.91	1.58	159.15	36	899	0.51	0.071	0.04	11.89	0.03	0.000
6.44	2.20	102.61	1.62	166.71	38	937	0.51	0.063	0.03	11.89	0.02	0.000
6.51	2.23	103.25	1.70	175.27	40	976	0.51	0.058	0.03	11.89	0.02	0.000
6.58	2.27	103.34	1.80	186.46	43	1020	0.51	0.052	0.02	11.89	0.02	0.000
6.65	2.30	103.03	1.94	199.59	47	1067	0.51	0.048	0.02	11.89	0.01	0.000
6.73	2.33	102.42	2.05	210.38	50	1100	0.51	0.045	0.01	11.89	0.01	0.000
6.77	2.36	101.21	2.16	218.34	53	1120	0.51	0.044	0.01	11.89	0.01	0.000
6.84	2.38	99.09	2.26	223.57	54	1126	0.51	0.044	0.01	11.89	0.01	0.000
6.91	2.41	96.58	2.40	232.13	57	1138	0.51	0.043	0.01	11.89	0.01	0.000
6.99	2.43	94.71	2.54	240.83	60	1152	0.51	0.043	0.01	11.89	0.01	0.000
7.02	2.45	93.71	2.65	248.76	63	1168	0.51	0.042	0.01	11.89	0.01	0.000
7.10	2.46	92.81	2.73	253.05	64	1174	0.51	0.042	0.01	11.89	0.01	0.000
7.15	2.47	91.56	2.80	256.73	65	1176	0.51	0.043	0.01	11.89	0.01	0.000
7.25	2.48	90.46	2.86	258.98	66	1176	0.51	0.044	0.01	11.89	0.01	0.000
7.29	2.49	90.12	2.89	260.29	67	1177	0.51	0.044	0.01	11.89	0.01	0.000
7.36	2.48	91.35	2.84	259.65	66	1182	0.51	0.044	0.01	11.89	0.01	0.000
7.43	2.46	94.79	2.70	255.78	65	1192	0.51	0.044	0.01	11.89	0.01	0.000
7.51	2.42	100.52	2.47	248.51	62	1204	0.51	0.044	0.01	11.89	0.01	0.000
7.58	2.38	106.85	2.26	241.28	59	1215	0.51	0.044	0.01	11.89	0.01	0.000
7.62	2.35	112.03	2.11	236.54	57	1224	0.51	0.043	0.01	11.89	0.01	0.000
7.70	2.33	115.07	2.04	235.14	56	1232	0.51	0.043	0.01	11.89	0.01	0.000
7.78	2.32	116.31	2.02	235.19	56	1237	0.51	0.044	0.01	11.89	0.01	0.000
7.82	2.32	116.97	2.00	234.38	56	1237	0.51	0.044	0.01	11.89	0.01	0.000
7.89	2.30	118.37	1.94	229.31	54	1226	0.51	0.046	0.01	11.89	0.01	0.000
7.97	2.28	121.63	1.83	223.18	52	1215	0.51	0.048	0.02	11.89	0.01	0.000
8.04	2.24	126.17	1.73	218.58	50	1210	0.51	0.049	0.02	11.89	0.01	0.000
8.08	2.21	133.73	1.63	217.80	49	1224	0.51	0.048	0.02	11.89	0.01	0.000
8.15	2.16	144.07	1.53	220.18	49	1248	0.51	0.046	0.02	11.89	0.01	0.000
8.23	2.12	155.05	1.45	224.55	49	1273	0.51	0.045	0.02	11.89	0.01	0.000
8.30	2.09	160.49	1.41	226.49	49	1295	0.51	0.044	0.02	11.89	0.01	0.000
8.34	2.08	162.81	1.40	227.19	49	1304	0.51	0.044	0.01	11.89	0.01	0.000
8.42	2.08	162.15	1.39	226.20	49	1307	0.51	0.044	0.02	11.89	0.01	0.000
8.50	2.09	161.56	1.41	227.09	49	1321	0.51	0.044	0.01	11.89	0.01	0.000
8.57	2.11	160.76	1.43	229.37	50	1341	0.50	0.043	0.01	11.89	0.01	0.000
8.61	2.13	160.47	1.46	234.39	51	1372	0.50	0.041	0.01	11.89	0.01	0.000
8.68	2.15	158.31	1.51	238.95	53	1398	0.50	0.040	0.01	11.89	0.01	0.000
8.75	2.19	153.95	1.59	244.12	55	1417	0.50	0.039	0.01	11.89	0.01	0.000
8.83	2.21	150.38	1.65	248.17	56	1430	0.50	0.039	0.01	11.89	0.01	0.000
8.86	2.24	145.46	1.73	251.87	58	1429	0.50	0.040	0.01	11.89	0.01	0.000
8.93	2.26	140.96	1.78	250.99	58	1415	0.50	0.041	0.01	11.89	0.01	0.000
9.01	2.27	135.42	1.81	245.34	57	1382	0.50	0.044	0.01	11.89	0.01	0.000
9.08	2.25	133.56	1.75	234.19	54	1347	0.50	0.047	0.01	11.89	0.01	0.000
9.12	2.21	134.66	1.63	219.64	50	1304	0.50	0.051	0.02	11.89	0.01	0.000
9.20	2.15	136.64	1.51	206.00	46	1260	0.50	0.056	0.02	11.89	0.02	0.000
9.28	2.08	138.90	1.40	194.10	42	1204	0.50	0.064	0.03	11.89	0.02	0.000
9.35	2.02	140.35	1.32	185.84	39	1144	0.50	0.074	0.03	11.89	0.03	0.000
9.42	1.96	141.00	1.28	180.27	37	1089	0.50	0.086	0.04	11.89	0.03	0.000
9.46	1.92	141.51	1.25	176.90	36	1049	0.50	0.097	0.05	11.89	0.04	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
9.54	1.90	141.04	1.24	174.57	35	1031	0.50	0.104	0.05	11.89	0.04	0.000
9.62	1.89	140.32	1.23	173.01	35	1024	0.50	0.108	0.06	11.89	0.04	0.000
9.65	1.89	139.14	1.23	171.56	34	1017	0.50	0.111	0.06	11.89	0.04	0.000
9.73	1.88	137.02	1.22	167.35	33	990	0.50	0.124	0.07	11.89	0.05	0.000
9.81	1.86	134.41	1.21	162.26	32	956	0.50	0.142	0.08	11.89	0.06	0.001
9.85	1.86	132.08	1.20	159.11	31	939	0.50	0.153	0.09	11.89	0.07	0.000
9.92	1.88	129.35	1.23	158.67	32	952	0.50	0.147	0.08	11.89	0.06	0.001
10.00	1.93	126.33	1.25	158.37	32	975	0.50	0.138	0.08	11.89	0.06	0.001
10.07	1.95	123.52	1.27	157.06	32	986	0.50	0.135	0.08	11.89	0.06	0.000
10.11	1.97	122.27	1.28	156.70	32	993	0.50	0.132	0.07	11.89	0.06	0.000
10.18	1.97	121.73	1.29	156.43	32	998	0.50	0.132	0.07	11.89	0.06	0.000
10.25	1.97	122.68	1.29	157.78	33	1012	0.50	0.128	0.07	11.89	0.05	0.000
10.32	1.97	124.84	1.28	159.97	33	1027	0.50	0.123	0.07	11.89	0.05	0.000
10.40	1.96	127.02	1.28	162.22	33	1043	0.50	0.119	0.06	11.89	0.05	0.000
10.44	1.96	127.93	1.28	163.22	33	1051	0.50	0.117	0.06	11.89	0.05	0.000
10.51	1.97	125.61	1.29	161.48	33	1052	0.50	0.118	0.06	11.89	0.05	0.000
10.59	1.99	122.86	1.30	159.83	33	1057	0.50	0.118	0.06	11.89	0.05	0.000
10.67	2.01	120.89	1.31	158.65	33	1061	0.50	0.119	0.06	11.89	0.05	0.000
10.71	2.00	121.94	1.31	159.75	33	1069	0.50	0.116	0.06	11.89	0.05	0.000
10.78	2.00	123.46	1.30	160.89	33	1078	0.50	0.115	0.06	11.89	0.05	0.000
10.86	1.98	125.53	1.29	162.49	34	1088	0.50	0.113	0.06	11.89	0.04	0.000
10.93	1.98	126.91	1.29	163.76	34	1098	0.50	0.111	0.06	11.89	0.04	0.000
10.97	1.97	129.16	1.28	165.55	34	1106	0.50	0.110	0.06	11.89	0.04	0.000
11.05	1.96	131.59	1.27	167.63	34	1118	0.50	0.107	0.06	11.89	0.04	0.000
11.12	1.94	134.49	1.27	170.27	35	1134	0.50	0.104	0.05	11.89	0.04	0.000
11.16	1.93	137.64	1.26	173.31	35	1150	0.50	0.101	0.05	11.89	0.04	0.000
11.24	1.93	139.25	1.26	174.87	35	1161	0.50	0.099	0.05	11.89	0.04	0.000
11.31	1.93	139.50	1.26	175.38	36	1171	0.50	0.098	0.05	11.89	0.04	0.000
11.39	1.94	138.16	1.26	174.57	36	1177	0.50	0.098	0.05	11.89	0.04	0.000
11.43	1.96	136.00	1.27	173.25	35	1181	0.50	0.097	0.05	11.89	0.04	0.000
11.50	1.97	133.46	1.29	171.62	35	1186	0.50	0.097	0.05	11.89	0.04	0.000
11.58	1.99	130.98	1.30	170.11	35	1191	0.50	0.097	0.05	11.89	0.04	0.000
11.62	2.01	128.89	1.32	169.51	35	1201	0.50	0.096	0.05	11.89	0.03	0.000
11.70	2.03	128.20	1.33	170.70	36	1224	0.50	0.092	0.05	11.89	0.03	0.000
11.77	2.05	127.25	1.36	172.44	37	1251	0.50	0.087	0.04	11.89	0.03	0.000
11.85	2.06	127.57	1.37	174.50	37	1277	0.50	0.083	0.04	11.89	0.03	0.000
11.88	2.06	128.56	1.37	175.95	38	1290	0.50	0.082	0.04	11.89	0.03	0.000
11.96	2.05	130.87	1.35	176.67	37	1295	0.50	0.082	0.04	11.89	0.03	0.000
12.03	2.02	134.26	1.33	178.17	37	1300	0.50	0.082	0.04	11.89	0.03	0.000
12.11	2.00	137.62	1.31	179.93	37	1305	0.50	0.082	0.04	11.89	0.03	0.000
12.15	1.97	143.31	1.28	184.03	38	1317	0.50	0.080	0.04	11.89	0.03	0.000
12.23	1.93	150.55	1.26	189.60	38	1334	0.50	0.079	0.04	11.89	0.03	0.000
12.30	1.90	158.85	1.23	195.99	39	1352	0.50	0.077	0.03	11.89	0.02	0.000
12.34	1.86	166.68	1.21	201.79	40	1370	0.50	0.074	0.03	11.89	0.02	0.000
12.42	1.84	172.08	1.19	205.16	40	1383	0.50	0.073	0.03	11.89	0.02	0.000
12.49	1.83	176.24	1.19	208.86	41	1409	0.50	0.071	0.03	11.89	0.02	0.000
12.57	1.82	181.33	1.18	213.46	42	1441	0.50	0.068	0.03	11.89	0.02	0.000
12.64	1.82	186.33	1.17	218.01	42	1473	0.50	0.065	0.03	11.89	0.02	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
12.68	1.81	190.46	1.16	220.79	43	1491	0.50	0.063	0.03	11.89	0.02	0.000
12.75	1.80	194.66	1.15	223.87	43	1515	0.50	0.062	0.02	11.89	0.02	0.000
12.83	1.78	198.24	1.13	224.56	43	1523	0.50	0.061	0.02	11.89	0.02	0.000
12.86	1.73	204.69	1.04	213.11	40	1475	0.50	0.067	0.03	11.89	0.02	0.000
12.94	1.68	213.20	1.00	213.20	40	1470	0.50	0.068	0.03	11.89	0.02	0.000
13.01	1.68	228.55	1.00	228.55	42	1565	0.50	0.059	0.02	11.89	0.02	0.000
13.09	1.71	243.48	1.01	246.39	46	1743	0.50	0.047	0.02	11.89	0.01	0.000
13.13	1.76	253.30	1.09	277.34	53	1913	0.50	0.040	0.01	11.89	0.01	0.000
13.21	1.79	259.14	1.14	295.74	57	2042	0.50	0.036	0.01	11.89	0.01	0.000
13.27	1.84	257.45	1.19	306.24	60	2149	0.50	0.033	0.01	11.89	0.01	0.000
13.35	1.88	248.07	1.23	304.30	61	2198	0.50	0.032	0.01	11.89	0.01	0.000
13.42	1.94	231.94	1.26	293.28	60	2204	0.50	0.032	0.01	11.89	0.01	0.000
13.46	1.99	218.55	1.30	283.85	59	2201	0.50	0.032	0.01	11.89	0.01	0.000
13.53	2.01	212.08	1.32	279.60	58	2203	0.50	0.032	0.01	11.89	0.01	0.000
13.62	2.02	209.77	1.32	277.83	58	2206	0.50	0.033	0.01	11.89	0.01	0.000
13.65	2.00	213.73	1.31	279.08	58	2196	0.50	0.033	0.01	11.89	0.01	0.000
13.73	1.96	222.00	1.28	283.51	58	2189	0.50	0.033	0.01	11.89	0.01	0.000
13.81	1.92	233.00	1.25	290.54	59	2187	0.50	0.034	0.01	11.89	0.01	0.000
13.88	1.88	243.83	1.22	297.75	59	2195	0.50	0.034	0.01	11.89	0.01	0.000
13.92	1.85	253.06	1.20	303.20	60	2203	0.50	0.034	0.01	11.89	0.01	0.000
13.99	1.82	261.48	1.18	307.73	60	2220	0.50	0.033	0.01	11.89	0.01	0.000
14.07	1.80	269.63	1.15	311.39	60	2240	0.50	0.033	0.01	11.89	0.01	0.000
14.14	1.79	276.04	1.14	314.02	60	2260	0.50	0.033	0.01	11.89	0.01	0.000
14.18	1.78	280.69	1.12	315.38	60	2273	0.50	0.033	0.01	11.89	0.01	0.000
14.26	1.77	283.64	1.11	315.60	60	2283	0.50	0.033	0.01	11.89	0.01	0.000
14.33	1.76	285.60	1.11	315.67	60	2292	0.50	0.033	0.01	11.89	0.01	0.000
14.37	1.76	285.60	1.11	315.95	60	2298	0.50	0.033	0.01	11.89	0.01	0.000
14.45	1.77	284.59	1.11	316.84	61	2310	0.50	0.033	0.01	11.89	0.01	0.000
14.52	1.77	285.08	1.12	318.93	61	2332	0.50	0.032	0.01	11.89	0.01	0.000
14.59	1.77	286.90	1.11	319.82	61	2346	0.50	0.032	0.01	11.89	0.01	0.000
14.63	1.76	288.46	1.11	319.02	61	2346	0.50	0.032	0.01	11.89	0.01	0.000
14.70	1.77	286.09	1.11	317.08	61	2338	0.50	0.033	0.01	11.89	0.01	0.000
14.79	1.78	280.21	1.13	315.94	61	2336	0.50	0.033	0.01	11.89	0.01	0.000
14.86	1.80	272.86	1.15	314.84	61	2342	0.50	0.033	0.01	11.89	0.01	0.000
14.93	1.82	266.27	1.17	312.46	61	2345	0.50	0.033	0.01	11.89	0.01	0.000
14.97	1.83	263.71	1.18	311.92	61	2354	0.50	0.033	0.01	11.89	0.01	0.000
15.05	1.83	265.77	1.18	314.53	61	2382	0.50	0.033	0.01	11.89	0.01	0.000
15.12	1.82	271.40	1.18	319.38	62	2419	0.50	0.032	0.01	11.89	0.01	0.000
15.19	1.82	276.02	1.17	322.82	63	2445	0.50	0.032	0.01	11.89	0.01	0.000
15.23	1.81	276.02	1.17	321.61	62	2436	0.50	0.032	0.01	11.89	0.01	0.000
15.31	1.81	272.20	1.16	317.02	62	2409	0.50	0.033	0.01	11.89	0.01	0.000
15.38	1.81	266.98	1.17	311.26	60	2373	0.50	0.034	0.01	11.89	0.01	0.000
15.46	1.81	262.73	1.17	306.56	60	2346	0.50	0.035	0.01	11.89	0.01	0.000
15.50	1.81	259.27	1.17	302.50	59	2318	0.50	0.036	0.01	11.89	0.01	0.000
15.57	1.81	257.58	1.17	300.52	58	2310	0.50	0.036	0.01	11.89	0.01	0.000
15.64	1.81	257.95	1.17	300.55	58	2315	0.50	0.036	0.01	11.89	0.01	0.000
15.68	1.80	262.31	1.15	301.52	58	2317	0.50	0.037	0.01	11.89	0.01	0.000
15.76	1.77	266.51	1.11	295.90	57	2274	0.50	0.038	0.01	11.89	0.01	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
15.84	1.74	271.22	1.06	288.46	55	2239	0.50	0.039	0.01	11.89	0.01	0.000
15.91	1.72	272.86	1.03	281.91	53	2215	0.50	0.040	0.01	11.89	0.01	0.000
15.95	1.73	271.86	1.04	283.45	53	2223	0.50	0.040	0.01	11.89	0.01	0.000
16.03	1.73	271.31	1.05	283.69	53	2229	0.50	0.040	0.01	11.89	0.01	0.000
16.09	1.76	262.50	1.10	287.86	55	2242	0.50	0.040	0.01	11.89	0.01	0.000
16.16	1.77	264.87	1.12	296.41	57	2311	0.50	0.038	0.01	11.89	0.01	0.000
16.23	1.78	273.42	1.13	308.74	59	2415	0.50	0.036	0.01	11.89	0.01	0.000
16.30	1.76	296.65	1.09	324.65	62	2549	0.50	0.033	0.01	11.89	0.01	0.000
16.34	1.73	321.85	1.05	338.37	64	2684	0.50	0.030	0.01	11.89	0.00	0.000
16.42	1.72	339.62	1.03	348.32	65	2794	0.50	0.029	0.01	11.89	0.00	0.000
16.49	1.72	346.03	1.03	357.68	67	2869	0.50	0.028	0.01	11.89	0.00	0.000
16.56	1.75	336.03	1.08	364.09	69	2889	0.50	0.028	0.01	11.89	0.00	0.000
16.63	1.78	320.89	1.13	362.41	70	2878	0.50	0.028	0.01	11.89	0.00	0.000
16.67	1.80	308.46	1.15	356.19	69	2844	0.50	0.029	0.01	11.89	0.00	0.000
16.75	1.80	304.73	1.15	350.21	68	2801	0.50	0.029	0.01	11.89	0.00	0.000
16.82	1.79	301.46	1.14	344.10	66	2755	0.50	0.030	0.01	11.89	0.00	0.000
16.89	1.78	304.28	1.12	341.45	65	2735	0.50	0.031	0.01	11.89	0.00	0.000
16.96	1.77	305.43	1.11	339.53	65	2727	0.50	0.031	0.01	11.89	0.00	0.000
17.00	1.74	314.69	1.07	336.25	64	2719	0.50	0.031	0.01	11.89	0.01	0.000
17.07	1.71	322.76	1.00	323.68	61	2681	0.50	0.032	0.01	11.89	0.01	0.000
17.15	1.68	326.64	1.00	326.64	61	2629	0.50	0.034	0.01	11.89	0.01	0.000
17.22	1.67	324.09	1.00	324.09	60	2577	0.50	0.035	0.01	11.89	0.01	0.000
17.26	1.68	313.88	1.00	313.88	58	2528	0.50	0.036	0.01	11.89	0.01	0.000
17.34	1.67	298.42	1.00	298.42	55	2389	0.50	0.040	0.01	11.89	0.01	0.000
17.41	1.64	278.62	1.00	278.62	51	2155	0.50	0.048	0.02	11.89	0.01	0.000
17.50	1.60	263.07	1.00	263.07	47	1936	0.50	0.060	0.02	11.89	0.01	0.000
17.54	1.59	256.26	1.00	256.26	46	1851	0.50	0.067	0.02	11.89	0.02	0.000
17.62	1.60	256.58	1.00	256.58	46	1895	0.50	0.064	0.02	11.89	0.01	0.000
17.65	1.61	264.63	1.00	264.63	48	1970	0.50	0.059	0.02	11.89	0.01	0.000
17.73	1.61	272.39	1.00	272.39	49	2039	0.50	0.055	0.02	11.89	0.01	0.000
17.80	1.59	291.08	1.00	291.08	52	2134	0.50	0.051	0.02	11.89	0.01	0.000
17.87	1.58	309.69	1.00	309.69	56	2250	0.50	0.046	0.01	11.89	0.01	0.000
17.94	1.58	328.73	1.00	328.73	59	2390	0.50	0.042	0.01	11.89	0.01	0.000
18.01	1.60	335.65	1.00	335.65	61	2506	0.50	0.039	0.01	11.89	0.01	0.000
18.05	1.63	337.22	1.00	337.22	62	2623	0.50	0.036	0.01	11.89	0.01	0.000
18.12	1.67	337.46	1.00	337.46	62	2752	0.50	0.034	0.01	11.89	0.01	0.000
18.20	1.70	340.23	1.00	340.23	64	2903	0.50	0.031	0.01	11.89	0.00	0.000
18.27	1.73	339.98	1.04	353.94	67	3004	0.50	0.030	0.01	11.89	0.00	0.000
18.32	1.75	336.40	1.08	362.48	69	3056	0.50	0.029	0.01	11.89	0.00	0.000
18.39	1.77	321.38	1.12	359.51	69	3029	0.50	0.030	0.01	11.89	0.00	0.000
18.46	1.80	304.10	1.15	350.52	68	2976	0.50	0.031	0.01	11.89	0.00	0.000
18.51	1.83	284.81	1.18	336.30	66	2893	0.50	0.032	0.01	11.89	0.00	0.000
18.58	1.84	273.22	1.19	325.40	64	2824	0.50	0.033	0.01	11.89	0.01	0.000
18.64	1.83	265.17	1.18	313.53	61	2712	0.50	0.036	0.01	11.89	0.01	0.000
18.74	1.80	261.65	1.16	302.87	59	2599	0.50	0.039	0.01	11.89	0.01	0.000
18.77	1.75	259.32	1.08	281.03	53	2401	0.50	0.044	0.01	11.89	0.01	0.000
18.85	1.68	253.20	1.00	253.20	47	2157	0.50	0.054	0.02	11.89	0.01	0.000
18.93	1.62	244.31	1.00	244.31	44	1913	0.51	0.070	0.03	11.89	0.02	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
19.00	1.59	234.56	1.00	234.56	42	1781	0.51	0.083	0.03	11.89	0.02	0.000
19.03	1.60	230.19	1.00	230.19	42	1768	0.51	0.085	0.04	11.89	0.02	0.000
19.11	1.61	228.26	1.00	228.26	41	1771	0.51	0.085	0.04	11.89	0.02	0.000
19.16	1.61	227.32	1.00	227.32	41	1784	0.51	0.084	0.04	11.89	0.02	0.000
19.26	1.61	229.00	1.00	229.00	41	1800	0.51	0.083	0.03	11.89	0.02	0.000
19.29	1.61	233.63	1.00	233.63	42	1838	0.51	0.079	0.03	11.89	0.02	0.000
19.36	1.62	238.80	1.00	238.80	43	1907	0.51	0.073	0.03	11.89	0.02	0.000
19.44	1.65	240.44	1.00	240.44	44	1995	0.51	0.067	0.03	11.89	0.02	0.000
19.51	1.68	240.28	1.00	240.28	44	2068	0.51	0.062	0.02	11.89	0.01	0.000
19.58	1.69	238.88	1.00	238.88	44	2102	0.51	0.061	0.02	11.89	0.01	0.000
19.65	1.69	239.20	1.00	239.20	45	2112	0.51	0.060	0.02	11.89	0.01	0.000
19.69	1.69	240.73	1.00	240.73	45	2109	0.51	0.061	0.02	11.89	0.01	0.000
19.76	1.69	242.11	1.00	242.11	45	2133	0.51	0.060	0.02	11.89	0.01	0.000
19.84	1.70	246.41	1.00	246.41	46	2208	0.51	0.056	0.02	11.89	0.01	0.000
19.91	1.72	249.90	1.03	256.96	48	2299	0.51	0.052	0.02	11.89	0.01	0.000
19.95	1.73	256.31	1.04	266.63	50	2379	0.51	0.049	0.02	11.89	0.01	0.000
20.03	1.72	260.46	1.04	270.36	51	2419	0.51	0.048	0.02	11.89	0.01	0.000
20.09	1.72	265.72	1.02	272.22	51	2451	0.51	0.047	0.02	11.89	0.01	0.000
20.14	1.70	276.51	1.00	276.51	52	2490	0.51	0.046	0.01	11.89	0.01	0.000
20.22	1.68	288.89	1.00	288.89	54	2539	0.51	0.045	0.01	11.89	0.01	0.000
20.28	1.66	301.14	1.00	301.14	55	2589	0.51	0.043	0.01	11.89	0.01	0.000
20.36	1.66	304.58	1.00	304.58	56	2618	0.51	0.043	0.01	11.89	0.01	0.000
20.41	1.66	305.12	1.00	305.12	56	2644	0.51	0.042	0.01	11.89	0.01	0.000
20.49	1.68	304.54	1.00	304.54	56	2692	0.51	0.041	0.01	11.89	0.01	0.000
20.56	1.70	305.24	1.00	305.24	57	2796	0.51	0.039	0.01	11.89	0.01	0.000
20.63	1.73	305.66	1.05	322.25	61	2921	0.51	0.036	0.01	11.89	0.01	0.000
20.71	1.76	305.35	1.10	334.57	64	3021	0.51	0.035	0.01	11.89	0.01	0.000
20.75	1.77	302.42	1.12	338.32	65	3060	0.51	0.034	0.01	11.89	0.00	0.000
20.83	1.79	295.96	1.14	336.47	65	3058	0.51	0.034	0.01	11.89	0.00	0.000
20.90	1.80	286.16	1.16	330.80	64	3028	0.51	0.035	0.01	11.89	0.01	0.000
20.97	1.82	276.47	1.17	323.88	63	2991	0.51	0.036	0.01	11.89	0.01	0.000
21.01	1.84	264.07	1.19	314.00	61	2934	0.51	0.037	0.01	11.89	0.01	0.000
21.09	1.85	252.34	1.20	303.57	60	2874	0.51	0.038	0.01	11.89	0.01	0.000
21.16	1.86	242.79	1.21	294.34	58	2817	0.51	0.040	0.01	11.89	0.01	0.000
21.20	1.86	239.99	1.21	290.24	57	2773	0.51	0.041	0.01	11.89	0.01	0.000
21.27	1.84	243.78	1.20	291.50	57	2758	0.51	0.041	0.01	11.89	0.01	0.000
21.35	1.82	251.17	1.17	294.89	57	2757	0.51	0.042	0.01	11.89	0.01	0.000
21.42	1.80	258.96	1.15	298.28	58	2768	0.52	0.042	0.01	11.89	0.01	0.000
21.46	1.79	263.26	1.14	299.63	58	2773	0.52	0.042	0.01	11.89	0.01	0.000
21.53	1.78	265.42	1.13	300.19	58	2779	0.52	0.042	0.01	11.89	0.01	0.000
21.60	1.77	269.50	1.12	302.04	58	2799	0.52	0.041	0.01	11.89	0.01	0.000
21.67	1.73	280.86	1.05	295.62	56	2758	0.52	0.043	0.01	11.89	0.01	0.000
21.75	1.68	296.40	1.00	296.40	55	2717	0.52	0.044	0.01	11.89	0.01	0.000
21.79	1.62	317.94	1.00	317.94	58	2680	0.52	0.045	0.01	11.89	0.01	0.000
21.87	1.58	333.13	1.00	333.13	60	2684	0.52	0.045	0.01	11.89	0.01	0.000
21.93	1.56	340.89	1.00	340.89	61	2687	0.52	0.045	0.01	11.89	0.01	0.000
22.01	1.57	333.53	1.00	333.53	60	2673	0.52	0.046	0.01	11.89	0.01	0.000
22.08	1.61	317.59	1.00	317.59	58	2678	0.52	0.046	0.01	11.89	0.01	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
22.12	1.65	303.43	1.00	303.43	56	2678	0.52	0.046	0.01	11.89	0.01	0.000
22.18	1.68	287.31	1.00	287.31	53	2666	0.52	0.046	0.01	11.89	0.01	0.000
22.26	1.72	268.52	1.03	275.67	52	2629	0.52	0.048	0.02	11.89	0.01	0.000
22.32	1.77	242.71	1.11	269.53	51	2543	0.52	0.051	0.02	11.89	0.01	0.000
22.38	1.79	224.98	1.15	257.65	50	2449	0.52	0.055	0.02	11.89	0.01	0.000
22.45	1.80	216.75	1.16	250.36	48	2392	0.52	0.058	0.02	11.89	0.01	0.000
22.51	1.80	217.06	1.15	249.50	48	2383	0.52	0.058	0.02	11.89	0.01	0.000
22.59	1.78	222.84	1.13	252.05	48	2401	0.52	0.058	0.02	11.89	0.01	0.000
22.64	1.75	235.93	1.08	254.96	48	2428	0.52	0.057	0.02	11.89	0.01	0.000
22.72	1.71	250.18	1.02	254.19	48	2461	0.52	0.055	0.02	11.89	0.01	0.000
22.77	1.71	254.87	1.00	255.72	48	2490	0.52	0.054	0.02	11.89	0.01	0.000
22.85	1.72	250.35	1.03	258.84	49	2500	0.52	0.054	0.02	11.89	0.01	0.000
22.91	1.75	241.07	1.08	259.56	49	2489	0.52	0.055	0.02	11.89	0.01	0.000
22.97	1.76	231.33	1.10	254.11	48	2438	0.52	0.057	0.02	11.89	0.01	0.000
23.05	1.77	221.96	1.11	247.04	47	2376	0.52	0.061	0.02	11.89	0.01	0.000
23.11	1.78	211.01	1.13	238.78	46	2305	0.52	0.064	0.02	11.89	0.01	0.000
23.17	1.80	199.66	1.16	230.78	45	2247	0.52	0.068	0.03	11.89	0.01	0.000
23.25	1.83	186.96	1.18	220.95	43	2185	0.52	0.073	0.03	11.89	0.02	0.000
23.30	1.83	178.39	1.18	210.82	41	2088	0.52	0.080	0.03	11.89	0.02	0.000
23.36	1.79	173.51	1.14	198.48	38	1934	0.52	0.096	0.04	11.89	0.02	0.000
23.43	1.76	169.35	1.10	185.92	35	1803	0.52	0.115	0.06	11.89	0.03	0.000
23.50	1.75	164.89	1.09	178.94	34	1740	0.52	0.127	0.07	11.89	0.04	0.000
23.57	1.78	160.02	1.13	181.17	35	1769	0.52	0.122	0.06	11.89	0.03	0.000
23.62	1.80	157.93	1.16	182.52	35	1797	0.52	0.117	0.06	11.89	0.03	0.000
23.69	1.82	156.73	1.17	183.66	36	1826	0.52	0.113	0.06	11.89	0.03	0.000
23.76	1.81	162.33	1.16	188.92	37	1873	0.52	0.107	0.05	11.89	0.03	0.000
23.83	1.79	175.73	1.14	199.50	38	1962	0.52	0.096	0.04	11.89	0.02	0.000
23.90	1.75	197.60	1.09	215.17	41	2111	0.52	0.081	0.03	11.89	0.02	0.000
23.97	1.71	226.08	1.02	230.08	43	2292	0.52	0.069	0.03	11.89	0.01	0.000
24.05	1.67	260.57	1.00	260.57	48	2483	0.52	0.059	0.02	11.89	0.01	0.000
24.11	1.62	299.79	1.00	299.79	54	2676	0.52	0.052	0.02	11.89	0.01	0.000
24.18	1.58	339.30	1.00	339.30	61	2893	0.52	0.045	0.01	11.89	0.01	0.000
24.25	1.56	371.08	1.00	371.08	66	3082	0.52	0.041	0.01	11.89	0.01	0.000
24.29	1.54	400.22	1.00	400.22	71	3262	0.52	0.038	0.01	11.89	0.00	0.000
24.37	1.53	420.61	1.00	420.61	74	3384	0.52	0.036	0.01	11.89	0.00	0.000
24.41	1.52	439.02	1.00	439.02	77	3485	0.52	0.034	0.01	11.89	0.00	0.000
24.48	1.52	447.64	1.00	447.64	79	3538	0.52	0.034	0.01	11.89	0.00	0.000
24.55	1.53	450.91	1.00	450.91	79	3627	0.52	0.032	0.01	11.89	0.00	0.000
24.61	1.55	447.33	1.00	447.33	79	3692	0.52	0.032	0.01	11.89	0.00	0.000
24.68	1.55	446.14	1.00	446.14	79	3686	0.53	0.032	0.01	11.89	0.00	0.000
24.74	1.54	441.73	1.00	441.73	78	3620	0.53	0.033	0.01	11.89	0.00	0.000
24.81	1.52	444.09	1.00	444.09	78	3558	0.53	0.034	0.01	11.89	0.00	0.000
24.88	1.52	444.98	1.00	444.98	78	3562	0.53	0.034	0.01	11.89	0.00	0.000
24.94	1.52	452.93	1.00	452.93	79	3612	0.53	0.033	0.01	11.89	0.00	0.000
25.01	1.53	453.63	1.00	453.63	80	3666	0.53	0.033	0.01	11.89	0.00	0.000
25.07	1.53	452.70	1.00	452.70	80	3697	0.53	0.032	0.01	11.89	0.00	0.000
25.14	1.54	448.68	1.00	448.68	79	3709	0.53	0.032	0.01	11.89	0.00	0.000
25.21	1.56	443.69	1.00	443.69	79	3759	0.53	0.032	0.01	11.89	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
25.27	1.57	436.14	1.00	436.14	78	3770	0.53	0.032	0.01	11.89	0.00	0.000
25.34	1.59	421.69	1.00	421.69	76	3747	0.53	0.032	0.01	11.89	0.00	0.000
25.41	1.61	403.20	1.00	403.20	73	3658	0.53	0.033	0.01	11.89	0.00	0.000
25.48	1.64	380.98	1.00	380.98	70	3589	0.53	0.034	0.01	11.89	0.00	0.000
25.53	1.68	347.51	1.00	347.51	64	3481	0.53	0.036	0.01	11.89	0.00	0.000
25.62	1.73	309.22	1.05	325.73	61	3340	0.53	0.039	0.01	11.89	0.01	0.000
25.69	1.79	269.48	1.14	308.10	59	3175	0.53	0.042	0.01	11.89	0.01	0.000
25.73	1.84	234.51	1.19	279.21	55	2956	0.53	0.047	0.01	11.89	0.01	0.000
25.80	1.89	200.62	1.23	246.42	49	2718	0.53	0.055	0.02	11.89	0.01	0.000
25.88	1.94	169.63	1.26	214.09	44	2478	0.53	0.066	0.03	11.89	0.01	0.000
25.95	1.98	149.26	1.29	192.97	40	2326	0.53	0.075	0.03	11.89	0.02	0.000
26.00	2.01	137.21	1.32	181.04	38	2243	0.53	0.081	0.04	11.89	0.02	0.000
26.07	2.05	128.47	1.35	173.65	37	2205	0.53	0.084	0.04	11.89	0.02	0.000
26.15	2.08	121.12	1.39	168.69	36	2189	0.53	0.086	0.04	11.89	0.02	0.000
26.18	2.10	117.05	1.42	166.64	36	2186	0.53	0.086	0.04	11.89	0.02	0.000
26.26	2.10	115.60	1.42	164.58	36	2163	0.53	0.089	0.04	11.89	0.02	0.000
26.34	2.10	115.08	1.41	162.64	35	2136	0.53	0.092	0.05	11.89	0.02	0.000
26.38	2.08	115.53	1.39	160.92	35	2101	0.53	0.096	0.05	11.89	0.02	0.000
26.46	2.08	115.04	1.39	159.44	34	2080	0.53	0.098	0.05	11.89	0.03	0.000
26.53	2.08	111.38	1.40	155.40	33	2039	0.53	0.103	0.06	11.89	0.03	0.000
26.60	2.10	105.53	1.42	150.04	33	1989	0.53	0.110	0.06	11.89	0.03	0.000
26.66	2.12	100.23	1.45	145.17	32	1939	0.53	0.118	0.07	11.89	0.03	0.000
26.73	2.13	96.67	1.46	141.32	31	1895	0.53	0.125	0.07	11.89	0.04	0.000
26.80	2.13	94.28	1.47	138.17	30	1858	0.53	0.133	0.08	11.89	0.04	0.000
26.87	2.14	91.65	1.48	135.47	30	1828	0.53	0.139	0.09	11.89	0.04	0.000
26.91	2.14	89.63	1.49	133.69	29	1809	0.53	0.143	0.09	11.89	0.04	0.000
26.98	2.15	87.85	1.51	132.67	29	1801	0.53	0.146	0.09	11.89	0.04	0.000
27.06	2.16	86.34	1.53	132.15	29	1800	0.53	0.147	0.09	11.89	0.05	0.000
27.10	2.17	85.68	1.55	132.55	30	1809	0.53	0.145	0.09	11.89	0.04	0.000
27.18	2.17	86.17	1.55	133.55	30	1826	0.53	0.142	0.09	11.89	0.04	0.000
27.26	2.17	88.30	1.54	135.55	30	1856	0.53	0.136	0.08	11.89	0.04	0.000
27.33	2.15	91.55	1.51	137.95	30	1889	0.53	0.131	0.08	11.89	0.04	0.000
27.37	2.12	97.23	1.46	141.78	31	1932	0.53	0.124	0.07	11.89	0.04	0.000
27.45	2.09	104.49	1.41	146.83	32	1978	0.53	0.117	0.07	11.89	0.03	0.000
27.52	2.05	112.91	1.36	153.30	33	2026	0.53	0.111	0.06	11.89	0.03	0.000
27.59	2.03	118.99	1.33	158.33	33	2058	0.53	0.107	0.06	11.89	0.03	0.000
27.63	2.02	121.09	1.32	160.19	34	2072	0.53	0.106	0.06	11.89	0.03	0.000
27.70	2.00	118.86	1.31	155.38	32	1984	0.53	0.118	0.07	11.89	0.03	0.000
27.78	1.97	113.21	1.29	145.75	30	1824	0.53	0.147	0.09	11.89	0.04	0.000
27.86	1.95	106.85	1.27	135.36	28	1652	0.53	0.197	0.13	11.89	0.06	0.001
27.90	1.96	99.28	1.28	127.05	26	1579	0.53	0.228	0.17	11.89	0.08	0.000
27.98	2.01	92.91	1.31	122.15	26	1581	0.53	0.228	0.17	11.89	0.08	0.001
28.02	2.07	85.48	1.38	117.55	25	1586	0.53	0.226	0.17	11.89	0.08	0.000
28.10	2.12	78.88	1.46	115.01	25	1596	0.53	0.223	0.17	11.89	0.08	0.001
28.16	2.17	74.85	1.54	115.62	26	1620	0.53	0.213	0.16	11.89	0.07	0.000
28.23	2.20	73.48	1.61	118.56	27	1665	0.53	0.196	0.14	11.89	0.07	0.001
28.30	2.22	73.46	1.68	123.32	28	1730	0.53	0.176	0.12	11.89	0.05	0.000
28.38	2.26	71.96	1.78	128.07	30	1785	0.53	0.162	0.10	11.89	0.05	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
28.42	2.29	70.07	1.89	132.48	31	1825	0.53	0.152	0.09	11.89	0.04	0.000
28.49	2.31	69.39	1.95	135.25	32	1852	0.53	0.147	0.08	11.89	0.04	0.000
28.58	2.32	68.88	1.99	137.25	33	1873	0.53	0.143	0.08	11.89	0.04	0.000
28.61	2.32	69.32	2.00	138.40	33	1890	0.53	0.140	0.08	11.89	0.04	0.000
28.69	2.33	68.59	2.03	139.50	33	1899	0.53	0.139	0.08	11.89	0.03	0.000
28.77	2.34	67.93	2.07	140.43	34	1907	0.53	0.138	0.07	11.89	0.03	0.000
28.81	2.34	67.45	2.09	140.99	34	1911	0.53	0.137	0.07	11.89	0.03	0.000
28.88	2.33	68.48	2.04	139.87	33	1911	0.53	0.138	0.07	11.89	0.03	0.000
28.95	2.30	71.22	1.93	137.72	32	1913	0.53	0.138	0.08	11.89	0.04	0.000
29.03	2.27	74.91	1.81	135.38	31	1913	0.53	0.138	0.08	11.89	0.04	0.000
29.11	2.24	77.88	1.72	133.89	31	1911	0.53	0.139	0.08	11.89	0.04	0.000
29.14	2.23	78.81	1.69	133.20	0	0	0.53	0.000	0.00	11.89	0.00	0.000
29.22	2.24	76.93	1.73	133.09	0	0	0.53	0.000	0.00	11.89	0.00	0.000
29.29	2.27	73.90	1.81	133.46	0	0	0.53	0.000	0.00	11.89	0.00	0.000
29.33	2.30	69.49	1.92	133.44	0	0	0.53	0.000	0.00	11.89	0.00	0.000
29.42	2.34	63.92	2.08	133.00	0	0	0.53	0.000	0.00	11.89	0.00	0.000
29.49	2.39	57.38	2.33	133.49	0	0	0.53	0.000	0.00	11.89	0.00	0.000
29.53	2.48	48.74	2.81	137.17	0	0	0.53	0.000	0.00	11.89	0.00	0.000
29.61	2.58	40.09	3.59	143.84	0	0	0.53	0.000	0.00	11.89	0.00	0.000
29.68	2.70	32.39	4.66	150.94	0	0	0.53	0.000	0.00	0.00	0.00	0.000
29.76	2.76	28.69	5.37	154.13	0	0	0.53	0.000	0.00	0.00	0.00	0.000
29.80	2.78	27.72	5.56	154.10	0	0	0.53	0.000	0.00	0.00	0.00	0.000
29.88	2.76	28.26	5.40	152.70	0	0	0.53	0.000	0.00	0.00	0.00	0.000
29.95	2.74	29.29	5.16	151.20	0	0	0.53	0.000	0.00	0.00	0.00	0.000
29.99	2.71	31.05	4.86	150.92	0	0	0.53	0.000	0.00	0.00	0.00	0.000
30.06	2.69	33.18	4.58	151.96	0	0	0.53	0.000	0.00	0.00	0.00	0.000
30.14	2.66	35.95	4.28	153.73	0	0	0.53	0.000	0.00	0.00	0.00	0.000
30.22	2.63	38.25	4.05	155.09	0	0	0.53	0.000	0.00	0.00	0.00	0.000
30.26	2.62	40.23	3.90	156.96	0	0	0.53	0.000	0.00	0.00	0.00	0.000
30.33	2.61	41.60	3.83	159.16	0	0	0.53	0.000	0.00	0.00	0.00	0.000
30.41	2.60	42.74	3.77	161.04	0	0	0.53	0.000	0.00	0.00	0.00	0.000
30.45	2.59	44.24	3.63	160.70	0	0	0.53	0.000	0.00	11.89	0.00	0.000
30.53	2.55	46.67	3.38	157.60	0	0	0.53	0.000	0.00	11.89	0.00	0.000
30.60	2.50	50.76	3.01	152.57	0	0	0.53	0.000	0.00	11.89	0.00	0.000
30.67	2.46	54.69	2.71	148.18	0	0	0.53	0.000	0.00	11.89	0.00	0.000
30.72	2.42	58.13	2.46	143.16	0	0	0.53	0.000	0.00	11.89	0.00	0.000
30.79	2.38	60.44	2.29	138.55	0	0	0.53	0.000	0.00	11.89	0.00	0.000
30.86	2.35	62.85	2.14	134.34	0	0	0.53	0.000	0.00	11.89	0.00	0.000
30.94	2.33	64.69	2.04	132.05	0	0	0.53	0.000	0.00	11.89	0.00	0.000
30.99	2.31	66.05	1.97	130.06	0	0	0.53	0.000	0.00	11.89	0.00	0.000
31.06	2.32	63.89	2.02	128.77	31	1867	0.53	0.163	0.10	11.89	0.04	0.000
31.11	2.32	63.15	2.02	127.61	30	1852	0.53	0.167	0.10	11.89	0.04	0.000
31.19	2.34	61.89	2.08	128.54	31	1855	0.53	0.167	0.10	11.89	0.04	0.000
31.27	2.33	63.10	2.06	130.13	0	0	0.53	0.000	0.00	11.89	0.00	0.000
31.31	2.36	62.30	2.18	135.62	0	0	0.53	0.000	0.00	11.89	0.00	0.000
31.38	2.40	60.74	2.36	143.24	0	0	0.53	0.000	0.00	11.89	0.00	0.000
31.45	2.45	57.61	2.66	153.28	0	0	0.53	0.000	0.00	11.89	0.00	0.000
31.53	2.50	54.00	3.00	162.23	0	0	0.53	0.000	0.00	11.89	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
31.57	2.56	50.00	3.44	171.79	0	0	0.53	0.000	0.00	11.89	0.00	0.000
31.65	2.61	46.68	3.86	180.16	0	0	0.53	0.000	0.00	0.00	0.00	0.000
31.73	2.64	45.30	4.11	186.34	0	0	0.53	0.000	0.00	0.00	0.00	0.000
31.80	2.67	43.70	4.37	191.09	0	0	0.53	0.000	0.00	0.00	0.00	0.000
31.84	2.66	44.72	4.28	191.28	0	0	0.53	0.000	0.00	0.00	0.00	0.000
31.91	2.62	47.81	3.94	188.50	0	0	0.53	0.000	0.00	0.00	0.00	0.000
31.99	2.55	54.47	3.34	182.17	0	0	0.53	0.000	0.00	11.89	0.00	0.000
32.03	2.47	63.57	2.77	175.97	0	0	0.53	0.000	0.00	11.89	0.00	0.000
32.11	2.39	73.66	2.32	170.94	0	0	0.53	0.000	0.00	11.89	0.00	0.000
32.18	2.32	83.41	2.01	168.04	0	0	0.53	0.000	0.00	11.89	0.00	0.000
32.22	2.27	90.88	1.83	166.27	0	0	0.53	0.000	0.00	11.89	0.00	0.000
32.29	2.24	94.71	1.73	164.04	0	0	0.53	0.000	0.00	11.89	0.00	0.000
32.37	2.20	98.95	1.62	160.64	0	0	0.53	0.000	0.00	11.89	0.00	0.000
32.45	2.17	102.56	1.54	157.66	0	0	0.53	0.000	0.00	11.89	0.00	0.000
32.48	2.12	107.19	1.45	155.26	0	0	0.53	0.000	0.00	11.89	0.00	0.000
32.56	2.08	109.46	1.39	152.36	0	0	0.53	0.000	0.00	11.89	0.00	0.000
32.63	2.06	107.84	1.36	146.97	0	0	0.53	0.000	0.00	11.89	0.00	0.000
32.70	2.07	100.03	1.38	138.28	30	2078	0.53	0.132	0.08	11.89	0.03	0.000
32.78	2.12	90.60	1.44	130.66	28	2009	0.53	0.144	0.09	11.89	0.04	0.000
32.82	2.17	81.45	1.55	125.93	28	1968	0.53	0.152	0.10	11.89	0.04	0.000
32.90	2.22	74.51	1.68	124.94	28	1957	0.53	0.155	0.10	11.89	0.04	0.000
32.98	2.27	68.75	1.83	126.07	29	1955	0.53	0.156	0.10	11.89	0.04	0.000
33.02	2.32	65.09	1.98	129.16	31	1972	0.53	0.153	0.09	11.89	0.04	0.000
33.10	2.33	64.08	2.05	131.52	31	1995	0.53	0.149	0.09	11.89	0.03	0.000
33.14	2.34	63.74	2.10	133.55	32	2016	0.53	0.145	0.08	11.89	0.03	0.000
33.21	2.33	65.56	2.03	133.40	32	2033	0.53	0.142	0.08	11.89	0.03	0.000
33.29	2.30	68.15	1.94	132.35	31	2043	0.53	0.141	0.08	11.89	0.03	0.000
33.36	2.27	71.38	1.83	130.59	30	2043	0.53	0.141	0.09	11.89	0.03	0.000
33.40	2.24	74.07	1.73	128.36	29	2026	0.53	0.144	0.09	11.89	0.04	0.000
33.47	2.21	76.63	1.64	125.67	28	1995	0.53	0.151	0.10	11.89	0.04	0.000
33.55	2.17	79.99	1.54	123.56	28	1961	0.53	0.158	0.11	11.89	0.04	0.000
33.62	2.13	83.67	1.47	122.92	27	1935	0.53	0.164	0.11	11.89	0.04	0.000
33.70	2.10	86.55	1.41	122.38	26	1902	0.53	0.173	0.12	11.89	0.05	0.000
33.74	2.05	88.69	1.35	119.83	25	1805	0.53	0.201	0.15	11.89	0.06	0.000
33.82	2.01	88.96	1.31	116.94	24	1711	0.53	0.237	0.19	11.89	0.07	0.001
33.89	1.98	88.36	1.29	114.34	24	1637	0.53	0.274	0.22	11.89	0.09	0.001
33.93	2.00	86.42	1.30	112.75	23	1635	0.53	0.275	0.23	11.89	0.09	0.000
34.00	2.02	82.93	1.32	109.71	23	1624	0.53	0.283	0.24	11.89	0.09	0.001
34.08	2.03	80.22	1.34	107.25	23	1609	0.53	0.292	0.25	11.89	0.10	0.001
34.15	2.04	78.57	1.35	105.72	22	1598	0.53	0.300	0.26	11.89	0.10	0.001
34.22	2.04	78.68	1.34	105.64	22	1596	0.53	0.302	0.26	11.89	0.10	0.001
34.26	2.04	77.70	1.35	104.85	22	1593	0.53	0.304	0.27	11.89	0.10	0.000
34.33	2.07	75.25	1.37	103.29	22	1595	0.53	0.304	0.27	11.89	0.10	0.001
34.41	2.09	72.39	1.41	101.97	22	1603	0.53	0.300	0.27	11.89	0.10	0.001
34.49	2.12	69.93	1.45	101.57	22	1621	0.53	0.290	0.26	11.89	0.10	0.001
34.53	2.15	67.91	1.50	102.11	23	1646	0.53	0.275	0.24	11.89	0.09	0.000
34.61	2.18	66.23	1.56	103.46	23	1680	0.53	0.259	0.22	11.89	0.08	0.001
34.68	2.20	64.94	1.62	105.42	24	1717	0.53	0.242	0.20	11.89	0.07	0.001

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
34.73	2.22	64.25	1.68	107.93	25	1757	0.53	0.226	0.18	11.89	0.07	0.000
34.80	2.24	63.79	1.73	110.60	25	1798	0.53	0.211	0.16	11.89	0.06	0.001
34.87	2.26	63.20	1.79	113.28	26	1837	0.53	0.199	0.14	11.89	0.05	0.000
34.91	2.28	62.46	1.86	116.18	27	1874	0.53	0.188	0.13	11.89	0.05	0.000
34.99	2.30	61.52	1.94	119.16	28	1910	0.53	0.179	0.12	11.89	0.04	0.000
35.07	2.32	60.93	2.00	122.15	29	1947	0.53	0.170	0.11	11.89	0.04	0.000
35.11	2.34	60.44	2.07	125.01	30	1979	0.53	0.163	0.10	11.89	0.04	0.000
35.18	2.35	60.25	2.12	127.91	31	2015	0.53	0.156	0.09	11.89	0.03	0.000
35.27	2.36	60.21	2.17	130.86	32	2052	0.53	0.149	0.09	11.89	0.03	0.000
35.31	2.36	61.46	2.17	133.46	32	2096	0.53	0.141	0.08	11.89	0.03	0.000
35.38	2.34	64.60	2.09	134.96	32	2144	0.53	0.134	0.08	11.89	0.03	0.000
35.46	2.32	68.53	1.98	136.02	32	2191	0.53	0.127	0.07	11.89	0.03	0.000
35.50	2.29	72.78	1.88	136.78	32	2230	0.53	0.122	0.07	11.89	0.02	0.000
35.58	2.28	73.87	1.86	137.57	0	0	0.53	0.000	0.00	11.89	0.00	0.000
35.65	2.30	71.61	1.94	138.82	0	0	0.53	0.000	0.00	11.89	0.00	0.000
35.73	2.34	67.11	2.09	140.50	0	0	0.53	0.000	0.00	11.89	0.00	0.000
35.77	2.38	62.52	2.28	142.57	0	0	0.53	0.000	0.00	11.89	0.00	0.000
35.84	2.40	60.13	2.39	143.80	0	0	0.53	0.000	0.00	11.89	0.00	0.000
35.92	2.42	58.79	2.46	144.71	0	0	0.53	0.000	0.00	11.89	0.00	0.000
35.99	2.42	58.82	2.47	145.04	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.03	2.42	58.79	2.48	146.06	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.11	2.42	59.39	2.48	147.13	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.18	2.40	61.91	2.37	147.00	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.26	2.37	66.08	2.20	145.49	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.30	2.31	73.06	1.95	142.79	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.37	2.25	80.77	1.75	141.00	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.44	2.19	88.61	1.59	140.86	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.51	2.15	93.39	1.51	141.28	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.55	2.14	95.34	1.48	140.86	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.62	2.12	95.94	1.45	139.29	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.70	2.09	97.36	1.41	137.00	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.78	2.06	99.26	1.37	135.66	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.82	2.04	100.83	1.34	135.33	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.89	2.04	99.04	1.35	133.56	28	2130	0.53	0.142	0.09	11.89	0.03	0.000
36.97	2.06	95.16	1.37	130.52	28	2116	0.53	0.145	0.10	11.89	0.03	0.000
37.01	2.10	89.10	1.42	126.15	27	2090	0.53	0.149	0.10	11.89	0.03	0.000
37.09	2.15	81.04	1.50	121.63	27	2062	0.53	0.155	0.11	11.89	0.04	0.000
37.15	2.17	77.00	1.55	119.16	27	2033	0.53	0.161	0.11	11.89	0.04	0.000
37.23	2.17	76.06	1.55	117.81	26	2013	0.53	0.166	0.12	11.89	0.04	0.000
37.30	2.14	79.60	1.49	118.40	26	2011	0.53	0.167	0.12	11.89	0.04	0.000
37.34	2.13	81.57	1.46	119.18	26	2014	0.53	0.166	0.12	11.89	0.04	0.000
37.41	2.12	82.45	1.45	119.74	26	2022	0.53	0.165	0.12	11.89	0.04	0.000
37.49	2.13	81.58	1.46	119.34	26	2023	0.53	0.165	0.12	11.89	0.04	0.000
37.57	2.14	79.25	1.49	118.24	26	2019	0.53	0.166	0.12	11.89	0.04	0.000
37.60	2.17	75.69	1.54	116.71	26	2008	0.53	0.169	0.12	11.89	0.04	0.000
37.68	2.19	72.26	1.60	115.59	26	1998	0.53	0.171	0.13	11.89	0.04	0.000
37.75	2.22	69.16	1.66	115.09	26	1993	0.53	0.173	0.13	11.89	0.04	0.000
37.83	2.23	67.56	1.71	115.23	26	1996	0.53	0.172	0.12	11.89	0.04	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
37.87	2.24	67.03	1.73	116.27	27	2013	0.53	0.169	0.12	11.89	0.04	0.000
37.95	2.25	66.73	1.77	117.88	27	2040	0.53	0.163	0.11	11.89	0.04	0.000
38.02	2.27	66.41	1.80	119.74	28	2070	0.53	0.157	0.11	11.89	0.03	0.000
38.06	2.28	65.76	1.85	121.88	28	2100	0.53	0.152	0.10	11.89	0.03	0.000
38.14	2.30	64.65	1.92	124.07	29	2128	0.53	0.147	0.09	11.89	0.03	0.000
38.21	2.32	63.25	2.01	126.91	30	2161	0.53	0.142	0.09	11.89	0.03	0.000
38.29	2.34	62.18	2.08	129.40	31	2188	0.53	0.138	0.08	11.89	0.03	0.000
38.33	2.35	61.74	2.14	132.06	32	2220	0.53	0.133	0.08	11.89	0.02	0.000
38.40	2.36	62.04	2.17	134.50	32	2257	0.53	0.128	0.07	11.89	0.02	0.000
38.48	2.36	62.76	2.18	136.76	33	2296	0.53	0.123	0.07	11.89	0.02	0.000
38.52	2.36	64.30	2.16	138.74	33	2337	0.53	0.119	0.06	11.89	0.02	0.000
38.59	2.35	66.61	2.11	140.51	34	2383	0.53	0.114	0.06	11.89	0.02	0.000
38.67	2.33	69.70	2.05	142.56	34	2439	0.53	0.108	0.06	11.89	0.02	0.000
38.75	2.32	72.39	1.99	144.40	34	2488	0.53	0.104	0.05	11.89	0.02	0.000
38.78	2.31	74.60	1.96	146.51	35	2534	0.53	0.100	0.05	11.89	0.02	0.000
38.85	2.31	76.58	1.95	148.98	35	2585	0.53	0.096	0.05	11.89	0.01	0.000
38.93	2.30	79.47	1.91	151.69	36	2646	0.53	0.091	0.05	11.89	0.01	0.000
39.00	2.28	82.84	1.86	153.87	36	2700	0.53	0.088	0.04	11.89	0.01	0.000
39.05	2.26	87.76	1.78	155.79	36	2753	0.53	0.085	0.04	11.89	0.01	0.000
39.13	2.23	93.33	1.69	157.91	36	2806	0.53	0.082	0.04	11.89	0.01	0.000
39.20	2.20	99.16	1.62	160.90	36	2864	0.52	0.079	0.04	11.89	0.01	0.000
39.27	2.19	103.20	1.58	163.49	37	2910	0.52	0.076	0.04	11.89	0.01	0.000
39.31	2.18	106.59	1.56	165.84	37	2949	0.52	0.075	0.04	11.89	0.01	0.000
39.38	2.16	110.81	1.51	167.86	37	2975	0.52	0.074	0.03	11.89	0.01	0.000
39.46	2.12	117.88	1.45	171.29	37	3003	0.52	0.072	0.03	11.89	0.01	0.000
39.53	2.09	125.41	1.40	175.62	38	3026	0.52	0.072	0.03	11.89	0.01	0.000
39.57	2.05	134.19	1.36	181.98	39	3058	0.52	0.070	0.03	11.89	0.01	0.000
39.65	2.02	141.88	1.32	187.80	39	3075	0.52	0.070	0.03	11.89	0.01	0.000
39.72	1.98	150.08	1.29	193.47	40	3045	0.52	0.071	0.03	11.89	0.01	0.000
39.79	1.95	155.54	1.27	197.22	40	3012	0.52	0.073	0.03	11.89	0.01	0.000
39.83	1.92	159.58	1.25	199.95	40	2981	0.52	0.074	0.03	11.89	0.01	0.000
39.91	1.91	162.11	1.25	201.94	41	2979	0.52	0.074	0.03	11.89	0.01	0.000
39.99	1.90	163.93	1.24	202.53	41	2943	0.52	0.076	0.03	11.89	0.01	0.000
40.06	1.90	160.41	1.24	198.12	40	2880	0.52	0.079	0.03	11.89	0.01	0.000
40.11	1.89	158.90	1.23	195.36	39	2818	0.52	0.083	0.04	11.89	0.01	0.000
40.18	1.88	157.80	1.22	193.02	38	2761	0.52	0.086	0.04	11.89	0.01	0.000
40.25	1.86	162.17	1.21	195.53	39	2734	0.52	0.088	0.04	11.89	0.01	0.000
40.32	1.84	166.78	1.19	198.38	39	2728	0.52	0.089	0.04	11.89	0.01	0.000
40.39	1.82	172.82	1.17	202.15	39	2736	0.52	0.088	0.04	11.89	0.01	0.000
40.43	1.78	182.45	1.13	206.33	40	2735	0.52	0.088	0.04	11.89	0.01	0.000
40.50	1.75	191.06	1.08	207.12	39	2723	0.52	0.089	0.04	11.89	0.01	0.000
40.58	1.73	196.61	1.04	205.26	39	2706	0.52	0.090	0.04	11.89	0.01	0.000
40.62	1.73	192.36	1.06	203.17	38	2677	0.52	0.093	0.04	11.89	0.01	0.000
40.69	1.77	178.83	1.11	198.25	38	2622	0.52	0.097	0.04	11.89	0.01	0.000
40.76	1.81	160.22	1.17	186.67	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.83	1.87	140.60	1.21	170.46	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.90	1.93	122.52	1.25	153.70	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.98	1.99	108.80	1.30	141.10	0	0	0.52	0.000	0.00	11.89	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
41.01	2.05	97.59	1.36	132.46	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.09	2.11	88.95	1.44	128.03	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.16	2.19	80.33	1.58	126.93	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.24	2.25	74.23	1.75	129.99	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.31	2.30	70.38	1.92	134.88	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.35	2.33	67.97	2.06	140.26	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.42	2.37	66.06	2.20	145.36	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.50	2.39	64.48	2.34	150.91	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.56	2.41	63.38	2.45	155.33	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.60	2.43	62.75	2.54	159.42	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.68	2.45	62.45	2.63	164.18	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.75	2.46	63.00	2.70	170.35	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.82	2.46	64.82	2.74	177.49	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.89	2.47	67.73	2.77	187.27	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.96	2.47	70.80	2.78	196.80	0	0	0.52	0.000	0.00	11.89	0.00	0.000
42.00	2.47	74.51	2.78	206.86	53	3491	0.52	0.058	0.02	11.89	0.00	0.000
42.07	2.46	78.54	2.73	214.68	54	3644	0.52	0.055	0.02	11.89	0.00	0.000
42.15	2.45	83.92	2.65	222.64	56	3818	0.52	0.051	0.01	11.89	0.00	0.000
42.22	2.43	89.16	2.56	228.04	57	3957	0.52	0.048	0.01	11.89	0.00	0.000
42.26	2.42	94.61	2.45	232.22	58	4078	0.52	0.046	0.01	11.89	0.00	0.000
42.32	2.40	99.51	2.37	235.65	58	4184	0.52	0.044	0.01	11.89	0.00	0.000
42.40	2.39	103.41	2.31	239.08	58	4278	0.52	0.043	0.01	11.89	0.00	0.000
42.47	2.40	102.69	2.36	242.46	60	4321	0.52	0.042	0.01	11.89	0.00	0.000
42.55	2.42	98.32	2.49	244.60	61	4305	0.52	0.043	0.01	11.89	0.00	0.000
42.62	2.43	93.93	2.56	240.89	60	4210	0.51	0.044	0.01	11.89	0.00	0.000
42.66	2.41	93.08	2.42	225.41	56	4005	0.51	0.048	0.01	11.89	0.00	0.000
42.73	2.35	96.97	2.14	207.51	50	3807	0.51	0.051	0.02	11.89	0.00	0.000
42.80	2.29	103.17	1.88	193.45	45	3645	0.51	0.055	0.02	11.89	0.01	0.000
42.88	2.23	110.54	1.70	188.16	43	3583	0.51	0.057	0.02	11.89	0.01	0.000
42.95	2.19	115.62	1.59	183.98	41	3502	0.51	0.059	0.02	11.89	0.01	0.000
42.99	2.15	119.52	1.51	179.99	40	3396	0.51	0.062	0.03	11.89	0.01	0.000
43.07	2.12	120.89	1.45	175.52	38	3275	0.51	0.066	0.03	11.89	0.01	0.000
43.14	2.10	121.28	1.41	171.21	37	3152	0.51	0.071	0.03	11.89	0.01	0.000
43.18	2.09	118.16	1.41	166.57	0	0	0.51	0.000	0.00	11.89	0.00	0.000
43.26	2.11	113.69	1.43	163.09	0	0	0.51	0.000	0.00	11.89	0.00	0.000
43.33	2.14	108.57	1.49	161.29	0	0	0.51	0.000	0.00	11.89	0.00	0.000
43.41	2.17	104.95	1.54	161.86	0	0	0.51	0.000	0.00	11.89	0.00	0.000
43.45	2.20	101.29	1.62	164.54	0	0	0.51	0.000	0.00	11.89	0.00	0.000
43.53	2.24	97.88	1.72	167.89	0	0	0.51	0.000	0.00	11.89	0.00	0.000
43.57	2.29	92.13	1.89	174.46	0	0	0.51	0.000	0.00	11.89	0.00	0.000
43.64	2.36	84.72	2.18	185.10	0	0	0.51	0.000	0.00	11.89	0.00	0.000
43.72	2.45	76.11	2.65	201.39	0	0	0.51	0.000	0.00	11.89	0.00	0.000
43.79	2.53	68.96	3.17	218.34	0	0	0.51	0.000	0.00	11.89	0.00	0.000
43.87	2.58	64.40	3.58	230.60	0	0	0.51	0.000	0.00	11.89	0.00	0.000
43.91	2.62	60.63	3.97	240.39	0	0	0.51	0.000	0.00	0.00	0.00	0.000
43.98	2.67	57.00	4.36	248.54	0	0	0.51	0.000	0.00	0.00	0.00	0.000
44.05	2.71	53.15	4.81	255.62	0	0	0.51	0.000	0.00	0.00	0.00	0.000
44.13	2.74	50.94	5.09	259.08	0	0	0.51	0.000	0.00	0.00	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
44.17	2.74	50.14	5.17	259.07	0	0	0.51	0.000	0.00	0.00	0.00	0.000
44.24	2.74	50.18	5.11	256.19	0	0	0.51	0.000	0.00	0.00	0.00	0.000
44.32	2.73	49.84	5.08	253.12	0	0	0.51	0.000	0.00	0.00	0.00	0.000
44.40	2.73	49.49	5.07	250.72	0	0	0.51	0.000	0.00	0.00	0.00	0.000
44.44	2.73	49.39	5.06	250.14	0	0	0.51	0.000	0.00	0.00	0.00	0.000
44.51	2.73	50.02	4.98	249.12	0	0	0.51	0.000	0.00	0.00	0.00	0.000
44.58	2.71	51.15	4.85	247.84	0	0	0.51	0.000	0.00	0.00	0.00	0.000
44.66	2.70	52.43	4.70	246.45	0	0	0.51	0.000	0.00	0.00	0.00	0.000
44.69	2.69	53.29	4.61	245.89	0	0	0.51	0.000	0.00	0.00	0.00	0.000
44.77	2.70	52.26	4.73	247.10	0	0	0.51	0.000	0.00	0.00	0.00	0.000
44.85	2.72	50.95	4.88	248.58	0	0	0.51	0.000	0.00	0.00	0.00	0.000
44.89	2.73	50.11	4.99	249.85	0	0	0.51	0.000	0.00	0.00	0.00	0.000
44.96	2.72	51.06	4.87	248.59	0	0	0.51	0.000	0.00	0.00	0.00	0.000
45.03	2.70	52.18	4.72	246.41	0	0	0.51	0.000	0.00	0.00	0.00	0.000
45.08	2.69	52.84	4.62	244.40	0	0	0.51	0.000	0.00	0.00	0.00	0.000
45.15	2.69	53.03	4.57	242.39	0	0	0.51	0.000	0.00	0.00	0.00	0.000
45.23	2.68	53.28	4.50	239.83	0	0	0.51	0.000	0.00	0.00	0.00	0.000
45.30	2.67	53.73	4.37	234.82	0	0	0.50	0.000	0.00	0.00	0.00	0.000
45.38	2.65	54.16	4.23	229.20	0	0	0.50	0.000	0.00	0.00	0.00	0.000
45.42	2.64	54.42	4.09	222.62	0	0	0.50	0.000	0.00	0.00	0.00	0.000
45.50	2.62	54.81	3.94	215.89	0	0	0.50	0.000	0.00	0.00	0.00	0.000
45.56	2.60	55.64	3.72	207.14	0	0	0.50	0.000	0.00	11.89	0.00	0.000
45.64	2.57	56.61	3.49	197.31	0	0	0.50	0.000	0.00	11.89	0.00	0.000
45.68	2.52	58.32	3.11	181.48	0	0	0.50	0.000	0.00	11.89	0.00	0.000
45.75	2.47	60.55	2.75	166.66	0	0	0.50	0.000	0.00	11.89	0.00	0.000
45.83	2.41	63.15	2.44	154.10	0	0	0.50	0.000	0.00	11.89	0.00	0.000
45.87	2.37	66.11	2.22	146.88	0	0	0.50	0.000	0.00	11.89	0.00	0.000
45.95	2.33	68.82	2.03	139.81	0	0	0.50	0.000	0.00	11.89	0.00	0.000
46.02	2.28	71.42	1.87	133.35	0	0	0.50	0.000	0.00	11.89	0.00	0.000
46.09	2.24	74.81	1.72	129.04	0	0	0.50	0.000	0.00	11.89	0.00	0.000
46.16	2.20	78.05	1.62	126.68	0	0	0.50	0.000	0.00	11.89	0.00	0.000
46.20	2.17	82.31	1.53	126.35	0	0	0.50	0.000	0.00	11.89	0.00	0.000
46.28	2.14	85.93	1.48	127.48	0	0	0.50	0.000	0.00	11.89	0.00	0.000
46.36	2.11	90.60	1.44	130.42	0	0	0.50	0.000	0.00	11.89	0.00	0.000
46.43	2.10	94.84	1.41	134.10	0	0	0.50	0.000	0.00	11.89	0.00	0.000
46.47	2.09	99.13	1.40	139.21	0	0	0.50	0.000	0.00	11.89	0.00	0.000
46.54	2.09	103.64	1.40	145.04	0	0	0.50	0.000	0.00	11.89	0.00	0.000
46.62	2.08	108.80	1.39	151.35	0	0	0.50	0.000	0.00	11.89	0.00	0.000
46.69	2.07	113.34	1.38	156.29	0	0	0.50	0.000	0.00	11.89	0.00	0.000
46.73	2.06	118.03	1.36	160.86	0	0	0.50	0.000	0.00	11.89	0.00	0.000
46.80	2.04	121.81	1.35	164.35	0	0	0.50	0.000	0.00	11.89	0.00	0.000
46.88	2.04	124.71	1.34	167.06	0	0	0.50	0.000	0.00	11.89	0.00	0.000
46.92	2.03	126.11	1.34	168.54	0	0	0.50	0.000	0.00	11.89	0.00	0.000
46.99	2.03	127.28	1.34	170.24	36	3171	0.50	0.073	0.04	11.89	0.01	0.000
47.06	2.03	129.23	1.34	172.55	36	3210	0.50	0.072	0.04	11.89	0.01	0.000
47.14	2.03	130.97	1.33	174.54	37	3243	0.50	0.071	0.03	11.89	0.01	0.000
47.18	2.02	132.90	1.33	176.42	37	3263	0.50	0.070	0.03	11.89	0.01	0.000
47.25	2.02	133.97	1.33	177.78	37	3290	0.50	0.069	0.03	11.89	0.01	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
47.33	2.02	134.93	1.33	179.14	38	3321	0.50	0.068	0.03	11.89	0.01	0.000
47.41	2.02	135.37	1.33	179.90	38	3343	0.50	0.067	0.03	11.89	0.01	0.000
47.45	2.02	136.44	1.33	180.99	38	3357	0.50	0.067	0.03	11.89	0.01	0.000
47.51	2.01	138.68	1.32	182.93	38	3369	0.50	0.066	0.03	11.89	0.01	0.000
47.59	2.00	141.58	1.31	185.52	39	3386	0.50	0.066	0.03	11.89	0.01	0.000
47.66	2.00	144.46	1.30	188.41	39	3416	0.50	0.065	0.03	11.89	0.01	0.000
47.74	1.99	146.43	1.30	190.59	40	3447	0.49	0.064	0.03	11.89	0.00	0.000
47.78	1.99	148.47	1.30	192.85	40	3477	0.49	0.063	0.03	11.89	0.00	0.000
47.85	1.99	149.93	1.30	194.26	40	3490	0.49	0.063	0.03	11.89	0.00	0.000
47.93	1.98	151.80	1.29	195.94	40	3499	0.49	0.063	0.03	11.89	0.00	0.000
48.00	1.97	153.31	1.29	197.23	41	3504	0.49	0.062	0.03	11.89	0.00	0.000
48.03	1.96	156.52	1.28	199.96	41	3505	0.49	0.062	0.03	11.89	0.00	0.000
48.12	1.95	160.11	1.27	203.19	41	3516	0.49	0.062	0.03	11.89	0.00	0.000
48.19	2.06	107.70	1.36	146.96	31	4120	0.49	0.049	0.03	11.89	0.00	0.000
48.27	2.05	108.91	1.36	147.61	31	4130	0.49	0.048	0.03	11.89	0.00	0.000
48.31	2.04	110.02	1.34	147.62	31	4109	0.49	0.049	0.03	11.89	0.00	0.000
48.38	2.02	111.85	1.32	148.16	31	4091	0.49	0.049	0.03	11.89	0.00	0.000
48.45	2.00	115.42	1.30	150.59	31	4107	0.49	0.049	0.03	11.89	0.00	0.000
48.52	1.98	119.54	1.29	154.07	32	4152	0.49	0.048	0.03	11.89	0.00	0.000
48.56	1.96	123.86	1.28	158.15	32	4216	0.49	0.047	0.03	11.89	0.00	0.000
48.63	1.94	127.08	1.27	160.78	33	4239	0.49	0.047	0.03	11.89	0.00	0.000
48.70	1.92	129.18	1.25	161.68	33	4205	0.49	0.047	0.03	11.89	0.00	0.000
48.78	1.91	129.77	1.24	161.52	33	4175	0.49	0.048	0.03	11.89	0.00	0.000
48.86	1.91	129.11	1.24	160.69	32	4160	0.49	0.048	0.03	11.89	0.00	0.000
48.89	1.92	128.48	1.25	160.68	32	4192	0.49	0.048	0.03	11.89	0.00	0.000
48.97	1.92	127.56	1.25	159.87	32	4190	0.49	0.048	0.03	11.89	0.00	0.000
49.04	1.93	127.35	1.25	159.69	32	4195	0.49	0.048	0.03	11.89	0.00	0.000
49.09	1.93	127.57	1.26	160.15	32	4217	0.49	0.047	0.03	11.89	0.00	0.000
49.18	1.92	128.69	1.25	161.28	33	4246	0.49	0.047	0.03	11.89	0.00	0.000
49.22	1.91	130.46	1.25	162.62	33	4253	0.49	0.047	0.03	11.89	0.00	0.000
49.29	1.90	132.14	1.24	163.21	33	4221	0.49	0.047	0.03	11.89	0.00	0.000
49.36	1.88	133.89	1.22	163.86	33	4194	0.49	0.048	0.03	11.89	0.00	0.000
49.43	1.87	134.77	1.22	163.76	32	4164	0.49	0.048	0.03	11.89	0.00	0.000
49.51	1.86	134.82	1.21	163.13	32	4136	0.49	0.049	0.03	11.89	0.00	0.000
49.55	1.85	134.86	1.20	162.06	32	4085	0.49	0.050	0.03	11.89	0.00	0.000
49.62	1.85	132.86	1.20	158.98	31	4000	0.49	0.051	0.03	11.89	0.00	0.000
49.70	1.85	127.91	1.20	153.90	30	3896	0.49	0.053	0.03	11.89	0.00	0.000
49.77	1.88	120.98	1.22	147.78	29	3807	0.49	0.055	0.03	11.89	0.00	0.000
49.81	1.93	112.48	1.26	141.49	29	3795	0.49	0.056	0.04	11.89	0.01	0.000
49.88	2.00	104.22	1.31	136.01	28	3826	0.49	0.055	0.04	11.89	0.01	0.000
49.95	2.10	92.60	1.41	130.82	28	3857	0.48	0.054	0.04	11.89	0.00	0.000
50.04	2.17	84.59	1.54	130.15	29	3863	0.48	0.054	0.03	11.89	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)

Total estimated settlement: 0.15

Abbreviations

Q_{tn}: Equivalent clean sand normalized cone resistance
K_c: Fines correction factor
$Q_{tn,cs}$: Post-liquefaction volumentric strain
G_{max}: Small strain shear modulus
CSR: Soil cyclic stress ratio
γ: Cyclic shear strain
$e_{vol(15)}$: Volumetric strain after 15 cycles
N_c: Equivalent number of cycles
e_v: Volumetric strain
Settle.: Calculated settlement

GeoTek, Inc.
1548 N. Maple Street
Corona, CA 92878
951-710-1160, www.geotekusa.com

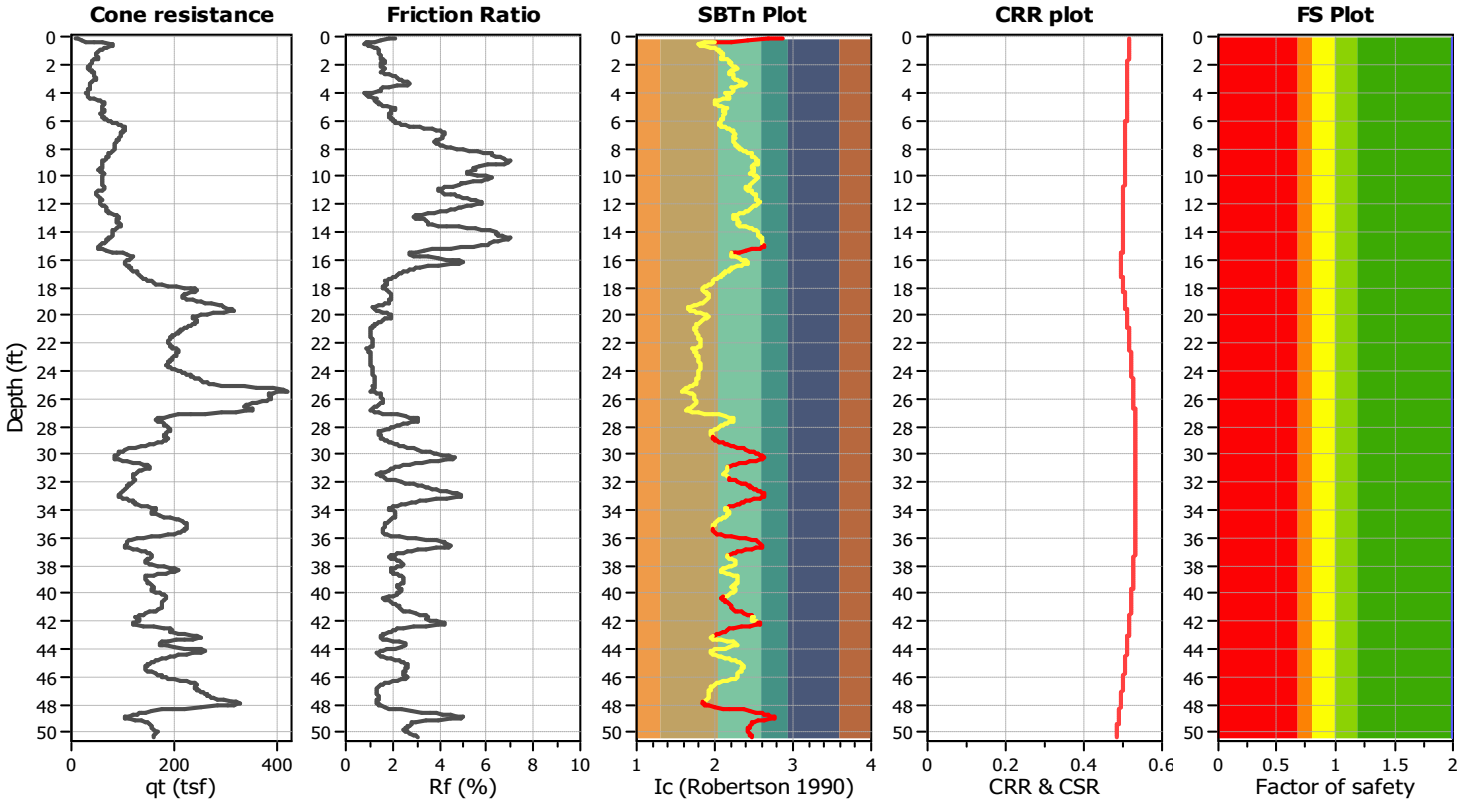
LIQUEFACTION ANALYSIS REPORT

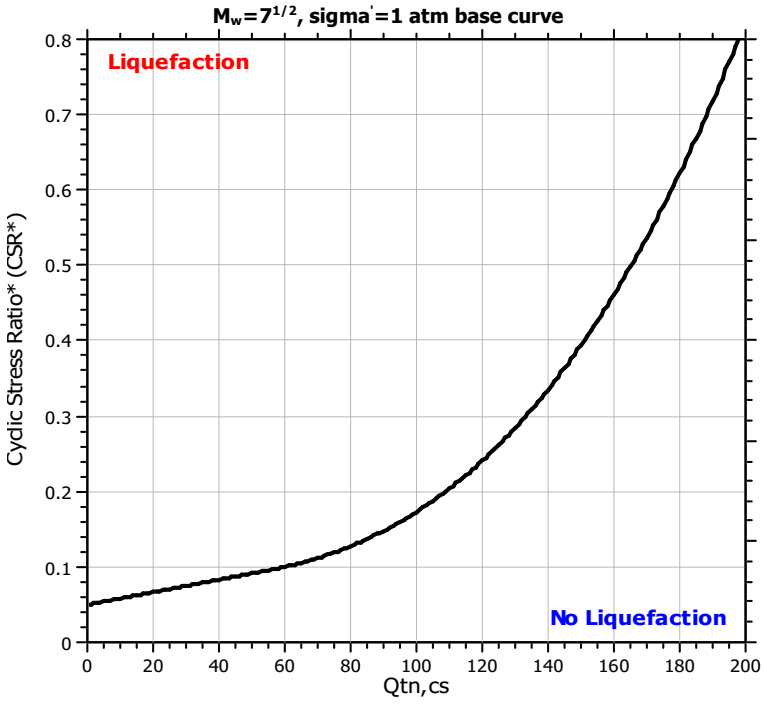
Project title : Xenia Site **Location : Beaumont, California**

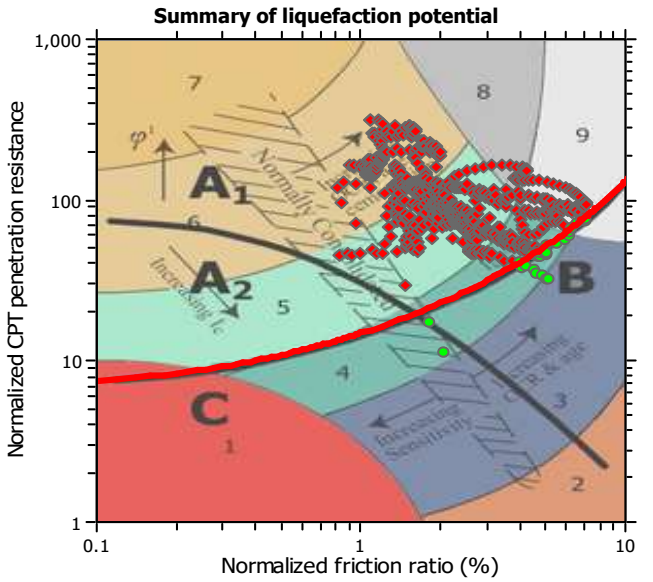
CPT file : CPT-3

Input parameters and analysis data

Analysis method:	NCEER (1998)	G.W.T. (in-situ):	100.00 ft	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	100.00 ft	Fill height:	N/A	Limit depth applied:	Yes
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	60.00 ft
Earthquake magnitude M_w:	7.13	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	0.90	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

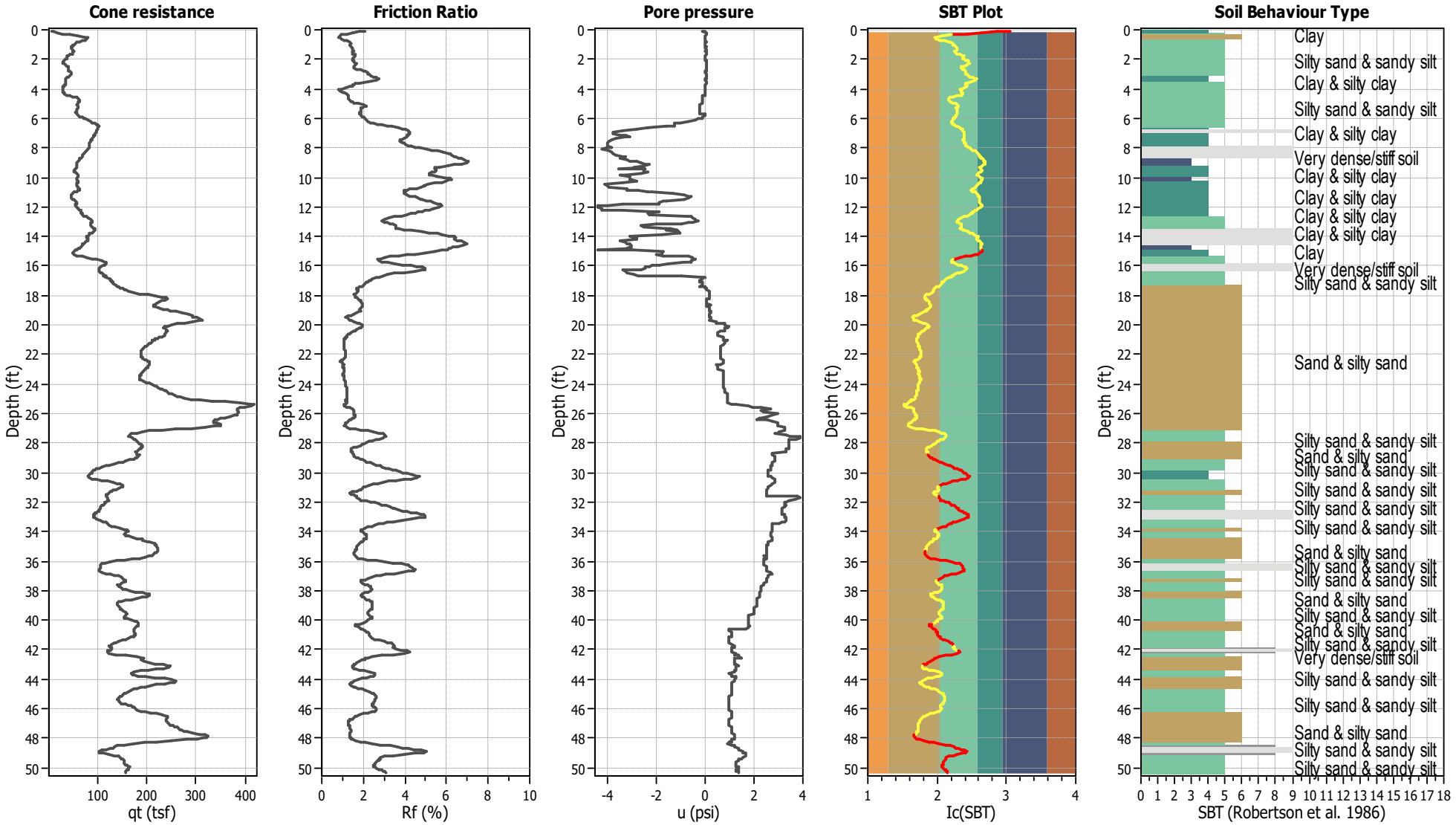






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plots



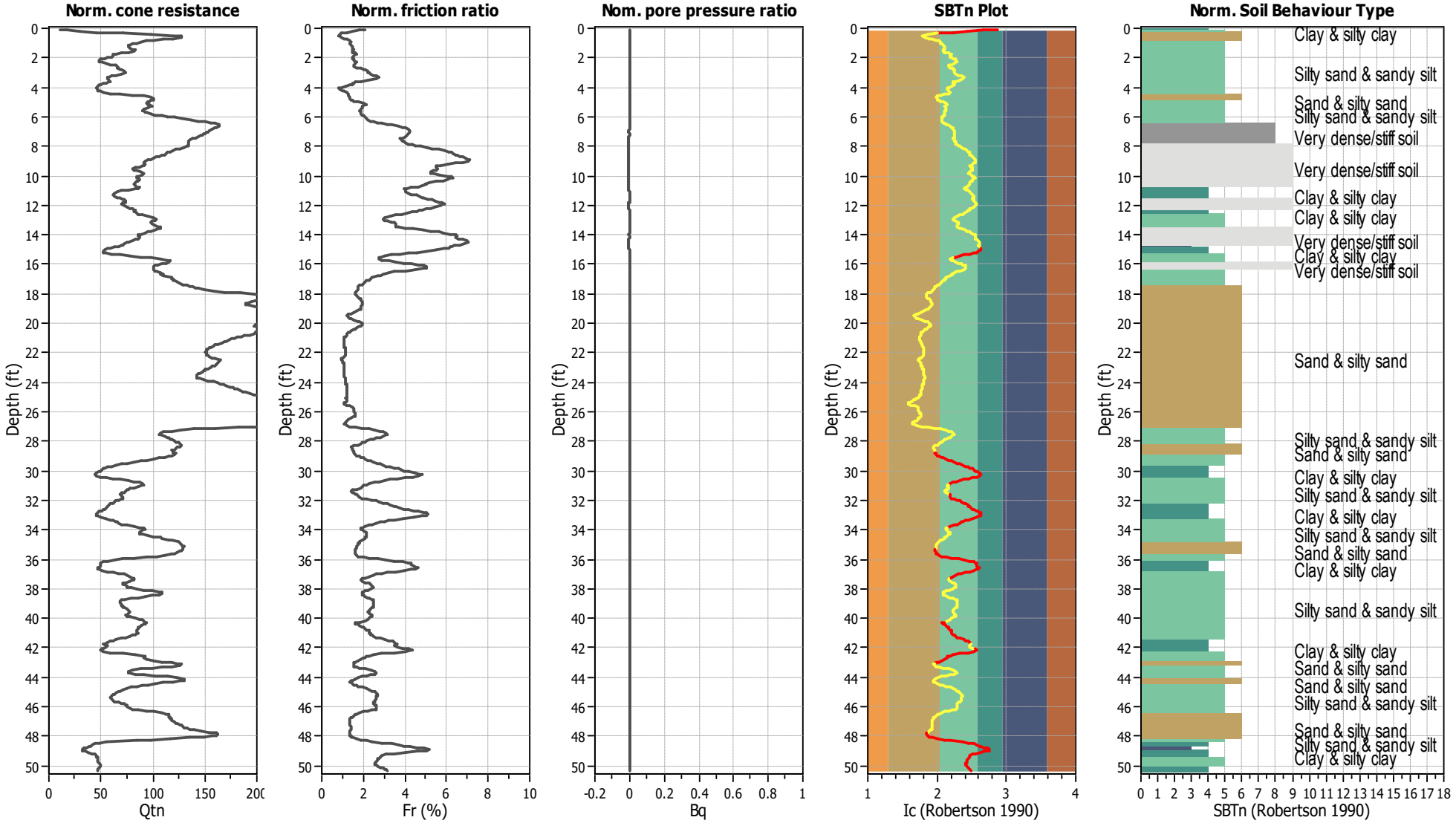
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	100.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.13	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.90	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	100.00 ft	Fill height:	N/A	Limit depth:	60.00 ft

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

CPT basic interpretation plots (normalized)



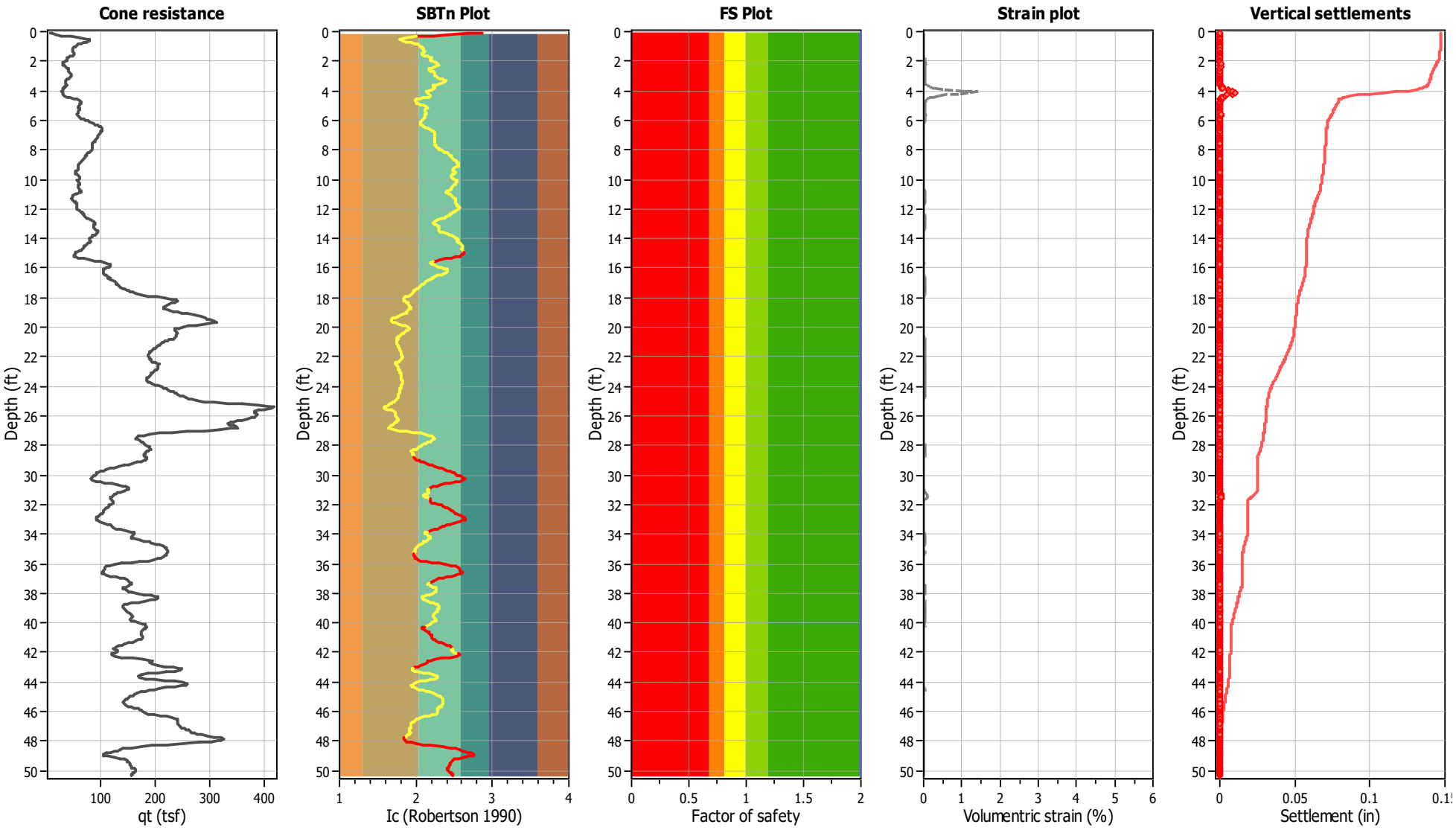
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	100.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.13	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.90	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	100.00 ft	Fill height:	N/A	Limit depth:	60.00 ft

SBTn legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

Estimation of post-earthquake settlements



Abbreviations

q_t:	Total cone resistance (cone resistance q_c corrected for pore water effects)
I_c:	Soil Behaviour Type Index
FS:	Calculated Factor of Safety against liquefaction
Volumentric strain:	Post-liquefaction volumentric strain

:: Post-earthquake settlement of dry sands ::

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
0.10	2.87	11.24	6.71	75.46	0	0	0.51	0.000	0.00	0.00	0.00	0.000
0.14	2.68	17.24	4.51	77.67	0	0	0.51	0.000	0.00	0.00	0.00	0.000
0.22	2.43	29.49	2.56	75.54	0	0	0.51	0.000	0.00	11.89	0.00	0.000
0.30	2.22	46.28	1.67	77.51	0	0	0.51	0.000	0.00	11.89	0.00	0.000
0.34	2.01	71.67	1.32	94.42	0	0	0.51	0.000	0.00	11.89	0.00	0.000
0.42	1.87	97.41	1.22	118.59	0	0	0.51	0.000	0.00	11.89	0.00	0.000
0.49	1.79	119.61	1.15	137.03	26	649	0.51	0.003	0.00	11.89	0.00	0.000
0.56	1.78	128.05	1.13	145.21	28	687	0.51	0.004	0.00	11.89	0.00	0.000
0.60	1.82	127.20	1.17	148.97	29	711	0.51	0.004	0.00	11.89	0.00	0.000
0.68	1.88	119.04	1.22	145.28	29	717	0.51	0.004	0.00	11.89	0.00	0.000
0.76	1.94	110.08	1.26	138.72	28	715	0.51	0.005	0.00	11.89	0.00	0.000
0.79	1.99	100.83	1.30	131.03	27	702	0.51	0.005	0.00	11.89	0.00	0.000
0.87	2.02	94.62	1.32	125.25	26	683	0.51	0.006	0.00	11.89	0.00	0.000
0.96	2.04	88.86	1.35	119.61	25	661	0.51	0.008	0.01	11.89	0.01	0.000
1.00	2.05	84.26	1.36	114.57	24	636	0.51	0.009	0.01	11.89	0.01	0.000
1.08	2.07	80.65	1.38	111.20	24	622	0.51	0.010	0.01	11.89	0.01	0.000
1.15	2.09	77.90	1.40	109.04	23	613	0.51	0.011	0.01	11.89	0.01	0.000
1.19	2.10	76.99	1.41	108.85	24	613	0.51	0.012	0.01	11.89	0.01	0.000
1.26	2.11	76.99	1.43	109.93	24	621	0.51	0.013	0.01	11.89	0.01	0.000
1.34	2.11	78.23	1.43	111.83	24	632	0.51	0.013	0.01	11.89	0.01	0.000
1.42	2.10	80.37	1.42	114.05	25	643	0.51	0.014	0.01	11.89	0.01	0.000
1.45	2.08	82.87	1.39	115.50	25	648	0.51	0.014	0.01	11.89	0.01	0.000
1.53	2.09	81.61	1.40	114.08	25	641	0.51	0.016	0.01	11.89	0.01	0.000
1.61	2.11	77.15	1.43	110.62	24	625	0.51	0.018	0.01	11.89	0.01	0.000
1.65	2.16	69.85	1.52	106.46	24	603	0.51	0.021	0.02	11.89	0.01	0.000
1.72	2.19	64.84	1.60	103.73	23	585	0.51	0.024	0.02	11.89	0.02	0.000
1.81	2.21	62.19	1.63	101.42	23	570	0.51	0.028	0.02	11.89	0.02	0.000
1.85	2.19	61.63	1.60	98.42	22	555	0.51	0.032	0.03	11.89	0.02	0.000
1.92	2.19	60.08	1.60	95.83	22	540	0.51	0.037	0.03	11.89	0.03	0.000
1.99	2.21	56.57	1.64	92.70	21	520	0.51	0.045	0.04	11.89	0.04	0.000
2.07	2.24	53.06	1.71	90.75	21	504	0.51	0.054	0.05	11.89	0.04	0.000
2.10	2.26	50.00	1.79	89.61	21	491	0.51	0.061	0.06	11.89	0.05	0.000
2.19	2.28	48.90	1.84	89.74	21	489	0.51	0.067	0.06	11.89	0.06	0.001
2.26	2.29	48.59	1.89	91.66	21	494	0.51	0.069	0.06	11.89	0.05	0.000
2.30	2.28	50.54	1.85	93.33	22	507	0.51	0.065	0.06	11.89	0.05	0.000
2.38	2.25	54.38	1.75	95.10	22	525	0.51	0.061	0.06	11.89	0.05	0.000
2.46	2.21	59.12	1.63	96.64	22	543	0.51	0.058	0.05	11.89	0.05	0.000
2.50	2.18	63.77	1.56	99.44	22	562	0.51	0.053	0.05	11.89	0.04	0.000
2.57	2.18	65.62	1.56	102.46	23	579	0.51	0.051	0.04	11.89	0.04	0.000
2.65	2.20	66.56	1.60	106.81	24	602	0.51	0.048	0.04	11.89	0.03	0.000
2.72	2.22	66.35	1.68	111.28	25	621	0.51	0.045	0.03	11.89	0.03	0.000
2.76	2.24	67.80	1.72	116.45	27	646	0.51	0.041	0.03	11.89	0.03	0.000
2.83	2.24	69.94	1.73	121.01	28	670	0.51	0.039	0.03	11.89	0.02	0.000
2.91	2.24	72.48	1.73	125.56	29	695	0.51	0.037	0.02	11.89	0.02	0.000
2.98	2.24	74.37	1.73	128.47	29	712	0.51	0.036	0.02	11.89	0.02	0.000
3.02	2.25	73.51	1.76	129.67	30	714	0.51	0.037	0.02	11.89	0.02	0.000
3.09	2.28	70.11	1.84	129.24	30	703	0.51	0.040	0.02	11.89	0.02	0.000
3.17	2.31	65.06	1.97	128.30	30	681	0.51	0.046	0.03	11.89	0.02	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
3.24	2.35	60.30	2.14	129.16	31	664	0.51	0.052	0.03	11.89	0.03	0.000
3.32	2.38	57.44	2.28	130.68	32	656	0.51	0.056	0.03	11.89	0.03	0.000
3.36	2.39	56.08	2.34	131.28	32	651	0.51	0.059	0.03	11.89	0.03	0.000
3.43	2.37	56.07	2.25	125.93	31	635	0.51	0.067	0.04	11.89	0.03	0.000
3.50	2.32	57.27	2.00	114.79	27	606	0.51	0.082	0.06	11.89	0.05	0.000
3.58	2.26	58.57	1.79	104.57	24	574	0.51	0.106	0.08	11.89	0.07	0.001
3.61	2.22	57.92	1.67	96.90	22	541	0.51	0.138	0.12	11.89	0.10	0.000
3.70	2.23	55.20	1.68	92.87	21	518	0.51	0.176	0.16	11.89	0.14	0.001
3.77	2.24	51.70	1.73	89.54	21	496	0.51	0.227	0.22	11.89	0.19	0.002
3.84	2.25	50.19	1.75	87.86	20	485	0.51	0.264	0.26	11.89	0.22	0.002
3.88	2.24	48.59	1.73	83.86	19	465	0.51	0.336	0.35	11.89	0.30	0.001
3.96	2.21	46.88	1.63	76.28	17	429	0.51	0.554	0.66	11.89	0.56	0.006
4.03	2.16	46.00	1.52	70.01	16	397	0.51	0.924	1.25	11.89	1.05	0.009
4.07	2.14	45.40	1.49	67.57	15	383	0.51	1.189	1.70	11.89	1.42	0.007
4.15	2.15	46.35	1.51	69.83	15	396	0.51	1.017	1.39	11.89	1.16	0.010
4.22	2.17	47.17	1.54	72.64	16	411	0.51	0.844	1.09	11.89	0.91	0.008
4.29	2.18	49.71	1.56	77.49	17	438	0.51	0.606	0.72	11.89	0.60	0.005
4.36	2.18	52.80	1.57	82.94	19	469	0.51	0.437	0.48	11.89	0.40	0.004
4.41	2.16	58.69	1.53	89.63	20	508	0.51	0.295	0.30	11.89	0.25	0.001
4.48	2.11	68.63	1.43	97.93	21	553	0.51	0.205	0.19	11.89	0.16	0.001
4.56	2.05	79.98	1.35	108.24	23	600	0.51	0.150	0.13	11.89	0.11	0.001
4.60	2.01	90.67	1.32	119.26	25	647	0.51	0.113	0.09	11.89	0.07	0.000
4.68	2.00	97.37	1.30	126.96	26	683	0.51	0.095	0.07	11.89	0.06	0.001
4.75	2.00	100.61	1.31	131.46	27	709	0.51	0.087	0.06	11.89	0.05	0.000
4.82	2.01	100.30	1.32	131.97	28	716	0.51	0.086	0.06	11.89	0.05	0.000
4.86	2.03	98.65	1.33	131.16	28	718	0.51	0.087	0.06	11.89	0.05	0.000
4.93	2.05	96.74	1.36	131.30	28	729	0.51	0.085	0.06	11.89	0.05	0.000
5.02	2.09	95.49	1.41	134.30	29	756	0.51	0.078	0.05	11.89	0.04	0.000
5.09	2.13	94.48	1.47	138.87	30	787	0.51	0.070	0.04	11.89	0.03	0.000
5.13	2.15	95.17	1.50	143.01	32	811	0.51	0.065	0.04	11.89	0.03	0.000
5.20	2.14	96.82	1.48	143.39	32	813	0.51	0.066	0.04	11.89	0.03	0.000
5.28	2.12	98.80	1.44	142.56	31	806	0.51	0.070	0.04	11.89	0.03	0.000
5.32	2.11	97.95	1.43	140.16	30	792	0.51	0.075	0.05	11.89	0.04	0.000
5.40	2.12	94.64	1.45	137.06	30	776	0.51	0.083	0.05	11.89	0.04	0.000
5.47	2.13	91.29	1.47	133.76	29	758	0.51	0.092	0.06	11.89	0.05	0.000
5.55	2.13	89.98	1.46	131.42	29	744	0.51	0.101	0.07	11.89	0.05	0.001
5.59	2.12	90.92	1.44	131.19	29	742	0.51	0.104	0.07	11.89	0.06	0.000
5.66	2.12	91.97	1.44	132.77	29	751	0.51	0.102	0.07	11.89	0.05	0.000
5.74	2.11	94.11	1.44	135.50	29	766	0.51	0.098	0.06	11.89	0.05	0.000
5.78	2.11	97.41	1.43	139.57	30	789	0.51	0.090	0.05	11.89	0.04	0.000
5.85	2.10	102.35	1.42	145.23	31	819	0.51	0.081	0.05	11.89	0.04	0.000
5.93	2.09	108.79	1.41	152.89	33	860	0.51	0.072	0.04	11.89	0.03	0.000
6.01	2.08	114.58	1.40	159.97	34	898	0.51	0.064	0.03	11.89	0.03	0.000
6.04	2.07	121.28	1.38	167.57	36	938	0.51	0.058	0.03	11.89	0.02	0.000
6.12	2.07	128.07	1.37	175.78	38	981	0.51	0.052	0.02	11.89	0.02	0.000
6.19	2.06	136.76	1.37	187.10	40	1043	0.51	0.045	0.02	11.89	0.02	0.000
6.27	2.06	144.04	1.37	197.42	42	1101	0.51	0.041	0.02	11.89	0.01	0.000
6.31	2.07	150.43	1.38	207.89	45	1163	0.51	0.036	0.01	11.89	0.01	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
6.39	2.09	155.72	1.40	218.47	47	1229	0.51	0.033	0.01	11.89	0.01	0.000
6.46	2.11	160.11	1.43	228.78	50	1292	0.51	0.030	0.01	11.89	0.01	0.000
6.50	2.13	163.15	1.46	238.83	52	1353	0.51	0.028	0.01	11.89	0.01	0.000
6.57	2.15	163.89	1.51	247.61	55	1404	0.51	0.026	0.01	11.89	0.01	0.000
6.65	2.18	163.17	1.57	256.94	58	1452	0.51	0.025	0.01	11.89	0.01	0.000
6.72	2.21	161.55	1.63	263.69	60	1481	0.51	0.025	0.01	11.89	0.01	0.000
6.77	2.22	159.39	1.68	267.59	61	1494	0.51	0.025	0.01	11.89	0.01	0.000
6.84	2.24	157.12	1.71	269.02	62	1494	0.51	0.025	0.01	11.89	0.01	0.000
6.92	2.25	154.61	1.74	269.01	62	1488	0.51	0.026	0.01	11.89	0.01	0.000
6.99	2.25	152.65	1.75	267.84	62	1478	0.51	0.026	0.01	11.89	0.01	0.000
7.03	2.25	151.30	1.76	265.64	61	1466	0.51	0.027	0.01	11.89	0.01	0.000
7.10	2.25	150.49	1.75	263.38	61	1454	0.51	0.028	0.01	11.89	0.01	0.000
7.18	2.25	149.24	1.75	260.81	60	1441	0.51	0.029	0.01	11.89	0.01	0.000
7.25	2.25	148.04	1.75	258.89	60	1430	0.51	0.030	0.01	11.89	0.01	0.000
7.29	2.25	146.08	1.76	256.62	59	1416	0.51	0.030	0.01	11.89	0.01	0.000
7.37	2.25	143.46	1.74	249.99	57	1382	0.51	0.032	0.01	11.89	0.01	0.000
7.45	2.24	140.55	1.72	242.14	56	1343	0.51	0.035	0.01	11.89	0.01	0.000
7.49	2.24	137.84	1.71	235.83	54	1310	0.51	0.037	0.01	11.89	0.01	0.000
7.57	2.24	136.03	1.73	235.36	54	1304	0.51	0.038	0.01	11.89	0.01	0.000
7.64	2.25	134.63	1.76	236.92	55	1306	0.51	0.039	0.01	11.89	0.01	0.000
7.68	2.26	133.92	1.78	238.98	55	1312	0.51	0.038	0.01	11.89	0.01	0.000
7.75	2.27	133.56	1.81	242.34	56	1324	0.51	0.038	0.01	11.89	0.01	0.000
7.82	2.28	134.20	1.84	247.42	58	1345	0.51	0.038	0.01	11.89	0.01	0.000
7.90	2.29	134.55	1.89	254.16	60	1370	0.51	0.037	0.01	11.89	0.01	0.000
7.97	2.30	134.54	1.94	260.70	61	1393	0.51	0.036	0.01	11.89	0.01	0.000
8.01	2.33	132.64	2.03	268.86	64	1413	0.51	0.035	0.01	11.89	0.01	0.000
8.09	2.35	129.78	2.14	277.91	67	1430	0.51	0.035	0.01	11.89	0.01	0.000
8.17	2.38	126.52	2.27	287.13	70	1443	0.51	0.035	0.01	11.89	0.01	0.000
8.21	2.41	122.72	2.41	295.59	73	1448	0.51	0.035	0.01	11.89	0.01	0.000
8.29	2.43	119.21	2.54	302.49	75	1449	0.51	0.035	0.01	11.89	0.01	0.000
8.37	2.45	116.30	2.65	308.28	78	1448	0.51	0.036	0.01	11.89	0.01	0.000
8.40	2.46	114.35	2.72	311.11	79	1445	0.51	0.036	0.01	11.89	0.01	0.000
8.48	2.47	112.85	2.77	312.19	79	1439	0.51	0.037	0.01	11.89	0.01	0.000
8.55	2.48	110.79	2.83	313.64	80	1431	0.50	0.038	0.01	11.89	0.01	0.000
8.63	2.49	109.08	2.89	315.12	81	1425	0.50	0.039	0.01	11.89	0.01	0.000
8.67	2.50	106.53	2.98	317.34	82	1415	0.50	0.040	0.01	11.89	0.01	0.000
8.74	2.52	103.52	3.08	319.25	83	1401	0.50	0.041	0.01	11.89	0.01	0.000
8.82	2.53	100.37	3.20	320.99	84	1386	0.50	0.043	0.01	11.89	0.01	0.000
8.86	2.54	97.57	3.30	321.79	85	1370	0.50	0.044	0.01	11.89	0.01	0.000
8.93	2.55	95.07	3.36	319.84	85	1350	0.50	0.046	0.01	11.89	0.01	0.000
9.01	2.56	92.56	3.39	313.64	83	1319	0.50	0.049	0.01	11.89	0.01	0.000
9.09	2.55	91.46	3.33	304.24	80	1290	0.50	0.053	0.01	11.89	0.01	0.000
9.13	2.53	91.80	3.18	291.98	76	1264	0.50	0.056	0.01	11.89	0.01	0.000
9.20	2.50	92.75	3.01	279.00	72	1239	0.50	0.060	0.01	11.89	0.01	0.000
9.28	2.49	91.72	2.89	264.85	68	1212	0.50	0.064	0.01	11.89	0.01	0.000
9.35	2.48	89.84	2.84	255.20	65	1187	0.50	0.069	0.02	11.89	0.01	0.000
9.39	2.49	86.78	2.89	250.65	64	1159	0.50	0.074	0.02	11.89	0.01	0.000
9.46	2.50	83.42	2.98	248.56	64	1137	0.50	0.079	0.02	11.89	0.01	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
9.55	2.51	80.78	3.06	246.91	64	1122	0.50	0.083	0.02	11.89	0.02	0.000
9.58	2.51	81.28	3.02	245.41	63	1127	0.50	0.083	0.02	11.89	0.02	0.000
9.66	2.49	84.20	2.89	243.42	62	1152	0.50	0.079	0.02	11.89	0.02	0.000
9.73	2.47	88.24	2.76	243.25	62	1190	0.50	0.073	0.02	11.89	0.01	0.000
9.81	2.46	91.06	2.69	245.02	62	1223	0.50	0.069	0.02	11.89	0.01	0.000
9.85	2.46	91.68	2.74	251.10	64	1245	0.50	0.066	0.02	11.89	0.01	0.000
9.93	2.49	89.39	2.91	259.79	67	1256	0.50	0.066	0.02	11.89	0.01	0.000
10.00	2.52	86.37	3.12	269.06	70	1261	0.50	0.066	0.01	11.89	0.01	0.000
10.04	2.54	84.38	3.27	275.62	72	1263	0.50	0.066	0.01	11.89	0.01	0.000
10.11	2.54	84.39	3.27	276.10	73	1272	0.50	0.066	0.01	11.89	0.01	0.000
10.19	2.53	85.61	3.19	273.32	71	1285	0.50	0.065	0.01	11.89	0.01	0.000
10.26	2.52	86.60	3.12	270.09	70	1294	0.50	0.065	0.01	11.89	0.01	0.000
10.34	2.51	86.33	3.06	263.74	68	1286	0.50	0.066	0.02	11.89	0.01	0.000
10.38	2.49	84.74	2.93	248.44	64	1243	0.50	0.073	0.02	11.89	0.01	0.000
10.45	2.47	83.70	2.81	234.87	60	1210	0.50	0.079	0.02	11.89	0.02	0.000
10.53	2.47	81.89	2.78	227.45	58	1186	0.50	0.085	0.02	11.89	0.02	0.000
10.57	2.47	82.38	2.78	229.16	58	1197	0.50	0.084	0.02	11.89	0.02	0.000
10.65	2.45	83.51	2.69	224.27	57	1202	0.50	0.084	0.02	11.89	0.02	0.000
10.72	2.43	84.91	2.56	217.76	54	1203	0.50	0.085	0.03	11.89	0.02	0.000
10.76	2.40	87.71	2.37	208.31	51	1201	0.50	0.086	0.03	11.89	0.02	0.000
10.84	2.39	86.54	2.33	201.51	49	1179	0.50	0.091	0.03	11.89	0.02	0.000
10.91	2.39	83.16	2.33	193.57	47	1140	0.50	0.102	0.04	11.89	0.03	0.000
10.99	2.42	76.29	2.48	189.20	47	1085	0.50	0.121	0.04	11.89	0.03	0.000
11.03	2.45	70.01	2.63	183.95	46	1026	0.50	0.147	0.05	11.89	0.04	0.000
11.10	2.46	65.72	2.74	180.02	46	988	0.50	0.170	0.06	11.89	0.05	0.000
11.17	2.49	62.56	2.88	180.17	46	969	0.50	0.185	0.07	11.89	0.05	0.000
11.25	2.50	61.48	3.00	184.28	48	977	0.50	0.183	0.06	11.89	0.05	0.000
11.29	2.52	61.56	3.12	192.07	50	1000	0.50	0.169	0.06	11.89	0.04	0.000
11.36	2.52	63.29	3.14	198.99	52	1037	0.50	0.150	0.05	11.89	0.03	0.000
11.45	2.52	65.38	3.14	205.56	54	1078	0.50	0.134	0.04	11.89	0.03	0.000
11.49	2.51	68.63	3.08	211.61	55	1125	0.50	0.118	0.03	11.89	0.03	0.000
11.56	2.52	70.92	3.09	219.10	57	1170	0.50	0.105	0.03	11.89	0.02	0.000
11.64	2.52	72.86	3.13	227.69	59	1216	0.50	0.095	0.03	11.89	0.02	0.000
11.71	2.53	73.57	3.19	235.00	61	1247	0.50	0.090	0.02	11.89	0.02	0.000
11.76	2.54	73.20	3.28	240.40	63	1262	0.50	0.087	0.02	11.89	0.02	0.000
11.83	2.56	71.78	3.39	243.60	65	1264	0.50	0.088	0.02	11.89	0.02	0.000
11.91	2.57	70.54	3.47	244.84	65	1263	0.50	0.089	0.02	11.89	0.02	0.000
11.94	2.57	70.45	3.46	244.01	65	1264	0.50	0.090	0.02	11.89	0.02	0.000
12.02	2.55	71.85	3.36	241.11	64	1277	0.50	0.088	0.02	11.89	0.02	0.000
12.10	2.52	74.86	3.15	236.02	62	1298	0.50	0.085	0.02	11.89	0.02	0.000
12.18	2.50	77.80	2.97	231.39	60	1318	0.50	0.083	0.02	11.89	0.02	0.000
12.21	2.48	80.64	2.82	227.26	58	1333	0.50	0.081	0.02	11.89	0.02	0.000
12.29	2.46	81.95	2.73	223.47	57	1340	0.50	0.080	0.02	11.89	0.02	0.000
12.36	2.45	82.56	2.65	218.43	55	1336	0.50	0.082	0.02	11.89	0.02	0.000
12.44	2.44	82.24	2.59	213.21	53	1325	0.50	0.085	0.03	11.89	0.02	0.000
12.48	2.42	82.73	2.50	206.84	51	1312	0.50	0.087	0.03	11.89	0.02	0.000
12.55	2.40	84.18	2.37	199.24	49	1304	0.50	0.090	0.03	11.89	0.02	0.000
12.62	2.37	86.35	2.22	191.45	46	1299	0.50	0.092	0.03	11.89	0.02	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
12.67	2.33	90.26	2.04	183.94	44	1300	0.50	0.092	0.04	11.89	0.03	0.000
12.75	2.29	95.08	1.88	178.71	42	1313	0.50	0.091	0.04	11.89	0.03	0.000
12.82	2.25	100.48	1.75	175.54	40	1331	0.50	0.088	0.04	11.89	0.03	0.000
12.90	2.23	103.39	1.69	174.74	40	1346	0.50	0.087	0.04	11.89	0.03	0.000
12.93	2.23	103.95	1.69	175.28	40	1353	0.50	0.086	0.04	11.89	0.03	0.000
13.01	2.24	101.94	1.74	176.96	41	1360	0.50	0.086	0.04	11.89	0.03	0.000
13.09	2.27	99.58	1.80	179.59	42	1368	0.50	0.085	0.04	11.89	0.02	0.000
13.13	2.29	98.16	1.87	183.85	43	1384	0.50	0.083	0.03	11.89	0.02	0.000
13.20	2.30	98.11	1.92	188.68	44	1411	0.50	0.080	0.03	11.89	0.02	0.000
13.27	2.30	99.37	1.94	192.53	45	1442	0.50	0.076	0.03	11.89	0.02	0.000
13.35	2.30	102.03	1.91	195.37	46	1477	0.50	0.072	0.03	11.89	0.02	0.000
13.42	2.29	104.57	1.89	197.79	46	1509	0.50	0.069	0.03	11.89	0.02	0.000
13.46	2.30	106.84	1.92	204.79	48	1558	0.50	0.065	0.02	11.89	0.02	0.000
13.54	2.32	106.88	2.02	216.01	51	1616	0.50	0.060	0.02	11.89	0.01	0.000
13.62	2.36	105.83	2.16	228.07	55	1667	0.50	0.056	0.02	11.89	0.01	0.000
13.65	2.40	101.67	2.39	243.26	60	1699	0.50	0.054	0.01	11.89	0.01	0.000
13.75	2.44	98.14	2.58	253.62	63	1718	0.50	0.054	0.01	11.89	0.01	0.000
13.78	2.47	94.72	2.79	264.41	67	1729	0.50	0.053	0.01	11.89	0.01	0.000
13.86	2.49	92.22	2.94	270.68	70	1736	0.50	0.053	0.01	11.89	0.01	0.000
13.94	2.52	88.80	3.14	278.57	73	1739	0.50	0.054	0.01	11.89	0.01	0.000
14.01	2.54	86.53	3.29	285.02	75	1746	0.50	0.054	0.01	11.89	0.01	0.000
14.08	2.55	86.47	3.32	287.40	76	1760	0.50	0.053	0.01	11.89	0.01	0.000
14.12	2.54	87.80	3.27	287.45	76	1778	0.50	0.052	0.01	11.89	0.01	0.000
14.20	2.54	87.89	3.27	287.54	76	1788	0.50	0.052	0.01	11.89	0.01	0.000
14.28	2.55	86.55	3.34	288.74	76	1788	0.50	0.052	0.01	11.89	0.01	0.000
14.32	2.57	83.40	3.50	291.78	78	1770	0.50	0.054	0.01	11.89	0.01	0.000
14.39	2.59	79.96	3.67	293.60	79	1749	0.50	0.056	0.01	11.89	0.01	0.000
14.47	2.61	76.72	3.81	292.60	0	0	0.50	0.000	0.00	0.00	0.00	0.000
14.54	2.61	74.57	3.87	288.74	0	0	0.50	0.000	0.00	0.00	0.00	0.000
14.58	2.61	73.11	3.84	280.64	0	0	0.50	0.000	0.00	0.00	0.00	0.000
14.66	2.60	71.54	3.77	270.05	0	0	0.50	0.000	0.00	0.00	0.00	0.000
14.74	2.60	69.77	3.72	259.56	70	1570	0.50	0.074	0.02	11.89	0.01	0.000
14.77	2.60	66.83	3.77	251.81	0	0	0.50	0.000	0.00	0.00	0.00	0.000
14.85	2.62	63.05	3.89	245.18	0	0	0.50	0.000	0.00	0.00	0.00	0.000
14.92	2.63	59.25	4.01	237.75	0	0	0.50	0.000	0.00	0.00	0.00	0.000
14.96	2.63	56.28	4.03	226.70	0	0	0.50	0.000	0.00	0.00	0.00	0.000
15.04	2.62	54.03	3.94	212.78	0	0	0.50	0.000	0.00	0.00	0.00	0.000
15.11	2.60	52.37	3.76	196.66	0	0	0.50	0.000	0.00	0.00	0.00	0.000
15.18	2.57	52.64	3.47	182.70	0	0	0.50	0.000	0.00	11.89	0.00	0.000
15.25	2.53	54.53	3.16	172.46	0	0	0.50	0.000	0.00	11.89	0.00	0.000
15.29	2.47	60.08	2.75	165.15	0	0	0.50	0.000	0.00	11.89	0.00	0.000
15.38	2.39	68.59	2.32	159.46	0	0	0.50	0.000	0.00	11.89	0.00	0.000
15.45	2.32	78.12	2.01	157.01	0	0	0.50	0.000	0.00	11.89	0.00	0.000
15.49	2.26	88.29	1.79	157.78	0	0	0.50	0.000	0.00	11.89	0.00	0.000
15.56	2.22	98.34	1.66	163.37	0	0	0.50	0.000	0.00	11.89	0.00	0.000
15.64	2.20	107.79	1.61	173.40	0	0	0.50	0.000	0.00	11.89	0.00	0.000
15.71	2.20	113.89	1.61	183.65	41	1661	0.50	0.072	0.03	11.89	0.02	0.000
15.75	2.22	116.19	1.68	195.01	44	1752	0.50	0.064	0.02	11.89	0.02	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
15.83	2.26	115.60	1.78	206.18	48	1827	0.50	0.059	0.02	11.89	0.01	0.000
15.90	2.30	112.70	1.94	218.55	52	1889	0.50	0.055	0.02	11.89	0.01	0.000
15.97	2.34	108.67	2.10	228.71	55	1922	0.50	0.054	0.02	11.89	0.01	0.000
16.02	2.38	105.00	2.27	237.87	58	1942	0.50	0.053	0.01	11.89	0.01	0.000
16.10	2.40	102.57	2.38	244.44	60	1961	0.50	0.052	0.01	11.89	0.01	0.000
16.17	2.42	101.20	2.46	248.57	62	1976	0.50	0.052	0.01	11.89	0.01	0.000
16.21	2.42	100.92	2.46	247.89	61	1974	0.50	0.052	0.01	11.89	0.01	0.000
16.28	2.41	100.45	2.42	243.36	60	1958	0.50	0.053	0.01	11.89	0.01	0.000
16.36	2.38	100.78	2.27	229.00	56	1901	0.50	0.057	0.02	11.89	0.01	0.000
16.44	2.34	101.61	2.08	210.99	50	1825	0.50	0.062	0.02	11.89	0.01	0.000
16.48	2.29	103.99	1.88	195.24	46	1756	0.50	0.068	0.03	11.89	0.02	0.000
16.55	2.25	106.84	1.75	187.12	43	1726	0.50	0.071	0.03	11.89	0.02	0.000
16.63	2.21	110.73	1.65	182.79	41	1718	0.50	0.073	0.03	11.89	0.02	0.000
16.70	2.22	107.12	1.67	178.76	41	1682	0.50	0.077	0.03	11.89	0.02	0.000
16.74	2.19	109.77	1.60	175.68	40	1669	0.50	0.079	0.03	11.89	0.02	0.000
16.83	2.18	110.71	1.56	173.11	39	1657	0.50	0.081	0.04	11.89	0.02	0.000
16.90	2.13	118.21	1.47	173.25	38	1667	0.50	0.080	0.04	11.89	0.02	0.000
16.94	2.12	118.75	1.45	172.25	38	1659	0.50	0.081	0.04	11.89	0.02	0.000
17.01	2.11	119.27	1.43	171.12	37	1650	0.50	0.083	0.04	11.89	0.03	0.000
17.09	2.10	119.92	1.42	170.07	37	1642	0.50	0.085	0.04	11.89	0.03	0.000
17.13	2.08	121.31	1.40	169.43	36	1631	0.50	0.086	0.04	11.89	0.03	0.000
17.21	2.07	123.10	1.38	169.51	36	1629	0.50	0.087	0.04	11.89	0.03	0.000
17.28	2.05	125.97	1.35	170.42	36	1628	0.50	0.088	0.04	11.89	0.03	0.000
17.36	2.03	128.67	1.33	171.61	36	1629	0.50	0.089	0.04	11.89	0.03	0.000
17.39	2.01	132.42	1.31	173.67	36	1626	0.50	0.089	0.04	11.89	0.03	0.000
17.47	1.99	135.34	1.30	175.44	36	1628	0.50	0.090	0.04	11.89	0.03	0.000
17.54	1.97	138.35	1.28	177.69	37	1635	0.50	0.089	0.04	11.89	0.03	0.000
17.59	1.96	141.13	1.28	180.61	37	1657	0.50	0.087	0.04	11.89	0.03	0.000
17.66	1.96	144.17	1.28	184.47	38	1696	0.50	0.083	0.04	11.89	0.02	0.000
17.73	1.95	149.42	1.27	190.10	39	1739	0.50	0.078	0.04	11.89	0.02	0.000
17.80	1.93	158.34	1.26	198.96	40	1793	0.50	0.074	0.03	11.89	0.02	0.000
17.88	1.90	169.01	1.24	208.81	42	1842	0.50	0.070	0.03	11.89	0.02	0.000
17.93	1.86	183.41	1.21	222.12	44	1915	0.50	0.064	0.03	11.89	0.02	0.000
18.00	1.85	197.17	1.20	236.27	46	2021	0.50	0.058	0.02	11.89	0.01	0.000
18.08	1.84	209.03	1.19	249.16	49	2127	0.50	0.053	0.02	11.89	0.01	0.000
18.12	1.84	216.11	1.20	258.34	51	2214	0.50	0.049	0.02	11.89	0.01	0.000
18.19	1.84	217.88	1.20	260.57	51	2240	0.50	0.048	0.02	11.89	0.01	0.000
18.26	1.85	216.50	1.20	260.63	51	2259	0.50	0.048	0.02	11.89	0.01	0.000
18.34	1.87	211.79	1.22	257.64	51	2264	0.50	0.048	0.02	11.89	0.01	0.000
18.38	1.89	206.10	1.23	253.56	51	2263	0.50	0.048	0.02	11.89	0.01	0.000
18.45	1.90	199.88	1.24	247.66	50	2238	0.50	0.049	0.02	11.89	0.01	0.000
18.53	1.91	194.81	1.24	242.51	49	2212	0.50	0.051	0.02	11.89	0.01	0.000
18.61	1.92	190.91	1.25	238.81	48	2200	0.50	0.051	0.02	11.89	0.01	0.000
18.64	1.93	189.12	1.26	237.41	48	2201	0.50	0.051	0.02	11.89	0.01	0.000
18.72	1.93	189.46	1.26	237.91	48	2213	0.50	0.051	0.02	11.89	0.01	0.000
18.80	1.92	191.46	1.25	239.68	48	2225	0.50	0.051	0.02	11.89	0.01	0.000
18.83	1.90	197.26	1.24	244.62	49	2242	0.50	0.050	0.02	11.89	0.01	0.000
18.91	1.89	204.28	1.23	250.66	50	2270	0.51	0.050	0.02	11.89	0.01	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
18.99	1.88	211.20	1.22	257.80	51	2325	0.51	0.048	0.02	11.89	0.01	0.000
19.07	1.87	217.19	1.22	264.25	52	2380	0.51	0.046	0.01	11.89	0.01	0.000
19.11	1.85	225.31	1.20	271.10	53	2415	0.51	0.045	0.01	11.89	0.01	0.000
19.18	1.81	236.99	1.17	276.76	54	2418	0.51	0.045	0.01	11.89	0.01	0.000
19.25	1.77	249.12	1.12	278.86	53	2414	0.51	0.045	0.01	11.89	0.01	0.000
19.32	1.73	255.19	1.05	268.29	51	2345	0.51	0.048	0.02	11.89	0.01	0.000
19.40	1.70	256.16	1.00	256.16	48	2250	0.51	0.052	0.02	11.89	0.01	0.000
19.44	1.67	257.07	1.00	257.07	47	2187	0.51	0.055	0.02	11.89	0.01	0.000
19.52	1.67	261.88	1.00	261.88	48	2235	0.51	0.053	0.02	11.89	0.01	0.000
19.59	1.68	268.11	1.00	268.11	50	2321	0.51	0.050	0.02	11.89	0.01	0.000
19.63	1.70	271.11	1.00	271.11	51	2403	0.51	0.047	0.02	11.89	0.01	0.000
19.70	1.73	265.99	1.04	276.94	52	2454	0.51	0.046	0.01	11.89	0.01	0.000
19.77	1.78	251.57	1.12	282.44	54	2485	0.51	0.045	0.01	11.89	0.01	0.000
19.84	1.82	235.46	1.18	277.14	54	2482	0.51	0.045	0.01	11.89	0.01	0.000
19.90	1.86	222.46	1.21	269.28	53	2477	0.51	0.046	0.01	11.89	0.01	0.000
19.97	1.89	213.56	1.23	262.33	52	2463	0.51	0.046	0.01	11.89	0.01	0.000
20.05	1.91	205.64	1.24	255.18	51	2437	0.51	0.047	0.02	11.89	0.01	0.000
20.09	1.92	198.82	1.25	248.00	50	2390	0.51	0.049	0.02	11.89	0.01	0.000
20.17	1.91	197.27	1.24	244.73	49	2345	0.51	0.051	0.02	11.89	0.01	0.000
20.24	1.89	198.13	1.23	243.22	49	2301	0.51	0.053	0.02	11.89	0.01	0.000
20.28	1.86	201.12	1.21	243.13	48	2259	0.51	0.055	0.02	11.89	0.01	0.000
20.36	1.84	202.47	1.19	241.77	47	2224	0.51	0.057	0.02	11.89	0.01	0.000
20.43	1.82	202.15	1.18	237.83	46	2168	0.51	0.061	0.02	11.89	0.01	0.000
20.50	1.80	200.25	1.16	231.56	45	2096	0.51	0.065	0.02	11.89	0.01	0.000
20.58	1.78	199.06	1.13	224.99	43	2028	0.51	0.071	0.03	11.89	0.02	0.000
20.62	1.76	199.59	1.10	220.22	42	1983	0.51	0.074	0.03	11.89	0.02	0.000
20.69	1.76	197.56	1.10	216.47	41	1954	0.51	0.077	0.03	11.89	0.02	0.000
20.77	1.76	193.68	1.10	212.61	40	1923	0.51	0.080	0.03	11.89	0.02	0.000
20.81	1.76	188.13	1.10	207.15	39	1876	0.51	0.085	0.04	11.89	0.02	0.000
20.88	1.75	184.81	1.09	201.61	38	1830	0.51	0.091	0.04	11.89	0.02	0.000
20.96	1.75	181.32	1.08	195.41	37	1780	0.51	0.098	0.05	11.89	0.03	0.000
21.04	1.74	178.86	1.07	191.51	36	1749	0.51	0.103	0.05	11.89	0.03	0.000
21.07	1.75	176.04	1.08	189.48	36	1731	0.51	0.106	0.05	11.89	0.03	0.000
21.15	1.75	173.41	1.09	188.80	36	1726	0.51	0.108	0.05	11.89	0.03	0.000
21.23	1.76	170.89	1.10	188.32	36	1724	0.51	0.109	0.05	11.89	0.03	0.000
21.27	1.77	168.63	1.11	187.45	36	1718	0.51	0.110	0.05	11.89	0.03	0.000
21.34	1.77	166.02	1.12	185.74	36	1707	0.51	0.112	0.06	11.89	0.03	0.000
21.42	1.78	162.93	1.13	183.51	35	1691	0.51	0.116	0.06	11.89	0.03	0.000
21.49	1.78	160.20	1.13	181.61	35	1679	0.52	0.119	0.06	11.89	0.03	0.000
21.53	1.79	157.85	1.14	180.07	35	1669	0.52	0.121	0.06	11.89	0.04	0.000
21.61	1.80	155.68	1.15	178.76	35	1664	0.52	0.123	0.06	11.89	0.04	0.000
21.68	1.80	153.94	1.15	177.72	34	1660	0.52	0.124	0.06	11.89	0.04	0.000
21.72	1.81	153.00	1.16	177.32	34	1661	0.52	0.125	0.07	11.89	0.04	0.000
21.80	1.81	152.24	1.16	176.86	34	1662	0.52	0.125	0.07	11.89	0.04	0.000
21.87	1.81	151.52	1.17	176.53	34	1665	0.52	0.125	0.07	11.89	0.04	0.000
21.95	1.81	150.96	1.17	176.32	34	1668	0.52	0.125	0.07	11.89	0.04	0.000
21.99	1.81	151.01	1.17	176.52	34	1673	0.52	0.125	0.07	11.89	0.04	0.000
22.06	1.81	151.19	1.17	176.59	34	1676	0.52	0.125	0.07	11.89	0.04	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
22.14	1.81	151.78	1.16	176.74	34	1678	0.52	0.125	0.07	11.89	0.04	0.000
22.21	1.81	152.42	1.16	176.89	34	1680	0.52	0.126	0.07	11.89	0.04	0.000
22.25	1.79	154.01	1.15	176.42	34	1668	0.52	0.128	0.07	11.89	0.04	0.000
22.33	1.76	156.73	1.11	173.59	33	1635	0.52	0.136	0.07	11.89	0.04	0.000
22.41	1.74	160.07	1.06	170.32	32	1612	0.52	0.143	0.08	11.89	0.05	0.000
22.45	1.72	163.52	1.04	169.53	32	1616	0.52	0.142	0.08	11.89	0.05	0.000
22.52	1.73	164.98	1.05	173.55	33	1651	0.52	0.135	0.07	11.89	0.04	0.000
22.60	1.75	164.00	1.08	177.62	34	1685	0.52	0.128	0.07	11.89	0.04	0.000
22.67	1.76	163.02	1.10	180.11	34	1710	0.52	0.124	0.06	11.89	0.04	0.000
22.72	1.77	161.92	1.12	180.62	35	1718	0.52	0.123	0.06	11.89	0.04	0.000
22.79	1.77	161.39	1.11	179.82	34	1713	0.52	0.124	0.06	11.89	0.04	0.000
22.87	1.77	159.62	1.12	178.31	34	1703	0.52	0.127	0.07	11.89	0.04	0.000
22.91	1.78	157.65	1.13	177.43	34	1698	0.52	0.128	0.07	11.89	0.04	0.000
22.98	1.78	155.41	1.13	176.20	34	1692	0.52	0.130	0.07	11.89	0.04	0.000
23.05	1.79	152.86	1.14	174.72	34	1684	0.52	0.133	0.07	11.89	0.04	0.000
23.13	1.80	150.85	1.15	173.50	34	1679	0.52	0.135	0.07	11.89	0.04	0.000
23.16	1.80	149.86	1.15	172.65	33	1673	0.52	0.136	0.07	11.89	0.04	0.000
23.24	1.80	148.90	1.15	171.15	33	1661	0.52	0.140	0.08	11.89	0.04	0.000
23.32	1.80	147.39	1.15	169.39	33	1646	0.52	0.144	0.08	11.89	0.04	0.000
23.40	1.80	145.62	1.15	167.82	32	1636	0.52	0.148	0.08	11.89	0.04	0.000
23.43	1.81	143.64	1.16	166.85	32	1634	0.52	0.148	0.08	11.89	0.05	0.000
23.51	1.81	142.94	1.17	166.67	32	1639	0.52	0.148	0.08	11.89	0.05	0.000
23.58	1.82	142.01	1.17	166.55	32	1646	0.52	0.147	0.08	11.89	0.04	0.000
23.65	1.82	142.43	1.18	167.46	33	1661	0.52	0.144	0.08	11.89	0.04	0.000
23.73	1.83	142.54	1.18	168.15	33	1675	0.52	0.141	0.08	11.89	0.04	0.000
23.77	1.82	144.76	1.18	170.23	33	1693	0.52	0.137	0.07	11.89	0.04	0.000
23.84	1.81	148.42	1.17	173.47	34	1722	0.52	0.132	0.07	11.89	0.04	0.000
23.92	1.81	152.78	1.16	177.30	34	1756	0.52	0.126	0.07	11.89	0.04	0.000
23.96	1.80	157.84	1.15	182.09	35	1800	0.52	0.118	0.06	11.89	0.03	0.000
24.04	1.80	161.75	1.15	186.06	36	1841	0.52	0.112	0.06	11.89	0.03	0.000
24.12	1.80	164.93	1.15	189.39	37	1876	0.52	0.108	0.05	11.89	0.03	0.000
24.16	1.79	167.71	1.15	192.17	37	1903	0.52	0.104	0.05	11.89	0.03	0.000
24.23	1.79	170.56	1.14	194.68	37	1929	0.52	0.101	0.05	11.89	0.03	0.000
24.30	1.79	174.09	1.14	197.78	38	1961	0.52	0.098	0.05	11.89	0.02	0.000
24.38	1.78	176.77	1.13	200.15	38	1986	0.52	0.095	0.04	11.89	0.02	0.000
24.41	1.78	179.17	1.13	202.47	39	2010	0.52	0.093	0.04	11.89	0.02	0.000
24.49	1.78	181.09	1.13	203.98	39	2027	0.52	0.092	0.04	11.89	0.02	0.000
24.57	1.77	183.27	1.12	205.52	39	2044	0.52	0.090	0.04	11.89	0.02	0.000
24.61	1.77	186.09	1.12	207.69	40	2066	0.52	0.088	0.04	11.89	0.02	0.000
24.68	1.77	189.33	1.11	210.88	40	2101	0.52	0.085	0.04	11.89	0.02	0.000
24.76	1.76	193.44	1.11	213.80	41	2133	0.52	0.083	0.04	11.89	0.02	0.000
24.83	1.76	197.92	1.10	217.09	41	2168	0.52	0.080	0.03	11.89	0.02	0.000
24.91	1.75	202.08	1.09	219.44	42	2196	0.52	0.078	0.03	11.89	0.02	0.000
24.94	1.74	208.45	1.07	222.54	42	2233	0.52	0.076	0.03	11.89	0.02	0.000
25.02	1.72	219.84	1.03	225.35	42	2286	0.53	0.073	0.03	11.89	0.02	0.000
25.10	1.70	234.07	1.00	234.07	44	2361	0.53	0.068	0.03	11.89	0.01	0.000
25.14	1.67	253.32	1.00	253.32	47	2484	0.53	0.062	0.02	11.89	0.01	0.000
25.21	1.66	274.36	1.00	274.36	50	2636	0.53	0.056	0.02	11.89	0.01	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
25.27	1.64	297.97	1.00	297.97	54	2792	0.53	0.050	0.02	11.89	0.01	0.000
25.35	1.61	313.75	1.00	313.75	57	2836	0.53	0.049	0.01	11.89	0.01	0.000
25.42	1.59	318.49	1.00	318.49	57	2797	0.53	0.051	0.01	11.89	0.01	0.000
25.46	1.59	313.76	1.00	313.76	56	2760	0.53	0.052	0.01	11.89	0.01	0.000
25.54	1.63	303.24	1.00	303.24	55	2818	0.53	0.050	0.01	11.89	0.01	0.000
25.62	1.68	292.95	1.00	292.95	54	2930	0.53	0.047	0.01	11.89	0.01	0.000
25.68	1.72	286.44	1.02	293.22	55	3020	0.53	0.045	0.01	11.89	0.01	0.000
25.74	1.73	285.25	1.05	300.11	57	3074	0.53	0.044	0.01	11.89	0.01	0.000
25.82	1.73	285.93	1.06	302.44	57	3100	0.53	0.044	0.01	11.89	0.01	0.000
25.85	1.73	286.75	1.05	302.42	57	3104	0.53	0.044	0.01	11.89	0.01	0.000
25.93	1.73	286.69	1.05	302.29	57	3108	0.53	0.044	0.01	11.89	0.01	0.000
26.00	1.74	284.83	1.07	303.57	57	3121	0.53	0.043	0.01	11.89	0.01	0.000
26.08	1.75	282.39	1.08	304.90	58	3136	0.53	0.043	0.01	11.89	0.01	0.000
26.12	1.76	277.43	1.10	304.54	58	3133	0.53	0.043	0.01	11.89	0.01	0.000
26.20	1.77	270.31	1.11	299.69	57	3090	0.53	0.045	0.01	11.89	0.01	0.000
26.27	1.77	262.39	1.11	290.76	56	3003	0.53	0.047	0.01	11.89	0.01	0.000
26.35	1.76	256.93	1.09	281.24	54	2908	0.53	0.050	0.02	11.89	0.01	0.000
26.38	1.74	251.68	1.07	270.47	51	2801	0.53	0.053	0.02	11.89	0.01	0.000
26.46	1.73	247.42	1.06	261.17	49	2716	0.53	0.056	0.02	11.89	0.01	0.000
26.53	1.72	245.30	1.03	251.54	47	2638	0.53	0.060	0.02	11.89	0.01	0.000
26.61	1.70	247.23	1.00	247.23	46	2589	0.53	0.062	0.02	11.89	0.01	0.000
26.64	1.68	252.56	1.00	252.56	47	2559	0.53	0.064	0.02	11.89	0.01	0.000
26.71	1.65	258.54	1.00	258.54	47	2537	0.53	0.065	0.02	11.89	0.01	0.000
26.79	1.64	259.87	1.00	259.87	48	2521	0.53	0.066	0.02	11.89	0.01	0.000
26.86	1.66	249.77	1.00	249.77	46	2499	0.53	0.067	0.02	11.89	0.01	0.000
26.94	1.71	231.92	1.00	232.03	43	2474	0.53	0.069	0.03	11.89	0.01	0.000
26.98	1.78	208.26	1.13	234.92	45	2472	0.53	0.069	0.03	11.89	0.01	0.000
27.05	1.87	183.00	1.22	222.58	44	2482	0.53	0.069	0.03	11.89	0.01	0.000
27.13	1.97	159.38	1.28	204.21	42	2489	0.53	0.069	0.03	11.89	0.01	0.000
27.17	2.06	139.66	1.36	190.29	40	2491	0.53	0.069	0.03	11.89	0.01	0.000
27.25	2.12	126.73	1.45	184.38	40	2494	0.53	0.069	0.03	11.89	0.01	0.000
27.33	2.18	117.50	1.56	182.91	41	2502	0.53	0.069	0.03	11.89	0.01	0.000
27.37	2.21	110.49	1.65	182.16	41	2489	0.53	0.069	0.03	11.89	0.01	0.000
27.44	2.23	107.11	1.70	182.62	42	2491	0.53	0.070	0.03	11.89	0.01	0.000
27.52	2.24	105.65	1.73	183.09	42	2496	0.53	0.070	0.03	11.89	0.01	0.000
27.60	2.23	107.78	1.70	183.35	42	2512	0.53	0.069	0.03	11.89	0.01	0.000
27.64	2.21	110.75	1.64	181.97	41	2506	0.53	0.070	0.03	11.89	0.01	0.000
27.71	2.19	113.63	1.58	179.56	40	2482	0.53	0.071	0.03	11.89	0.01	0.000
27.79	2.16	115.75	1.53	176.64	39	2443	0.53	0.074	0.03	11.89	0.02	0.000
27.83	2.14	117.20	1.48	173.26	38	2388	0.53	0.077	0.04	11.89	0.02	0.000
27.90	2.11	118.27	1.44	170.43	37	2338	0.53	0.081	0.04	11.89	0.02	0.000
27.97	2.09	120.33	1.40	168.55	36	2290	0.53	0.085	0.04	11.89	0.02	0.000
28.05	2.06	122.64	1.37	167.97	36	2256	0.53	0.088	0.04	11.89	0.02	0.000
28.12	2.04	124.58	1.35	167.87	36	2230	0.53	0.091	0.05	11.89	0.02	0.000
28.16	2.03	126.37	1.33	168.03	35	2206	0.53	0.093	0.05	11.89	0.02	0.000
28.23	2.00	127.10	1.31	165.87	34	2133	0.53	0.101	0.05	11.89	0.02	0.000
28.31	1.96	127.09	1.28	162.51	33	2030	0.53	0.114	0.06	11.89	0.03	0.000
28.35	1.94	125.71	1.26	158.84	32	1945	0.53	0.127	0.07	11.89	0.03	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
28.43	1.94	123.58	1.27	156.35	32	1923	0.53	0.132	0.08	11.89	0.04	0.000
28.50	1.96	121.63	1.27	154.91	32	1930	0.53	0.131	0.08	11.89	0.04	0.000
28.54	1.96	120.82	1.28	154.25	32	1932	0.53	0.131	0.08	11.89	0.04	0.000
28.62	1.97	118.27	1.29	152.24	31	1936	0.53	0.131	0.08	11.89	0.04	0.000
28.69	1.98	118.94	1.29	153.23	32	1954	0.53	0.128	0.07	11.89	0.03	0.000
28.77	1.98	119.56	1.29	154.15	32	1972	0.53	0.126	0.07	11.89	0.03	0.000
28.81	1.97	122.22	1.28	156.99	0	0	0.53	0.000	0.00	11.89	0.00	0.000
28.88	1.99	120.90	1.30	156.77	0	0	0.53	0.000	0.00	11.89	0.00	0.000
28.96	2.01	118.31	1.32	155.83	0	0	0.53	0.000	0.00	11.89	0.00	0.000
29.03	2.04	115.34	1.34	154.66	0	0	0.53	0.000	0.00	11.89	0.00	0.000
29.07	2.06	111.38	1.37	152.71	0	0	0.53	0.000	0.00	11.89	0.00	0.000
29.15	2.09	106.46	1.41	150.02	0	0	0.53	0.000	0.00	11.89	0.00	0.000
29.23	2.13	100.10	1.47	146.85	0	0	0.53	0.000	0.00	11.89	0.00	0.000
29.30	2.16	94.36	1.53	144.44	0	0	0.53	0.000	0.00	11.89	0.00	0.000
29.34	2.20	88.07	1.62	142.93	0	0	0.53	0.000	0.00	11.89	0.00	0.000
29.42	2.25	81.60	1.74	142.29	0	0	0.53	0.000	0.00	11.89	0.00	0.000
29.49	2.30	74.72	1.91	142.66	0	0	0.53	0.000	0.00	11.89	0.00	0.000
29.56	2.33	69.48	2.06	143.26	0	0	0.53	0.000	0.00	11.89	0.00	0.000
29.61	2.37	64.95	2.22	143.99	0	0	0.53	0.000	0.00	11.89	0.00	0.000
29.68	2.40	60.64	2.40	145.32	0	0	0.53	0.000	0.00	11.89	0.00	0.000
29.76	2.44	56.74	2.60	147.49	0	0	0.53	0.000	0.00	11.89	0.00	0.000
29.80	2.47	53.88	2.81	151.38	0	0	0.53	0.000	0.00	11.89	0.00	0.000
29.87	2.50	52.22	2.98	155.64	0	0	0.53	0.000	0.00	11.89	0.00	0.000
29.95	2.52	50.98	3.13	159.64	0	0	0.53	0.000	0.00	11.89	0.00	0.000
29.99	2.54	49.81	3.27	162.88	0	0	0.53	0.000	0.00	11.89	0.00	0.000
30.06	2.57	47.92	3.48	166.78	0	0	0.53	0.000	0.00	11.89	0.00	0.000
30.14	2.60	45.46	3.79	172.47	0	0	0.53	0.000	0.00	0.00	0.00	0.000
30.22	2.63	44.24	3.99	176.70	0	0	0.53	0.000	0.00	0.00	0.00	0.000
30.26	2.64	43.94	4.09	179.52	0	0	0.53	0.000	0.00	0.00	0.00	0.000
30.33	2.61	46.00	3.87	178.05	0	0	0.53	0.000	0.00	0.00	0.00	0.000
30.40	2.57	49.68	3.51	174.28	0	0	0.53	0.000	0.00	11.89	0.00	0.000
30.48	2.52	54.61	3.09	168.92	0	0	0.53	0.000	0.00	11.89	0.00	0.000
30.52	2.45	61.20	2.66	162.87	0	0	0.53	0.000	0.00	11.89	0.00	0.000
30.60	2.39	68.40	2.30	157.52	0	0	0.53	0.000	0.00	11.89	0.00	0.000
30.67	2.32	75.93	2.02	153.49	0	0	0.53	0.000	0.00	11.89	0.00	0.000
30.71	2.27	82.19	1.83	150.36	0	0	0.53	0.000	0.00	11.89	0.00	0.000
30.78	2.23	86.83	1.70	147.21	0	0	0.53	0.000	0.00	11.89	0.00	0.000
30.86	2.19	90.30	1.59	143.36	0	0	0.53	0.000	0.00	11.89	0.00	0.000
30.94	2.16	91.45	1.53	139.79	0	0	0.53	0.000	0.00	11.89	0.00	0.000
30.97	2.15	89.74	1.51	135.11	0	0	0.53	0.000	0.00	11.89	0.00	0.000
31.05	2.15	86.11	1.51	130.08	29	1945	0.53	0.145	0.09	11.89	0.04	0.000
31.13	2.16	81.64	1.53	124.72	28	1871	0.53	0.162	0.11	11.89	0.05	0.000
31.20	2.17	78.25	1.54	120.75	27	1816	0.53	0.176	0.12	11.89	0.05	0.000
31.24	2.14	76.49	1.49	114.25	25	1712	0.53	0.210	0.16	11.89	0.07	0.000
31.32	2.12	75.35	1.45	109.16	24	1626	0.53	0.248	0.20	11.89	0.09	0.001
31.39	2.10	74.02	1.42	105.05	23	1555	0.53	0.289	0.25	11.89	0.10	0.001
31.47	2.12	72.19	1.45	104.93	23	1570	0.53	0.281	0.24	11.89	0.10	0.001
31.51	2.15	70.19	1.50	105.41	23	1591	0.53	0.269	0.22	11.89	0.09	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
31.59	2.17	69.37	1.54	106.61	24	1617	0.53	0.256	0.21	11.89	0.09	0.001
31.64	2.18	68.84	1.57	108.28	24	1647	0.53	0.242	0.19	11.89	0.08	0.001
31.71	2.18	70.20	1.57	110.22	0	0	0.53	0.000	0.00	11.89	0.00	0.000
31.78	2.19	70.91	1.60	113.44	0	0	0.53	0.000	0.00	11.89	0.00	0.000
31.86	2.21	71.30	1.64	117.17	0	0	0.53	0.000	0.00	11.89	0.00	0.000
31.90	2.25	69.65	1.76	122.34	0	0	0.53	0.000	0.00	11.89	0.00	0.000
31.97	2.29	67.28	1.89	127.33	0	0	0.53	0.000	0.00	11.89	0.00	0.000
32.05	2.33	65.01	2.04	132.88	0	0	0.53	0.000	0.00	11.89	0.00	0.000
32.12	2.36	63.51	2.16	136.90	0	0	0.53	0.000	0.00	11.89	0.00	0.000
32.16	2.38	61.76	2.28	140.90	0	0	0.53	0.000	0.00	11.89	0.00	0.000
32.24	2.41	59.58	2.43	144.88	0	0	0.53	0.000	0.00	11.89	0.00	0.000
32.31	2.44	57.51	2.60	149.57	0	0	0.53	0.000	0.00	11.89	0.00	0.000
32.39	2.46	56.44	2.71	153.11	0	0	0.53	0.000	0.00	11.89	0.00	0.000
32.43	2.47	55.93	2.80	156.62	0	0	0.53	0.000	0.00	11.89	0.00	0.000
32.50	2.49	55.06	2.92	160.76	0	0	0.53	0.000	0.00	11.89	0.00	0.000
32.58	2.52	53.71	3.09	165.89	0	0	0.53	0.000	0.00	11.89	0.00	0.000
32.65	2.54	52.26	3.27	170.75	0	0	0.53	0.000	0.00	11.89	0.00	0.000
32.69	2.57	50.54	3.49	176.24	0	0	0.53	0.000	0.00	11.89	0.00	0.000
32.77	2.60	48.88	3.71	181.44	0	0	0.53	0.000	0.00	11.89	0.00	0.000
32.85	2.62	47.52	3.91	186.01	0	0	0.53	0.000	0.00	0.00	0.00	0.000
32.88	2.63	46.74	4.04	188.89	0	0	0.53	0.000	0.00	0.00	0.00	0.000
32.96	2.64	46.14	4.11	189.50	0	0	0.53	0.000	0.00	0.00	0.00	0.000
33.03	2.64	45.86	4.11	188.66	0	0	0.53	0.000	0.00	0.00	0.00	0.000
33.07	2.62	47.07	3.90	183.63	0	0	0.53	0.000	0.00	0.00	0.00	0.000
33.15	2.57	49.93	3.52	175.71	0	0	0.53	0.000	0.00	11.89	0.00	0.000
33.23	2.51	54.52	3.03	165.16	0	0	0.53	0.000	0.00	11.89	0.00	0.000
33.31	2.45	58.75	2.67	156.68	0	0	0.53	0.000	0.00	11.89	0.00	0.000
33.34	2.41	62.24	2.41	149.71	0	0	0.53	0.000	0.00	11.89	0.00	0.000
33.42	2.38	63.84	2.27	144.67	0	0	0.53	0.000	0.00	11.89	0.00	0.000
33.49	2.35	65.17	2.14	139.27	0	0	0.53	0.000	0.00	11.89	0.00	0.000
33.56	2.32	66.93	2.01	134.49	0	0	0.53	0.000	0.00	11.89	0.00	0.000
33.64	2.29	69.70	1.88	130.92	0	0	0.53	0.000	0.00	11.89	0.00	0.000
33.68	2.24	74.73	1.73	129.31	0	0	0.53	0.000	0.00	11.89	0.00	0.000
33.75	2.19	81.22	1.60	129.54	0	0	0.53	0.000	0.00	11.89	0.00	0.000
33.83	2.15	87.66	1.50	131.32	0	0	0.53	0.000	0.00	11.89	0.00	0.000
33.87	2.12	91.86	1.45	133.35	0	0	0.53	0.000	0.00	11.89	0.00	0.000
33.95	2.12	92.17	1.45	134.10	29	2115	0.53	0.131	0.08	11.89	0.03	0.000
34.01	2.14	90.62	1.48	134.24	30	2132	0.53	0.129	0.08	11.89	0.03	0.000
34.06	2.16	88.65	1.52	134.62	30	2151	0.53	0.127	0.08	11.89	0.03	0.000
34.14	2.18	86.96	1.56	135.47	30	2175	0.53	0.124	0.08	11.89	0.03	0.000
34.20	2.18	86.78	1.57	136.48	31	2196	0.53	0.121	0.07	11.89	0.03	0.000
34.28	2.18	87.36	1.57	137.07	31	2208	0.53	0.120	0.07	11.89	0.03	0.000
34.32	2.17	90.43	1.55	139.85	31	2252	0.53	0.114	0.07	11.89	0.03	0.000
34.40	2.15	95.49	1.51	144.13	32	2317	0.53	0.108	0.06	11.89	0.02	0.000
34.48	2.13	101.12	1.47	149.01	33	2386	0.53	0.101	0.06	11.89	0.02	0.000
34.52	2.10	107.74	1.42	153.35	33	2426	0.53	0.098	0.05	11.89	0.02	0.000
34.59	2.10	109.09	1.42	154.44	33	2440	0.53	0.096	0.05	11.89	0.02	0.000
34.67	2.07	114.86	1.38	158.21	34	2462	0.53	0.095	0.05	11.89	0.02	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
34.74	2.05	118.47	1.36	160.66	34	2472	0.53	0.094	0.05	11.89	0.02	0.000
34.81	2.02	124.86	1.32	165.33	35	2484	0.53	0.094	0.05	11.89	0.02	0.000
34.88	2.01	125.72	1.32	165.74	35	2480	0.53	0.094	0.05	11.89	0.02	0.000
34.92	2.00	126.79	1.31	166.24	35	2471	0.53	0.095	0.05	11.89	0.02	0.000
35.00	2.00	128.02	1.30	166.84	35	2462	0.53	0.096	0.05	11.89	0.02	0.000
35.08	1.99	129.04	1.30	167.35	35	2454	0.53	0.097	0.05	11.89	0.02	0.000
35.11	1.98	129.58	1.29	167.61	35	2449	0.53	0.097	0.05	11.89	0.02	0.000
35.19	1.98	129.36	1.29	167.21	35	2444	0.53	0.098	0.05	11.89	0.02	0.000
35.26	1.98	129.09	1.29	166.46	34	2426	0.53	0.100	0.05	11.89	0.02	0.000
35.33	1.97	128.41	1.29	165.11	34	2399	0.53	0.103	0.05	11.89	0.02	0.000
35.41	1.97	127.54	1.28	163.66	0	0	0.53	0.000	0.00	11.89	0.00	0.000
35.45	1.97	125.83	1.29	161.78	0	0	0.53	0.000	0.00	11.89	0.00	0.000
35.52	1.98	123.49	1.29	159.47	0	0	0.53	0.000	0.00	11.89	0.00	0.000
35.60	1.99	120.96	1.30	156.96	0	0	0.53	0.000	0.00	11.89	0.00	0.000
35.64	2.00	117.76	1.31	153.86	0	0	0.53	0.000	0.00	11.89	0.00	0.000
35.71	2.03	111.64	1.33	148.64	0	0	0.53	0.000	0.00	11.89	0.00	0.000
35.80	2.07	103.92	1.37	142.85	0	0	0.53	0.000	0.00	11.89	0.00	0.000
35.83	2.13	93.35	1.47	137.47	0	0	0.53	0.000	0.00	11.89	0.00	0.000
35.91	2.21	82.32	1.65	135.81	0	0	0.53	0.000	0.00	11.89	0.00	0.000
35.99	2.30	71.62	1.94	138.97	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.03	2.39	62.97	2.32	145.88	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.10	2.46	56.61	2.73	154.32	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.18	2.52	52.12	3.13	163.24	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.26	2.55	50.20	3.37	169.01	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.29	2.56	49.97	3.44	171.79	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.36	2.57	49.92	3.47	173.24	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.44	2.58	49.11	3.57	175.39	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.52	2.59	48.03	3.69	177.45	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.56	2.60	47.28	3.77	178.19	0	0	0.53	0.000	0.00	0.00	0.00	0.000
36.64	2.60	47.35	3.71	175.74	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.71	2.57	48.67	3.51	170.83	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.75	2.53	51.58	3.17	163.38	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.82	2.47	56.33	2.76	155.25	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.90	2.40	62.21	2.37	147.65	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.97	2.35	67.26	2.12	142.91	0	0	0.53	0.000	0.00	11.89	0.00	0.000
37.01	2.30	71.90	1.93	139.09	0	0	0.53	0.000	0.00	11.89	0.00	0.000
37.09	2.27	75.20	1.80	135.54	0	0	0.53	0.000	0.00	11.89	0.00	0.000
37.16	2.23	78.32	1.68	131.78	0	0	0.53	0.000	0.00	11.89	0.00	0.000
37.24	2.20	80.22	1.61	128.86	0	0	0.53	0.000	0.00	11.89	0.00	0.000
37.27	2.17	81.94	1.54	126.10	0	0	0.53	0.000	0.00	11.89	0.00	0.000
37.36	2.16	81.88	1.52	124.52	0	0	0.53	0.000	0.00	11.89	0.00	0.000
37.43	2.16	80.74	1.53	123.34	27	2111	0.53	0.147	0.10	11.89	0.03	0.000
37.47	2.19	77.84	1.59	123.45	28	2124	0.53	0.145	0.10	11.89	0.03	0.000
37.55	2.22	74.45	1.67	124.33	28	2144	0.53	0.142	0.09	11.89	0.03	0.000
37.62	2.25	71.37	1.77	126.20	29	2169	0.53	0.138	0.09	11.89	0.03	0.000
37.67	2.27	71.38	1.80	128.81	30	2210	0.53	0.132	0.08	11.89	0.03	0.000
37.74	2.27	72.61	1.81	131.17	30	2254	0.53	0.126	0.08	11.89	0.02	0.000
37.81	2.26	74.76	1.79	134.07	31	2309	0.53	0.120	0.07	11.89	0.02	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
37.89	2.27	75.73	1.80	136.57	32	2354	0.53	0.115	0.07	11.89	0.02	0.000
37.93	2.25	78.73	1.76	138.71	32	2400	0.53	0.110	0.06	11.89	0.02	0.000
38.00	2.22	84.22	1.67	140.42	32	2442	0.53	0.106	0.06	11.89	0.02	0.000
38.08	2.18	91.85	1.56	142.95	32	2484	0.53	0.102	0.06	11.89	0.02	0.000
38.15	2.13	99.82	1.47	146.35	32	2513	0.53	0.100	0.06	11.89	0.02	0.000
38.23	2.10	105.38	1.42	149.25	32	2529	0.53	0.099	0.06	11.89	0.02	0.000
38.26	2.08	108.77	1.39	151.29	32	2536	0.53	0.098	0.05	11.89	0.02	0.000
38.33	2.08	108.51	1.39	150.93	32	2534	0.53	0.099	0.06	11.89	0.02	0.000
38.41	2.09	105.82	1.41	148.72	32	2517	0.53	0.100	0.06	11.89	0.02	0.000
38.48	2.12	99.81	1.45	144.29	31	2480	0.53	0.104	0.06	11.89	0.02	0.000
38.55	2.15	93.22	1.50	139.96	31	2438	0.53	0.108	0.06	11.89	0.02	0.000
38.59	2.19	85.59	1.59	136.09	31	2393	0.53	0.113	0.07	11.89	0.02	0.000
38.66	2.23	78.59	1.70	133.40	30	2349	0.53	0.118	0.07	11.89	0.02	0.000
38.74	2.27	72.82	1.81	131.85	31	2311	0.53	0.122	0.07	11.89	0.02	0.000
38.78	2.29	69.58	1.88	131.15	31	2286	0.53	0.125	0.07	11.89	0.02	0.000
38.86	2.30	68.65	1.91	131.13	31	2284	0.53	0.126	0.08	11.89	0.02	0.000
38.93	2.30	68.70	1.91	131.32	31	2290	0.53	0.125	0.07	11.89	0.02	0.000
39.01	2.29	69.27	1.90	131.52	31	2300	0.53	0.124	0.07	11.89	0.02	0.000
39.04	2.29	69.96	1.88	131.86	31	2310	0.53	0.123	0.07	11.89	0.02	0.000
39.12	2.29	70.23	1.89	132.39	31	2323	0.53	0.122	0.07	11.89	0.02	0.000
39.20	2.29	70.78	1.88	132.73	31	2335	0.52	0.121	0.07	11.89	0.02	0.000
39.28	2.28	71.36	1.86	132.70	31	2341	0.52	0.120	0.07	11.89	0.02	0.000
39.31	2.27	72.79	1.81	131.93	31	2337	0.52	0.121	0.07	11.89	0.02	0.000
39.38	2.25	74.76	1.76	131.27	30	2337	0.52	0.121	0.07	11.89	0.02	0.000
39.46	2.23	77.06	1.70	131.11	30	2343	0.52	0.120	0.07	11.89	0.02	0.000
39.54	2.22	78.45	1.68	131.48	30	2355	0.52	0.119	0.07	11.89	0.02	0.000
39.58	2.23	78.39	1.68	131.98	30	2365	0.52	0.118	0.07	11.89	0.02	0.000
39.65	2.24	76.86	1.72	132.54	30	2375	0.52	0.117	0.07	11.89	0.02	0.000
39.73	2.26	75.07	1.77	133.25	31	2386	0.52	0.116	0.07	11.89	0.02	0.000
39.77	2.27	73.98	1.81	134.11	31	2397	0.52	0.115	0.07	11.89	0.02	0.000
39.85	2.26	74.96	1.79	134.46	31	2410	0.52	0.114	0.07	11.89	0.02	0.000
39.92	2.24	78.26	1.72	134.93	31	2430	0.52	0.112	0.07	11.89	0.02	0.000
39.99	2.21	83.01	1.64	136.15	31	2460	0.52	0.109	0.06	11.89	0.02	0.000
40.06	2.19	87.09	1.59	138.08	31	2494	0.52	0.106	0.06	11.89	0.02	0.000
40.11	2.18	89.50	1.57	140.26	31	2533	0.52	0.103	0.06	11.89	0.02	0.000
40.18	2.15	91.16	1.51	137.40	30	2468	0.52	0.109	0.07	11.89	0.02	0.000
40.26	2.11	92.60	1.44	133.30	29	2360	0.52	0.120	0.08	11.89	0.02	0.000
40.29	2.07	93.48	1.38	129.39	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.36	2.08	92.77	1.39	128.76	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.44	2.10	91.42	1.42	129.45	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.52	2.12	88.91	1.46	129.54	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.56	2.14	87.17	1.49	130.17	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.63	2.16	85.65	1.53	131.01	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.71	2.18	85.55	1.56	133.30	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.78	2.19	85.16	1.59	135.45	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.82	2.20	85.09	1.62	137.64	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.90	2.21	85.23	1.63	138.82	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.97	2.21	85.30	1.64	139.49	0	0	0.52	0.000	0.00	11.89	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
41.01	2.21	84.66	1.65	139.35	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.08	2.22	82.88	1.68	138.86	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.16	2.24	80.11	1.73	138.25	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.24	2.26	77.26	1.79	138.23	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.28	2.29	73.60	1.90	139.48	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.36	2.33	69.42	2.05	142.14	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.43	2.38	64.56	2.27	146.52	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.51	2.41	61.21	2.45	150.19	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.55	2.44	58.52	2.61	152.84	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.62	2.47	55.82	2.76	154.06	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.70	2.49	53.60	2.88	154.61	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.74	2.49	52.99	2.91	154.32	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.81	2.48	54.58	2.82	153.80	39	2572	0.52	0.102	0.05	11.89	0.01	0.000
41.89	2.47	55.98	2.76	154.37	39	2602	0.52	0.100	0.04	11.89	0.01	0.000
41.93	2.48	55.57	2.84	157.98	40	2641	0.52	0.097	0.04	11.89	0.01	0.000
42.00	2.52	52.92	3.10	163.87	43	2675	0.52	0.095	0.04	11.89	0.01	0.000
42.08	2.55	50.36	3.37	169.71	45	2706	0.52	0.093	0.04	11.89	0.01	0.000
42.16	2.57	49.00	3.53	172.80	0	0	0.52	0.000	0.00	11.89	0.00	0.000
42.20	2.57	49.05	3.50	171.90	0	0	0.52	0.000	0.00	11.89	0.00	0.000
42.28	2.53	51.83	3.21	166.17	0	0	0.52	0.000	0.00	11.89	0.00	0.000
42.35	2.44	59.50	2.62	155.69	0	0	0.52	0.000	0.00	11.89	0.00	0.000
42.42	2.34	70.68	2.07	146.57	0	0	0.52	0.000	0.00	11.89	0.00	0.000
42.46	2.24	83.18	1.72	142.82	0	0	0.52	0.000	0.00	11.89	0.00	0.000
42.53	2.18	90.70	1.57	142.45	0	0	0.52	0.000	0.00	11.89	0.00	0.000
42.61	2.16	93.22	1.52	141.25	0	0	0.51	0.000	0.00	11.89	0.00	0.000
42.68	2.15	91.55	1.51	138.50	0	0	0.51	0.000	0.00	11.89	0.00	0.000
42.72	2.14	90.92	1.49	135.57	0	0	0.51	0.000	0.00	11.89	0.00	0.000
42.80	2.11	93.79	1.44	134.96	0	0	0.51	0.000	0.00	11.89	0.00	0.000
42.87	2.07	100.83	1.37	138.41	0	0	0.51	0.000	0.00	11.89	0.00	0.000
42.95	2.03	108.88	1.33	144.81	0	0	0.51	0.000	0.00	11.89	0.00	0.000
42.99	1.99	118.03	1.30	153.14	0	0	0.51	0.000	0.00	11.89	0.00	0.000
43.06	1.97	123.94	1.28	158.87	0	0	0.51	0.000	0.00	11.89	0.00	0.000
43.14	1.95	127.49	1.27	162.34	0	0	0.51	0.000	0.00	11.89	0.00	0.000
43.18	1.96	125.76	1.28	160.47	33	2614	0.51	0.101	0.06	11.89	0.01	0.000
43.26	1.99	118.54	1.30	153.65	32	2580	0.51	0.104	0.06	11.89	0.01	0.000
43.33	2.03	109.35	1.33	145.62	31	2549	0.51	0.107	0.06	11.89	0.02	0.000
43.37	2.09	98.85	1.40	138.79	30	2553	0.51	0.107	0.07	11.89	0.02	0.000
43.44	2.16	88.39	1.53	135.21	30	2577	0.51	0.105	0.06	11.89	0.02	0.000
43.52	2.23	80.08	1.70	136.33	31	2622	0.51	0.101	0.06	11.89	0.01	0.000
43.59	2.28	76.10	1.84	139.68	33	2673	0.51	0.097	0.05	11.89	0.01	0.000
43.67	2.28	76.57	1.86	142.06	33	2719	0.51	0.094	0.05	11.89	0.01	0.000
43.71	2.27	78.41	1.83	143.50	33	2753	0.51	0.092	0.05	11.89	0.01	0.000
43.78	2.25	82.83	1.75	144.80	33	2793	0.51	0.089	0.05	11.89	0.01	0.000
43.86	2.20	91.54	1.60	146.87	33	2837	0.51	0.087	0.05	11.89	0.01	0.000
43.93	2.13	102.36	1.47	150.87	33	2868	0.51	0.085	0.05	11.89	0.01	0.000
43.97	2.06	114.62	1.37	157.28	34	2870	0.51	0.085	0.05	11.89	0.01	0.000
44.04	2.01	124.15	1.31	163.14	34	2834	0.51	0.087	0.05	11.89	0.01	0.000
44.12	1.96	129.99	1.28	166.32	34	2762	0.51	0.092	0.05	11.89	0.01	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
44.19	1.94	130.06	1.27	164.58	34	2675	0.51	0.098	0.05	11.89	0.01	0.000
44.23	1.94	126.13	1.26	159.09	32	2569	0.51	0.106	0.06	11.89	0.01	0.000
44.30	1.95	119.44	1.27	151.31	31	2469	0.51	0.116	0.07	11.89	0.02	0.000
44.38	1.97	110.18	1.29	141.74	29	2388	0.51	0.125	0.08	11.89	0.02	0.000
44.46	2.01	101.81	1.32	134.19	28	2357	0.51	0.129	0.09	11.89	0.02	0.000
44.49	2.05	95.12	1.36	129.00	27	2347	0.51	0.130	0.09	11.89	0.02	0.000
44.57	2.09	89.62	1.40	125.84	27	2359	0.51	0.129	0.09	11.89	0.02	0.000
44.65	2.13	84.41	1.47	123.87	27	2379	0.51	0.126	0.09	11.89	0.02	0.000
44.69	2.18	79.28	1.57	124.15	28	2425	0.51	0.121	0.08	11.89	0.02	0.000
44.77	2.22	75.15	1.67	125.71	29	2470	0.51	0.116	0.08	11.89	0.02	0.000
44.84	2.26	71.37	1.80	128.21	30	2513	0.51	0.112	0.07	11.89	0.02	0.000
44.91	2.29	68.84	1.89	130.10	30	2538	0.51	0.110	0.07	11.89	0.01	0.000
44.95	2.31	66.51	1.97	131.34	31	2546	0.51	0.109	0.06	11.89	0.01	0.000
45.03	2.33	64.32	2.06	132.19	32	2547	0.51	0.109	0.06	11.89	0.01	0.000
45.12	2.35	62.52	2.12	132.80	32	2545	0.51	0.110	0.06	11.89	0.01	0.000
45.15	2.36	61.40	2.16	132.74	32	2536	0.51	0.110	0.06	11.89	0.01	0.000
45.23	2.36	60.46	2.18	131.55	32	2513	0.50	0.113	0.06	11.89	0.01	0.000
45.30	2.36	59.74	2.18	129.94	31	2485	0.50	0.115	0.07	11.89	0.01	0.000
45.37	2.36	59.43	2.16	128.57	31	2465	0.50	0.118	0.07	11.89	0.01	0.000
45.41	2.35	59.61	2.15	127.99	31	2460	0.50	0.118	0.07	11.89	0.01	0.000
45.49	2.35	60.06	2.13	128.16	31	2470	0.50	0.117	0.07	11.89	0.01	0.000
45.56	2.34	61.54	2.09	128.62	31	2492	0.50	0.115	0.07	11.89	0.01	0.000
45.63	2.33	63.53	2.03	129.20	31	2520	0.50	0.112	0.07	11.89	0.01	0.000
45.67	2.31	66.58	1.95	129.91	31	2555	0.50	0.109	0.07	11.89	0.01	0.000
45.75	2.29	69.64	1.89	131.57	31	2603	0.50	0.105	0.06	11.89	0.01	0.000
45.83	2.28	72.48	1.85	134.38	31	2669	0.50	0.100	0.06	11.89	0.01	0.000
45.91	2.28	73.96	1.85	137.05	32	2726	0.50	0.096	0.05	11.89	0.01	0.000
45.94	2.29	74.67	1.87	139.62	33	2775	0.50	0.093	0.05	11.89	0.01	0.000
46.01	2.29	75.52	1.88	141.75	33	2820	0.50	0.090	0.05	11.89	0.01	0.000
46.08	2.28	77.79	1.85	143.76	34	2868	0.50	0.087	0.05	11.89	0.01	0.000
46.16	2.26	80.99	1.79	144.77	33	2902	0.50	0.085	0.05	11.89	0.01	0.000
46.20	2.22	86.53	1.67	144.61	33	2908	0.50	0.085	0.05	11.89	0.01	0.000
46.27	2.17	93.69	1.54	144.41	32	2885	0.50	0.086	0.05	11.89	0.01	0.000
46.35	2.11	101.22	1.44	145.76	32	2849	0.50	0.088	0.05	11.89	0.01	0.000
46.39	2.06	108.15	1.37	148.25	32	2803	0.50	0.091	0.05	11.89	0.01	0.000
46.47	2.03	112.98	1.33	150.56	32	2764	0.50	0.094	0.05	11.89	0.01	0.000
46.54	2.00	115.50	1.31	151.33	32	2714	0.50	0.097	0.06	11.89	0.01	0.000
46.60	1.99	115.83	1.30	150.43	31	2661	0.50	0.101	0.06	11.89	0.01	0.000
46.67	1.97	115.76	1.29	149.04	31	2597	0.50	0.107	0.06	11.89	0.01	0.000
46.74	1.96	116.61	1.27	148.50	30	2535	0.50	0.112	0.07	11.89	0.01	0.000
46.83	1.94	117.30	1.26	148.30	30	2495	0.50	0.116	0.07	11.89	0.01	0.000
46.87	1.94	117.61	1.26	148.38	30	2487	0.50	0.117	0.07	11.89	0.01	0.000
46.94	1.93	118.59	1.26	149.38	30	2497	0.50	0.116	0.07	11.89	0.01	0.000
47.02	1.93	120.24	1.26	151.14	31	2518	0.50	0.114	0.07	11.89	0.01	0.000
47.09	1.93	122.03	1.25	153.00	31	2537	0.50	0.112	0.07	11.89	0.01	0.000
47.13	1.92	124.07	1.25	155.32	31	2568	0.50	0.110	0.06	11.89	0.01	0.000
47.20	1.92	126.07	1.25	157.72	32	2607	0.50	0.106	0.06	11.89	0.01	0.000
47.28	1.92	127.82	1.25	159.94	32	2647	0.50	0.103	0.06	11.89	0.01	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
47.32	1.92	129.25	1.25	161.88	33	2686	0.50	0.100	0.06	11.89	0.01	0.000
47.39	1.92	130.49	1.25	163.54	33	2720	0.50	0.098	0.05	11.89	0.01	0.000
47.46	1.92	132.61	1.25	165.96	34	2755	0.50	0.095	0.05	11.89	0.01	0.000
47.54	1.92	135.03	1.25	168.48	34	2781	0.50	0.094	0.05	11.89	0.01	0.000
47.58	1.90	139.31	1.24	172.61	35	2808	0.49	0.092	0.05	11.89	0.01	0.000
47.65	1.88	145.85	1.23	178.78	36	2848	0.49	0.089	0.04	11.89	0.01	0.000
47.72	1.86	154.34	1.21	186.67	37	2905	0.49	0.086	0.04	11.89	0.01	0.000
47.80	1.85	160.78	1.20	192.68	38	2959	0.49	0.083	0.04	11.89	0.01	0.000
47.84	1.85	163.00	1.20	195.27	0	0	0.49	0.000	0.00	11.89	0.00	0.000
47.92	1.86	160.55	1.21	193.50	0	0	0.49	0.000	0.00	11.89	0.00	0.000
48.00	1.87	156.55	1.21	190.00	0	0	0.49	0.000	0.00	11.89	0.00	0.000
48.03	1.89	149.32	1.23	183.22	0	0	0.49	0.000	0.00	11.89	0.00	0.000
48.11	1.93	136.02	1.26	170.91	0	0	0.49	0.000	0.00	11.89	0.00	0.000
48.19	2.01	116.45	1.32	153.27	0	0	0.49	0.000	0.00	11.89	0.00	0.000
48.26	2.10	98.60	1.42	139.88	0	0	0.49	0.000	0.00	11.89	0.00	0.000
48.30	2.19	84.43	1.58	133.48	0	0	0.49	0.000	0.00	11.89	0.00	0.000
48.38	2.36	54.90	2.18	119.74	0	0	0.49	0.000	0.00	11.89	0.00	0.000
48.45	2.45	48.37	2.67	128.91	0	0	0.49	0.000	0.00	11.89	0.00	0.000
48.53	2.53	43.82	3.17	138.99	0	0	0.49	0.000	0.00	11.89	0.00	0.000
48.57	2.57	41.86	3.52	147.15	0	0	0.49	0.000	0.00	11.89	0.00	0.000
48.64	2.60	40.54	3.78	153.27	0	0	0.49	0.000	0.00	0.00	0.00	0.000
48.72	2.64	38.93	4.08	158.67	0	0	0.49	0.000	0.00	0.00	0.00	0.000
48.76	2.68	36.32	4.50	163.56	0	0	0.49	0.000	0.00	0.00	0.00	0.000
48.84	2.72	33.75	4.96	167.39	0	0	0.49	0.000	0.00	0.00	0.00	0.000
48.91	2.76	31.73	5.36	170.05	0	0	0.49	0.000	0.00	0.00	0.00	0.000
48.95	2.75	32.00	5.26	168.24	0	0	0.49	0.000	0.00	0.00	0.00	0.000
49.03	2.70	34.29	4.72	161.78	0	0	0.49	0.000	0.00	0.00	0.00	0.000
49.10	2.63	37.93	4.02	152.44	0	0	0.49	0.000	0.00	0.00	0.00	0.000
49.18	2.56	41.45	3.40	140.83	0	0	0.49	0.000	0.00	11.89	0.00	0.000
49.25	2.50	43.78	3.00	131.15	0	0	0.49	0.000	0.00	11.89	0.00	0.000
49.28	2.47	45.04	2.80	126.18	0	0	0.49	0.000	0.00	11.89	0.00	0.000
49.36	2.47	45.70	2.75	125.66	0	0	0.49	0.000	0.00	11.89	0.00	0.000
49.44	2.46	46.31	2.73	126.40	0	0	0.49	0.000	0.00	11.89	0.00	0.000
49.48	2.45	46.83	2.66	124.65	0	0	0.49	0.000	0.00	11.89	0.00	0.000
49.56	2.44	46.97	2.61	122.63	0	0	0.49	0.000	0.00	11.89	0.00	0.000
49.63	2.44	46.97	2.58	121.04	0	0	0.49	0.000	0.00	11.89	0.00	0.000
49.69	2.43	47.23	2.54	119.91	0	0	0.49	0.000	0.00	11.89	0.00	0.000
49.78	2.42	47.66	2.50	119.24	0	0	0.49	0.000	0.00	11.89	0.00	0.000
49.81	2.41	48.58	2.45	118.83	0	0	0.49	0.000	0.00	11.89	0.00	0.000
49.88	2.41	49.36	2.42	119.68	0	0	0.48	0.000	0.00	11.89	0.00	0.000
49.96	2.41	49.89	2.43	121.18	0	0	0.48	0.000	0.00	11.89	0.00	0.000
50.00	2.42	49.63	2.49	123.83	0	0	0.48	0.000	0.00	11.89	0.00	0.000
50.08	2.44	48.79	2.59	126.60	0	0	0.48	0.000	0.00	11.89	0.00	0.000
50.15	2.46	47.80	2.71	129.64	0	0	0.48	0.000	0.00	11.89	0.00	0.000
50.23	2.47	47.42	2.77	131.46	0	0	0.48	0.000	0.00	11.89	0.00	0.000
50.27	2.48	47.12	2.84	133.72	0	0	0.48	0.000	0.00	11.89	0.00	0.000
50.34	2.48	47.00	2.88	135.18	0	0	0.48	0.000	0.00	11.89	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)

Total estimated settlement: 0.15

Abbreviations

Q_{tn}: Equivalent clean sand normalized cone resistance
K_c: Fines correction factor
$Q_{tn,cs}$: Post-liquefaction volumentric strain
G_{max}: Small strain shear modulus
CSR: Soil cyclic stress ratio
γ: Cyclic shear strain
$e_{vol(15)}$: Volumetric strain after 15 cycles
N_c: Equivalent number of cycles
e_v: Volumetric strain
Settle.: Calculated settlement

GeoTek, Inc.
1548 N. Maple Street
Corona, CA 92878
951-710-1160, www.geotekusa.com

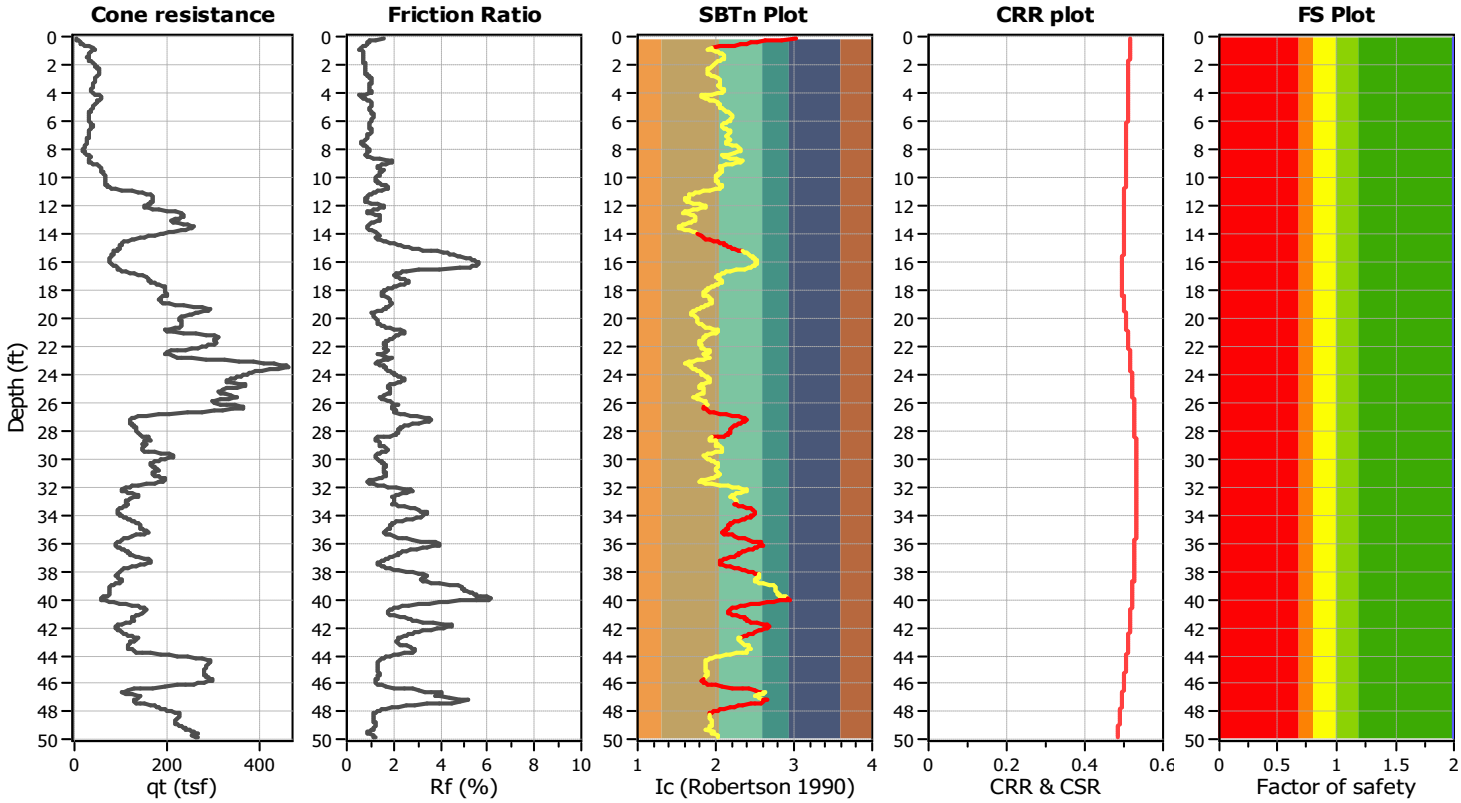
LIQUEFACTION ANALYSIS REPORT

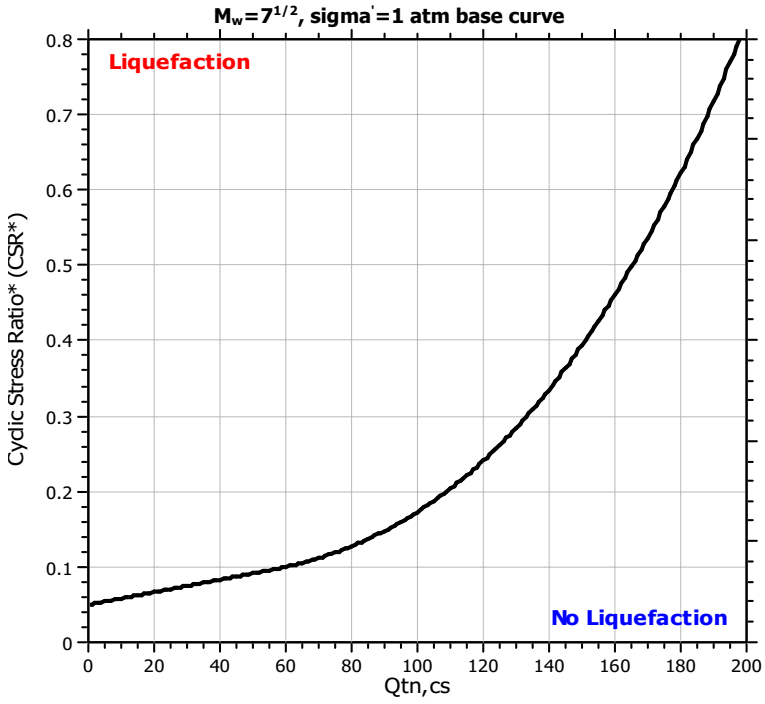
Project title : Xenia Site **Location : Beaumont, California**

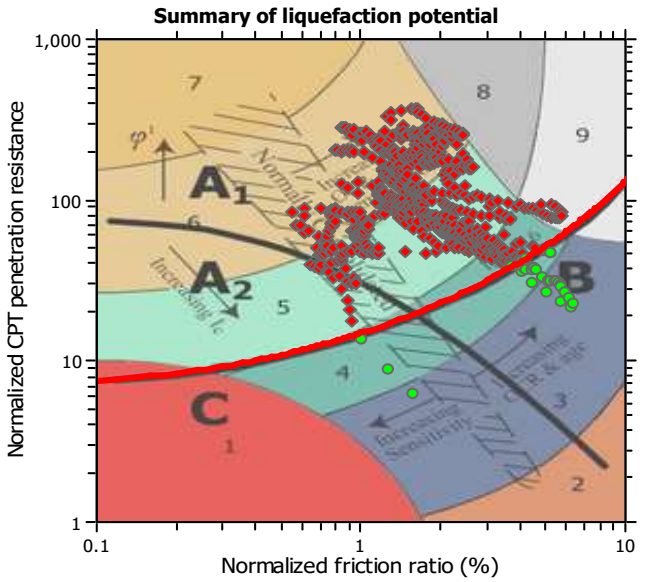
CPT file : CPT-4

Input parameters and analysis data

Analysis method:	NCEER (1998)	G.W.T. (in-situ):	100.00 ft	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	100.00 ft	Fill height:	N/A	Limit depth applied:	Yes
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	60.00 ft
Earthquake magnitude M_w:	7.13	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	0.90	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

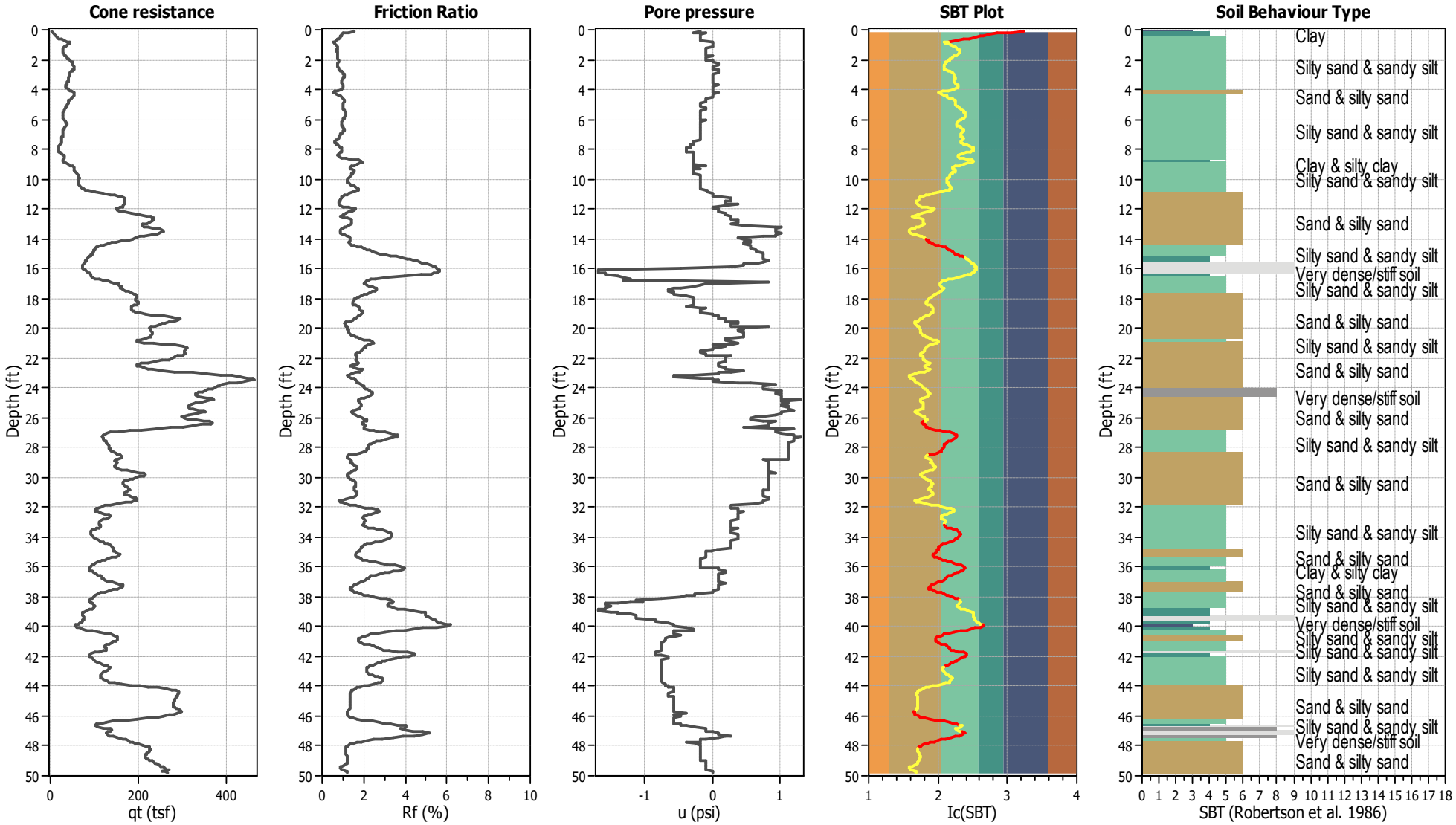






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plots



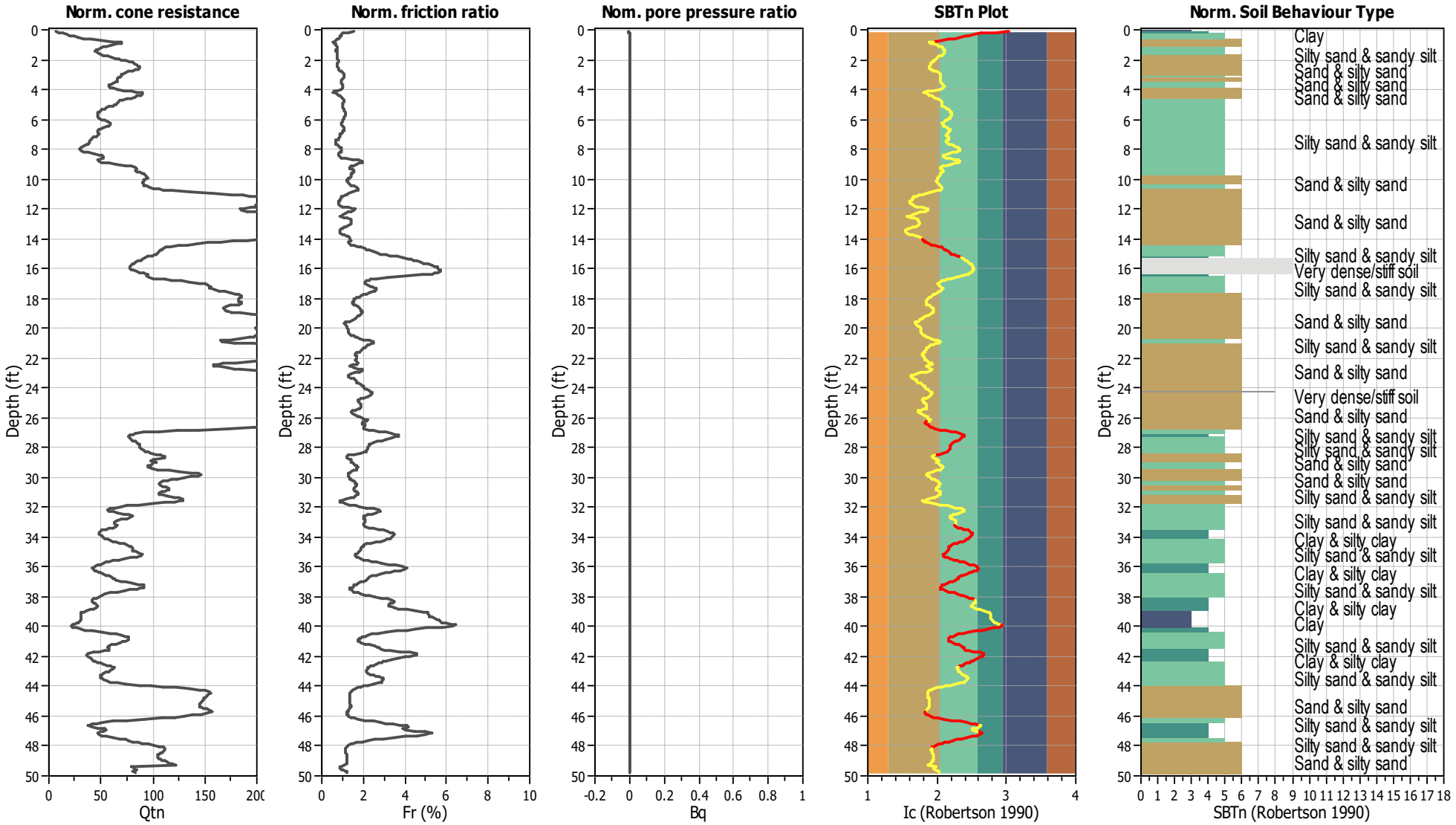
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	100.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.13	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.90	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	100.00 ft	Fill height:	N/A	Limit depth:	60.00 ft

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

CPT basic interpretation plots (normalized)



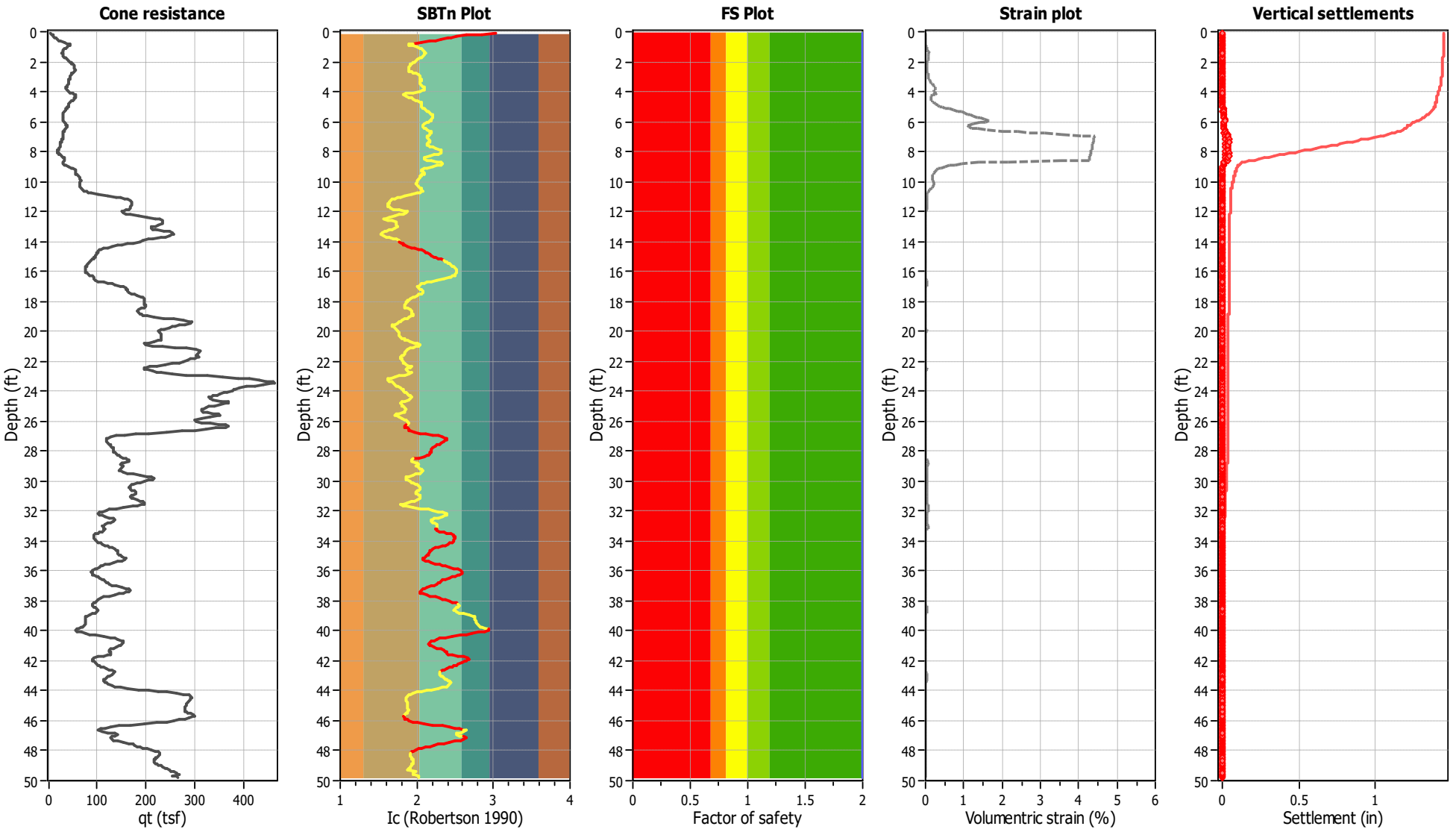
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	100.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.13	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.90	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	100.00 ft	Fill height:	N/A	Limit depth:	60.00 ft

SBTn legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

Estimation of post-earthquake settlements



Abbreviations

q_t:	Total cone resistance (cone resistance q_c corrected for pore water effects)
I_c:	Soil Behaviour Type Index
FS:	Calculated Factor of Safety against liquefaction
Volumentric strain:	Post-liquefaction volumentric strain

:: Post-earthquake settlement of dry sands ::

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
0.07	3.03	6.14	9.36	57.47	0	0	0.51	0.000	0.00	0.00	0.00	0.000
0.14	2.85	8.84	6.49	57.33	0	0	0.51	0.000	0.00	0.00	0.00	0.000
0.22	2.64	13.53	4.11	55.56	0	0	0.51	0.000	0.00	0.00	0.00	0.000
0.29	2.52	17.52	3.14	54.98	0	0	0.51	0.000	0.00	11.89	0.00	0.000
0.33	2.45	20.77	2.68	55.63	0	0	0.51	0.000	0.00	11.89	0.00	0.000
0.41	2.40	23.56	2.39	56.27	0	0	0.51	0.000	0.00	11.89	0.00	0.000
0.48	2.32	28.06	2.02	56.70	0	0	0.51	0.000	0.00	11.89	0.00	0.000
0.56	2.25	33.05	1.75	57.75	0	0	0.51	0.000	0.00	11.89	0.00	0.000
0.59	2.16	40.20	1.53	61.62	0	0	0.51	0.000	0.00	11.89	0.00	0.000
0.67	2.06	50.34	1.36	68.69	0	0	0.51	0.000	0.00	11.89	0.00	0.000
0.74	1.95	62.39	1.27	79.39	0	0	0.51	0.000	0.00	11.89	0.00	0.000
0.82	1.89	70.08	1.23	86.42	0	0	0.51	0.000	0.00	11.89	0.00	0.000
0.86	1.90	70.38	1.24	87.02	17	437	0.51	0.014	0.02	11.89	0.01	0.000
0.93	1.95	65.32	1.27	82.81	17	430	0.51	0.016	0.02	11.89	0.02	0.000
1.01	2.00	59.87	1.31	78.17	16	421	0.51	0.020	0.03	11.89	0.02	0.000
1.05	2.04	55.61	1.34	74.50	16	410	0.51	0.023	0.03	11.89	0.03	0.000
1.12	2.06	52.56	1.36	71.71	15	399	0.51	0.029	0.04	11.89	0.04	0.000
1.19	2.08	49.40	1.39	68.60	15	385	0.51	0.037	0.05	11.89	0.05	0.000
1.26	2.09	46.65	1.41	65.84	14	371	0.51	0.048	0.07	11.89	0.06	0.001
1.33	2.10	45.56	1.42	64.61	14	364	0.51	0.058	0.09	11.89	0.08	0.001
1.41	2.11	44.91	1.43	64.27	14	363	0.51	0.068	0.10	11.89	0.09	0.001
1.45	2.10	45.80	1.42	65.24	14	368	0.51	0.068	0.10	11.89	0.09	0.000
1.52	2.10	46.82	1.42	66.53	14	375	0.51	0.070	0.10	11.89	0.09	0.001
1.59	2.08	49.76	1.39	69.27	15	389	0.51	0.068	0.10	11.89	0.08	0.001
1.67	2.06	52.60	1.37	72.00	15	401	0.51	0.066	0.09	11.89	0.08	0.001
1.71	2.04	56.30	1.34	75.49	16	416	0.51	0.061	0.08	11.89	0.07	0.000
1.79	2.01	60.25	1.32	79.39	17	431	0.51	0.058	0.07	11.89	0.06	0.001
1.86	1.99	64.14	1.30	83.39	17	447	0.51	0.056	0.07	11.89	0.06	0.001
1.90	1.98	67.43	1.29	87.07	18	463	0.51	0.051	0.06	11.89	0.05	0.000
1.98	1.97	70.43	1.28	90.45	19	478	0.51	0.050	0.05	11.89	0.05	0.000
2.06	1.95	74.12	1.27	94.36	19	493	0.51	0.048	0.05	11.89	0.04	0.000
2.13	1.94	77.32	1.26	97.53	20	504	0.51	0.049	0.05	11.89	0.04	0.000
2.17	1.92	80.22	1.25	100.24	20	511	0.51	0.048	0.05	11.89	0.04	0.000
2.24	1.91	82.36	1.24	102.25	21	516	0.51	0.050	0.05	11.89	0.04	0.000
2.32	1.90	84.41	1.23	104.21	21	522	0.51	0.051	0.05	11.89	0.04	0.000
2.40	1.89	85.80	1.23	105.64	21	527	0.51	0.053	0.05	11.89	0.04	0.000
2.43	1.89	86.89	1.23	106.85	21	533	0.51	0.053	0.05	11.89	0.04	0.000
2.51	1.89	87.13	1.23	107.27	21	535	0.51	0.056	0.05	11.89	0.04	0.000
2.58	1.91	85.67	1.24	106.27	21	536	0.51	0.059	0.05	11.89	0.05	0.000
2.66	1.93	83.27	1.25	104.40	21	534	0.51	0.063	0.06	11.89	0.05	0.000
2.69	1.95	80.02	1.27	101.87	21	533	0.51	0.066	0.06	11.89	0.05	0.000
2.76	1.99	76.67	1.30	99.33	21	531	0.51	0.070	0.07	11.89	0.06	0.000
2.84	2.02	73.31	1.32	96.90	20	528	0.51	0.076	0.07	11.89	0.06	0.001
2.91	2.04	71.04	1.34	95.32	20	525	0.51	0.082	0.08	11.89	0.07	0.001
2.99	2.04	70.38	1.35	94.83	20	524	0.51	0.088	0.09	11.89	0.08	0.001
3.03	2.04	70.13	1.35	94.53	20	522	0.51	0.092	0.09	11.89	0.08	0.000
3.10	2.05	69.03	1.35	93.48	20	518	0.51	0.100	0.10	11.89	0.09	0.001
3.17	2.05	67.58	1.36	91.91	20	511	0.51	0.113	0.12	11.89	0.10	0.001

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
3.26	2.06	66.37	1.36	90.44	19	503	0.51	0.127	0.13	11.89	0.11	0.001
3.28	2.05	66.02	1.35	89.40	19	495	0.51	0.139	0.15	11.89	0.13	0.000
3.37	2.04	65.76	1.35	88.53	19	489	0.51	0.156	0.17	11.89	0.14	0.001
3.44	2.04	65.30	1.34	87.61	19	483	0.51	0.175	0.19	11.89	0.16	0.002
3.48	2.05	63.85	1.35	86.28	18	478	0.51	0.190	0.21	11.89	0.18	0.001
3.56	2.06	61.84	1.37	84.76	18	473	0.51	0.211	0.24	11.89	0.20	0.002
3.64	2.08	59.69	1.40	83.28	18	468	0.51	0.235	0.27	11.89	0.23	0.002
3.68	2.10	58.28	1.41	82.30	18	464	0.51	0.253	0.29	11.89	0.25	0.001
3.75	2.10	58.07	1.42	82.39	18	465	0.51	0.263	0.30	11.89	0.25	0.002
3.83	2.10	59.26	1.41	83.72	18	472	0.51	0.258	0.29	11.89	0.24	0.002
3.90	2.08	61.66	1.40	86.08	19	483	0.51	0.240	0.26	11.89	0.22	0.002
3.94	2.04	66.36	1.34	89.00	19	490	0.51	0.230	0.25	11.89	0.21	0.001
4.02	1.95	72.60	1.27	92.26	19	481	0.51	0.266	0.29	11.89	0.24	0.002
4.10	1.87	79.29	1.21	96.16	19	472	0.51	0.310	0.33	11.89	0.28	0.002
4.14	1.81	85.19	1.17	99.57	19	475	0.51	0.306	0.32	11.89	0.27	0.001
4.21	1.82	89.63	1.17	105.14	20	503	0.51	0.243	0.24	11.89	0.20	0.002
4.29	1.86	89.57	1.21	108.01	21	527	0.51	0.204	0.19	11.89	0.16	0.001
4.35	1.89	88.66	1.23	109.15	22	545	0.51	0.181	0.16	11.89	0.14	0.001
4.42	1.93	85.16	1.26	107.15	22	551	0.51	0.179	0.16	11.89	0.14	0.001
4.49	1.95	83.60	1.27	106.24	22	554	0.51	0.182	0.16	11.89	0.14	0.001
4.53	1.98	79.35	1.29	102.73	21	548	0.51	0.195	0.18	11.89	0.15	0.001
4.61	2.02	75.14	1.32	99.20	21	540	0.51	0.218	0.21	11.89	0.17	0.001
4.68	2.04	71.68	1.34	96.32	20	531	0.51	0.246	0.24	11.89	0.20	0.002
4.72	2.06	68.98	1.36	93.86	20	522	0.51	0.275	0.28	11.89	0.23	0.001
4.80	2.06	66.98	1.37	91.75	20	511	0.51	0.315	0.32	11.89	0.27	0.002
4.88	2.07	65.32	1.37	89.64	19	500	0.51	0.370	0.39	11.89	0.32	0.003
4.95	2.06	64.26	1.37	88.09	19	491	0.51	0.423	0.46	11.89	0.38	0.003
4.99	2.06	63.36	1.37	86.78	19	484	0.51	0.471	0.52	11.89	0.43	0.002
5.07	2.08	61.20	1.39	84.81	18	475	0.51	0.544	0.61	11.89	0.50	0.005
5.14	2.10	58.29	1.41	82.47	18	465	0.51	0.642	0.74	11.89	0.61	0.005
5.22	2.12	55.44	1.45	80.42	18	455	0.51	0.755	0.88	11.89	0.73	0.006
5.26	2.14	53.03	1.49	78.88	17	447	0.51	0.859	1.02	11.89	0.84	0.004
5.34	2.16	51.23	1.52	78.01	17	442	0.51	0.966	1.15	11.89	0.94	0.009
5.41	2.18	49.57	1.56	77.42	17	438	0.51	1.069	1.27	11.89	1.04	0.009
5.48	2.19	48.46	1.59	77.22	17	435	0.51	1.150	1.36	11.89	1.11	0.009
5.52	2.20	47.56	1.62	76.97	17	433	0.51	1.220	1.44	11.89	1.18	0.006
5.60	2.21	46.95	1.64	76.82	17	431	0.51	1.308	1.55	11.89	1.26	0.012
5.68	2.21	46.65	1.64	76.67	17	430	0.51	1.392	1.65	11.89	1.34	0.013
5.72	2.21	46.69	1.63	76.15	17	428	0.51	1.473	1.76	11.89	1.43	0.007
5.79	2.20	47.08	1.61	75.65	17	426	0.51	1.574	1.91	11.89	1.55	0.014
5.87	2.18	47.77	1.58	75.27	17	425	0.51	1.665	2.04	11.89	1.66	0.015
5.94	2.17	48.81	1.55	75.54	17	428	0.51	1.669	2.05	11.89	1.66	0.014
5.98	2.15	50.61	1.51	76.32	17	433	0.51	1.577	1.93	11.89	1.57	0.008
6.06	2.13	53.15	1.46	77.83	17	441	0.51	1.454	1.76	11.89	1.42	0.013
6.14	2.10	56.15	1.42	79.93	17	451	0.51	1.307	1.55	11.89	1.25	0.011
6.21	2.09	58.40	1.40	81.69	18	459	0.51	1.215	1.42	11.89	1.14	0.010
6.25	2.08	59.70	1.39	82.73	18	463	0.51	1.169	1.35	11.89	1.09	0.005
6.32	2.08	59.49	1.39	82.67	18	464	0.51	1.208	1.39	11.89	1.12	0.010

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
6.40	2.09	58.33	1.41	82.01	18	462	0.51	1.291	1.50	11.89	1.20	0.011
6.44	2.11	55.88	1.44	80.56	18	456	0.51	1.426	1.67	11.89	1.34	0.006
6.51	2.14	52.87	1.49	78.78	17	447	0.51	1.684	2.00	11.89	1.60	0.014
6.59	2.17	50.02	1.54	76.93	17	436	0.51	2.069	2.50	11.89	2.00	0.019
6.67	2.18	48.16	1.57	75.52	17	427	0.51	2.470	3.02	11.89	2.42	0.022
6.71	2.18	47.45	1.57	74.62	17	422	0.51	2.747	3.41	11.89	2.72	0.013
6.78	2.18	47.24	1.56	73.71	16	417	0.51	3.081	3.89	11.89	3.10	0.026
6.86	2.17	47.38	1.54	72.82	16	412	0.51	3.467	4.47	11.89	3.56	0.035
6.90	2.15	47.73	1.50	71.75	16	407	0.51	3.899	5.16	11.89	4.10	0.017
6.97	2.14	47.83	1.48	70.82	16	401	0.51	4.462	6.03	11.89	4.41	0.040
7.04	2.14	46.98	1.48	69.41	15	393	0.51	5.376	7.45	11.89	4.40	0.038
7.13	2.15	45.52	1.49	68.02	15	386	0.51	6.532	9.23	11.89	4.40	0.043
7.16	2.16	43.57	1.52	66.43	15	376	0.51	8.062	11.63	11.89	4.39	0.021
7.24	2.17	42.05	1.55	65.07	14	368	0.51	9.967	14.66	11.89	4.39	0.039
7.31	2.17	40.64	1.54	62.45	14	354	0.51	14.448	22.38	11.89	4.38	0.036
7.39	2.15	39.94	1.51	60.20	13	341	0.51	20.551	33.51	11.89	4.37	0.044
7.43	2.14	39.54	1.48	58.47	13	331	0.51	27.183	46.24	11.89	4.37	0.019
7.51	2.14	39.23	1.49	58.33	13	331	0.51	28.882	49.16	11.89	4.36	0.041
7.58	2.15	38.87	1.50	58.50	13	332	0.51	29.194	49.29	11.89	4.36	0.037
7.62	2.17	38.12	1.54	58.69	13	332	0.51	29.266	48.81	11.89	4.35	0.021
7.69	2.21	35.86	1.64	58.65	13	329	0.51	33.164	54.25	11.89	4.35	0.040
7.76	2.25	33.51	1.76	58.99	14	325	0.51	38.465	61.12	11.89	4.34	0.033
7.83	2.30	31.15	1.92	59.73	14	320	0.51	46.117	70.50	11.89	4.34	0.041
7.90	2.31	30.50	1.98	60.32	14	320	0.51	48.464	72.61	11.89	4.33	0.037
7.95	2.32	30.04	2.02	60.77	14	320	0.51	49.970	73.77	11.89	4.33	0.022
8.03	2.32	30.38	2.01	61.17	15	322	0.51	48.157	70.62	11.89	4.32	0.043
8.10	2.31	31.23	1.97	61.53	15	327	0.51	43.855	64.23	11.89	4.31	0.037
8.14	2.28	33.17	1.87	62.01	14	336	0.51	35.043	51.56	11.89	4.31	0.021
8.21	2.23	37.37	1.68	62.81	14	351	0.51	24.473	36.56	11.89	4.30	0.037
8.30	2.16	42.36	1.53	64.82	14	367	0.51	16.961	25.16	11.89	4.30	0.043
8.34	2.11	47.86	1.43	68.36	15	386	0.51	11.390	16.30	11.89	4.29	0.022
8.42	2.09	50.55	1.40	70.99	15	399	0.51	8.974	12.37	11.89	4.29	0.040
8.47	2.09	52.35	1.41	73.76	16	415	0.51	6.772	8.90	11.89	4.28	0.029
8.54	2.13	52.24	1.46	76.23	17	432	0.51	5.201	6.47	11.89	4.28	0.035
8.61	2.18	50.48	1.58	79.56	18	449	0.50	3.998	4.59	11.89	3.53	0.030
8.66	2.26	48.48	1.78	86.22	20	474	0.50	2.812	2.83	11.89	2.17	0.014
8.74	2.32	47.27	1.99	94.28	22	499	0.50	2.058	1.80	11.89	1.38	0.012
8.81	2.34	48.51	2.07	100.38	24	523	0.50	1.547	1.24	11.89	0.95	0.008
8.86	2.32	51.61	1.99	102.79	24	544	0.50	1.247	0.98	11.89	0.75	0.005
8.93	2.26	57.70	1.79	103.49	24	567	0.50	0.995	0.80	11.89	0.61	0.005
9.01	2.20	64.80	1.63	105.38	24	592	0.50	0.799	0.65	11.89	0.49	0.004
9.06	2.14	73.20	1.48	108.10	24	619	0.50	0.635	0.52	11.89	0.39	0.002
9.14	2.09	78.83	1.41	110.88	24	643	0.50	0.536	0.43	11.89	0.33	0.003
9.19	2.06	83.71	1.36	113.97	24	662	0.50	0.470	0.37	11.89	0.28	0.002
9.27	2.05	84.89	1.36	115.30	24	673	0.50	0.442	0.35	11.89	0.26	0.002
9.32	2.07	84.44	1.38	116.56	25	685	0.50	0.413	0.32	11.89	0.24	0.002
9.40	2.09	83.84	1.40	117.61	25	696	0.50	0.391	0.29	11.89	0.22	0.002
9.47	2.09	84.73	1.41	119.07	26	709	0.50	0.367	0.27	11.89	0.21	0.002

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
9.53	2.07	87.35	1.38	120.34	26	718	0.50	0.350	0.26	11.89	0.20	0.001
9.59	2.05	89.46	1.36	121.62	26	728	0.50	0.335	0.25	11.89	0.19	0.001
9.65	2.05	90.81	1.35	122.68	26	737	0.50	0.322	0.23	11.89	0.18	0.001
9.72	2.04	92.36	1.34	123.91	26	746	0.50	0.309	0.22	11.89	0.17	0.001
9.79	2.02	94.07	1.33	124.74	26	752	0.50	0.305	0.22	11.89	0.17	0.001
9.87	2.01	94.81	1.31	124.45	26	750	0.50	0.314	0.23	11.89	0.17	0.002
9.91	2.00	93.78	1.31	122.51	25	739	0.50	0.341	0.25	11.89	0.19	0.001
9.99	2.00	92.36	1.31	120.61	25	731	0.50	0.365	0.28	11.89	0.21	0.002
10.06	2.00	91.13	1.30	118.90	25	724	0.50	0.390	0.30	11.89	0.23	0.002
10.14	2.00	90.68	1.30	118.26	25	724	0.50	0.399	0.31	11.89	0.23	0.002
10.18	2.00	90.55	1.31	118.72	25	730	0.50	0.385	0.30	11.89	0.22	0.001
10.25	2.02	90.50	1.32	119.47	25	742	0.50	0.366	0.28	11.89	0.21	0.002
10.33	2.03	90.88	1.33	121.23	26	760	0.50	0.333	0.25	11.89	0.18	0.002
10.40	2.04	91.60	1.34	122.93	26	776	0.50	0.309	0.23	11.89	0.17	0.001
10.44	2.05	93.35	1.36	126.92	27	807	0.50	0.264	0.18	11.89	0.14	0.001
10.52	2.07	95.98	1.38	132.23	28	847	0.50	0.219	0.14	11.89	0.11	0.001
10.59	2.07	100.79	1.38	139.13	30	897	0.50	0.179	0.11	11.89	0.08	0.001
10.67	2.06	106.17	1.36	144.86	31	936	0.50	0.155	0.09	11.89	0.07	0.001
10.71	2.05	109.95	1.35	148.54	31	960	0.50	0.143	0.08	11.89	0.06	0.000
10.78	2.01	118.50	1.31	155.51	32	996	0.50	0.127	0.07	11.89	0.05	0.000
10.85	1.93	136.20	1.25	170.80	35	1057	0.50	0.106	0.06	11.89	0.04	0.000
10.91	1.84	158.84	1.19	189.36	37	1131	0.50	0.088	0.04	11.89	0.03	0.000
10.99	1.78	175.53	1.13	199.07	38	1184	0.50	0.078	0.04	11.89	0.03	0.000
11.03	1.74	186.11	1.08	200.09	38	1206	0.50	0.075	0.03	11.89	0.03	0.000
11.11	1.71	193.95	1.00	194.12	36	1212	0.50	0.075	0.04	11.89	0.03	0.000
11.18	1.67	201.20	1.00	201.20	37	1215	0.50	0.076	0.04	11.89	0.03	0.000
11.26	1.65	205.04	1.00	205.04	38	1222	0.50	0.075	0.04	11.89	0.03	0.000
11.30	1.65	206.41	1.00	206.41	38	1231	0.50	0.074	0.03	11.89	0.03	0.000
11.37	1.65	206.36	1.00	206.36	38	1224	0.50	0.076	0.04	11.89	0.03	0.000
11.45	1.63	205.44	1.00	205.44	37	1204	0.50	0.081	0.04	11.89	0.03	0.000
11.48	1.61	205.67	1.00	205.67	37	1180	0.50	0.086	0.04	11.89	0.03	0.000
11.56	1.61	204.77	1.00	204.77	37	1179	0.50	0.088	0.04	11.89	0.03	0.000
11.64	1.62	202.43	1.00	202.43	37	1187	0.50	0.087	0.04	11.89	0.03	0.000
11.71	1.63	200.09	1.00	200.09	37	1192	0.50	0.087	0.04	11.89	0.03	0.000
11.75	1.66	199.15	1.00	199.15	37	1221	0.50	0.082	0.04	11.89	0.03	0.000
11.83	1.70	198.30	1.00	198.30	37	1282	0.50	0.073	0.03	11.89	0.03	0.000
11.90	1.78	194.18	1.12	218.28	42	1364	0.50	0.063	0.03	11.89	0.02	0.000
11.98	1.84	187.50	1.19	223.63	44	1419	0.50	0.058	0.02	11.89	0.02	0.000
12.02	1.87	183.54	1.22	223.42	44	1440	0.50	0.056	0.02	11.89	0.02	0.000
12.10	1.86	184.80	1.21	223.00	44	1434	0.50	0.058	0.02	11.89	0.02	0.000
12.17	1.82	190.45	1.17	223.65	44	1424	0.50	0.059	0.02	11.89	0.02	0.000
12.21	1.77	200.46	1.11	223.40	43	1420	0.50	0.060	0.02	11.89	0.02	0.000
12.29	1.71	216.36	1.01	218.44	41	1442	0.50	0.058	0.02	11.89	0.02	0.000
12.36	1.65	234.67	1.00	234.67	43	1462	0.50	0.057	0.02	11.89	0.02	0.000
12.43	1.59	252.49	1.00	252.49	45	1478	0.50	0.056	0.02	11.89	0.01	0.000
12.47	1.57	264.66	1.00	264.66	47	1504	0.50	0.054	0.02	11.89	0.01	0.000
12.54	1.62	267.64	1.00	267.64	49	1628	0.50	0.046	0.02	11.89	0.01	0.000
12.62	1.67	270.80	1.00	270.80	50	1757	0.50	0.040	0.01	11.89	0.01	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
12.69	1.72	269.79	1.04	279.34	53	1859	0.50	0.036	0.01	11.89	0.01	0.000
12.73	1.73	271.05	1.04	281.79	53	1876	0.50	0.036	0.01	11.89	0.01	0.000
12.81	1.73	267.90	1.04	279.88	53	1867	0.50	0.037	0.01	11.89	0.01	0.000
12.89	1.74	259.23	1.06	274.45	52	1828	0.50	0.039	0.01	11.89	0.01	0.000
12.96	1.74	250.70	1.07	269.04	51	1790	0.50	0.040	0.01	11.89	0.01	0.000
13.00	1.75	240.77	1.08	261.08	50	1736	0.50	0.043	0.01	11.89	0.01	0.000
13.08	1.72	239.70	1.03	247.39	47	1679	0.50	0.047	0.02	11.89	0.01	0.000
13.15	1.68	240.31	1.00	240.31	45	1621	0.50	0.051	0.02	11.89	0.01	0.000
13.19	1.65	249.90	1.00	249.90	46	1614	0.50	0.051	0.02	11.89	0.01	0.000
13.26	1.61	262.88	1.00	262.88	48	1633	0.50	0.051	0.02	11.89	0.01	0.000
13.34	1.58	274.33	1.00	274.33	49	1640	0.50	0.051	0.02	11.89	0.01	0.000
13.42	1.55	281.35	1.00	281.35	50	1621	0.50	0.052	0.02	11.89	0.01	0.000
13.46	1.53	282.94	1.00	282.94	50	1605	0.50	0.054	0.02	11.89	0.01	0.000
13.54	1.54	280.91	1.00	280.91	50	1609	0.50	0.054	0.02	11.89	0.01	0.000
13.60	1.56	273.99	1.00	273.99	49	1624	0.50	0.053	0.02	11.89	0.01	0.000
13.68	1.60	263.41	1.00	263.41	48	1649	0.50	0.052	0.02	11.89	0.01	0.000
13.72	1.65	252.43	1.00	252.43	46	1667	0.50	0.051	0.02	11.89	0.01	0.000
13.79	1.70	234.24	1.00	234.24	44	1652	0.50	0.053	0.02	11.89	0.01	0.000
13.85	1.73	223.45	1.05	234.72	44	1638	0.50	0.054	0.02	11.89	0.01	0.000
13.92	1.76	211.23	1.11	233.64	45	1614	0.50	0.056	0.02	11.89	0.01	0.000
13.99	1.78	204.55	1.12	229.74	44	1590	0.50	0.059	0.02	11.89	0.02	0.000
14.07	1.81	190.87	1.16	221.33	0	0	0.50	0.000	0.00	11.89	0.00	0.000
14.11	1.82	177.33	1.18	208.41	0	0	0.50	0.000	0.00	11.89	0.00	0.000
14.19	1.83	164.58	1.18	195.00	0	0	0.50	0.000	0.00	11.89	0.00	0.000
14.27	1.84	152.88	1.19	182.53	0	0	0.50	0.000	0.00	11.89	0.00	0.000
14.31	1.88	142.27	1.22	174.06	0	0	0.50	0.000	0.00	11.89	0.00	0.000
14.39	1.93	132.98	1.25	166.76	0	0	0.50	0.000	0.00	11.89	0.00	0.000
14.47	1.97	124.30	1.29	159.92	0	0	0.50	0.000	0.00	11.89	0.00	0.000
14.50	2.02	117.19	1.33	155.30	0	0	0.50	0.000	0.00	11.89	0.00	0.000
14.58	2.06	113.05	1.36	154.30	0	0	0.50	0.000	0.00	11.89	0.00	0.000
14.66	2.09	110.37	1.41	155.51	0	0	0.50	0.000	0.00	11.89	0.00	0.000
14.73	2.11	109.22	1.44	157.45	0	0	0.50	0.000	0.00	11.89	0.00	0.000
14.77	2.14	107.82	1.48	159.47	0	0	0.50	0.000	0.00	11.89	0.00	0.000
14.85	2.16	106.26	1.53	162.37	0	0	0.50	0.000	0.00	11.89	0.00	0.000
14.93	2.19	104.79	1.59	167.12	0	0	0.50	0.000	0.00	11.89	0.00	0.000
15.00	2.22	103.64	1.66	171.86	0	0	0.50	0.000	0.00	11.89	0.00	0.000
15.04	2.25	101.59	1.75	177.56	0	0	0.50	0.000	0.00	11.89	0.00	0.000
15.12	2.28	99.03	1.85	183.02	0	0	0.50	0.000	0.00	11.89	0.00	0.000
15.16	2.32	95.78	1.99	190.60	0	0	0.50	0.000	0.00	11.89	0.00	0.000
15.23	2.35	92.57	2.14	197.91	0	0	0.50	0.000	0.00	11.89	0.00	0.000
15.31	2.38	90.17	2.28	205.29	0	0	0.50	0.000	0.00	11.89	0.00	0.000
15.38	2.40	89.32	2.36	210.42	52	1552	0.50	0.073	0.02	11.89	0.02	0.000
15.42	2.41	88.05	2.44	214.92	53	1563	0.50	0.072	0.02	11.89	0.01	0.000
15.50	2.43	86.36	2.53	218.10	54	1569	0.50	0.072	0.02	11.89	0.01	0.000
15.57	2.45	83.70	2.66	222.23	56	1568	0.50	0.073	0.02	11.89	0.01	0.000
15.65	2.46	81.95	2.75	225.11	57	1570	0.50	0.073	0.02	11.89	0.01	0.000
15.69	2.48	79.92	2.88	229.82	59	1572	0.50	0.073	0.02	11.89	0.01	0.000
15.76	2.50	78.56	2.99	234.69	61	1584	0.50	0.073	0.02	11.89	0.01	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
15.84	2.51	77.92	3.07	239.18	62	1601	0.50	0.071	0.02	11.89	0.01	0.000
15.88	2.52	77.91	3.11	242.52	63	1617	0.50	0.070	0.02	11.89	0.01	0.000
15.96	2.52	78.03	3.13	244.48	64	1632	0.50	0.069	0.02	11.89	0.01	0.000
16.03	2.52	79.03	3.14	248.17	65	1662	0.50	0.067	0.02	11.89	0.01	0.000
16.11	2.52	80.88	3.11	251.26	65	1699	0.50	0.064	0.02	11.89	0.01	0.000
16.15	2.51	83.98	3.03	254.77	66	1746	0.50	0.061	0.01	11.89	0.01	0.000
16.22	2.49	87.38	2.92	255.40	66	1789	0.50	0.058	0.01	11.89	0.01	0.000
16.29	2.47	91.37	2.78	254.35	65	1830	0.50	0.056	0.01	11.89	0.01	0.000
16.37	2.45	93.85	2.68	251.22	63	1848	0.50	0.055	0.01	11.89	0.01	0.000
16.41	2.42	94.98	2.48	235.58	58	1799	0.50	0.058	0.02	11.89	0.01	0.000
16.49	2.36	94.41	2.16	204.03	49	1661	0.50	0.070	0.02	11.89	0.02	0.000
16.57	2.27	96.47	1.81	174.99	41	1529	0.50	0.087	0.04	11.89	0.02	0.000
16.64	2.19	100.62	1.60	161.14	36	1460	0.50	0.099	0.05	11.89	0.03	0.000
16.68	2.14	111.50	1.48	165.13	36	1511	0.50	0.091	0.04	11.89	0.03	0.000
16.75	2.10	118.43	1.43	168.88	37	1545	0.50	0.086	0.04	11.89	0.03	0.000
16.82	2.07	127.01	1.38	174.71	37	1588	0.50	0.081	0.04	11.89	0.02	0.000
16.88	2.04	134.44	1.35	181.34	38	1637	0.50	0.076	0.03	11.89	0.02	0.000
16.96	2.02	144.40	1.32	190.73	40	1702	0.50	0.070	0.03	11.89	0.02	0.000
17.00	2.01	150.56	1.32	198.32	41	1769	0.50	0.064	0.03	11.89	0.02	0.000
17.08	2.02	153.06	1.33	203.08	43	1828	0.50	0.060	0.02	11.89	0.02	0.000
17.15	2.04	154.56	1.34	207.63	44	1891	0.50	0.056	0.02	11.89	0.01	0.000
17.22	2.05	155.79	1.36	211.44	45	1943	0.50	0.054	0.02	11.89	0.01	0.000
17.27	2.07	155.01	1.38	213.84	46	1983	0.50	0.052	0.02	11.89	0.01	0.000
17.34	2.08	156.18	1.39	216.76	47	2021	0.50	0.050	0.02	11.89	0.01	0.000
17.42	2.07	159.14	1.38	220.02	47	2056	0.50	0.049	0.02	11.89	0.01	0.000
17.46	2.06	164.19	1.36	223.44	48	2077	0.50	0.048	0.02	11.89	0.01	0.000
17.54	2.03	168.73	1.34	225.67	48	2083	0.50	0.048	0.02	11.89	0.01	0.000
17.60	2.00	174.36	1.31	228.32	48	2077	0.49	0.049	0.02	11.89	0.01	0.000
17.68	1.97	179.46	1.29	230.76	48	2064	0.49	0.050	0.02	11.89	0.01	0.000
17.72	1.94	183.14	1.27	231.95	47	2038	0.49	0.051	0.02	11.89	0.01	0.000
17.80	1.92	185.09	1.25	231.58	47	2005	0.49	0.053	0.02	11.89	0.01	0.000
17.87	1.90	185.19	1.24	229.13	46	1959	0.49	0.056	0.02	11.89	0.01	0.000
17.95	1.88	184.24	1.23	226.00	45	1916	0.50	0.059	0.02	11.89	0.01	0.000
17.99	1.87	183.09	1.22	222.95	44	1877	0.50	0.062	0.02	11.89	0.01	0.000
18.06	1.86	182.23	1.21	220.60	44	1850	0.50	0.064	0.03	11.89	0.02	0.000
18.15	1.85	181.89	1.20	219.05	43	1833	0.50	0.066	0.03	11.89	0.02	0.000
18.19	1.85	182.22	1.20	218.74	43	1828	0.50	0.067	0.03	11.89	0.02	0.000
18.26	1.84	185.33	1.19	220.34	43	1832	0.50	0.067	0.03	11.89	0.02	0.000
18.33	1.84	184.61	1.19	220.03	43	1837	0.50	0.067	0.03	11.89	0.02	0.000
18.41	1.85	182.07	1.20	218.65	43	1842	0.50	0.067	0.03	11.89	0.02	0.000
18.44	1.89	175.07	1.23	214.91	43	1857	0.50	0.066	0.03	11.89	0.02	0.000
18.52	1.91	170.47	1.25	212.29	43	1875	0.50	0.065	0.03	11.89	0.02	0.000
18.59	1.93	167.54	1.26	210.90	43	1897	0.50	0.064	0.03	11.89	0.02	0.000
18.67	1.94	167.26	1.26	211.08	43	1912	0.50	0.063	0.03	11.89	0.02	0.000
18.72	1.94	168.92	1.26	213.19	43	1934	0.50	0.062	0.02	11.89	0.02	0.000
18.79	1.94	170.54	1.26	215.67	44	1968	0.50	0.060	0.02	11.89	0.01	0.000
18.86	1.95	172.09	1.27	218.29	45	2005	0.50	0.058	0.02	11.89	0.01	0.000
18.90	1.95	175.55	1.27	222.45	45	2044	0.50	0.056	0.02	11.89	0.01	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
18.98	1.93	183.61	1.26	230.50	47	2095	0.50	0.054	0.02	11.89	0.01	0.000
19.06	1.90	195.20	1.24	241.76	48	2160	0.50	0.051	0.02	11.89	0.01	0.000
19.10	1.87	212.52	1.22	258.62	51	2262	0.50	0.047	0.02	11.89	0.01	0.000
19.17	1.84	231.23	1.19	275.27	54	2363	0.50	0.044	0.01	11.89	0.01	0.000
19.25	1.80	249.16	1.16	288.53	56	2445	0.50	0.041	0.01	11.89	0.01	0.000
19.32	1.78	259.79	1.13	293.10	56	2474	0.50	0.041	0.01	11.89	0.01	0.000
19.36	1.76	264.69	1.11	292.56	56	2470	0.50	0.041	0.01	11.89	0.01	0.000
19.43	1.75	260.11	1.08	280.40	53	2379	0.50	0.044	0.01	11.89	0.01	0.000
19.51	1.71	251.16	1.02	255.88	48	2212	0.50	0.051	0.02	11.89	0.01	0.000
19.59	1.69	240.15	1.00	240.15	45	2041	0.50	0.060	0.02	11.89	0.01	0.000
19.63	1.68	232.74	1.00	232.74	43	1954	0.50	0.066	0.03	11.89	0.02	0.000
19.71	1.69	226.31	1.00	226.31	42	1942	0.50	0.067	0.03	11.89	0.02	0.000
19.79	1.70	219.83	1.00	219.83	41	1926	0.50	0.069	0.03	11.89	0.02	0.000
19.83	1.73	209.69	1.05	219.36	41	1897	0.50	0.071	0.03	11.89	0.02	0.000
19.90	1.74	203.29	1.07	216.82	41	1870	0.50	0.074	0.03	11.89	0.02	0.000
19.98	1.76	198.10	1.10	217.08	41	1869	0.50	0.074	0.03	11.89	0.02	0.000
20.05	1.76	199.85	1.10	219.94	42	1897	0.50	0.072	0.03	11.89	0.02	0.000
20.08	1.77	200.80	1.12	223.98	43	1934	0.50	0.070	0.03	11.89	0.02	0.000
20.16	1.77	201.53	1.12	225.37	43	1950	0.51	0.069	0.03	11.89	0.02	0.000
20.24	1.77	202.31	1.12	225.64	43	1957	0.51	0.069	0.03	11.89	0.02	0.000
20.31	1.77	202.17	1.12	226.01	43	1965	0.51	0.068	0.03	11.89	0.02	0.000
20.36	1.79	200.71	1.14	228.02	44	1989	0.51	0.067	0.03	11.89	0.02	0.000
20.43	1.81	199.37	1.16	231.78	45	2041	0.51	0.064	0.02	11.89	0.01	0.000
20.50	1.83	198.28	1.19	235.08	46	2099	0.51	0.060	0.02	11.89	0.01	0.000
20.58	1.85	197.52	1.20	236.93	47	2142	0.51	0.058	0.02	11.89	0.01	0.000
20.62	1.87	193.74	1.22	235.61	47	2164	0.51	0.057	0.02	11.89	0.01	0.000
20.69	1.91	184.35	1.24	229.41	46	2180	0.51	0.057	0.02	11.89	0.01	0.000
20.77	1.96	173.88	1.28	222.12	46	2202	0.51	0.056	0.02	11.89	0.01	0.000
20.81	2.01	165.44	1.32	218.35	46	2253	0.51	0.054	0.02	11.89	0.01	0.000
20.88	2.04	166.33	1.34	223.42	47	2347	0.51	0.050	0.02	11.89	0.01	0.000
20.95	2.03	178.88	1.33	238.01	50	2487	0.51	0.045	0.02	11.89	0.01	0.000
21.03	1.99	196.43	1.30	255.29	53	2612	0.51	0.042	0.01	11.89	0.01	0.000
21.07	1.94	219.57	1.27	277.81	57	2742	0.51	0.039	0.01	11.89	0.01	0.000
21.14	1.91	238.12	1.24	295.70	59	2843	0.51	0.037	0.01	11.89	0.01	0.000
21.21	1.88	254.21	1.22	310.36	62	2919	0.51	0.035	0.01	11.89	0.01	0.000
21.29	1.86	260.63	1.21	315.29	62	2940	0.51	0.035	0.01	11.89	0.01	0.000
21.33	1.85	261.13	1.20	314.00	62	2912	0.51	0.036	0.01	11.89	0.01	0.000
21.41	1.85	257.80	1.20	308.80	61	2860	0.51	0.037	0.01	11.89	0.01	0.000
21.49	1.83	254.96	1.19	302.39	59	2784	0.51	0.039	0.01	11.89	0.01	0.000
21.56	1.82	254.15	1.17	297.57	58	2722	0.51	0.041	0.01	11.89	0.01	0.000
21.59	1.80	255.30	1.15	294.47	57	2677	0.51	0.042	0.01	11.89	0.01	0.000
21.67	1.78	258.31	1.13	292.26	56	2648	0.51	0.043	0.01	11.89	0.01	0.000
21.74	1.78	255.75	1.13	288.14	55	2615	0.51	0.044	0.01	11.89	0.01	0.000
21.82	1.78	250.71	1.13	283.71	54	2582	0.51	0.045	0.01	11.89	0.01	0.000
21.85	1.81	240.79	1.16	279.09	54	2562	0.51	0.046	0.01	11.89	0.01	0.000
21.93	1.81	235.37	1.17	274.71	53	2536	0.51	0.047	0.01	11.89	0.01	0.000
22.01	1.82	228.17	1.17	267.52	52	2481	0.51	0.049	0.02	11.89	0.01	0.000
22.09	1.82	221.57	1.17	259.70	51	2414	0.51	0.052	0.02	11.89	0.01	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
22.12	1.84	209.42	1.19	249.15	49	2343	0.51	0.055	0.02	11.89	0.01	0.000
22.20	1.87	194.58	1.21	236.37	47	2276	0.51	0.058	0.02	11.89	0.01	0.000
22.28	1.90	179.89	1.24	222.70	45	2207	0.51	0.062	0.02	11.89	0.01	0.000
22.32	1.92	168.27	1.25	210.85	43	2132	0.51	0.067	0.03	11.89	0.02	0.000
22.39	1.92	161.82	1.25	201.99	41	2035	0.51	0.074	0.03	11.89	0.02	0.000
22.47	1.89	158.09	1.23	194.15	39	1912	0.51	0.086	0.04	11.89	0.02	0.000
22.51	1.85	158.87	1.20	191.23	38	1838	0.51	0.095	0.04	11.89	0.02	0.000
22.58	1.85	164.15	1.20	197.34	39	1898	0.51	0.088	0.04	11.89	0.02	0.000
22.67	1.88	171.27	1.22	209.49	42	2063	0.51	0.074	0.03	11.89	0.02	0.000
22.74	1.91	178.11	1.24	220.95	44	2226	0.51	0.063	0.02	11.89	0.01	0.000
22.78	1.93	184.17	1.26	231.43	47	2383	0.52	0.055	0.02	11.89	0.01	0.000
22.86	1.90	202.48	1.24	250.45	50	2521	0.52	0.050	0.02	11.89	0.01	0.000
22.94	1.85	227.45	1.20	272.73	54	2643	0.52	0.046	0.01	11.89	0.01	0.000
22.98	1.77	262.65	1.11	291.49	56	2731	0.52	0.044	0.01	11.89	0.01	0.000
23.05	1.71	290.19	1.00	290.19	54	2783	0.52	0.043	0.01	11.89	0.01	0.000
23.12	1.65	317.57	1.00	317.57	58	2825	0.52	0.042	0.01	11.89	0.01	0.000
23.19	1.62	336.13	1.00	336.13	61	2872	0.52	0.041	0.01	11.89	0.01	0.000
23.23	1.62	353.30	1.00	353.30	64	3027	0.52	0.038	0.01	11.89	0.01	0.000
23.31	1.65	364.11	1.00	364.11	67	3233	0.52	0.034	0.01	11.89	0.00	0.000
23.37	1.67	373.57	1.00	373.57	69	3444	0.52	0.031	0.01	11.89	0.00	0.000
23.44	1.69	374.09	1.00	374.09	70	3530	0.52	0.030	0.01	11.89	0.00	0.000
23.50	1.70	368.73	1.00	368.73	69	3522	0.52	0.031	0.01	11.89	0.00	0.000
23.56	1.71	354.53	1.00	355.12	66	3449	0.52	0.032	0.01	11.89	0.00	0.000
23.63	1.73	338.97	1.04	352.70	66	3389	0.52	0.033	0.01	11.89	0.00	0.000
23.69	1.76	322.54	1.09	352.62	67	3366	0.52	0.033	0.01	11.89	0.00	0.000
23.77	1.79	309.41	1.14	352.38	68	3385	0.52	0.033	0.01	11.89	0.00	0.000
23.82	1.81	301.89	1.16	351.38	68	3411	0.52	0.033	0.01	11.89	0.00	0.000
23.90	1.82	298.52	1.17	350.39	68	3426	0.52	0.032	0.01	11.89	0.00	0.000
23.96	1.83	294.25	1.18	347.51	68	3418	0.52	0.033	0.01	11.89	0.00	0.000
24.02	1.85	286.04	1.20	342.42	67	3413	0.52	0.033	0.01	11.89	0.00	0.000
24.10	1.86	278.80	1.21	337.89	67	3422	0.52	0.033	0.01	11.89	0.00	0.000
24.16	1.89	272.52	1.23	334.32	67	3449	0.52	0.033	0.01	11.89	0.00	0.000
24.23	1.91	266.11	1.24	330.12	66	3472	0.52	0.032	0.01	11.89	0.00	0.000
24.30	1.92	258.17	1.25	323.37	65	3462	0.52	0.033	0.01	11.89	0.00	0.000
24.38	1.93	254.34	1.26	319.34	65	3440	0.52	0.033	0.01	11.89	0.00	0.000
24.41	1.93	251.52	1.25	315.34	64	3392	0.52	0.034	0.01	11.89	0.00	0.000
24.49	1.91	252.96	1.25	315.08	63	3359	0.52	0.034	0.01	11.89	0.00	0.000
24.56	1.89	258.11	1.23	317.39	63	3322	0.52	0.035	0.01	11.89	0.00	0.000
24.64	1.84	271.67	1.20	324.99	64	3291	0.52	0.036	0.01	11.89	0.00	0.000
24.70	1.81	283.10	1.16	328.47	64	3257	0.52	0.037	0.01	11.89	0.00	0.000
24.74	1.79	285.13	1.14	324.55	62	3197	0.52	0.038	0.01	11.89	0.01	0.000
24.82	1.79	279.97	1.14	318.39	61	3141	0.52	0.039	0.01	11.89	0.01	0.000
24.89	1.80	269.35	1.15	310.13	60	3079	0.52	0.040	0.01	11.89	0.01	0.000
24.97	1.81	260.45	1.17	303.64	59	3039	0.52	0.041	0.01	11.89	0.01	0.000
25.01	1.83	250.11	1.19	296.38	58	3004	0.52	0.042	0.01	11.89	0.01	0.000
25.09	1.84	243.41	1.20	291.06	57	2981	0.52	0.043	0.01	11.89	0.01	0.000
25.17	1.85	238.57	1.20	286.83	56	2960	0.52	0.044	0.01	11.89	0.01	0.000
25.20	1.85	236.55	1.20	284.48	56	2940	0.52	0.044	0.01	11.89	0.01	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
25.28	1.85	236.71	1.20	283.80	56	2929	0.52	0.045	0.01	11.89	0.01	0.000
25.36	1.84	238.34	1.19	284.35	56	2926	0.52	0.045	0.01	11.89	0.01	0.000
25.40	1.82	245.71	1.17	287.25	56	2911	0.52	0.045	0.01	11.89	0.01	0.000
25.47	1.77	255.77	1.12	285.98	55	2856	0.52	0.047	0.01	11.89	0.01	0.000
25.55	1.73	265.24	1.06	280.39	53	2812	0.52	0.049	0.02	11.89	0.01	0.000
25.62	1.72	268.38	1.02	274.75	52	2782	0.52	0.050	0.02	11.89	0.01	0.000
25.66	1.73	264.18	1.05	276.68	52	2788	0.52	0.050	0.02	11.89	0.01	0.000
25.73	1.76	250.80	1.10	275.79	53	2768	0.52	0.050	0.02	11.89	0.01	0.000
25.79	1.80	235.73	1.15	272.23	53	2767	0.52	0.051	0.02	11.89	0.01	0.000
25.89	1.84	223.42	1.19	266.61	52	2780	0.52	0.050	0.02	11.89	0.01	0.000
25.93	1.86	220.52	1.21	266.89	53	2830	0.52	0.049	0.02	11.89	0.01	0.000
26.01	1.88	223.72	1.22	272.97	54	2933	0.52	0.046	0.01	11.89	0.01	0.000
26.08	1.89	230.20	1.23	283.25	57	3088	0.52	0.043	0.01	11.89	0.01	0.000
26.12	1.90	241.57	1.24	298.87	60	3290	0.52	0.039	0.01	11.89	0.01	0.000
26.19	1.88	254.93	1.22	311.97	62	3381	0.52	0.037	0.01	11.89	0.00	0.000
26.26	1.85	266.22	1.20	320.39	63	3403	0.53	0.037	0.01	11.89	0.00	0.000
26.34	1.83	270.24	1.19	320.51	0	0	0.53	0.000	0.00	11.89	0.00	0.000
26.41	1.84	266.89	1.19	318.34	0	0	0.53	0.000	0.00	11.89	0.00	0.000
26.44	1.87	250.82	1.22	304.94	0	0	0.53	0.000	0.00	11.89	0.00	0.000
26.52	1.89	233.86	1.23	287.91	0	0	0.53	0.000	0.00	11.89	0.00	0.000
26.59	1.90	217.53	1.24	269.08	0	0	0.53	0.000	0.00	11.89	0.00	0.000
26.66	1.92	196.86	1.25	246.31	0	0	0.53	0.000	0.00	11.89	0.00	0.000
26.73	1.97	172.69	1.28	221.15	0	0	0.53	0.000	0.00	11.89	0.00	0.000
26.79	2.05	143.90	1.36	195.02	0	0	0.53	0.000	0.00	11.89	0.00	0.000
26.86	2.12	124.08	1.45	180.22	0	0	0.53	0.000	0.00	11.89	0.00	0.000
26.92	2.20	106.02	1.61	171.02	0	0	0.53	0.000	0.00	11.89	0.00	0.000
26.99	2.28	91.62	1.84	168.73	0	0	0.53	0.000	0.00	11.89	0.00	0.000
27.05	2.33	83.81	2.05	172.05	0	0	0.53	0.000	0.00	11.89	0.00	0.000
27.11	2.37	79.94	2.20	176.06	0	0	0.53	0.000	0.00	11.89	0.00	0.000
27.19	2.38	77.71	2.29	177.76	0	0	0.53	0.000	0.00	11.89	0.00	0.000
27.26	2.39	76.46	2.32	177.17	0	0	0.53	0.000	0.00	11.89	0.00	0.000
27.30	2.38	76.36	2.27	172.97	0	0	0.53	0.000	0.00	11.89	0.00	0.000
27.38	2.36	77.37	2.15	166.59	0	0	0.53	0.000	0.00	11.89	0.00	0.000
27.45	2.32	79.03	2.01	159.03	0	0	0.53	0.000	0.00	11.89	0.00	0.000
27.52	2.29	80.70	1.90	153.23	0	0	0.53	0.000	0.00	11.89	0.00	0.000
27.56	2.26	82.67	1.80	148.55	0	0	0.53	0.000	0.00	11.89	0.00	0.000
27.64	2.24	84.49	1.72	145.00	0	0	0.53	0.000	0.00	11.89	0.00	0.000
27.71	2.21	86.11	1.65	142.26	0	0	0.53	0.000	0.00	11.89	0.00	0.000
27.76	2.20	87.06	1.62	140.80	0	0	0.53	0.000	0.00	11.89	0.00	0.000
27.84	2.20	87.27	1.60	140.04	0	0	0.53	0.000	0.00	11.89	0.00	0.000
27.91	2.19	87.33	1.60	139.54	0	0	0.53	0.000	0.00	11.89	0.00	0.000
27.99	2.19	87.40	1.59	139.22	0	0	0.53	0.000	0.00	11.89	0.00	0.000
28.03	2.19	88.03	1.58	139.16	0	0	0.53	0.000	0.00	11.89	0.00	0.000
28.10	2.18	89.01	1.56	139.20	0	0	0.53	0.000	0.00	11.89	0.00	0.000
28.18	2.17	90.65	1.54	139.59	0	0	0.53	0.000	0.00	11.89	0.00	0.000
28.25	2.16	92.38	1.52	140.17	0	0	0.53	0.000	0.00	11.89	0.00	0.000
28.29	2.14	94.91	1.49	141.23	0	0	0.53	0.000	0.00	11.89	0.00	0.000
28.37	2.10	98.61	1.41	139.23	0	0	0.53	0.000	0.00	11.89	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
28.44	2.03	102.99	1.33	137.26	0	0	0.53	0.000	0.00	11.89	0.00	0.000
28.48	1.96	107.61	1.28	137.32	0	0	0.53	0.000	0.00	11.89	0.00	0.000
28.56	1.93	110.38	1.26	138.70	0	0	0.53	0.000	0.00	11.89	0.00	0.000
28.63	1.93	111.59	1.26	140.23	28	1683	0.53	0.183	0.12	11.89	0.06	0.000
28.71	1.94	111.16	1.26	140.16	28	1695	0.53	0.180	0.12	11.89	0.05	0.001
28.75	1.99	102.44	1.30	132.88	28	1685	0.53	0.183	0.13	11.89	0.06	0.000
28.82	2.00	100.21	1.31	131.12	27	1686	0.53	0.184	0.13	11.89	0.06	0.000
28.89	2.02	97.94	1.32	129.47	27	1688	0.53	0.184	0.13	11.89	0.06	0.000
28.96	1.99	102.86	1.30	134.02	28	1719	0.53	0.175	0.12	11.89	0.05	0.000
29.04	2.01	101.22	1.32	133.43	28	1740	0.53	0.170	0.11	11.89	0.05	0.000
29.08	2.03	99.55	1.34	133.08	28	1763	0.53	0.164	0.11	11.89	0.05	0.000
29.15	2.05	97.73	1.36	132.57	28	1782	0.53	0.159	0.11	11.89	0.05	0.000
29.23	2.07	95.93	1.38	132.04	28	1797	0.53	0.156	0.10	11.89	0.05	0.000
29.27	2.08	94.66	1.39	132.01	28	1813	0.53	0.153	0.10	11.89	0.05	0.000
29.35	2.09	95.18	1.40	133.19	29	1836	0.53	0.148	0.10	11.89	0.04	0.000
29.43	2.07	99.15	1.38	136.60	29	1869	0.53	0.142	0.09	11.89	0.04	0.000
29.50	2.04	105.26	1.34	141.45	30	1902	0.53	0.136	0.08	11.89	0.04	0.000
29.53	1.99	115.13	1.30	149.59	31	1935	0.53	0.130	0.08	11.89	0.03	0.000
29.61	1.94	125.45	1.26	158.66	32	1968	0.53	0.125	0.07	11.89	0.03	0.000
29.68	1.90	136.42	1.23	168.33	34	2000	0.53	0.121	0.06	11.89	0.03	0.000
29.76	1.87	143.20	1.21	173.88	34	2018	0.53	0.119	0.06	11.89	0.03	0.000
29.80	1.85	145.98	1.20	175.74	35	2018	0.53	0.119	0.06	11.89	0.03	0.000
29.87	1.86	143.31	1.21	173.15	34	2000	0.53	0.122	0.06	11.89	0.03	0.000
29.95	1.88	137.26	1.22	167.79	33	1974	0.53	0.126	0.07	11.89	0.03	0.000
30.03	1.91	130.15	1.24	161.48	32	1951	0.53	0.131	0.07	11.89	0.03	0.000
30.07	1.93	123.54	1.26	155.54	32	1932	0.53	0.134	0.08	11.89	0.03	0.000
30.15	1.96	118.53	1.27	151.08	31	1922	0.53	0.137	0.08	11.89	0.04	0.000
30.19	1.98	113.45	1.29	146.81	30	1916	0.53	0.138	0.08	11.89	0.04	0.000
30.26	2.01	109.90	1.31	144.19	30	1921	0.53	0.138	0.08	11.89	0.04	0.000
30.34	2.03	107.13	1.33	142.52	30	1934	0.53	0.136	0.08	11.89	0.04	0.000
30.41	2.04	106.15	1.34	142.21	30	1946	0.53	0.134	0.08	11.89	0.04	0.000
30.45	2.04	106.38	1.34	142.78	30	1959	0.53	0.132	0.08	11.89	0.04	0.000
30.52	2.03	107.53	1.34	143.91	30	1973	0.53	0.130	0.08	11.89	0.03	0.000
30.60	2.02	109.92	1.33	145.87	31	1985	0.53	0.129	0.08	11.89	0.03	0.000
30.68	2.01	112.48	1.31	147.85	31	1993	0.53	0.128	0.08	11.89	0.03	0.000
30.71	1.99	115.30	1.30	150.17	31	2001	0.53	0.127	0.07	11.89	0.03	0.000
30.79	1.99	115.81	1.30	150.68	31	2008	0.53	0.126	0.07	11.89	0.03	0.000
30.87	2.00	114.60	1.31	149.81	31	2013	0.53	0.126	0.07	11.89	0.03	0.000
30.91	2.02	110.96	1.33	147.08	31	2012	0.53	0.126	0.07	11.89	0.03	0.000
30.98	2.04	108.07	1.34	145.07	31	2015	0.53	0.126	0.08	11.89	0.03	0.000
31.06	2.05	106.20	1.36	143.98	31	2021	0.53	0.126	0.08	11.89	0.03	0.000
31.13	2.05	106.65	1.35	144.43	31	2029	0.53	0.125	0.07	11.89	0.03	0.000
31.17	2.04	109.34	1.34	146.42	31	2037	0.53	0.124	0.07	11.89	0.03	0.000
31.24	2.01	114.35	1.31	150.17	31	2047	0.53	0.123	0.07	11.89	0.03	0.000
31.32	1.97	120.40	1.29	154.87	32	2051	0.53	0.122	0.07	11.89	0.03	0.000
31.40	1.94	125.09	1.26	157.78	32	2022	0.53	0.127	0.07	11.89	0.03	0.000
31.44	1.87	128.75	1.22	156.78	31	1890	0.53	0.152	0.09	11.89	0.04	0.000
31.51	1.82	129.29	1.17	151.39	29	1749	0.53	0.190	0.12	11.89	0.05	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
31.59	1.78	126.59	1.13	143.53	28	1632	0.53	0.236	0.16	11.89	0.07	0.001
31.66	1.82	120.35	1.17	140.78	27	1629	0.53	0.238	0.16	11.89	0.07	0.001
31.70	1.87	111.60	1.21	135.50	27	1634	0.53	0.236	0.17	11.89	0.07	0.000
31.78	1.96	97.34	1.28	124.22	25	1638	0.53	0.235	0.18	11.89	0.07	0.001
31.83	2.05	85.42	1.36	115.77	25	1652	0.53	0.229	0.18	11.89	0.07	0.000
31.91	2.15	74.72	1.49	111.68	25	1670	0.53	0.222	0.17	11.89	0.07	0.001
31.99	2.20	70.24	1.61	113.07	25	1703	0.53	0.210	0.16	11.89	0.06	0.001
32.03	2.28	63.65	1.84	117.19	27	1739	0.53	0.198	0.14	11.89	0.06	0.000
32.10	2.34	58.93	2.10	123.68	30	1782	0.53	0.185	0.12	11.89	0.05	0.000
32.18	2.38	56.97	2.29	130.60	32	1838	0.53	0.170	0.10	11.89	0.04	0.000
32.25	2.39	57.74	2.33	134.42	33	1886	0.53	0.158	0.09	11.89	0.04	0.000
32.29	2.37	61.31	2.20	134.96	33	1928	0.53	0.150	0.08	11.89	0.03	0.000
32.37	2.33	65.87	2.03	133.66	32	1956	0.53	0.144	0.08	11.89	0.03	0.000
32.44	2.27	71.89	1.83	131.65	31	1976	0.53	0.141	0.08	11.89	0.03	0.000
32.51	2.23	76.88	1.69	130.26	30	1980	0.53	0.141	0.09	11.89	0.04	0.000
32.55	2.20	79.94	1.61	128.77	29	1965	0.53	0.144	0.09	11.89	0.04	0.000
32.63	2.19	79.93	1.59	126.73	28	1937	0.53	0.150	0.10	11.89	0.04	0.000
32.71	2.19	78.33	1.59	124.38	28	1905	0.53	0.157	0.11	11.89	0.04	0.000
32.75	2.21	74.76	1.63	121.97	28	1869	0.53	0.166	0.11	11.89	0.05	0.000
32.82	2.23	70.22	1.70	119.53	27	1829	0.53	0.177	0.12	11.89	0.05	0.000
32.90	2.26	65.57	1.79	117.12	27	1784	0.53	0.190	0.13	11.89	0.05	0.000
32.98	2.27	63.68	1.81	115.16	27	1754	0.53	0.201	0.14	11.89	0.06	0.001
33.02	2.27	62.72	1.82	113.99	26	1736	0.53	0.208	0.15	11.89	0.06	0.000
33.09	2.26	63.57	1.78	113.39	26	1735	0.53	0.209	0.15	11.89	0.06	0.001
33.17	2.26	63.82	1.77	113.22	26	1737	0.53	0.208	0.15	11.89	0.06	0.001
33.21	2.25	65.20	1.75	114.04	0	0	0.53	0.000	0.00	11.89	0.00	0.000
33.28	2.27	64.24	1.81	116.43	0	0	0.53	0.000	0.00	11.89	0.00	0.000
33.36	2.30	61.94	1.93	119.72	0	0	0.53	0.000	0.00	11.89	0.00	0.000
33.40	2.35	58.08	2.14	124.28	0	0	0.53	0.000	0.00	11.89	0.00	0.000
33.47	2.40	54.42	2.37	128.76	0	0	0.53	0.000	0.00	11.89	0.00	0.000
33.55	2.44	51.10	2.61	133.54	0	0	0.53	0.000	0.00	11.89	0.00	0.000
33.62	2.47	49.21	2.80	137.63	0	0	0.53	0.000	0.00	11.89	0.00	0.000
33.70	2.49	48.39	2.91	140.63	0	0	0.53	0.000	0.00	11.89	0.00	0.000
33.74	2.50	48.11	2.99	143.89	0	0	0.53	0.000	0.00	11.89	0.00	0.000
33.82	2.51	48.19	3.03	146.02	0	0	0.53	0.000	0.00	11.89	0.00	0.000
33.86	2.50	48.97	3.00	146.91	0	0	0.53	0.000	0.00	11.89	0.00	0.000
33.93	2.49	50.38	2.91	146.55	0	0	0.53	0.000	0.00	11.89	0.00	0.000
34.01	2.47	52.20	2.80	146.00	0	0	0.53	0.000	0.00	11.89	0.00	0.000
34.08	2.46	53.85	2.71	145.68	0	0	0.53	0.000	0.00	11.89	0.00	0.000
34.13	2.44	56.02	2.57	144.09	0	0	0.53	0.000	0.00	11.89	0.00	0.000
34.20	2.41	58.62	2.41	141.03	0	0	0.53	0.000	0.00	11.89	0.00	0.000
34.28	2.37	61.95	2.22	137.32	0	0	0.53	0.000	0.00	11.89	0.00	0.000
34.35	2.33	65.07	2.05	133.28	0	0	0.53	0.000	0.00	11.89	0.00	0.000
34.39	2.28	68.67	1.86	127.69	0	0	0.53	0.000	0.00	11.89	0.00	0.000
34.46	2.24	72.12	1.73	124.44	0	0	0.53	0.000	0.00	11.89	0.00	0.000
34.54	2.20	75.64	1.63	122.96	0	0	0.53	0.000	0.00	11.89	0.00	0.000
34.61	2.19	77.78	1.59	123.83	0	0	0.53	0.000	0.00	11.89	0.00	0.000
34.65	2.18	79.37	1.56	123.62	0	0	0.53	0.000	0.00	11.89	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
34.72	2.17	79.99	1.54	123.09	0	0	0.53	0.000	0.00	11.89	0.00	0.000
34.80	2.16	80.28	1.53	122.55	0	0	0.53	0.000	0.00	11.89	0.00	0.000
34.86	2.16	80.45	1.52	122.23	0	0	0.53	0.000	0.00	11.89	0.00	0.000
34.94	2.15	80.85	1.51	122.22	0	0	0.53	0.000	0.00	11.89	0.00	0.000
34.97	2.14	82.55	1.49	122.86	0	0	0.53	0.000	0.00	11.89	0.00	0.000
35.06	2.12	85.40	1.45	123.92	0	0	0.53	0.000	0.00	11.89	0.00	0.000
35.14	2.10	88.50	1.42	125.23	0	0	0.53	0.000	0.00	11.89	0.00	0.000
35.17	2.08	90.53	1.39	125.98	0	0	0.53	0.000	0.00	11.89	0.00	0.000
35.24	2.09	89.23	1.40	124.78	0	0	0.53	0.000	0.00	11.89	0.00	0.000
35.32	2.11	84.58	1.44	121.67	0	0	0.53	0.000	0.00	11.89	0.00	0.000
35.40	2.15	78.66	1.51	118.56	0	0	0.53	0.000	0.00	11.89	0.00	0.000
35.44	2.20	72.32	1.61	116.29	0	0	0.53	0.000	0.00	11.89	0.00	0.000
35.52	2.24	67.12	1.72	115.78	0	0	0.53	0.000	0.00	11.89	0.00	0.000
35.59	2.29	61.91	1.90	117.48	0	0	0.53	0.000	0.00	11.89	0.00	0.000
35.67	2.34	58.35	2.07	120.62	0	0	0.53	0.000	0.00	11.89	0.00	0.000
35.70	2.38	55.43	2.27	125.79	0	0	0.53	0.000	0.00	11.89	0.00	0.000
35.78	2.43	52.58	2.52	132.60	0	0	0.53	0.000	0.00	11.89	0.00	0.000
35.86	2.48	49.62	2.83	140.51	0	0	0.53	0.000	0.00	11.89	0.00	0.000
35.90	2.53	46.69	3.18	148.37	0	0	0.53	0.000	0.00	11.89	0.00	0.000
35.97	2.57	44.19	3.49	154.18	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.05	2.59	43.01	3.66	157.26	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.12	2.60	42.10	3.76	158.10	0	0	0.53	0.000	0.00	0.00	0.00	0.000
36.16	2.59	42.71	3.64	155.27	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.24	2.56	43.71	3.45	150.94	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.32	2.53	45.82	3.17	145.42	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.35	2.50	47.77	2.95	140.71	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.43	2.46	49.58	2.74	135.98	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.50	2.42	52.36	2.48	129.98	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.58	2.38	55.17	2.27	124.98	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.62	2.34	57.97	2.09	121.28	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.70	2.32	59.93	1.99	119.43	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.77	2.30	61.43	1.93	118.41	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.81	2.29	62.76	1.88	118.12	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.89	2.27	64.86	1.81	117.61	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.96	2.23	69.33	1.69	117.34	0	0	0.53	0.000	0.00	11.89	0.00	0.000
37.04	2.19	74.47	1.58	117.97	0	0	0.53	0.000	0.00	11.89	0.00	0.000
37.08	2.14	80.87	1.49	120.21	0	0	0.53	0.000	0.00	11.89	0.00	0.000
37.15	2.10	86.29	1.42	122.83	0	0	0.53	0.000	0.00	11.89	0.00	0.000
37.23	2.07	90.63	1.38	125.26	0	0	0.53	0.000	0.00	11.89	0.00	0.000
37.28	2.06	91.90	1.37	125.49	0	0	0.53	0.000	0.00	11.89	0.00	0.000
37.36	2.05	90.66	1.35	122.64	0	0	0.53	0.000	0.00	11.89	0.00	0.000
37.43	2.04	88.35	1.34	118.82	0	0	0.53	0.000	0.00	11.89	0.00	0.000
37.47	2.05	84.37	1.35	114.16	0	0	0.53	0.000	0.00	11.89	0.00	0.000
37.55	2.08	78.49	1.40	109.59	0	0	0.53	0.000	0.00	11.89	0.00	0.000
37.63	2.13	72.15	1.47	105.72	0	0	0.53	0.000	0.00	11.89	0.00	0.000
37.67	2.18	66.03	1.56	102.71	0	0	0.53	0.000	0.00	11.89	0.00	0.000
37.75	2.24	58.86	1.72	101.41	0	0	0.53	0.000	0.00	11.89	0.00	0.000
37.80	2.29	54.26	1.89	102.79	0	0	0.53	0.000	0.00	11.89	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
37.87	2.34	51.08	2.08	106.45	0	0	0.53	0.000	0.00	11.89	0.00	0.000
37.94	2.37	50.55	2.21	111.56	0	0	0.53	0.000	0.00	11.89	0.00	0.000
38.02	2.42	47.99	2.48	119.00	0	0	0.53	0.000	0.00	11.89	0.00	0.000
38.09	2.47	45.65	2.76	126.22	0	0	0.52	0.000	0.00	11.89	0.00	0.000
38.13	2.51	43.47	3.05	132.73	0	0	0.52	0.000	0.00	11.89	0.00	0.000
38.20	2.54	42.03	3.28	137.81	0	0	0.52	0.000	0.00	11.89	0.00	0.000
38.28	2.56	41.44	3.41	141.20	0	0	0.52	0.000	0.00	11.89	0.00	0.000
38.36	2.56	41.73	3.40	141.99	38	2040	0.52	0.158	0.07	11.89	0.02	0.000
38.39	2.54	42.60	3.30	140.45	37	2040	0.52	0.158	0.08	11.89	0.02	0.000
38.47	2.52	43.97	3.14	138.19	36	2041	0.52	0.158	0.08	11.89	0.02	0.000
38.54	2.50	45.82	2.99	137.06	35	2060	0.52	0.154	0.08	11.89	0.02	0.000
38.61	2.49	47.31	2.91	137.76	35	2091	0.52	0.149	0.08	11.89	0.02	0.000
38.66	2.50	47.40	2.97	140.56	36	2123	0.52	0.143	0.07	11.89	0.02	0.000
38.73	2.53	45.65	3.17	144.57	38	2143	0.52	0.140	0.07	11.89	0.02	0.000
38.81	2.56	43.20	3.45	148.97	40	2153	0.52	0.139	0.06	11.89	0.02	0.000
38.85	2.62	39.87	3.89	155.08	0	0	0.52	0.000	0.00	0.00	0.00	0.000
38.92	2.67	36.27	4.45	161.42	0	0	0.52	0.000	0.00	0.00	0.00	0.000
39.00	2.73	33.11	5.03	166.60	0	0	0.52	0.000	0.00	0.00	0.00	0.000
39.08	2.76	31.42	5.37	168.55	0	0	0.52	0.000	0.00	0.00	0.00	0.000
39.12	2.76	31.07	5.40	167.91	0	0	0.52	0.000	0.00	0.00	0.00	0.000
39.19	2.76	31.00	5.41	167.63	0	0	0.52	0.000	0.00	0.00	0.00	0.000
39.26	2.76	31.09	5.42	168.45	0	0	0.52	0.000	0.00	0.00	0.00	0.000
39.34	2.77	31.25	5.44	169.93	0	0	0.52	0.000	0.00	0.00	0.00	0.000
39.38	2.77	31.47	5.47	172.06	0	0	0.52	0.000	0.00	0.00	0.00	0.000
39.45	2.78	31.31	5.57	174.44	0	0	0.52	0.000	0.00	0.00	0.00	0.000
39.53	2.79	31.06	5.69	176.80	0	0	0.52	0.000	0.00	0.00	0.00	0.000
39.60	2.80	30.70	5.80	178.19	0	0	0.52	0.000	0.00	0.00	0.00	0.000
39.64	2.81	29.90	5.95	177.80	0	0	0.52	0.000	0.00	0.00	0.00	0.000
39.72	2.82	28.68	6.16	176.64	0	0	0.52	0.000	0.00	0.00	0.00	0.000
39.76	2.86	26.63	6.58	175.27	0	0	0.52	0.000	0.00	0.00	0.00	0.000
39.84	2.90	24.41	7.16	174.74	0	0	0.52	0.000	0.00	0.00	0.00	0.000
39.91	2.93	22.37	7.71	172.48	0	0	0.52	0.000	0.00	0.00	0.00	0.000
39.99	2.94	21.58	7.82	168.81	0	0	0.52	0.000	0.00	0.00	0.00	0.000
40.03	2.89	23.06	7.09	163.56	0	0	0.52	0.000	0.00	0.00	0.00	0.000
40.12	2.81	26.49	5.96	157.99	0	0	0.52	0.000	0.00	0.00	0.00	0.000
40.19	2.73	30.67	5.00	153.39	0	0	0.52	0.000	0.00	0.00	0.00	0.000
40.23	2.65	35.51	4.24	150.43	0	0	0.52	0.000	0.00	0.00	0.00	0.000
40.30	2.57	42.16	3.46	145.96	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.38	2.46	51.11	2.70	137.84	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.46	2.36	59.34	2.20	130.50	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.50	2.30	65.09	1.94	126.10	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.57	2.26	69.26	1.80	124.37	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.65	2.22	73.69	1.67	122.96	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.72	2.19	76.09	1.60	121.59	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.75	2.17	76.93	1.56	119.64	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.82	2.17	76.32	1.54	117.40	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.90	2.16	75.89	1.52	115.59	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.97	2.17	74.10	1.54	114.29	0	0	0.52	0.000	0.00	11.89	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
41.04	2.19	71.38	1.59	113.46	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.08	2.22	67.82	1.67	113.37	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.15	2.27	63.91	1.80	115.11	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.22	2.32	60.03	1.99	119.62	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.30	2.36	57.70	2.17	125.10	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.37	2.38	57.03	2.26	129.06	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.41	2.38	57.62	2.28	131.55	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.49	2.39	57.86	2.33	134.88	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.56	2.41	57.10	2.44	139.35	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.60	2.46	53.98	2.71	146.26	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.67	2.53	48.51	3.18	154.49	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.76	2.61	42.57	3.81	162.23	0	0	0.52	0.000	0.00	0.00	0.00	0.000
41.83	2.67	38.15	4.36	166.21	0	0	0.51	0.000	0.00	0.00	0.00	0.000
41.87	2.68	36.89	4.46	164.65	0	0	0.51	0.000	0.00	0.00	0.00	0.000
41.94	2.67	36.48	4.42	161.23	0	0	0.51	0.000	0.00	0.00	0.00	0.000
42.03	2.65	37.04	4.23	156.54	0	0	0.51	0.000	0.00	0.00	0.00	0.000
42.07	2.63	37.82	4.00	151.12	0	0	0.51	0.000	0.00	0.00	0.00	0.000
42.14	2.59	39.62	3.64	144.11	0	0	0.51	0.000	0.00	11.89	0.00	0.000
42.22	2.54	41.52	3.29	136.76	0	0	0.51	0.000	0.00	11.89	0.00	0.000
42.30	2.51	42.97	3.06	131.69	0	0	0.51	0.000	0.00	11.89	0.00	0.000
42.33	2.49	44.51	2.89	128.63	0	0	0.51	0.000	0.00	11.89	0.00	0.000
42.41	2.46	46.42	2.73	126.68	0	0	0.51	0.000	0.00	11.89	0.00	0.000
42.48	2.43	49.28	2.53	124.63	0	0	0.51	0.000	0.00	11.89	0.00	0.000
42.55	2.40	52.26	2.36	123.08	0	0	0.51	0.000	0.00	11.89	0.00	0.000
42.59	2.36	55.84	2.18	121.70	0	0	0.51	0.000	0.00	11.89	0.00	0.000
42.66	2.33	59.16	2.04	120.55	0	0	0.51	0.000	0.00	11.89	0.00	0.000
42.74	2.30	61.79	1.94	119.61	0	0	0.51	0.000	0.00	11.89	0.00	0.000
42.79	2.29	62.50	1.90	118.54	0	0	0.51	0.000	0.00	11.89	0.00	0.000
42.86	2.30	61.33	1.91	117.00	27	2160	0.51	0.149	0.10	11.89	0.03	0.000
42.94	2.30	59.24	1.94	114.91	27	2119	0.51	0.157	0.11	11.89	0.03	0.000
43.01	2.31	57.14	1.98	113.00	27	2079	0.51	0.164	0.12	11.89	0.03	0.000
43.05	2.33	54.99	2.03	111.83	27	2048	0.51	0.171	0.12	11.89	0.03	0.000
43.13	2.35	52.93	2.12	112.24	27	2040	0.51	0.173	0.12	11.89	0.03	0.000
43.21	2.37	51.03	2.23	113.74	28	2046	0.51	0.172	0.12	11.89	0.03	0.000
43.24	2.40	49.87	2.35	117.23	29	2082	0.51	0.164	0.11	11.89	0.03	0.000
43.32	2.42	49.36	2.46	121.45	30	2133	0.51	0.155	0.09	11.89	0.02	0.000
43.39	2.43	49.28	2.56	126.00	31	2193	0.51	0.145	0.08	11.89	0.02	0.000
43.47	2.44	49.43	2.62	129.47	32	2242	0.51	0.137	0.08	11.89	0.02	0.000
43.51	2.44	50.49	2.62	132.22	33	2291	0.51	0.131	0.07	11.89	0.02	0.000
43.59	2.43	52.80	2.54	134.16	33	2348	0.51	0.124	0.07	11.89	0.02	0.000
43.66	2.41	56.26	2.41	135.85	34	2414	0.51	0.116	0.06	11.89	0.01	0.000
43.73	2.39	58.96	2.33	137.18	34	2465	0.51	0.111	0.06	11.89	0.01	0.000
43.77	2.34	65.47	2.09	136.78	33	2523	0.51	0.106	0.06	11.89	0.01	0.000
43.84	2.27	74.30	1.83	136.30	32	2576	0.51	0.101	0.06	11.89	0.01	0.000
43.92	2.19	87.56	1.58	138.69	31	2635	0.51	0.097	0.06	11.89	0.01	0.000
43.99	2.13	98.29	1.46	143.38	31	2675	0.51	0.094	0.05	11.89	0.01	0.000
44.03	2.06	110.40	1.37	151.23	32	2716	0.51	0.091	0.05	11.89	0.01	0.000
44.10	2.01	122.50	1.31	160.92	34	2756	0.51	0.089	0.05	11.89	0.01	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
44.18	1.95	135.26	1.27	172.11	35	2789	0.51	0.087	0.04	11.89	0.01	0.000
44.26	1.92	144.52	1.25	180.30	36	2806	0.51	0.086	0.04	11.89	0.01	0.000
44.30	1.89	150.96	1.23	185.68	37	2809	0.51	0.086	0.04	11.89	0.01	0.000
44.36	1.87	154.21	1.22	187.97	37	2799	0.51	0.086	0.04	11.89	0.01	0.000
44.44	1.86	155.32	1.21	188.22	37	2778	0.51	0.088	0.04	11.89	0.01	0.000
44.52	1.86	154.56	1.21	186.94	37	2753	0.51	0.089	0.04	11.89	0.01	0.000
44.56	1.86	153.29	1.21	185.49	37	2735	0.51	0.091	0.04	11.89	0.01	0.000
44.64	1.86	152.29	1.21	184.52	36	2730	0.50	0.091	0.04	11.89	0.01	0.000
44.71	1.87	151.12	1.21	183.60	36	2731	0.50	0.091	0.04	11.89	0.01	0.000
44.78	1.87	150.04	1.22	182.85	36	2738	0.50	0.091	0.04	11.89	0.01	0.000
44.82	1.88	149.12	1.22	182.11	36	2738	0.50	0.091	0.04	11.89	0.01	0.000
44.89	1.88	148.40	1.22	181.26	36	2729	0.50	0.091	0.05	11.89	0.01	0.000
44.97	1.88	147.81	1.22	180.44	36	2717	0.50	0.092	0.05	11.89	0.01	0.000
45.01	1.88	147.18	1.22	179.70	36	2708	0.50	0.093	0.05	11.89	0.01	0.000
45.10	1.88	146.27	1.22	178.98	36	2711	0.50	0.093	0.05	11.89	0.01	0.000
45.17	1.88	145.40	1.23	178.36	36	2717	0.50	0.092	0.05	11.89	0.01	0.000
45.25	1.89	144.88	1.23	178.01	36	2723	0.50	0.092	0.05	11.89	0.01	0.000
45.29	1.89	144.73	1.23	177.86	35	2724	0.50	0.092	0.05	11.89	0.01	0.000
45.36	1.89	145.54	1.23	178.57	36	2729	0.50	0.092	0.05	11.89	0.01	0.000
45.44	1.88	146.78	1.22	179.67	36	2737	0.50	0.091	0.05	11.89	0.01	0.000
45.48	1.87	149.01	1.22	181.64	36	2747	0.50	0.091	0.04	11.89	0.01	0.000
45.55	1.86	151.45	1.21	183.48	36	2749	0.50	0.091	0.04	11.89	0.01	0.000
45.63	1.85	154.93	1.20	185.57	36	2735	0.50	0.092	0.04	11.89	0.01	0.000
45.71	1.83	157.55	1.18	186.39	36	2708	0.50	0.094	0.05	11.89	0.01	0.000
45.75	1.82	157.27	1.18	185.00	0	0	0.50	0.000	0.00	11.89	0.00	0.000
45.82	1.83	152.27	1.19	180.54	0	0	0.50	0.000	0.00	11.89	0.00	0.000
45.90	1.85	146.10	1.20	175.19	0	0	0.50	0.000	0.00	11.89	0.00	0.000
45.93	1.87	138.88	1.22	168.88	0	0	0.50	0.000	0.00	11.89	0.00	0.000
46.01	1.90	130.47	1.24	161.62	0	0	0.50	0.000	0.00	11.89	0.00	0.000
46.09	1.95	120.79	1.27	153.02	0	0	0.50	0.000	0.00	11.89	0.00	0.000
46.13	2.01	108.28	1.31	142.16	0	0	0.50	0.000	0.00	11.89	0.00	0.000
46.20	2.09	93.05	1.41	130.91	0	0	0.50	0.000	0.00	11.89	0.00	0.000
46.28	2.21	75.26	1.65	124.08	0	0	0.50	0.000	0.00	11.89	0.00	0.000
46.35	2.33	61.30	2.05	125.97	0	0	0.50	0.000	0.00	11.89	0.00	0.000
46.40	2.42	51.95	2.51	130.27	0	0	0.50	0.000	0.00	11.89	0.00	0.000
46.48	2.49	45.88	2.92	133.96	0	0	0.50	0.000	0.00	11.89	0.00	0.000
46.56	2.55	41.27	3.34	137.98	0	0	0.50	0.000	0.00	11.89	0.00	0.000
46.60	2.60	38.51	3.76	144.75	0	0	0.50	0.000	0.00	0.00	0.00	0.000
46.67	2.64	37.42	4.11	153.69	0	0	0.50	0.000	0.00	0.00	0.00	0.000
46.74	2.61	41.03	3.88	159.14	0	0	0.50	0.000	0.00	0.00	0.00	0.000
46.81	2.56	47.01	3.45	162.43	43	2771	0.50	0.091	0.04	11.89	0.01	0.000
46.88	2.51	53.66	3.04	163.30	42	2892	0.50	0.083	0.03	11.89	0.01	0.000
46.92	2.52	55.11	3.08	169.98	44	3001	0.50	0.078	0.03	11.89	0.01	0.000
47.00	2.56	52.36	3.45	180.45	48	3093	0.50	0.074	0.03	11.89	0.00	0.000
47.08	2.61	49.15	3.88	190.86	0	0	0.50	0.000	0.00	0.00	0.00	0.000
47.12	2.65	47.14	4.17	196.67	0	0	0.49	0.000	0.00	0.00	0.00	0.000
47.19	2.64	47.14	4.15	195.86	0	0	0.49	0.000	0.00	0.00	0.00	0.000
47.26	2.62	48.50	3.91	189.67	0	0	0.49	0.000	0.00	0.00	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
47.34	2.58	50.86	3.56	180.90	0	0	0.49	0.000	0.00	11.89	0.00	0.000
47.38	2.51	55.60	3.04	169.08	0	0	0.49	0.000	0.00	11.89	0.00	0.000
47.45	2.44	61.38	2.57	157.76	0	0	0.49	0.000	0.00	11.89	0.00	0.000
47.52	2.35	68.17	2.14	145.60	0	0	0.49	0.000	0.00	11.89	0.00	0.000
47.60	2.28	73.20	1.87	136.82	0	0	0.49	0.000	0.00	11.89	0.00	0.000
47.64	2.23	77.07	1.68	129.50	0	0	0.49	0.000	0.00	11.89	0.00	0.000
47.72	2.17	80.61	1.55	124.82	0	0	0.49	0.000	0.00	11.89	0.00	0.000
47.79	2.11	85.40	1.44	122.58	0	0	0.49	0.000	0.00	11.89	0.00	0.000
47.87	2.06	89.96	1.37	123.18	0	0	0.49	0.000	0.00	11.89	0.00	0.000
47.91	2.02	95.30	1.32	126.10	0	0	0.49	0.000	0.00	11.89	0.00	0.000
47.99	1.98	100.88	1.29	130.31	0	0	0.49	0.000	0.00	11.89	0.00	0.000
48.06	1.95	106.34	1.27	134.85	0	0	0.49	0.000	0.00	11.89	0.00	0.000
48.10	1.93	110.12	1.25	138.10	0	0	0.49	0.000	0.00	11.89	0.00	0.000
48.18	1.92	111.58	1.25	139.33	0	0	0.49	0.000	0.00	11.89	0.00	0.000
48.26	1.91	112.03	1.25	139.67	0	0	0.49	0.000	0.00	11.89	0.00	0.000
48.30	1.92	111.39	1.25	139.03	28	2291	0.49	0.137	0.09	11.89	0.01	0.000
48.37	1.92	110.18	1.25	137.84	28	2284	0.49	0.138	0.09	11.89	0.02	0.000
48.45	1.93	108.53	1.25	136.19	28	2275	0.49	0.140	0.09	11.89	0.02	0.000
48.52	1.93	106.92	1.26	134.62	27	2267	0.49	0.141	0.10	11.89	0.02	0.000
48.56	1.94	105.52	1.26	133.28	27	2262	0.49	0.142	0.10	11.89	0.02	0.000
48.63	1.94	104.58	1.27	132.45	27	2262	0.49	0.142	0.10	11.89	0.02	0.000
48.71	1.95	104.20	1.27	132.19	27	2269	0.49	0.141	0.10	11.89	0.02	0.000
48.78	1.95	104.72	1.27	132.84	27	2281	0.49	0.139	0.10	11.89	0.02	0.000
48.85	1.95	105.63	1.27	133.86	27	2296	0.49	0.137	0.09	11.89	0.01	0.000
48.89	1.94	107.18	1.26	135.54	28	2315	0.49	0.134	0.09	11.89	0.01	0.000
48.96	1.94	108.98	1.26	137.40	28	2334	0.49	0.132	0.09	11.89	0.01	0.000
49.03	1.93	111.47	1.26	139.93	28	2356	0.49	0.129	0.09	11.89	0.01	0.000
49.11	1.92	113.64	1.25	142.07	29	2373	0.49	0.127	0.08	11.89	0.01	0.000
49.15	1.91	115.97	1.24	144.34	29	2389	0.49	0.125	0.08	11.89	0.01	0.000
49.22	1.90	118.12	1.24	146.43	29	2405	0.49	0.124	0.08	11.89	0.01	0.000
49.30	1.87	122.04	1.22	148.48	29	2352	0.49	0.130	0.08	11.89	0.01	0.000
49.37	1.98	79.42	1.29	102.62	21	2754	0.48	0.094	0.09	11.89	0.01	0.000
49.41	1.95	80.91	1.27	102.76	21	2700	0.48	0.097	0.09	11.89	0.01	0.000
49.49	1.95	82.22	1.27	104.27	21	2738	0.48	0.095	0.09	11.89	0.01	0.000
49.57	1.96	83.36	1.28	106.34	22	2820	0.48	0.089	0.08	11.89	0.01	0.000
49.61	1.97	84.51	1.28	108.33	22	2893	0.48	0.085	0.07	11.89	0.01	0.000
49.68	2.02	80.00	1.32	105.88	22	2928	0.48	0.083	0.07	11.89	0.01	0.000
49.75	2.03	81.87	1.33	108.89	23	3028	0.48	0.078	0.07	11.89	0.01	0.000
49.81	2.03	83.14	1.33	110.87	23	3093	0.48	0.076	0.06	11.89	0.01	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)

Total estimated settlement: 1.44

Abbreviations

Q_{tn}: Equivalent clean sand normalized cone resistance
K_c: Fines correction factor
$Q_{tn,cs}$: Post-liquefaction volumentric strain
G_{max}: Small strain shear modulus
CSR: Soil cyclic stress ratio
γ: Cyclic shear strain
$e_{vol(15)}$: Volumetric strain after 15 cycles
N_c: Equivalent number of cycles
e_v: Volumetric strain
Settle.: Calculated settlement

APPENDIX G

GENERAL GRADING GUIDELINES

Updated Geotechnical and Infiltration Evaluation
Xenia Apartment Project, Beaumont, California
Project No. 2784-CR

GEOTEK

GENERAL GRADING GUIDELINES

Guidelines presented herein are intended to address general construction procedures for earthwork construction. Specific situations and conditions often arise which cannot reasonably be discussed in general guidelines, when anticipated these are discussed in the text of the report. Often unanticipated conditions are encountered which may necessitate modification or changes to these guidelines. It is our hope that these will assist the contractor to more efficiently complete the project by providing a reasonable understanding of the procedures that would be expected during earthwork and the testing and observation used to evaluate those procedures.

General

Grading should be performed to at least the minimum requirements of governing agencies, Chapters 18 and 33 of the California Building Code, CBC (2019) and the guidelines presented below.

Preconstruction Meeting

A preconstruction meeting should be held prior to site earthwork. Any questions the contractor has regarding our recommendations, general site conditions, apparent discrepancies between reported and actual conditions and/or differences in procedures the contractor intends to use should be brought up at that meeting. The contractor (including the main onsite representative) should review our report and these guidelines in advance of the meeting. Any comments the contractor may have regarding these guidelines should be brought up at that meeting.

Grading Observation and Testing

1. Observation of the fill placement should be provided by our representative during grading. Verbal communication during the course of each day will be used to inform the contractor of test results. The contractor should receive a copy of the "Daily Field Report" indicating results of field density tests that day. If our representative does not provide the contractor with these reports, our office should be notified.
2. Testing and observation procedures are, by their nature, specific to the work or area observed and location of the tests taken, variability may occur in other locations. The contractor is responsible for the uniformity of the grading operations; our observations and test results are intended to evaluate the contractor's overall level of efforts during grading. The contractor's personnel are the only individuals participating in all aspect of site work. Compaction testing and observation should not be considered as relieving the contractor's responsibility to properly compact the fill.
3. Cleanouts, processed ground to receive fill, key excavations, and subdrains should be observed by our representative prior to placing any fill. It will be the contractor's responsibility to notify our representative or office when such areas are ready for observation.
4. Density tests may be made on the surface material to receive fill, as considered warranted by this firm.
5. In general, density tests would be made at maximum intervals of two feet of fill height or every 1,000 cubic yards of fill placed. Criteria will vary depending on soil conditions and size of the fill. More frequent testing may be performed. In any case, an adequate number of field density tests should be made to evaluate the required compaction and moisture content is generally being obtained.

6. Laboratory testing to support field test procedures will be performed, as considered warranted, based on conditions encountered (e.g. change of material sources, types, etc.) Every effort will be made to process samples in the laboratory as quickly as possible and in progress construction projects are our first priority. However, laboratory workloads may cause in delays and some soils may require a **minimum of 48 to 72 hours to complete test procedures**. Whenever possible, our representative(s) should be informed in advance of operational changes that might result in different source areas for materials.
7. Procedures for testing of fill slopes are as follows:
   a) Density tests should be taken periodically during grading on the flat surface of the fill, three to five feet horizontally from the face of the slope.
   b) If a method other than over building and cutting back to the compacted core is to be employed, slope compaction testing during construction should include testing the outer six inches to three feet in the slope face to determine if the required compaction is being achieved.
8. Finish grade testing of slopes and pad surfaces should be performed after construction is complete.

Site Clearing

1. All vegetation, and other deleterious materials, should be removed from the site. If material is not immediately removed from the site it should be stockpiled in a designated area(s) well outside of all current work areas and delineated with flagging or other means. Site clearing should be performed in advance of any grading in a specific area.
2. Efforts should be made by the contractor to remove all organic or other deleterious material from the fill, as even the most diligent efforts may result in the incorporation of some materials. This is especially important when grading is occurring near the natural grade. All equipment operators should be aware of these efforts. Laborers may be required as root pickers.
3. Nonorganic debris or concrete may be placed in deeper fill areas provided the procedures used are observed and found acceptable by our representative.

Treatment of Existing Ground

1. Following site clearing, all surficial deposits of alluvium and colluvium as well as weathered or creep effected bedrock, should be removed unless otherwise specifically indicated in the text of this report.
2. In some cases, removal may be recommended to a specified depth (e.g. flat sites where partial alluvial removals may be sufficient). The contractor should not exceed these depths unless directed otherwise by our representative.
3. Groundwater existing in alluvial areas may make excavation difficult. Deeper removals than indicated in the text of the report may be necessary due to saturation during winter months.
4. Subsequent to removals, the natural ground should be processed to a depth of six inches, moistened to near optimum moisture conditions and compacted to fill standards.
5. Exploratory back hoe or dozer trenches still remaining after site removal should be excavated and filled with compacted fill if they can be located.

Fill Placement

1. Unless otherwise indicated, all site soil and bedrock may be reused for compacted fill; however, some special processing or handling may be required (see text of report).

2. Material used in the compacting process should be evenly spread, moisture conditioned, processed, and compacted in thin lifts six (6) to eight (8) inches in compacted thickness to obtain a uniformly dense layer. The fill should be placed and compacted on a nearly horizontal plane, unless otherwise found acceptable by our representative.
3. If the moisture content or relative density varies from that recommended by this firm, the contractor should rework the fill until it is in accordance with the following:
   a) Moisture content of the fill should be at or above optimum moisture. Moisture should be evenly distributed without wet and dry pockets. Pre-watering of cut or removal areas should be considered in addition to watering during fill placement, particularly in clay or dry surficial soils. The ability of the contractor to obtain the proper moisture content will control production rates.
   b) Each six-inch layer should be compacted to at least 90 percent of the maximum dry density in compliance with the testing method specified by the controlling governmental agency. In most cases, the testing method is ASTM Test Designation D 1557.
4. Rock fragments less than eight inches in diameter may be utilized in the fill, provided:
   a) They are not placed in concentrated pockets;
   b) There is a sufficient percentage of fine-grained material to surround the rocks;
   c) The distribution of the rocks is observed by, and acceptable to, our representative.
5. Rocks exceeding eight (8) inches in diameter should be taken off site, broken into smaller fragments, or placed in accordance with recommendations of this firm in areas designated suitable for rock disposal. On projects where significant large quantities of oversized materials are anticipated, alternate guidelines for placement may be included. If significant oversize materials are encountered during construction, these guidelines should be requested.
6. In clay soil, dry or large chunks or blocks are common. If in excess of eight (8) inches minimum dimension, then they are considered as oversized. Sheepsfoot compactors or other suitable methods should be used to break up blocks. When dry, they should be moisture conditioned to provide a uniform condition with the surrounding fill.

Slope Construction

1. The contractor should obtain a minimum relative compaction of 90 percent out to the finished slope face of fill slopes. This may be achieved by either overbuilding the slope and cutting back to the compacted core, or by direct compaction of the slope face with suitable equipment.
2. Slopes trimmed to the compacted core should be overbuilt by at least three (3) feet with compaction efforts out to the edge of the false slope. Failure to properly compact the outer edge results in trimming not exposing the compacted core and additional compaction after trimming may be necessary.
3. If fill slopes are built "at grade" using direct compaction methods, then the slope construction should be performed so that a constant gradient is maintained throughout construction. Soil should not be "spilled" over the slope face nor should slopes be "pushed out" to obtain grades. Compaction equipment should compact each lift along the immediate top of slope. Slopes should be back rolled or otherwise compacted at approximately every 4 feet vertically as the slope is built.
4. Corners and bends in slopes should have special attention during construction as these are the most difficult areas to obtain proper compaction.
5. Cut slopes should be cut to the finished surface. Excessive undercutting and smoothing of the face with fill may necessitate stabilization.

UTILITY TRENCH CONSTRUCTION AND BACKFILL

Utility trench excavation and backfill is the contractors responsibility. The geotechnical consultant typically provides periodic observation and testing of these operations. While efforts are made to make sufficient observations and tests to verify that the contractors' methods and procedures are adequate to achieve proper compaction, it is typically impractical to observe all backfill procedures. As such, it is critical that the contractor use consistent backfill procedures.

Compaction methods vary for trench compaction and experience indicates many methods can be successful. However, procedures that "worked" on previous projects may or may not prove effective on a given site. The contractor(s) should outline the procedures proposed, so that we may discuss them **prior** to construction. We will offer comments based on our knowledge of site conditions and experience.

1. Utility trench backfill in slopes, structural areas, in streets and beneath flat work or hardscape should be brought to at least optimum moisture and compacted to at least 90 percent of the laboratory standard. Soil should be moisture conditioned prior to placing in the trench.
2. Flooding and jetting are not typically recommended or acceptable for native soils. Flooding or jetting may be used with select sand having a Sand Equivalent (SE) of 30 or higher. This is typically limited to the following uses:
   a) shallow (12 + inches) under slab interior trenches and,
   b) as bedding in pipe zone.

   The water should be allowed to dissipate prior to pouring slabs or completing trench compaction.
3. Care should be taken not to place soils at high moisture content within the upper three feet of the trench backfill in street areas, as overly wet soils may impact subgrade preparation. Moisture may be reduced to 2% below optimum moisture in areas to be paved within the upper three feet below sub grade.
4. Sand backfill should not be allowed in exterior trenches adjacent to and within an area extending below a 1:1 projection from the outside bottom edge of a footing, unless it is similar to the surrounding soil.
5. Trench compaction testing is generally at the discretion of the geotechnical consultant. Testing frequency will be based on trench depth and the contractors procedures. A probing rod would be used to assess the consistency of compaction between tested areas and untested areas. If zones are found that are considered less compact than other areas, this would be brought to the contractors attention.

JOB SAFETY

General

Personnel safety is a primary concern on all job sites. The following summaries are safety considerations for use by all our employees on multi-employer construction sites. On ground personnel are at highest risk of injury and possible fatality on grading construction projects. The company recognizes that construction activities will vary on each site and that job site safety is the contractor's responsibility. However, it is, imperative that all personnel be safety conscious to avoid accidents and potential injury.

In an effort to minimize risks associated with geotechnical testing and observation, the following precautions are to be implemented for the safety of our field personnel on grading and construction projects.

1. Safety Meetings: Our field personnel are directed to attend the contractor's regularly scheduled safety meetings.
2. Safety Vests: Safety vests are provided for and are to be worn by our personnel while on the job site.
3. Safety Flags: Safety flags are provided to our field technicians; one is to be affixed to the vehicle when on site, the other is to be placed atop the spoil pile on all test pits.

In the event that the contractor's representative observes any of our personnel not following the above, we request that it be brought to the attention of our office.

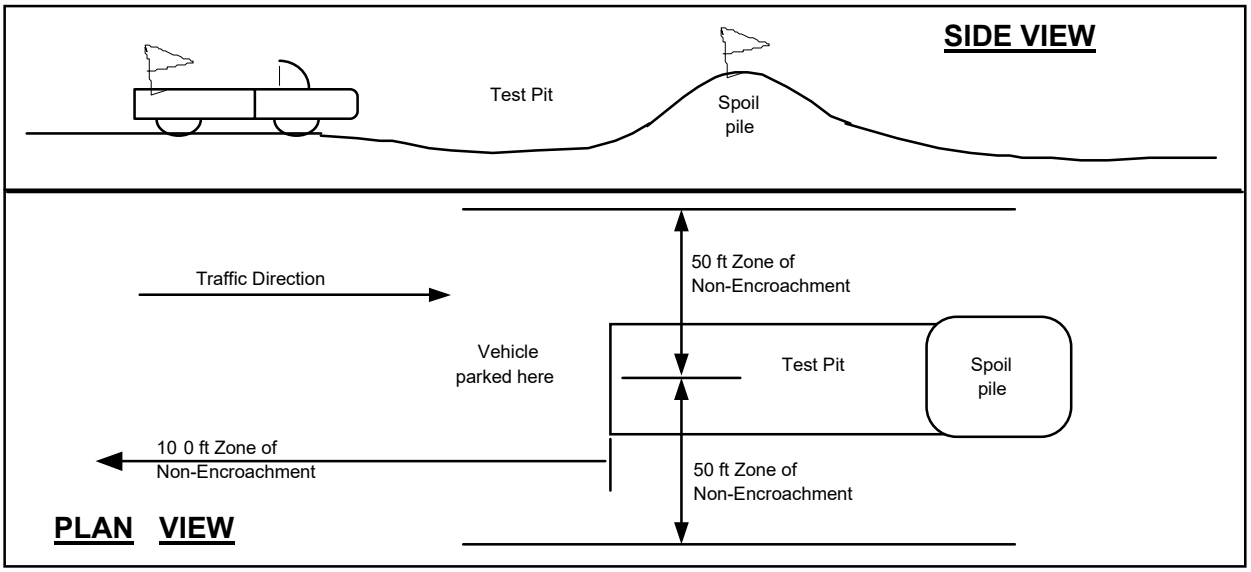
Test Pits Location, Orientation and Clearance

The technician is responsible for selecting test pit locations. The primary concern is the technician's safety. However, it is necessary to take sufficient tests at various locations to obtain a representative sampling of the fill. As such, efforts will be made to coordinate locations with the grading contractors authorized representatives (e.g. dump man, operator, supervisor, grade checker, etc.), and to select locations following or behind the established traffic pattern, preferably outside of current traffic. The contractors authorized representative should direct excavation of the pit and safety during the test period. Again, safety is the paramount concern.

Test pits should be excavated so that the spoil pile is placed away from oncoming traffic. The technician's vehicle is to be placed next to the test pit, opposite the spoil pile. This necessitates that the fill be maintained in a drivable condition. Alternatively, the contractor may opt to park a piece of equipment in front of test pits, particularly in small fill areas or those with limited access.

A zone of non-encroachment should be established for all test pits (see diagram below). No grading equipment should enter this zone during the test procedure. The zone should extend outward to the sides approximately 50 feet from the center of the test pit and 100 feet in the direction of traffic flow. This zone is established both for safety and to avoid excessive ground vibration, which typically decreases test results.

TEST PIT SAFETY PLAN



Slope Tests

When taking slope tests, the technician should park their vehicle directly above or below the test location on the slope. The contractor's representative should effectively keep all equipment at a safe operation distance (e.g. 50 feet) away from the slope during testing.

The technician is directed to withdraw from the active portion of the fill as soon as possible following testing. The technician's vehicle should be parked at the perimeter of the fill in a highly visible location.

Trench Safety

It is the contractor's responsibility to provide safe access into trenches where compaction testing is needed. Trenches for all utilities should be excavated in accordance with CAL-OSHA and any other applicable safety standards. Safe conditions will be required to enable compaction testing of the trench backfill.

All utility trench excavations in excess of 5 feet deep, which a person enters, are to be shored or laid back. Trench access should be provided in accordance with OSHA standards. Our personnel are directed not to enter any trench by being lowered or "riding down" on the equipment.

Our personnel are directed not to enter any excavation which;

1. is 5 feet or deeper unless shored or laid back,
2. exit points or ladders are not provided,
3. displays any evidence of instability, has any loose rock or other debris which could fall into the trench, or
4. displays any other evidence of any unsafe conditions regardless of depth.

If the contractor fails to provide safe access to trenches for compaction testing, our company policy requires that the soil technician withdraws and notifies their supervisor. The contractors representative will then be contacted in an effort to effect a solution. All backfill not tested due to safety concerns or other reasons is subject to reprocessing and/or removal.

Procedures

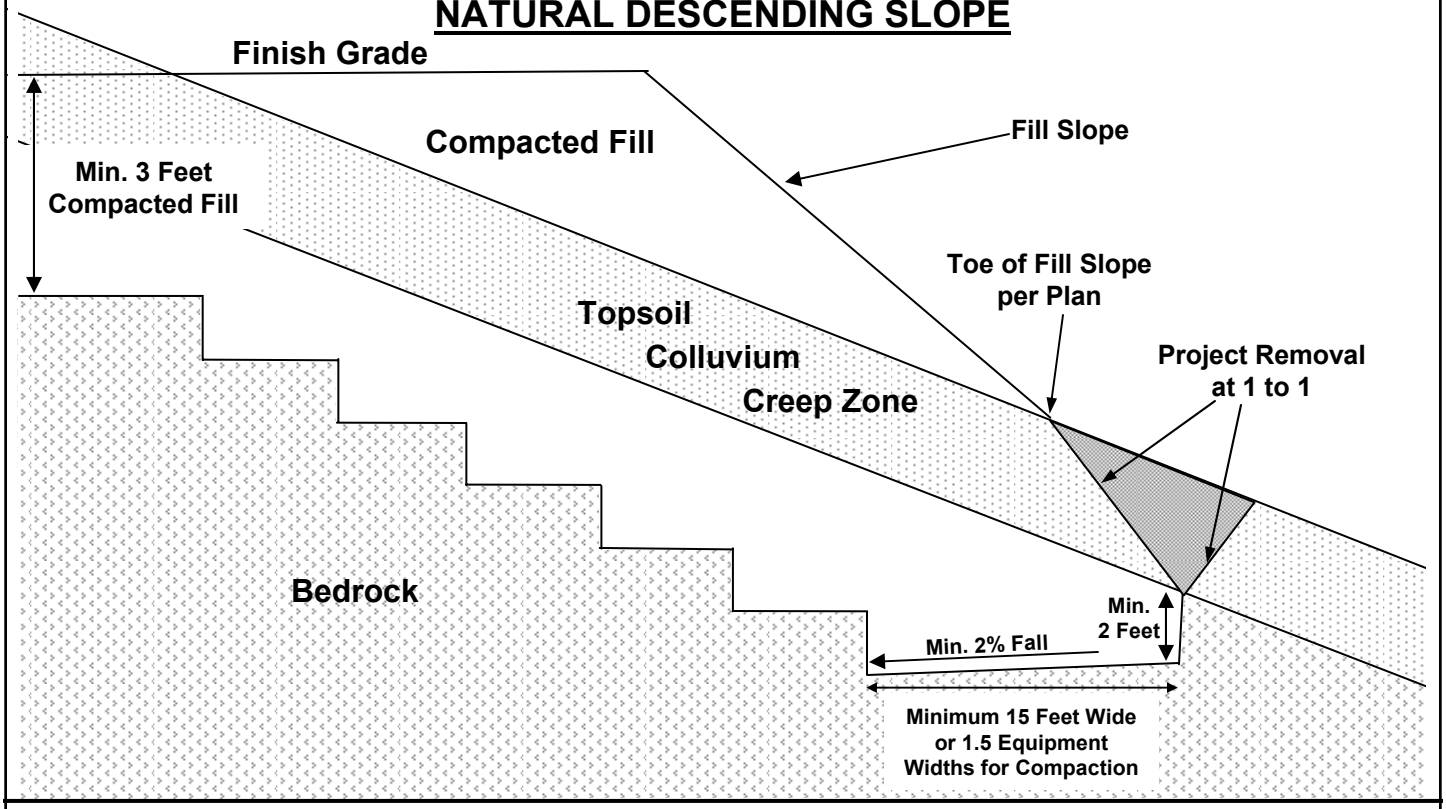
In the event that the technician's safety is jeopardized or compromised as a result of the contractor's failure to comply with any of the above, the technician is directed to inform both the developer's and contractor's representatives. If the condition is not rectified, the technician is required, by company policy, to immediately withdraw and notify their supervisor. The contractor's representative will then be contacted in an effort to effect a solution. No further testing will be performed until the situation is rectified. Any fill placed in the interim can be considered unacceptable and subject to reprocessing, recompaction or removal.

In the event that the soil technician does not comply with the above or other established safety guidelines, we request that the contractor bring this to technicians attention and notify our project manager or office. Effective communication and coordination between the contractors' representative and the field technician(s) is strongly encouraged in order to implement the above safety program and safety in general.

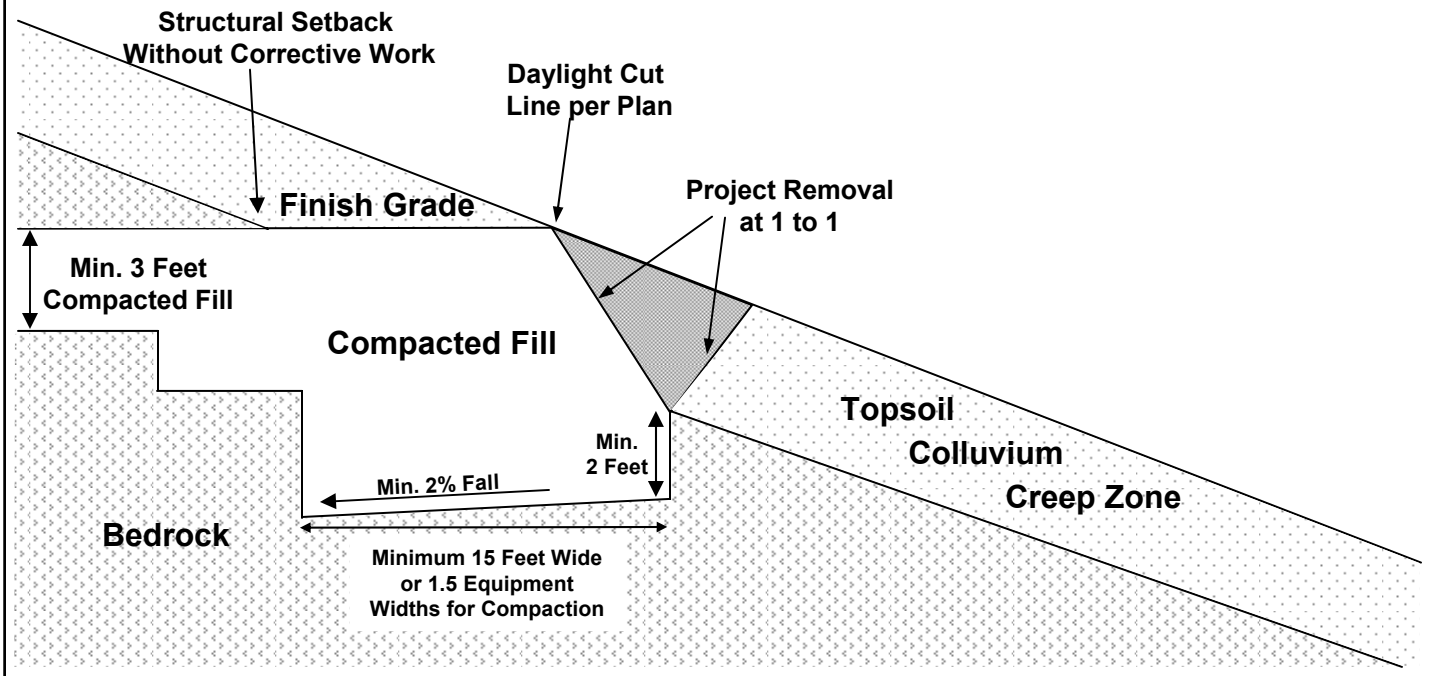
The safety procedures outlined above should be discussed at the contractor's safety meetings. This will serve to inform and remind equipment operators of these safety procedures particularly the zone of non-encroachment.

The safety procedures outlined above should be discussed at the contractor's safety meetings. This will serve to inform and remind equipment operators of these safety procedures particularly the zone of non-encroachment.

TYPICAL FILL SLOPE OVER NATURAL DESCENDING SLOPE



DAYLIGHT CUT AREA OVER NATURAL DESCENDING SLOPE



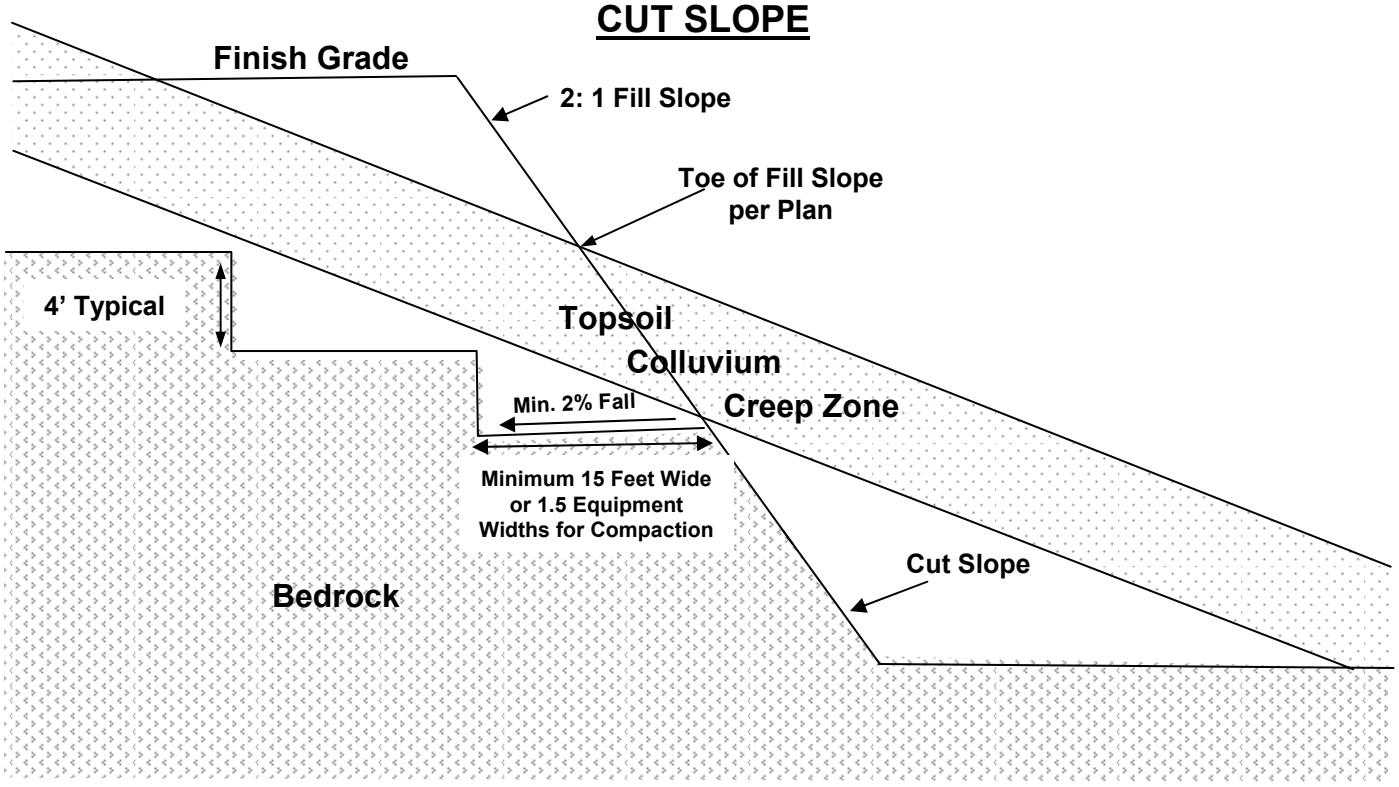
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TREATMENT ABOVE NATURAL SLOPES

STANDARD GRADING GUIDELINES

PLATE G-1

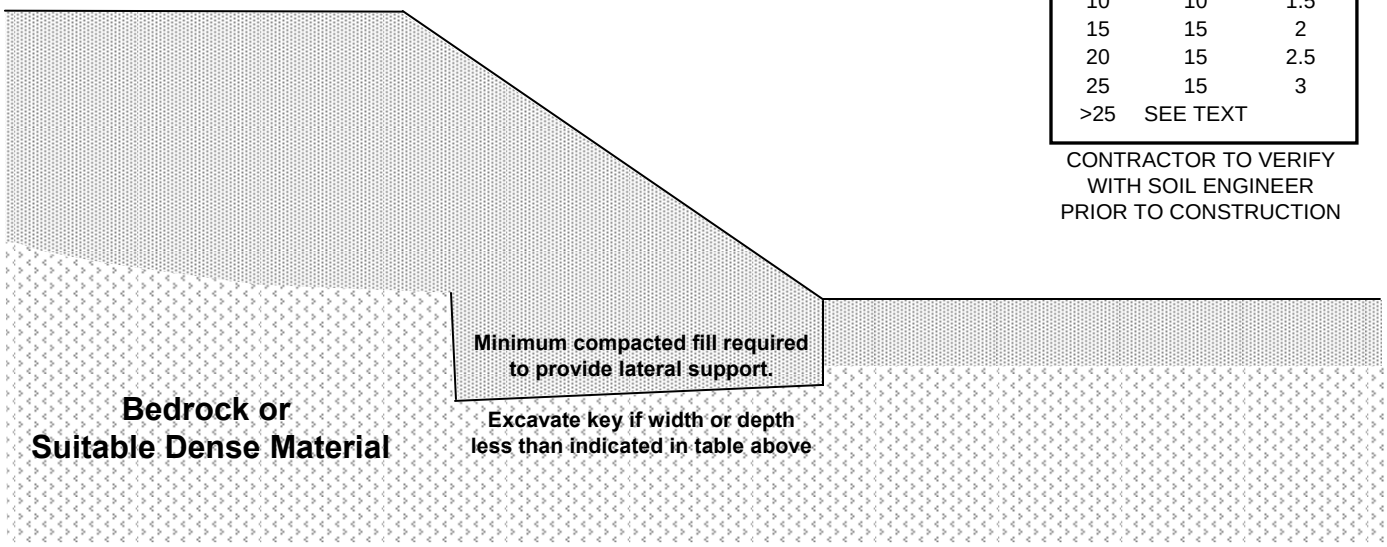
TYPICAL FILL SLOPE OVER CUT SLOPE



TYPICAL FILL SLOPE

SLOPE HEIGHT	MIN. KEY WIDTH	MIN. KEY DEPTH
5	7	1
10	10	1.5
15	15	2
20	15	2.5
25	15	3
>25	SEE TEXT	

CONTRACTOR TO VERIFY WITH SOIL ENGINEER PRIOR TO CONSTRUCTION



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1548 North Maple Street
Corona, California 92880

COMMON FILL SLOPE KEYS

STANDARD GRADING GUIDELINES

PLATE G-2

Appendix E

Paleontological Site Assessment
Western Science Center
September 2, 2022

WESTERN SCIENCE CENTER

September 2, 2022

ECORP Consulting, Inc.
Niranjala Kottachchi
2525 Warren Drive
Rocklin, CA 95677

Dear Ms. Kottachchi,

This letter presents the results of a record search conducted for the Xenia Multi-Family Residential Project located in the City of Beaumont, Riverside County, California. The project site is located between East 8th Street and East 6th Street, east of Xenia Avenue and west of North Highland Springs Avenue in Sections 1, 2, 3, 10, 122, & 12 of Township 3 South , Range 1 West on the *Beaumont, CA* USGS 7.5 minute quadrangle.

The geologic units underlying this project are mapped entirely as alluvial sediments from San Gorgonio Pass, dating from the Pleistocene epoch (Dibblee and Minch 2003). Pleistocene alluvial units are considered to be fossiliferous and highly paleontologically sensitive. The Western Science Center does not have any localities within the project area or within a 1 mile radius, although we do have localities from similarly mapped units from across Southern California.

Any fossil specimens recovered from the Xenia Multi-Family Residential Project would be scientifically significant. Excavation activity associated with the development of the project area would impact the paleontologically sensitive Pleistocene units, and it is the recommendation of the Western Science Center that a paleontological resource mitigation program be put in place to monitor, salvage, and curate any recovered fossils from the study area.

If you have any questions, or would like further information, please feel free to contact me at bstoneburg@westerncentermuseum.org.

Sincerely,

Brittney Elizabeth Stoneburg, MSc
Collections Manager

Appendix F

Project Specific Water Quality Management Plan
Stevenson, Porto & Pierce, Inc.
February 4, 2022
Revised May 27, 2022, September 19, 2022

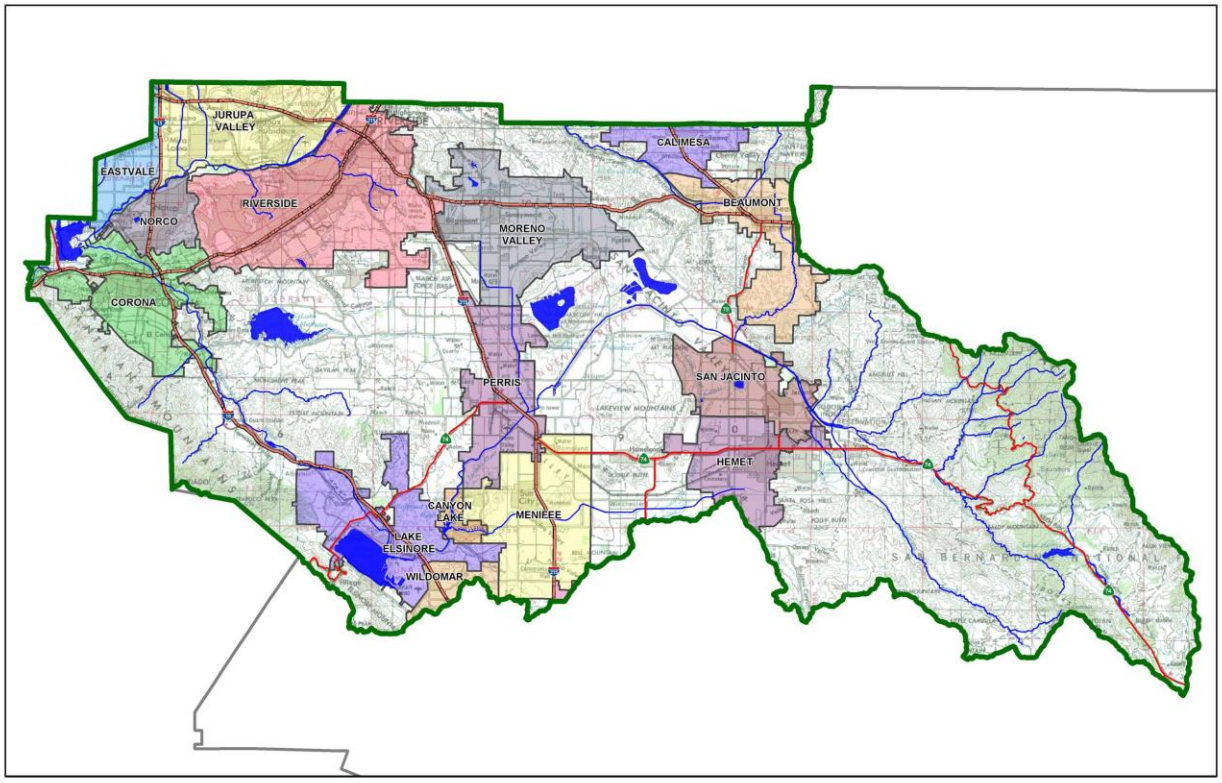
Project Specific Water Quality Management Plan

*A Template for Projects located within the **Santa Ana Watershed** Region of Riverside County*

Project Title: Xenia Apartments

Tract Number: Parcel Map No. 38233

Design Review/Case No: PW2021-0822



☒ **Preliminary**
☐ **Final**

Original Date Prepared: 2/4/2022

Revision Date(s): 5/27/2022, 9/19/2022

Prepared for Compliance with
Regional Board Order No. **R8-2010-0033**

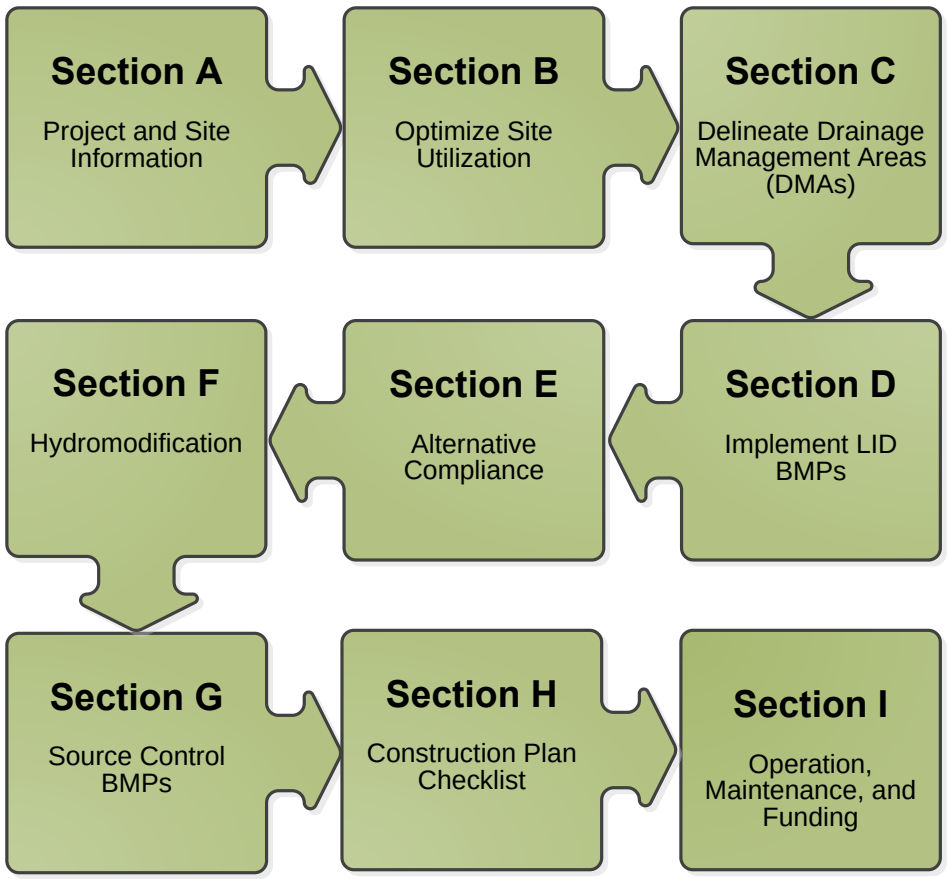
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A Brief Introduction

This Project-Specific WQMP Template for the **Santa Ana Region** has been prepared to help guide you in documenting compliance for your project. Because this document has been designed to specifically document compliance, you will need to utilize the WQMP Guidance Document as your "how-to" manual to help guide you through this process. Both the Template and Guidance Document go hand-in-hand, and will help facilitate a well prepared Project-Specific WQMP. Below is a flowchart for the layout of this Template that will provide the steps required to document compliance.



OWNER'S CERTIFICATION

This preliminary Project-Specific Water Quality Management Plan (PWQMP) has been prepared for **Beaumont Land Partners, LLC. – Paul Onufer** by **Stevenson, Porto & Pierce, Inc.** for the **Xenia Apartment Project**.

This WQMP is intended to comply with the requirements of City of Beaumont per city ordinance for the preparation and implementation of a Project-Specific WQMP.

The undersigned, while owning the property/project described in the preceding paragraph, shall be responsible for the implementation and funding of this WQMP and will ensure that this WQMP is amended as appropriate to reflect up-to-date conditions on the site. In addition, the property owner accepts responsibility for interim operation and maintenance of Stormwater BMPs until such time as this responsibility is formally transferred to a subsequent owner. This WQMP will be reviewed with the facility operator, facility supervisors, employees, tenants, maintenance and service contractors, or any other party (or parties) having responsibility for implementing portions of this WQMP. At least one copy of this WQMP will be maintained at the project site or project office in perpetuity. The undersigned is authorized to certify and to approve implementation of this WQMP. The undersigned is aware that implementation of this WQMP is enforceable under City of Beaumont Water Quality Ordinance.

"I, the undersigned, certify under penalty of law that the provisions of this WQMP have been reviewed and accepted and that the WQMP will be transferred to future successors in interest."

Owner's Signature

Owner's Printed Nam TO BE COMPLETE PRIOR TO FINAL APPROVAL

Owner's Title/Position

PREPARER'S CERTIFICATION

"The selection, sizing and design of stormwater treatment and other stormwater quality and quantity control measures in this plan meet the requirements of Regional Water Quality Control Board Order No. **R8-2010-0033** and any subsequent amendments thereto."

Preparer's Signature

Date

Jimmy C. Chen

ct Manager

Preparer's Printed Name

Preparer's Title/Position

TO BE COMPLETE PRIOR TO FINAL APPROVAL

Engineer of Record Signature

Date

Jimmy C. Chen

Senior Project Manager

Engineer of Record Printed Name

Engineer of Record Title/Position

EOR's Licensure: RCE #51394, Exp: 6/30/22

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Appendix 2: Construction Plans

Appendix 3: Soils Information

Appendix 4: Historical Site Conditions

Appendix 5: LID Infeasibility

Appendix 6: BMP Design Details

Appendix 7: Hydromodification

Appendix 8: Source Control Checklist

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Appendix 10: Education Materials:

Section A: Project and Site Information

PROJECT INFORMATION	
Type of Project:	Residential - Apartments
Planning Area:	N/A
Community Name:	Xenia Apartments
Development Name:	Xenia Apartments
PROJECT LOCATION	
Latitude & Longitude 33°55'53.37"N, 116°57'09.89"W	
Project Watershed and Sub-Watershed: Santa Ana River Watershed, San Jacinto River Basin	
Gross Acres: 10.93 acres	
APN(s): 419-160-005, 419-160-024, 419-170-016, 419-170-017, 419-170-018, 419-170-022, & 419-170-027	
Map Book and Page No.:	
PROJECT CHARACTERISTICS	
Proposed or Potential Land Use(s)	R-MF (Residential Mulit-Family)
Proposed or Potential SIC Code(s)	1521, General Builder Contractor, single-family residential.
Area of Impervious Project Footprint (SF)	320,796 s.f.
Total Area of proposed Impervious Surfaces within the Project Limits (SF)/or Replacement	320,796 s.f.
Does the project consist of offsite road improvements?	☐ Y ☒ N
Does the project propose to construct unpaved roads?	☐ Y ☒ N
Is the project part of a larger common plan of development (phased project)?	☐ Y ☒ N
EXISTING SITE CHARACTERISTICS	
Total area of existing Impervious Surfaces within the project limits (SF)	0 s.f.
Is the project located within any MSHCP Criteria Cell?	☐ Y ☒ N
If so, identify the Cell number:	Not in a cell
Are there any natural hydrologic features on the project site?	☐ Y ☒ N
Is a Geotechnical Report attached?	☒ Y ☐ N
If no Geotech. Report, list the NRCS soils type(s) present on the site (A, B, C and/or D)	
What is the Water Quality Design Storm Depth for the project?	0.85

A.1 Maps and Site Plans

The Project-Specific WQMP, includes a map of the local vicinity and existing site. In addition, all grading, drainage, landscape details and other pertinent construction plans are in Appendix 2. The WQMP Site Plan includes the following:

- Drainage Management Areas
- Proposed Structural BMPs
- Drainage Path
- Drainage Infrastructure, Inlets, Overflows
- Source Control BMPs
- Buildings, Roof Lines, Downspouts
- Impervious Surfaces
- Standard Labeling
- BMP Locations (Lat/Long)

Use your discretion on whether or not you may need to create multiple sheets or can appropriately accommodate these features on one or two sheets. Keep in mind that the Co-Permittee plan reviewer must be able to easily analyze your project utilizing this template and its associated site plans and maps.

Project Description:

The Xenia Apartments project proposes the development of 10.93-acres into an apartment complex within the City of Beaumont and County of Riverside. At present, the site is vacant and that is mostly comprised of bare soil with sparse vegetation. The site's topography generally slopes from north to south with no definitive historical concentrated drainage paths. Currently, the runoff that leaves the site flows through the neighboring properties along the south property line and eventually reaches the inlets along E 6th Street. These inlets connect to the city storm drain system within E 6th Street and proceeds eastward. The project is primarily accessed via Xenia Avenue, south of 8th Street. The project is surrounded by vacant, undeveloped land, and single-family residential lands.

For the proposed condition, all the onsite runoff generally flows from the north towards the south and is collected by the proposed stormwater systems consisting of catch basin inlets, stormwater conveyance pipes, and an extended detention basin. From here, the treated runoff leaves the project via a calibrated outlet structure within the basin through an extension of the existing 30" storm drain from E 6th Street.

A.2 Identify Receiving Waters

Table A.1 below lists in order of upstream to downstream, the receiving waters that the project site is tributary to and identifies the Receiving Water's 303(d) listed impairments (if any), designated beneficial uses, and proximity, if any, to a RARE beneficial use. Appendix 1 includes a map of the receiving waters.

Table A.1 Identification of Receiving Waters

Receiving Waters	EPA Approved 303(d) List Impairments	Designated Beneficial Uses	Proximity to RARE Beneficial Use
On-site Storm Drain System	N/A	N/A	N/A
San Jacinto River 3 – Canyon Lake to Nuevo Road	N/A	MUN, AGR, GWR, REC1, REC2, WARM, WILD	N/A
San Jacinto Reach 2 - Canyon Lake (HU 802.11)	Nutrients, Pathogens	MUN, AGR, GWR, REC1, REC2, WARM, WILD	N/A
San Jacinto River Reach 1 – Lake Elsinore to Canyon Lake (HU 801.32)	N/A	MUN, AGR, GWR, REC1, REC2, WARM, WILD	N/A
Lake Elsinore (HU 802.31)	Nutrients, Organic Enrichment/Low Dissolved Oxygen, PCBs, Sedimentation/Siltation	MUN, AGR, REC1, REC2, WARM, WILD	N/A

A.3 Additional Permits/Approvals required for the Project:

Table A.2 Other Applicable Permits

Agency	Permit Required	
State Department of Fish and Game, 1602 Streambed Alteration Agreement	☐ Y	☒ N
State Water Resources Control Board, Clean Water Act (CWA) Section 401 Water Quality Cert.	☐ Y	☒ N

US Army Corps of Engineers, CWA Section 404 Permit	☐ Y	☒ N
US Fish and Wildlife, Endangered Species Act Section 7 Biological Opinion	☐ Y	☒ N
Statewide Construction General Permit Coverage	☒ Y	☐ N
Statewide Industrial General Permit Coverage	☐ Y	☒ N
Western Riverside MSHCP Consistency Approval (e.g., JPR, DBESP)	☐ Y	☒ N

Section B: Optimize Site Utilization (LID Principles)

The 2010 Santa Ana MS4 Permit requires that LID Retention BMPs (Infiltration Only or Harvest and Use) be used unless it can be shown that those BMPs are infeasible or in some other way not required. Therefore, the narratives below identify and justify if there are any constraints that would prevent the use of those categories of LID BMPs. Similarly, noted opportunities that exist are described below as to how they will be utilized during project design. These Constraints and Opportunities are noted on the WQMP Site plan in Appendix 1.

Site Optimization

The following questions help describe the site's opportunities and/or constraints, and document compliance.

Did you identify and preserve existing drainage patterns? If so, how? If not, why?

Yes, the existing site drains towards the south via overland sheet flow and concentrated flow paths until is confluences and is intercepted by the existing City drainage system located within E 6th Street. The proposed on-site system will discharge treated runoff in the City's storm drain system upstream within Xenia Avenue which connects to the mainline in E 6th Street.

Did you identify and protect existing vegetation? If so, how? If not, why?

No. The current site is barren which will be graded and compacted for the proposed improvements. However, the proposed site will be planted with landscaping approved by the city of Beaumont.

Did you identify and preserve natural infiltration capacity? If so, how? If not, why?

No; infiltration capacity will be lessened due to the proposed impermeable surfaces, and soil compaction. In areas where ornamental landscaping is proposed, natural infiltration may be implemented.

Did you identify and minimize impervious area? If so, how? If not, why?

Yes - Within the development envelope, street and sidewalk widths were minimized to the acceptable City standards.

Did you identify and disperse runoff to adjacent pervious areas? If so, how? If not, why?

Yes—buildings are to drain to adjacent landscape areas where possible. All runoff from the project will be directed to the proposed Extended Detention Basin before leaving the site.

Section C: Delineate Drainage Management Areas (DMAs)

Utilizing the procedure in Section 3.3 of the WQMP Guidance Document which discusses the methods of delineating and mapping the project site into individual DMAs, the completed Table C.1 below appropriately categorizes the types of classification (e.g., Roofs, Ornamental Landscaping, etc.) of the DMA's for your project site.

Table C.1 DMA Classifications

DMA Name or ID	Surface Type(s)[1]	Area (Sq. Ft.)	DMA Type
DMA 1	Rooftop, Driveway, Sidewalk, Asphalt Street, Landscaping	267,513 s.f.	Type D
SRA-1	Mixed: Roofs, Sidewalks, Ornamental Landscaping	14,190 s.f.	Type B
SRA-2	Mixed: Roofs, Sidewalks, Ornamental Landscaping	9,969 s.f.	Type B
SRA-3	Mixed: Roofs, Sidewalks, Ornamental Landscaping	10,820 s.f.	Type B
SRA-4	Mixed: Roofs, Sidewalks, Ornamental Landscaping	11,479 s.f.	Type B
SRA-5	Mixed: Roofs, Sidewalks, Ornamental Landscaping	12,250 s.f.	Type B
SRA-6	Mixed: Roofs, Sidewalks, Ornamental Landscaping	12,448 s.f.	Type B
SRA-7	Mixed: Roofs, Sidewalks, Ornamental Landscaping	11,688 s.f.	Type B
SRA-8	Mixed: Roofs, Sidewalks, Ornamental Landscaping	12,055 s.f.	Type B
SRA-9	Mixed: Roofs, Sidewalks, Ornamental Landscaping	11,788 s.f.	Type B
SRA-10	Mixed: Roofs, Sidewalks, Ornamental Landscaping	11,601 s.f.	Type B
SRA-11	Mixed: Roofs, Sidewalks, Ornamental Landscaping	12,141 s.f.	Type B
SRA-12	Mixed: Roofs, Sidewalks, Ornamental Landscaping	12,281 s.f.	Type B
SRA-13	Mixed: Roofs, Sidewalks, Ornamental Landscaping	11,911 s.f.	Type B
SRA-14	Mixed: Roofs, Sidewalks, Ornamental Landscaping	11,613 s.f.	Type B
SRA-15	Mixed: Roofs, Sidewalks, Ornamental Landscaping	12,084 s.f.	Type B
SRA-16	Mixed: Roofs, Sidewalks, Ornamental Landscaping	11,994 s.f.	Type B

[1]*Reference Table 2-1 in the WQMP Guidance Document to populate this column*

(Impervious Cover for Developed Areas RCFC & WCD Hydrology Manual Plate D-5.6)

Table C.2 Type 'A', Self-Treating Areas – **NOT APPLICABLE**

DMA Name or ID	Area (Sq. Ft.)	Stabilization Type	Irrigation Type (if any)

Table C.3 Type 'B', Self-Retaining Areas

Self-Retaining Area				**Type 'C' DMAs that are draining to the Self-Retaining Area**		
DMA Name/ ID	Post-project surface type	Area (square feet) [A]	Storm Depth (inches) [B]	DMA Name / ID	[C] from Table C.4 = [C]	Required Retention Depth (inches) [D]
SRA-1	Ornamental Landscaping	6,410	0.85	**SRA-1**	7,780	1.88
SRA-2	Ornamental Landscaping	3,354	0.85	**SRA-2**	6,615	2.53
SRA-3	Ornamental Landscaping	3,683	0.85	**SRA-3**	7,137	2.50
SRA-4	Ornamental Landscaping	4,008	0.85	**SRA-4**	7,471	2.43
SRA-5	Ornamental Landscaping	4,439	0.85	**SRA-5**	7,811	2.35
SRA-6	Ornamental Landscaping	4,777	0.85	**SRA-6**	7,671	2.21
SRA-7	Ornamental Landscaping	4,258	0.85	**SRA-7**	7,430	2.33
SRA-8	Ornamental Landscaping	4,610	0.85	**SRA-8**	7,445	2.22
SRA-9	Ornamental Landscaping	4,124	0.85	**SRA-9**	7,664	2.43
SRA-10	Ornamental Landscaping	3,961	0.85	**SRA-10**	7,640	2.49
SRA-11	Ornamental Landscaping	4,703	0.85	**SRA-11**	7,438	2.19
SRA-12	Ornamental Landscaping	4,824	0.85	**SRA-12**	7,457	2.16

SRA-13	Ornamental Landscaping	4,151	0.85	**SRA-13**	7,760	2.44
SRA-14	Ornamental Landscaping	4,015	0.85	**SRA-14**	7,598	2.46
SRA-15	Ornamental Landscaping	4,672	0.85	**SRA-15**	7,412	2.20
SRA-16	Ornamental Landscaping	4,802	0.85	**SRA-16**	7,192	2.12

$$[D] = [B] + \frac{[B] \cdot [C]}{[A]}$$

Table C.4 Type 'C', Areas that Drain to Self-Retaining Areas

DMA					**Receiving Self-Retaining DMA**		
DMA Name/ ID	Area (square feet)	Post-project surface type	Runoff factor	Product		Area (square feet)	Ratio
	[A]		[B]	[C] = [A] x [B]	DMA name /ID	[D]	[C]/[D]
SRA-1	7,780	Roofs & Sidewalks	1.0	7,780	**SRA-1**	6,410	1.21 < 2
SRA-2	6,615	Roofs & Sidewalks	1.0	6,615	**SRA-2**	3,354	1.97 < 2
SRA-3	7,137	Roofs & Sidewalks	1.0	7,137	**SRA-3**	3,683	1.94 < 2
SRA-4	7,471	Roofs & Sidewalks	1.0	7,471	**SRA-4**	4,008	1.86 < 2
SRA-5	7,811	Roofs & Sidewalks	1.0	7,811	**SRA-5**	4,439	1.76 < 2
SRA-6	7,671	Roofs & Sidewalks	1.0	7,671	**SRA-6**	4,777	1.61 < 2
SRA-7	7,430	Roofs & Sidewalks	1.0	7,430	**SRA-7**	4,258	1.74 < 2
SRA-8	7,445	Roofs & Sidewalks	1.0	7,445	**SRA-8**	4,610	1.61 < 2

SRA-9	7,664	Roofs & Sidewalks	1.0	7,664	**SRA-9**	4,124	1.86 < 2
SRA-10	7,640	Roofs & Sidewalks	1.0	7,640	**SRA-10**	3,961	1.93 < 2
SRA-11	7,438	Roofs & Sidewalks	1.0	7,438	**SRA-11**	4,703	1.58 < 2
SRA-12	7,457	Roofs & Sidewalks	1.0	7,457	**SRA-12**	4,824	1.55 < 2
SRA-13	7,760	Roofs & Sidewalks	1.0	7,760	**SRA-13**	4,151	1.87 < 2
SRA-14	7,598	Roofs & Sidewalks	1.0	7,598	**SRA-14**	4,015	1.89 < 2
SRA-15	7,412	Roofs & Sidewalks	1.0	7,412	**SRA-15**	4,672	1.59 < 2
SRA-16	7,192	Roofs & Sidewalks	1.0	7,192	**SRA-16**	4,802	1.50 < 2

Table C.5 Type 'D', Areas Draining to BMPs

DMA Name or ID	BMP Name or ID
DMA 1	Bioretention Basin "A"

Note: More than one drainage management area can drain to a single LID BMP, however, one drainage management area may not drain to more than one BMP.

Section D: Implement LID BMPs

D.1 Infiltration Applicability

Is there an approved downstream 'Highest and Best Use' for stormwater runoff (see discussion in Chapter 2.4.4 of the WQMP Guidance Document for further details)? ☐ Y ☒ N

Geotechnical Report

A Geotechnical Report and Phase I Environmental Site Assessment has been prepared for this project to confirm present and past site characteristics that may affect the use of Infiltration BMPs. The geotechnical report is included it in Appendix 3. In addition, the Phase I Environmental Site Assessment is included in Appendix 4.

Is this project classified as a small project consistent with the requirements of Chapter 2 of the WQMP Guidance Document? ☐ Y ☒ N

Infiltration Feasibility

Table D.1 below is meant to provide a simple means of assessing which DMAs on your site support Infiltration BMPs and is discussed in the WQMP Guidance Document in Chapter 2.4.5. Check the appropriate box for each question and then list affected DMAs as applicable. If additional space is needed, add a row below the corresponding answer.

Table D.1 Infiltration Feasibility

Does the project site…	YES	NO
…have any DMAs with a seasonal high groundwater mark shallower than 10 feet?		x
If Yes, list affected DMAs:		
…have any DMAs located within 100 feet of a water supply well?		x
If Yes, list affected DMAs:		
…have any areas identified by the geotechnical report as posing a public safety risk where infiltration of stormwater could have a negative impact?		x
If Yes, list affected DMAs:		
…have measured in-situ infiltration rates of less than 1.6 inches / hour?	x	
If Yes, list affected DMAs: Entire Site, especially at the WQ Basin site (0.5 in/hr.)		
…have significant cut and/or fill conditions that would preclude in-situ testing of infiltration rates at the final infiltration surface?	x	
If Yes, list affected DMAs: All		
…geotechnical report identify other site-specific factors that would preclude effective and safe infiltration?		x
Describe here: low to no infiltration capability		

If you answered "Yes" to any of the questions above for any DMA, Infiltration BMPs should not be used for those DMAs and you should proceed to the assessment for Harvest and Use below.

Infiltration will not be relied upon due to in-situ infiltration rates below 1.6 in/hr.

D.2 Harvest and Use Assessment

Please check what applies*:*

☐ Reclaimed water will be used for the non-potable water demands for the project.

☐Downstream water rights may be impacted by Harvest and Use as approved by the Regional Board (verify with the Copermittee).

☐The Design Capture Volume will be addressed using Infiltration Only BMPs. In such a case, Harvest and Use BMPs are still encouraged, but it would not be required if the Design Capture Volume will be infiltrated or evapotranspired.

If any of the above boxes have been checked, Harvest and Use BMPs need not be assessed for the site. If neither of the above criteria applies, follow the steps below to assess the feasibility of irrigation use, toilet use and other non-potable uses (e.g., industrial use).

Irrigation Use Feasibility

Complete the following steps to determine the feasibility of harvesting stormwater runoff for Irrigation Use BMPs on your site: **Not Feasible.**

Step 1: Identify the total area of irrigated landscape on the site, and the type of landscaping used.

Total Area of Irrigated Landscape: 2.68 acres

Type of Landscaping (Conservation Design or Active Turf): Active Turf

Step 2: Identify the planned total of all impervious areas on the proposed project from which runoff might be feasibly captured and stored for irrigation use. Depending on the configuration of buildings and other impervious areas on the site, you may consider the site as a whole, or parts of the site, to evaluate reasonable scenarios for capturing and storing runoff and directing the stored runoff to the potential use(s) identified in Step 1 above.

Total Area of Impervious Surfaces: 7.36 acres

Step 3: Cross reference the Design Storm depth for the project site (see Exhibit A of the WQMP Guidance Document) with the left column of Table 2-3 in Chapter 2 to determine the minimum area of Effective Irrigated Area per Tributary Impervious Area (EIATIA).

Enter your EIATIA factor: 1.10

Step 4: Multiply the unit value obtained from Step 3 by the total of impervious areas from Step 2 to develop the minimum irrigated area that would be required.

Minimum required irrigated area: 8.10 acres

Step 5: Determine if harvesting stormwater runoff for irrigation use is feasible for the project by comparing the total area of irrigated landscape (Step 1) to the minimum required irrigated area (Step 4).

Minimum required irrigated area (Step 4)	Available Irrigated Landscape (Step 1)
8.10 acres	**2.68 acres**

Toilet Use Feasibility

Complete the following steps to determine the feasibility of harvesting stormwater runoff for toilet flushing uses on your site: **Not Feasible.**

Step 1: Identify the projected total number of daily toilet users during the wet season, and account for any periodic shut downs or other lapses in occupancy:

Projected Number of Daily Toilet Users: 768 users

Project Type: Residential

Step 2: Identify the planned total of all impervious areas on the proposed project from which runoff might be feasibly captured and stored for toilet use. Depending on the configuration of buildings and other impervious areas on the site, you may consider the site as a whole, or parts of the site, to evaluate reasonable scenarios for capturing and storing runoff and directing the stored runoff to the potential use(s) identified in Step 1 above.

Total Area of Impervious Surfaces: 7.36 acres

Step 3: Enter the Design Storm depth for the project site (see Exhibit A) into the left column of Table 2-1 in Chapter 2 to determine the minimum number or toilet users per tributary impervious acre (TUTIA).

Enter your TUTIA factor: 138

Step 4: Multiply the unit value obtained from Step 3 by the total of impervious areas from Step 2 to develop the minimum number of toilet users that would be required.

Minimum number of toilet users: 1,016 users

Step 5: Determine if harvesting stormwater runoff for toilet flushing use is feasible for the project by comparing the Number of Daily Toilet Users (Step 1) to the minimum required number of toilet users (Step 4).

Minimum required Toilet Users (Step 4)	Projected number of toilet users (Step 1)
1,016 Users	**768 Users**

`

Other Non-Potable Use Feasibility

Are there other non-potable uses for stormwater runoff on the site (e.g. industrial use)? See Chapter 2 of the Guidance for further information. If yes, describe below. If no, write N/A.

Not Applicable – No other non-potable uses available.

Step 1: Identify the projected average daily non-potable demand, in gallons per day, during the wet season and accounting for any periodic shut downs or other lapses in occupancy or operation.

Average Daily Demand: **Not Applicable– No other non-potable uses available.**

Step 2: Identify the planned total of all impervious areas on the proposed project from which runoff might be feasibly captured and stored for the identified non-potable use. Depending on the configuration of buildings and other impervious areas on the site, you may consider the site as

a whole, or parts of the site, to evaluate reasonable scenarios for capturing and storing runoff and directing the stored runoff to the potential use(s) identified in Step 1 above.

Total Area of Impervious Surfaces: **Not Applicable– No other non-potable uses available.**

Step 3: Enter the Design Storm depth for the project site (see Exhibit A) into the left column of Table 2-3 in Chapter 2 to determine the minimum demand for non-potable uses per tributary impervious acre.

Enter the factor from Table 2-3: **Not Applicable– No other non-potable uses available.**

Step 4: Multiply the unit value obtained from Step 4 by the total of impervious areas from Step 3 to develop the minimum number of gallons per day of non-potable use that would be required.

Minimum required use: **Not Applicable– No other non-potable uses available.**

Step 5: Determine if harvesting stormwater runoff for other non-potable use is feasible for the project by comparing the Number of Daily Toilet Users (Step 1) to the minimum required number of toilet users (Step 4).

Minimum required non-potable use (Step 4)	Projected average daily use (Step 1)
Not Applicable	Not Applicable

If Irrigation, Toilet and Other Use feasibility anticipated demands are less than the applicable minimum values, Harvest and Use BMPs are not required and you should proceed to utilize LID Bioretention and Biotreatment, unless a site-specific analysis has been completed that demonstrates technical infeasibility as noted in D.3 below.

D.3 Bioretention and Biotreatment Assessment

Other LID Bioretention and Biotreatment BMPs as described in Chapter 2.4.7 of the WQMP Guidance Document are feasible on nearly all development sites with sufficient advance planning.

Select one of the following:

☒ LID Bioretention/Biotreatment BMPs will be used for some or all DMAs of the project as noted below in Section D.4 (note the requirements of Section 3.4.2 in the WQMP Guidance Document).

☐ A site-specific analysis demonstrating the technical infeasibility of all LID BMPs has been performed and is included in Appendix 5. If you plan to submit an analysis demonstrating the technical infeasibility of LID BMPs, request a pre-submittal meeting with the Copermittee to discuss this option. Proceed to Section E to document your alternative compliance measures.

D.4 Feasibility Assessment Summaries

From the Infiltration, Harvest and Use, Bioretention and Biotreatment Sections above, complete Table D.2 below to summarize which LID BMPs are technically feasible, and which are not, based upon the established hierarchy.

Table D.2 LID Prioritization Summary Matrix

DMA Name/ID	LID BMP Hierarchy				No LID (Alternative Compliance)
	1. Infiltration	2. Harvest and use	3. Bioretention	4. Biotreatment	
DMA 1	☐	☐	☒	☒	☐

For those DMAs where LID BMPs are not feasible, provide a brief narrative below summarizing why they are not feasible, include your technical infeasibility criteria in Appendix 5, and proceed to Section E below to document Alternative Compliance measures for those DMAs. Recall that each proposed DMA must pass through the LID BMP hierarchy before alternative compliance measures may be considered.

Infiltration will not be relied upon due to in-situ infiltration rates below 1.6 in/hr. Harvest and Use is not feasible because all landscaped areas are within each privately owned lot thereby eliminating the ability to apply harvest reuse for irrigation. An extended Detention Basin will be used for DMA 1 sized for both water quality and increased runoff mitigation.

D.5 LID BMP Sizing

Each LID BMP must be designed to ensure that the Design Capture Volume will be addressed by the selected BMPs. First**,** calculations were prepared of the Design Capture Volume for each LID BMP using the V_{BMP} worksheet in Appendix F of the LID BMP Design Handbook. Second**,** the Co-permittee approved design of the LID BMP meet the requirements of the V_{BMP}. The completed Table D.3 below documents the Design Capture Volume and the Proposed Volume for each LID BMP. The completed design procedure sheets for each LID BMP in located in Appendix 6.

Table D.5.1 DCV Calculations for LID BMPs

DMA Type/ID	DMA Area (s.f.)	Post-Project Surface Type	Effective Impervious Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*BMP Name:* *Extended Detention Basin "A"*		
DMA 1	*[A]*		*[B]*	*[C]*	*[A] x [C]*			
Impervious: Roofs, Sidewalks & Parking / Streets	*201,250*	*Roofs, Concrete and Asphalt*	*1*	*0.89*	*179,515*	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
Pervious: Open Space / Landscaping	*44,922*	*Ornamental Landscaping*	*0.1*	*0.1*	*4,962*			
Basin	*21,341*	*Ornamental Landscaping*	*0.1*	*0.1*	*2,357.3*			
	$A_T = \Sigma[A]$ **267,513**				$\Sigma = [D]$ **186,834.3**	*[E]* **0.85**	$[F] = \frac{[D]x[}{12}$ **13,234.1**	*[G]* ***97,162***

[B], [C] is obtained as described in Section 2.3.1 of the WQMP Guidance Document
[E] is obtained from Exhibit A in the WQMP Guidance Document
[G] is obtained from a design procedure sheet, such as in LID BMP Design Handbook and placed in Appendix 6

Section E: Alternative Compliance (LID Waiver Program) – N/A

LID BMPs are expected to be feasible on virtually all projects. Where LID BMPs have been demonstrated to be infeasible as documented in Section D, other Treatment Control BMPs must be used (subject to LID waiver approval by the Copermittee). Check one of the following Boxes:

☒ LID Principles and LID BMPs have been incorporated into the site design to fully address all Drainage Management Areas. No alternative compliance measures are required for this project and thus this Section is not required to be completed.

- *Or* -

☐ The following Drainage Management Areas are unable to be addressed using LID BMPs. A site-specific analysis demonstrating technical infeasibility of LID BMPs has been approved by the Co-Permittee and included in Appendix 5. Additionally, no downstream regional and/or sub-regional LID BMPs exist or are available for use by the project. The following alternative compliance measures on the following pages are being implemented to ensure that any pollutant loads expected to be discharged by not incorporating LID BMPs, are fully mitigated.

E.1 Identify Pollutants of Concern

Table A.1 from Section A above noted the project's receiving waters and their associated EPA approved 303(d) listed impairments. Table E.1 below cross references this information with the selected Priority Development Project Category. The identified General Pollutant Categories of Nutrients is the same as those listed for the receiving waters. As such, **Nutrients** will be the "Pollutants of Concern" for this project. The purpose of this is to document compliance and appropriately plan for mitigating the Pollutants of Concern in lieu of implementing LID BMPs.

Table E.1 Potential Pollutants by Land Use Type

Priority Development Project Categories and/or Project Features (check those that apply)	General Pollutant Categories							
	Bacterial Indicators	Metals	Nutrients	Pesticides	Toxic Organic Compounds	Sediments	Trash & Debris	Oil & Grease
☐ Detached Residential Development	P	N	P	P	N	P	P	P
☒ Attached Residential Development	P	N	P	P	N	P	P	P(2)
☐ Commercial/Industrial Development	P(3)	P	P(1)	P(1)	P(5)	P(1)	P	P
☐ Automotive Repair Shops	N	P	N	N	P(4, 5)	N	P	P
☐ Restaurants (>5,000 ft^2)	P	N	N	N	N	N	P	P
☐ Hillside Development (>5,000 ft^2)	P	N	P	P	N	P	P	P

☐	Parking Lots (>5,000 ft^2)	P[6]	P	P[1]	P[1]	P[4]	P[1]	P	P
☐	Retail Gasoline Outlets	N	P	N	N	P	N	P	P
Project Priority Pollutant(s) of Concern		☒	☐	☒	☐	☐	☐	☐	☐

P = Potential

N = Not Potential

[1] A potential Pollutant if non-native landscaping exists or is proposed onsite; otherwise not expected

[2] A potential Pollutant if the project includes uncovered parking areas; otherwise not expected

[3] A potential Pollutant is land use involving animal waste

[4] Specifically petroleum hydrocarbons

[5] Specifically solvents

[6] Bacterial indicators are routinely detected in pavement runoff

E.2 Stormwater Credits

Projects that cannot implement LID BMPs but nevertheless implement smart growth principles are potentially eligible for Stormwater Credits. Utilize Table 3-8 within the WQMP Guidance Document to identify your Project Category and its associated Water Quality Credit. If not applicable, write N/A.

Table E.2 Water Quality Credits (High Density can only apply one category)

Qualifying Project Categories	Credit Percentage[2]
Total Credit Percentage[1]	

[1]Cannot Exceed 50%

[2]Obtain corresponding data from Table 3-8 in the WQMP Guidance Document

E.3 Sizing Criteria

After you appropriately considered Stormwater Credits for your project, utilize Table E.3 below to appropriately size them to the DCV, or Design Flow Rate, as applicable. Please reference Chapter 3.5.2 of the WQMP Guidance Document for further information.

E.4 Treatment Control BMP Selection

Treatment Control BMPs typically provide proprietary treatment mechanisms to treat potential pollutants in runoff, but do not sustain significant biological processes. Treatment Control BMPs must have a removal efficiency of a medium or high effectiveness as quantified below:

- **High**: equal to or greater than 80% removal efficiency
- **Medium**: between 40% and 80% removal efficiency

Such removal efficiency documentation (e.g., studies, reports, etc.) as further discussed in Chapter 3.5.2 of the WQMP Guidance Document, must be included in Appendix 6. In addition, ensure that proposed Treatment Control BMPs are properly identified on the WQMP Site Plan in Appendix 1.

Table E.3 Treatment Control BMP Selection

Selected Treatment Control BMP Name or ID[1]	Priority Pollutant(s) of Concern to Mitigate[2]	Removal Efficiency Percentage[3]

[1] Treatment Control BMPs must not be constructed within Receiving Waters. In addition, a proposed Treatment Control BMP may be listed more than once if they possess more than one qualifying pollutant removal efficiency.

[2] Cross Reference Table E.1 above to populate this column.

[3] As documented in a Co-Permittee Approved Study and provided in Appendix 6.

Section F: Hydromodification

F.1 Hydrologic Conditions of Concern (HCOC) Analysis

Once you have determined that the LID design is adequate to address water quality requirements, you will need to assess if the proposed LID Design may still create a HCOC. Review Chapters 2 and 3 (including Figure 3-7) of the WQMP Guidance Document to determine if your project must mitigate for Hydromodification impacts. If your project meets one of the following criteria which will be indicated by the check boxes below, you do not need to address Hydromodification at this time. However, if the project does not qualify for Exemptions 1, 2 or 3, then additional measures must be added to the design to comply with HCOC criteria. This is discussed in further detail below in Section F.2.

HCOC EXEMPTION 1: The Priority Development Project disturbs less than one acre. The Copermittee has the discretion to require a Project-Specific WQMP to address HCOCs on projects less than one acre on a case by case basis. The disturbed area calculation should include all disturbances associated with larger common plans of development.

Does the project qualify for this HCOC Exemption? ☐ Y ☒ N

If Yes, HCOC criteria do not apply.

HCOC EXEMPTION 2: The volume and time of concentration[1] of storm water runoff for the post-development condition is not significantly different from the pre-development condition for a 2-year return frequency storm (a difference of 5% or less is considered insignificant) using one of the following methods to calculate:

- Riverside County Hydrology Manual
- Technical Release 55 (TR-55): Urban Hydrology for Small Watersheds (NRCS 1986), or derivatives thereof, such as the Santa Barbara Urban Hydrograph Method
- Other methods acceptable to the Co-Permittee

Does the project qualify for this HCOC Exemption? ☐ Y ☒ N

If Yes, report results in Table F.1 below and provide your substantiated hydrologic analysis in Appendix 7.

Table F.1 Hydrologic Conditions of Concern Summary

DMA A	2 year – 24 hour		
	Pre-condition	**Post-condition**	**% Difference**
Time of Concentration (minutes)	10.40	15.57	49.7%
Volume (Cubic Feet)	54,991	72,977	32.7%

[1] Time of concentration is defined as the time after the beginning of the rainfall when all portions of the drainage basin are contributing to flow at the outlet.

HCOC EXEMPTION 3: All downstream conveyance channels to an adequate sump (for example, Prado Dam, Lake Elsinore, Canyon Lake, Santa Ana River, or other lake, reservoir or naturally erosion resistant feature) that will receive runoff from the project are engineered and regularly maintained to ensure design flow capacity; no sensitive stream habitat areas will be adversely affected; or are not identified on the Co-Permittees Hydromodification Sensitivity Maps.

Does the project qualify for this HCOC Exemption? ☐ Y ☒ N

If Yes, HCOC criteria do not apply and note below which adequate sump applies to this HCOC qualifier:

F.2 HCOC Mitigation

If none of the above HCOC Exemption Criteria are applicable, HCOC criteria is considered mitigated if they meet one of the following conditions:

a. Additional LID BMPS are implemented onsite or offsite to mitigate potential erosion or habitat impacts as a result of HCOCs. This can be conducted by an evaluation of site-specific conditions utilizing accepted professional methodologies published by entities such as the California Stormwater Quality Association (CASQA), the Southern California Coastal Water Research Project (SCCRWP), or other Co-Permittee approved methodologies for site-specific HCOC analysis.

b. The project is developed consistent with an approved Watershed Action Plan that addresses HCOC in Receiving Waters.

c. Mimicking the pre-development hydrograph with the post-development hydrograph, for a 2-year return frequency storm. Generally, the hydrologic conditions of concern are not significant, if the post-development hydrograph is no more than 10% greater than pre-development hydrograph. In cases where excess volume cannot be infiltrated or captured and reused, discharge from the site must be limited to a flow rate no greater than 110% of the pre-development 2-year peak flow.

Be sure to include all pertinent documentation used in your analysis of the items a, b or c in Appendix 7.

C. The proposed extended detention basin "A" and outlet structure has been designed to detain and mitigate the 2-year post-developed peak runoff to below 110% of the 2-year pre-developed peak runoff rate. This is achieved with a basin that has a total capacity of 1.87 ac-ft with a calibrated outlet structure. Please see the following table summarizing the pre- and post-developed peak runoff and the results basin mitigation results. Therefore, HCOC mitigation has been achieved through method C. Please see Appendix 7 for the supporting calculations and results.

Site Flow Rate Summary				
Undeveloped	2Y 1H	2Y 3H	2Y 6H	2Y 24H
Total Site Peak Flow (cfs) 15.3 Ac.	13.2	6.0	4.2	1.2
Developed	2Y 1H	2Y 3H	2Y 6H	2Y 24H
Total Site Peak Flow (cfs) 15.3 Ac.	16.8	9.2	7.5	3.5
Mitigation Status	Fail	Fail	Fail	Fail
Developed w/ Detention Routing	2Y 1H	2Y 3H	2Y 6H	2Y 24H
Total Site Peak Flow (cfs) 68.7 Ac.	1.2	1.0	1.1	1.3
Percent Difference	-91%	-83%	-73%	6%
Mitigation Status	Pass	Pass	Pass	Pass

Section G: Source Control BMPs

Source control BMPs include permanent, structural features that may be required in your project plans — such as roofs over and berms around trash and recycling areas — and Operational BMPs, such as regular sweeping and "housekeeping", that must be implemented by the site's occupant or user. The MEP standard typically requires both types of BMPs. In general, Operational BMPs cannot be substituted for a feasible and effective permanent BMP. Using the Pollutant Sources/Source Control Checklist in Appendix 8, review the following procedure to specify Source Control BMPs for your site:

1. ***Identify Pollutant Sources*:** Review Column 1 in the Pollutant Sources/Source Control Checklist. Check off the potential sources of Pollutants that apply to your site.

2. ***Note Locations on Project-Specific WQMP Exhibit*:** Note the corresponding requirements listed in Column 2 of the Pollutant Sources/Source Control Checklist. Show the location of each Pollutant source and each permanent Source Control BMP in your Project-Specific WQMP Exhibit located in Appendix 1.

3. ***Prepare a Table and Narrative*:** Check off the corresponding requirements listed in Column 3 in the Pollutant Sources/Source Control Checklist. In the left column of Table G.1 below, list each potential source of runoff Pollutants on your site (from those that you checked in the Pollutant Sources/Source Control Checklist). In the middle column, list the corresponding permanent, Structural Source Control BMPs (from Columns 2 and 3 of the Pollutant Sources/Source Control Checklist) used to prevent Pollutants from entering runoff. **Add additional narrative** in this column that explains any special features, materials or methods of construction that will be used to implement these permanent, Structural Source Control BMPs.

4. ***Identify Operational Source Control BMPs:*** To complete your table, refer once again to the Pollutant Sources/Source Control Checklist. List in the right column of your table the Operational BMPs that should be implemented as long as the anticipated activities continue at the site. Copermittee stormwater ordinances require that applicable Source Control BMPs be implemented; the same BMPs may also be required as a condition of a use permit or other revocable Discretionary Approval for use of the site.

Table G.1 Permanent and Operational Source Control Measures

Potential Sources of Runoff pollutants	Permanent Structural Source Control BMPs	Operational Source Control BMPs
D1. Need for future indoor & structural pest control	Note building design features that discourage entry of pests.	Provide Intergraded Pest Management information to owners, lessees, and operators.
D2. Landscape/Outdoor Pesticide Use	Design landscaping to minimize irrigation and runoff, to promote surface infiltration where appropriate, and to minimize the use of fertilizers and pesticides that can contribute to stormwater pollution by following manufactures guidelines. Where landscaped areas are used to retain or detain	Maintain landscaping using minimum or no pesticides. See applicable operational BMPs in "What you should know for….Landscaping and Gardening" at http://rcflood.org/stormwater/ Provide IPM information to new owners, lessees and operation

	stormwater, specify plants that are tolerant of saturated soil conditions. Consider using pest-resistant plants, especially adjacent to hardscape. To insure successful establishment, select plants appropriate to site soil, slopes, climate, sun, wind, rain, land use, air movement, ecological consistency, and plant interactions.	
E. Pools, spas, ponds, decorative fountains, and other water features.	If the Co-Permittee requires pools to be plumbed to the sanitary sewer, place a note on the plans and state in the narrative that this connection will be made according to local requirements.	See applicable operational BMPs in "Guidelines for Maintaining Your Swimming Pool, Jacuzzi and Garden Fountain" at http://rcflood.org/stormwater/
G. Refuse areas	State how site refuse will be handled and provide supporting detail to what is shown on plans. State that signs will be posted on or near dumpsters with the words "Do not dump hazardous materials here" or similar.	State how the following will be implemented: Provide adequate number of receptacles. Inspect receptacles regularly; repair or replace leaky receptacles. Keep receptacles covered. Prohibit/ prevent dumping of liquid or hazardous wastes. Post "no hazardous materials" signs. Inspect and pick-up spills immediately. See Fact Sheet WM-4 "Spill Prevention and Control" in the CASQA Stormwater Quality Handbook at www.cabmphandbooks.com Keep spill control materials available on-site. See Fact Sheet SC-34. "Waste Handling and Disposal" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com
Onsite Storm Drain Inlets	Mark with "Only Rain in the Drain"	Maintain regularly, provide educational material to residents (good practices and discharge prohibitions)
Sidewalks & Streets	n/a	Sweep regularly and prevent litter from accumulating (no cleaning agents or degreasers discharging to storm drain system)

N. Fire Sprinkler Test Water	Provide a means to drain fire sprinkler test water to the sanitary sewer.	See the note in Fact Sheet SC-41, "Building and Grounds Maintenance," in the CASQA Stormwater Quality Handbook at www.cabmphandbooks.com
O. Roofing, gutter, and trim.	Avoid roofing, gutter, and trim made of copper or other unprotected metals that may leach into runoff.	n/a

Section H: Construction Plan Checklist

Populate Table H.1 below to assist the plan checker in an expeditious review of your project. The first two columns will contain information that was prepared in previous steps, while the last column will be populated with the corresponding plan sheets. This table is to be completed with the submittal of your final Project-Specific WQMP.

Table H.1 Construction Plan Cross-reference

BMP No. or ID	BMP Identifier and Description	Corresponding Plan Sheet(s)
Bioretention Basin "A"	Extended Detention Basin sized to capture and treat the required Design Volume	Preliminary WQMP Site Plan Exhibit

Note that the updated table — or Construction Plan WQMP Checklist — is **only a reference tool** to facilitate an easy comparison of the construction plans to your Project-Specific WQMP. Co-Permittee staff can advise you regarding the process required to propose changes to the approved Project-Specific WQMP.

Section I: Operation, Maintenance and Funding

The Copermittee will periodically verify that Stormwater BMPs on your site are maintained and continue to operate as designed. To make this possible, your Copermittee will require that you include in Appendix 9 of this Project-Specific WQMP:

1. A means to finance and implement facility maintenance in perpetuity, including replacement cost.
2. Acceptance of responsibility for maintenance from the time the BMPs are constructed until responsibility for operation and maintenance is legally transferred. A warranty covering a period following construction may also be required.
3. An outline of general maintenance requirements for the Stormwater BMPs you have selected.
4. Figures delineating and designating pervious and impervious areas, location, and type of Stormwater BMP, and tables of pervious and impervious areas served by each facility. Geo-locating the BMPs using a coordinate system of latitude and longitude is recommended to help facilitate a future statewide database system.
5. A separate list and location of self-retaining areas or areas addressed by LID Principles that do not require specialized O&M or inspections but will require typical landscape maintenance as noted in Chapter 5, pages 85-86, in the WQMP Guidance. Include a brief description of typical landscape maintenance for these areas.

Your local Co-Permittee will also require that you prepare and submit a detailed Stormwater BMP Operation and Maintenance Plan that sets forth a maintenance schedule for each of the Stormwater BMPs built on your site. An agreement assigning responsibility for maintenance and providing for inspections and certification may also be required.

Details of these requirements and instructions for preparing a Stormwater BMP Operation and Maintenance Plan are in Chapter 5 of the WQMP Guidance Document.

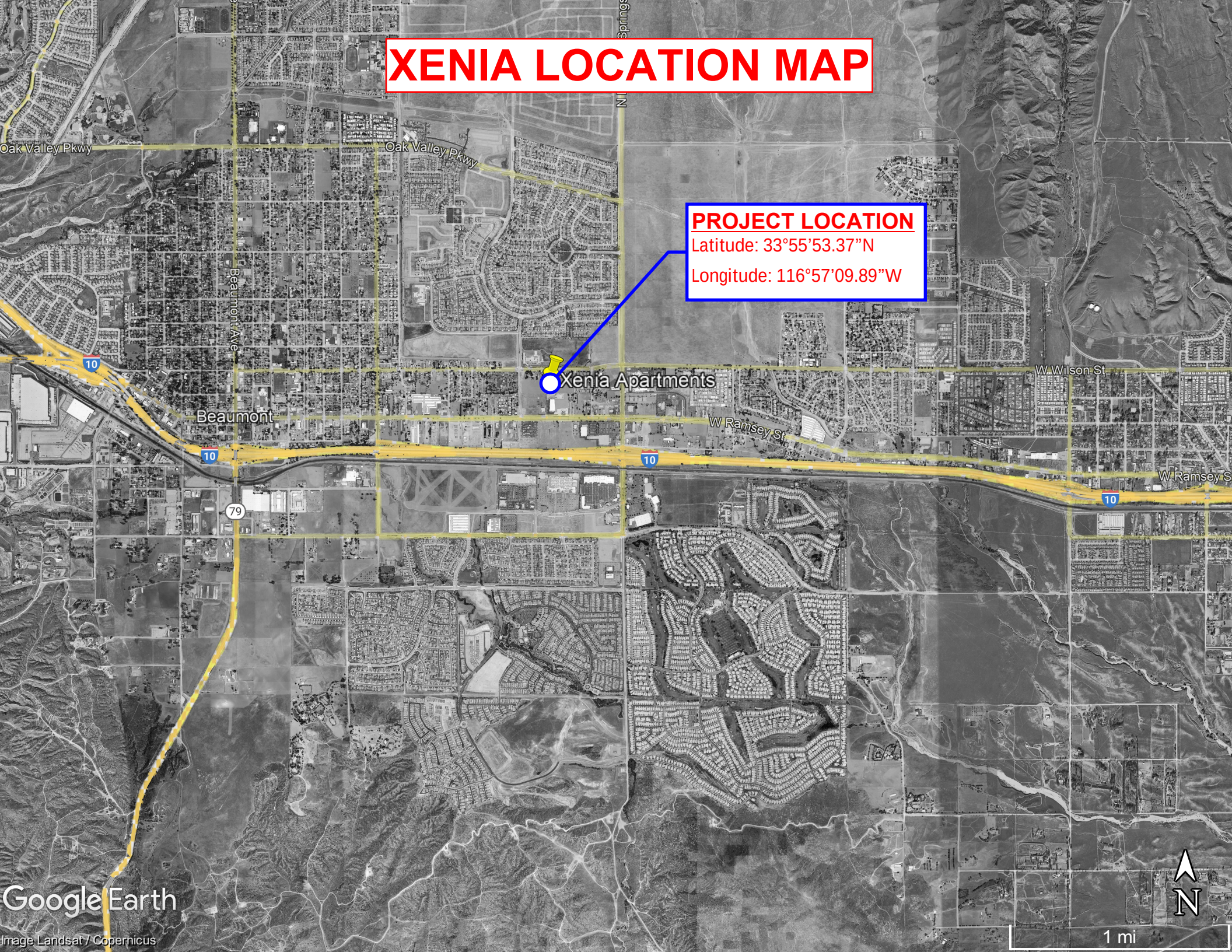
Maintenance Mechanism: Public facilities, like the storm drain system within public right-of-way, will be maintained by the City of Beaumont and funded by City maintenance funds. Flood Control District will own and maintain the Flood Control storm drain system and funding will be District maintenance funds. Private facilities, like the extended detention basin and onsite drainage inlets and pipes, will be maintained by the Property Owner's Association and funded by a residential HOA fee assessment.

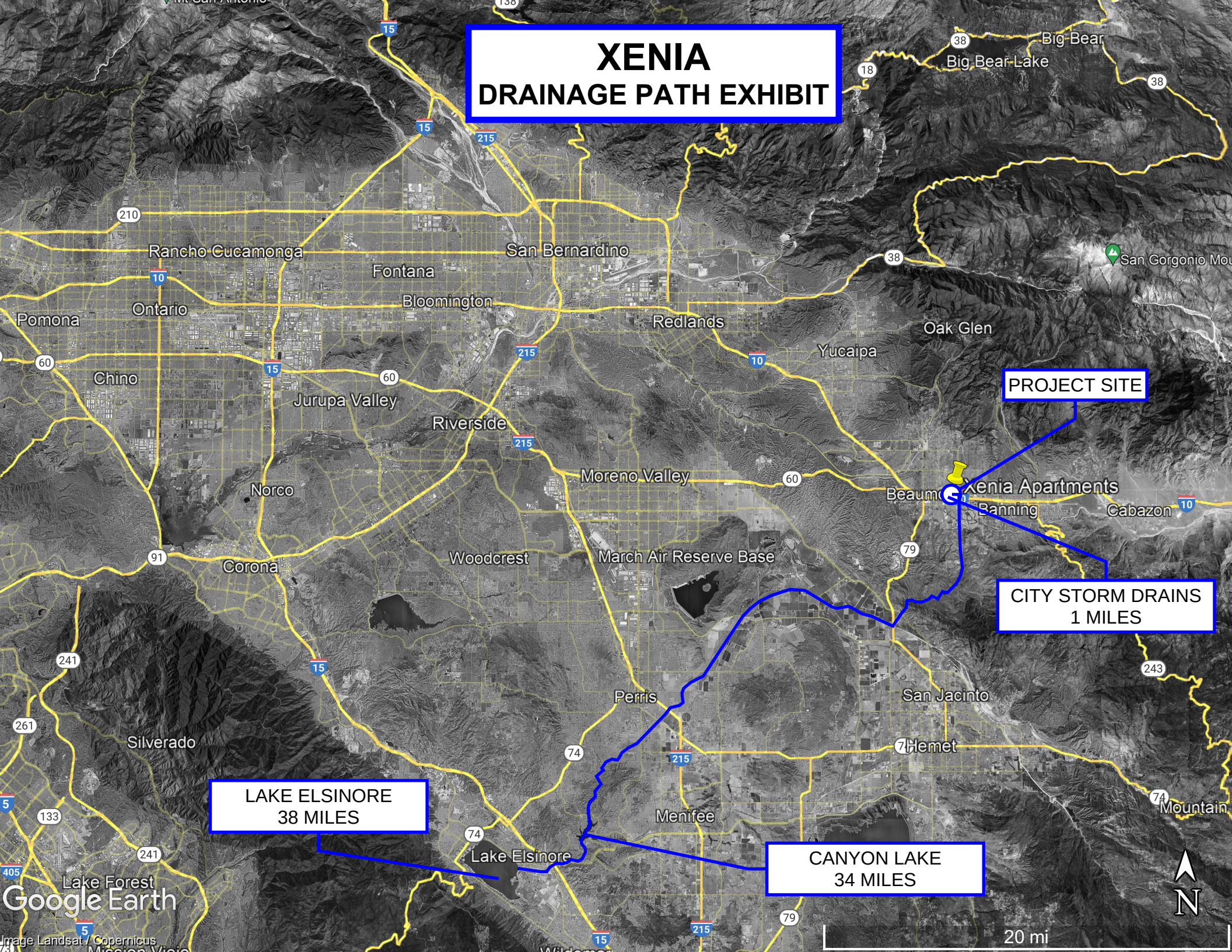
Will the proposed BMPs be maintained by a Home Owners' Association (HOA) or Property Owners Association (POA)?

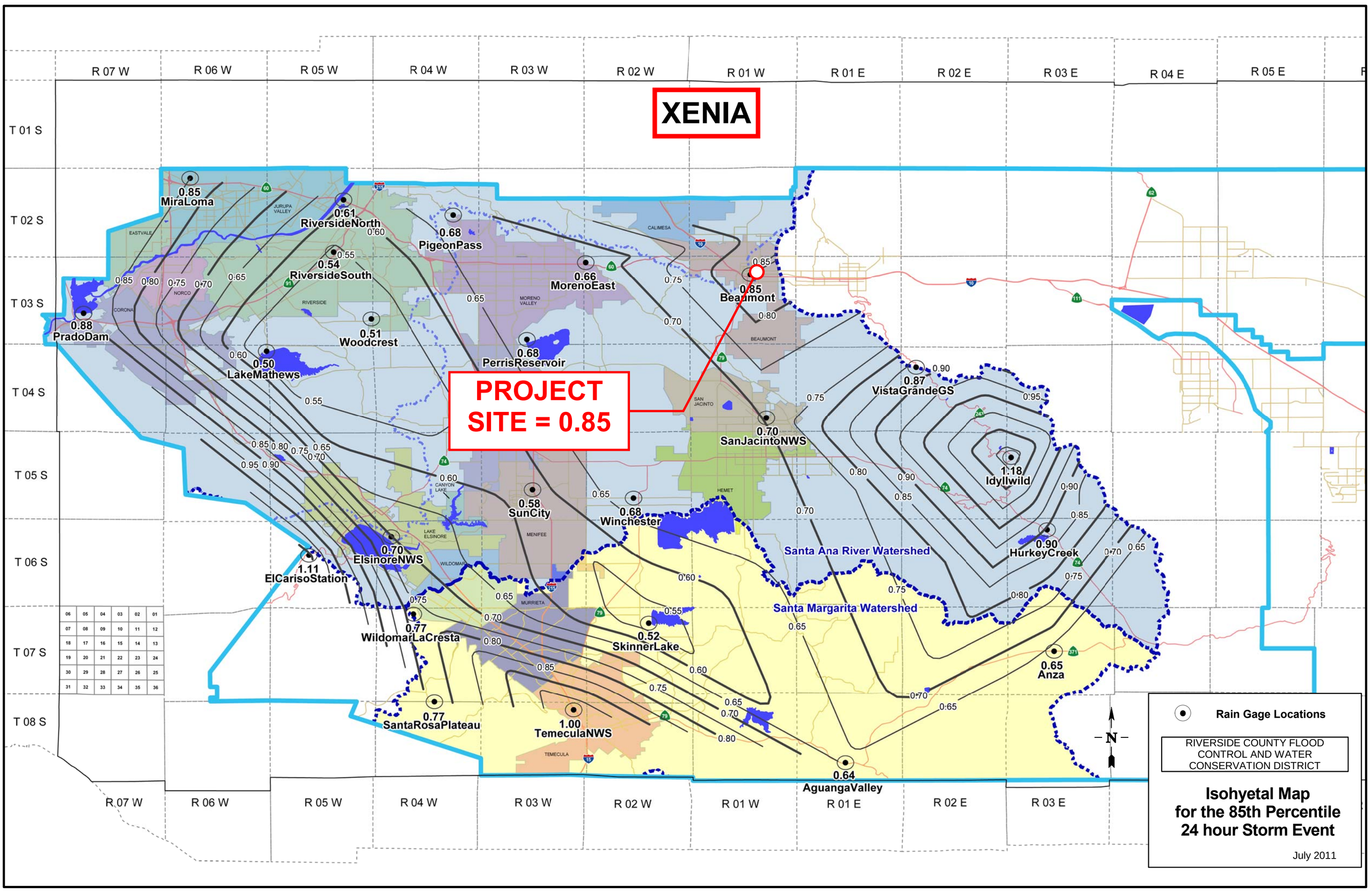
☒ Y ☐ N

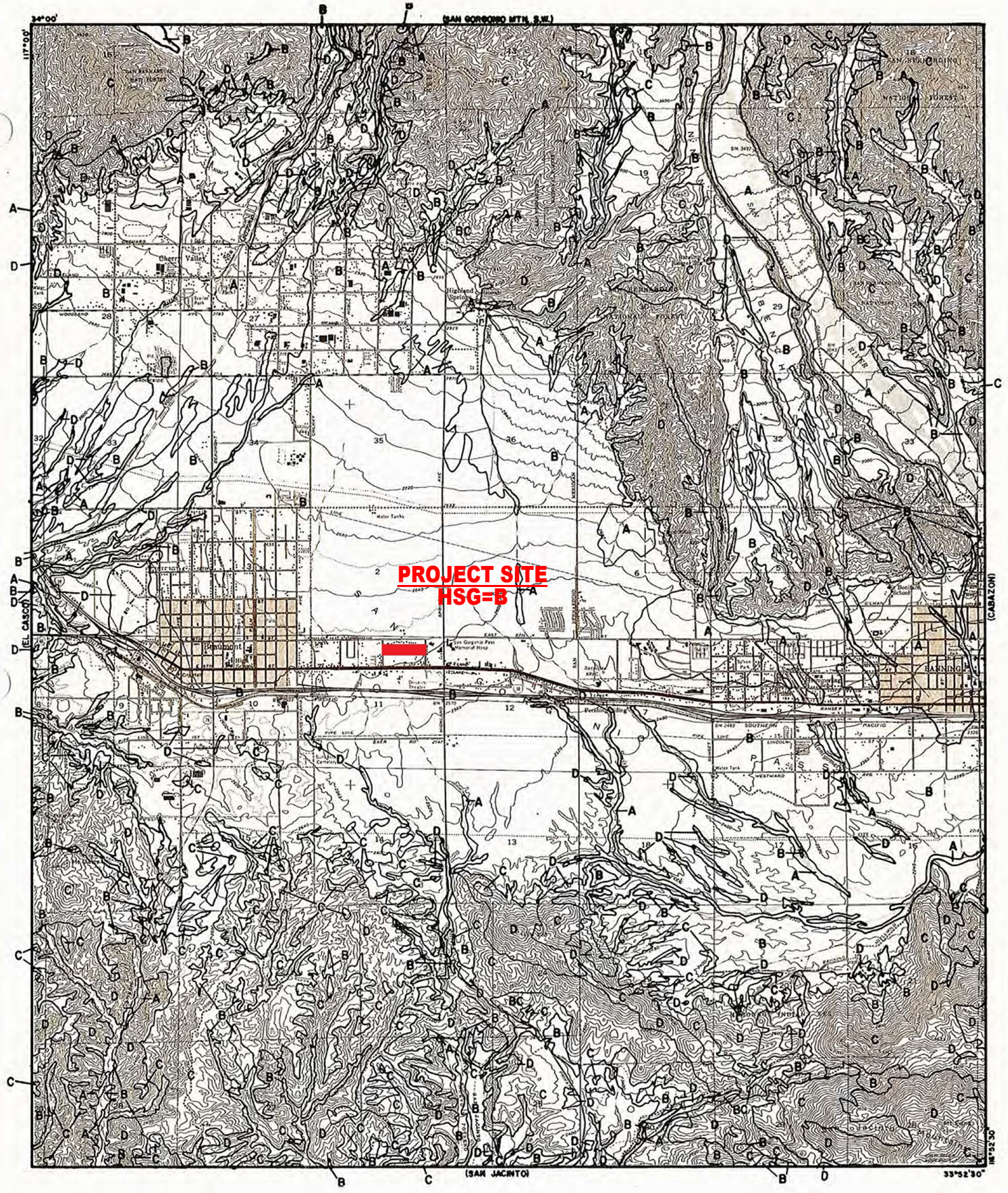
This site has one (1) primary water quality treatment BMP's which would require an O&M Plan. As described throughout this document, there a Bioretention Basin proposed. This basin will be maintained by the Property Owner's Association where maintenance and the funding mechanism will be detailed in the Conditions, Covenants and Restrictions (CC&R's). The maintenance schedule is included in the Operations & Maintenance Plan for BMP Basins in Appendix 10.

Appendix 1: Maps and Site Plans


XENIA LOCATION MAP
PROJECT LOCATION
Latitude: 33°55'53.37"N
Longitude: 116°57'09.89"W
Xenia Apartments
Oak Valley Pkwy
Oak Valley Pkwy
Beaumont Ave
Beaumont
W Ramsey St
W Wilson St
W Ramsey St
10
10
10
79
Google Earth
Image Landsat / Copernicus
N
1 mi


XENIA
DRAINAGE PATH EXHIBIT
PROJECT SITE
Xenia Apartments
CITY STORM DRAINS
1 MILES
LAKE ELSINORE
38 MILES
CANYON LAKE
34 MILES
Rancho Cucamonga
San Bernardino
Fontana
Bloomington
Ontario
Pomona
Redlands
Oak Glen
Yucaipa
Chino
Jurupa Valley
Riverside
Moreno Valley
Norco
Corona
Woodcrest
March Air Reserve Base
Beaumont
Banning
Cabazon
Perris
San Jacinto
Hemet
Silverado
Menifee
Lake Elsinore
Lake Forest
Big Bear
Big Bear Lake
San Gorgonio Mou
Mountain
Google Earth
Image Landsat / Copernicus
N
20 mi


XENIA
PROJECT SITE = 0.85
R 07 W
R 06 W
R 05 W
R 04 W
R 03 W
R 02 W
R 01 W
R 01 E
R 02 E
R 03 E
R 04 E
R 05 E
T 01 S
T 02 S
T 03 S
T 04 S
T 05 S
T 06 S
T 07 S
T 08 S
0.85 MiraLoma
0.61 RiverSideNorth
0.68 PigeonPass
0.54 RiverSideSouth
0.66 MorenoEast
0.85 Beaumont
0.88 PradoDam
0.51 Woodcrest
0.68 PerrisReservoir
0.50 LakeMathews
0.87 VistaGrandeGS
1.18 Idyllwild
0.70 SanJacintoNWS
0.58 SunCity
0.68 Winchester
0.70 ElsinoreNWS
1.11 ElCarisoStation
0.90 HurkeyCreek
0.77 WildomarLaCresta
0.52 SkinnerLake
0.65 Anza
0.77 SantaRosaPlateau
1.00 TemeculaNWS
0.64 AguangaValley
Santa Ana River Watershed
Santa Margarita Watershed
JURUPA VALLEY
EASTVALE
NORCO
CORONA
RIVERSIDE
MORENO VALLEY
CALIMESA
BEAUMONT
SAN JACINTO
HEMET
CANYON LAKE
LAKE ELSINORE
MENIFEE
WILDOMAR
MURRIETA
TEMECULA
Rain Gage Locations
RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
Isohyetal Map for the 85th Percentile 24 hour Storm Event
July 2011



LEGEND

—— SOILS GROUP BOUNDARY

A SOILS GROUP DESIGNATION

RCFC&WCD

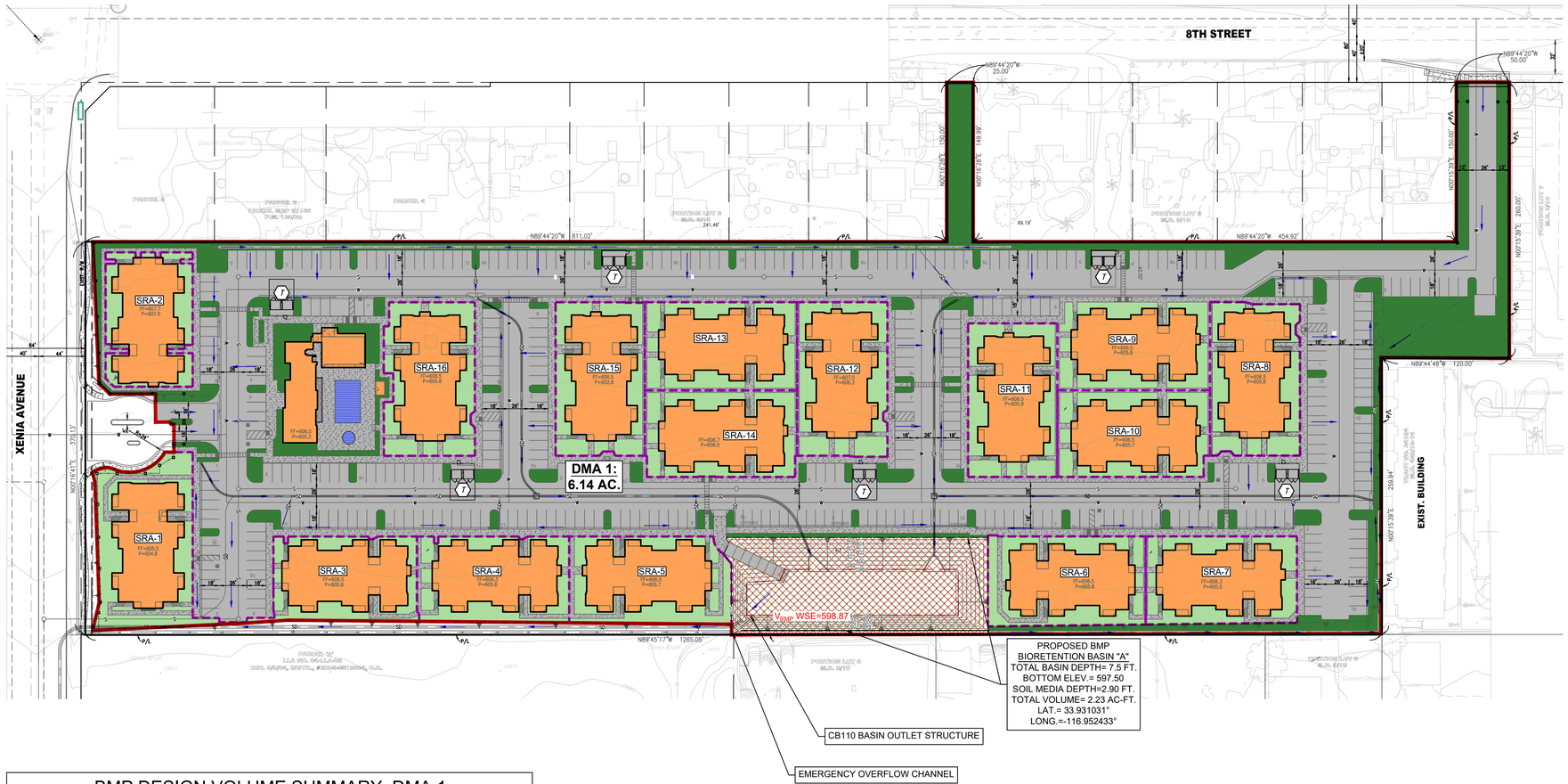
HYDROLOGY MANUAL

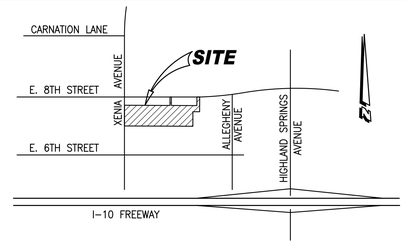
N

0 FEET 5000

HYDROLOGIC SOILS GROUP MAP FOR BEAUMONT

PLATE C-1.19





VICINITY MAP
NTS

OWNER/APPLICANT:

BEAUMONT LAND PARTNERS, LLC
16133 VENTURA BLVD. #633
ENCINO, CA 91436
CONTACT: PAUL ONUFER
OFFICE PH: 626-263-4205
EMAIL: PONUFER@AVPRE.NET

GENERAL MAP NOTES:

1. ASSESSOR'S PARCEL NUMBER:
   419-160-005, 419-160-024, 419-170-016, 419-170-017, 419-170-018, 419-170-022, & 419-170-027.
2. SITE ZONING:
   - (R-MF) RESIDENTIAL MULTI-FAMILY (20 DU ACRE)
3. SITE GENERAL PLAN DESIGNATION:
   -MULTI-FAMILY RESIDENTIAL
4. LAND USE:
   -EXIST: VACANT
   -PROPOSED: APARTMENTS
5. SITE ACREAGE:
   - GROSS AREA: 10.931 ACRES (476,164.12 SF)
   - NET AREA: 10.927 NET (475,964.1 SF)
6. NO OFF-SITE RIGHT-OF-WAY IS REQUIRED FOR FOR SITE ACCESSIBILITY.
7. THIS PARCEL MAP INCLUDES THE ENTIRE CONTIGUOUS OWNERSHIP OF THE LAND DIVIDER.
8. WATER QUALITY AND DETENTION AREAS TO BE MAINTAINED BY LAND OWNER.
9. NO HAZARDOUS MATERIALS HAVE BEEN KNOWN TO BE STORED ON SITE.
10. THE PROPERTY IS NOT SUBJECT TO LIQUEFACTION OR GEOLOGICAL HAZARDS. OR SUBJECT TO OVERFLOW, INUNDATION, OR FLOOD HAZARDS.
11. THERE ARE NO KNOWN WELLS ON-SITE OR WITHIN 200' OF THE SITE.

LEGEND:

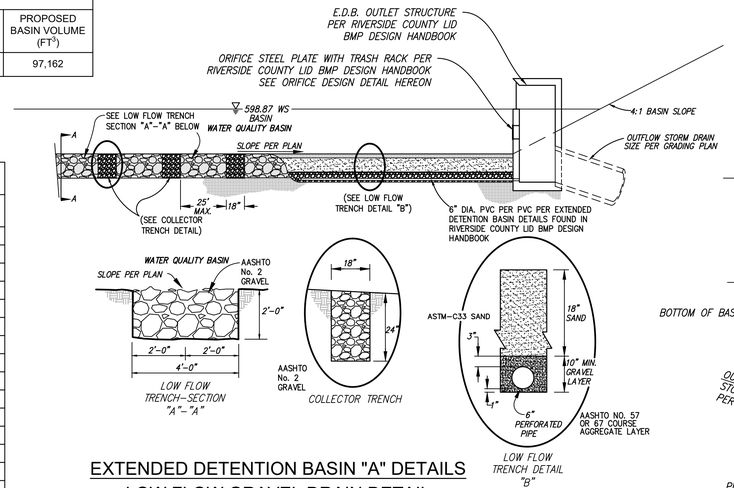
- FLOW ARROW
- DMA BOUNDARY
- SELF-RETAINING AREA BOUNDARY
- IMPERVIOUS AREAS: (STREET, PARKING, AND SIDEWALKS)
- IMPERVIOUS AREAS: (ROOFS)
- PERVIOUS AREAS: (OPEN SPACE AND LANDSCAPING)
- PERVIOUS AREAS: (SELF-RETAINING LANDSCAPED AREAS)
- PROPOSED BMP AREAS
- PROPOSED STORM DRAIN
- (7) PROPOSED TRASH ENCLOSURE
- PROPOSED INLETS (TYPICAL)

BMP DESIGN VOLUME SUMMARY: DMA 1

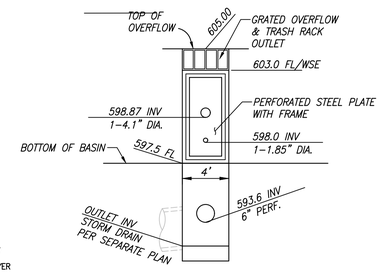
IMPERVIOUS AREAS: ROOFS, SIDEWALKS, & STREETS/PARKING (FT^2)	PERVIOUS AREAS: OPEN SPACES & LANDSCAPING (FT^2)	BASIN AREA (FT^2)	TOTAL AREA (AC.)	VBMP (FT^3)	PROPOSED BASIN VOLUME (FT^3)
201,250	44,922	21,341	6.14	13,234	97,162

SELF-RETAINING AREA SUMMARY

AREA ID	PERVIOUS AREA (SQ-FT.)	IMPERVIOUS AREA (SQ-FT.)	TOTAL AREA (SQ-FT.)	REQ. RETENTION DEPTH (IN)	RATIO
SRA-1	6,410	7,780	14,190	1.88	1.12 < 2
SRA-2	3,354	6,615	9,969	2.53	1.97 < 2
SRA-3	3,683	7,137	10,820	2.50	1.94 < 2
SRA-4	4,008	7,471	11,479	2.43	1.86 < 2
SRA-5	4,439	7,811	12,250	2.35	1.76 < 2
SRA-6	4,777	7,671	12,448	2.21	1.61 < 2
SRA-7	4,258	7,430	11,688	2.33	1.74 < 2
SRA-8	4,610	7,445	12,055	2.22	1.61 < 2
SRA-9	4,124	7,664	11,788	2.43	1.86 < 2
SRA-10	3,961	7,640	11,601	2.49	1.93 < 2
SRA-11	4,703	7,438	12,141	2.19	1.58 < 2
SRA-12	4,824	7,457	12,281	2.16	1.55 < 2
SRA-13	4,151	7,760	11,911	2.44	1.87 < 2
SRA-14	4015	7,598	11,613	2.46	1.89 < 2
SRA-15	4,672	7,412	12,084	2.20	1.59 < 2
SRA-16	4,802	7,192	11,994	2.12	1.50 < 2



EXTENDED DETENTION BASIN "A" DETAILS
LOW FLOW GRAVEL DRAIN DETAIL
N.T.S.



BASIN "A" OUTLET DETAIL
PER RIVERSIDE COUNTY LID BMP DESIGN HANDBOOK

SOURCE CONTROL

- LANDSCAPED AREAS WITHIN THE RESIDENTIAL LOTS AND RIGHT-OF-WAYS SHALL BE MAINTAINED USING MINIMUM TO NO PESTICIDES
- POOLS SHALL BE PLUMBED TO THE SANITARY SEWER IF REQUESTED BY THE CO-PERMITTEE.
- PROPERTY OWNERS SHALL KEEP TRASH RECEPTACLES CLOSE AT ALL TIMES.
- CAR WASHING AND MAINTENANCE SHALL BE PROHIBITED ONSITE.
- FIRE SPRINKLERS TEST WATER SHALL DRAIN TO THE SANITARY SEWER.
- CONDENSATION DRAIN LINES MAY DISCHARGE TO LANDSCAPED AREAS IF THE FLOW IS SMALL ENOUGH THAT RUNOFF WILL NOT OCCUR. CONDENSATE DRAIN LINES MAY NOT DISCHARGE TO THE STORM DRAIN SYSTEM.
- AVOID ROOFING, GUTTERS, AND TRIM MADE OF COPPER OR OTHER UNPROTECTED METALS THAT MAY LEACH INTO RUNOFF.
- STREET SHALL BE SWEPT BY A PRIVATE CONTRACTOR EVERY TWO WEEKS.

85^{TH} PERCENTILE, 24-HOUR RAIN FALL DEPTH FROM ISOHYETAL MAP: D_{85} = 0.85 IN

60' 0 60' 120' 180'
SCALE: 1" = 60'

PREPARED BY:
SP2 & Co.
A LAND DEVELOPMENT SERVICES COMPANY
265 S. RANDOLPH AVENUE #105
BREA, CA 92821
PHONE: (714) 490-1500
"SERVING THE DEVELOPMENT COMMUNITY SINCE 1985"

XENIA APARTMENTS
PRELIMINARY WATER QUALITY MANAGEMENT PLAN
SITE PLAN

Plotted: Sep 18, 2022 - 5:38pm By: AlexanderJaramillo DWG: C:\Users\AlexanderJaramillo\OneDrive - sp2inc.com\Projects\Xenia\Beaumont-10\Stormwater\Water Quality\Drawings\Xenia-PWQMP Site Plan.dwg

Appendix 2: Construction Plans

REVISIONS			
NO.	BY:	DESCRIPTION	DATE

(CASE# _____)

TENTATIVE PARCEL MAP 38233

IN THE CITY OF BEAUMONT, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA

LEGEND

B.W.	BACK OF WALK
F.S.	FINISHED SURFACE
P/L	PROPERTY LINE
S.M.H.	SEWER MANHOLE
C&G	CURB AND GUTTER
S.C.O.	SEWER CLEAN OUT
C.L.F.	CHAIN LINK FENCE
A.C.	ASPHALT CONCRETE PAVEMENT
R.V.	RECREATIONAL VEHICLE
E.P.	EDGE OF PAVEMENT
S.D.	STORM DRAIN
R/W	RIGHT-OF-WAY
DRWY.	CONCRETE APRON DRIVEWAY
B.S.L.	BUILDING SETBACK LINE
F.H.	FIRE HYDRANT
T.C.	TOP OF CURB
F.L.	FLOW LINE
P.B.	PULL BOX
I.B.	IRRIGATION BOX
C.F.	CURB FACE
	LIGHT STANDARD
	FIRE HYDRANT
	WATER VALVE
	TUBULAR STEEL FENCE
W	PROP. WATER LINE
	PROPERTY LINE
S.D.	STORM DRAIN

BASIS OF BEARINGS

"THE BASIS OF BEARINGS FOR THIS SURVEY IS THE CALIFORNIA STATE PLANE COORDINATE SYSTEM, CCS83, ZONE 6, BASED LOCALLY ON CONTROL STATIONS "P609", "PPBF", AND "P584" NAD 83 (CSRS) EPOCH 2017.50 AS SHOWN HEREON. ALL BEARINGS SHOWN ON THIS MAP ARE GRID. QUOTED BEARINGS AND DISTANCES FROM REFERENCE MAPS OR DEEDS ARE AS SHOWN PER THAT RECORD REFERENCE. ALL DISTANCES SHOWN ARE GROUND DISTANCES UNLESS SPECIFIED OTHERWISE. GRID DISTANCES, MAY BE OBTAINED BY MULTIPLYING THE GROUND DISTANCE BY A COMBINATION FACTOR OF 0.9998886511. CALCULATIONS ARE MADE AT "1000" WITH COORDINATES OF: N: 2,283,669.169, E: 6,347,837.206, USING AN ELEVATION OF 2611.65'.

PUBLIC SERVICE/UTILITY PURVEYORS

SCHOOL DISTRICT: BEAUMONT UNIFIED SCHOOL DISTRICT
SEWER: CITY OF BEAUMONT
WATER: BEAUMONT CHERRY WATER DISTRICT
FIRE PROTECTION: CITY OF BEAUMONT
GAS: SOUTHERN CALIFORNIA GAS COMPANY
ELECTRIC: SOUTHERN CALIFORNIA EDISON COMPANY

FLOOD ZONE DESIGNATION

ZONE X, MAP PANEL #06065C0812G, EFFECTIVE DATE: AUGUST 28, 2008

0.2% ANNUAL CHANCE FLOOD , AREAS OF 1% ANNUAL CHANCE FLOOD WITH AVERAGE DEPTHS OF LESS THAN 1 FOOT OR WITH DRAINAGE AREAS LESS THAN ONE SQUARE MILE; AND AREAS PROTECTED BY LEVEES FROM 1% ANNUAL CHANCE FLOOD.

BENCHMARK:

RIVERSIDE COUNTY BENCHMARK C-2-2-65
STANDARD 3 1/4" ALUMINUN DISK SET ON TOP CONCRETE POST
STAMPED C-2-2-65 ELEVATION 2635.813' NGVD 29 DATUM.

LEGAL DESCRIPTION

BEING A SURVEY OF PARCEL 1 OF PARCEL MAP NO. 21136 AS SHOWN ON MAP ON FILE IN BOOK 138, PAGE 33 OF PARCEL MAPS IN THE OFFICE OF THE COUNTY RECORDER OF THE COUNTY OF RIVERSIDE, STATE OF CALIFORNIA AND PORTIONS OF LOTS 3, 5 AND 7 IN BLOCK 5 OF THE SUBDIVISION OF SECTION 11, TOWNSHIP 3 SOUTH, RANGE 1 WEST, SAN BERNARDINO BASE AND MERIDIAN AS SHOWN BY MAP ON FILE IN BOOK 9, PAGE 10 OF MAPS, RECORDS OF THE COUNTY OF SAN BERNARDINO IN THE COUNTY OF RIVERSIDE, STATE OF CALIFORNIA.

RECORDED EASEMENT NOTES

1. AN EASEMENT FOR PIPELINES AND INCIDENTAL PURPOSES, RECORDED JANUARY 12, 1910, BOOK 295, PAGE 204, OF OFFICIAL RECORDS RIVERSIDE COUNTY. (LOCATION OF EASEMENT CANNOT BE DETERMINED FROM RECORD INFORMATION).
2. AN EASEMENT FOR INGRESS AND EGRESS PURPOSES, RECORDED FEBRUARY 6, 1980, AS INSTRUMENT NO. 24822, AND JUNE 11, 1985, AS INSTRUMENT NO. 125201, BOTH OF OFFICIAL RECORDS.

PROPOSED EASEMENT NOTES

1. AN PROPOSED EASEMENT FOR EMERGENCY ACCESS AND PUBLIC UTILITY PURPOSES IN FAVOR OF THE CITY OF BEAUMONT.
2. AN PROPOSED EASEMENT FOR PUBLIC UTILITY PURPOSES IN FAVOR OF THE BEAUMONT CHERRY VALLEY WATER DISTRICT
3. AN PROPOSED EASEMENT FOR SEWER PURPOSES IN FAVOR OF THE CITY OF BEAUMONT.

SETBACK CRITERIA (*)

SETBACKS:

A. FRONT YARD:
- 25'
- 25' (TWO-LEVEL)

B. REAR YARD:
- 15' FOR INTERIOR LOTS.
- 5' FOR ACCESSORY STRUCTURES USED EXCLUSIVELY FOR PARKING
- 20' (TWO-LEVEL)

C. SIDE YARD:
- 5' FOR INTERIOR LOTS.
- 10' FOR INTERIOR LOTS>70' IN WIDTH
- 10' FOR CORNER LOTS
- 15' (TWO-LEVEL)
- 20' (TWO-LEVEL/CORNER LOTS)

* SETBACK CRITERIA PER BMC TABLE 17.03-2

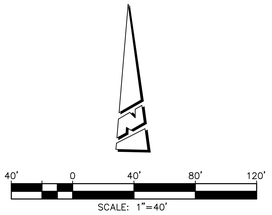
NEIGHBORING ZONING AND GENERAL PLAN DESIGNATIONS

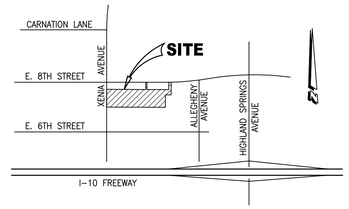
NORTH:
ZONING: DOWNTOWN RESIDENTIAL MULTIFAMILY
GP LAND USE: DOWNTOWN MIXED USE

SOUTH:
ZONING: SIXTH STREET MIXED USE
GP LAND USE: DOWNTOWN MIXED USE

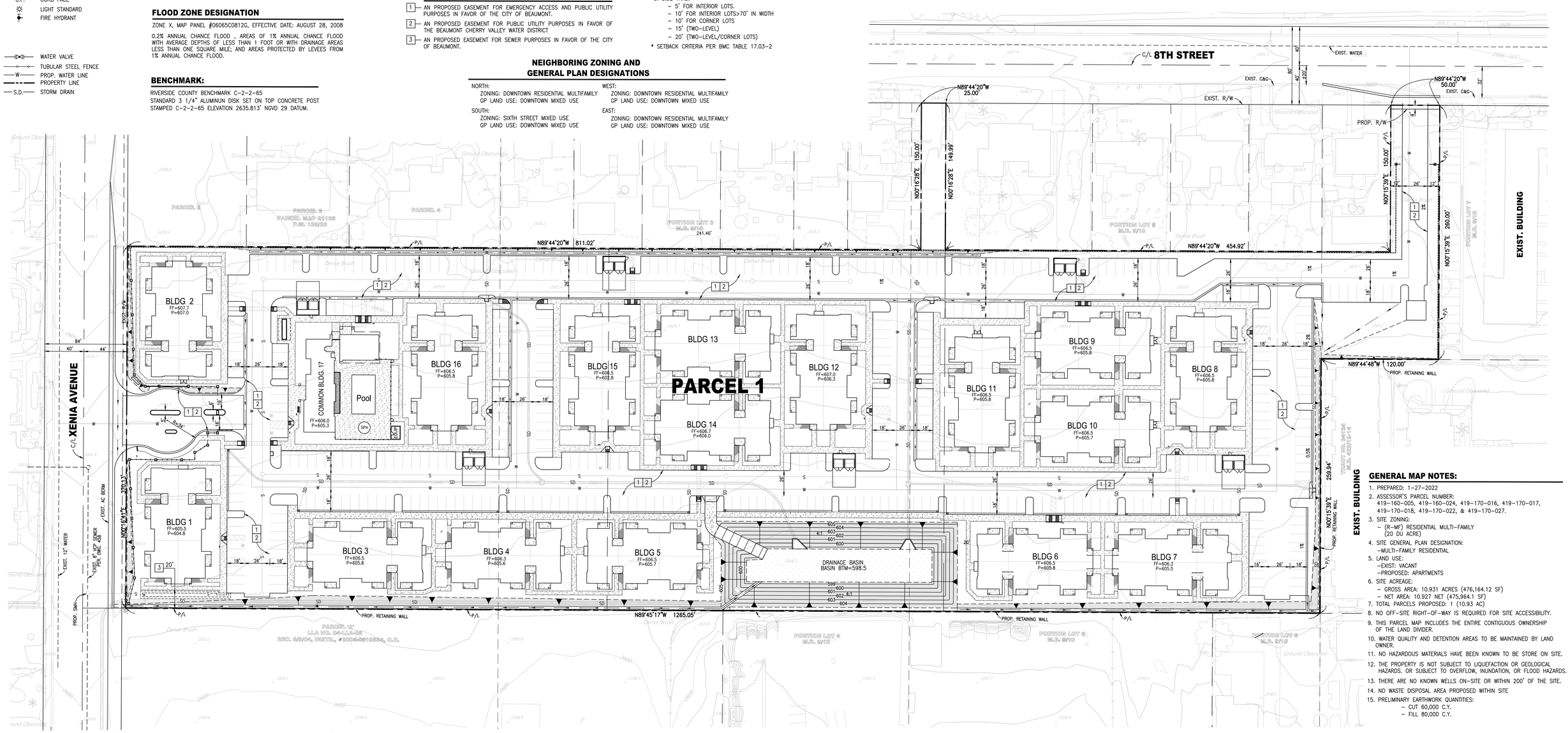
WEST:
ZONING: DOWNTOWN RESIDENTIAL MULTIFAMILY
GP LAND USE: DOWNTOWN MIXED USE

EAST:
ZONING: DOWNTOWN RESIDENTIAL MULTIFAMILY
GP LAND USE: DOWNTOWN MIXED USE



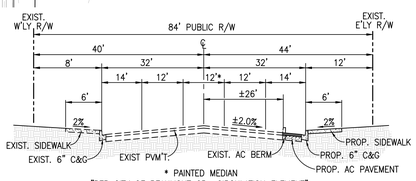


VICINITY MAP
NTS



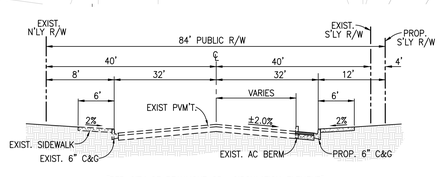
GENERAL MAP NOTES:

1. PREPARED: 1-27-2022
2. ASSESSOR'S PARCEL NUMBER: 419-160-005, 419-160-024, 419-170-016, 419-170-017, 419-170-018, 419-170-022, & 419-170-027.
3. SITE ZONING:
   - (R-MF) RESIDENTIAL MULTI-FAMILY (20 DU ACRE)
4. SITE GENERAL PLAN DESIGNATION:
   -MULTI-FAMILY RESIDENTIAL
5. LAND USE:
   -EXIST: VACANT
   -PROPOSED: APARTMENTS
6. SITE ACREAGE:
   - GROSS AREA: 10.931 ACRES (476,164.12 SF)
   - NET AREA: 10.927 NET (475,964.1 SF)
7. TOTAL PARCELS PROPOSED: 1 (10.93 AC)
8. NO OFF-SITE RIGHT-OF-WAY IS REQUIRED FOR SITE ACCESSIBILITY.
9. THIS PARCEL MAP INCLUDES THE ENTIRE CONTIGUOUS OWNERSHIP OF THE LAND DIVIDER.
10. WATER QUALITY AND DETENTION AREAS TO BE MAINTAINED BY LAND OWNER.
11. NO HAZARDOUS MATERIALS HAVE BEEN KNOWN TO BE STORE ON SITE.
12. THE PROPERTY IS NOT SUBJECT TO LIQUEFACTION OR GEOLOGICAL HAZARDS. OR SUBJECT TO OVERFLOW, INUNDATION, OR FLOOD HAZARDS.
13. THERE ARE NO KNOWN WELLS ON-SITE OR WITHIN 200' OF THE SITE.
14. NO WASTE DISPOSAL AREA PROPOSED WITHIN SITE
15. PRELIMINARY EARTHWORK QUANTITIES:
    - CUT 60,000 C.Y.
    - FILL 80,000 C.Y.



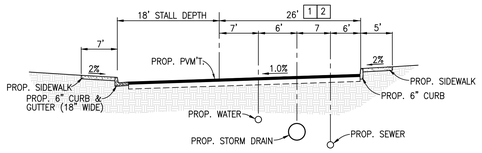
* PAINTED MEDIAN
"PER CITY OF BEAUMONT GP CIRCULATION ELEMENT"

XENIA AVENUE - SECONDARY B
N.T.S.



"PER CITY OF BEAUMONT GP CIRCULATION ELEMENT"

8TH STREET- SECONDARY A
N.T.S.



TYPICAL PRIVATE DRIVE AISLE SECTION
N.T.S.

PREPARED BY:
STEVENSON, PORTO & PIERCE, INC.
A LAND DEVELOPMENT SERVICES COMPANY
265 S. RANDOLPH AVENUE #105
BREA, CALIFORNIA 91750
PHONE: (714) 490-1514
CONTACT: HENRY LOZANO
EMAIL: HENRY@SP2INC.COM

OWNER/APPLICANT:
BEAUMONT LAND PARTNERS, LLC
16133 VENTURA BLVD. #633
ENCINO, CA 91436
CONTACT: PAUL ONUFER
OFFICE PH: (626) 263-4205
EMAIL: PONUFER@AVPRE.NET

REVISIONS			
NO.	BY:	DESCRIPTION	DATE

TENTATIVE PARCEL MAP 38233
CONCEPTUAL GRADING PLAN
IN THE CITY OF BEAUMONT, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA

(CASE# _____)

LEGEND

B.W.	BACK OF WALK
F.S.	FINISHED SURFACE
P/L	PROPERTY LINE
S.M.H.	SEWER MANHOLE
C&G	CURB AND GUTTER
S.C.O.	SEWER CLEAN OUT
C.L.F.	CHAIN LINK FENCE
A.C.	ASPHALT CONCRETE PAVEMENT
T.G.	TOP OF GRATE INLET
R.V.	RECREATIONAL VEHICLE
E.P.	EDGE OF PAVEMENT
S.D.	STORM DRAIN
R/W	RIGHT-OF-WAY
DRWY.	CONCRETE APRON DRIVEWAY
B.S.L.	BUILDING SETBACK LINE
F.H.	FIRE HYDRANT
T.C.	TOP OF CURB
F.L.	FLOW LINE
G.I.	GRATE INLET
C.B.	CATCH BASIN
P.B.	PULL BOX
I.B.	IRRIGATION BOX
C.F.	CURB FACE
	LIGHT STANDARD
	FIRE HYDRANT
	WATER VALVE
	TUBULAR STEEL FENCE
W	PROP. WATER LINE
	PROPERTY LINE
SD	STORM DRAIN
S	PROP. SEWER LINE
	TYPICAL CROSS-SECTION REFERENCE
	SHEET NO.
	PROP. SLOPE

BASIS OF BEARINGS

"THE BASIS OF BEARINGS FOR THIS SURVEY IS THE CALIFORNIA STATE PLANE COORDINATE SYSTEM, CCS83, ZONE 6, BASED LOCALLY ON CONTROL STATIONS "P609", "PPBF", AND "P584" NAD 83 (CSRS) EPOCH 2017.50 AS SHOWN HEREON. ALL BEARINGS SHOWN ON THIS MAP ARE GRID. QUOTED BEARINGS AND DISTANCES FROM REFERENCE MAPS OR DEEDS ARE AS SHOWN PER THAT RECORD REFERENCE. ALL DISTANCES SHOWN ARE GROUND DISTANCES UNLESS SPECIFIED OTHERWISE. GRID DISTANCES, MAY BE OBTAINED BY MULTIPLYING THE GROUND DISTANCE BY A COMBINATION FACTOR OF 0.9998886511. CALCULATIONS ARE MADE AT "1100" WITH COORDINATES OF: N: 2,283,669.169, E: 6,347,837.206, USING AN ELEVATION OF 2611.65'.

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SCHOOL DISTRICT: BEAUMONT UNIFIED SCHOOL DISTRICT
SEWER: CITY OF BEAUMONT
WATER: BEAUMONT CHERRY WATER DISTRICT
FIRE PROTECTION: CITY OF BEAUMONT
GAS: SOUTHERN CALIFORNIA GAS COMPANY
ELECTRIC: SOUTHERN CALIFORNIA EDISON COMPANY

FLOOD ZONE DESIGNATION

ZONE X, MAP PANEL #06065C0812G, EFFECTIVE DATE: AUGUST 28, 2008

0.2% ANNUAL CHANCE FLOOD , AREAS OF 1% ANNUAL CHANCE FLOOD WITH AVERAGE DEPTHS OF LESS THAN 1 FOOT OR WITH DRAINAGE AREAS LESS THAN ONE SQUARE MILE; AND AREAS PROTECTED BY LEVEES FROM 1% ANNUAL CHANCE FLOOD.

RECORDED EASEMENT NOTES

1. AN EASEMENT FOR PIPELINES AND INCIDENTAL PURPOSES, RECORDED JANUARY 12, 1910, BOOK 295, PAGE 204, OF OFFICIAL RECORDS RIVERSIDE COUNTY (LOCATION OF EASEMENT CANNOT BE DETERMINED FROM RECORD INFORMATION).
2. AN EASEMENT FOR INGRESS AND EGRESS PURPOSES, RECORDED FEBRUARY 6, 1980, AS INSTRUMENT NO. 24822, AND JUNE 11, 1985, AS INSTRUMENT NO. 125201, BOTH OF OFFICIAL RECORDS.

LEGAL DESCRIPTION

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GENERAL MAP NOTES:

1. PREPARED: 1/27/2022
2. ASSESSOR'S PARCEL NUMBER: 419-160-005, 419-160-024, 419-170-016, 419-170-017, 419-170-018, 419-170-022, & 419-170-027.
3. SITE ZONING:
   - (R-MF) RESIDENTIAL MULTI-FAMILY (20 DU ACRE)
4. SITE GENERAL PLAN DESIGNATION:
   - MULTI-FAMILY RESIDENTIAL
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   - NET AREA: 10.927 NET (475,964.1 SF)
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8. THIS PARCEL MAP INCLUDES THE ENTIRE CONTIGUOUS OWNERSHIP OF THE LAND DIVIDER.
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14. PRELIMINARY EARTHWORK QUANTITIES:
    - CUT 60,000 C.Y.
    - FILL 80,000 C.Y.

SETBACK CRITERIA (*)

SETBACKS:

A. FRONT YARD:
   - 25'
   - 25' (TWO-LEVEL)

B. REAR YARD:
   - 15' FOR INTERIOR LOTS.
   - 5' FOR ACCESSORY STRUCTURES USED EXCLUSIVELY FOR PARKING
   - 20' (TWO-LEVEL)

C. SIDE YARD:
   - 5' FOR INTERIOR LOTS.
   - 10' FOR INTERIOR LOTS>70' IN WIDTH
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   - 15' (TWO-LEVEL)
   - 20' (TWO-LEVEL/CORNER LOTS)

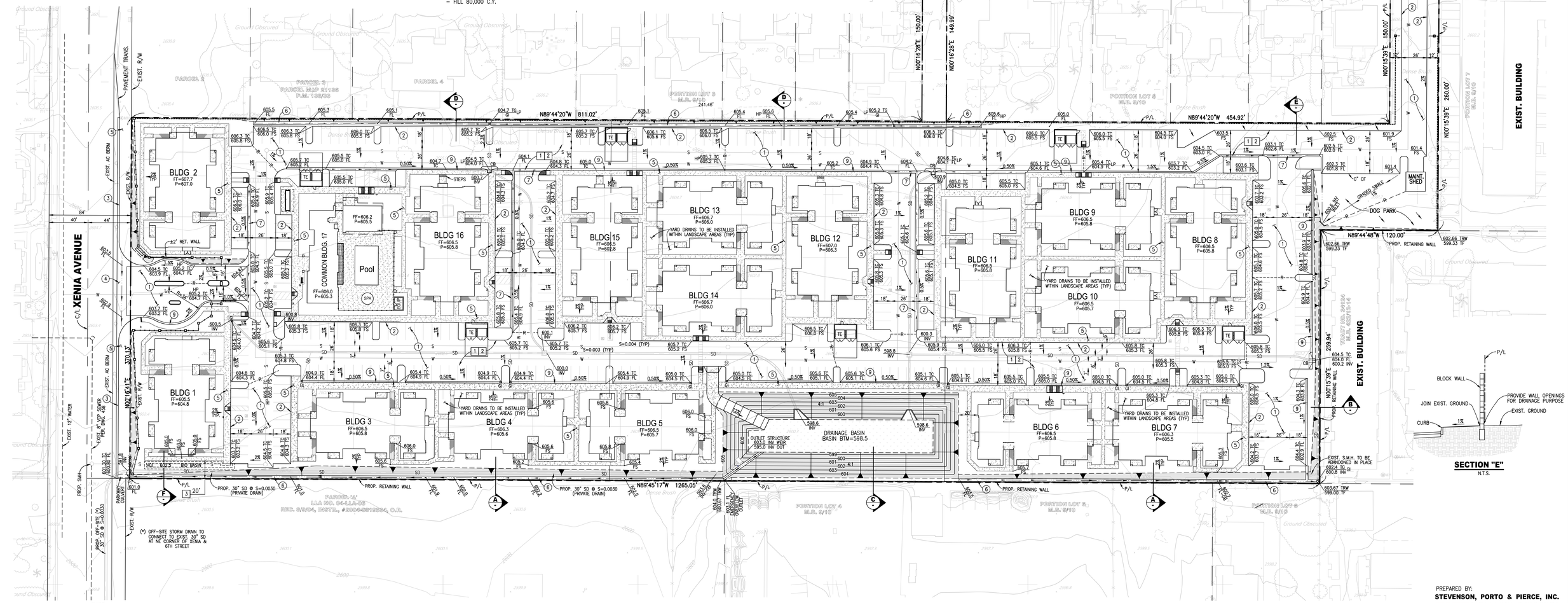
* SETBACK CRITERIA PER BMC TABLE 17.03-2

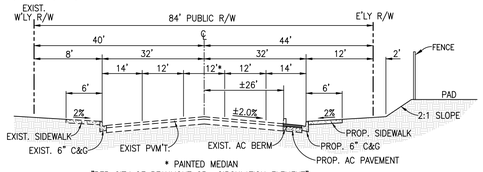
BENCHMARK:

RIVERSIDE COUNTY BENCHMARK C-2-2-65
STANDARD 3 1/4" ALUMINUN DISK SET ON TOP CONCRETE POST STAMPED C-2-2-65 ELEVATION 2635.813' NGVD 29 DATUM.

TYPICAL IMPROVEMENT PLAN NOTES:

1. CONCRETE PAVING PER GEOTECHNICAL RECOMMENDATIONS
2. PROPOSED 6" (TYPE "D") CURB PER R.C.T.D. PER R.C.T.D. STD. 204.
3. PROPOSED 6" (TYPE "A-6") CURB AND GUTTER PER R.C.T.D. STD. 200.
4. PROPOSED COMMERCIAL DRIVEWAY PER R.C.T.D. STD. 207A.
5. PROPOSED SIDEWALK PER R.C.T.D. STD. 401
6. 3" WIDE (18" DEEP) CONCRETE "V" DITCH (S=0.003)
7. 3" WIDE RIBBON GUTTER
8. PROPOSED RESIDENTIAL DRIVEWAY PER R.C.T.D. STD. 207.
9. PROPOSED 6" (TYPE "A-6"-18" GUTTER) CURB AND GUTTER PER R.C.T.D. STD. 200.



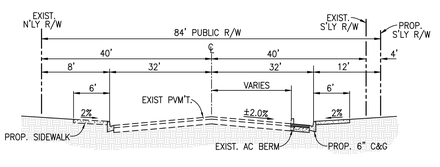


* PAINTED MEDIAN

"PER CITY OF BEAUMONT GP CIRCULATION ELEMENT"

XENIA AVENUE - SECONDARY B

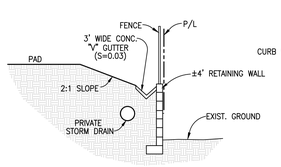
N.T.S.



"PER CITY OF BEAUMONT GP CIRCULATION ELEMENT"

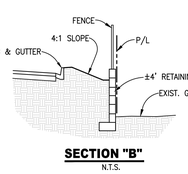
8TH STREET- SECONDARY A

N.T.S.



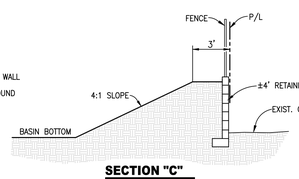
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N.T.S.



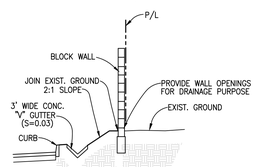
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SECTION "C"

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SECTION "D"

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SECTION "E"

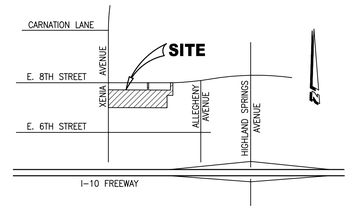
N.T.S.



SECTION "F"

N.T.S.

SCALE: 1"=40'



VICINITY MAP

NTS

PROPOSED EASEMENT NOTES

1. AN PROPOSED EASEMENT FOR EMERGENCY ACCESS AND PUBLIC UTILITY PURPOSES IN FAVOR OF THE CITY OF BEAUMONT.
2. AN PROPOSED EASEMENT FOR PUBLIC UTILITY PURPOSES IN FAVOR OF THE BEAUMONT CHERRY VALLEY WATER DISTRICT
3. AN PROPOSED EASEMENT FOR SEWER PURPOSES IN FAVOR OF THE CITY OF BEAUMONT.

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Appendix 3: Soils Information

UPDATED GEOTECHNICAL AND INFILTRATION EVALUATION

FOR

PROPOSED MULTI-FAMILY RESIDENTIAL DEVELOPMENT
XENIA APARTMENT PROJECT
EAST OF XENIA AVENUE AND ABOUT 200 FEET SOUTH OF EAST 8TH STREET
BEAUMONT, RIVERSIDE COUNTY, CALIFORNIA

PREPARED FOR

BEAUMONT LAND PARTNERS
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PASADENA, CALIFORNIA 91105

PREPARED BY

GEOTEK, INC.
1548 NORTH MAPLE STREET
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PROJECT NO. 2784-CR **JULY 7, 2021**

GEOTEK

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July 7, 2021
Project No. 2784-CR

Beaumont Land Partners
556 South Fair Oaks Avenue
Pasadena, California 91105

Attention: Mr. Paul Onufer

Subject: Updated Geotechnical and Infiltration Evaluation
Proposed Multi-Family Residential Development
Xenia Apartment Project
East of Xenia Avenue and about 200 Feet South of East 8th Street
Beaumont, Riverside County, California

Dear Mr. Onufer:

We are pleased to provide our updated geotechnical and infiltration report for proposed development at the subject property located in the city of Beaumont, Riverside County, California. This report presents a discussion of our evaluation and provides updated geotechnical recommendations for earthwork, foundation design, and construction.

In our opinion, site development appears feasible from a geotechnical viewpoint provided that the recommendations presented in this report are incorporated into the design and construction phases of the project.

The opportunity to be of service is sincerely appreciated. If you have any questions, please do not hesitate to call our office.

Respectfully submitted,
GeoTek, Inc.

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Distribution: (1) Addressee via email (one PDF file)

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Appendix A – Logs of Borings by ESSW (2006)
Appendix B – Logs of Borings and Laboratory Test Results by Converse (2019)
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Appendix D – Laboratory Test Results by GeoTek
Appendix E – Percolation/Infiltration Test Data
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1. PURPOSE AND SCOPE OF SERVICES

The purpose of this study was to evaluate the existing geotechnical conditions for the currently proposed development. Services provided for this study included the following:

- Research and review of readily available geologic data and past soil reports pertinent to the site,
- A site reconnaissance,
- Site exploration via two exploratory borings excavated to 20 feet below existing grade and four Cone Penetration Test (CPT) soundings to depths of about 50 feet each across the site,
- Testing of eight percolation test borings to estimate the infiltration rate of the subsoils within two basins (four tests at each basin) proposed at the site,
- Collection relatively undisturbed and bulk samples of the site soils for geotechnical and corrosion assessment,
- Review and evaluation of site seismicity,
- Engineering analyses, and;
- Compilation of this updated geotechnical and infiltration evaluation which presents our findings, conclusions, and recommendations for site development.

The intent of this report is to aid in the evaluation of the site for future proposed development from a geotechnical perspective. The professional opinions and geotechnical information contained in this report may need to be updated based upon our review of the final site development plans. Final site development plans should be provided to GeoTek for review when available.

2. SITE DESCRIPTION AND PROPOSED DEVELOPMENT

2.1 SITE DESCRIPTION

The project site comprises 10.9 acres located east of Xenia Avenue and about 200 feet south of East 8th Street in the city of Beaumont, Riverside County, California. The property consists of vacant land; however, the site was used as agricultural land in the 1990s and earlier. The property has a relatively flat terrain with elevations ranging from 2607 feet above mean sea level (amsl) toward the north portion of the site to 2600 feet amsl in the south portion. Surface drainage is generally to the south, with some minor local variations. At the time of our visit, the property had minor visible trash and was mostly void of vegetation.

The site is bounded on the north by existing single-family residences; on the west by Xenia Avenue with apartment homes beyond; on the south by commercial properties and vacant land; and on the east by an apartment complex. The general location of the site is shown in Figure 1.

2.2 PROPOSED DEVELOPMENT

According to the *Xenia Apartment Complex – Proposed Off-Site Sewer & Storm Drain Plan* prepared by Stevenson, Porto & Pierce, Inc. and undated, the site will be developed with 16 apartment buildings, a pool/recreation area, two water quality basins, parking/drive areas, underground utilities, and other improvements. The residential structures are anticipated to be up to three stories in height, of wood-framed construction, utilizing conventional shallow foundations and slab-on-grade. A maximum wall load of about 3 kips per linear foot and a maximum column load of about 40 kips were assumed.

Proposed cuts and fills as well as slopes are anticipated to be minimal. The two water quality basins are planned to be constructed near the south property line and will be excavated to a depth of about five feet, as indicated by the project civil engineer.

If site development differs from the information presented in this report, the recommendations should be subject to further review and evaluation by GeoTek. Final site development plans should be reviewed by GeoTek when they become available.

3. REVIEW OF PAST REPORTS

On May 9, 2006, Earth System Southwest (ESSW) issued a *Preliminary Geotechnical Engineering Report* for the project. The study indicated that six borings were drilled on the 11-acre site to depths ranging from 14 to 21.5 feet. ESSW stated that the borings encountered "very low" expansive silty sand and clayey sand. However, no results of laboratory testing were included in the ESSW report.

ESSW stated that groundwater was not encountered in any of their exploratory borings, and depth to groundwater was on the order of 300 feet. The potential for soil liquefaction at the site was considered negligible. However, no information regarding the potential for seismically induced settlement of dry sands was furnished.

ESSW recommended that the existing soils within the building pad and foundation areas be over-excavated to a minimum of three feet below existing grade or two feet below the footing level (whichever is lower). The over-excavation was recommended to extend five feet beyond the outer edges of the exterior footings. Garden and retaining wall areas were recommended to be prepared similar to building pads, but the lateral extent of the over-excavations should be at least two feet beyond the edges of the improvements.

Foundations were suggested to be designed using an allowable bearing capacity of 1,500 pounds per square foot (psf). Total static settlement of about one-inch and differential static settlement of less than 0.5-inch in 20 feet were predicted.

On September 27, 2019, Converse Consultants (Converse) completed a *Preliminary Geotechnical Investigation Report* for the site. The evaluation included the excavation of eight exploratory borings to 16.5 to 51.5 feet below grade. The excavations encountered native alluvial materials consisting of silty sand, sand, and silt.

Groundwater was not encountered in any of the borings by Converse to a maximum depth of 51.5 feet, and the risk of liquefaction was considered low. Converse also stated that the risk of seismically induced settlement was low due to the absence of unconsolidated granular sediments at the site.

The study stated that building areas should be over-excavated to at least five feet below proposed grade or two feet below the bottom of footings, whichever is deeper. The over-excavation was recommended to extend a minimum of five feet beyond the building footprint. Pavement areas were recommended to be supported on at least 12 inches of compacted fill.

Geotechnical design parameters for conventional foundations resting on "very low" expansive soils were provided by Converse. The study recommended the use of an allowable bearing pressure of 2,000 psf. Static settlement of less than one-inch total and less than 0.5-inch differential settlement over 40 feet were also estimated.

A shrinkage factor of about 10 to 15 percent for soil excavated and replaced as compacted fill, and a subsidence of about 0.10 to 0.15 feet were estimated for the project. The study also reported that soluble sulfate contents of two surface soil samples were negligible (0.0036 and 0.0038 percent) and a minimum concrete compressive strength of 2,500 psi was recommended. The minimum resistivity for surficial soil samples was found to be about 10,158 and 6,826 ohm-cm, and the soils were considered to have a "moderate" corrosive potential with respect to ferrous metal installations.

Logs of the exploratory borings reported by ESSW (2006) and Converse (2019) are included in Appendices A and B, respectively. The locations of these explorations are shown on the Exploration Location Map presented as Figure 2.

4. FIELD EXPLORATION, LABORATORY TESTING, AND PERCOLATION TESTING

4.1 FIELD EXPLORATION

GeoTek conducted a field exploration at the site on June 14, 2021 which consisted of excavating two exploratory borings and four CPT soundings across the property. The explorations were excavated to depths ranging from 21.5 to 50 feet. The borings were excavated with a truck-mounted drill rig, and the CPT soundings with a 30-ton CPT rig. The approximate locations of these excavations along with the borings reported by the ESSW (2006) and Converse (2019) are shown on Figure 2, Exploration Location Map. Logs of the excavations performed by GeoTek are included in Appendix C.

4.2 LABORATORY TESTING

Laboratory testing was performed on selected soil samples collected during our field exploration. The purpose of the laboratory testing was to confirm the field classification of the soil materials encountered and to evaluate the physical properties of the soils for use in the engineering design and analysis. Laboratory testing included in-situ dry density-moisture

content, proctor, remolded direct shear, collapse, expansion index, among other tests. Test results are presented in Appendix D.

4.3 PERCOLATION TESTING

GeoTek utilized the percolation test procedure (Riverside County, 2011) to estimate the infiltration rate of the subsurface materials encountered at the two proposed site basins.

The percolation test borings (Borings I-1 through I-8) were excavated with a hollow-stem auger drill rig within the basin areas as shown on the *Xenia Apartment Complex Off-Site Sewer & Storm Drain Plan* (Stevenson, Porto & Piece, Inc., undated). All test borings were drilled to depths of about five feet, which was the approximate depth of the proposed basins. The borings were approximately eight inches in diameter. A three-inch diameter perforated PVC pipe encapsulated in filter sock was inserted into each of the test holes. The annular space between the test hole sidewalls and PVC pipe was filled with gravel.

Native alluvial materials typically consisting of silty sand were encountered in our test holes. In addition to the test borings, Borings B-1 and B-2 were drilled to 20 feet below grade within the future basin areas to confirm the absence of impermeable materials or groundwater. All deep borings encountered granular alluvial materials of silty sand. The logs of the borings are presented in Appendix C. The locations of the test borings and deep borings drilled within the basin areas are shown on Figure 2.

Subsequent to pre-soaking the test holes, percolation testing was performed in the lower 20 inches of each test hole by a representative from our firm. The percolation rates were converted to infiltration rates via the Porchet Method.

The infiltration rates, which do not include a factor of safety and were determined after the water levels had stabilized, are presented in the following table.

SUMMARY OF INFILTRATION FIELD RATES		
Basin	Boring No.	Infiltration Field Rate (inches per hour)
South-Central	I-1	2.4
	I-2	3.3
	I-3	1.1
	I-4	1.4
Southeastern	I-5	4.0
	I-6	2.3
	I-7	1.1
	I-8	0.5

Detailed infiltration/percolation test data and Porchet conversion calculations are presented in Appendix E.

Over the lifetime of the basin systems, the infiltration rates may be affected by silt build up and biological activities, as well as local variations in near surface soil conditions. A suitable factor of safety should be applied to the field rates to design the infiltration system.

It should be noted that the infiltration rates provided above were performed in relatively undisturbed native materials. Infiltration rates will vary and are mostly dependent on the underlying consistency of the site soils and relative density. Infiltration rates will be impacted by weight of equipment travelling over the soils, placement of engineered fill and other various factors. GeoTek assumes no responsibility or liability for the ultimate design or performance of the storm water management system.

5. GEOLOGIC AND SOILS CONDITIONS

5.1 REGIONAL SETTING

The property is situated in the Peninsular Ranges geomorphic province. The Peninsular Ranges province is one of the largest geomorphic units in western North America. Basically, it extends from the point of contact with the Transverse Ranges geomorphic province, southerly to the tip of Baja California. This province varies in width from about 30 to 100 miles. It is bounded on the west by the Pacific Ocean, on the south by the Gulf of California, and on the east by the Colorado Desert Province.

The Peninsular Ranges are essentially a series of northwest-southeast oriented fault blocks. Several major fault zones are found in this province. The Elsinore Fault zone and the San Jacinto Fault zone trend northwest-southeast and are found near the middle of the province. The San Andreas Fault zone borders the northeasterly margin of the province.

More specific to the subject property, the site is located in an area geologically mapped to be underlain by alluvial fan deposits (Dibblee, T.W., and Minch, J.A., 2003). According the CGS 7.5-Minute Quadrangle, the nearest known active faults are the San Gorgonio Pass Fault Zone located 2.7 miles to the northeast of the site and the Banning Fault located 2.6 miles to the north of the site. No active faults are shown in the immediate site vicinity on the maps reviewed for the area.

5.2 SUBSURFACE SOIL CONDITIONS

A brief description of the earth materials reported to be on the site by ESSW (2006) and Converse (2019) and encountered during our field investigation is presented in the following sections.

5.2.1 Topsoil/Disturbed Soil (unmapped)

Our explorations noted that the upper one foot (±) of soil is loose and disturbed due to the past agricultural activities at the site. The topsoil mostly consists of dry to slightly moist, light brown silty sand.

5.2.2 Alluvium Fan Deposits

Our excavations encountered alluvial fan deposits below the topsoil. The alluvium was typically composed of silty sand and occasional gravel and was light brown to brown in color, slightly moist to moist, and medium dense to dense, as indicated by our blow counts and in-place density data. Tests performed on the most unfavorable samples of the alluvium (selected based on blow counts) suggest a slight potential for soil collapse (0.2 to 1.2 percent). This agrees with Converse's findings that the alluvium has slight to moderate potential for collapse (0.1 to 2.5 percent).

Results of expansion index tests show that the site surficial soils have a "very low" expansion potential (EI ≈ 5 to 10) which concurs with the findings by Converse and ESSW.

Detailed logs of the site explorations are included in Appendices A through C. The locations of the site explorations are shown on the Exploration Location Map, Figure 2.

5.3 SURFACE WATER AND GROUNDWATER

5.3.1 Surface Water

Surface water on this site is the result of precipitation or surface run-off from surrounding areas. Overall surface drainage is generally to the south.

5.3.2 Groundwater

The exploratory boring BH-5 by Converse (2019) and all of our CPT soundings excavated to a maximum depth of 50 feet did not encounter groundwater at the property.

The California Water Dara Library (https://wdl.water.ca.gov/waterdatalibrary/) shows a groundwater well located approximately one-quarter mile northeast from the site. Records of this well indicate that groundwater in the region is deeper than 200 feet.

5.4 FAULTING AND SEISMICITY

The geologic structure of the entire southern California area is dominated mainly by northwest-trending faults associated with the San Andreas system. The site is in a seismically active region. No active or potentially active fault is presently known to exist at this site nor is the site situated within an *"Alquist-Priolo"* Earthquake Fault Zone. The County of Riverside (https://countyofriverside.us/Residents/PropertyInformation.aspx) has designated the site area as "not in fault zone", "not in a fault line", having a "low" potential for liquefaction, and "susceptible" to subsidence. According the CGS 7.5-Minute Quadrangle, the nearest known active faults are the San Gorgonio Pass Fault Zone located 2.7 miles to the northeast of the site and the Banning Fault located 2.6 miles to the north of the site.

5.4.1 Seismic Design Parameters

The site is located at approximately 33.9315° Latitude and -116.9527° Longitude. Site spectral accelerations (S_a and S_1), for 0.2 and 1.0 second periods for a Class "D" site, was determined from the SEAOC/OSHPD web interface that utilizes the USGS web services and retrieves the seismic design data and presents that information in a report format. Using the ASCE 7-16 option on the SEAOC/OSHPD website results in the values for S_{M1} and S_{D1} reported as "null-See Section 11.4.8" (of ASCE 7-16). As noted in ASCE 7-16, Section 11.4.8, a site-specific ground motion procedure is recommended for Site Class "D" when the value S_1 exceeds 0.2. The value S_1 for the subject site exceeds 0.2.

For a site Class "D", an exception to performing a site-specific ground motion analysis is allowed in ASCE 7-16 where S_1 exceeds 0.2 provided the value of the seismic response

coefficient, Cs, is conservatively calculated by Eq 12.8-2 of ASCE 7-16 for values of T≤1.5Ts and taken as equal to 1.5 times the value computed in accordance with either Eq. 12.8-3 for $T_L \geq T > 1.5Ts$ or Eq. 12.8-4 for $T > T_L$.

The results, based on the 2015 NEHRP and the 2019 CBC, are presented in the following table and we have assumed that the exception as allowed in ASCE 7-16 is applicable. If the exception is deemed not appropriate, a site-specific ground motion analysis will be required.

SITE SEISMIC PARAMETERS	
Mapped 0.2 sec Period Spectral Acceleration, S_S	2.013g
Mapped 1.0 sec Period Spectral Acceleration, S_1	0.69g
Site Coefficient for Site Class "D", F_a	1.0
Site Coefficient for Site Class "D", F_v	1.7
Maximum Considered Earthquake Spectral Response Acceleration for 0.2 Second, S_{MS}	2.013g
Maximum Considered Earthquake Spectral Response Acceleration for 1.0 Second, S_{M1}	1.173g
5% Damped Design Spectral Response Acceleration Parameter at 0.2 Second, S_{DS}	1.342g
5% Damped Design Spectral Response Acceleration Parameter at 1 second, S_{D1}	0.782g
Peak Ground Acceleration Adjusted for Site Class Effects, PGA_M	0.903g
Seismic Design Category	D

Final selection of the appropriate seismic design coefficients should be made by the project structural engineer based upon the local practices and ordinances, expected building response and desired level of conservatism.

5.5 LIQUEFACTION AND SEISMICALLY INDUCED SETTLEMENT

Due to the anticipated depth to groundwater (greater than 200 feet), the potential for liquefaction at the site is nil.

However, loose to medium dense granular soils tend to density during strong earthquake shaking. The potential for seismically induced settlements of the upper 50 feet of dry sandy alluvial fan sediments at the property was assessed using the data of our CPT soundings with the aid of the computer program Cliq version 3.3.1.14 (Geologismiki, 2006). A mean magnitude weighted (Mw) seismic event of 7.13 obtained using the USGS deaggregation web application (based on a two percent exceedance in 50 years) and a PGA_M of 0.903g obtained from the USGS website were used in our assessment.

The results of the analyses indicated the presence of occasional layers of loose to medium dense sands and silty sands that would be prone to settlement. The following table summarizes the amount of total seismically induced settlement estimated at each CPT location:

ESTIMATED SEISMICALLY INDUCED TOTAL SETTLEMENT	
CPT Sounding	Total Settlement (in)
1	1.0
2	0.2
3	0.2
4	1.5

As noted above, a seismically induced settlement of up to about 1.5 inches total and 0.75 inches differential over a 40-foot span is estimated for the property. The results of the seismic settlement analyses are presented within Appendix F.

5.6 OTHER HAZARDS

Evidence of ancient landslides or slope instabilities at this site was not observed during our site reconnaissance. Thus, the potential for landslides is considered negligible for design purposes.

The potential for secondary seismic hazard such as a tsunami or a seiche is considered negligible due to site elevation and great distance to the ocean or a lake.

6. CONCLUSIONS AND RECOMMENDATIONS

6.1 GENERAL

The proposed development appears feasible from a geotechnical viewpoint provided that the following recommendations are incorporated into design and construction.

The site contains topsoil and loose surficial alluvium. These materials are unsuitable for foundation support and thus should be removed and replaced as engineered compacted fill.

Our analyses also indicate that site may be subject to densification of the upper dry sands during the design level earthquake. This could result in seismically induced settlement of up to about 1.5 inches total and 0.75-inch differential over a 40-foot span. Provided that the site is prepared as recommended in the following sections of this report, static settlement is estimated to be up to 0.5-inch total and up to 0.25-inch differential over a 40-foot span. The

combined static plus seismic differential settlement of about 1 inch in 40 feet is anticipated to be tolerated by the residential buildings supported on conventional shallow footings.

6.2 EARTHWORK CONSIDERATIONS

Earthwork and grading should be performed in accordance with the applicable grading ordinances of the City of Beaumont/County of Riverside, the 2019 California Building Code (CBC), and recommendations contained in this report. The Grading Guidelines included in Appendix G outline general procedures and do not anticipate all site-specific situations. In the event of conflict, the recommendations presented in the text of this report should supersede those contained in Appendix G.

6.2.1 Site Clearing

The site should be cleared of existing vegetation, roots, and debris. These materials should be properly disposed of off-site.

6.2.2 Remedial Grading

The upper five feet of existing soil or two feet below the base of footings, whichever is deeper, should be completely over-excavated from proposed building areas and areas to receive structural fill. Additional over-excavation may be recommended if unsuitable materials are exposed. The bottom of over-excavations should expose competent native materials which are defined as relatively uniform, no visually porous soils with an in-place compaction of at least 85 percent of the soil's maximum dry density as determined per ASTM D 1557. As a minimum over-excavations should extend down and away from foundation elements at a 1:1 (h:v) projection to the recommended removal depth or a minimum of 5 feet.

The upper two feet of existing soil or one foot below the pavement/flatwork subgrade, whichever is deeper, should be removed. The horizontal extent of over-excavations should extend at least two feet beyond the edge of the improvement.

The bottom of all removals should be scarified to a minimum depth of eight inches, brought to above the optimum moisture content, and then recompacted to at least 90 percent of the soil's maximum dry density per ASTM D 1557. The bottoms of remedial excavations should be observed by a GeoTek representative prior to scarification.

6.2.3 Excavation Characteristics

Excavation in the on-site soils is expected to be feasible utilizing heavy-duty grading equipment in good operating condition.

All temporary excavations for grading purposes and installation of underground utilities should be constructed in accordance with local and Cal-OSHA guidelines. Temporary vertical excavations within the on-site materials should be stable up to four feet with a 1:1 (h:v) cut above. Flatter inclinations may be needed depending on the field conditions. Temporary construction slopes should be periodically examined by a competent person, per Cal-OSHA requirements, to look of evidence of instability.

6.2.4 Engineered Fill

The onsite soils are considered suitable for reuse as engineered fill provided they are free from vegetation, debris, deleterious material, and hard lumps greater than six inches in maximum dimension.

Fill materials should be placed in horizontal lifts not exceeding six inches in loose thickness, moisture conditioned to at least the optimum moisture content, and compacted to a minimum relative compaction of 90 percent (ASTM D 1557).

Detailed recommendations pertaining to the placement of engineered fill are presented in Appendix G.

6.2.5 Slopes

Fill and cut slopes constructed at gradients of 2:1 (h:v) or flatter, in accordance with industry standards, are anticipated to be both grossly and surficially stable. Fill placed on slopes should be properly benched into competent soils per the geotechnical engineer's direction. Cut slopes should be observed by a geotechnical engineer/engineering geologist to approve the exposed conditions upon excavation.

The onsite soils are mostly granular and subject to erosion. Slopes should be landscaped shortly after construction.

6.2.6 Trench Excavation and Backfill

Trench excavations should conform to Cal-OSHA regulations. The contractor should have a competent person, per OSHA requirements, on site during construction to observe conditions and to make the appropriate recommendations.

Utility trench backfill should be compacted to at least 90 percent relative compaction (ASTM D 1557). Compaction should be achieved with a mechanical compaction device. Jetting of trench backfill is not recommended. If soils to be used as backfill have dried out, they should be thoroughly moisture conditioned prior to placement in trenches.

6.2.7 Shrinkage and Subsidence

Several factors will impact earthwork balancing on the site, including shrinkage, subsidence, trench spoil from utilities and footing excavations, as well as the accuracy of topography.

Shrinkage is primarily dependent upon the degree of compactive effort achieved during construction. For planning purposes, a shrinkage factor of approximately 5 to 15 percent may be considered for the materials requiring recompaction. Subsidence of up to 0.1 feet may occur.

6.3 DESIGN RECOMMENDATIONS

6.3.1 Foundation Design Criteria

The site surficial soils possess "very low" ($0 \leq EI \leq 20$) expansion potential in accordance with ASTM D 4829, as noted by our soils data and data by past consultants. However, verification testing should be performed after site remedial grading.

The foundation elements for the proposed structures should bear entirely in engineered fill soils and should be designed in accordance with the 2019 CBC.

GEOTECHNICAL RECOMMENDATIONS FOR CONVENTIONALLY REINFORCED SHALLOW FOUNDATIONS	
Design Parameter	"Very Low" Expansion Potential (0≤EI≤20)
Foundation Depth or Minimum Perimeter Beam Depth (inches below lowest adjacent grade)	One- and Two-story – 12 Three-story - 18
Minimum Foundation Width (Inches)*	One- and Two-story – 12 Three-story - 15
Minimum Slab Thickness (actual)**	4 – Actual
Minimum Slab Reinforcing**	6" x 6" – W1.4/W1.4 welded wire fabric placed in middle of slab
Minimum Footing Reinforcement	Two No. 4 reinforcing bars, one placed near the top and one near the bottom
Effective Plasticity Index***	NA
Presaturation of Subgrade Soil (Percent of Optimum)	Minimum of 100% of the optimum moisture content to a depth of at least 12 inches prior to placing concrete

* Code minimums per Table 1809.7 of the 2019 CBC.
**Slab thickness and reinforcement should be determined by the structural engineer.
***Effective plasticity index should be verified at the completion of rough grading.

It should be noted that the criteria provided are based on soil support characteristics only. The structural engineer should design the slab and footing/beam reinforcement based on actual loading conditions.

The following criteria for design of foundations are preliminary and should be re-evaluated based on the results of additional laboratory testing of samples obtained near finish pad grade.

An allowable bearing capacity of 2,000 psf may be used for design of footings 12 inches deep and 12 inches wide. This value may be increased by 400 psf and 200 psf for each additional 12 inches in depth or width, respectively, to a maximum value of 3,000 psf. An increase of one-third may be applied when considering short-term live loads (e.g. seismic and wind loads).

For footings designed in accordance with the recommendations presented in this report, we would anticipate a maximum static settlement of less than 0.5-inch and a maximum differential static settlement of less than 0.25-inch in a 40-foot span. Seismic settlement is anticipated to be up to 1.5-inches total and 0.75-inch differential over a 40-foot span.

The passive earth pressure may be computed as an equivalent fluid having a density of 250 psf per foot of depth, to a maximum earth pressure of 2,500 psf for footings founded on engineered fill. A coefficient of friction between soil and concrete of 0.40 may be used with dead load forces. When combining passive pressure and frictional resistance, the passive pressure component should be reduced by one-third.

Moisture and vapor retarding systems are intended to provide a certain level of resistance to vapor and moisture transmission through the concrete, but do not eliminate it. The acceptable level of moisture transmission through the slab is to a large extent based on the type of flooring used and environmental conditions. Ultimately, the vapor retarding system should be comprised of suitable elements to limit migration of water and reduce transmission of water vapor through the slab to acceptable levels. The selected elements should have suitable properties (i.e., thickness, composition, strength, and permeability) to achieve the desired performance level. Consideration should be given to consulting with an individual possessing specific expertise in this area for additional evaluation.

Moisture retarders can reduce, but not eliminate, moisture vapor rise from the underlying soils up through the slab. Moisture retarders should be designed and constructed in accordance with applicable American Concrete Institute, Portland Cement Association, Post-Tensioning Concrete Institute, ASTM and California Building Code requirements and guidelines.

GeoTek does not practice in the field of moisture vapor transmission evaluation/mitigation, since this does not fall under the geotechnical disciplines. Therefore, we recommend that a qualified person, such as the flooring contractor, structural engineer, and/or architect be consulted to evaluate the general and specific moisture vapor transmission paths and any impact on the proposed construction. That person (or persons) should provide recommendations for mitigation of potential adverse impact of moisture vapor transmission on various components of the structures as deemed appropriate. In addition, the recommendations in this report and our services in general are not intended to address mold prevention, since we along with geotechnical consultants in general, do no practice in areas of mold prevention. If specific recommendations are desired, a professional mold prevention consultant should be contacted.

6.3.2 Miscellaneous Foundation Recommendations

- To reduce moisture penetration beneath the slab on grade areas, utility trenches should be backfilled with engineered fill, lean concrete, or concrete slurry where they intercept the perimeter footing or thickened slab edge.
- Soils from the footing excavations should not be placed in the slab-on-grade areas unless properly compacted and tested. The excavations should be free of loose/sloughed materials and be neatly trimmed at the time of concrete placement.
- Under-slab utility trenches should be compacted to project specifications. Compaction should be achieved with a mechanical compaction device. If soils to be used as backfill have dried out, they should be thoroughly moisture conditioned prior to placement in trenches.

6.3.3 Foundation Setbacks

Minimum setbacks for all foundations should comply with the *2019 CBC* or City of Beaumont/County of Riverside requirements, whichever is more stringent. Improvements not conforming to these setbacks are subject to the increased likelihood of excessive lateral movements and/or differential settlements. If large enough, these movements can compromise the integrity of the improvements. The following recommendations are presented:

- The outside bottom edge of all footings should be set back a minimum of H/2 (where H is the slope height) from the face of any ascending slope. The setback should be at least 5 feet and need not to exceed 15 feet. Where a retaining wall is constructed at the toe of the slope, the height of the slope should be measured from top of the wall to the top of the slope.
- The outside bottom edge of all footings should be set back a minimum of H/3 from the face of any descending slope. The setback should be at least 7 feet and need not to exceed 40 feet.
- The bottom of any proposed foundations for structures should be deepened so as to extend below a 1:1 projection upward from the bottom of the nearest excavation.
- The bottom of all footings for new structures near retaining walls should be deepened so as to extend below a 1:1 projection upward from the bottom inside edge of the wall foundation.

6.3.4 Retaining Wall Design and Construction

6.3.4.1 General Design Criteria

Recommendations presented in this report apply to typical masonry or concrete vertical walls retaining up to six feet of compacted soils. These are typical design criteria and are not intended to supersede the design by the structural engineer.

Retaining wall foundations should be designed in accordance with Section 6.3.1 of this report. A minimum embedment of 12 inches into engineered compacted fill and a minimum footing width of 12 inches is recommended. Structural needs may govern and should be evaluated by the project structural engineer.

All earth retention structure plans, as applicable, should be reviewed by this office prior to finalization.

The backfill material placement for all earth retention structures should meet the requirement of Section 6.3.4.4 in this report.

In general, cantilever earth retention structures, which are designed to yield at least 0.001H, where H is equal to the height of the wall to the base of the footing, may be designed using the active condition. Rigid earth retention structures (including but not limited to rigid walls, and walls braced at top, such as typical basement walls) should be designed using the at-rest condition.

In addition to the design lateral forces due to retained earth, surcharges due to improvements, such as an adjacent building or traffic loading, should be considered in the design of the earth retention structures. Loads applied within a 1:1 (h:v) projection from the surcharge on the footing of the earth retention structure should be considered in the design.

Final selection of the appropriate design parameters should be made by the designer of the earth retention structures.

6.3.4.2 Cantilevered Walls

The recommendations presented below are for cantilevered retaining walls. Active earth pressure may be used for retaining wall design, provided the top of the wall is not restrained from minor deflections. An equivalent fluid pressure approach may be used to compute the horizontal pressure against the wall. Appropriate fluid unit weights are given below for specific slope gradients of the retained material. These do not include other superimposed loading conditions such as traffic, structures, seismic events, or adverse geologic conditions.

ACTIVE EARTH PRESSURES	
Surface Slope of Retained Materials (h:v)	Equivalent Fluid Pressure (pcf) Native Backfill*
Level	41
2:1	64

* The design pressures assume the backfill material has an expansion index less than or equal to 20. Backfill zone includes area between the back of the wall and footing to a plane (1:1 h:v) up from the bottom of the wall foundation to the ground surface.

6.3.4.3 Restrained Retaining Walls

Retaining walls that will be restrained prior to placing and compacting backfill material, or that have reentrant or male corners, should be designed for an at-rest equivalent fluid pressure of

62 pcf, plus any applicable surcharge loading, for native backfill and level back slope condition. For areas of male or reentrant corners, the restrained wall design should extend a minimum distance of twice the height of the wall laterally from the corner, or a distance otherwise determined by the project structural engineer.

6.3.4.4 Retaining Wall Backfill and Drainage

Retaining wall backfill should consist of materials with expansion index (EI) ≤ 20 and free of deleterious and/or oversized materials. The wall backfill should also include a minimum one-foot wide section of ¾- to 1-inch clean crushed rock (or approved equivalent). The rock should be placed immediately adjacent to the back of wall and extend up from the back drain to within approximately 12 inches of finish grade. The upper 12 inches should consist of compacted onsite materials. Presence of other materials might necessitate revision to the parameters provided and modification of wall designs. The backfill materials should be placed in lifts no greater than 8-inches in thickness and compacted to a minimum of 90 percent relative compaction in accordance with ASTM Test Method D 1557. Proper surface drainage needs to be provided and maintained. Bracing of the walls during backfilling and compaction may also be necessary.

All earth retention structures should be provided with an adequate pipe and gravel back drain system to reduce the potential for hydrostatic pressure build up. As a minimum, backdrains should consist of a four-inch diameter perforated collector pipe (Schedule 40, SDR 35, or approved equivalent) embedded in a minimum of one cubic foot per lineal foot of ¾- to 1-inch clean crushed rock or equivalent, wrapped in filter fabric (Mirafi 140N or approved equivalent). The drain system should be connected to a suitable outlet, as determined by the civil engineer. Drain outlets should be maintained over the life of the project and should not be obstructed or plugged by adjacent improvements. Waterproofing of site walls should be performed where moisture migration through the wall is undesirable.

Proper surface drainage needs to be provided and maintained. Water should not be allowed to pond behind retaining walls. Waterproofing of site walls should be performed where moisture migration through the wall is undesirable.

6.3.4.5 Other Design Considerations

- Retaining wall foundation elements should be designed in accordance with building code setback requirements.
- Wall design should consider the additional surcharge loads from superjacent slopes and/or footings, where appropriate.

- No backfill should be placed against concrete until minimum design strengths are evident by compression tests of cylinders.
- The retaining wall footing excavations, backcuts, and backfill materials should be approved by the project geotechnical engineer or their authorized representative.

6.3.5 Pool Design

The proposed swimming pool should derive support entirely from engineered fill. A minimum 12 inches of fill compacted to at least 90 percent of the soil's maximum dry density per ASTM D 1557 should be provided below the pool shell.

The pool walls should be designed for at-rest soil conditions using an equivalent fluid pressure of 62 pcf for at-rest conditions. Pool walls surcharged by adjacent structures should be designed for additional pressures. Alternatively, the pool walls may be designed as freestanding walls using the active soil state conditions provided that some lateral movement of the pool walls would be acceptable. If the active state is to be used, an equivalent fluid pressure of 41 pcf is considered suitable. These recommended pressures are based on drained conditions and using granular native fills with expansion index of less than 20. If a drain system adjacent/beneath the pool is not provided, the pool walls should then be designed for an equivalent fluid pressure of 98 pcf for the at-rest condition and 85 pcf for the active condition.

As noted above, the use of the lower (drained condition) at-rest or active soil pressures will require a subdrain system beneath/adjacent to the pool. A typical subdrain system includes a series of four-inch diameter perforated drain pipes encapsulated with at least one cubic foot of free-draining material per linear foot of pipe. The free-draining material should be encapsulated within a geotextile to prevent migration of fines into the drainage medium. The drain pipes should be routed to an acceptable discharge location, as determined by the pool designer. If desired, GeoTek can review the subdrain system once designed to determine if additional measures are warranted.

Pool decking supported on grade should be separated from the pool bond beam by a full-depth, mastic construction joint. If it is desired to extend the pool deck over the bond beam, consideration should be given to designing the deck as a structural slab supported by the pool shell. This will reduce the possibility of deck cracking occurring along the outer edge of the bond beam. We also recommend that the pool decking subgrade be "pre-saturated" prior to concrete placement. The subgrade soils should be moisture conditioned to at least 100% of the soil's optimum moisture content to a depth of 12 inches, prior to concrete placement. Testing by the geotechnical engineer is recommended to confirm that the soils have been adequately moisture treated.

Pool decking may consist of 5-inch thick concrete and the use of reinforcement is suggested. A minimum of #3 bars spaced 24 inches or 6" x 6" – W1.4/W1.4 welded wire mesh placed on center may be used. Control joints should be placed in two directions and located a distance apart approximately equal to 24 to 36 times the slab thickness. The pool designer should provide final design recommendations.

It is our recommendation that Type V cement be used for the pool construction due to the chemicals associated with the pool water.

6.3.6 Soil Corrosivity

The soil corrosivity at this site was tested in the laboratory for two representative samples collected during our field exploration. The results of the saturated resistivity testing indicate that the soil samples are "moderately corrosive" and "mildly corrosive" to buried ferrous metals, based on the guidelines provided in *Corrosion Basics: An Introduction* (Roberge, 2000). Chloride concentrations were negligible (0.0006 percent). Consideration should be given to consulting with a corrosion engineer. The laboratory test results are provided in Appendix D.

6.3.7 Soil Sulfate Content

The sulfate content was determined in the laboratory for two representative soil samples collected during our field exploration. The results (0.0012 and 0.0016 percent) indicate that the water-soluble sulfate for the tested samples were negligible, per Table 4.2.1 of ACI 318. Based upon the test results, no special concrete mix design is required for sulfate attack resistance. The laboratory test results are provided in Appendix D.

6.3.8 Pavement Design Considerations

Pavement design for proposed on-site street improvements was conducted per Caltrans *Highway Design Manual* guidelines for flexible pavements. Based on traffic indices (TIs) of 5.0 and 6.0 generally associated with these types of projects and using a design R-value of 23 (Converse, 2019), the following preliminary sections were estimated:

PRELIMINARY PAVEMENT SECTIONS			
TI	R-Value	Thickness of Asphalt Concrete (inches)	Thickness of Aggregate Base (inches)
5.0	23	3	7
6.0	23	4	8

The TIs used in our pavement design are considered reasonable values for the proposed street areas and should provide a pavement life of approximately 20 years with a normal amount of flexible pavement maintenance. Irrigation adjacent to pavements, without a deep curb or other cutoff to separate landscaping from the paving may result in premature pavement failure. Traffic parameters used for design were selected based upon engineering judgment and not upon information furnished to us such as an equivalent wheel load analysis or a traffic study.

The recommended pavement sections provided are intended as a minimum guideline and final selection of pavement cross section parameters should be made by the project civil engineer, based upon the local laws and ordinates, expected subgrade and pavement response, and desired level of conservatism. If thinner or highly variable pavement sections are constructed, increased maintenance and repair could be expected. Final pavement design should be checked by testing of soils exposed at subgrade (the upper 12 inches) after final grading has been completed.

Asphalt concrete and aggregate base should conform to current Caltrans Standard Specifications Section 39 and 26-1.02, respectively. As an alternative, asphalt concrete can conform to Section 203-6 of the current Standard Specifications for Public Work (Green Book). Crushed aggregate base or crushed miscellaneous base can conform to Section 200-2.2 and 200-2.4 of the Green Book, respectively. Pavement base should be compacted to at least 95 percent of the ASTM D1557 laboratory maximum dry density (modified proctor).

All pavement installation, including preparation and compaction of subgrade, compaction of base material, placement and rolling of asphaltic concrete, should be done in accordance with the City of Beaumont specifications, and under the observation and testing of GeoTek and a City Inspector where required. Jurisdictional minimum compaction requirements in excess of the aforementioned minimums may govern.

Deleterious material, excessive wet or dry pockets, oversized rock fragments, and other unsuitable yielding materials encountered during grading should be removed. Once existing compacted fill are brought to the proposed pavement subgrade elevations, the subgrade should be proof-rolled in order to check for a uniform and unyielding surface. The upper 12 inches of pavement subgrade soils should be scarified, moisture conditioned at or near optimum moisture content, and recompacted to at least 95 percent of the laboratory maximum dry density (ASTM D1557). If loose or yielding materials are encountered during construction, additional evaluation of these areas should be carried out by GeoTek. All pavement section changes should be properly transitioned.

6.3.9 Concrete Construction

6.3.9.1 General

Concrete construction should follow the 2019 CBC and ACI guidelines regarding design, mix placement, and curing of the concrete. If desired, we could provide quality control testing of the concrete during construction.

6.3.9.2 Concrete Mix Design

As indicated in Section 6.3.6, the site will not require a particular concrete mix design to resist sulfate attack.

6.3.9.3 Concrete Flatwork

Exterior concrete flatwork (sidewalks, driveways, patios, etc.) should have a minimum thickness of four inches. No specific reinforcement is required due to the non-structural nature. However, the use of some reinforcement should be considered. Some shrinkage and cracking of the concrete should be anticipated as a result of typical mix designs and curing practices commonly utilized in residential construction.

"Very low" expansive subgrade soils below exterior concrete flatwork should be pre-saturated to at least 100 percent of optimum moisture content. Minimum depth of pre-saturation should be 12 inches.

Sidewalks and driveways may be under the jurisdiction of the governing agency. If so, jurisdictional design and construction criteria would apply, if more restrictive than the recommendations presented in this report.

All concrete installation, including preparation and compaction of subgrade, should be done in accordance with the City of Beaumont/County of Riverside specifications, and under the observation and testing of GeoTek and a City/County inspector, if necessary.

6.3.9.4 Concrete Performance

Concrete cracks should be expected. These cracks can vary from sizes that are essentially unnoticeable to more than 0.125-inch in width. Most cracks in concrete, while unsightly, do not significantly impact long-term performance. While it is possible to take measures (proper concrete mix, placement, curing, control joints, etc.) to reduce the extent and size of cracks that occur, some cracking will occur despite the best efforts to minimize it. Concrete can also undergo chemical processes that are dependent upon a wide range of variables, which are

difficult, at best, to control. Concrete, while seemingly a stable material, is subject to internal expansion and contraction due to external changes over time.

One of the simplest means to control cracking is to provide weakened control joints for cracking to occur along. These do not prevent cracks from developing; they simply provide a relief point for the stresses that develop. These joints are a widely accepted means to control cracks but are not always effective. Control joints are more effective the more closely spaced they are. GeoTek suggests that control joints be placed in two orthogonal directions and located a distance apart approximately equal to 24 to 36 times the slab thickness.

6.4 POST CONSTRUCTION CONSIDERATIONS

6.4.1 Landscape Maintenance and Planting

Water has been shown to weaken the inherent strength of soil, and slope stability is significantly reduced by overly wet conditions. Positive surface drainage away from graded slopes should be maintained and only the amount of irrigation necessary to sustain plant life should be provided for planted slopes. Controlling surface drainage and runoff and maintaining a suitable vegetation cover can minimize erosion. Plants selected for landscaping should be lightweight, deep-rooted types that require little water and are capable of surviving the prevailing climate.

Overwatering should be avoided. Care should be taken when adding soil amendments to avoid excessive watering. An abatement program to control ground-burrowing rodents should be implemented and maintained. This is critical as burrowing rodents can decrease the long-term performance of slopes.

It is common for planting to be placed adjacent to structures in planter or lawn areas. This will result in the introduction of water into the ground adjacent to the foundation. This type of landscaping should be avoided.

6.4.2 Drainage

The need to maintain proper surface drainage and subsurface systems cannot be overly emphasized. Positive site drainage should be maintained at all times. Drainage should not flow uncontrolled down any descending slope. Water should be directed away from foundations and not allowed to pond or seep into the ground adjacent to the footings. Roof leaders and downspouts should discharge onto paved surfaces sloping away from the structure or into a closed pipe system which outfalls to the street gutter pan or directly to the storm drain

system. Pad drainage should be directed toward approved areas and not be blocked by other improvements.

It is the owner's responsibility to maintain and clean drainage devices on or contiguous to their lot. In order to be effective, maintenance should be conducted on a regular and routine schedule and necessary corrections made prior to each rainy season.

6.5 PLAN REVIEW AND CONSTRUCTION OBSERVATIONS

We recommend that foundation plans for the site be reviewed by this office prior to construction to check for conformance with the recommendations of this report. We also recommend that GeoTek representatives be present during construction of foundation and other improvements to observe and document proper implementation of the geotechnical recommendations. The owner/developer should verify that GeoTek representatives perform at least the following duties:

- Observe site clearing and grubbing operations for proper removal of unsuitable materials.
- Observe and test bottom of removals prior to fill placement.
- Evaluate the suitability of on-site and import materials for fill placement and collect soil samples for laboratory testing when necessary.
- Observe the fill for uniformity during placement including utility trenches.
- Test the fill for field density and relative compaction.
- Test the near-surface soils to verify proper moisture content.
- Observe and probe foundation excavations to confirm suitability of bearing materials.

If requested, a construction observation and compaction report can be provided by GeoTek, which can comply with the requirements of the governmental agencies having jurisdiction over the project.

7 INTENT

It is the intent of this report to aid in the design and construction of the proposed development. Implementation of the advice presented in this report is intended to reduce risk associated with construction projects. The professional opinions and geotechnical advice contained in this report are not intended to imply total performance of the project or

guarantee that unusual or variable conditions will not be discovered during or after construction.

The scope of our report is limited to the boundaries of the subject property. This update does not and should in no way be construed to encompass any areas beyond the specific area of the proposed construction as indicated to us by our client. Further, no evaluation of any existing site improvements is included. The scope is based on our understanding of the project and the client's needs, our fee estimate (Proposal No. P-0507021-CR) date May 24, 2021 and geotechnical engineering standards normally used on similar projects in this locality at the present.

8 LIMITATIONS

Our findings are based on site conditions observed and the stated sources. Thus, our comments are professional opinions that are limited to the extent of the available data.

GeoTek has prepared this report in a manner consistent with that level of care and skill ordinarily exercised by members of the engineering and science professions currently practicing under similar conditions in the jurisdiction in which the services are provided, subject to the time limits and physical constraints applicable to this report.

Since our recommendations are based on the site conditions observed and encountered, and laboratory testing, our conclusions and recommendations are professional opinions that are limited to the extent of the available data. Observations during construction are important to allow for any change in recommendations found to be warranted. These opinions have been derived in accordance with current standards of practice and no warranty of any kind is expressed or implied. Standards of care/practice are subject to change with time.

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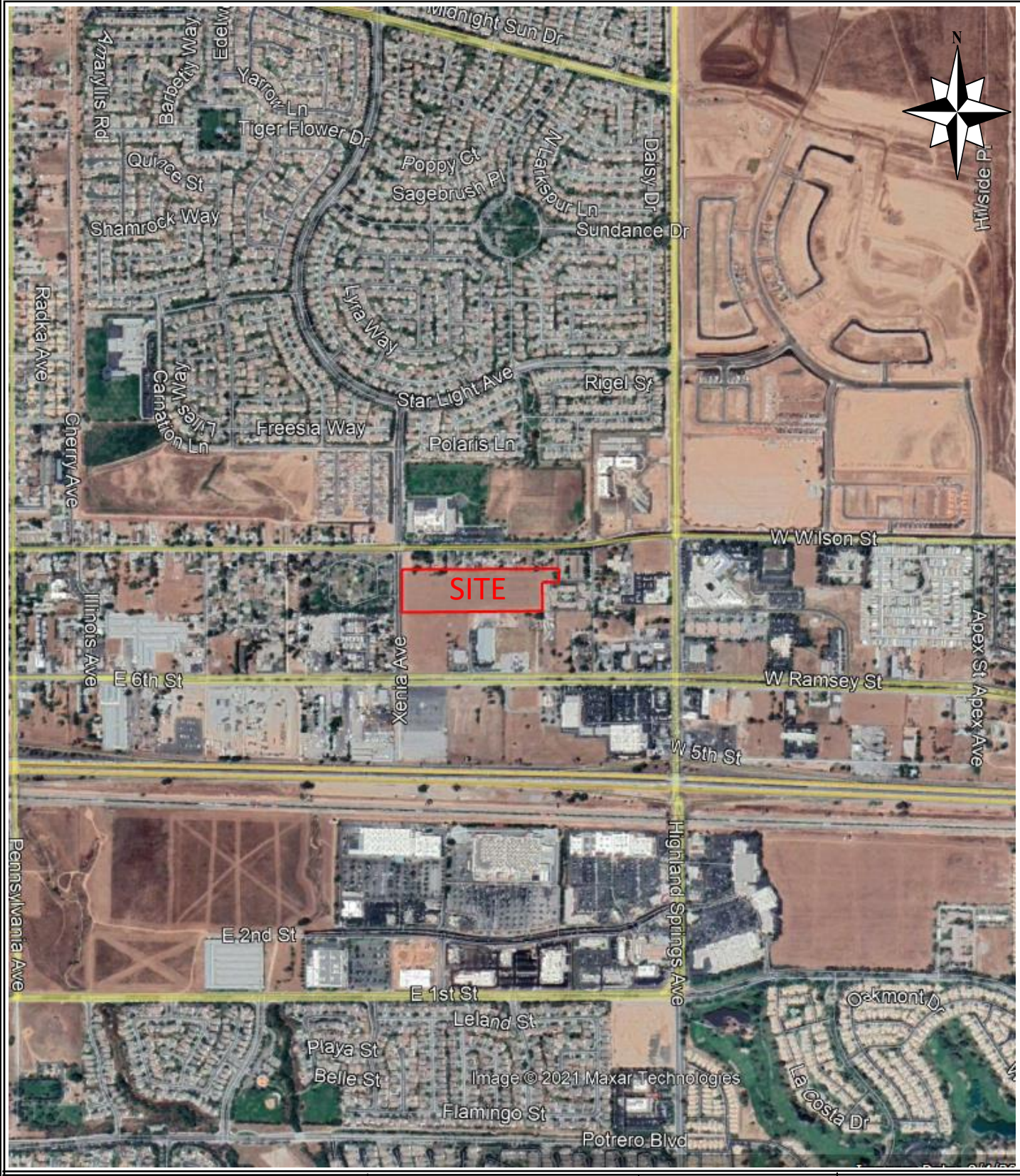
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Beaumont Land Partners
Xenia Apartment Project
Beaumont, Riverside County, California

Project No. 2784-CR

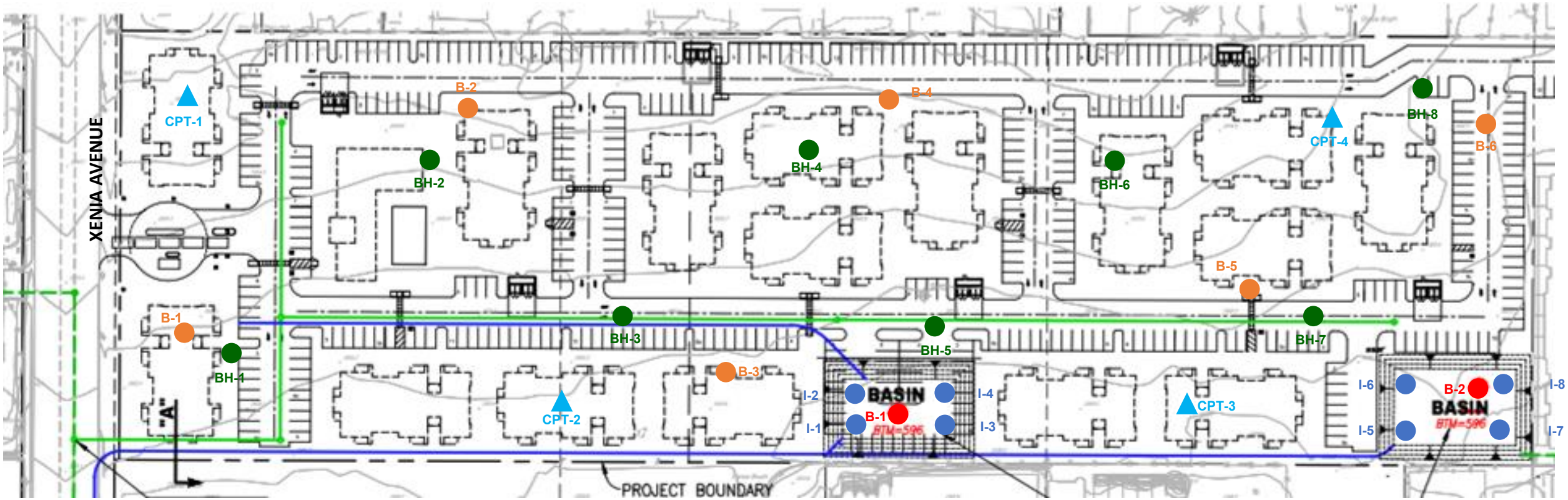
Scale:

0 0.2 mi

Figure 1

Site Location Map

GEOTEK



LEGEND

(Locations are approximate)

- B-6 — Exploratory Boring by ESSW (2006)
- BH-8 — Exploratory Boring by Converse (2019)
- B-2 — Exploratory Boring by GeoTek
- I-8 — Percolation Boring by GeoTek
- CPT-4 — CPT Sounding by GeoTek

Beaumont Land Partners
Xenia Apartment Project
Beaumont, Riverside County, California

Project No. 2784-CR

Scale:

0 — 210 ft

Figure 2

Exploration Location Map

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APPENDIX A

LOGS OF BORINGS by ESSW (2006)

Updated Geotechnical and Infiltration Evaluation
Xenia Apartment Project, Beaumont, California
Project No. 2784-CR

GEOTEK

Earth Systems
Southwest
79-811 B Country Club Dirve, Bermuda Dunes, CA 92203
Phone (760) 345-1588, Fax (760) 345-7315

Boring No: B-1

Project Name: E. Side of Xenia Ave., Between 6th & 8th Sts., Beaumont, CA
File Number: 10437-03
Boring Location: See Figure 2

Drilling Date: April 21, 2006
Drilling Method: 8" Hollow Stem Auger
Drill Type: Williams CME 55 w/Auto Hammer
Logged By: Dirk Wiggins

Description of Units

Note: The stratification lines shown represent the approximate boundary between soil and/or rock types and the transition may be gradational.

Depth (Ft.)	Sample Type (Bulk / SPT / MOD Calif.)	Penetration Resistance (Blows/6")	Symbol	USCS	Dry Density (pcf)	Moisture Content (%)	Description of Units
0				SM			SILTY SAND: dark reddish brown, medium dense, damp, fine to medium grained, trace coarse grained
	MOD Calif.	7,6,7					
5							
	MOD Calif.	4,9,13		SC			CLAYEY SAND: dark reddish brown, stiff, damp, fine to medium grained
10							
	MOD Calif.	10,22,32					very stiff
15							
	MOD Calif.	9,12,21					dark reddish brown to light brown
20							Total Depth 19 feet No Groundwater Encountered
25							
30							
35							
40							

Graphic Trend: Blow Count / Dry Density

Earth Systems
Southwest
79-811 B Country Club Dirve, Bermuda Dunes, CA 92203
Phone (760) 345-1588, Fax (760) 345-7315

Boring No: B-2

Project Name: E. Side of Xenia Ave., Between 6th & 8th Sts., Beaumont, CA
File Number: 10437-03
Boring Location: See Figure 2

Drilling Date: April 21, 2006
Drilling Method: 8" Hollow Stem Auger
Drill Type: Williams CME 55 w/Auto Hammer
Logged By: Dirk Wiggins

Description of Units

Note: The stratification lines shown represent the approximate boundary between soil and/or rock types and the transition may be gradational.

Depth (Ft.)	Sample Type (Bulk / SPT / MOD Calif.)	Penetration Resistance (Blows/6")	Symbol	USCS	Dry Density (pcf)	Moisture Content (%)	Description of Units	Graphic Trend: Blow Count / Dry Density
0	Bulk			SC			CLAYEY SAND: light brown, stiff, damp, fine to medium grained, trace coarse grained	
5	MOD Calif.	5,10,11						
10	MOD Calif.	5,9,10						
15	MOD Calif.	12,16,20					light brown to white, very stiff, dry, fine to coarse grained	
20							Total Depth 14 feet No Groundwater Encountered	
25								
30								
35								
40								

Earth Systems
Southwest
79-811 B Country Club Dirve, Bermuda Dunes, CA 92203
Phone (760) 345-1588, Fax (760) 345-7315

Boring No: B-3

Project Name: E. Side of Xenia Ave., Between 6th & 8th Sts., Beaumont, CA
File Number: 10437-03
Boring Location: See Figure 2

Drilling Date: April 21, 2006
Drilling Method: 8" Hollow Stem Auger
Drill Type: Williams CME 55 w/Auto Hammer
Logged By: Dirk Wiggins

Description of Units

Note: The stratification lines shown represent the approximate boundary between soil and/or rock types and the transition may be gradational.

Depth (Ft.)	Sample Type (Bulk / SPT / MOD Calif.)	Penetration Resistance (Blows/6")	Symbol	USCS	Dry Density (pcf)	Moisture Content (%)	Description of Units
0				SC			CLAYEY SAND: moderate brown to light brown, stiff, damp, fine to medium grained, trace coarse grained
5	MOD Calif.	6,10,13					
10	MOD Calif.	7,11,15					light brown
15	MOD Calif.	6,21,26					light brown to moderate brown with white minerals, very stiff, dry, fine to coarse grained, trace fine gravel
20							Total Depth 16.5 feet No Groundwater Encountered
25							
30							
35							
40							

Graphic Trend
Blow Count Dry Density

Earth Systems
Southwest
79-811 B Country Club Dirve, Bermuda Dunes, CA 92203
Phone (760) 345-1588, Fax (760) 345-7315

Boring No: B-4

Project Name: E. Side of Xenia Ave., Between 6th & 8th Sts., Beaumont, CA
File Number: 10437-03
Boring Location: See Figure 2

Drilling Date: April 21, 2006
Drilling Method: 8" Hollow Stem Auger
Drill Type: Williams CME 55 w/Auto Hammer
Logged By: Dirk Wiggins

Depth (Ft.)	Sample Type (Bulk, SPT, MOD Calif.)	Penetration Resistance (Blows/6")	Symbol	USCS	Dry Density (pcf)	Moisture Content (%)	Description of Units
0		2,2,2		SM			SILTY SAND: dark reddish brown, loose, damp, fine to medium grained
5		4,6,8		SC			CLAYEY SAND: reddish light brown, stiff, damp, fine to medium grained, lenses of silty sand
10		6,12,14					light brown, trace coarse grained
15		6,10,12					
20		4,5,5		SM			SILTY SAND: light brown, medium dense, dry, fine to medium grained
25							Total Depth 21.5 feet No Groundwater Encountered
30							
35							
40							

Note: The stratification lines shown represent the approximate boundary between soil and/or rock types and the transition may be gradational.

Graphic Trend
Blow Count Dry Density

Earth Systems
Southwest
79-811 B Country Club Dirve, Bermuda Dunes, CA 92203
Phone (760) 345-1588, Fax (760) 345-7315

Boring No: B-5

Project Name: E. Side of Xenia Ave., Between 6th & 8th Sts., Beaumont, CA
File Number: 10437-03
Boring Location: See Figure 2

Drilling Date: April 21, 2006
Drilling Method: 8" Hollow Stem Auger
Drill Type: Williams CME 55 w/Auto Hammer
Logged By: Dirk Wiggins

Depth (Ft.)	Sample Type: Bulk	Sample Type: SPT	Sample Type: MOD Calif.	Penetration Resistance (Blows/6")	Symbol	USCS	Dry Density (pcf)	Moisture Content (%)	Description of Units	Graphic Trend: Blow Count / Dry Density
0						SM			SILTY SAND: light brown, medium dense, damp, fine to medium grained	
5			■	4,10,9						
						SC			CLAYEY SAND: reddish brown, firm, damp, fine to medium grained, trace coarse grained	
10		■		2,2,3						
		■		3,5,6					light brown to reddish brown, stiff	
15									Total Depth 14 feet No Groundwater Encountered	
20										
25										
30										
35										
40										

Description of Units

Note: The stratification lines shown represent the approximate boundary between soil and/or rock types and the transition may be gradational.

Earth Systems
Southwest
79-811 B Country Club Dirve, Bermuda Dunes, CA 92203
Phone (760) 345-1588, Fax (760) 345-7315

Boring No: B-6

Project Name: E. Side of Xenia Ave., Between 6th & 8th Sts., Beaumont, CA
File Number: 10437-03
Boring Location: See Figure 2

Drilling Date: April 21, 2006
Drilling Method: 8" Hollow Stem Auger
Drill Type: Williams CME 55 w/Auto Hammer
Logged By: Dirk Wiggins

Depth (Ft.)	Sample Type (Bulk / SPT / MOD Calif.)	Penetration Resistance (Blows/6")	Symbol	USCS	Dry Density (pcf)	Moisture Content (%)	Description of Units
0	Bulk			SC/SM			SILTY SAND TO CLAYEY SAND: light brown, medium dense, damp, fine to medium grained, interbedded
5	MOD Calif.	4,6,7		SC			CLAYEY SAND: light brown, stiff, damp, fine to medium grained, few coarse grained, organic matter, white minerals
10	MOD Calif.	4,6,9					
15	MOD Calif.	5,9,15					fine to coarse grained
20	MOD Calif.	22,37,41					very stiff, dry, trace fine gravel, less clay, more silt, lenses of silty sand
25							Total Depth 21.5 feet No Groundwater Encountered
30							
35							
40							

Note: The stratification lines shown represent the approximate boundary between soil and/or rock types and the transition may be gradational.

Graphic Trend
Blow Count Dry Density

APPENDIX B

LOGS OF BORINGS AND LABORATORY TEST RESULTS BY CONVERSE (2019)

Updated Geotechnical and Infiltration Evaluation
Xenia Apartment Project, Beaumont, California
Project No. 2784-CR

GEOTEK

Log of Boring No. BH-01

Dates Drilled: 8/4/2019 Logged by: William Buckley Checked By: Mehrab Jesmani

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 2610 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		ALLUVIUM **SILTY SAND (SM):** fine to medium-grained, brown.		■				se
5			■		7/14/17	7	102	col
			■		11/15/18	9	114	
10			■		10/14/16	13	112	
15			■		10/20/20	11	113	
		End of boring at 16.5 feet bgs. No groundwater encountered. Borehole backfilled with soil cuttings and compacted with an auger using the weight of the drill rig on 9/4/2019.						

Converse Consultants

Approximately 10.93-Acre Site
Southeast of Xenia Avenue and 8th Street
City of Beaumont, Riverside County, California
For: Pardee Homes

Project No. 19-81-237-01

Drawing No. A-2

Log of Boring No. BH-02

Dates Drilled: 8/4/2019 Logged by: William Buckley Checked By: Mehrab Jesmani

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 2612 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE	DRY UNIT WT. (pcf)	OTHER
		ALLUVIUM: **SILTY SAND (SM):** fine to medium-grained, brown.						
5			■	▨	11/10/12	8	103	ma
			■	▨	8/14/20	13	113	
10			■		10/12/15	13	113	
15		- fine to coarse-grained	■		10/18/21	6	109	
		End of boring at 16.5 feet bgs. No groundwater encountered. Borehole backfilled with soil cuttings and compacted with an auger using the weight of the drill rig on 9/4/2019.						

Converse Consultants

Approximately 10.93-Acre Site
Southeast of Xenia Avenue and 8th Street
City of Beaumont, Riverside County, California
For: Pardee Homes

Project No. 19-81-237-01

Drawing No. A-3

Log of Boring No. BH-03

Dates Drilled: 8/4/2019 Logged by: William Buckley Checked By: Mehrab Jesmani

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 2609 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE	DRY UNIT WT. (pcf)	OTHER
		ALLUVIUM: **SILTY SAND (SM):** fine to medium-grained, brown.		■				ca,er,max
5			■		8/8/11	12	114	
			■		6/8/15	10	118	ds
10		- fine to coarse grained	■		8/16/19	12	119	
15		- scattered gravel up to 0.5" in largest dimension	■		20/20/23	6	112	
		End of boring at 16.5 feet bgs. No groundwater encountered. Borehole backfilled with soil cuttings and compacted with an auger using the weight of the drill rig on 9/4/2019.						

Converse Consultants

Approximately 10.93-Acre Site
Southeast of Xenia Avenue and 8th Street
City of Beaumont, Riverside County, California
For: Pardee Homes

Project No. 19-81-237-01

Drawing No. A-4

Log of Boring No. BH-04

Dates Drilled: 8/4/2019 Logged by: William Buckley Checked By: Mehrab Jesmani

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 2612 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		ALLUVIUM: **SILTY SAND (SM):** fine to medium-grained, brown.						
5			■	▨	8/8/12	11	117	ma
					8/12/15	15	111	col
10			■		7/9/14	16	116	
15			■		8/9/12	13	116	
		End of boring at 16.5 feet bgs. No groundwater encountered. Borehole backfilled with soil cuttings and compacted with an auger using the weight of the drill rig on 9/4/2019.						

Converse Consultants

Approximately 10.93-Acre Site
Southeast of Xenia Avenue and 8th Street
City of Beaumont, Riverside County, California
For: Pardee Homes

Project No. 19-81-237-01

Drawing No. A-5

Log of Boring No. BH-05

Dates Drilled: 8/4/2019 Logged by: William Buckley Checked By: Mehrab Jesmani

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 2608 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		ALLUVIUM: **SILTY SAND (SM):** fine to medium-grained, brown.		■				r,ma
5			■		8/10/12	12	109	
10		- fine to coarse-grained, scattered gravel up to 0.5" in largest dimension	■		8/12/14	12	124	
15		- scattered gravel up to 1" in largest dimension	■		23/35/40	6	117	
20			☒		24/20/23			
25		- few gravel up to 1" in largest dimension, orangish-brown	■		20/50-5"	4	107	
30		- scattered gravel up to 0.5" in largest dimension	☒		17/18/16			

Converse Consultants

Approximately 10.93-Acre Site
Southeast of Xenia Avenue and 8th Street
City of Beaumont, Riverside County, California
For: Pardee Homes

Project No. 19-81-237-01

Drawing No. A-6a

Log of Boring No. BH-05

Dates Drilled: 8/4/2019 Logged by: William Buckley Checked By: Mehrab Jesmani

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 2608 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		ALLUVIUM: **SAND with SILT (SP-SM):** fine to medium-grained, light brown.	■		15/25/28	3	97	
40			☒		14/17/27			
45			■		27/35/40	4	103	
50			☒		14/20/25			
		End of boring at 51.5 feet bgs. No groundwater encountered. Borehole backfilled with soil cuttings and compacted with an auger using the weight of the drill rig on 9/4/2019.						

Converse Consultants

Approximately 10.93-Acre Site
Southeast of Xenia Avenue and 8th Street
City of Beaumont, Riverside County, California
For: Pardee Homes

Project No. 19-81-237-01

Drawing No. A-6b

Log of Boring No. BH-06

Dates Drilled: 8/4/2019 Logged by: William Buckley Checked By: Mehrab Jesmani

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 2611 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		ALLUVIUM: **SILTY SAND (SM):** fine to medium-grained, brown.		■				se
5			■		3/3/4	6	102	ds
10			■		9/12/15	8	107	
15			■		10/10/12	12	106	
		End of boring at 16.5 feet bgs. No groundwater encountered. Borehole backfilled with soil cuttings and compacted with an auger using the weight of the drill rig on 9/4/2019.						

Converse Consultants

Approximately 10.93-Acre Site
Southeast of Xenia Avenue and 8th Street
City of Beaumont, Riverside County, California
For: Pardee Homes

Project No. 19-81-237-01

Drawing No. A-7

Log of Boring No. BH-07

Dates Drilled: 8/4/2019 Logged by: William Buckley Checked By: Mehrab Jesmani

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 2607 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		ALLUVIUM: **SILTY SAND (SM):** fine to medium-grained, brown.						
5			■	▨	3/2/3	7	100	max
			■	▨	5/7/9	13	111	
10			■		8/12/14	14	116	
15			■		10/12/18	11	114	
		End of boring at 16.5 feet bgs. No groundwater encountered. Borehole backfilled with soil cuttings and compacted with an auger using the weight of the drill rig on 9/4/2019.						

Converse Consultants

Approximately 10.93-Acre Site
Southeast of Xenia Avenue and 8th Street
City of Beaumont, Riverside County, California
For: Pardee Homes

Project No. 19-81-237-01

Drawing No. A-8

Log of Boring No. BH-08

Dates Drilled: 8/4/2019 Logged by: William Buckley Checked By: Mehrab Jesmani

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 2609 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		ALLUVIUM: **SILTY SAND (SM):** fine to medium-grained, brown.		■				ca,er,ma
5			■		5/6/7	10	103	
10			■		6/10/20	13	123	
15		- fine to coarse-grained, scattered gravel up to 0.5" in largest dimension	■		8/16/24	11	123	
		End of boring at 16.5 feet bgs. No groundwater encountered. Borehole backfilled with soil cuttings and compacted with an auger using the weight of the drill rig on 9/4/2019.						

Converse Consultants

Approximately 10.93-Acre Site
Southeast of Xenia Avenue and 8th Street
City of Beaumont, Riverside County, California
For: Pardee Homes

Project No. 19-81-237-01

Drawing No. A-9

APPENDIX B

LABORATORY TESTING PROGRAM

Tests were conducted in our laboratory on representative soil samples for the purpose of classification and evaluation of their physical properties and engineering characteristics. The amount and selection of tests were based on the geotechnical parameters required for this project. Test results are presented herein and on the Logs of Borings, in Appendix A, *Field Exploration*. The following is a summary of the various laboratory tests conducted for this project.

In-Situ Moisture Content and Dry Density

Results of these tests performed on relatively undisturbed ring samples were used to aid in the classification and to provide quantitative measure of the *in situ* dry density and moisture content, (ASTM D2216). Data obtained from this test provides qualitative information on strength and compressibility characteristics of the site soils. For test results, see the Logs of Borings in Appendix A, *Field Exploration*.

Expansion Index

One sample was tested to evaluate the expansion potential of material encountered at the site. The test was conducted in accordance with ASTM Standard D4829. Test result is presented in the following table.

Table No. B-1, Summary of Expansion Index Test Result

Boring No.	Depth (feet)	Soil Description	Expansion Index	Expansion Potential
BH-05	0 to 5	Silty Sand (SM)	7	Very Low

Sand Equivalent

Two representative soil samples were tested in accordance with the ASTM D2419 test method to determine the sand equivalent. The test results are presented in the following table.

Table No. B-2, Sand Equivalent Test Results

Boring No.	Depth (feet)	Soil Description	Sand Equivalent
BH-01	0-5	Silty Sand (SM)	11
BH-06	0-5	Silty Sand (SM)	20

R-value

One representative bulk soil sample was tested for resistance value (R-value) in accordance with California Test Method CT301. This test is designed to provide a relative measure of soil strength for use in pavement design. The test result is shown in the following table.

Table No. B-3, R-Value Test Result

Boring No.	Depth (feet)	Soil Classification	Measured R-value
BH-05	0-5	Silty Sand (SM)	23

Soil Corrosivity Tests

Two representative soil samples were tested to determine minimum electrical resistivity, pH, and chemical content, including soluble sulfate and chloride concentrations. The purpose of the tests was to determine the corrosion potential of sites soils when placed in contact with common construction materials. The tests were performed by AP Engineering and Testing, Inc. (Pomona, CA) in accordance to Caltrans Test Methods 643, 422 and 417. Test results are presented in the following table.

Table No. B-4, Summary of Soil Corrosivity Test Results

Boring No.	Depth (feet)	pH	Soluble Sulfates (CA 417) (% by weight)	Soluble Chlorides (CA 422) (ppm)	Min. Resistivity (CA 643) (Ohm-cm)
BH-03	0-5	7.0	0.0038	35	10,158
BH-08	0-5	6.9	0.0036	35	6,826

Collapse Tests

To evaluate the moisture sensitivity (collapse/swell potential) of the encountered soils, two collapse tests were performed in accordance with the ASTM Standard D5333 laboratory procedure. The samples were loaded to approximately 2 kips per square foot (ksf), allowed to stabilize under load, and then submerged. The test results are presented in the following table.

Table No. B-5, Collapse Test Results

Boring No.	Depth (feet)	Soil Classification	Percent Swell (+) Percent Collapse (-)	Collapse Potential
BH-01	5.0-6.5	Silty Sand (SM)	-2.5	Moderate
BH-04	7.5-9.0	Silty Sand (SM)	-0.1	Slight

Grain-Size Analyses

To assist in classification of soils, mechanical grain-size analyses were performed on four select samples in accordance with the ASTM Standard D422 test method. Grain-size curves are shown in Drawing No. B-1, *Grain Size Distribution Results*.

Maximum Dry Density and Optimum Moisture Content Test

Laboratory maximum dry density-optimum moisture content relationship test were performed on two representative bulk samples. These tests were conducted in accordance with the ASTM Standard D1557 test method. The test results are presented in Drawing No. B-2, *Moisture-Density Relationship Results,* and is summarized in the following table.

Table No B-6, Summary of Moisture-Density Relationship Results

Boring No.	Depth (feet)	Soil Description	Optimum Moisture (%)	Maximum Density (lb/cft)
BH-03	0-5	Silty Sand (SM), Brown	7.5	133.5
BH-07	5-10	Silty Sand (SM), Brown	7.8	133.3

Direct Shear Test

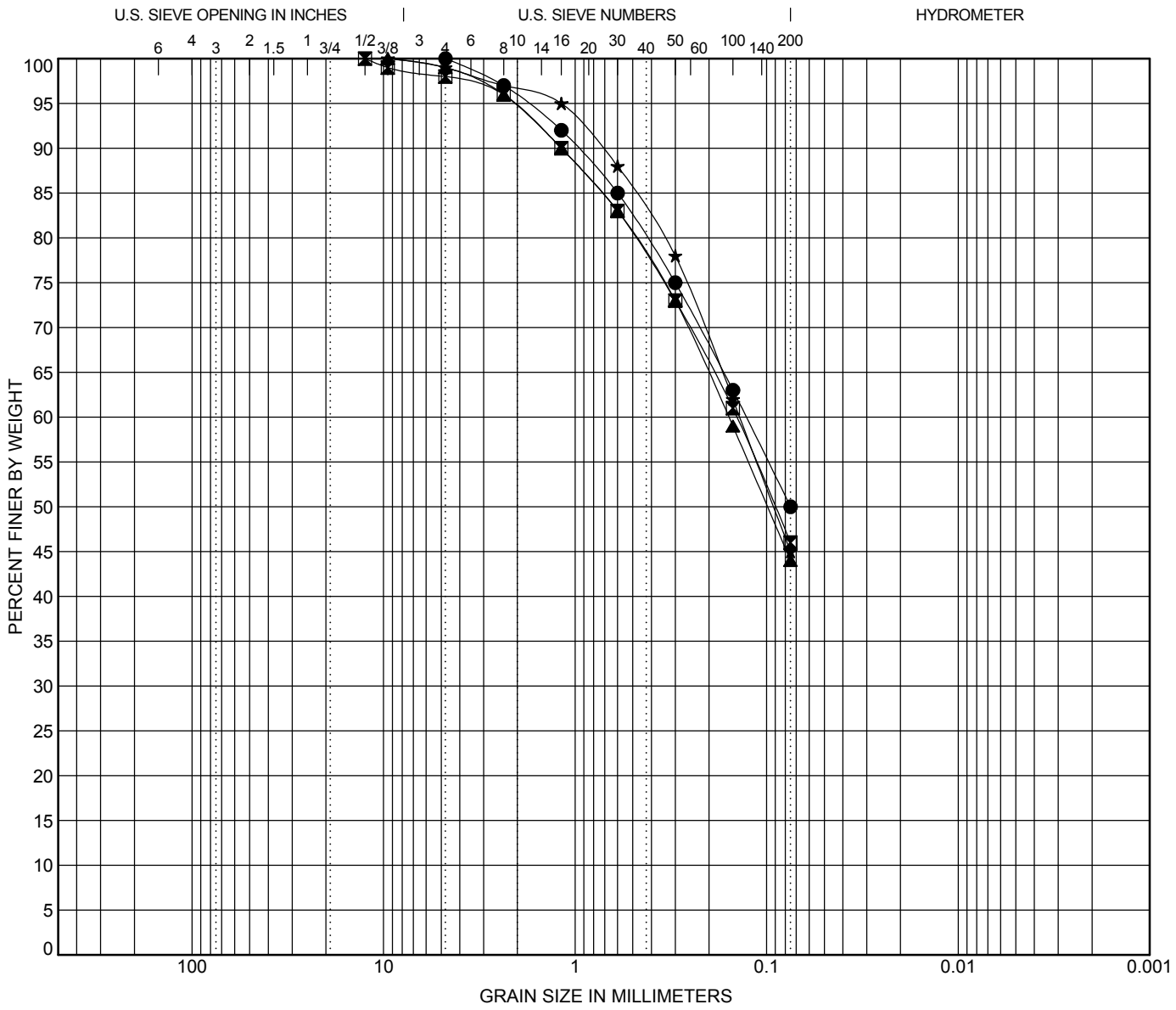
Two direct shear tests were performed on relatively undisturbed samples in soaked moisture condition in accordance with ASTM D3080. For these tests, three samples contained in brass sampler rings were placed, one at a time, directly into the test apparatus and subjected to a range of normal loads appropriate for the anticipated conditions. The samples were then sheared at a constant strain rate of 0.025 inch/minute. Shear deformation was recorded until a maximum of about 0.25-inch shear displacement was achieved. Ultimate strength was selected from the shear-stress deformation data and plotted to determine the shear strength parameters. For test data, including sample density and moisture content, see Drawings No. B-3 and B-4*, Direct Shear Test Results,* and the following table.

Table No. B-7, Summary of Direct Shear Test Results

Boring No.	Depth (feet)	Soil Description	Peak Strength Parameters	
			Friction Angle (degrees)	Cohesion (psf)
BH-03	7.5-9.0	Silty Sand (SM)	35	120
BH-06	5.0-6.5	Silty Sand (SM)	31	60

Sample Storage

Soil samples presently stored in our laboratory will be discarded 30 days after the date of this report, unless this office receives a specific request to retain the samples for a longer period.



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Boring No.	Depth (ft)	Description	LL	PL	PI	Cc	Cu
●	**BH-02**	**5-10**	**SILTY SAND (SM)**					
⊠	**BH-04**	**5-10**	**SILTY SAND (SM)**					
▲	**BH-05**	**0-5**	**SILTY SAND (SM)**					
★	**BH-08**	**0-5**	**SILTY SAND (SM)**					

	Boring No.	Depth (ft)	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**BH-02**	**5-10**	**4.75**	**0.128**			**0.0**	**50.0**	**50.0**	
⊠	**BH-04**	**5-10**	**12.5**	**0.143**			**2.0**	**52.0**	**46.0**	
▲	**BH-05**	**0-5**	**9.5**	**0.158**			**1.0**	**55.0**	**44.0**	
★	**BH-08**	**0-5**	**9.5**	**0.138**			**1.0**	**54.0**	**45.0**	

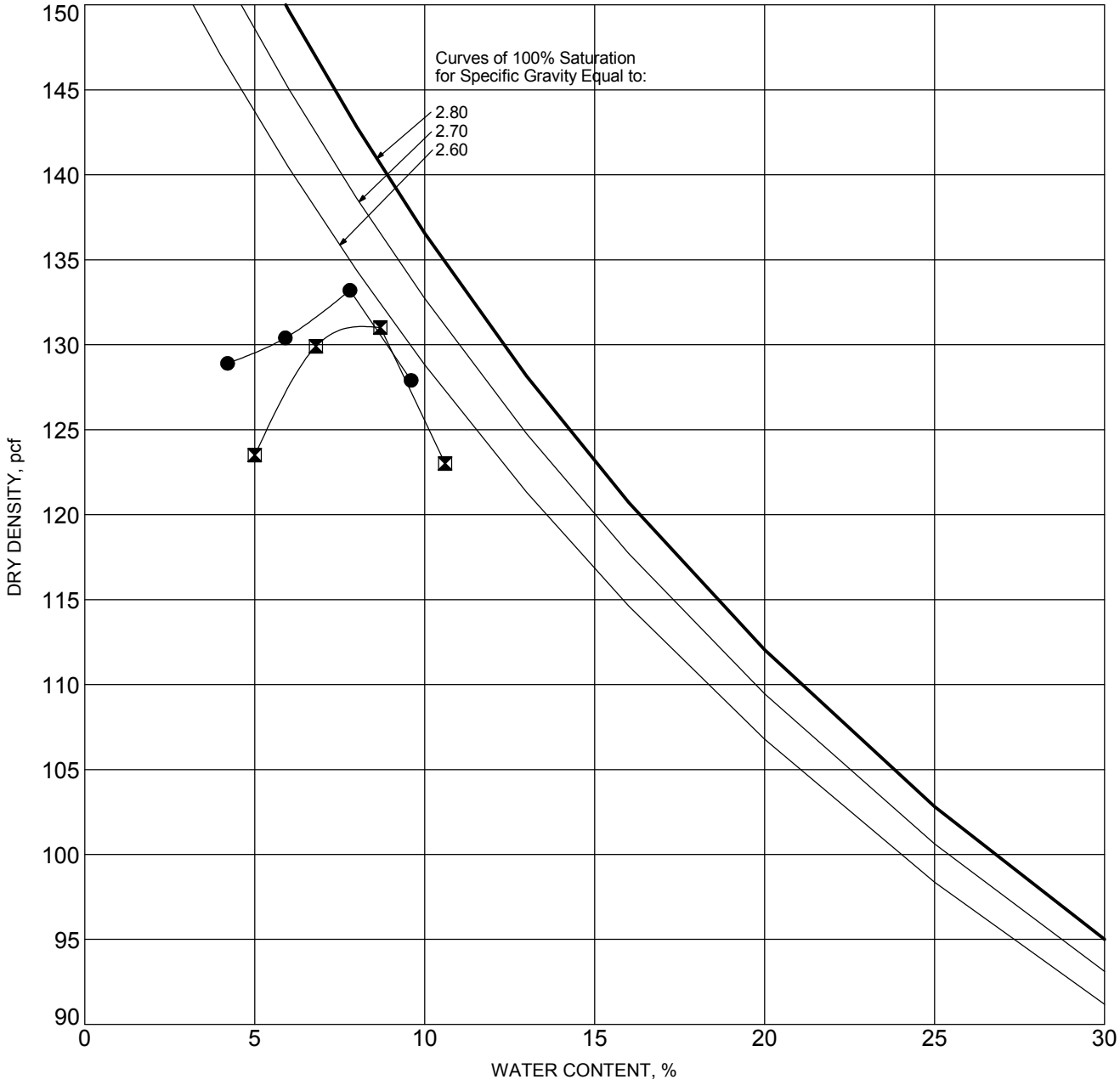
GRAIN SIZE DISTRIBUTION RESULTS

Converse Consultants

Approximately 10.93-Acre Site
Southeast of Xenia Avenue and 8th Street
City of Beaumont, Riverside County, California
For: Pardee Homes

Project No. **19-81-237-01**

Drawing No. **B-1**



SYMBOL	BORING NO.	DEPTH (ft)	DESCRIPTION	ASTM TEST METHOD	OPTIMUM WATER, %	MAXIMUM DRY DENSITY, pcf
●	**BH-03**	**0-5**	**SILTY SAND (SM), BROWN**	**D1557 - A**	**7.5**	**133.5**
⊠	**BH-07**	**5-10**	**SILTY SAND (SM), BROWN**	**D1557 - A**	**7.8**	**133.3**

MOISTURE-DENSITY RELATIONSHIP RESULTS

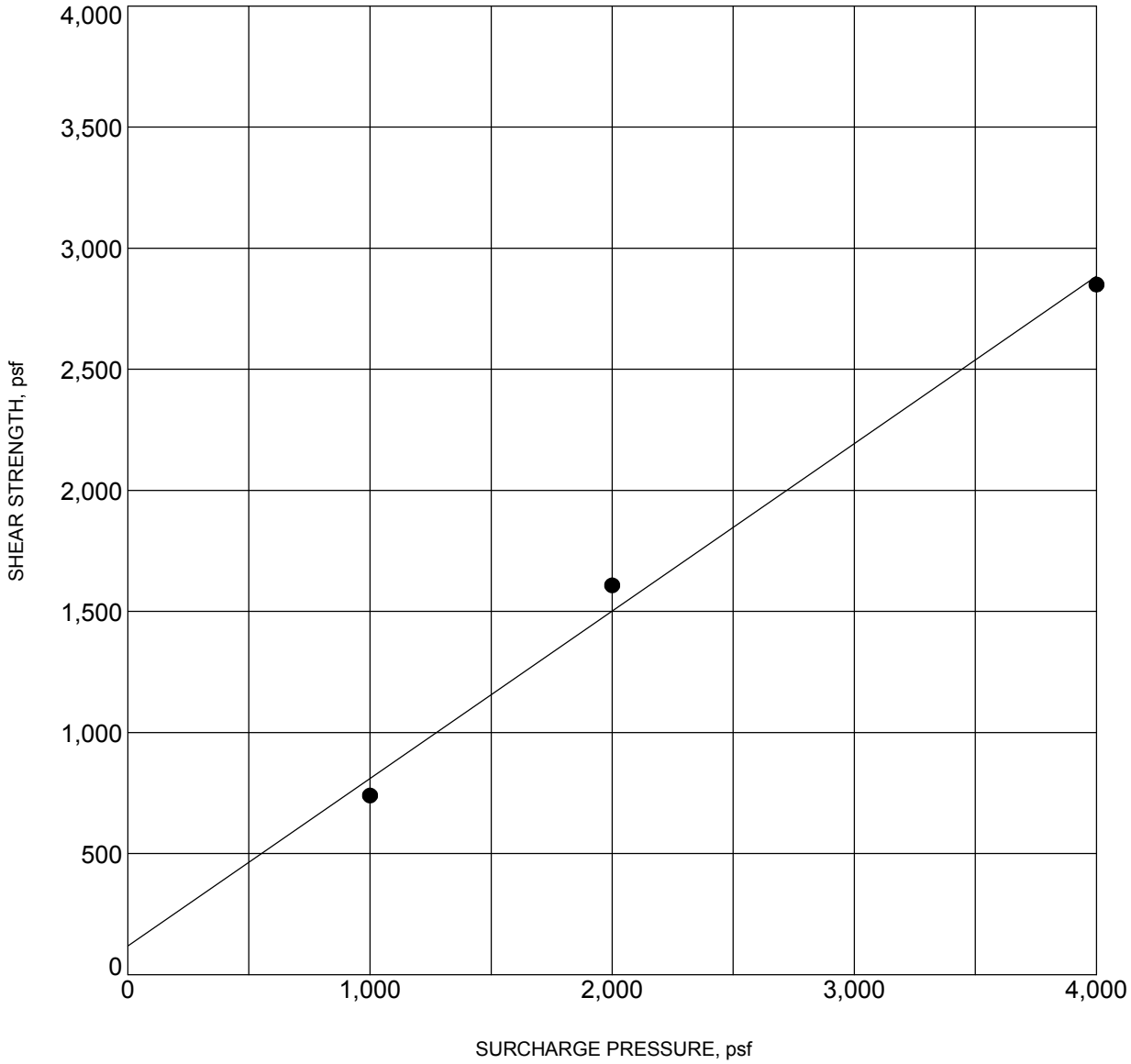
Converse Consultants

Approximately 10.93-Acre Site
Southeast of Xenia Avenue and 8th Street
City of Beaumont, Riverside County, California
For: Pardee Homes

Project No. **19-81-237-01**

Drawing No. **B-2**

Project ID: 19-81-237-01.GPJ; Template: COMPACTION



BORING NO.	:	**BH-03**	DEPTH (ft)	:	**7.5-9.0**
DESCRIPTION	:	**SILTY SAND (SM)**			
COHESION (psf)	:	**120**	FRICTION ANGLE (degrees):		**35**
MOISTURE CONTENT (%)	:	**10.0**	DRY DENSITY (pcf)	:	**118.0**

NOTE: Ultimate Strength.

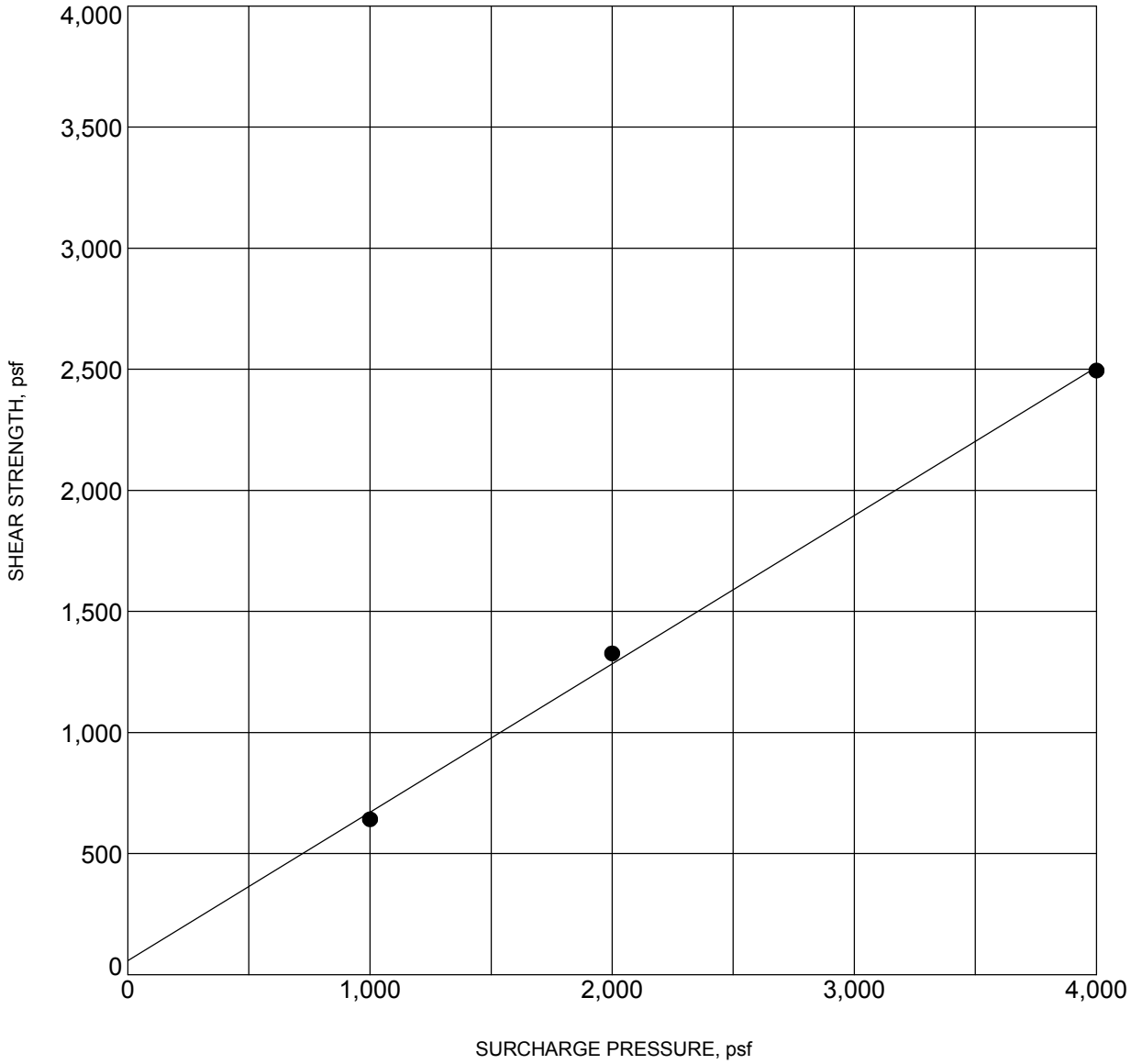
DIRECT SHEAR TEST RESULTS

Converse Consultants

Approximately 10.93-Acre Site
Southeast of Xenia Avenue and 8th Street
City of Beaumont, Riverside County, California
For: Pardee Homes

Project No. **19-81-237-01**

Drawing No. **B-3**



BORING NO.	:	**BH-06**	DEPTH (ft)	:	**5.0-6.5**
DESCRIPTION	:	**SILTY SAND (SM)**			
COHESION (psf)	:	**60**	FRICTION ANGLE (degrees):		**32**
MOISTURE CONTENT (%)	:	**6.0**	DRY DENSITY (pcf)	:	**102.0**

NOTE: Ultimate Strength.

DIRECT SHEAR TEST RESULTS

Converse Consultants

Approximately 10.93-Acre Site
Southeast of Xenia Avenue and 8th Street
City of Beaumont, Riverside County, California
For: Pardee Homes

Project No. **19-81-237-01**

Drawing No. **B-4**

APPENDIX C

LOGS OF BORINGS AND CPT SOUNDINGS BY GEOTEK

Updated Geotechnical and Infiltration Evaluation
Xenia Apartment Project, Beaumont, California
Project No. 2784-CR

GEOTEK

A - FIELD TESTING AND SAMPLING PROCEDURES

The Modified Split-Barrel Sampler (Ring)

The ring sampler is driven into the ground in accordance with ASTM Test Method D 3550. The sampler, with an external diameter of 3.0 inches, is lined with 1-inch long, thin brass rings with inside diameters of approximately 2.4 inches. The sampler is typically driven into the ground 12 or 18 inches with a 140-pound hammer free falling from a height of 30 inches. Blow counts are recorded for every 6 inches of penetration as indicated on the logs of borings. The samples are removed from the sample barrel in the brass rings, sealed, and transported to the laboratory for testing.

Bulk Samples (Large)

These samples are normally large bags of earth materials over 20 pounds in weight collected from the field by means of hand digging or exploratory cuttings.

Bulk Samples (Small)

These are plastic bag samples which are normally airtight and contain less than five pounds in weight of earth materials collected from the field by means of hand digging or exploratory cuttings. These samples are primarily used for determining natural moisture content and classification indices.

B – BORING

The following abbreviations and symbols often appear in the classification and description of soil and rock on the logs of borings:

SOILS

USCS	Unified Soil Classification System
f-c	Fine to coarse
f-m	Fine to medium

GEOLOGIC

B: Attitudes	Bedding: strike/dip
J: Attitudes	Joint: strike/dip
C: Contact line	
……..	Dashed line denotes USCS material change
———	Solid Line denotes unit / formational change
———	Thick solid line denotes end of boring

(Additional denotations and symbols are provided on the logs of borings).

GeoTek, Inc.

LOG OF EXPLORATORY BORING

CLIENT:	Beaumont Land Partners	**DRILLER:**	2R Drilling	**LOGGED BY:**	Franklin Sullivan
PROJECT NAME:	Xenia Apt Project	**DRILL METHOD:**	Hollow Stem	**OPERATOR:**	Adrian
PROJECT NO.:	2784-CR	**HAMMER:**	140#/30"	**RIG TYPE:**	CME 75
LOCATION:	Beaumont			**DATE:**	6/14/2021

Boring No.: B-1

Depth (ft)	SAMPLES: Sample Type	SAMPLES: Blows/ 6 in	SAMPLES: Sample Number	USCS Symbol	MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Others
0					**Alluvium:**			MD, EI, SH, SR
		7 9 11		SM	Silty f Sand, brown, slight moisture	6.0	111.9	
		10 12 17			becomes moist	9.0	115.3	
5		13 14 14				14.3	115.7	HC
		10 14 16				12.9	120.3	
10		21 42 43			contains trace gravel	7.2	126.7	
15		21 24 32				7.0	120.7	
20		23 50/6			**BORING TERMINATED AT 20 FEET** No groundwater encountered Boring backfilled with soil cuttings			
25								
30								

LEGEND

Sample type: ---Ring ---SPT ---Small Bulk ---Large Bulk ---No Recovery ---Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

GeoTek, Inc.

LOG OF EXPLORATORY BORING

CLIENT:	Beaumont Land Partners	**DRILLER:**	2R Drilling	**LOGGED BY:**	Franklin Sullivan
PROJECT NAME:	Xenia Apt Project	**DRILL METHOD:**	Hollow Stem	**OPERATOR:**	Adrian
PROJECT NO.:	2784-CR	**HAMMER:**	140#/30"	**RIG TYPE:**	CME 75
LOCATION:	Beaumont			**DATE:**	6/14/2021

Depth (ft)	SAMPLES: Sample Type	SAMPLES: Blows/ 6 in	SAMPLES: Sample Number	USCS Symbol	Boring No.: B-2 / MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Others
0					**Alluvium:**			EI, SR
		25 21 22		SM	Silty f-m Sand, light brown to brown, slight moisture	6.1	115.8	
		15 23 25			becomes moist, trace gravel	8.1	125.6	
5		9 11 12				6.8	117.7	
		7 9 12			contains trace clay	16.1	114.8	HC
10		11 17 18			Silty f Sand with clay, dark brown, moist	13.9	125.1	HC
15		9 17 22		ML	fine Sandy Silt, dark brown, slight moisture			
20		13 23 37		SM	Silty f-m Sand, medium brown, slight moisture	8.2	118.7	
					BORING TERMINATED AT 20 FEET No groundwater encountered Boring backfilled with soil cuttings			
25								
30								

LEGEND

Sample type: ---Ring ---SPT ---Small Bulk ---Large Bulk ---No Recovery ---Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

GeoTek, Inc.

LOG OF EXPLORATORY BORING

CLIENT:	Beaumont Land Partners	**DRILLER:**	2R Drilling	**LOGGED BY:**	Franklin Sullivan
PROJECT NAME:	Xenia Apt Project	**DRILL METHOD:**	Hollow Stem	**OPERATOR:**	Adrian
PROJECT NO.:	2784-CR	**HAMMER:**	140#/30"	**RIG TYPE:**	CME 75
LOCATION:	Beaumont			**DATE:**	6/15/2021

Depth (ft)	SAMPLES: Sample Type	SAMPLES: Blows/ 6 in	SAMPLES: Sample Number	USCS Symbol	Boring No.: I-1 / MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Others
0				SM	**Alluvium:** Silty f-m Sand, light brown to brown, slight moisture			
5					**BORING TERMINATED AT 5 FEET**			
10								
15								
20								
25								
30								

LEGEND

Sample type: ---Ring ---SPT ---Small Bulk ---Large Bulk ---No Recovery ---Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

GeoTek, Inc.

LOG OF EXPLORATORY BORING

CLIENT:	Beaumont Land Partners	**DRILLER:**	2R Drilling	**LOGGED BY:**	Franklin Sullivan
PROJECT NAME:	Xenia Apt Project	**DRILL METHOD:**	Hollow Stem	**OPERATOR:**	Adrian
PROJECT NO.:	2784-CR	**HAMMER:**	140#/30"	**RIG TYPE:**	CME 75
LOCATION:	Beaumont			**DATE:**	6/15/2021

Depth (ft)	SAMPLES: Sample Type	SAMPLES: Blows/ 6 in	SAMPLES: Sample Number	USCS Symbol	Boring No.: I-2 / MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Others
0				SM	**Alluvium:** Silty f-m Sand, light brown to brown, slight moisture			
5					**BORING TERMINATED AT 5 FEET**			
10								
15								
20								
25								
30								

LEGEND

Sample type: ---Ring ---SPT ---Small Bulk ---Large Bulk ---No Recovery ---Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

GeoTek, Inc.

LOG OF EXPLORATORY BORING

CLIENT:	Beaumont Land Partners	**DRILLER:**	2R Drilling	**LOGGED BY:**	Franklin Sullivan
PROJECT NAME:	Xenia Apt Project	**DRILL METHOD:**	Hollow Stem	**OPERATOR:**	Adrian
PROJECT NO.:	2784-CR	**HAMMER:**	140#/30"	**RIG TYPE:**	CME 75
LOCATION:	Beaumont			**DATE:**	6/15/2021

Depth (ft)	SAMPLES: Sample Type	SAMPLES: Blows/ 6 in	SAMPLES: Sample Number	USCS Symbol	Boring No.: I-3 / MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Others
0				SM	**Alluvium:** Silty f-m Sand, light brown to brown, slight moisture			
5					**BORING TERMINATED AT 5 FEET**			
10								
15								
20								
25								
30								

LEGEND

Sample type: ---Ring ---SPT ---Small Bulk ---Large Bulk ---No Recovery ---Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

GeoTek, Inc.

LOG OF EXPLORATORY BORING

CLIENT:	Beaumont Land Partners	**DRILLER:**	2R Drilling	**LOGGED BY:**	Franklin Sullivan
PROJECT NAME:	Xenia Apt Project	**DRILL METHOD:**	Hollow Stem	**OPERATOR:**	Adrian
PROJECT NO.:	2784-CR	**HAMMER:**	140#/30"	**RIG TYPE:**	CME 75
LOCATION:	Beaumont			**DATE:**	6/15/2021

Depth (ft)	SAMPLES: Sample Type	SAMPLES: Blows/ 6 in	SAMPLES: Sample Number	USCS Symbol	Boring No.: I-4 / MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Others
0				SM	**Alluvium:** Silty f-m Sand, light brown to brown, slight moisture			
5					**BORING TERMINATED AT 5 FEET**			
10								
15								
20								
25								
30								

LEGEND

Sample type: ---Ring ---SPT ---Small Bulk ---Large Bulk ---No Recovery ---Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

GeoTek, Inc.

LOG OF EXPLORATORY BORING

CLIENT:	Beaumont Land Partners	**DRILLER:**	2R Drilling	**LOGGED BY:**	Franklin Sullivan
PROJECT NAME:	Xenia Apt Project	**DRILL METHOD:**	Hollow Stem	**OPERATOR:**	Adrian
PROJECT NO.:	2784-CR	**HAMMER:**	140#/30"	**RIG TYPE:**	CME 75
LOCATION:	Beaumont			**DATE:**	6/16/2021

Depth (ft)	SAMPLES: Sample Type	SAMPLES: Blows/ 6 in	SAMPLES: Sample Number	USCS Symbol	Boring No.: I-5 / MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Others
0				SM	**Alluvium:** Silty f-m Sand, light brown to brown, slight moisture			
5					**BORING TERMINATED AT 5 FEET**			
10								
15								
20								
25								
30								

LEGEND

Sample type: ---Ring ---SPT ---Small Bulk ---Large Bulk ---No Recovery ---Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

GeoTek, Inc.

LOG OF EXPLORATORY BORING

CLIENT:	Beaumont Land Partners	**DRILLER:**	2R Drilling	**LOGGED BY:**	Franklin Sullivan
PROJECT NAME:	Xenia Apt Project	**DRILL METHOD:**	Hollow Stem	**OPERATOR:**	Adrian
PROJECT NO.:	2784-CR	**HAMMER:**	140#/30"	**RIG TYPE:**	CME 75
LOCATION:	Beaumont			**DATE:**	6/16/2021

Depth (ft)	SAMPLES: Sample Type	SAMPLES: Blows/ 6 in	SAMPLES: Sample Number	USCS Symbol	Boring No.: I-6 / MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Others
0				SM	**Alluvium:** Silty f-m Sand, light brown to brown, slight moisture			
5					**BORING TERMINATED AT 5 FEET**			
10								
15								
20								
25								
30								

LEGEND

Sample type: ---Ring ---SPT ---Small Bulk ---Large Bulk ---No Recovery ---Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

GeoTek, Inc.

LOG OF EXPLORATORY BORING

CLIENT:	Beaumont Land Partners	**DRILLER:**	2R Drilling	**LOGGED BY:**	Franklin Sullivan
PROJECT NAME:	Xenia Apt Project	**DRILL METHOD:**	Hollow Stem	**OPERATOR:**	Adrian
PROJECT NO.:	2784-CR	**HAMMER:**	140#/30"	**RIG TYPE:**	CME 75
LOCATION:	Beaumont			**DATE:**	6/16/2021

Boring No.: I-7

Depth (ft)	SAMPLES: Sample Type	SAMPLES: Blows/ 6 in	SAMPLES: Sample Number	USCS Symbol	MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Others
0				SM	**Alluvium:** Silty f-m Sand, light brown to brown, slight moisture			
5					**BORING TERMINATED AT 5 FEET**			
10								
15								
20								
25								
30								

LEGEND

Sample type: ---Ring ---SPT ---Small Bulk ---Large Bulk ---No Recovery ---Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

GeoTek, Inc.

LOG OF EXPLORATORY BORING

CLIENT:	Beaumont Land Partners	**DRILLER:**	2R Drilling	**LOGGED BY:**	Franklin Sullivan
PROJECT NAME:	Xenia Apt Project	**DRILL METHOD:**	Hollow Stem	**OPERATOR:**	Adrian
PROJECT NO.:	2784-CR	**HAMMER:**	140#/30"	**RIG TYPE:**	CME 75
LOCATION:	Beaumont			**DATE:**	6/16/2021

Depth (ft)	SAMPLES: Sample Type	SAMPLES: Blows/ 6 in	SAMPLES: Sample Number	USCS Symbol	**Boring No.: I-8** / MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Others
0				SM	**Alluvium:** Silty f-m Sand, light brown to brown, slight moisture			
5					**BORING TERMINATED AT 5 FEET**			
10								
15								
20								
25								
30								

LEGEND

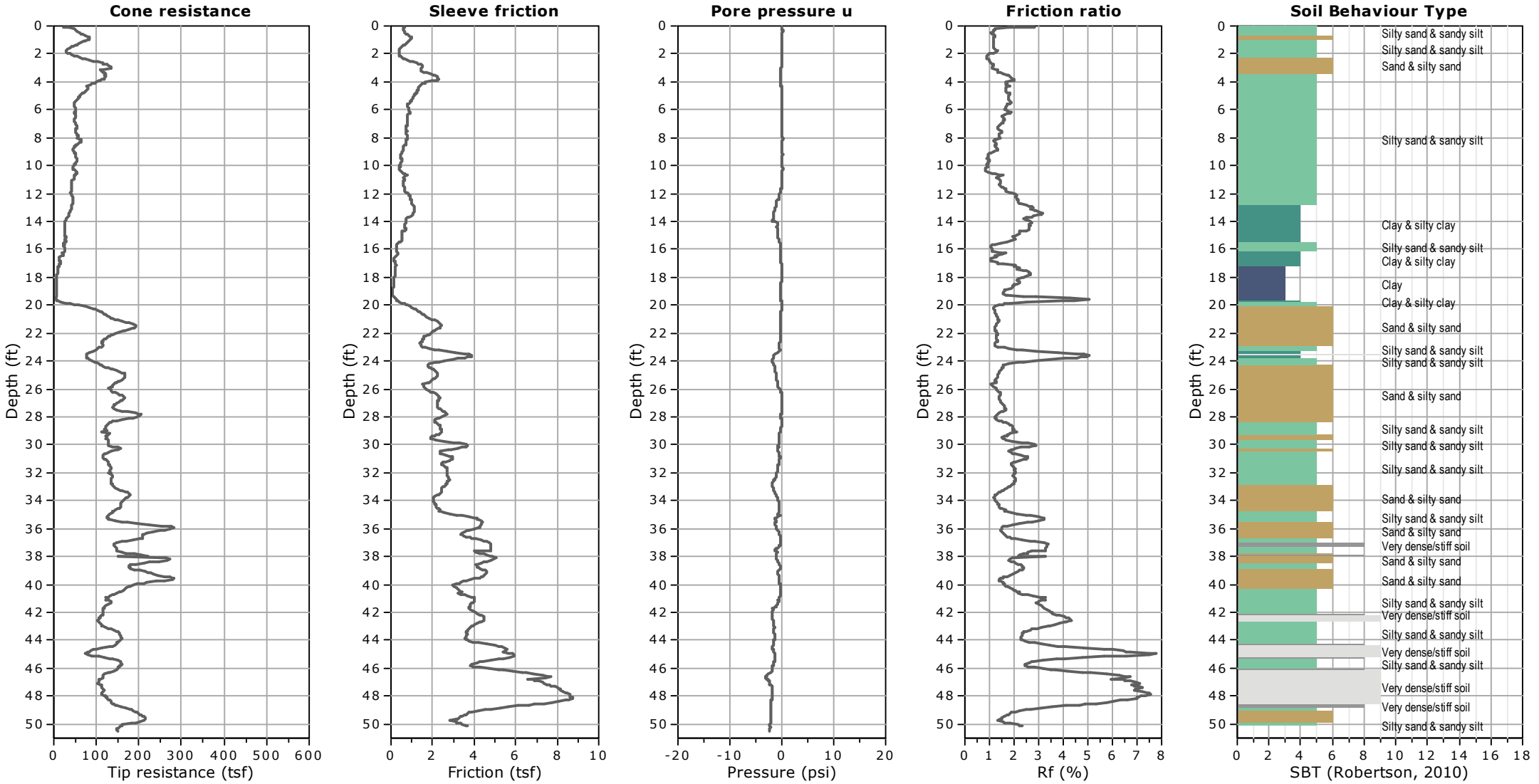
Sample type: ---Ring ---SPT ---Small Bulk ---Large Bulk ---No Recovery ---Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

Kehoe Testing and Engineering
714-901-7270
steve@kehoetesting.com
www.kehoetesting.com

Project: GeoTek / Xenia Site
Location: Beaumont, CA

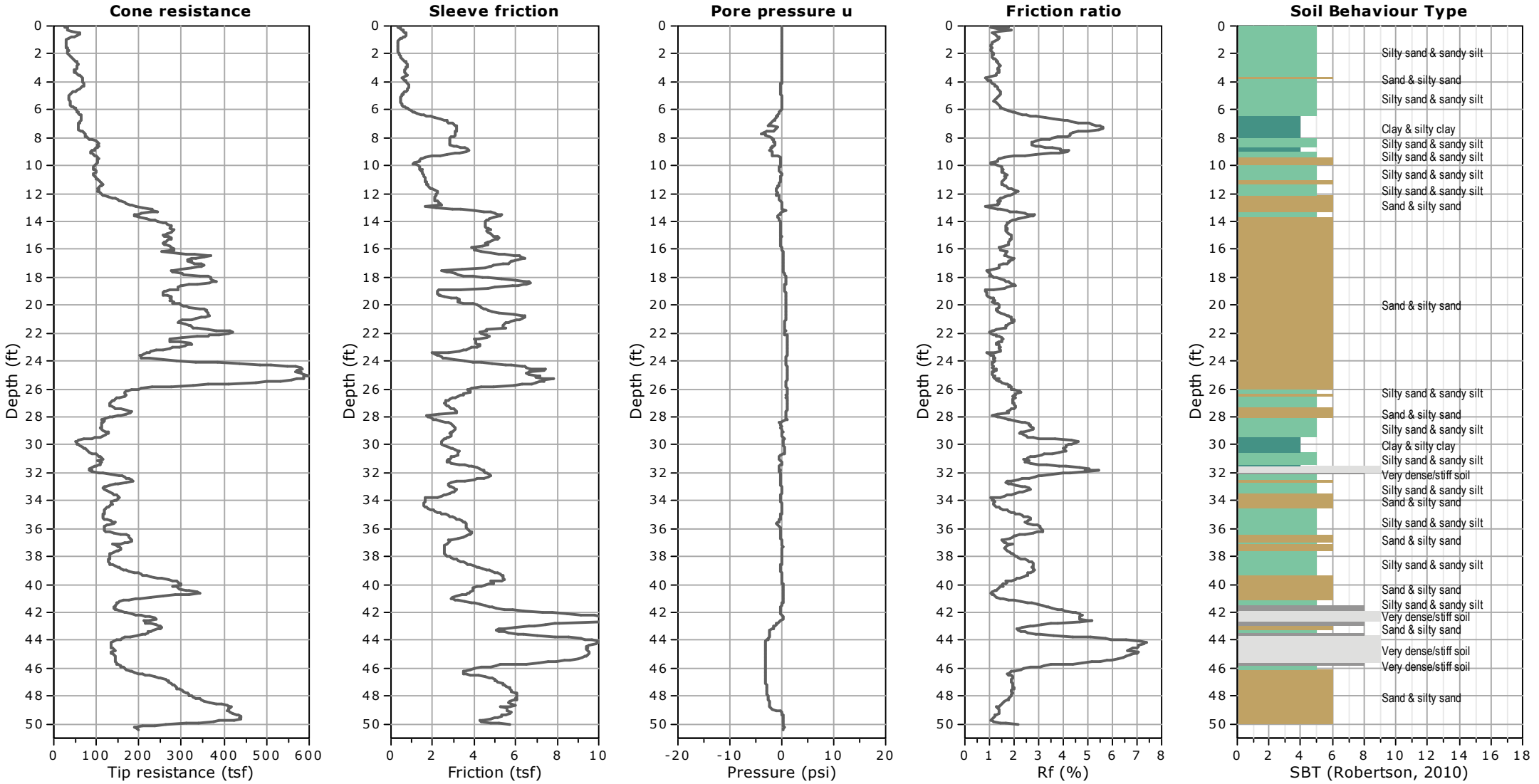
CPT-1
Total depth: 50.54 ft, Date: 6/15/2021



Kehoe Testing and Engineering
714-901-7270
steve@kehoetesting.com
www.kehoetesting.com

Project: **GeoTek / Xenia Site**
Location: **Beaumont, CA**

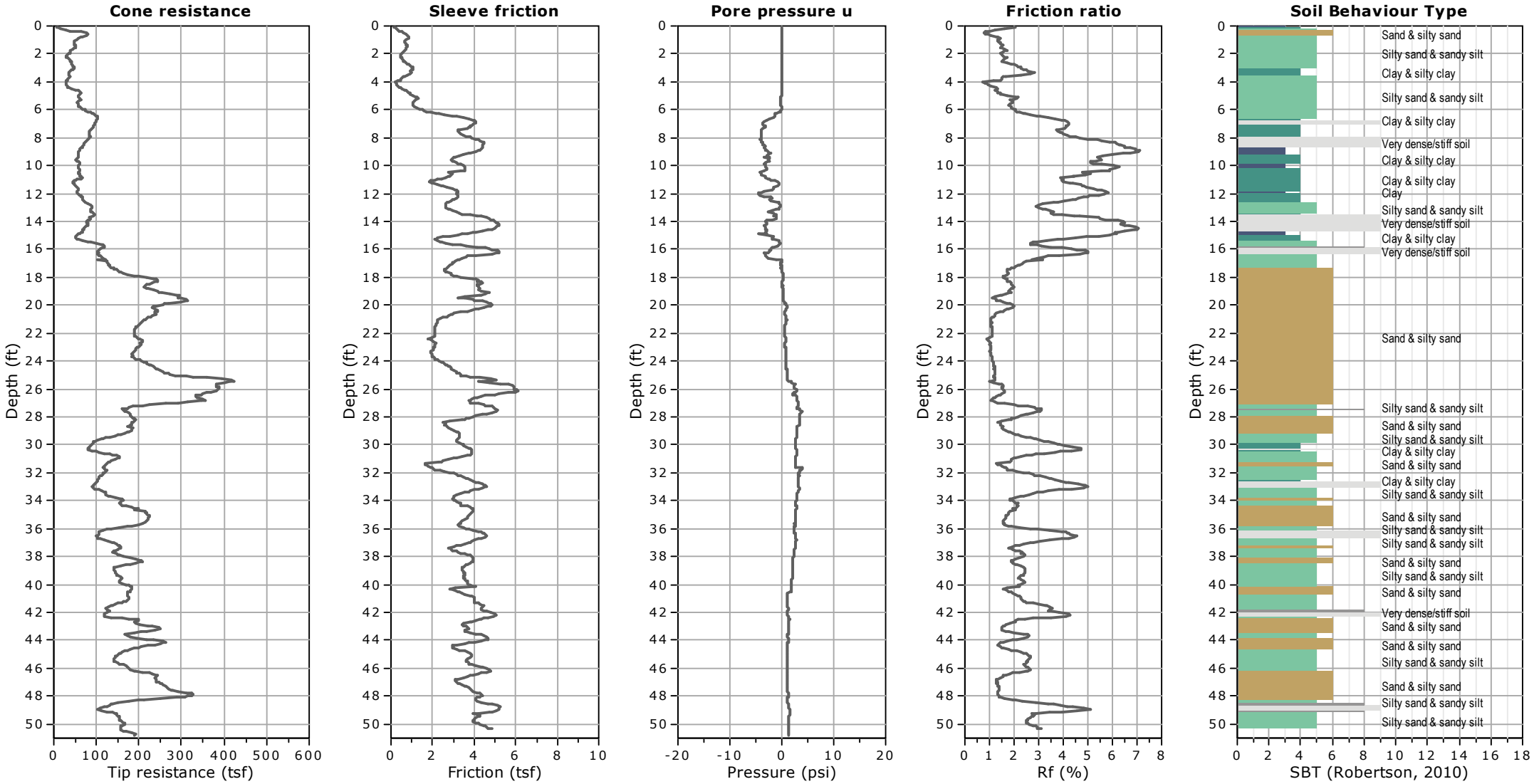
CPT-2
Total depth: 50.42 ft, Date: 6/15/2021



Kehoe Testing and Engineering
714-901-7270
steve@kehoetesting.com
www.kehoetesting.com

Project: GeoTek / Xenia Site
Location: Beaumont, CA

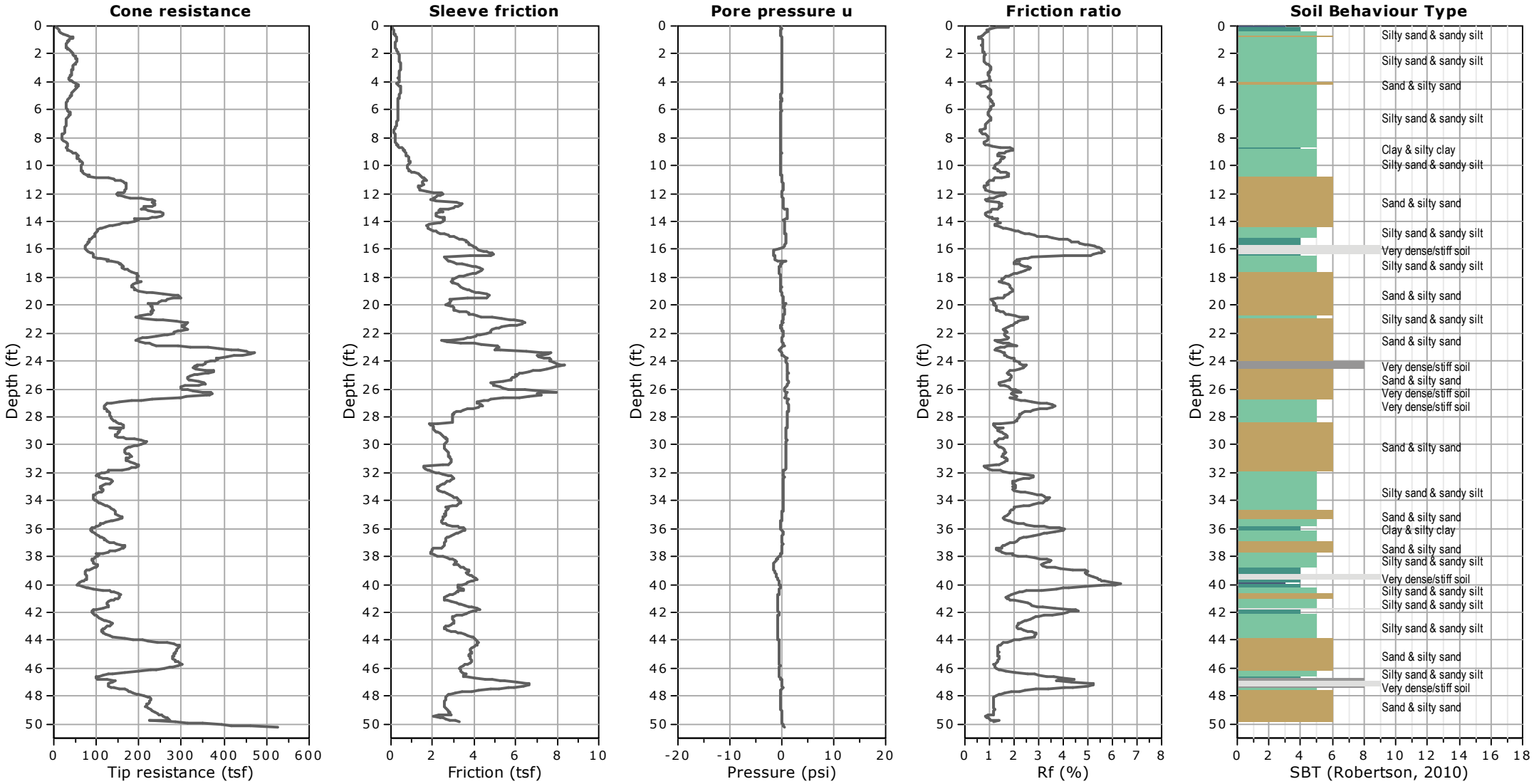
CPT-3
Total depth: 50.76 ft, Date: 6/15/2021



Kehoe Testing and Engineering
714-901-7270
steve@kehoetesting.com
www.kehoetesting.com

Project: GeoTek / Xenia Site
Location: Beaumont, CA

CPT-4
Total depth: 50.21 ft, Date: 6/15/2021



APPENDIX D

LABORATORY TEST RESULTS BY GEOTEK

Updated Geotechnical and Infiltration Evaluation
Xenia Apartment Project, Beaumont, California
Project No. 2784-CR

GEOTEK

SUMMARY OF LABORATORY TESTING

In Situ Moisture Content and Unit Weight

The field moisture content was measured in the laboratory on selected samples collected during the field investigation. The field moisture content is determined as a percentage of the dry unit weight. The dry density was measured in the laboratory on selected ring samples. The results are shown on the logs of exploratory borings in Appendix C.

Moisture-Density Relationship

Laboratory testing was performed on a selected sample collected during the subsurface exploration. The laboratory maximum dry density and optimum moisture content for the soil types were determined in general accordance with test method ASTM Test Procedure D 1557. The results are included herein.

Direct Shear

Direct shear testing was performed on remolded samples of the surficial soils according to ASTM Test Method D 3080. The test results are presented herein.

Expansion Index

Expansion Index testing was performed on a selected soil sample collected from the site. Testing was performed in general accordance with ASTM Test Method D 4829. The test results are presented herein.

Collapse

Collapse tests were conducted in accordance with ASTM D2435. The results of these tests are presented herein.

Sulfate Content, Resistivity and Chloride Content

Testing to determine the water-soluble sulfate content was performed by others in general accordance with ASTM D4327. Resistivity testing was completed by others in general accordance with ASTM G187. Testing to determine the chloride content was performed by others in general accordance with ASTM D4327. pH testing was completed by others in general accordance with ASTM D4972. The results of the testing are provided below.

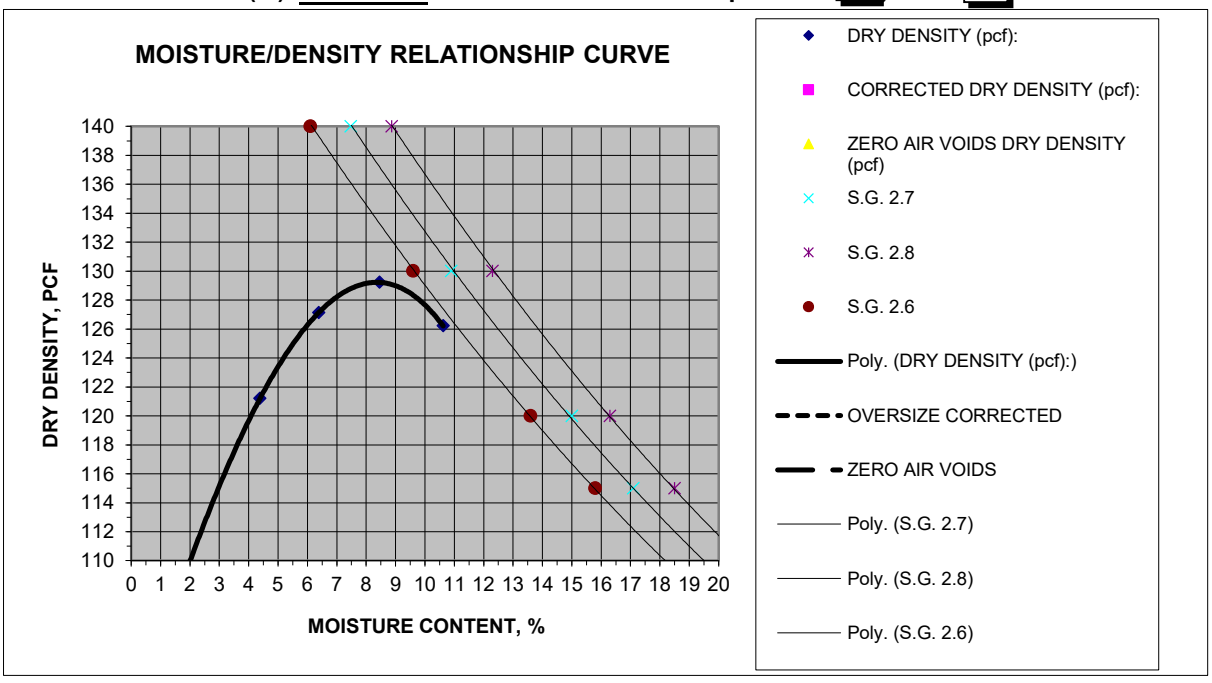
GEOTEK

MOISTURE/DENSITY RELATIONSHIP

Client:	Beaumont Land Partners	**Job No.:**	2784-CR
Project:	Xenia Apartments	**Lab No.:**	Corona
Location:	Beaumont		
Material Type:	Brown Silty Sand		
Material Supplier:	-		
Material Source:	-		
Sample Location:	B1 @ 0-5'		
	-		
Sampled By:	FS	**Date Sampled:**	6/14/2021
Received By:	RJ	**Date Received:**	6/14/2021
Tested By:	RL	**Date Tested:**	6/28/2021
Reviewed By:	RJ	**Date Reviewed:**	6/30/2021

Test Procedure: ASTM D1557 **Method:** A

Oversized Material (%): 3.9 **Correction Required:** [ ] yes [x] no



MOISTURE DENSITY RELATIONSHIP VALUES

Maximum Dry Density, pcf	129.5	**@ Optimum Moisture, %**	8.5
Corrected Maximum Dry Density, pcf		**@ Optimum Moisture, %**	

MATERIAL DESCRIPTION

Grain Size Distribution:

	% Gravel (retained on No. 4)
	% Sand (Passing No. 4, Retained on No. 200)
	% Silt and Clay (Passing No. 200)

Atterberg Limits:

	Liquid Limit, %
	Plastic Limit, %
	Plasticity Index, %

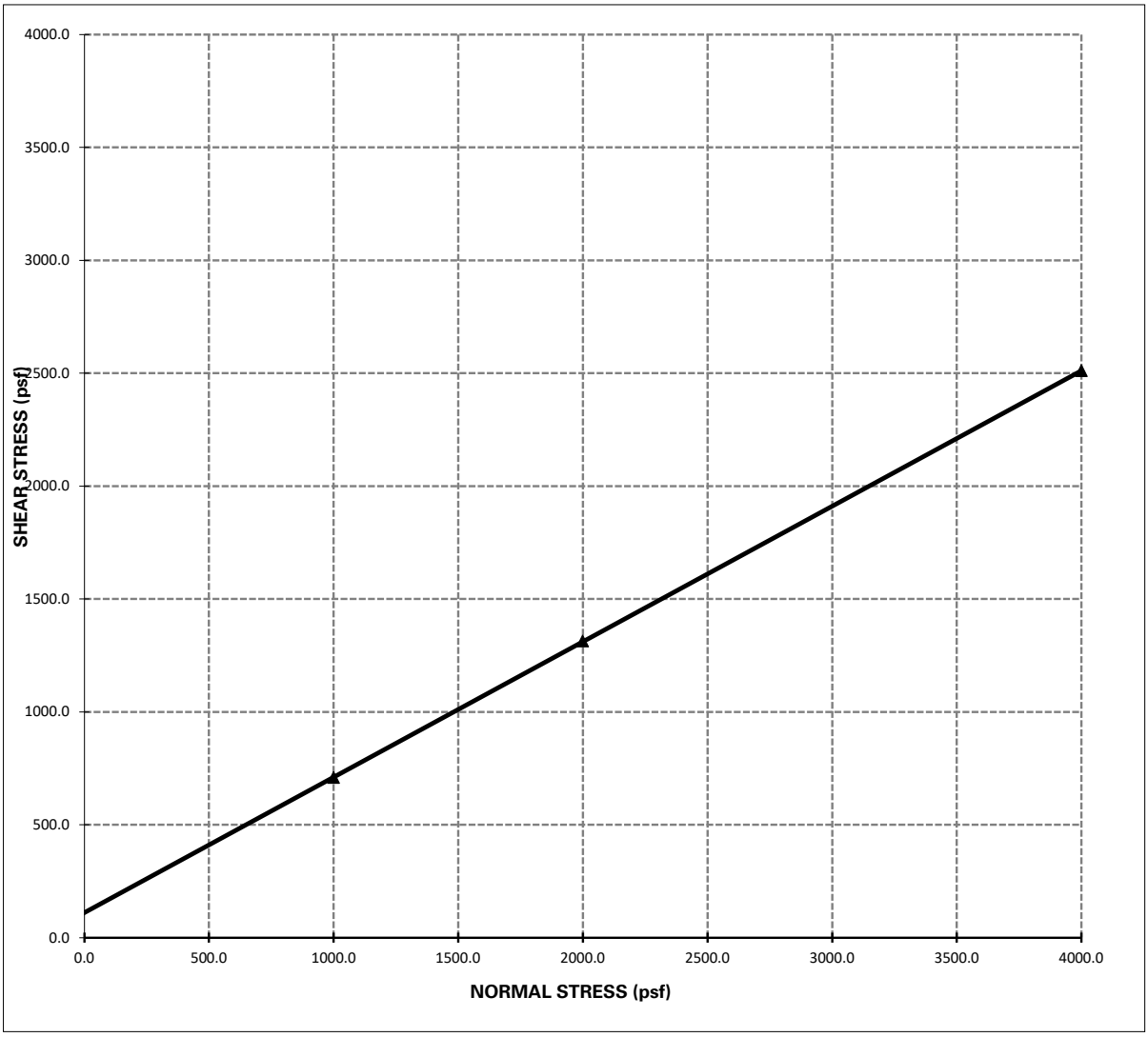
Classification:

Unified Soils Classification:

AASHTO Soils Classification:

DIRECT SHEAR TEST

Project Name:	Beaumont Land Partners	***Sample Location:***	B1 @ 0-5'
Project Number:	2784-CR	***Date Tested:***	7/1/2021



Shear Strength: Φ = 31 °, C = 111 psf

Notes:
1 - The soil specimen used in the shear box was a ring sample remolded to approximately 90% relative compaction from a bulk sample collected during the field investigation.
2 - The above reflect direct shear strength at saturated conditions.
3 - The tests were run at a shear rate of 0.035 in/min.

GEOTEK

EXPANSION INDEX TEST

(ASTM D4829)

Client:	Beaumont Land Partners	***Tested/ Checked By:***	CD Lab No Corona
Project Number:	2784-CR	***Date Tested:***	6/23/2021
Project Location:	Xenia Apartments Project	***Sample Source:***	B1 @ 0-5'
		Sample Description:	

Ring #:_____ Ring Dia. : 4.01" Ring Ht.1"

DENSITY DETERMINATION

A	Weight of compacted sample & ring (gm)	780.8
B	Weight of ring (gm)	365.5
C	Net weight of sample (gm)	**415.3**
D	Wet Density, lb / ft3 (C*0.3016)	**125.3**
E	Dry Density, lb / ft3 (D/1.F)	**115.0**

SATURATION DETERMINATION

F	Moisture Content, %	8.9
G	Specific Gravity, assumed	**2.70**
H	Unit Wt. of Water @ 20 °C, (pcf)	**62.4**
I	% Saturation	**51.7**

READINGS

DATE	TIME	READING	
6/23/2021		0.3410	Initial
6/23/2021		0.3390	10 min/Dry
6/24/2021		0.3440	Final

FINAL MOISTURE

Final Weight of wet sample & tare	% Moisture
804.3	**14.6**

EXPANSION INDEX = 5

GEOTEK

EXPANSION INDEX TEST

(ASTM D4829)

Client:	Beaumont Land Partners	***Tested/ Checked By:***	CD Lab No Corona
Project Number:	2784-CR	***Date Tested:***	6/24/2021
Project Location:	Xenia Apartments Project	***Sample Source:***	B2 @ 0-5'
		Sample Description:	

Ring #:_____ Ring Dia. : 4.01" Ring Ht. 1"

DENSITY DETERMINATION

A	Weight of compacted sample & ring (gm)	781.9
B	Weight of ring (gm)	365.4
C	Net weight of sample (gm)	**416.5**
D	Wet Density, lb / ft3 (C*0.3016)	**125.6**
E	Dry Density, lb / ft3 (D/1.F)	**115.5**

SATURATION DETERMINATION

F	Moisture Content, %	8.8
G	Specific Gravity, assumed	**2.70**
H	Unit Wt. of Water @ 20 °C, (pcf)	**62.4**
I	% Saturation	**51.7**

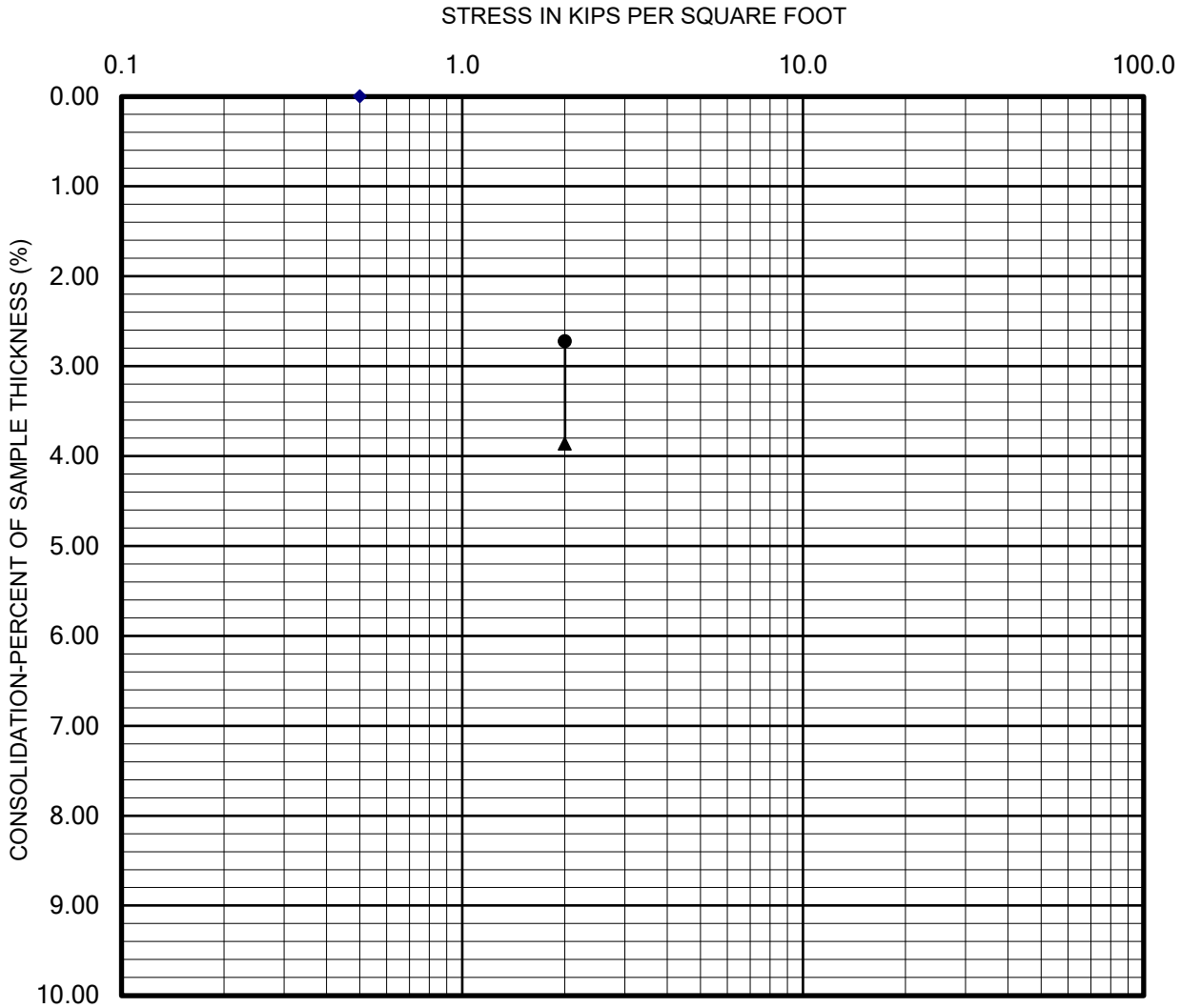
READINGS

DATE	TIME	READING	
6/24/2021		0.2290	Initial
6/24/2021		0.2290	10 min/Dry
6/25/2021		0.2390	Final

FINAL MOISTURE

Final Weight of wet sample & tare	% Moisture
810.3	**15.6**

EXPANSION INDEX = 10



Seating Cycle
Loading Prior to Inundation
Loading After Inundation
Rebound Cycle

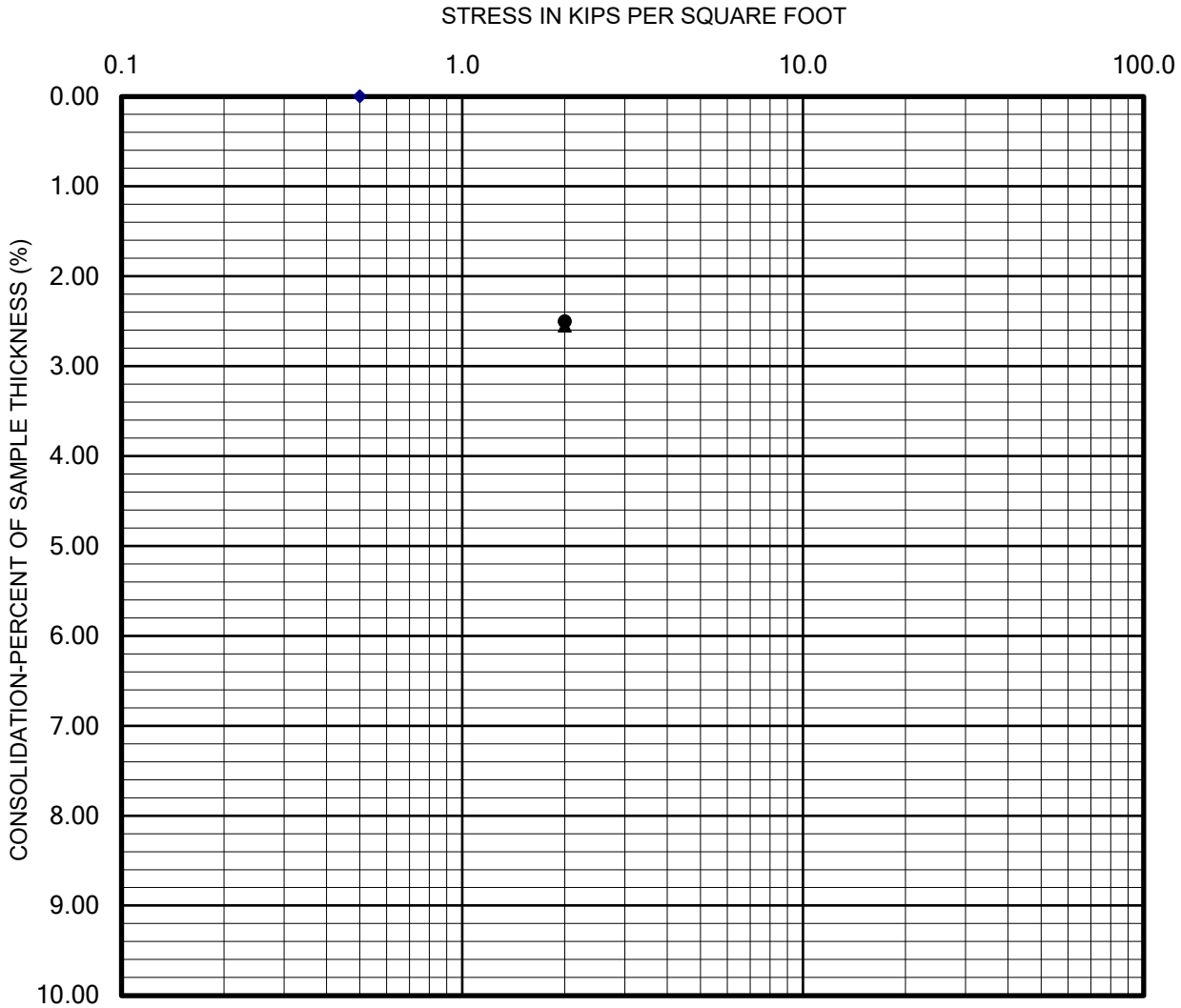
PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 4546

GEOTEK

COLLAPSE REPORT

Sample: B-1 @ 6 feet

CHECKED BY: RJ	Lab: Corona
PROJECT NO.: 2784-CR	Date: 7-1-21



Seating Cycle
Loading Prior to Inundation
Loading After Inundation
Rebound Cycle

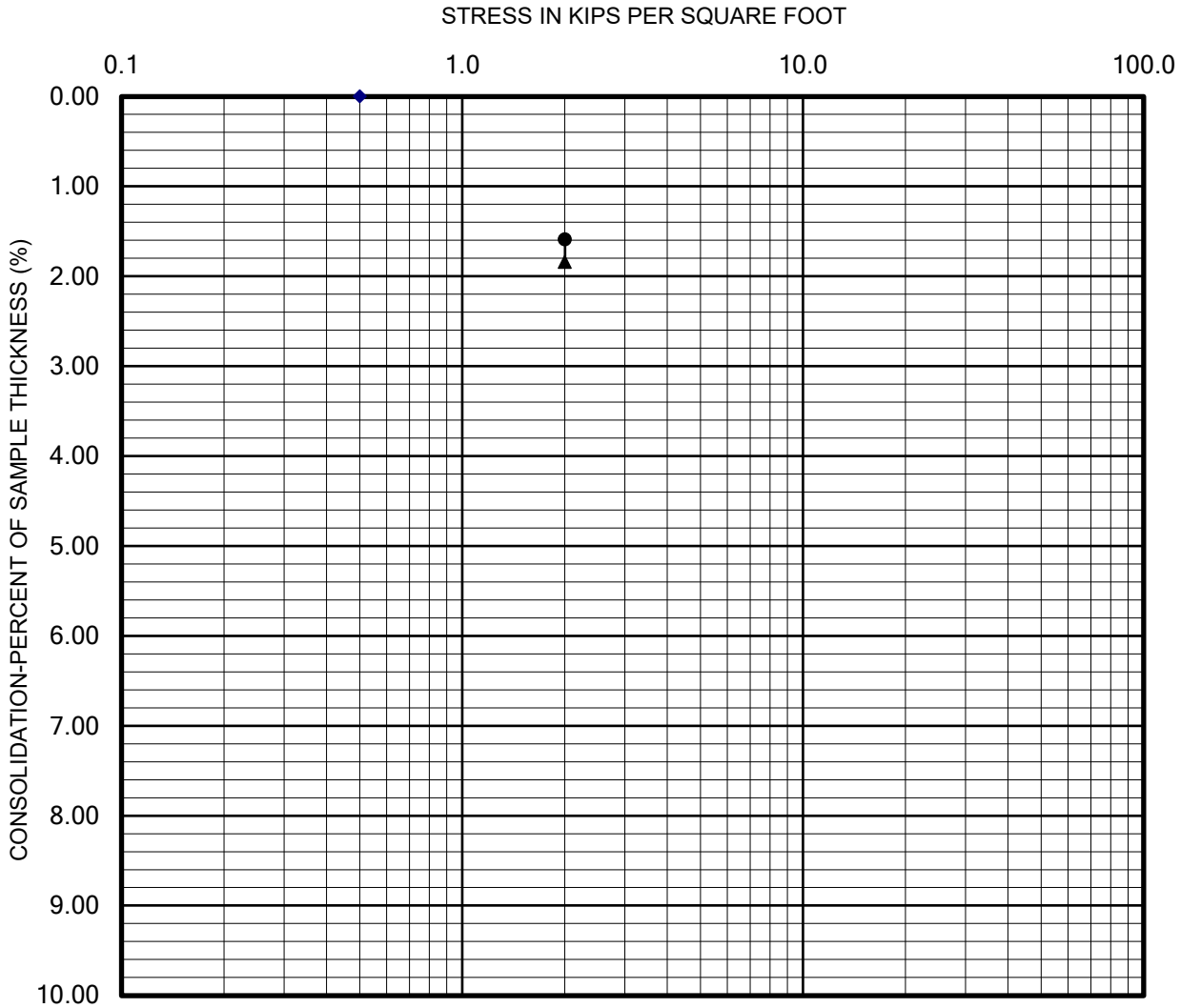
PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 4546

GEOTEK

COLLAPSE REPORT

Sample: B-2 @ 7 feet

CHECKED BY: RJ	Lab: Corona
PROJECT NO.: 2784-CR	Date:7-1-21



Seating Cycle
Loading Prior to Inundation
Loading After Inundation
Rebound Cycle

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 4546

GEOTEK

COLLAPSE REPORT

Sample: B-2 @ 10 feet

CHECKED BY: RJ	Lab: Corona
PROJECT NO.: 2784-CR	Date:7-1-21

Soil Analysis Lab Results

Client: GeoTek, Inc.
Job Name: Xenia Apartment Project, Beaumont
Client Job Number: 2484-CR Beaumont Land Project
Project X Job Number: S210701B
July 6, 2021

	Method	ASTM D4327		ASTM D4327		ASTM G187		ASTM D4972	ASTM G200	SM 4500-S2-D	ASTM D4327	ASTM D6919	ASTM D6919	ASTM D6919	ASTM D6919	ASTM D6919	ASTM D6919	ASTM D4327	ASTM D4327
Bore# / Description	**Depth**	**Sulfates** SO_4^{2-}		**Chlorides** Cl^-		**Resistivity** As Rec'd | Minimum		**pH**	**Redox**	**Sulfide** S^{2-}	**Nitrate** NO_3^-	**Ammonium** NH_4^+	**Lithium** Li^+	**Sodium** Na^+	**Potassium** K^+	**Magnesium** Mg^{2+}	**Calcium** Ca^{2+}	**Fluoride** F_2^{--}	**Phosphate** PO_4^{3-}
	(ft)	(mg/kg)	(wt%)	(mg/kg)	(wt%)	(Ohm-cm)	(Ohm-cm)		(mV)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
2784-CR B-1	0-5	12.2	0.0012	5.7	0.0006	40,200	9,380	7.2	118	<0.01	14.0	22.7	0.04	49.5	4.8	51.2	246.5	2.8	0.3
2784-CR B-2	0-5	16.4	0.0016	5.6	0.0006	66,330	12,730	8.3	175	<0.01	4.2	34.2	0.03	63.8	4.3	56.5	266.5	1.9	0.6

Cations and Anions, except Sulfide and Bicarbonate, tested with Ion Chromatography
mg/kg = milligrams per kilogram (parts per million) of dry soil weight
ND = 0 = Not Detected | NT = Not Tested | Unk = Unknown
Chemical Analysis performed on 1:3 Soil-To-Water extract
PPM = mg/kg (soil) = mg/L (Liquid)

APPENDIX E

PERCOLATION/INFILTRATION TEST DATA

Updated Geotechnical and Infiltration Evaluation
Xenia Apartment Project, Beaumont, California
Project No. 2784-CR

GEOTEK

Client:	**Beaumont Land Partners**
Project:	**Xenia Apartments**
Project No:	**2784-CR**
Date:	**7/7/2021**

Boring No. **I-1**

Infiltration Rate (Porchet Method)

Time Interval, Δt =	10	min
Final Depth to Water, D_F =	44.25	in
Test Hole Radius, r =	4	in
Initial Depth to Water, D_O =	40.25	in
Total Test Hole Depth, D_T =	60.25	in

Equation - $I_t = \dfrac{\Delta H\,(60r)}{\Delta t\,(r+2H_{avg})}$

$H_O = D_T - D_O$ =	20	in
$H_F = D_T - D_F$ =	16	in
$\Delta H = \Delta D = H_O - H_F$ =	4	in
$H_{avg} = (H_O+H_F)/2$ =	18	in

I_t = 2.4 **Inches per Hour**

GEOTEK

Client:	**Beaumont Land Partners**
Project:	**Xenia Apartments**
Project No:	**2784-CR**
Date:	**7/7/2021**

Boring No. **I-2**

Infiltration Rate (Porchet Method)

Time Interval, Δt =	10	min
Final Depth to Water, D_F =	45.75	in
Test Hole Radius, r =	4	in
Initial Depth to Water, D_O =	40.5	in
Total Test Hole Depth, D_T =	60.5	in

Equation - $I_t = \dfrac{\Delta H\,(60r)}{\Delta t\,(r+2H_{avg})}$

$H_O = D_T - D_O$ =	20	in
$H_F = D_T - D_F$ =	14.75	in
$\Delta H = \Delta D = H_O - H_F$ =	5.25	in
$H_{avg} = (H_O+H_F)/2$ =	17.375	in

I_t = 3.3 **Inches per Hour**

GEOTEK

Client:	**Beaumont Land Partners**
Project:	**Xenia Apartments**
Project No:	**2784-CR**
Date:	**7/7/2021**

Boring No. **I-3**

Infiltration Rate (Porchet Method)

Time Interval, Δt =	10	min
Final Depth to Water, D_F =	44.63	in
Test Hole Radius, r =	4	in
Initial Depth to Water, D_O =	42.75	in
Total Test Hole Depth, D_T =	62.75	in

Equation - $I_t = \dfrac{\Delta H\,(60r)}{\Delta t\,(r+2H_{avg})}$

$H_O = D_T - D_O$ =	20	in
$H_F = D_T - D_F$ =	18.12	in
$\Delta H = \Delta D = H_O - H_F$ =	1.88	in
$H_{avg} = (H_O+H_F)/2$ =	19.06	in

I_t = 1.1 **Inches per Hour**

GEOTEK

Client:	**Beaumont Land Partners**
Project:	**Xenia Apartments**
Project No:	**2784-CR**
Date:	**7/7/2021**

Boring No. **I-4**

Infiltration Rate (Porchet Method)

Time Interval, Δt =	10	min
Final Depth to Water, D_F =	46	in
Test Hole Radius, r =	4	in
Initial Depth to Water, D_O =	43.5	in
Total Test Hole Depth, D_T =	63.5	in

Equation - $I_t = \dfrac{\Delta H\,(60r)}{\Delta t\,(r+2H_{avg})}$

$H_O = D_T - D_O$ =	20	in
$H_F = D_T - D_F$ =	17.5	in
$\Delta H = \Delta D = H_O - H_F$ =	2.5	in
$H_{avg} = (H_O+H_F)/2$ =	18.75	in

I_t = 1.4 **Inches per Hour**

GEOTEK

Client:	**Beaumont Land Partners**
Project:	**Xenia Apartments**
Project No:	**2784-CR**
Date:	**7/7/2021**

Boring No. **I-5**

Infiltration Rate (Porchet Method)

Time Interval, Δt =	10	min
Final Depth to Water, D_F =	48.5	in
Test Hole Radius, r =	4	in
Initial Depth to Water, D_O =	42.25	in
Total Test Hole Depth, D_T =	62.25	in

Equation - $I_t = \dfrac{\Delta H\,(60r)}{\Delta t\,(r+2H_{avg})}$

$H_O = D_T - D_O$ =	20	in
$H_F = D_T - D_F$ =	13.75	in
$\Delta H = \Delta D = H_O - H_F$ =	6.25	in
$H_{avg} = (H_O+H_F)/2$ =	16.88	in

I_t = 4.0 **Inches per Hour**

GEOTEK

Client:	**Beaumont Land Partners**
Project:	**Xenia Apartments**
Project No:	**2784-CR**
Date:	**7/7/2021**

Boring No. **I-6**

Infiltration Rate (Porchet Method)

Time Interval, Δt =	10	min
Final Depth to Water, D_F =	44.3	in
Test Hole Radius, r =	4	in
Initial Depth to Water, D_O =	40.5	in
Total Test Hole Depth, D_T =	60.5	in

Equation - $I_t = \dfrac{\Delta H\,(60r)}{\Delta t\,(r+2H_{avg})}$

$H_O = D_T - D_O$ =	20	in
$H_F = D_T - D_F$ =	16.2	in
$\Delta H = \Delta D = H_O - H_F$ =	3.8	in
$H_{avg} = (H_O+H_F)/2$ =	18.1	in

I_t = 2.3 **Inches per Hour**

GEOTEK

Client:	**Beaumont Land Partners**
Project:	**Xenia Apartments**
Project No:	**2784-CR**
Date:	**7/7/2021**

Boring No. **I-7**

Infiltration Rate (Porchet Method)

Time Interval, Δt =	10	min
Final Depth to Water, D_F =	42.5	in
Test Hole Radius, r =	4	in
Initial Depth to Water, D_O =	40.5	in
Total Test Hole Depth, D_T =	60.5	in

Equation - $I_t = \dfrac{\Delta H\,(60r)}{\Delta t\,(r+2H_{avg})}$

$H_O = D_T - D_O$ =	20	in
$H_F = D_T - D_F$ =	18	in
$\Delta H = \Delta D = H_O - H_F$ =	2	in
$H_{avg} = (H_O+H_F)/2$ =	19	in

I_t = 1.1 **Inches per Hour**

GEOTEK

Client:	**Beaumont Land Partners**
Project:	**Xenia Apartments**
Project No:	**2784-CR**
Date:	**7/7/2021**

Boring No. **I-8**

Infiltration Rate (Porchet Method)

Time Interval, Δt =	30	min
Final Depth to Water, D_F =	46.38	in
Test Hole Radius, r =	4	in
Initial Depth to Water, D_O =	43.63	in
Total Test Hole Depth, D_T =	63.63	in

Equation - $I_t = \dfrac{\Delta H\,(60r)}{\Delta t\,(r+2H_{avg})}$

$H_O = D_T - D_O$ =	20	in
$H_F = D_T - D_F$ =	17.25	in
$\Delta H = \Delta D = H_O - H_F$ =	2.75	in
$Havg = (H_O+H_F)/2$ =	18.63	in

I_t = 0.5 **Inches per Hour**

GEOTEK

Percolation Test Data Sheet

Project:	Xenia Apt Project, Beaumont	**Project No:**	2784-CR	**Date:**	6/16/21
Test Hole No:	I-1	**Tested By:**	F. Sullivan		
Depth of Test Hole, D_T:	5.02'	**USCS Soil Classification:**	SM		

Test Hole Dimensions (inches)			**Length**	**Width**	
Diameter (if round)=	8	**Sides (if rectangular)=**			

Sandy Soil Criteria Test*

Trial No.	Start Time	Stop Time	Time Interval, (min.)	Initial Depth to Water (in.)	Final Depth to Water (in.)	Change in Water Level (in.)	Greater than or Equal to 6"? (y/n)
1	9:00	9:25	25	40.25	50.25	10	Y
2	9:25	9:50	25	40.25	50	9.25	Y

*If two consecutive measurements show that six inches of water seeps away in less than 25 minutes, the test shall be run for an additional hour with measurements taken every 10 minutes. Other wise, pre-soak (fill) overnight. Obtain at least twelve measurements per hole over at least six hours (approximately 30 minute intervals) with a precision of at least 0.25".

Trial No.	Start Time	Stop Time	Δt Time Interval (min.)	D_o Initial Depth to Water (in.)	D_f Final Depth to Water (in.)	ΔD Change in Water Level (in.)	Percolation Rate (min./in.)
1	9:50	10:00	10	40.25	44.75	4.5	2.22
2	10:00	10:14	10	40.25	44.5	4.25	2.35
3	10:14	10:24	10	40.25	44.5	4.25	2.35
4	10:24	10:34	10	40.25	44.25	4.0	2.5
5	10:34	10:44	10	40.25	45.11	4.86	2.06
6	10:44	10:54	10	40.25	44.25	4.0	2.5
7							
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10							
11							
12							
13							
14							
15							

COMMENTS:

Percolation Test Data Sheet

Project:	Xenia Apt Project, Beaumont	Project No:	2794-CR	Date:	6/16/21
Test Hole No:	I-2	Tested By:	F. Sullivan		
Depth of Test Hole, D_T:	5.04'	USCS Soil Classification:	SM		
Test Hole Dimensions (inches)				Length	Width
Diameter (if round)=	8	Sides (if rectangular)=			

Sandy Soil Criteria Test*

Trial No.	Start Time	Stop Time	Time Interval, (min.)	Initial Depth to Water (in.)	Final Depth to Water (in.)	Change in Water Level (in.)	Greater than or Equal to 6"? (y/n)
1	9:15	9:40	25	40.5	54.5	14.5	Y
2	9:40	10:05	25	40.5	53.5	13.0	Y

*If two consecutive measurements show that six inches of water seeps away in less than 25 minutes, the test shall be run for an additional hour with measurements taken every 10 minutes. Other wise, pre-soak (fill) overnight. Obtain at least twelve measurements per hole over at least six hours (approximately 30 minute intervals) with a precision of at least 0.25".

Trial No.	Start Time	Stop Time	Δt Time Interval (min.)	D_o Initial Depth to Water (in.)	D_f Final Depth to Water (in.)	ΔD Change in Water Level (in.)	Percolation Rate (min./in.)
1	10:05	10:15	10	40.5	46	5.5	1.82
2	10:15	10:25	10	40.5	45.75	5.25	1.90
3	10:25	10:35	10	40.5	46	5.5	1.82
4	10:35	10:45	10	40.5	45.75	5.25	1.90
5	10:45	10:55	10	40.5	45	4.5	2.22
6	10:55	11:05	10	40.5	45.75	5.25	1.90
7							
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12							
13							
14							
15							

COMMENTS:

Percolation Test Data Sheet

Project:	Xenia Apt project, Beaumont	Project No:	2784-CR	Date:	6/16/21
Test Hole No:	I-3	Tested By:	F. Sullivan		
Depth of Test Hole, D_T:	5.23'	USCS Soil Classification:	SM		
Test Hole Dimensions (inches)			Length	Width	
Diameter (if round)=	8	Sides (if rectangular)=			

Sandy Soil Criteria Test*

Trial No.	Start Time	Stop Time	Time Interval, (min.)	Initial Depth to Water (in.)	Final Depth to Water (in.)	Change in Water Level (in.)	Greater than or Equal to 6"? (y/n)
1	10:48	11:13	25	42.75	49	6.25	Y
2	11:13	11:38	25	42.75	48.75	6.0	Y

*If two consecutive measurements show that six inches of water seeps away in less than 25 minutes, the test shall be run for an additional hour with measurements taken every 10 minutes. Other wise, pre-soak (fill) overnight. Obtain at least twelve measurements per hole over at least six hours (approximately 30 minute intervals) with a precision of at least 0.25".

Trial No.	Start Time	Stop Time	Δt Time Interval (min.)	D_o Initial Depth to Water (in.)	D_f Final Depth to Water (in.)	ΔD Change in Water Level (in.)	Percolation Rate (min./in.)
1	11:48	11:58	10	42.75	44.5	1.75	5.71
2	11:58	12:08	10	42.75	45.25	2.5	4.0
3	12:08	12:18	10	42.75	45.0	2.25	4.44
4	12:18	12:28	10	42.75	44.75	2.0	5.0
5	12:28	12:38	10	42.75	45.25	2.5	4.0
6	12:38	12:48	10	42.75	44.63	1.88	5.32
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10							
11							
12							
13							
14							
15							

COMMENTS:

Percolation Test Data Sheet

Project:	Xenia Apt Project, Beaumont	**Project No:**	2784-Cr	**Date:**	6/16/21
Test Hole No:	I-4	**Tested By:**	F. Sullivan		
Depth of Test Hole, D_f:	5.29'	**USCS Soil Classification:**	SM		
Test Hole Dimensions (inches)				**Length**	**Width**
Diameter (if round)=	8	**Sides (if rectangular)=**			

Sandy Soil Criteria Test*

Trial No.	Start Time	Stop Time	Time Interval, (min.)	Initial Depth to Water (in.)	Final Depth to Water (in.)	Change in Water Level (in.)	Greater than or Equal to 6"? (y/n)
1	12:16	12:41	25	43.5	50	6.5	Y
2	12:41	1:06	25	43.5	49.88	6.38	Y

*If two consecutive measurements show that six inches of water seeps away in less than 25 minutes, the test shall be run for an additional hour with measurements taken every 10 minutes. Other wise, pre-soak (fill) overnight. Obtain at least twelve measurements per hole over at least six hours (approximately 30 minute intervals) with a precision of at least 0.25".

Trial No.	Start Time	Stop Time	Δt Time Interval (min.)	D_o Initial Depth to Water (in.)	D_f Final Depth to Water (in.)	ΔD Change in Water Level (in.)	Percolation Rate (min./in.)
1	1:06	1:16	10	43.5	46.63	3.13	3.19
2	1:16	1:26	10	43.5	46.5	3.0	3.33
3	1:26	1:36	10	43.5	46.25	2.75	3.64
4	1:36	1:46	10	43.5	46.5	3	3.33
5	1:46	1:56	10	43.5	46.5	3	3.33
6	1:56	2:06	10	43.5	46.0	2.5	4
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12							
13							
14							
15							

COMMENTS:

Percolation Test Data Sheet

Project:	Xenia Apt Project, Beaumont	**Project No:**	2784-Cr	**Date:**	6/17/21
Test Hole No:	I-5	**Tested By:**	F. Sullivan		
Depth of Test Hole, D_T:	5.19'	**USCS Soil Classification:**	SM		
Test Hole Dimensions (inches)			**Length**	**Width**	
Diameter (if round)=	8	**Sides (if rectangular)=**			

Sandy Soil Criteria Test*

Trial No.	Start Time	Stop Time	Time Interval, (min.)	Initial Depth to Water (in.)	Final Depth to Water (in.)	Change in Water Level (in.)	Greater than or Equal to 6"? (y/n)
1	9:39	9:04	25	42.25	61.75	19.5	Y
2	9:04	9:29	25	42.25	61.5	19.25	Y

*If two consecutive measurements show that six inches of water seeps away in less than 25 minutes, the test shall be run for an additional hour with measurements taken every 10 minutes. Other wise, pre-soak (fill) overnight. Obtain at least twelve measurements per hole over at least six hours (approximately 30 minute intervals) with a precision of at least 0.25".

Trial No.	Start Time	Stop Time	Δt Time Interval (min.)	D_o Initial Depth to Water (in.)	D_f Final Depth to Water (in.)	ΔD Change in Water Level (in.)	Percolation Rate (min./in.)
1	9:29	9:39	10	42.25	47.75	5.5	1.82
2	9:39	9:49	10	42.25	49.5	7.25	1.38
3	9:49	9:59	10	42.25	49.13	6.88	1.45
4	9:59	10:09	10	42.25	48.75	6.5	1.54
5	10:09	10:19	10	42.25	48.63	6.38	1.57
6	10:19	10:29	10	42.25	48.5	6.25	1.6
7							
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13							
14							
15							

COMMENTS:

Percolation Test Data Sheet

Project:	Xenia Apt Project, Beaumont	Project No:	2784-Cr	Date:	6/17/21
Test Hole No:	I-6	Tested By:	F. Sullivan		
Depth of Test Hole, D_T:	5.04	USCS Soil Classification:	SM		
Test Hole Dimensions (inches)			Length	Width	
Diameter (if round)=	8	Sides (if rectangular)=			

Sandy Soil Criteria Test*

Trial No.	Start Time	Stop Time	Time Interval, (min.)	Initial Depth to Water (in.)	Final Depth to Water (in.)	Change in Water Level (in.)	Greater than or Equal to 6"? (y/n)
1	8:42	9:07	25	40.5	53.4	12.9	Y
2	9:07	9:32	25	40.5	53.88	13.3	Y

*If two consecutive measurements show that six inches of water seeps away in less than 25 minutes, the test shall be run for an additional hour with measurements taken every 10 minutes. Other wise, pre-soak (fill) overnight. Obtain at least twelve measurements per hole over at least six hours (approximately 30 minute intervals) with a precision of at least 0.25".

Trial No.	Start Time	Stop Time	Δt Time Interval (min.)	D_o Initial Depth to Water (in.)	D_f Final Depth to Water (in.)	ΔD Change in Water Level (in.)	Percolation Rate (min./in.)
1	9:32	9:42	10	40.5	45.38	4.88	2.05
2	9:42	9:52	10	40.5	45.38	4.88	2.05
3	9:52	10:02	10	40.5	44.25	3.75	2.67
4	10:02	10:12	10	40.5	46.25	5.75	1.74
5	10:12	10:22	10	40.5	44.5	4.0	2.5
6	10:22	10:32	10	40.5	44.3	3.80	2.63
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15							

COMMENTS:

Percolation Test Data Sheet

Project:	Xenia Apt Project, Beaumont	**Project No:**	2784-Cr	**Date:**	6/17/21
Test Hole No:	I-7	**Tested By:**	F. Sullivan		
Depth of Test Hole, D_T:	5.04'	**USCS Soil Classification:**	SM		
Test Hole Dimensions (inches)				Length	Width
Diameter (if round)=	8	**Sides (if rectangular)=**			

Sandy Soil Criteria Test*

Trial No.	Start Time	Stop Time	Time Interval, (min.)	Initial Depth to Water (in.)	Final Depth to Water (in.)	Change in Water Level (in.)	Greater than or Equal to 6"? (y/n)
1	10:20	10:45	25	40.5	48.38	7.88	Y
2	10:45	11:10	25	40.5	48	7.5	Y

*If two consecutive measurements show that six inches of water seeps away in less than 25 minutes, the test shall be run for an additional hour with measurements taken every 10 minutes. Other wise, pre-soak (fill) overnight. Obtain at least twelve measurements per hole over at least six hours (approximately 30 minute intervals) with a precision of at least 0.25".

Trial No.	Start Time	Stop Time	Δt Time Interval (min.)	D_o Initial Depth to Water (in.)	D_f Final Depth to Water (in.)	ΔD Change in Water Level (in.)	Percolation Rate (min./in.)
1	11:10	11:20	10	40.5	43.25	2.75	3.64
2	11:20	11:30	10	40.5	43.38	2.88	3.47
3	11:30	11:40	10	40.5	43.5	3.0	3.33
4	11:40	11:50	10	40.5	42.88	2.38	4.20
5	11:50	12:00	10	40.5	43.5	3.0	3.33
6	12:00	12:10	10	40.5	42.5	2.0	5.0
7							
8							
9							
10							
11							
12							
13							
14							
15							

COMMENTS:

Percolation Test Data Sheet

Project:	Xenia Apt Project, Beaumont	Project No:	2784-Cr	Date:	7/7/21
Test Hole No:	I-8	Tested By:	F. Sullivan		
Depth of Test Hole, D_T:	5.30'	USCS Soil Classification:	SM		
Test Hole Dimensions (inches)			Length	Width	
Diameter (if round)=	8	Sides (if rectangular)=			

Sandy Soil Criteria Test*

Trial No.	Start Time	Stop Time	Time Interval, (min.)	Initial Depth to Water (in.)	Final Depth to Water (in.)	Change in Water Level (in.)	Greater than or Equal to 6"? (y/n)
1	8:49	9:14	25	43.63	45.26	1.63	N
2	9:14	9:39	25	43.63	45.13	1.5	N

*If two consecutive measurements show that six inches of water seeps away in less than 25 minutes, the test shall be run for an additional hour with measurements taken every 10 minutes. Other wise, pre-soak (fill) overnight. Obtain at least twelve measurements per hole over at least six hours (approximately 30 minute intervals) with a precision of at least 0.25".

Trial No.	Start Time	Stop Time	Δt Time Interval (min.)	D_o Initial Depth to Water (in.)	D_f Final Depth to Water (in.)	ΔD Change in Water Level (in.)	Percolation Rate (min./in.)
1	9:39	10:09	30	43.63	46.76	3.13	9.58
2	10:09	10:39	30	43.63	46.51	2.88	10.42
3	10:39	11:09	30	43.63	47.13	3.5	8.57
4	11:09	11:39	30	43.63	46.13	2.5	12.0
5	11:39	12:09	30	43.63	46.76	3.13	9.58
6	12:09	12:39	30	43.63	46.51	2.88	10.42
7	12:39	1:09	30	43.63	46.88	3.25	9.23
8	1:09	1:39	30	43.63	46.88	3.25	9.23
9	1:39	2:09	30	43.63	46.13	2.5	12.0
10	2:09	2:39	30	43.63	46.13	2.5	12.0
11	2:39	3:09	30	43.63	46.63	3.0	10.0
12	3:09	3:39	30	43.63	46.38	2.75	10.91
13							
14							
15							

COMMENTS:

APPENDIX F

SEISMIC SETTLEMENT ANALYSES

Updated Geotechnical and Infiltration Evaluation
Xenia Apartment Project, Beaumont, California
Project No. 2784-CR

GEOTEK

GeoTek, Inc.
1548 N. Maple Street
Corona, CA 92878
951-710-1160, www.geotekusa.com

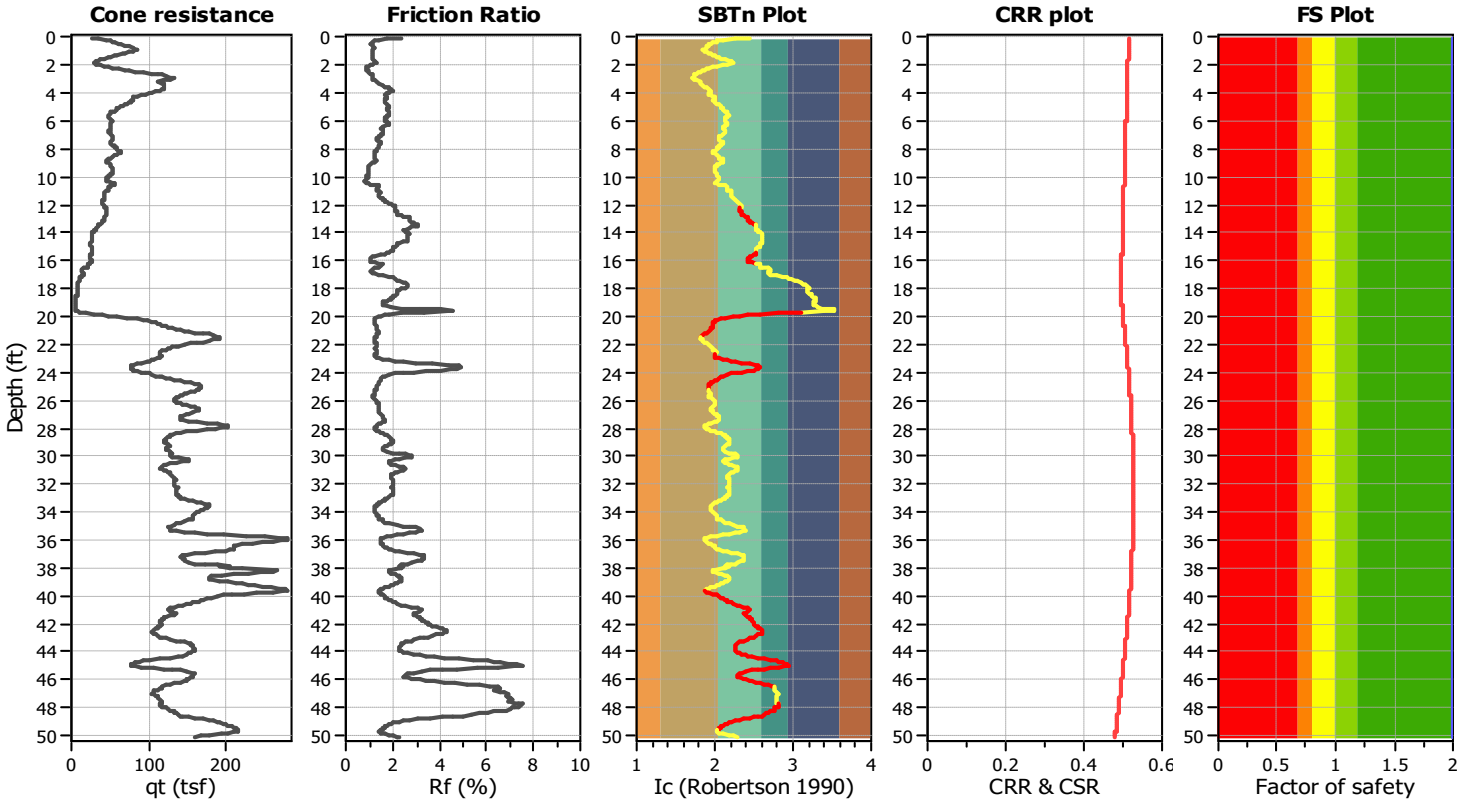
LIQUEFACTION ANALYSIS REPORT

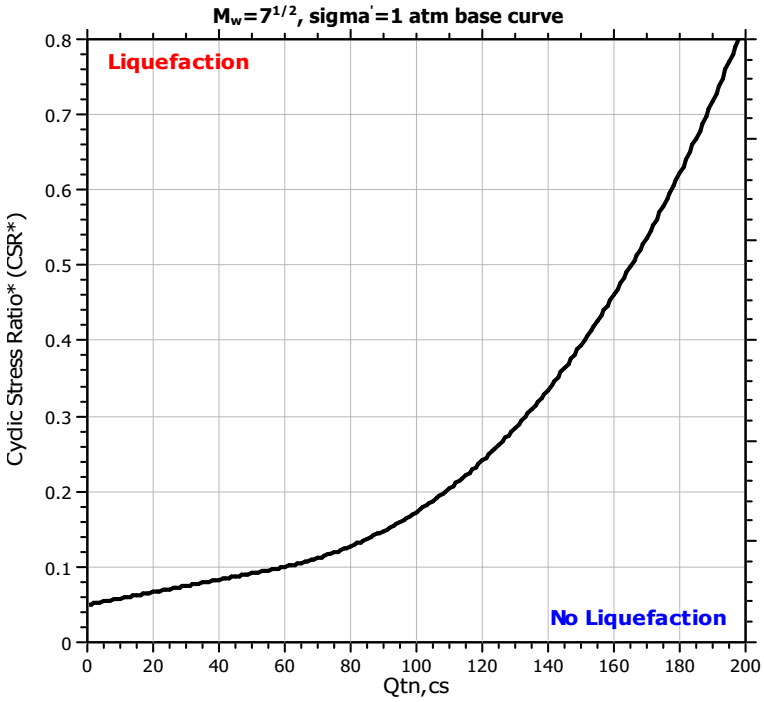
Project title : Xenia Site **Location : Beaumont, California**

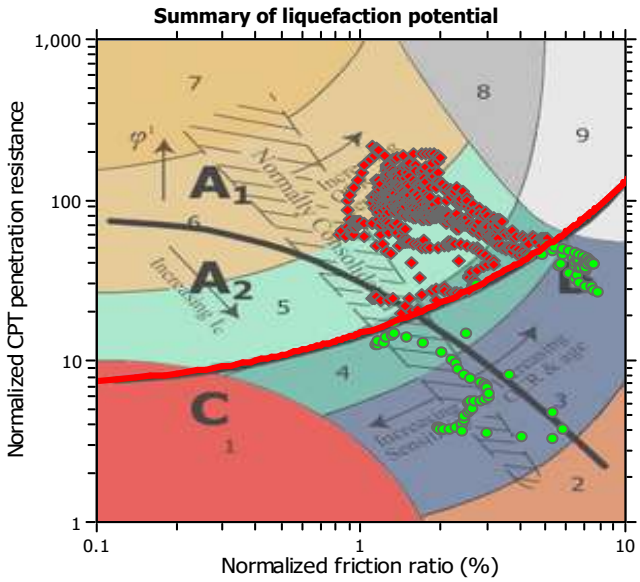
CPT file : CPT-1

Input parameters and analysis data

Analysis method:	NCEER (1998)	G.W.T. (in-situ):	100.00 ft	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	100.00 ft	Fill height:	N/A	Limit depth applied:	Yes
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	60.00 ft
Earthquake magnitude M_w:	7.13	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	0.90	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

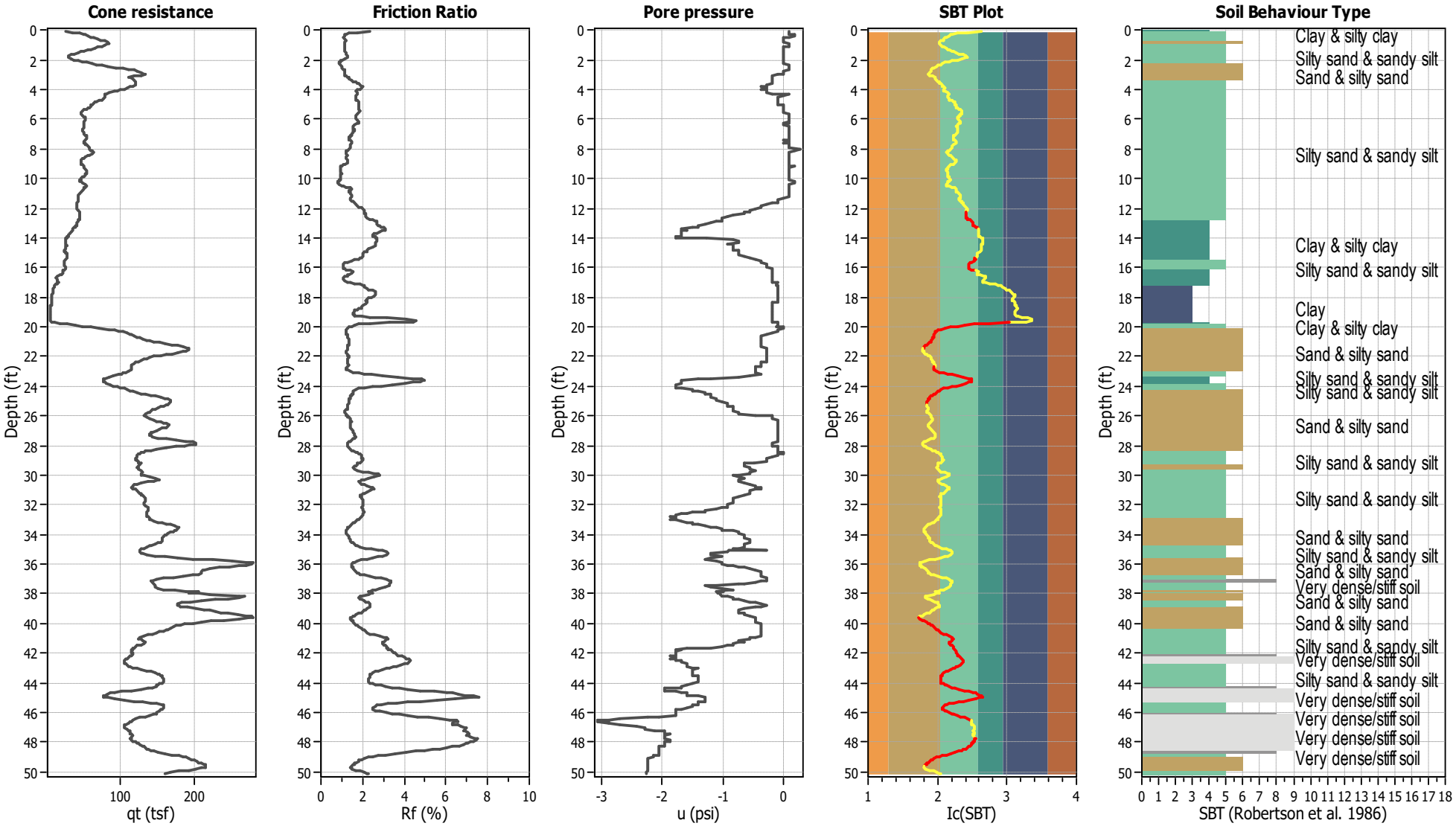






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plots



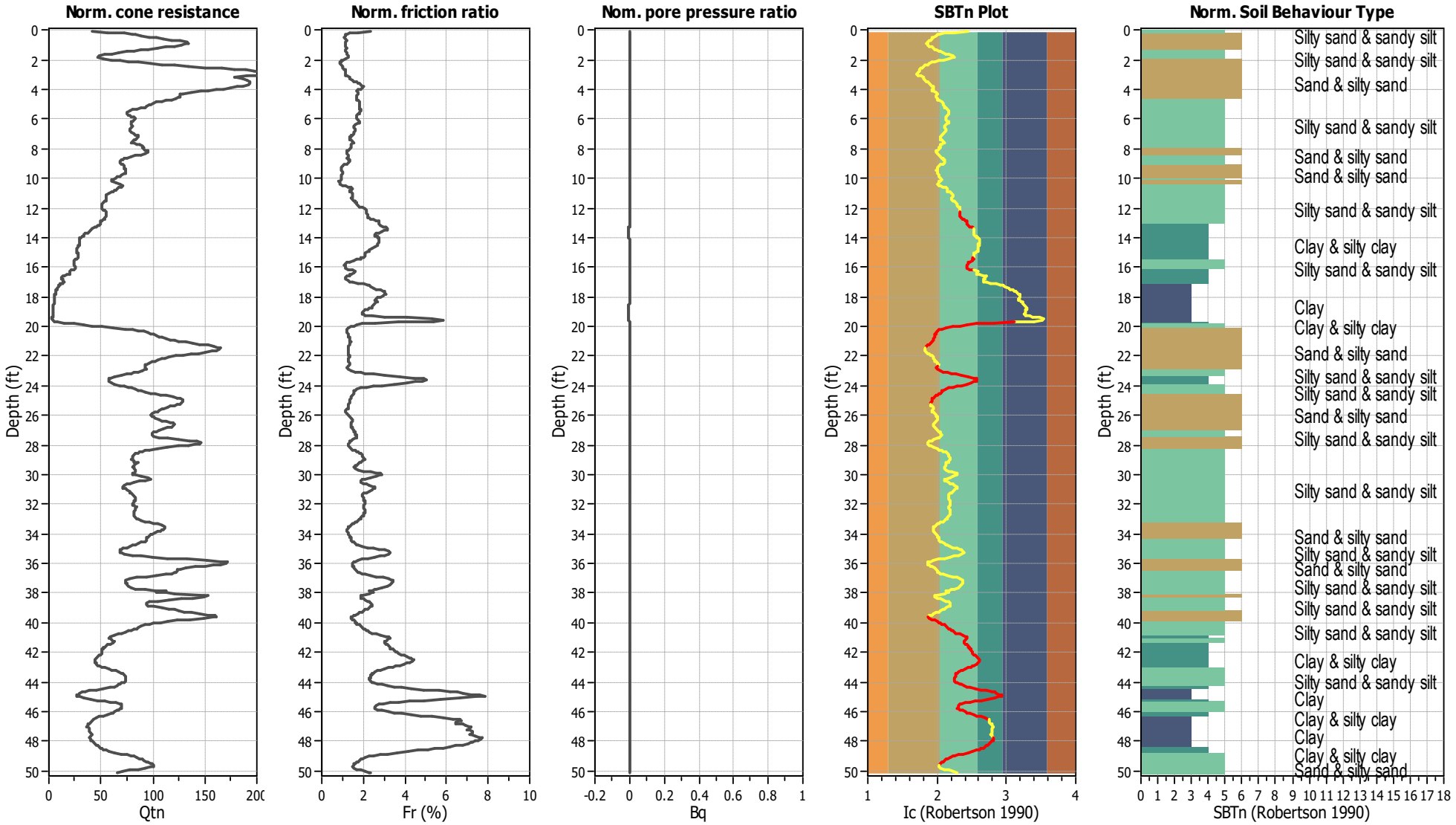
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	100.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.13	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.90	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	100.00 ft	Fill height:	N/A	Limit depth:	60.00 ft

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

CPT basic interpretation plots (normalized)



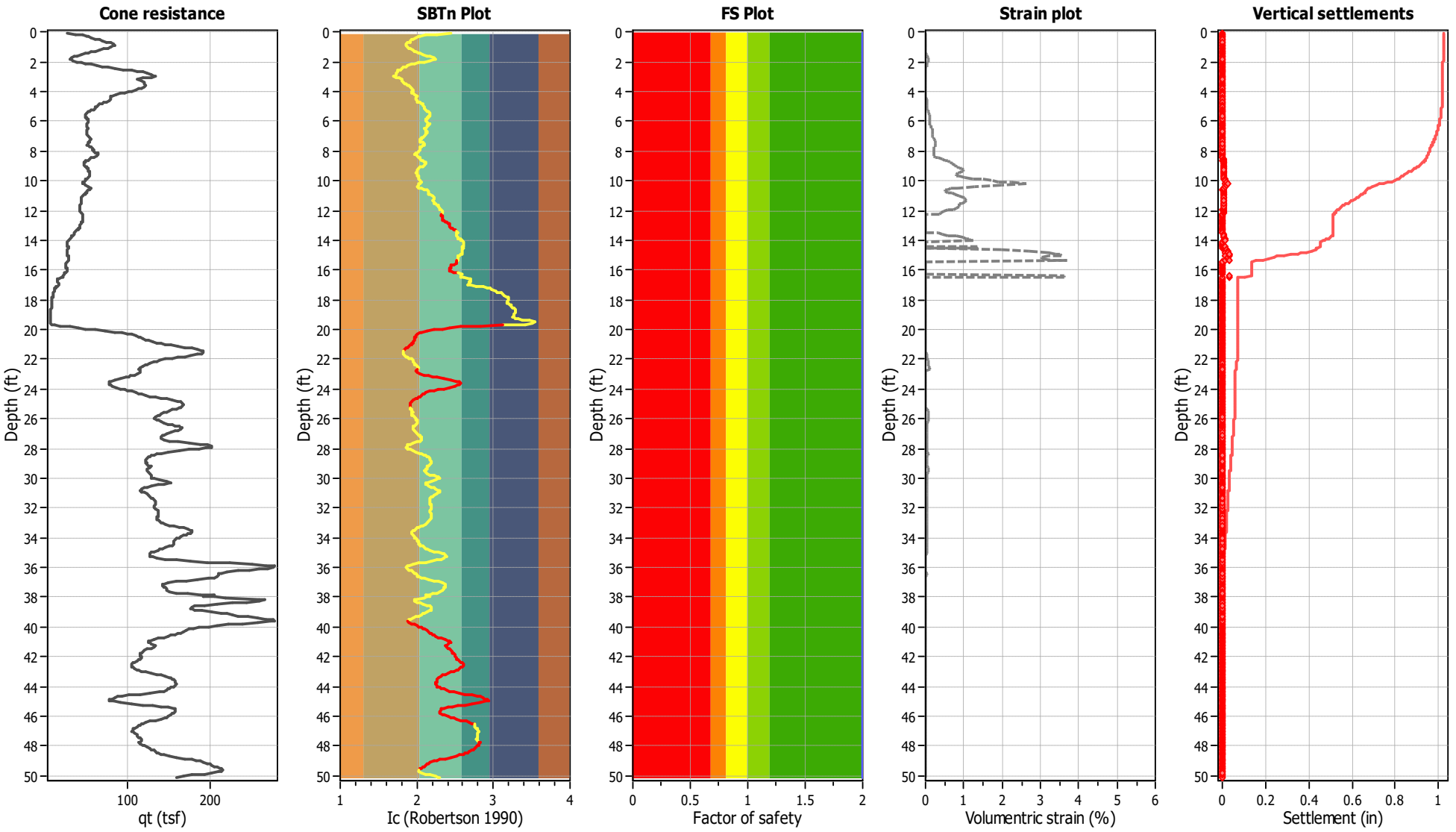
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	100.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.13	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.90	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	100.00 ft	Fill height:	N/A	Limit depth:	60.00 ft

SBTn legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

Estimation of post-earthquake settlements



Abbreviations

q_t:	Total cone resistance (cone resistance q_c corrected for pore water effects)
I_c:	Soil Behaviour Type Index
FS:	Calculated Factor of Safety against liquefaction
Volumentric strain:	Post-liquefaction volumentric strain

:: Post-earthquake settlement of dry sands ::

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
0.08	2.44	41.38	2.62	108.40	27	512	0.51	0.001	0.00	11.89	0.00	0.000
0.14	2.26	56.36	1.77	99.83	23	549	0.51	0.001	0.00	11.89	0.00	0.000
0.20	2.11	71.95	1.43	102.93	22	582	0.51	0.001	0.00	11.89	0.00	0.000
0.27	2.04	80.23	1.34	107.48	23	592	0.51	0.002	0.00	11.89	0.00	0.000
0.33	2.02	83.38	1.32	110.11	23	600	0.51	0.002	0.00	11.89	0.00	0.000
0.40	1.98	88.57	1.29	114.53	24	611	0.51	0.003	0.00	11.89	0.00	0.000
0.47	1.95	96.36	1.27	122.23	25	636	0.51	0.003	0.00	11.89	0.00	0.000
0.54	1.93	103.20	1.25	129.46	26	663	0.51	0.004	0.00	11.89	0.00	0.000
0.60	1.92	110.04	1.25	137.41	28	699	0.51	0.004	0.00	11.89	0.00	0.000
0.67	1.91	117.58	1.24	145.89	29	736	0.51	0.004	0.00	11.89	0.00	0.000
0.75	1.88	126.27	1.23	154.76	31	768	0.51	0.005	0.00	11.89	0.00	0.000
0.82	1.86	132.41	1.21	160.43	32	786	0.51	0.005	0.00	11.89	0.00	0.000
0.89	1.86	134.40	1.20	161.91	32	789	0.51	0.005	0.00	11.89	0.00	0.000
0.93	1.86	132.20	1.21	159.76	32	781	0.51	0.006	0.00	11.89	0.00	0.000
1.00	1.87	127.00	1.22	154.88	31	764	0.51	0.007	0.00	11.89	0.00	0.000
1.08	1.89	120.74	1.23	148.77	30	743	0.51	0.008	0.00	11.89	0.00	0.000
1.12	1.92	112.39	1.25	140.33	28	714	0.51	0.009	0.01	11.89	0.00	0.000
1.20	1.94	104.24	1.26	131.84	27	683	0.51	0.010	0.01	11.89	0.01	0.000
1.27	1.97	95.34	1.28	122.44	25	647	0.51	0.012	0.01	11.89	0.01	0.000
1.34	1.99	88.88	1.30	115.51	24	619	0.51	0.015	0.01	11.89	0.01	0.000
1.38	2.02	81.98	1.32	108.47	23	592	0.51	0.017	0.01	11.89	0.01	0.000
1.45	2.05	75.58	1.35	102.16	22	566	0.51	0.021	0.02	11.89	0.02	0.000
1.52	2.09	67.58	1.40	94.65	20	532	0.51	0.026	0.03	11.89	0.02	0.000
1.58	2.13	60.37	1.46	88.16	19	499	0.51	0.034	0.04	11.89	0.03	0.000
1.66	2.18	53.32	1.56	83.09	19	470	0.51	0.046	0.05	11.89	0.04	0.000
1.73	2.22	48.56	1.66	80.82	18	452	0.51	0.057	0.06	11.89	0.06	0.000
1.81	2.24	46.35	1.73	80.22	18	444	0.51	0.067	0.07	11.89	0.06	0.001
1.85	2.22	47.65	1.68	80.01	18	447	0.51	0.068	0.08	11.89	0.07	0.000
1.92	2.17	52.39	1.54	80.80	18	458	0.51	0.067	0.08	11.89	0.07	0.001
1.99	2.09	60.14	1.41	84.71	18	477	0.51	0.062	0.07	11.89	0.06	0.000
2.07	2.03	68.13	1.33	90.84	19	498	0.51	0.057	0.06	11.89	0.05	0.000
2.11	1.98	76.77	1.29	98.92	20	525	0.51	0.049	0.05	11.89	0.04	0.000
2.17	1.93	86.41	1.26	108.57	22	557	0.51	0.043	0.04	11.89	0.03	0.000
2.25	1.89	97.99	1.23	120.30	24	598	0.51	0.037	0.03	11.89	0.03	0.000
2.32	1.86	108.53	1.21	130.89	26	638	0.51	0.032	0.02	11.89	0.02	0.000
2.36	1.83	120.53	1.18	142.82	28	687	0.51	0.027	0.02	11.89	0.02	0.000
2.44	1.81	133.56	1.16	155.15	30	738	0.51	0.024	0.01	11.89	0.01	0.000
2.52	1.78	149.94	1.13	168.97	32	799	0.51	0.021	0.01	11.89	0.01	0.000
2.58	1.76	166.18	1.10	182.13	35	861	0.51	0.019	0.01	11.89	0.01	0.000
2.66	1.75	178.76	1.08	192.74	37	914	0.51	0.017	0.01	11.89	0.01	0.000
2.69	1.74	189.46	1.07	203.28	39	965	0.51	0.016	0.01	11.89	0.01	0.000
2.77	1.74	197.35	1.07	210.64	40	1001	0.51	0.015	0.01	11.89	0.01	0.000
2.84	1.73	206.49	1.04	215.41	41	1030	0.51	0.015	0.01	11.89	0.01	0.000
2.92	1.71	212.37	1.02	215.61	40	1041	0.51	0.015	0.01	11.89	0.01	0.000
2.96	1.70	215.16	1.00	215.16	40	1040	0.51	0.016	0.01	11.89	0.01	0.000
3.03	1.73	205.06	1.04	214.09	40	1024	0.51	0.017	0.01	11.89	0.01	0.000
3.10	1.77	190.46	1.11	212.21	41	1003	0.51	0.018	0.01	11.89	0.01	0.000
3.18	1.81	178.16	1.16	207.28	40	987	0.51	0.019	0.01	11.89	0.01	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
3.22	1.81	179.36	1.17	209.31	41	998	0.51	0.019	0.01	11.89	0.01	0.000
3.29	1.81	186.14	1.16	216.54	42	1031	0.51	0.019	0.01	11.89	0.01	0.000
3.36	1.82	191.13	1.18	224.82	44	1076	0.51	0.018	0.01	11.89	0.01	0.000
3.44	1.85	192.87	1.20	231.19	45	1121	0.51	0.017	0.01	11.89	0.01	0.000
3.51	1.87	193.12	1.22	234.67	46	1153	0.51	0.017	0.01	11.89	0.01	0.000
3.55	1.88	193.71	1.23	237.46	47	1179	0.51	0.016	0.01	11.89	0.00	0.000
3.63	1.90	193.66	1.23	238.92	48	1196	0.51	0.016	0.01	11.89	0.00	0.000
3.70	1.91	191.95	1.24	238.66	48	1207	0.51	0.016	0.01	11.89	0.00	0.000
3.77	1.93	187.19	1.25	234.81	48	1203	0.51	0.017	0.01	11.89	0.01	0.000
3.84	1.94	181.68	1.26	229.75	47	1190	0.51	0.018	0.01	11.89	0.01	0.000
3.88	1.95	175.03	1.27	222.26	45	1158	0.51	0.019	0.01	11.89	0.01	0.000
3.95	1.94	167.98	1.26	212.46	43	1101	0.51	0.021	0.01	11.89	0.01	0.000
4.03	1.93	160.87	1.26	202.57	41	1043	0.51	0.025	0.01	11.89	0.01	0.000
4.07	1.93	153.32	1.26	193.07	39	994	0.51	0.028	0.01	11.89	0.01	0.000
4.14	1.95	146.42	1.27	185.88	38	968	0.51	0.030	0.01	11.89	0.01	0.000
4.22	1.98	136.27	1.29	175.72	36	934	0.51	0.034	0.02	11.89	0.01	0.000
4.29	2.00	129.12	1.31	168.52	35	907	0.51	0.037	0.02	11.89	0.02	0.000
4.34	2.00	125.77	1.31	164.85	34	892	0.51	0.040	0.02	11.89	0.02	0.000
4.41	1.99	126.77	1.30	164.86	34	885	0.51	0.042	0.02	11.89	0.02	0.000
4.48	1.99	126.71	1.30	164.18	34	877	0.51	0.044	0.02	11.89	0.02	0.000
4.56	1.99	125.00	1.30	162.35	34	870	0.51	0.046	0.02	11.89	0.02	0.000
4.60	2.00	122.30	1.31	159.72	33	861	0.51	0.048	0.03	11.89	0.02	0.000
4.67	2.01	118.69	1.32	156.34	33	849	0.51	0.051	0.03	11.89	0.02	0.000
4.76	2.04	113.23	1.34	151.66	32	835	0.51	0.056	0.03	11.89	0.03	0.000
4.82	2.06	108.13	1.36	147.51	31	821	0.51	0.060	0.04	11.89	0.03	0.000
4.87	2.08	103.73	1.39	143.78	31	805	0.51	0.065	0.04	11.89	0.03	0.000
4.94	2.08	100.72	1.40	140.72	30	791	0.51	0.071	0.04	11.89	0.04	0.000
5.01	2.09	98.12	1.40	137.82	30	775	0.51	0.077	0.05	11.89	0.04	0.000
5.08	2.09	96.36	1.41	135.84	29	765	0.51	0.083	0.05	11.89	0.04	0.000
5.12	2.10	94.46	1.42	134.05	29	756	0.51	0.088	0.06	11.89	0.05	0.000
5.19	2.11	92.00	1.43	131.87	29	745	0.51	0.095	0.06	11.89	0.05	0.000
5.27	2.12	88.44	1.46	128.80	28	729	0.51	0.105	0.07	11.89	0.06	0.001
5.35	2.14	84.84	1.48	125.79	28	713	0.51	0.118	0.08	11.89	0.07	0.001
5.38	2.16	81.14	1.52	123.03	27	697	0.51	0.130	0.09	11.89	0.07	0.000
5.45	2.17	77.99	1.55	120.60	27	683	0.51	0.146	0.10	11.89	0.08	0.001
5.53	2.18	75.63	1.56	117.76	26	666	0.51	0.166	0.12	11.89	0.10	0.001
5.60	2.17	74.77	1.54	115.52	26	654	0.51	0.185	0.14	11.89	0.11	0.001
5.68	2.16	74.97	1.53	114.33	25	648	0.51	0.199	0.15	11.89	0.12	0.001
5.72	2.15	76.01	1.51	114.48	25	649	0.51	0.200	0.15	11.89	0.12	0.001
5.79	2.14	77.55	1.49	115.45	25	655	0.51	0.199	0.15	11.89	0.12	0.001
5.87	2.13	79.49	1.47	116.84	26	662	0.51	0.195	0.14	11.89	0.12	0.001
5.91	2.12	81.69	1.45	118.68	26	672	0.51	0.186	0.14	11.89	0.11	0.001
5.98	2.12	82.64	1.45	119.94	26	679	0.51	0.183	0.13	11.89	0.11	0.001
6.05	2.13	82.13	1.47	120.73	26	684	0.51	0.182	0.13	11.89	0.10	0.001
6.13	2.15	80.07	1.51	120.86	27	685	0.51	0.186	0.13	11.89	0.11	0.001
6.20	2.16	79.16	1.53	121.01	27	686	0.51	0.190	0.13	11.89	0.11	0.001
6.24	2.16	78.71	1.52	119.92	27	680	0.51	0.201	0.14	11.89	0.11	0.001
6.31	2.14	79.30	1.49	118.21	26	670	0.51	0.219	0.16	11.89	0.13	0.001

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
6.39	2.13	79.49	1.46	115.98	25	657	0.51	0.246	0.19	11.89	0.15	0.001
6.46	2.11	80.38	1.43	114.96	25	649	0.51	0.266	0.20	11.89	0.16	0.001
6.50	2.10	80.18	1.42	114.21	25	645	0.51	0.279	0.22	11.89	0.17	0.001
6.57	2.11	79.33	1.44	113.92	25	644	0.51	0.288	0.22	11.89	0.18	0.002
6.65	2.12	78.07	1.45	113.55	25	643	0.51	0.299	0.23	11.89	0.18	0.002
6.72	2.13	77.51	1.46	113.34	25	642	0.51	0.309	0.24	11.89	0.19	0.002
6.80	2.13	77.56	1.46	113.29	25	642	0.51	0.318	0.25	11.89	0.20	0.002
6.84	2.12	78.26	1.45	113.68	25	644	0.51	0.318	0.25	11.89	0.20	0.001
6.91	2.11	79.40	1.44	114.18	25	646	0.51	0.322	0.25	11.89	0.20	0.002
6.98	2.10	81.34	1.41	115.00	25	648	0.51	0.324	0.25	11.89	0.20	0.002
7.06	2.08	83.59	1.39	115.95	25	650	0.51	0.329	0.25	11.89	0.20	0.002
7.10	2.06	85.38	1.37	116.83	25	651	0.51	0.331	0.25	11.89	0.20	0.001
7.17	2.05	86.12	1.36	116.95	25	649	0.51	0.344	0.26	11.89	0.21	0.002
7.24	2.05	85.91	1.35	116.16	25	643	0.51	0.368	0.29	11.89	0.23	0.002
7.32	2.05	85.16	1.35	114.95	24	636	0.51	0.400	0.32	11.89	0.25	0.002
7.36	2.05	83.70	1.36	113.55	24	630	0.51	0.424	0.34	11.89	0.27	0.001
7.43	2.07	81.70	1.38	112.97	24	632	0.51	0.427	0.34	11.89	0.27	0.002
7.51	2.09	80.19	1.41	112.91	24	636	0.51	0.427	0.34	11.89	0.26	0.003
7.57	2.10	79.78	1.42	113.39	25	640	0.51	0.423	0.33	11.89	0.26	0.002
7.61	2.09	81.53	1.40	114.12	25	641	0.51	0.424	0.33	11.89	0.26	0.001
7.69	2.07	84.47	1.37	115.99	25	647	0.51	0.415	0.32	11.89	0.25	0.002
7.77	2.05	87.31	1.36	118.32	25	656	0.51	0.399	0.30	11.89	0.24	0.002
7.84	2.04	89.38	1.35	120.26	25	664	0.51	0.385	0.29	11.89	0.23	0.002
7.88	2.04	90.93	1.34	121.89	26	674	0.51	0.362	0.27	11.89	0.21	0.001
7.95	2.04	90.20	1.35	121.37	26	676	0.51	0.366	0.27	11.89	0.21	0.002
8.03	2.03	91.32	1.33	121.67	26	680	0.51	0.365	0.27	11.89	0.21	0.002
8.09	2.01	92.36	1.32	121.60	25	680	0.51	0.372	0.28	11.89	0.22	0.002
8.17	1.98	95.30	1.29	123.31	26	687	0.51	0.363	0.27	11.89	0.21	0.002
8.23	1.98	95.78	1.29	123.48	25	689	0.51	0.364	0.27	11.89	0.21	0.002
8.27	1.98	94.83	1.29	122.61	25	688	0.51	0.372	0.28	11.89	0.22	0.001
8.34	2.00	92.12	1.31	120.24	25	682	0.51	0.395	0.30	11.89	0.23	0.002
8.41	2.02	88.16	1.32	116.57	24	669	0.51	0.444	0.35	11.89	0.27	0.002
8.49	2.04	83.52	1.34	112.00	24	650	0.51	0.526	0.43	11.89	0.33	0.003
8.56	2.05	79.23	1.36	107.40	23	628	0.50	0.642	0.55	11.89	0.42	0.004
8.63	2.06	75.82	1.37	103.73	22	611	0.50	0.763	0.68	11.89	0.52	0.004
8.66	2.08	73.15	1.39	101.50	22	600	0.50	0.851	0.77	11.89	0.59	0.002
8.73	2.09	70.97	1.41	100.08	22	595	0.50	0.913	0.83	11.89	0.64	0.005
8.80	2.11	69.26	1.43	99.35	22	593	0.50	0.950	0.87	11.89	0.66	0.005
8.87	2.11	68.31	1.44	98.43	21	591	0.50	0.997	0.92	11.89	0.70	0.006
8.94	2.10	68.45	1.42	97.36	21	588	0.50	1.048	0.98	11.89	0.75	0.006
9.01	2.08	69.50	1.39	96.53	21	586	0.50	1.091	1.05	11.89	0.80	0.007
9.09	2.05	71.01	1.36	96.27	20	585	0.50	1.125	1.10	11.89	0.84	0.008
9.12	2.03	72.10	1.33	96.03	20	582	0.50	1.176	1.16	11.89	0.88	0.004
9.19	2.02	71.96	1.32	95.12	20	577	0.50	1.261	1.27	11.89	0.96	0.008
9.27	2.01	72.04	1.31	94.72	20	576	0.50	1.306	1.32	11.89	1.01	0.009
9.34	2.00	72.59	1.31	95.18	20	581	0.50	1.273	1.28	11.89	0.97	0.009
9.41	2.00	73.48	1.31	95.90	20	586	0.50	1.230	1.23	11.89	0.93	0.008
9.45	1.99	74.19	1.30	96.64	20	592	0.50	1.181	1.18	11.89	0.89	0.004

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
9.52	2.00	74.33	1.31	97.18	20	599	0.50	1.121	1.11	11.89	0.84	0.007
9.59	2.01	74.37	1.31	97.60	20	606	0.50	1.073	1.05	11.89	0.79	0.006
9.66	2.01	73.89	1.32	97.24	20	607	0.50	1.079	1.06	11.89	0.80	0.007
9.73	2.02	72.35	1.32	95.55	20	600	0.50	1.176	1.18	11.89	0.88	0.007
9.81	2.02	70.29	1.33	93.28	20	590	0.50	1.328	1.36	11.89	1.02	0.009
9.84	2.03	68.12	1.33	90.70	19	576	0.50	1.556	1.65	11.89	1.24	0.006
9.91	2.03	66.16	1.33	88.27	19	564	0.50	1.820	1.99	11.89	1.49	0.012
9.98	2.04	63.95	1.35	86.08	18	554	0.50	2.075	2.32	11.89	1.74	0.014
10.05	2.06	61.91	1.37	84.51	18	549	0.50	2.260	2.56	11.89	1.92	0.017
10.13	2.06	60.49	1.37	82.70	18	540	0.50	2.575	3.00	11.89	2.24	0.020
10.20	2.05	59.92	1.36	81.29	17	532	0.50	2.903	3.46	11.89	2.58	0.023
10.24	2.03	60.97	1.34	81.53	17	532	0.50	2.933	3.52	11.89	2.62	0.013
10.31	2.02	64.09	1.32	84.86	18	553	0.50	2.307	2.65	11.89	1.97	0.016
10.38	2.01	68.44	1.32	90.10	19	588	0.50	1.602	1.72	11.89	1.28	0.011
10.46	2.02	71.63	1.32	94.88	20	624	0.50	1.147	1.15	11.89	0.86	0.007
10.53	2.05	71.52	1.36	97.06	21	648	0.50	0.947	0.91	11.89	0.68	0.006
10.60	2.09	69.60	1.41	98.09	21	662	0.50	0.857	0.80	11.89	0.59	0.005
10.64	2.14	67.53	1.48	99.78	22	673	0.50	0.786	0.70	11.89	0.52	0.002
10.71	2.15	66.20	1.51	100.04	22	676	0.50	0.784	0.69	11.89	0.51	0.004
10.77	2.16	64.63	1.52	98.01	22	665	0.50	0.874	0.79	11.89	0.58	0.005
10.85	2.15	63.34	1.50	95.31	21	650	0.50	1.007	0.95	11.89	0.70	0.006
10.92	2.16	62.06	1.52	94.14	21	644	0.50	1.081	1.03	11.89	0.76	0.006
10.96	2.18	60.16	1.56	93.97	21	641	0.50	1.128	1.06	11.89	0.78	0.004
11.04	2.20	57.46	1.61	92.80	21	630	0.50	1.269	1.20	11.89	0.88	0.008
11.11	2.22	55.23	1.66	91.77	21	620	0.50	1.417	1.35	11.89	0.99	0.009
11.16	2.22	54.59	1.67	91.29	21	618	0.50	1.473	1.41	11.89	1.03	0.006
11.23	2.22	54.73	1.66	90.96	21	619	0.50	1.475	1.42	11.89	1.03	0.008
11.30	2.22	54.73	1.65	90.46	21	620	0.50	1.496	1.45	11.89	1.06	0.009
11.36	2.21	54.76	1.65	90.21	20	621	0.50	1.500	1.46	11.89	1.06	0.009
11.43	2.22	54.78	1.66	90.86	21	627	0.50	1.445	1.39	11.89	1.01	0.008
11.51	2.23	54.53	1.69	92.14	21	635	0.50	1.367	1.29	11.89	0.93	0.009
11.58	2.24	53.84	1.74	93.40	21	640	0.50	1.323	1.22	11.89	0.88	0.007
11.62	2.26	52.71	1.79	94.22	22	640	0.50	1.338	1.21	11.89	0.87	0.004
11.69	2.27	51.73	1.83	94.59	22	640	0.50	1.367	1.22	11.89	0.88	0.008
11.76	2.28	51.11	1.86	95.02	22	641	0.50	1.373	1.21	11.89	0.87	0.008
11.84	2.29	50.79	1.90	96.40	23	648	0.50	1.316	1.14	11.89	0.82	0.008
11.91	2.31	50.54	1.95	98.65	23	658	0.50	1.223	1.02	11.89	0.73	0.006
11.95	2.32	50.86	2.02	102.71	24	677	0.50	1.055	0.83	11.89	0.60	0.003
12.03	2.33	51.50	2.06	106.25	25	696	0.50	0.915	0.69	11.89	0.49	0.004
12.10	2.34	52.56	2.07	108.83	26	716	0.50	0.804	0.59	11.89	0.42	0.004
12.18	2.33	53.46	2.05	109.57	26	727	0.50	0.751	0.54	11.89	0.39	0.003
12.22	2.32	54.41	2.02	109.91	26	736	0.50	0.711	0.52	11.89	0.37	0.002
12.29	2.32	54.73	2.01	110.15	0	0	0.50	0.000	0.00	11.89	0.00	0.000
12.37	2.32	54.74	2.02	110.53	0	0	0.50	0.000	0.00	11.89	0.00	0.000
12.40	2.33	54.79	2.03	111.35	0	0	0.50	0.000	0.00	11.89	0.00	0.000
12.48	2.33	54.69	2.05	112.04	0	0	0.50	0.000	0.00	11.89	0.00	0.000
12.55	2.33	54.44	2.06	112.16	0	0	0.50	0.000	0.00	11.89	0.00	0.000
12.62	2.34	54.01	2.08	112.53	0	0	0.50	0.000	0.00	11.89	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
12.69	2.35	53.60	2.12	113.57	0	0	0.50	0.000	0.00	11.89	0.00	0.000
12.73	2.36	53.09	2.20	116.63	0	0	0.50	0.000	0.00	11.89	0.00	0.000
12.81	2.39	52.09	2.30	120.08	0	0	0.50	0.000	0.00	11.89	0.00	0.000
12.89	2.41	50.94	2.43	123.63	0	0	0.50	0.000	0.00	11.89	0.00	0.000
12.93	2.43	50.18	2.51	126.14	0	0	0.50	0.000	0.00	11.89	0.00	0.000
13.00	2.43	49.72	2.54	126.42	0	0	0.50	0.000	0.00	11.89	0.00	0.000
13.08	2.43	49.19	2.56	125.94	0	0	0.50	0.000	0.00	11.89	0.00	0.000
13.15	2.44	48.18	2.61	125.90	0	0	0.50	0.000	0.00	11.89	0.00	0.000
13.22	2.46	47.02	2.70	126.93	0	0	0.50	0.000	0.00	11.89	0.00	0.000
13.26	2.48	45.85	2.81	128.93	0	0	0.50	0.000	0.00	11.89	0.00	0.000
13.33	2.50	43.63	2.99	130.64	0	0	0.50	0.000	0.00	11.89	0.00	0.000
13.40	2.53	41.52	3.16	131.38	0	0	0.50	0.000	0.00	11.89	0.00	0.000
13.48	2.54	40.02	3.26	130.31	0	0	0.50	0.000	0.00	11.89	0.00	0.000
13.52	2.53	40.06	3.16	126.67	33	740	0.50	0.911	0.50	11.89	0.35	0.001
13.59	2.52	38.87	3.15	122.32	32	720	0.50	1.078	0.62	11.89	0.43	0.004
13.67	2.52	37.06	3.14	116.51	30	689	0.50	1.402	0.85	11.89	0.59	0.006
13.75	2.53	35.25	3.16	111.43	29	660	0.50	1.838	1.17	11.89	0.81	0.007
13.78	2.53	34.08	3.19	108.68	28	643	0.50	2.188	1.44	11.89	0.99	0.004
13.86	2.54	33.05	3.29	108.65	29	636	0.50	2.380	1.55	11.89	1.07	0.010
13.94	2.57	31.74	3.47	110.01	29	630	0.50	2.566	1.62	11.89	1.12	0.010
13.98	2.58	30.94	3.58	110.78	30	626	0.50	2.699	1.68	11.89	1.16	0.006
14.05	2.60	29.85	3.72	111.14	30	619	0.50	2.959	1.82	11.89	1.25	0.010
14.13	2.60	29.28	3.77	110.50	0	0	0.50	0.000	0.00	0.00	0.00	0.000
14.20	2.60	28.99	3.79	109.83	0	0	0.50	0.000	0.00	0.00	0.00	0.000
14.27	2.60	28.99	3.77	109.40	0	0	0.50	0.000	0.00	0.00	0.00	0.000
14.31	2.60	29.03	3.76	109.23	0	0	0.50	0.000	0.00	0.00	0.00	0.000
14.38	2.60	28.94	3.77	109.05	0	0	0.50	0.000	0.00	0.00	0.00	0.000
14.46	2.60	29.18	3.73	108.85	29	620	0.50	3.178	2.00	11.89	1.36	0.013
14.53	2.60	29.19	3.73	108.97	29	623	0.50	3.123	1.96	11.89	1.33	0.012
14.57	2.60	28.67	3.76	107.82	0	0	0.50	0.000	0.00	0.00	0.00	0.000
14.65	2.60	27.62	3.75	103.55	28	595	0.50	4.368	2.92	11.89	1.97	0.019
14.72	2.59	26.73	3.71	99.08	27	575	0.50	5.650	3.99	11.89	2.70	0.023
14.79	2.59	26.40	3.64	96.18	26	565	0.50	6.501	4.78	11.89	3.22	0.026
14.83	2.59	26.38	3.65	96.20	26	566	0.50	6.468	4.75	11.89	3.20	0.015
14.90	2.59	26.20	3.64	95.29	26	564	0.50	6.778	5.04	11.89	3.39	0.030
14.98	2.57	26.57	3.52	93.51	25	564	0.50	6.832	5.24	11.89	3.52	0.032
15.05	2.55	27.41	3.33	91.36	24	568	0.50	6.610	5.28	11.89	3.55	0.031
15.09	2.53	28.34	3.22	91.13	24	578	0.50	5.907	4.78	11.89	3.20	0.015
15.17	2.53	28.45	3.22	91.63	24	583	0.50	5.634	4.53	11.89	3.03	0.029
15.24	2.53	28.35	3.23	91.47	24	584	0.50	5.679	4.57	11.89	3.05	0.026
15.32	2.53	28.12	3.21	90.17	24	580	0.50	6.076	4.98	11.89	3.32	0.032
15.36	2.52	28.30	3.09	87.36	23	573	0.50	6.650	5.72	11.89	3.70	0.016
15.43	2.52	27.13	3.13	84.91	0	0	0.50	0.000	0.00	11.89	0.00	0.000
15.51	2.52	25.83	3.11	80.21	0	0	0.50	0.000	0.00	11.89	0.00	0.000
15.58	2.51	24.49	3.05	74.68	0	0	0.50	0.000	0.00	11.89	0.00	0.000
15.65	2.48	24.27	2.84	68.85	0	0	0.50	0.000	0.00	11.89	0.00	0.000
15.69	2.45	24.12	2.68	64.66	0	0	0.50	0.000	0.00	11.89	0.00	0.000
15.76	2.44	24.19	2.60	62.99	0	0	0.50	0.000	0.00	11.89	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
15.84	2.44	24.29	2.58	62.58	0	0	0.50	0.000	0.00	11.89	0.00	0.000
15.88	2.43	24.75	2.56	63.31	0	0	0.50	0.000	0.00	11.89	0.00	0.000
15.96	2.43	24.89	2.56	63.63	0	0	0.50	0.000	0.00	11.89	0.00	0.000
16.03	2.43	24.99	2.55	63.71	0	0	0.50	0.000	0.00	11.89	0.00	0.000
16.10	2.44	24.91	2.58	64.37	0	0	0.50	0.000	0.00	11.89	0.00	0.000
16.14	2.48	23.97	2.81	67.46	0	0	0.50	0.000	0.00	11.89	0.00	0.000
16.21	2.54	22.11	3.26	72.09	0	0	0.50	0.000	0.00	11.89	0.00	0.000
16.28	2.58	20.80	3.62	75.20	0	0	0.50	0.000	0.00	11.89	0.00	0.000
16.36	2.58	20.51	3.55	72.87	19	470	0.50	40.188	41.47	11.89	3.61	0.034
16.44	2.57	19.73	3.53	69.56	19	452	0.50	58.174	63.59	11.89	3.61	0.034
16.47	2.61	17.30	3.83	66.21	0	0	0.50	0.000	0.00	0.00	0.00	0.000
16.55	2.67	14.39	4.44	63.85	0	0	0.50	0.000	0.00	0.00	0.00	0.000
16.62	2.70	12.80	4.74	60.60	0	0	0.50	0.000	0.00	0.00	0.00	0.000
16.70	2.70	12.43	4.72	58.63	0	0	0.50	0.000	0.00	0.00	0.00	0.000
16.76	2.70	12.58	4.65	58.54	0	0	0.50	0.000	0.00	0.00	0.00	0.000
16.80	2.68	13.18	4.51	59.35	0	0	0.50	0.000	0.00	0.00	0.00	0.000
16.88	2.68	13.87	4.46	61.81	0	0	0.50	0.000	0.00	0.00	0.00	0.000
16.96	2.67	14.56	4.42	64.28	0	0	0.50	0.000	0.00	0.00	0.00	0.000
17.00	2.71	14.08	4.79	67.44	0	0	0.50	0.000	0.00	0.00	0.00	0.000
17.07	2.78	12.77	5.58	71.21	0	0	0.50	0.000	0.00	0.00	0.00	0.000
17.15	2.86	11.19	6.66	74.59	0	0	0.50	0.000	0.00	0.00	0.00	0.000
17.22	2.92	10.20	7.48	76.27	0	0	0.50	0.000	0.00	0.00	0.00	0.000
17.26	2.95	9.48	8.00	75.84	0	0	0.50	0.000	0.00	0.00	0.00	0.000
17.33	2.98	8.89	8.47	75.26	0	0	0.50	0.000	0.00	0.00	0.00	0.000
17.41	3.03	8.14	9.24	75.29	0	0	0.50	0.000	0.00	0.00	0.00	0.000
17.48	3.06	7.75	9.77	75.64	0	0	0.50	0.000	0.00	0.00	0.00	0.000
17.52	3.10	7.27	10.58	76.98	0	0	0.50	0.000	0.00	0.00	0.00	0.000
17.60	3.12	7.12	10.92	77.79	0	0	0.49	0.000	0.00	0.00	0.00	0.000
17.67	3.13	7.00	11.12	77.88	0	0	0.49	0.000	0.00	0.00	0.00	0.000
17.74	3.15	6.67	11.53	76.95	0	0	0.49	0.000	0.00	0.00	0.00	0.000
17.82	3.17	6.25	12.10	75.64	0	0	0.49	0.000	0.00	0.00	0.00	0.000
17.86	3.19	5.88	12.59	73.96	0	0	0.49	0.000	0.00	0.00	0.00	0.000
17.93	3.20	5.67	12.73	72.22	0	0	0.49	0.000	0.00	0.00	0.00	0.000
18.01	3.19	5.59	12.61	70.50	0	0	0.49	0.000	0.00	0.00	0.00	0.000
18.05	3.19	5.55	12.46	69.16	0	0	0.49	0.000	0.00	0.00	0.00	0.000
18.12	3.18	5.56	12.25	68.09	0	0	0.49	0.000	0.00	0.00	0.00	0.000
18.20	3.18	5.48	12.31	67.41	0	0	0.49	0.000	0.00	0.00	0.00	0.000
18.27	3.20	5.30	12.63	67.02	0	0	0.49	0.000	0.00	0.00	0.00	0.000
18.34	3.22	5.08	13.12	66.58	0	0	0.49	0.000	0.00	0.00	0.00	0.000
18.39	3.23	4.89	13.39	65.47	0	0	0.49	0.000	0.00	0.00	0.00	0.000
18.46	3.24	4.72	13.57	64.06	0	0	0.50	0.000	0.00	0.00	0.00	0.000
18.53	3.25	4.50	13.85	62.34	0	0	0.50	0.000	0.00	0.00	0.00	0.000
18.60	3.26	4.28	14.25	61.02	0	0	0.50	0.000	0.00	0.00	0.00	0.000
18.64	3.28	4.10	14.63	59.95	0	0	0.50	0.000	0.00	0.00	0.00	0.000
18.72	3.29	3.94	14.96	58.91	0	0	0.50	0.000	0.00	0.00	0.00	0.000
18.79	3.30	3.80	15.06	57.27	0	0	0.50	0.000	0.00	0.00	0.00	0.000
18.86	3.29	3.70	15.02	55.63	0	0	0.50	0.000	0.00	0.00	0.00	0.000
18.90	3.28	3.70	14.75	54.49	0	0	0.50	0.000	0.00	0.00	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
18.98	3.27	3.74	14.48	54.13	0	0	0.50	0.000	0.00	0.00	0.00	0.000
19.06	3.27	3.78	14.30	54.05	0	0	0.50	0.000	0.00	0.00	0.00	0.000
19.12	3.26	3.82	14.14	54.03	0	0	0.50	0.000	0.00	0.00	0.00	0.000
19.16	3.27	3.79	14.35	54.34	0	0	0.50	0.000	0.00	0.00	0.00	0.000
19.24	3.28	3.71	14.72	54.68	0	0	0.50	0.000	0.00	0.00	0.00	0.000
19.32	3.33	3.61	15.89	57.45	0	0	0.50	0.000	0.00	0.00	0.00	0.000
19.39	3.38	3.52	17.44	61.30	0	0	0.50	0.000	0.00	0.00	0.00	0.000
19.43	3.47	3.34	20.31	67.85	0	0	0.50	0.000	0.00	0.00	0.00	0.000
19.51	3.54	3.27	22.77	74.45	0	0	0.50	0.000	0.00	0.00	0.00	0.000
19.57	3.51	3.72	21.85	81.35	0	0	0.50	0.000	0.00	0.00	0.00	0.000
19.65	3.41	4.76	18.21	86.59	0	0	0.50	0.000	0.00	0.00	0.00	0.000
19.69	3.12	8.24	10.96	90.26	0	0	0.50	0.000	0.00	0.00	0.00	0.000
19.77	2.82	14.56	6.12	89.01	0	0	0.50	0.000	0.00	0.00	0.00	0.000
19.84	2.58	23.87	3.56	84.88	0	0	0.50	0.000	0.00	11.89	0.00	0.000
19.91	2.43	32.99	2.53	83.47	0	0	0.50	0.000	0.00	11.89	0.00	0.000
19.98	2.33	41.37	2.03	84.03	0	0	0.50	0.000	0.00	11.89	0.00	0.000
20.01	2.23	51.38	1.68	86.44	0	0	0.50	0.000	0.00	11.89	0.00	0.000
20.09	2.14	62.32	1.48	92.08	0	0	0.50	0.000	0.00	11.89	0.00	0.000
20.16	2.07	73.32	1.38	100.83	0	0	0.50	0.000	0.00	11.89	0.00	0.000
20.24	2.03	80.51	1.34	107.71	0	0	0.50	0.000	0.00	11.89	0.00	0.000
20.28	2.01	86.32	1.32	113.72	0	0	0.50	0.000	0.00	11.89	0.00	0.000
20.35	2.00	91.01	1.30	118.76	0	0	0.50	0.000	0.00	11.89	0.00	0.000
20.43	1.99	95.43	1.30	123.64	0	0	0.50	0.000	0.00	11.89	0.00	0.000
20.50	1.98	98.46	1.29	127.05	0	0	0.50	0.000	0.00	11.89	0.00	0.000
20.54	1.98	100.72	1.29	129.75	0	0	0.50	0.000	0.00	11.89	0.00	0.000
20.61	1.97	102.82	1.29	132.31	0	0	0.50	0.000	0.00	11.89	0.00	0.000
20.69	1.97	105.47	1.28	135.40	0	0	0.50	0.000	0.00	11.89	0.00	0.000
20.75	1.96	108.95	1.28	139.25	0	0	0.50	0.000	0.00	11.89	0.00	0.000
20.83	1.95	113.03	1.27	143.74	0	0	0.50	0.000	0.00	11.89	0.00	0.000
20.90	1.94	116.97	1.27	148.11	0	0	0.50	0.000	0.00	11.89	0.00	0.000
20.94	1.94	121.01	1.26	152.67	0	0	0.50	0.000	0.00	11.89	0.00	0.000
21.01	1.93	125.24	1.26	157.39	0	0	0.50	0.000	0.00	11.89	0.00	0.000
21.08	1.92	131.15	1.25	163.82	0	0	0.50	0.000	0.00	11.89	0.00	0.000
21.16	1.90	138.40	1.24	171.21	0	0	0.50	0.000	0.00	11.89	0.00	0.000
21.23	1.88	145.43	1.22	177.87	0	0	0.50	0.000	0.00	11.89	0.00	0.000
21.26	1.86	152.73	1.21	184.23	0	0	0.51	0.000	0.00	11.89	0.00	0.000
21.34	1.84	158.48	1.19	189.00	0	0	0.51	0.000	0.00	11.89	0.00	0.000
21.41	1.83	163.06	1.18	192.78	0	0	0.51	0.000	0.00	11.89	0.00	0.000
21.48	1.82	164.85	1.18	193.95	0	0	0.51	0.000	0.00	11.89	0.00	0.000
21.56	1.82	164.22	1.17	192.87	0	0	0.51	0.000	0.00	11.89	0.00	0.000
21.63	1.82	161.66	1.18	190.20	37	1703	0.51	0.099	0.05	11.89	0.03	0.000
21.67	1.83	157.17	1.18	186.07	36	1675	0.51	0.103	0.05	11.89	0.03	0.000
21.74	1.84	150.44	1.20	179.99	35	1638	0.51	0.110	0.06	11.89	0.03	0.000
21.81	1.86	143.55	1.21	173.55	34	1600	0.51	0.118	0.06	11.89	0.04	0.000
21.85	1.88	136.28	1.22	166.86	33	1564	0.51	0.126	0.07	11.89	0.04	0.000
21.92	1.90	129.07	1.24	160.08	32	1531	0.51	0.135	0.08	11.89	0.04	0.000
22.00	1.93	121.52	1.26	152.59	31	1491	0.51	0.147	0.09	11.89	0.05	0.000
22.08	1.94	115.92	1.27	146.73	30	1455	0.51	0.159	0.10	11.89	0.06	0.001

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
22.12	1.95	111.97	1.27	142.24	29	1420	0.51	0.172	0.11	11.89	0.06	0.000
22.19	1.96	108.64	1.27	138.39	28	1390	0.51	0.185	0.12	11.89	0.07	0.001
22.27	1.96	105.09	1.28	134.44	28	1362	0.51	0.199	0.14	11.89	0.08	0.001
22.34	1.97	102.15	1.29	131.38	27	1344	0.51	0.210	0.15	11.89	0.08	0.001
22.38	1.99	99.24	1.30	128.56	27	1329	0.51	0.219	0.16	11.89	0.09	0.000
22.45	2.00	96.35	1.31	125.92	26	1319	0.51	0.226	0.16	11.89	0.09	0.001
22.53	2.02	93.65	1.32	123.65	26	1312	0.51	0.232	0.17	11.89	0.09	0.001
22.61	2.02	92.64	1.32	122.57	26	1306	0.51	0.237	0.18	11.89	0.10	0.001
22.64	2.01	92.39	1.32	121.59	25	1290	0.51	0.249	0.19	11.89	0.10	0.000
22.72	2.00	92.72	1.31	121.21	25	1280	0.51	0.258	0.19	11.89	0.11	0.001
22.79	2.00	92.91	1.30	121.11	0	0	0.51	0.000	0.00	11.89	0.00	0.000
22.87	2.00	93.30	1.30	121.74	0	0	0.51	0.000	0.00	11.89	0.00	0.000
22.91	2.01	92.68	1.31	121.71	0	0	0.51	0.000	0.00	11.89	0.00	0.000
22.97	2.04	89.31	1.35	120.41	0	0	0.51	0.000	0.00	11.89	0.00	0.000
23.04	2.09	85.52	1.41	120.58	0	0	0.51	0.000	0.00	11.89	0.00	0.000
23.12	2.16	81.44	1.52	123.39	0	0	0.51	0.000	0.00	11.89	0.00	0.000
23.19	2.20	79.04	1.62	128.33	0	0	0.51	0.000	0.00	11.89	0.00	0.000
23.23	2.27	75.30	1.81	136.40	0	0	0.51	0.000	0.00	11.89	0.00	0.000
23.31	2.35	69.86	2.13	148.95	0	0	0.51	0.000	0.00	11.89	0.00	0.000
23.38	2.45	63.71	2.65	168.64	0	0	0.51	0.000	0.00	11.89	0.00	0.000
23.46	2.52	59.37	3.14	186.48	0	0	0.51	0.000	0.00	11.89	0.00	0.000
23.50	2.56	57.80	3.44	198.76	0	0	0.51	0.000	0.00	11.89	0.00	0.000
23.57	2.57	57.61	3.52	202.57	0	0	0.51	0.000	0.00	11.89	0.00	0.000
23.64	2.57	57.44	3.51	201.56	0	0	0.51	0.000	0.00	11.89	0.00	0.000
23.72	2.56	57.33	3.43	196.45	0	0	0.51	0.000	0.00	11.89	0.00	0.000
23.76	2.54	57.92	3.24	187.50	0	0	0.51	0.000	0.00	11.89	0.00	0.000
23.83	2.49	59.83	2.93	175.60	0	0	0.51	0.000	0.00	11.89	0.00	0.000
23.90	2.43	63.59	2.51	159.72	0	0	0.51	0.000	0.00	11.89	0.00	0.000
23.98	2.35	68.11	2.13	144.87	0	0	0.51	0.000	0.00	11.89	0.00	0.000
24.05	2.28	72.03	1.86	134.15	0	0	0.51	0.000	0.00	11.89	0.00	0.000
24.09	2.22	75.87	1.67	126.35	0	0	0.51	0.000	0.00	11.89	0.00	0.000
24.17	2.16	79.54	1.53	122.00	0	0	0.51	0.000	0.00	11.89	0.00	0.000
24.24	2.12	83.22	1.45	120.36	0	0	0.51	0.000	0.00	11.89	0.00	0.000
24.28	2.09	86.41	1.40	121.39	0	0	0.51	0.000	0.00	11.89	0.00	0.000
24.35	2.08	89.19	1.39	123.55	0	0	0.52	0.000	0.00	11.89	0.00	0.000
24.42	2.06	92.93	1.37	126.89	0	0	0.52	0.000	0.00	11.89	0.00	0.000
24.50	2.04	97.47	1.35	131.21	0	0	0.52	0.000	0.00	11.89	0.00	0.000
24.57	2.02	102.16	1.33	135.63	0	0	0.52	0.000	0.00	11.89	0.00	0.000
24.61	2.00	107.87	1.31	141.04	0	0	0.52	0.000	0.00	11.89	0.00	0.000
24.69	1.98	113.28	1.29	146.25	0	0	0.52	0.000	0.00	11.89	0.00	0.000
24.75	1.96	119.18	1.28	151.99	0	0	0.52	0.000	0.00	11.89	0.00	0.000
24.83	1.94	123.66	1.26	156.33	0	0	0.52	0.000	0.00	11.89	0.00	0.000
24.90	1.93	126.72	1.26	159.21	0	0	0.52	0.000	0.00	11.89	0.00	0.000
24.94	1.92	128.49	1.25	160.80	0	0	0.52	0.000	0.00	11.89	0.00	0.000
25.01	1.92	128.76	1.25	160.92	0	0	0.52	0.000	0.00	11.89	0.00	0.000
25.08	1.92	128.38	1.25	160.24	0	0	0.52	0.000	0.00	11.89	0.00	0.000
25.15	1.91	127.25	1.25	158.62	0	0	0.52	0.000	0.00	11.89	0.00	0.000
25.23	1.91	125.94	1.24	156.72	0	0	0.52	0.000	0.00	11.89	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
25.26	1.91	123.94	1.24	154.18	0	0	0.52	0.000	0.00	11.89	0.00	0.000
25.34	1.92	120.95	1.25	150.86	30	1601	0.52	0.155	0.09	11.89	0.05	0.000
25.41	1.93	117.19	1.25	146.91	30	1575	0.52	0.163	0.10	11.89	0.05	0.000
25.48	1.94	113.46	1.26	143.12	29	1554	0.52	0.171	0.11	11.89	0.06	0.000
25.56	1.94	110.64	1.27	140.12	29	1534	0.52	0.179	0.12	11.89	0.06	0.001
25.60	1.94	108.44	1.26	136.73	28	1488	0.52	0.198	0.13	11.89	0.07	0.000
25.67	1.93	106.35	1.26	133.75	27	1452	0.52	0.215	0.15	11.89	0.08	0.001
25.74	1.93	104.16	1.26	130.99	27	1424	0.52	0.231	0.16	11.89	0.08	0.001
25.81	1.95	102.12	1.27	129.58	26	1432	0.52	0.227	0.16	11.89	0.08	0.001
25.88	1.97	99.28	1.28	127.42	26	1437	0.52	0.226	0.16	11.89	0.08	0.001
25.95	1.98	98.43	1.29	127.08	26	1448	0.52	0.222	0.16	11.89	0.08	0.001
26.00	1.99	97.86	1.30	127.11	26	1462	0.52	0.215	0.15	11.89	0.08	0.000
26.06	1.99	99.42	1.30	129.15	27	1488	0.52	0.204	0.14	11.89	0.07	0.001
26.14	2.00	100.30	1.31	130.91	27	1520	0.52	0.192	0.13	11.89	0.07	0.001
26.20	2.00	102.61	1.31	134.17	28	1565	0.52	0.176	0.12	11.89	0.06	0.000
26.28	2.00	105.76	1.31	138.11	29	1611	0.52	0.162	0.11	11.89	0.05	0.000
26.35	1.99	109.06	1.30	141.86	29	1650	0.52	0.152	0.10	11.89	0.05	0.000
26.39	1.98	112.83	1.29	145.75	30	1681	0.52	0.145	0.09	11.89	0.04	0.000
26.45	1.97	116.39	1.28	149.28	31	1706	0.52	0.140	0.08	11.89	0.04	0.000
26.53	1.96	119.52	1.27	152.38	31	1729	0.52	0.135	0.08	11.89	0.04	0.000
26.60	1.95	121.17	1.27	154.02	31	1742	0.52	0.133	0.08	11.89	0.04	0.000
26.64	1.95	121.24	1.27	154.09	31	1744	0.52	0.133	0.08	11.89	0.04	0.000
26.72	1.96	119.87	1.27	152.69	31	1738	0.52	0.135	0.08	11.89	0.04	0.000
26.78	1.96	117.48	1.28	150.29	31	1726	0.52	0.138	0.08	11.89	0.04	0.000
26.85	1.98	114.14	1.29	147.07	30	1710	0.52	0.142	0.09	11.89	0.04	0.000
26.92	1.99	110.32	1.30	143.61	30	1697	0.52	0.146	0.09	11.89	0.04	0.000
26.99	2.01	106.30	1.32	140.19	29	1686	0.52	0.150	0.09	11.89	0.05	0.000
27.07	2.03	102.99	1.34	137.52	29	1678	0.52	0.152	0.10	11.89	0.05	0.000
27.14	2.04	100.81	1.35	135.78	29	1672	0.52	0.154	0.10	11.89	0.05	0.000
27.17	2.05	99.73	1.35	134.94	29	1670	0.52	0.155	0.10	11.89	0.05	0.000
27.25	2.05	99.13	1.36	134.60	29	1673	0.52	0.155	0.10	11.89	0.05	0.000
27.33	2.06	98.71	1.36	134.56	29	1681	0.52	0.154	0.10	11.89	0.05	0.000
27.36	2.06	99.19	1.37	135.52	29	1697	0.52	0.150	0.10	11.89	0.05	0.000
27.44	2.06	101.25	1.36	137.78	29	1724	0.52	0.144	0.09	11.89	0.04	0.000
27.51	2.04	106.25	1.34	142.43	30	1764	0.52	0.136	0.08	11.89	0.04	0.000
27.58	2.00	114.47	1.31	149.72	31	1810	0.52	0.128	0.07	11.89	0.04	0.000
27.65	1.96	125.33	1.27	159.61	33	1859	0.52	0.120	0.07	11.89	0.03	0.000
27.72	1.92	135.02	1.25	168.47	34	1898	0.52	0.114	0.06	11.89	0.03	0.000
27.76	1.89	142.73	1.23	175.29	35	1926	0.52	0.110	0.06	11.89	0.03	0.000
27.83	1.87	145.89	1.22	177.53	35	1927	0.52	0.110	0.06	11.89	0.03	0.000
27.91	1.86	145.56	1.21	176.34	35	1906	0.52	0.114	0.06	11.89	0.03	0.000
27.98	1.87	140.40	1.22	170.74	34	1858	0.52	0.122	0.06	11.89	0.03	0.000
28.05	1.88	133.62	1.23	163.86	33	1808	0.52	0.132	0.07	11.89	0.03	0.000
28.09	1.91	124.30	1.24	154.66	31	1749	0.52	0.144	0.08	11.89	0.04	0.000
28.17	1.95	114.57	1.27	145.38	30	1704	0.52	0.156	0.10	11.89	0.05	0.000
28.24	2.00	104.09	1.30	135.81	28	1664	0.52	0.168	0.11	11.89	0.05	0.000
28.32	2.04	97.09	1.34	130.17	27	1646	0.52	0.174	0.12	11.89	0.06	0.000
28.35	2.07	92.32	1.38	127.12	27	1641	0.52	0.176	0.12	11.89	0.06	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
28.43	2.10	89.35	1.41	126.12	27	1653	0.52	0.173	0.12	11.89	0.06	0.001
28.50	2.12	86.84	1.45	126.16	28	1672	0.52	0.168	0.11	11.89	0.05	0.000
28.58	2.14	85.35	1.48	126.61	28	1689	0.52	0.164	0.11	11.89	0.05	0.000
28.61	2.15	83.86	1.51	126.81	28	1698	0.52	0.162	0.11	11.89	0.05	0.000
28.69	2.17	82.13	1.54	126.21	28	1696	0.52	0.163	0.11	11.89	0.05	0.000
28.76	2.17	81.11	1.55	126.02	28	1697	0.52	0.164	0.11	11.89	0.05	0.000
28.84	2.18	80.04	1.57	125.86	28	1699	0.52	0.164	0.11	11.89	0.05	0.000
28.88	2.19	80.30	1.58	126.83	28	1713	0.52	0.160	0.11	11.89	0.05	0.000
28.95	2.18	81.07	1.57	127.49	29	1726	0.52	0.158	0.10	11.89	0.05	0.000
29.02	2.19	79.53	1.60	127.12	29	1723	0.52	0.159	0.10	11.89	0.05	0.000
29.09	2.17	81.50	1.55	126.70	28	1721	0.52	0.160	0.11	11.89	0.05	0.000
29.16	2.16	82.24	1.53	125.57	28	1707	0.52	0.165	0.11	11.89	0.05	0.000
29.22	2.13	85.36	1.47	125.10	27	1693	0.52	0.169	0.12	11.89	0.05	0.000
29.30	2.13	83.78	1.46	122.70	27	1664	0.52	0.179	0.13	11.89	0.06	0.001
29.34	2.13	81.90	1.47	119.98	26	1629	0.52	0.191	0.14	11.89	0.06	0.000
29.41	2.12	81.48	1.45	117.93	26	1598	0.52	0.203	0.15	11.89	0.07	0.001
29.49	2.11	81.00	1.44	116.25	25	1575	0.53	0.214	0.16	11.89	0.07	0.001
29.53	2.11	81.63	1.43	116.47	25	1576	0.53	0.214	0.16	11.89	0.07	0.000
29.60	2.11	82.19	1.44	118.37	26	1610	0.53	0.201	0.15	11.89	0.07	0.001
29.67	2.13	83.41	1.48	123.04	27	1687	0.53	0.176	0.12	11.89	0.05	0.000
29.75	2.17	83.65	1.55	129.96	29	1795	0.53	0.148	0.09	11.89	0.04	0.000
29.82	2.22	82.94	1.66	137.75	31	1902	0.53	0.127	0.07	11.89	0.03	0.000
29.86	2.26	81.87	1.78	145.72	34	1994	0.53	0.113	0.06	11.89	0.03	0.000
29.93	2.28	81.16	1.86	151.07	35	2052	0.53	0.106	0.05	11.89	0.02	0.000
30.01	2.29	80.92	1.90	154.14	36	2087	0.53	0.102	0.05	11.89	0.02	0.000
30.05	2.28	82.82	1.85	153.56	36	2094	0.53	0.102	0.05	11.89	0.02	0.000
30.13	2.24	87.97	1.72	151.01	35	2093	0.53	0.102	0.05	11.89	0.02	0.000
30.20	2.18	94.85	1.57	148.64	33	2078	0.53	0.104	0.06	11.89	0.02	0.000
30.27	2.14	98.65	1.48	145.77	32	2029	0.53	0.111	0.06	11.89	0.03	0.000
30.35	2.12	98.07	1.44	141.61	31	1963	0.53	0.120	0.07	11.89	0.03	0.000
30.38	2.12	93.25	1.45	134.80	29	1871	0.53	0.137	0.09	11.89	0.04	0.000
30.46	2.13	87.81	1.47	129.23	28	1806	0.53	0.151	0.10	11.89	0.04	0.000
30.54	2.16	81.91	1.52	124.63	28	1754	0.53	0.164	0.11	11.89	0.05	0.000
30.62	2.19	77.79	1.59	123.62	28	1747	0.53	0.167	0.11	11.89	0.05	0.000
30.65	2.22	74.81	1.67	125.02	28	1763	0.53	0.163	0.11	11.89	0.05	0.000
30.73	2.25	72.80	1.76	128.27	30	1799	0.53	0.155	0.10	11.89	0.04	0.000
30.80	2.28	71.33	1.86	132.54	31	1843	0.53	0.145	0.09	11.89	0.04	0.000
30.88	2.30	70.81	1.91	135.23	32	1873	0.53	0.140	0.08	11.89	0.03	0.000
30.91	2.29	71.80	1.90	136.37	32	1892	0.53	0.136	0.08	11.89	0.03	0.000
30.99	2.28	73.56	1.84	135.72	32	1900	0.53	0.135	0.08	11.89	0.03	0.000
31.06	2.26	75.64	1.77	134.05	31	1894	0.53	0.137	0.08	11.89	0.03	0.000
31.13	2.23	77.35	1.69	131.07	30	1868	0.53	0.142	0.09	11.89	0.04	0.000
31.20	2.21	78.34	1.64	128.17	29	1836	0.53	0.150	0.10	11.89	0.04	0.000
31.24	2.19	79.32	1.58	125.72	28	1804	0.53	0.157	0.10	11.89	0.04	0.000
31.31	2.18	80.01	1.56	124.69	28	1792	0.53	0.161	0.11	11.89	0.05	0.000
31.39	2.17	80.89	1.54	124.74	28	1795	0.53	0.161	0.11	11.89	0.05	0.000
31.46	2.17	81.61	1.54	125.66	28	1811	0.53	0.157	0.11	11.89	0.04	0.000
31.50	2.17	82.36	1.54	127.18	28	1835	0.53	0.152	0.10	11.89	0.04	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
31.57	2.17	82.84	1.55	128.37	29	1856	0.53	0.148	0.10	11.89	0.04	0.000
31.65	2.18	82.96	1.56	129.19	29	1872	0.53	0.145	0.09	11.89	0.04	0.000
31.72	2.18	82.67	1.57	129.42	29	1879	0.53	0.144	0.09	11.89	0.04	0.000
31.76	2.18	82.11	1.57	129.21	29	1878	0.53	0.145	0.09	11.89	0.04	0.000
31.84	2.19	81.36	1.58	128.82	29	1876	0.53	0.146	0.09	11.89	0.04	0.000
31.92	2.19	81.25	1.58	128.47	29	1874	0.53	0.146	0.09	11.89	0.04	0.000
31.97	2.19	80.49	1.59	128.12	29	1871	0.53	0.147	0.10	11.89	0.04	0.000
32.04	2.19	81.11	1.58	128.21	29	1876	0.53	0.147	0.10	11.89	0.04	0.000
32.11	2.18	81.78	1.57	128.39	29	1881	0.53	0.146	0.09	11.89	0.04	0.000
32.19	2.17	83.42	1.55	128.99	29	1892	0.53	0.145	0.09	11.89	0.04	0.000
32.23	2.17	83.93	1.54	129.42	29	1900	0.53	0.143	0.09	11.89	0.04	0.000
32.30	2.17	83.50	1.55	129.74	29	1909	0.53	0.142	0.09	11.89	0.04	0.000
32.37	2.18	82.96	1.57	130.17	29	1919	0.53	0.140	0.09	11.89	0.04	0.000
32.45	2.19	82.51	1.58	130.42	29	1927	0.53	0.139	0.09	11.89	0.04	0.000
32.49	2.19	82.44	1.58	130.32	29	1927	0.53	0.140	0.09	11.89	0.04	0.000
32.56	2.18	82.28	1.58	129.69	29	1921	0.53	0.141	0.09	11.89	0.04	0.000
32.64	2.18	82.01	1.57	128.83	29	1911	0.53	0.144	0.09	11.89	0.04	0.000
32.71	2.18	81.75	1.57	128.06	29	1903	0.53	0.146	0.09	11.89	0.04	0.000
32.75	2.18	81.90	1.56	127.44	28	1895	0.53	0.148	0.10	11.89	0.04	0.000
32.82	2.17	82.50	1.54	126.95	28	1889	0.53	0.149	0.10	11.89	0.04	0.000
32.89	2.15	83.52	1.51	126.35	28	1880	0.53	0.152	0.10	11.89	0.04	0.000
32.97	2.14	84.43	1.49	125.83	28	1870	0.53	0.154	0.10	11.89	0.04	0.000
33.01	2.13	85.81	1.46	125.61	28	1861	0.53	0.157	0.11	11.89	0.04	0.000
33.08	2.11	88.19	1.43	126.35	27	1861	0.53	0.157	0.11	11.89	0.04	0.000
33.16	2.08	92.07	1.39	128.27	28	1868	0.53	0.156	0.11	11.89	0.04	0.000
33.24	2.06	96.20	1.36	130.87	28	1877	0.53	0.155	0.10	11.89	0.04	0.000
33.28	2.03	100.63	1.33	134.15	28	1890	0.53	0.152	0.10	11.89	0.04	0.000
33.36	2.01	104.62	1.31	137.23	29	1899	0.53	0.151	0.10	11.89	0.04	0.000
33.43	1.98	108.47	1.29	140.17	29	1901	0.53	0.151	0.10	11.89	0.04	0.000
33.50	1.96	110.82	1.28	141.71	29	1891	0.53	0.153	0.10	11.89	0.04	0.000
33.54	1.95	111.92	1.27	142.04	29	1872	0.53	0.158	0.10	11.89	0.04	0.000
33.61	1.94	111.59	1.26	141.04	29	1847	0.53	0.164	0.11	11.89	0.04	0.000
33.68	1.94	110.35	1.26	139.14	28	1817	0.53	0.172	0.11	11.89	0.04	0.000
33.75	1.94	108.75	1.26	137.15	28	1794	0.53	0.179	0.12	11.89	0.05	0.000
33.79	1.94	106.77	1.26	135.04	27	1777	0.53	0.184	0.13	11.89	0.05	0.000
33.87	1.95	104.60	1.27	132.97	27	1769	0.53	0.187	0.13	11.89	0.05	0.000
33.94	1.97	101.99	1.28	130.62	27	1763	0.53	0.190	0.13	11.89	0.05	0.000
34.03	1.98	99.99	1.29	128.92	27	1763	0.53	0.190	0.14	11.89	0.05	0.001
34.07	1.99	98.24	1.30	127.59	26	1766	0.53	0.190	0.14	11.89	0.05	0.000
34.14	2.00	96.68	1.31	126.59	26	1776	0.53	0.188	0.13	11.89	0.05	0.000
34.22	2.01	95.25	1.32	125.74	26	1785	0.53	0.185	0.13	11.89	0.05	0.000
34.25	2.02	94.62	1.33	125.56	26	1795	0.53	0.182	0.13	11.89	0.05	0.000
34.33	2.02	94.52	1.33	125.64	26	1803	0.53	0.181	0.13	11.89	0.05	0.000
34.40	2.03	94.57	1.33	125.80	26	1809	0.53	0.180	0.13	11.89	0.05	0.000
34.47	2.03	93.70	1.34	125.41	26	1818	0.53	0.178	0.13	11.89	0.05	0.000
34.55	2.05	92.03	1.35	124.65	26	1830	0.53	0.175	0.12	11.89	0.05	0.000
34.59	2.08	89.14	1.39	123.54	26	1848	0.53	0.170	0.12	11.89	0.05	0.000
34.66	2.10	85.99	1.42	121.76	26	1846	0.53	0.171	0.12	11.89	0.05	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
34.74	2.12	83.07	1.45	120.31	26	1844	0.53	0.172	0.12	11.89	0.05	0.000
34.78	2.14	80.71	1.49	120.05	26	1856	0.53	0.170	0.12	11.89	0.04	0.000
34.86	2.18	78.14	1.56	122.06	27	1903	0.53	0.159	0.11	11.89	0.04	0.000
34.93	2.23	74.53	1.70	126.85	29	1977	0.53	0.144	0.09	11.89	0.03	0.000
35.01	2.28	71.61	1.86	133.05	31	2050	0.53	0.132	0.08	11.89	0.03	0.000
35.05	2.33	69.26	2.04	141.17	34	2133	0.53	0.120	0.06	11.89	0.02	0.000
35.12	2.36	68.54	2.16	148.22	36	2208	0.53	0.110	0.06	11.89	0.02	0.000
35.19	2.38	68.18	2.26	154.11	38	2271	0.53	0.104	0.05	11.89	0.02	0.000
35.27	2.38	68.54	2.29	156.93	38	2308	0.53	0.100	0.05	11.89	0.02	0.000
35.31	2.38	69.56	2.27	157.94	38	2331	0.53	0.098	0.04	11.89	0.02	0.000
35.38	2.36	73.01	2.16	157.82	38	2366	0.53	0.095	0.04	11.89	0.02	0.000
35.46	2.31	79.98	1.96	157.08	37	2418	0.53	0.091	0.04	11.89	0.02	0.000
35.53	2.26	88.45	1.78	157.02	36	2468	0.53	0.088	0.04	11.89	0.02	0.000
35.57	2.19	99.78	1.59	158.48	36	2511	0.53	0.085	0.04	11.89	0.02	0.000
35.64	2.11	114.13	1.44	163.87	36	2551	0.53	0.082	0.04	11.89	0.01	0.000
35.71	2.02	132.97	1.33	176.39	37	2596	0.52	0.080	0.04	11.89	0.01	0.000
35.78	1.95	151.49	1.27	192.03	39	2636	0.52	0.077	0.03	11.89	0.01	0.000
35.86	1.90	164.86	1.23	203.59	41	2663	0.52	0.076	0.03	11.89	0.01	0.000
35.93	1.87	171.42	1.22	208.76	41	2669	0.52	0.076	0.03	11.89	0.01	0.000
35.97	1.87	171.03	1.21	207.55	41	2641	0.52	0.078	0.03	11.89	0.01	0.000
36.05	1.87	165.74	1.22	201.81	40	2585	0.52	0.081	0.04	11.89	0.01	0.000
36.12	1.88	158.88	1.23	194.64	39	2522	0.52	0.085	0.04	11.89	0.01	0.000
36.16	1.90	150.20	1.24	185.96	37	2457	0.52	0.090	0.04	11.89	0.01	0.000
36.23	1.93	141.06	1.25	176.99	36	2403	0.52	0.095	0.05	11.89	0.02	0.000
36.30	1.96	131.77	1.27	167.93	34	2352	0.52	0.100	0.05	11.89	0.02	0.000
36.38	1.98	125.94	1.29	162.41	34	2326	0.52	0.102	0.06	11.89	0.02	0.000
36.42	1.99	123.58	1.30	160.48	33	2326	0.52	0.103	0.06	11.89	0.02	0.000
36.49	2.00	122.91	1.31	160.48	33	2348	0.52	0.101	0.05	11.89	0.02	0.000
36.57	2.01	122.09	1.32	160.90	34	2388	0.52	0.097	0.05	11.89	0.02	0.000
36.64	2.03	120.96	1.33	161.25	34	2431	0.52	0.094	0.05	11.89	0.02	0.000
36.68	2.05	118.27	1.36	160.72	34	2472	0.52	0.091	0.05	11.89	0.02	0.000
36.76	2.10	112.30	1.41	158.56	34	2507	0.52	0.088	0.05	11.89	0.02	0.000
36.83	2.16	102.94	1.52	156.31	35	2534	0.52	0.086	0.04	11.89	0.02	0.000
36.90	2.22	93.38	1.67	156.23	36	2547	0.52	0.086	0.04	11.89	0.01	0.000
36.94	2.29	84.55	1.88	158.60	37	2550	0.52	0.086	0.04	11.89	0.01	0.000
37.02	2.34	78.32	2.07	161.97	39	2553	0.52	0.086	0.04	11.89	0.01	0.000
37.10	2.37	74.38	2.21	164.74	40	2555	0.52	0.086	0.04	11.89	0.01	0.000
37.17	2.38	73.22	2.26	165.46	40	2556	0.52	0.086	0.04	11.89	0.01	0.000
37.21	2.37	73.56	2.24	165.04	40	2557	0.52	0.086	0.04	11.89	0.01	0.000
37.29	2.37	74.21	2.22	164.75	40	2564	0.52	0.086	0.04	11.89	0.01	0.000
37.36	2.36	75.13	2.19	164.40	40	2573	0.52	0.085	0.04	11.89	0.01	0.000
37.44	2.36	75.66	2.17	164.10	40	2579	0.52	0.085	0.04	11.89	0.01	0.000
37.48	2.36	75.70	2.17	163.95	40	2580	0.52	0.085	0.04	11.89	0.01	0.000
37.55	2.34	75.97	2.08	158.02	38	2517	0.52	0.089	0.04	11.89	0.01	0.000
37.62	2.30	79.00	1.93	152.26	36	2472	0.52	0.093	0.05	11.89	0.02	0.000
37.70	2.26	83.77	1.77	148.50	34	2449	0.52	0.095	0.05	11.89	0.02	0.000
37.74	2.21	92.47	1.64	151.95	34	2523	0.52	0.090	0.05	11.89	0.02	0.000
37.81	2.17	101.86	1.54	156.94	35	2602	0.52	0.084	0.04	11.89	0.01	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
37.88	2.12	113.00	1.45	163.87	36	2681	0.52	0.080	0.04	11.89	0.01	0.000
37.96	2.18	103.84	1.56	161.70	36	2692	0.52	0.079	0.04	11.89	0.01	0.000
37.99	2.14	112.14	1.49	166.90	37	2759	0.52	0.075	0.04	11.89	0.01	0.000
38.06	2.10	121.08	1.43	172.54	37	2813	0.52	0.073	0.03	11.89	0.01	0.000
38.12	1.99	148.33	1.30	192.89	40	2893	0.52	0.069	0.03	11.89	0.01	0.000
38.19	1.97	153.14	1.28	196.38	40	2880	0.52	0.070	0.03	11.89	0.01	0.000
38.27	1.97	149.22	1.29	191.86	40	2831	0.52	0.072	0.03	11.89	0.01	0.000
38.35	2.00	138.83	1.31	181.69	38	2762	0.52	0.076	0.04	11.89	0.01	0.000
38.42	2.04	126.89	1.35	170.90	36	2695	0.52	0.080	0.04	11.89	0.01	0.000
38.46	2.09	115.11	1.40	161.19	35	2623	0.52	0.084	0.04	11.89	0.01	0.000
38.53	2.13	105.13	1.47	154.04	34	2563	0.52	0.089	0.05	11.89	0.01	0.000
38.60	2.17	97.05	1.54	149.50	33	2519	0.52	0.092	0.05	11.89	0.02	0.000
38.68	2.18	94.23	1.58	148.47	33	2511	0.52	0.093	0.05	11.89	0.02	0.000
38.75	2.19	93.34	1.59	148.60	33	2519	0.52	0.092	0.05	11.89	0.02	0.000
38.79	2.19	94.04	1.59	149.65	34	2538	0.52	0.091	0.05	11.89	0.02	0.000
38.86	2.19	95.85	1.58	151.42	34	2571	0.52	0.089	0.05	11.89	0.01	0.000
38.93	2.16	101.20	1.53	154.90	34	2624	0.52	0.085	0.04	11.89	0.01	0.000
39.00	2.13	108.40	1.47	159.30	35	2677	0.52	0.082	0.04	11.89	0.01	0.000
39.07	2.10	115.38	1.42	163.78	35	2717	0.52	0.080	0.04	11.89	0.01	0.000
39.14	2.08	120.46	1.39	167.16	36	2739	0.52	0.079	0.04	11.89	0.01	0.000
39.18	2.06	124.95	1.36	170.09	36	2748	0.52	0.078	0.04	11.89	0.01	0.000
39.25	2.03	129.70	1.34	173.20	36	2748	0.52	0.078	0.04	11.89	0.01	0.000
39.33	2.00	136.96	1.30	178.55	37	2747	0.52	0.079	0.04	11.89	0.01	0.000
39.40	1.96	145.56	1.27	185.44	38	2745	0.52	0.079	0.04	11.89	0.01	0.000
39.47	1.92	153.32	1.25	191.79	39	2741	0.52	0.079	0.04	11.89	0.01	0.000
39.50	1.89	159.27	1.23	196.07	39	2717	0.52	0.081	0.04	11.89	0.01	0.000
39.57	1.87	161.00	1.22	196.20	39	2674	0.52	0.083	0.04	11.89	0.01	0.000
39.64	1.87	157.81	1.22	191.82	0	0	0.52	0.000	0.00	11.89	0.00	0.000
39.72	1.89	148.39	1.23	182.42	0	0	0.52	0.000	0.00	11.89	0.00	0.000
39.79	1.93	135.13	1.26	169.70	0	0	0.52	0.000	0.00	11.89	0.00	0.000
39.86	1.97	123.84	1.28	158.84	0	0	0.52	0.000	0.00	11.89	0.00	0.000
39.90	2.00	114.43	1.31	149.83	0	0	0.52	0.000	0.00	11.89	0.00	0.000
39.97	2.02	107.67	1.33	143.07	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.05	2.05	100.80	1.36	136.86	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.13	2.08	96.02	1.39	133.16	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.16	2.10	92.15	1.43	131.35	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.24	2.13	89.26	1.46	130.56	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.31	2.15	86.45	1.51	130.33	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.39	2.17	84.42	1.55	130.46	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.43	2.19	82.23	1.59	130.48	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.50	2.21	79.78	1.63	130.40	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.57	2.23	76.87	1.68	129.23	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.65	2.25	73.67	1.75	128.71	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.71	2.28	70.45	1.84	129.64	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.75	2.32	66.67	2.00	133.55	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.83	2.36	63.07	2.20	138.68	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.90	2.41	59.43	2.42	143.87	0	0	0.51	0.000	0.00	11.89	0.00	0.000
40.96	2.43	58.45	2.51	146.86	0	0	0.51	0.000	0.00	11.89	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
41.03	2.44	57.57	2.58	148.46	0	0	0.51	0.000	0.00	11.89	0.00	0.000
41.09	2.42	58.88	2.51	147.77	0	0	0.51	0.000	0.00	11.89	0.00	0.000
41.16	2.41	60.01	2.45	146.96	0	0	0.51	0.000	0.00	11.89	0.00	0.000
41.23	2.39	62.22	2.33	144.97	0	0	0.51	0.000	0.00	11.89	0.00	0.000
41.30	2.38	62.94	2.28	143.30	0	0	0.51	0.000	0.00	11.89	0.00	0.000
41.34	2.39	61.56	2.31	142.33	0	0	0.51	0.000	0.00	11.89	0.00	0.000
41.42	2.41	59.13	2.41	142.63	0	0	0.51	0.000	0.00	11.89	0.00	0.000
41.49	2.43	56.48	2.54	143.63	0	0	0.51	0.000	0.00	11.89	0.00	0.000
41.56	2.45	54.67	2.64	144.39	0	0	0.51	0.000	0.00	11.89	0.00	0.000
41.64	2.46	53.65	2.69	144.46	0	0	0.51	0.000	0.00	11.89	0.00	0.000
41.70	2.46	53.00	2.73	144.45	0	0	0.51	0.000	0.00	11.89	0.00	0.000
41.74	2.47	52.20	2.78	145.20	0	0	0.51	0.000	0.00	11.89	0.00	0.000
41.81	2.48	51.43	2.86	147.14	0	0	0.51	0.000	0.00	11.89	0.00	0.000
41.89	2.49	50.95	2.94	149.81	0	0	0.51	0.000	0.00	11.89	0.00	0.000
41.96	2.50	50.96	2.99	152.14	0	0	0.51	0.000	0.00	11.89	0.00	0.000
42.00	2.50	51.21	3.00	153.64	0	0	0.51	0.000	0.00	11.89	0.00	0.000
42.08	2.51	50.98	3.05	155.50	0	0	0.51	0.000	0.00	11.89	0.00	0.000
42.15	2.52	50.27	3.14	158.05	0	0	0.51	0.000	0.00	11.89	0.00	0.000
42.19	2.54	48.89	3.30	161.44	0	0	0.51	0.000	0.00	11.89	0.00	0.000
42.27	2.56	47.55	3.45	163.96	0	0	0.51	0.000	0.00	11.89	0.00	0.000
42.35	2.58	46.23	3.59	166.19	0	0	0.51	0.000	0.00	11.89	0.00	0.000
42.42	2.60	45.17	3.71	167.58	0	0	0.51	0.000	0.00	11.89	0.00	0.000
42.46	2.61	44.25	3.81	168.65	0	0	0.51	0.000	0.00	0.00	0.00	0.000
42.54	2.61	43.78	3.85	168.59	0	0	0.51	0.000	0.00	0.00	0.00	0.000
42.61	2.61	43.84	3.81	167.10	0	0	0.51	0.000	0.00	0.00	0.00	0.000
42.69	2.60	44.20	3.73	164.98	0	0	0.51	0.000	0.00	11.89	0.00	0.000
42.72	2.58	45.00	3.60	161.86	0	0	0.51	0.000	0.00	11.89	0.00	0.000
42.80	2.56	46.02	3.44	158.16	0	0	0.51	0.000	0.00	11.89	0.00	0.000
42.87	2.54	47.48	3.23	153.56	0	0	0.51	0.000	0.00	11.89	0.00	0.000
42.95	2.51	48.82	3.07	149.80	0	0	0.51	0.000	0.00	11.89	0.00	0.000
42.98	2.49	50.76	2.88	146.18	0	0	0.51	0.000	0.00	11.89	0.00	0.000
43.06	2.45	53.39	2.67	142.77	0	0	0.51	0.000	0.00	11.89	0.00	0.000
43.13	2.41	57.27	2.43	138.99	0	0	0.51	0.000	0.00	11.89	0.00	0.000
43.21	2.37	60.83	2.24	136.40	0	0	0.51	0.000	0.00	11.89	0.00	0.000
43.25	2.34	64.47	2.08	134.35	0	0	0.51	0.000	0.00	11.89	0.00	0.000
43.32	2.31	67.38	1.97	132.90	0	0	0.51	0.000	0.00	11.89	0.00	0.000
43.39	2.29	70.01	1.88	131.87	0	0	0.51	0.000	0.00	11.89	0.00	0.000
43.47	2.28	71.41	1.84	131.40	0	0	0.51	0.000	0.00	11.89	0.00	0.000
43.51	2.27	72.20	1.82	131.39	0	0	0.51	0.000	0.00	11.89	0.00	0.000
43.58	2.27	72.78	1.81	131.37	0	0	0.51	0.000	0.00	11.89	0.00	0.000
43.66	2.26	73.40	1.79	131.20	0	0	0.51	0.000	0.00	11.89	0.00	0.000
43.73	2.26	73.86	1.77	130.83	0	0	0.51	0.000	0.00	11.89	0.00	0.000
43.77	2.25	74.19	1.76	130.38	0	0	0.51	0.000	0.00	11.89	0.00	0.000
43.84	2.25	74.19	1.76	130.37	0	0	0.51	0.000	0.00	11.89	0.00	0.000
43.93	2.26	73.84	1.77	130.80	0	0	0.51	0.000	0.00	11.89	0.00	0.000
44.00	2.27	72.51	1.82	131.71	0	0	0.50	0.000	0.00	11.89	0.00	0.000
44.03	2.29	70.29	1.90	133.58	0	0	0.50	0.000	0.00	11.89	0.00	0.000
44.11	2.32	68.32	2.01	137.32	0	0	0.50	0.000	0.00	11.89	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
44.18	2.35	66.76	2.15	143.45	0	0	0.50	0.000	0.00	11.89	0.00	0.000
44.25	2.39	65.34	2.31	151.07	0	0	0.50	0.000	0.00	11.89	0.00	0.000
44.33	2.43	62.47	2.55	159.07	0	0	0.50	0.000	0.00	11.89	0.00	0.000
44.40	2.48	58.67	2.84	166.35	0	0	0.50	0.000	0.00	11.89	0.00	0.000
44.44	2.55	52.72	3.32	174.83	0	0	0.50	0.000	0.00	11.89	0.00	0.000
44.51	2.63	45.61	4.04	184.20	0	0	0.50	0.000	0.00	0.00	0.00	0.000
44.59	2.72	39.01	4.93	192.50	0	0	0.50	0.000	0.00	0.00	0.00	0.000
44.63	2.79	34.46	5.73	197.53	0	0	0.50	0.000	0.00	0.00	0.00	0.000
44.71	2.83	31.98	6.22	198.79	0	0	0.50	0.000	0.00	0.00	0.00	0.000
44.79	2.86	30.11	6.63	199.54	0	0	0.50	0.000	0.00	0.00	0.00	0.000
44.82	2.89	28.41	7.10	201.82	0	0	0.50	0.000	0.00	0.00	0.00	0.000
44.90	2.93	27.07	7.59	205.55	0	0	0.50	0.000	0.00	0.00	0.00	0.000
44.97	2.94	26.65	7.84	208.98	0	0	0.50	0.000	0.00	0.00	0.00	0.000
45.02	2.90	28.93	7.22	209.03	0	0	0.50	0.000	0.00	0.00	0.00	0.000
45.09	2.82	33.41	6.14	205.15	0	0	0.50	0.000	0.00	0.00	0.00	0.000
45.16	2.72	39.88	4.94	196.93	0	0	0.50	0.000	0.00	0.00	0.00	0.000
45.23	2.62	47.03	3.94	185.32	0	0	0.50	0.000	0.00	0.00	0.00	0.000
45.32	2.54	53.06	3.28	174.09	0	0	0.50	0.000	0.00	11.89	0.00	0.000
45.36	2.47	59.11	2.76	162.93	0	0	0.50	0.000	0.00	11.89	0.00	0.000
45.43	2.40	64.08	2.39	153.19	0	0	0.50	0.000	0.00	11.89	0.00	0.000
45.51	2.35	68.04	2.14	145.72	0	0	0.50	0.000	0.00	11.89	0.00	0.000
45.54	2.33	69.66	2.02	140.95	0	0	0.50	0.000	0.00	11.89	0.00	0.000
45.62	2.31	70.21	1.96	137.62	0	0	0.50	0.000	0.00	11.89	0.00	0.000
45.69	2.30	70.14	1.92	134.67	0	0	0.50	0.000	0.00	11.89	0.00	0.000
45.76	2.30	69.46	1.92	133.07	0	0	0.50	0.000	0.00	11.89	0.00	0.000
45.83	2.31	68.29	1.95	133.43	0	0	0.50	0.000	0.00	11.89	0.00	0.000
45.87	2.33	66.90	2.04	136.39	0	0	0.50	0.000	0.00	11.89	0.00	0.000
45.95	2.36	65.49	2.17	142.43	0	0	0.50	0.000	0.00	11.89	0.00	0.000
46.03	2.40	63.46	2.38	151.26	0	0	0.50	0.000	0.00	11.89	0.00	0.000
46.10	2.44	61.90	2.58	159.46	0	0	0.50	0.000	0.00	11.89	0.00	0.000
46.14	2.48	59.73	2.82	168.28	0	0	0.50	0.000	0.00	11.89	0.00	0.000
46.21	2.52	56.50	3.15	178.24	0	0	0.50	0.000	0.00	11.89	0.00	0.000
46.29	2.58	52.69	3.59	188.91	0	0	0.50	0.000	0.00	11.89	0.00	0.000
46.33	2.64	48.57	4.10	199.36	0	0	0.50	0.000	0.00	0.00	0.00	0.000
46.40	2.69	45.44	4.60	208.85	0	0	0.50	0.000	0.00	0.00	0.00	0.000
46.47	2.73	43.38	5.01	217.54	0	0	0.50	0.000	0.00	0.00	0.00	0.000
46.55	2.75	42.33	5.28	223.69	0	0	0.49	0.000	0.00	0.00	0.00	0.000
46.62	2.76	42.04	5.34	224.42	0	0	0.49	0.000	0.00	0.00	0.00	0.000
46.66	2.75	41.28	5.30	218.70	0	0	0.49	0.000	0.00	0.00	0.00	0.000
46.74	2.76	40.04	5.35	214.24	0	0	0.49	0.000	0.00	0.00	0.00	0.000
46.81	2.77	38.70	5.48	211.95	0	0	0.49	0.000	0.00	0.00	0.00	0.000
46.86	2.79	37.84	5.72	216.29	0	0	0.49	0.000	0.00	0.00	0.00	0.000
46.92	2.80	37.48	5.84	219.09	0	0	0.49	0.000	0.00	0.00	0.00	0.000
47.00	2.81	36.84	6.04	222.36	0	0	0.49	0.000	0.00	0.00	0.00	0.000
47.06	2.81	37.39	5.99	224.04	0	0	0.49	0.000	0.00	0.00	0.00	0.000
47.14	2.80	38.36	5.87	225.01	0	0	0.49	0.000	0.00	0.00	0.00	0.000
47.21	2.79	39.54	5.71	225.82	0	0	0.49	0.000	0.00	0.00	0.00	0.000
47.25	2.79	39.59	5.76	228.16	0	0	0.49	0.000	0.00	0.00	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
47.32	2.80	39.38	5.86	230.70	0	0	0.49	0.000	0.00	0.00	0.00	0.000
47.40	2.80	39.80	5.84	232.26	0	0	0.49	0.000	0.00	0.00	0.00	0.000
47.47	2.79	40.45	5.75	232.65	0	0	0.49	0.000	0.00	0.00	0.00	0.000
47.51	2.78	41.39	5.61	232.38	0	0	0.49	0.000	0.00	0.00	0.00	0.000
47.58	2.79	41.17	5.67	233.62	0	0	0.49	0.000	0.00	0.00	0.00	0.000
47.66	2.80	40.46	5.83	235.87	0	0	0.49	0.000	0.00	0.00	0.00	0.000
47.73	2.81	39.55	6.03	238.39	0	0	0.49	0.000	0.00	0.00	0.00	0.000
47.78	2.82	39.22	6.13	240.25	0	0	0.49	0.000	0.00	0.00	0.00	0.000
47.85	2.82	39.75	6.05	240.56	0	0	0.49	0.000	0.00	0.00	0.00	0.000
47.92	2.80	40.75	5.89	240.07	0	0	0.49	0.000	0.00	0.00	0.00	0.000
47.99	2.79	42.04	5.68	238.89	0	0	0.49	0.000	0.00	0.00	0.00	0.000
48.03	2.77	43.00	5.54	238.39	0	0	0.49	0.000	0.00	0.00	0.00	0.000
48.11	2.77	43.58	5.47	238.25	0	0	0.49	0.000	0.00	0.00	0.00	0.000
48.18	2.75	44.54	5.31	236.45	0	0	0.49	0.000	0.00	0.00	0.00	0.000
48.26	2.74	45.79	5.09	233.14	0	0	0.49	0.000	0.00	0.00	0.00	0.000
48.30	2.71	47.26	4.82	227.93	0	0	0.49	0.000	0.00	0.00	0.00	0.000
48.37	2.69	48.28	4.61	222.35	0	0	0.49	0.000	0.00	0.00	0.00	0.000
48.45	2.67	49.21	4.37	214.90	0	0	0.49	0.000	0.00	0.00	0.00	0.000
48.52	2.64	50.65	4.07	206.21	0	0	0.49	0.000	0.00	0.00	0.00	0.000
48.59	2.60	52.36	3.78	197.72	0	0	0.49	0.000	0.00	0.00	0.00	0.000
48.63	2.56	54.71	3.44	188.10	0	0	0.49	0.000	0.00	11.89	0.00	0.000
48.70	2.51	58.07	3.05	177.24	0	0	0.49	0.000	0.00	11.89	0.00	0.000
48.77	2.44	63.21	2.61	164.89	0	0	0.49	0.000	0.00	11.89	0.00	0.000
48.84	2.37	69.50	2.21	153.58	0	0	0.49	0.000	0.00	11.89	0.00	0.000
48.92	2.31	74.62	1.95	145.82	0	0	0.48	0.000	0.00	11.89	0.00	0.000
48.96	2.26	78.58	1.78	139.77	0	0	0.48	0.000	0.00	11.89	0.00	0.000
49.03	2.22	81.39	1.66	135.52	0	0	0.48	0.000	0.00	11.89	0.00	0.000
49.10	2.18	84.69	1.56	132.50	0	0	0.48	0.000	0.00	11.89	0.00	0.000
49.18	2.15	87.41	1.50	131.33	0	0	0.48	0.000	0.00	11.89	0.00	0.000
49.22	2.13	89.78	1.46	131.35	0	0	0.48	0.000	0.00	11.89	0.00	0.000
49.29	2.11	91.65	1.44	131.60	0	0	0.48	0.000	0.00	11.89	0.00	0.000
49.37	2.09	93.88	1.41	131.93	0	0	0.48	0.000	0.00	11.89	0.00	0.000
49.44	2.07	95.83	1.38	132.34	0	0	0.48	0.000	0.00	11.89	0.00	0.000
49.48	2.05	98.05	1.36	133.20	0	0	0.48	0.000	0.00	11.89	0.00	0.000
49.56	2.04	99.50	1.34	133.78	0	0	0.48	0.000	0.00	11.89	0.00	0.000
49.63	2.03	100.35	1.33	133.84	0	0	0.48	0.000	0.00	11.89	0.00	0.000
49.67	2.02	100.09	1.32	132.30	0	0	0.48	0.000	0.00	11.89	0.00	0.000
49.74	2.03	97.42	1.33	129.98	27	2435	0.48	0.117	0.08	11.89	0.01	0.000
49.82	2.06	92.91	1.36	126.50	27	2428	0.48	0.117	0.08	11.89	0.01	0.000
49.89	2.11	86.38	1.43	123.91	27	2475	0.48	0.113	0.08	11.89	0.01	0.000
49.97	2.18	77.44	1.56	120.69	27	2481	0.48	0.112	0.08	11.89	0.01	0.000
50.01	2.24	70.92	1.71	121.32	28	2512	0.48	0.109	0.07	11.89	0.01	0.000
50.09	2.28	66.05	1.86	123.07	29	2537	0.48	0.107	0.07	11.89	0.01	0.000
50.13	2.29	65.68	1.90	124.54	29	2563	0.48	0.105	0.07	11.89	0.01	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)

Total estimated settlement: 1.02

Abbreviations

Q_{tn}: Equivalent clean sand normalized cone resistance
K_c: Fines correction factor
$Q_{tn,cs}$: Post-liquefaction volumentric strain
G_{max}: Small strain shear modulus
CSR: Soil cyclic stress ratio
γ: Cyclic shear strain
$e_{vol(15)}$: Volumetric strain after 15 cycles
N_c: Equivalent number of cycles
e_v: Volumetric strain
Settle.: Calculated settlement

GeoTek, Inc.
1548 N. Maple Street
Corona, CA 92878
951-710-1160, www.geotekusa.com

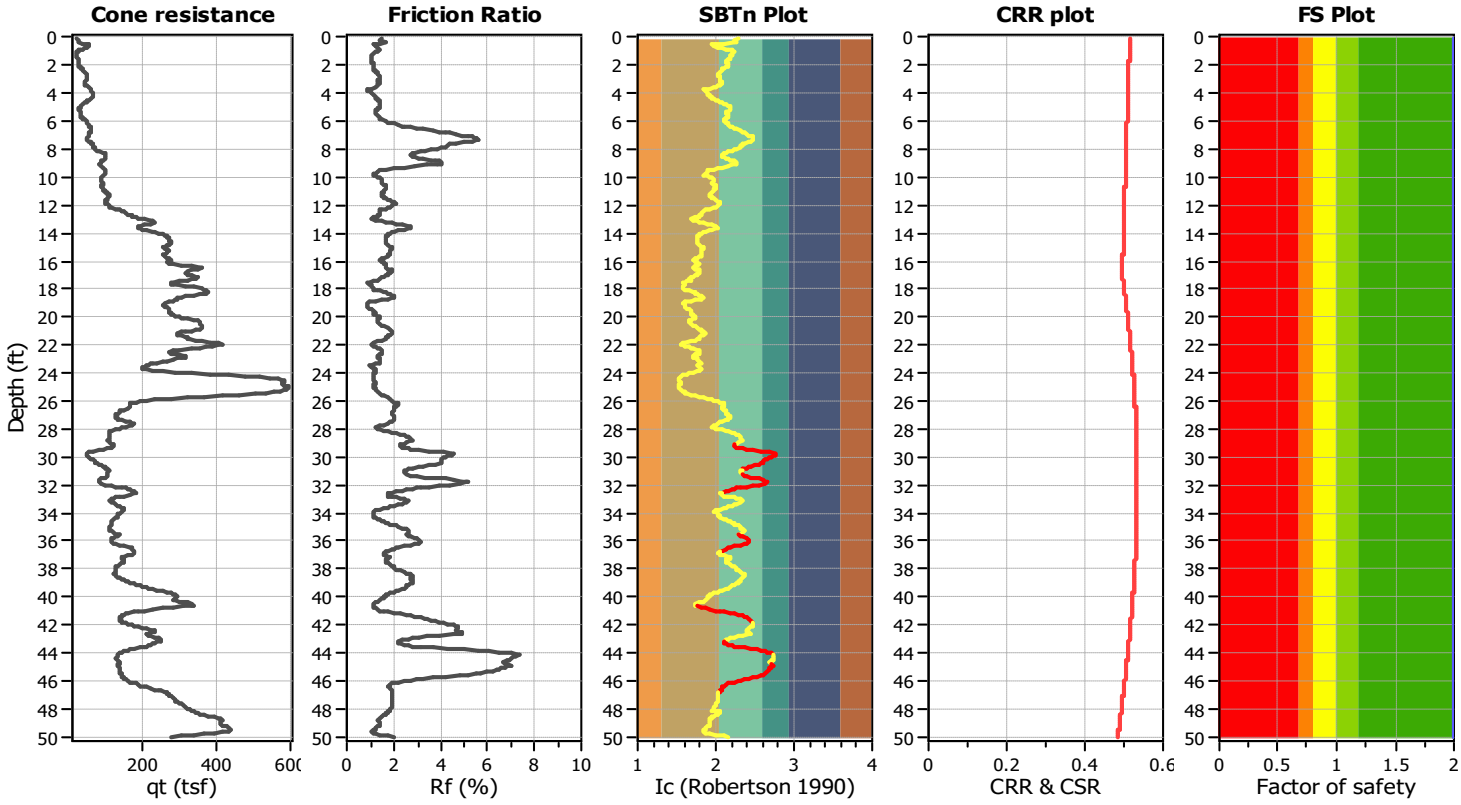
LIQUEFACTION ANALYSIS REPORT

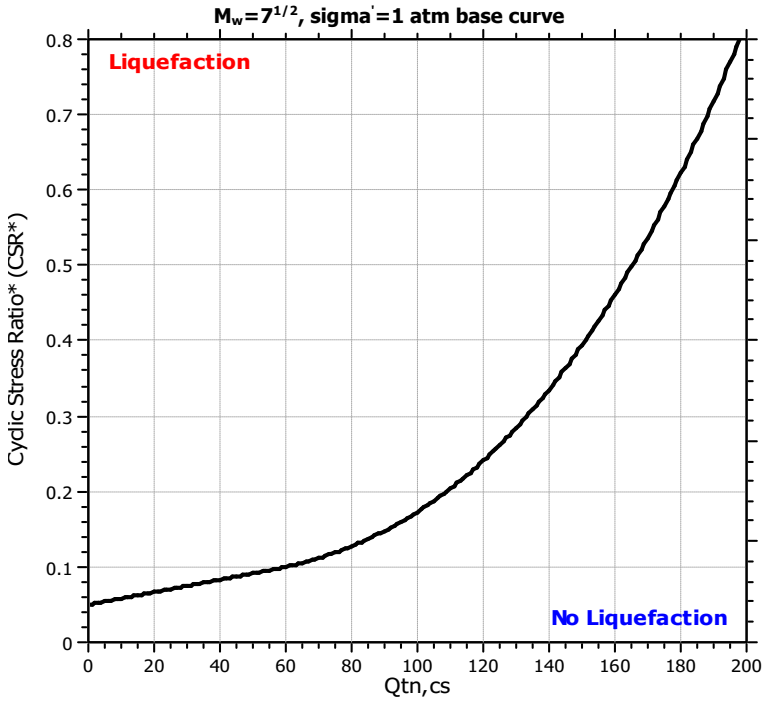
Project title : Xenia Site **Location : Beaumont, California**

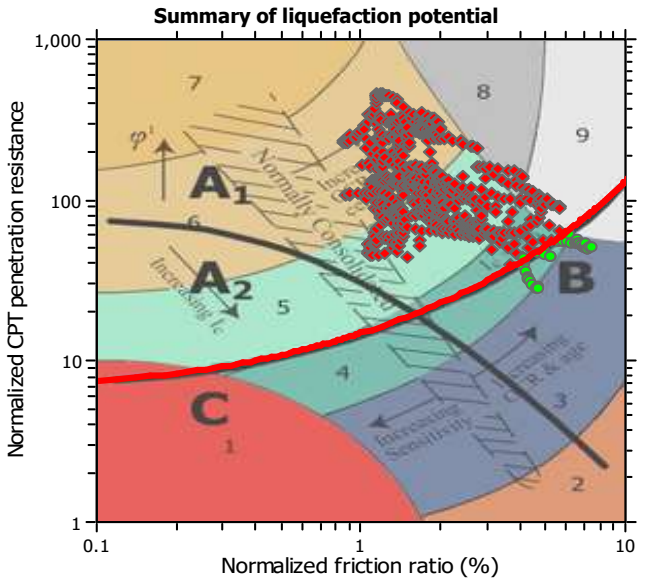
CPT file : CPT-2

Input parameters and analysis data

Analysis method:	NCEER (1998)	G.W.T. (in-situ):	100.00 ft	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	100.00 ft	Fill height:	N/A	Limit depth applied:	Yes
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	60.00 ft
Earthquake magnitude M_w:	7.13	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	0.90	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

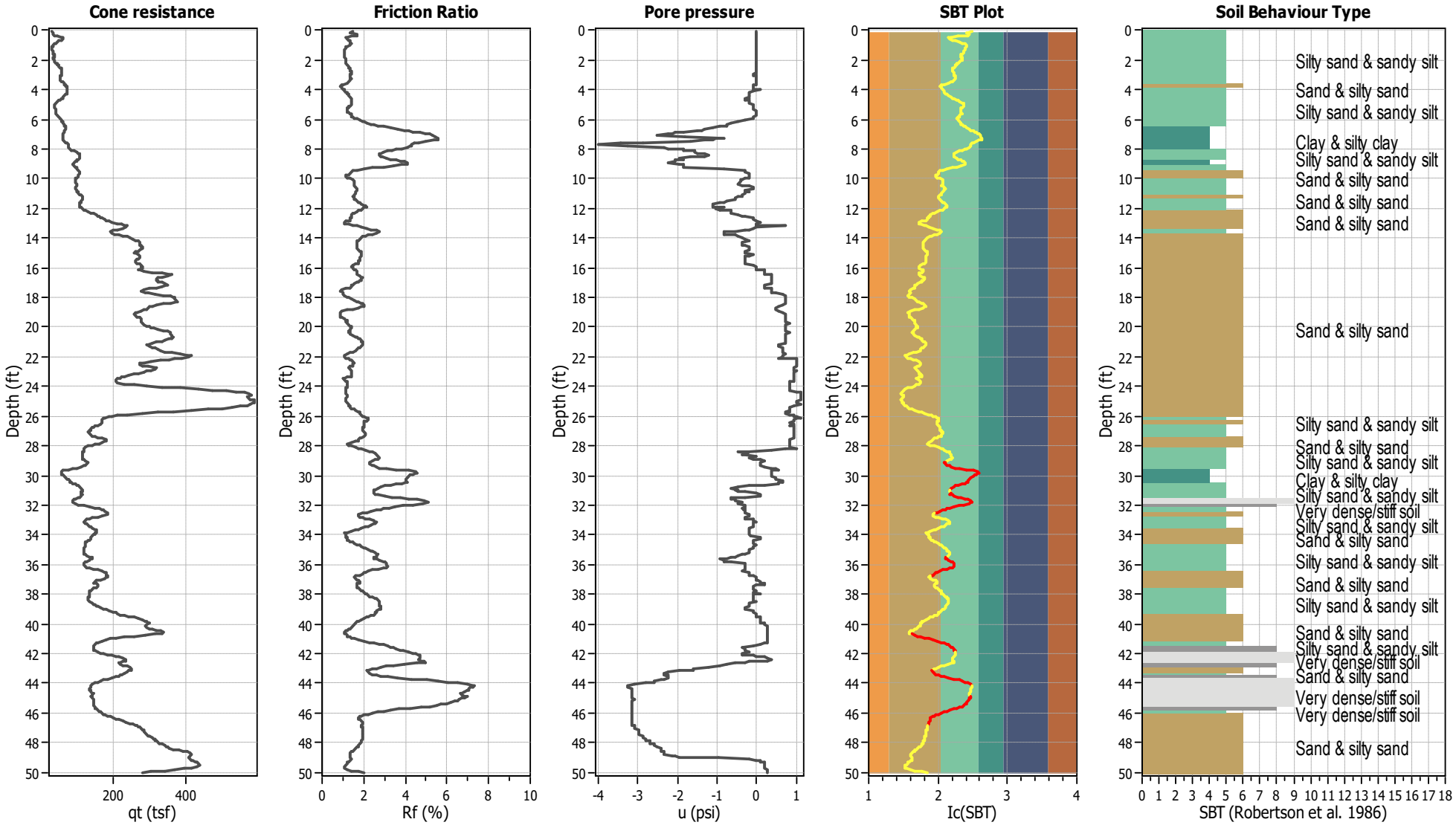






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plots



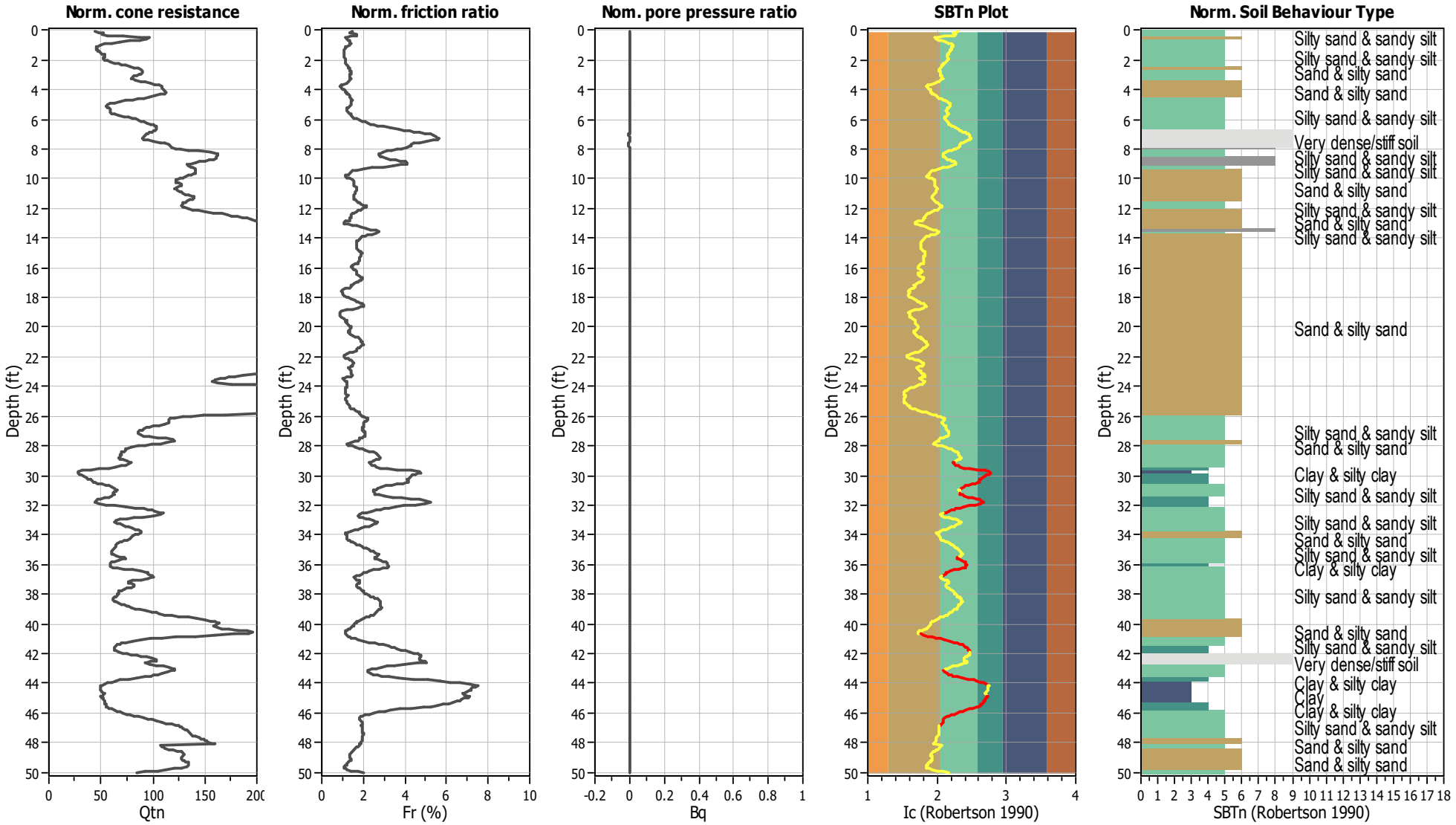
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	100.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.13	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.90	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	100.00 ft	Fill height:	N/A	Limit depth:	60.00 ft

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

CPT basic interpretation plots (normalized)



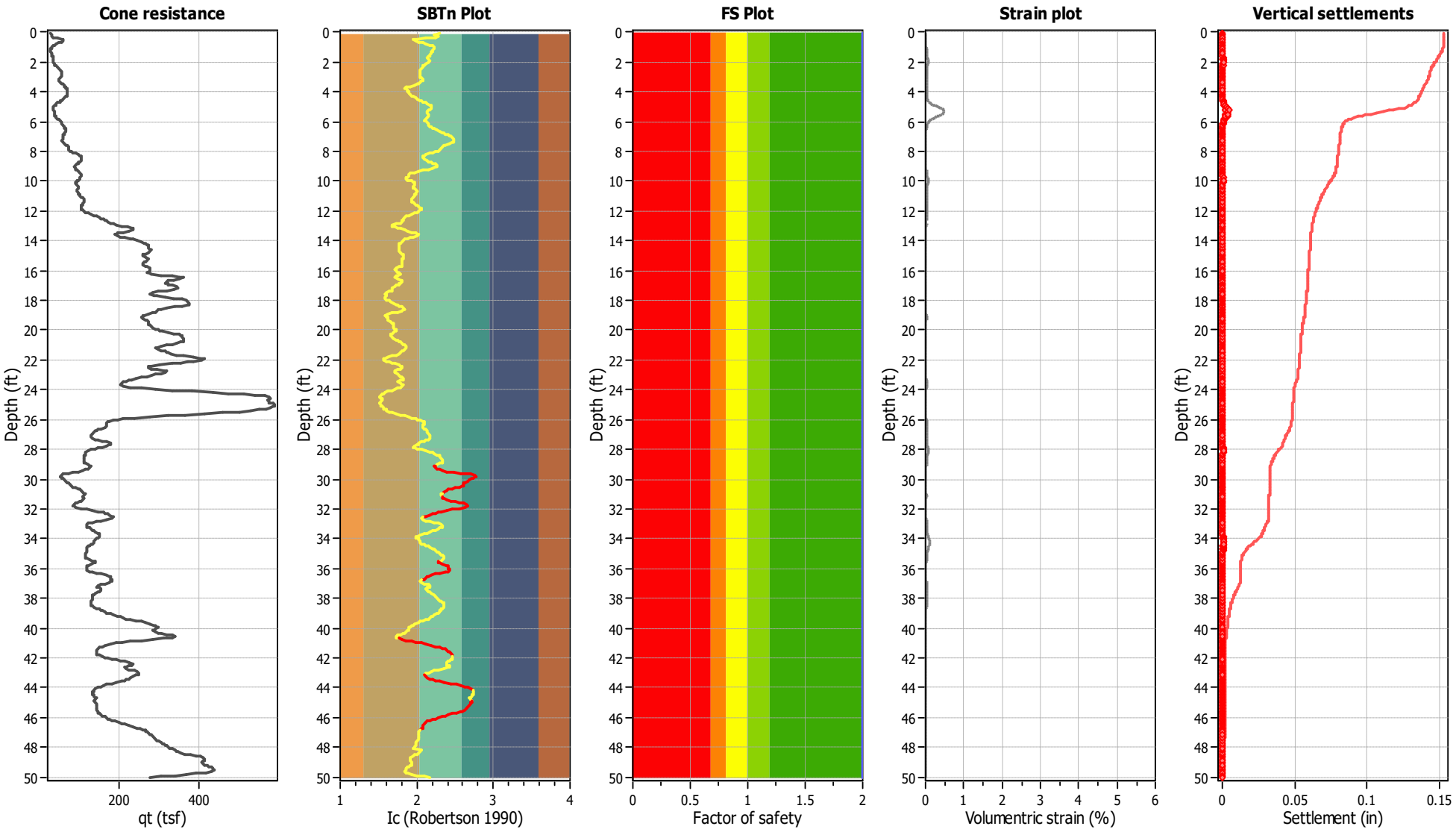
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	100.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.13	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.90	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	100.00 ft	Fill height:	N/A	Limit depth:	60.00 ft

SBTn legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

Estimation of post-earthquake settlements



Abbreviations

q_t:	Total cone resistance (cone resistance q_c corrected for pore water effects)
I_c:	Soil Behaviour Type Index
FS:	Calculated Factor of Safety against liquefaction
Volumentric strain:	Post-liquefaction volumentric strain

:: Post-earthquake settlement of dry sands ::

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
0.07	2.30	43.80	1.92	84.30	20	452	0.51	0.001	0.00	11.89	0.00	0.000
0.14	2.24	48.25	1.73	83.39	19	462	0.51	0.001	0.00	11.89	0.00	0.000
0.22	2.22	51.74	1.68	86.76	20	484	0.51	0.002	0.00	11.89	0.00	0.000
0.29	2.28	51.33	1.84	94.31	22	513	0.51	0.003	0.00	11.89	0.00	0.000
0.33	2.24	56.93	1.72	98.08	22	544	0.51	0.003	0.00	11.89	0.00	0.000
0.41	2.11	71.48	1.44	103.06	22	583	0.51	0.003	0.00	11.89	0.00	0.000
0.49	2.00	87.58	1.31	114.78	24	621	0.51	0.004	0.00	11.89	0.00	0.000
0.53	1.96	96.72	1.28	123.51	25	648	0.51	0.004	0.00	11.89	0.00	0.000
0.62	1.98	94.31	1.29	121.93	25	650	0.51	0.005	0.00	11.89	0.00	0.000
0.70	2.02	87.45	1.33	116.15	24	635	0.51	0.005	0.00	11.89	0.00	0.000
0.74	2.08	77.85	1.39	107.87	23	604	0.51	0.006	0.01	11.89	0.00	0.000
0.81	2.12	68.59	1.46	99.93	22	566	0.51	0.008	0.01	11.89	0.01	0.000
0.89	2.17	60.48	1.54	93.33	21	528	0.51	0.011	0.01	11.89	0.01	0.000
0.92	2.20	54.13	1.62	87.65	20	493	0.51	0.013	0.01	11.89	0.01	0.000
1.00	2.22	50.02	1.66	83.27	19	466	0.51	0.018	0.02	11.89	0.02	0.000
1.07	2.23	46.91	1.68	78.86	18	440	0.51	0.023	0.03	11.89	0.02	0.000
1.15	2.22	45.96	1.66	76.25	17	427	0.51	0.029	0.03	11.89	0.03	0.000
1.19	2.21	45.85	1.63	74.92	17	421	0.51	0.033	0.04	11.89	0.04	0.000
1.26	2.20	46.04	1.62	74.41	17	419	0.51	0.037	0.05	11.89	0.04	0.000
1.35	2.19	46.44	1.60	74.20	17	418	0.51	0.042	0.05	11.89	0.05	0.000
1.38	2.19	46.99	1.58	74.29	17	419	0.51	0.044	0.05	11.89	0.05	0.000
1.46	2.18	47.73	1.57	75.12	17	424	0.51	0.047	0.06	11.89	0.05	0.000
1.53	2.18	49.22	1.56	76.60	17	433	0.51	0.048	0.06	11.89	0.05	0.000
1.61	2.16	51.22	1.53	78.24	17	443	0.51	0.049	0.06	11.89	0.05	0.000
1.65	2.14	53.07	1.49	79.24	17	449	0.51	0.049	0.06	11.89	0.05	0.000
1.72	2.14	53.61	1.48	79.57	18	451	0.51	0.053	0.06	11.89	0.05	0.001
1.81	2.14	53.35	1.49	79.68	18	452	0.51	0.058	0.07	11.89	0.06	0.001
1.84	2.16	52.70	1.52	79.86	18	453	0.51	0.060	0.07	11.89	0.06	0.000
1.92	2.16	52.85	1.53	80.69	18	457	0.51	0.063	0.07	11.89	0.06	0.001
1.99	2.16	54.04	1.52	82.05	18	465	0.51	0.064	0.07	11.89	0.06	0.001
2.07	2.15	55.73	1.50	83.53	18	474	0.51	0.065	0.07	11.89	0.06	0.001
2.10	2.12	58.87	1.46	85.83	19	486	0.51	0.060	0.07	11.89	0.06	0.000
2.18	2.10	62.52	1.42	88.97	19	502	0.51	0.058	0.06	11.89	0.05	0.001
2.26	2.09	66.71	1.40	93.29	20	524	0.51	0.053	0.05	11.89	0.05	0.000
2.33	2.08	69.81	1.39	96.91	21	543	0.51	0.050	0.05	11.89	0.04	0.000
2.37	2.07	73.25	1.38	101.12	22	566	0.51	0.045	0.04	11.89	0.04	0.000
2.45	2.06	77.60	1.37	106.10	23	591	0.51	0.042	0.04	11.89	0.03	0.000
2.53	2.05	81.94	1.35	111.01	24	615	0.51	0.040	0.03	11.89	0.03	0.000
2.56	2.04	85.94	1.34	115.28	24	635	0.51	0.037	0.03	11.89	0.03	0.000
2.64	2.03	88.28	1.34	118.09	25	649	0.51	0.037	0.03	11.89	0.02	0.000
2.72	2.04	89.77	1.34	120.23	25	662	0.51	0.037	0.03	11.89	0.02	0.000
2.79	2.04	89.92	1.35	121.07	26	669	0.51	0.037	0.03	11.89	0.02	0.000
2.82	2.05	89.31	1.35	120.55	26	667	0.51	0.038	0.03	11.89	0.02	0.000
2.91	2.05	88.16	1.35	119.06	25	659	0.51	0.042	0.03	11.89	0.03	0.000
2.98	2.05	86.70	1.35	117.11	25	648	0.51	0.046	0.04	11.89	0.03	0.000
3.02	2.05	84.69	1.35	114.72	24	636	0.51	0.050	0.04	11.89	0.03	0.000
3.10	2.06	82.13	1.37	112.40	24	626	0.51	0.055	0.04	11.89	0.04	0.000
3.17	2.07	79.92	1.38	110.43	24	618	0.51	0.061	0.05	11.89	0.04	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
3.25	2.08	78.77	1.39	109.60	24	615	0.51	0.065	0.05	11.89	0.05	0.000
3.29	2.07	80.01	1.38	110.18	24	616	0.51	0.066	0.05	11.89	0.05	0.000
3.37	2.05	83.06	1.35	112.46	24	623	0.51	0.067	0.05	11.89	0.05	0.000
3.44	2.02	87.96	1.33	116.78	25	639	0.51	0.064	0.05	11.89	0.04	0.000
3.52	2.00	92.60	1.31	121.28	25	655	0.51	0.061	0.05	11.89	0.04	0.000
3.55	1.97	97.65	1.28	125.18	26	660	0.51	0.061	0.05	11.89	0.04	0.000
3.63	1.91	102.24	1.25	127.40	26	646	0.51	0.069	0.05	11.89	0.04	0.000
3.70	1.86	106.33	1.21	128.86	25	631	0.51	0.077	0.06	11.89	0.05	0.000
3.74	1.84	108.38	1.20	129.62	25	627	0.51	0.081	0.06	11.89	0.05	0.000
3.81	1.86	109.17	1.21	131.59	26	641	0.51	0.078	0.06	11.89	0.05	0.000
3.90	1.87	109.37	1.22	133.15	26	656	0.51	0.075	0.05	11.89	0.05	0.000
3.96	1.89	109.69	1.23	134.63	27	669	0.51	0.073	0.05	11.89	0.04	0.000
4.01	1.90	110.13	1.24	136.08	27	682	0.51	0.070	0.05	11.89	0.04	0.000
4.09	1.90	111.57	1.24	138.25	28	696	0.51	0.068	0.05	11.89	0.04	0.000
4.16	1.91	112.74	1.24	140.32	28	711	0.51	0.065	0.04	11.89	0.04	0.000
4.23	1.92	112.83	1.25	141.17	29	720	0.51	0.065	0.04	11.89	0.04	0.000
4.30	1.94	111.28	1.26	140.27	28	723	0.51	0.066	0.04	11.89	0.04	0.000
4.34	1.96	107.57	1.27	137.03	28	717	0.51	0.069	0.05	11.89	0.04	0.000
4.41	1.98	102.46	1.29	132.33	27	705	0.51	0.076	0.05	11.89	0.04	0.000
4.49	2.01	96.05	1.32	126.40	26	686	0.51	0.086	0.06	11.89	0.05	0.000
4.56	2.04	90.79	1.34	121.61	26	669	0.51	0.097	0.07	11.89	0.06	0.001
4.60	2.06	85.54	1.37	116.91	25	651	0.51	0.110	0.08	11.89	0.07	0.000
4.68	2.08	80.28	1.40	112.18	24	630	0.51	0.130	0.10	11.89	0.09	0.001
4.75	2.11	74.12	1.44	106.58	23	603	0.51	0.161	0.14	11.89	0.11	0.001
4.81	2.14	68.27	1.48	101.26	22	574	0.51	0.206	0.18	11.89	0.15	0.001
4.89	2.16	63.56	1.53	97.19	22	551	0.51	0.260	0.24	11.89	0.20	0.002
4.93	2.18	59.60	1.57	93.81	21	530	0.51	0.320	0.30	11.89	0.25	0.001
5.00	2.19	56.94	1.60	91.05	20	513	0.51	0.391	0.38	11.89	0.31	0.003
5.07	2.20	55.19	1.60	88.50	20	499	0.51	0.474	0.48	11.89	0.39	0.004
5.15	2.19	54.78	1.59	87.00	20	491	0.51	0.538	0.55	11.89	0.46	0.004
5.19	2.17	55.78	1.55	86.57	19	490	0.51	0.556	0.58	11.89	0.48	0.002
5.26	2.15	57.42	1.51	86.85	19	492	0.51	0.563	0.59	11.89	0.48	0.004
5.34	2.14	59.01	1.48	87.47	19	496	0.51	0.563	0.59	11.89	0.48	0.004
5.41	2.14	59.66	1.48	88.31	19	501	0.51	0.553	0.57	11.89	0.47	0.004
5.49	2.15	59.55	1.50	89.10	20	505	0.51	0.547	0.56	11.89	0.46	0.004
5.52	2.16	59.70	1.52	90.55	20	513	0.51	0.510	0.51	11.89	0.41	0.001
5.59	2.16	60.75	1.52	92.60	21	525	0.51	0.470	0.45	11.89	0.37	0.003
5.66	2.16	63.19	1.52	95.91	21	544	0.51	0.403	0.37	11.89	0.31	0.002
5.73	2.14	67.39	1.49	100.25	22	568	0.51	0.333	0.30	11.89	0.24	0.002
5.81	2.12	71.88	1.46	104.67	23	593	0.51	0.281	0.24	11.89	0.19	0.002
5.84	2.11	76.73	1.43	109.69	24	620	0.51	0.232	0.19	11.89	0.15	0.001
5.91	2.11	80.22	1.43	114.50	25	647	0.51	0.198	0.15	11.89	0.12	0.001
5.99	2.11	83.36	1.44	120.15	26	680	0.51	0.165	0.12	11.89	0.10	0.001
6.06	2.13	85.96	1.47	126.16	28	715	0.51	0.139	0.09	11.89	0.08	0.001
6.14	2.14	88.24	1.49	131.58	29	746	0.51	0.122	0.08	11.89	0.06	0.001
6.18	2.15	91.09	1.51	137.44	30	779	0.51	0.105	0.06	11.89	0.05	0.000
6.25	2.16	94.23	1.53	143.77	32	815	0.51	0.093	0.05	11.89	0.04	0.000
6.32	2.17	98.02	1.55	151.90	34	860	0.51	0.079	0.04	11.89	0.03	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
6.40	2.18	100.91	1.58	159.15	36	899	0.51	0.071	0.04	11.89	0.03	0.000
6.44	2.20	102.61	1.62	166.71	38	937	0.51	0.063	0.03	11.89	0.02	0.000
6.51	2.23	103.25	1.70	175.27	40	976	0.51	0.058	0.03	11.89	0.02	0.000
6.58	2.27	103.34	1.80	186.46	43	1020	0.51	0.052	0.02	11.89	0.02	0.000
6.65	2.30	103.03	1.94	199.59	47	1067	0.51	0.048	0.02	11.89	0.01	0.000
6.73	2.33	102.42	2.05	210.38	50	1100	0.51	0.045	0.01	11.89	0.01	0.000
6.77	2.36	101.21	2.16	218.34	53	1120	0.51	0.044	0.01	11.89	0.01	0.000
6.84	2.38	99.09	2.26	223.57	54	1126	0.51	0.044	0.01	11.89	0.01	0.000
6.91	2.41	96.58	2.40	232.13	57	1138	0.51	0.043	0.01	11.89	0.01	0.000
6.99	2.43	94.71	2.54	240.83	60	1152	0.51	0.043	0.01	11.89	0.01	0.000
7.02	2.45	93.71	2.65	248.76	63	1168	0.51	0.042	0.01	11.89	0.01	0.000
7.10	2.46	92.81	2.73	253.05	64	1174	0.51	0.042	0.01	11.89	0.01	0.000
7.15	2.47	91.56	2.80	256.73	65	1176	0.51	0.043	0.01	11.89	0.01	0.000
7.25	2.48	90.46	2.86	258.98	66	1176	0.51	0.044	0.01	11.89	0.01	0.000
7.29	2.49	90.12	2.89	260.29	67	1177	0.51	0.044	0.01	11.89	0.01	0.000
7.36	2.48	91.35	2.84	259.65	66	1182	0.51	0.044	0.01	11.89	0.01	0.000
7.43	2.46	94.79	2.70	255.78	65	1192	0.51	0.044	0.01	11.89	0.01	0.000
7.51	2.42	100.52	2.47	248.51	62	1204	0.51	0.044	0.01	11.89	0.01	0.000
7.58	2.38	106.85	2.26	241.28	59	1215	0.51	0.044	0.01	11.89	0.01	0.000
7.62	2.35	112.03	2.11	236.54	57	1224	0.51	0.043	0.01	11.89	0.01	0.000
7.70	2.33	115.07	2.04	235.14	56	1232	0.51	0.043	0.01	11.89	0.01	0.000
7.78	2.32	116.31	2.02	235.19	56	1237	0.51	0.044	0.01	11.89	0.01	0.000
7.82	2.32	116.97	2.00	234.38	56	1237	0.51	0.044	0.01	11.89	0.01	0.000
7.89	2.30	118.37	1.94	229.31	54	1226	0.51	0.046	0.01	11.89	0.01	0.000
7.97	2.28	121.63	1.83	223.18	52	1215	0.51	0.048	0.02	11.89	0.01	0.000
8.04	2.24	126.17	1.73	218.58	50	1210	0.51	0.049	0.02	11.89	0.01	0.000
8.08	2.21	133.73	1.63	217.80	49	1224	0.51	0.048	0.02	11.89	0.01	0.000
8.15	2.16	144.07	1.53	220.18	49	1248	0.51	0.046	0.02	11.89	0.01	0.000
8.23	2.12	155.05	1.45	224.55	49	1273	0.51	0.045	0.02	11.89	0.01	0.000
8.30	2.09	160.49	1.41	226.49	49	1295	0.51	0.044	0.02	11.89	0.01	0.000
8.34	2.08	162.81	1.40	227.19	49	1304	0.51	0.044	0.01	11.89	0.01	0.000
8.42	2.08	162.15	1.39	226.20	49	1307	0.51	0.044	0.02	11.89	0.01	0.000
8.50	2.09	161.56	1.41	227.09	49	1321	0.51	0.044	0.01	11.89	0.01	0.000
8.57	2.11	160.76	1.43	229.37	50	1341	0.50	0.043	0.01	11.89	0.01	0.000
8.61	2.13	160.47	1.46	234.39	51	1372	0.50	0.041	0.01	11.89	0.01	0.000
8.68	2.15	158.31	1.51	238.95	53	1398	0.50	0.040	0.01	11.89	0.01	0.000
8.75	2.19	153.95	1.59	244.12	55	1417	0.50	0.039	0.01	11.89	0.01	0.000
8.83	2.21	150.38	1.65	248.17	56	1430	0.50	0.039	0.01	11.89	0.01	0.000
8.86	2.24	145.46	1.73	251.87	58	1429	0.50	0.040	0.01	11.89	0.01	0.000
8.93	2.26	140.96	1.78	250.99	58	1415	0.50	0.041	0.01	11.89	0.01	0.000
9.01	2.27	135.42	1.81	245.34	57	1382	0.50	0.044	0.01	11.89	0.01	0.000
9.08	2.25	133.56	1.75	234.19	54	1347	0.50	0.047	0.01	11.89	0.01	0.000
9.12	2.21	134.66	1.63	219.64	50	1304	0.50	0.051	0.02	11.89	0.01	0.000
9.20	2.15	136.64	1.51	206.00	46	1260	0.50	0.056	0.02	11.89	0.02	0.000
9.28	2.08	138.90	1.40	194.10	42	1204	0.50	0.064	0.03	11.89	0.02	0.000
9.35	2.02	140.35	1.32	185.84	39	1144	0.50	0.074	0.03	11.89	0.03	0.000
9.42	1.96	141.00	1.28	180.27	37	1089	0.50	0.086	0.04	11.89	0.03	0.000
9.46	1.92	141.51	1.25	176.90	36	1049	0.50	0.097	0.05	11.89	0.04	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
9.54	1.90	141.04	1.24	174.57	35	1031	0.50	0.104	0.05	11.89	0.04	0.000
9.62	1.89	140.32	1.23	173.01	35	1024	0.50	0.108	0.06	11.89	0.04	0.000
9.65	1.89	139.14	1.23	171.56	34	1017	0.50	0.111	0.06	11.89	0.04	0.000
9.73	1.88	137.02	1.22	167.35	33	990	0.50	0.124	0.07	11.89	0.05	0.000
9.81	1.86	134.41	1.21	162.26	32	956	0.50	0.142	0.08	11.89	0.06	0.001
9.85	1.86	132.08	1.20	159.11	31	939	0.50	0.153	0.09	11.89	0.07	0.000
9.92	1.88	129.35	1.23	158.67	32	952	0.50	0.147	0.08	11.89	0.06	0.001
10.00	1.93	126.33	1.25	158.37	32	975	0.50	0.138	0.08	11.89	0.06	0.001
10.07	1.95	123.52	1.27	157.06	32	986	0.50	0.135	0.08	11.89	0.06	0.000
10.11	1.97	122.27	1.28	156.70	32	993	0.50	0.132	0.07	11.89	0.06	0.000
10.18	1.97	121.73	1.29	156.43	32	998	0.50	0.132	0.07	11.89	0.06	0.000
10.25	1.97	122.68	1.29	157.78	33	1012	0.50	0.128	0.07	11.89	0.05	0.000
10.32	1.97	124.84	1.28	159.97	33	1027	0.50	0.123	0.07	11.89	0.05	0.000
10.40	1.96	127.02	1.28	162.22	33	1043	0.50	0.119	0.06	11.89	0.05	0.000
10.44	1.96	127.93	1.28	163.22	33	1051	0.50	0.117	0.06	11.89	0.05	0.000
10.51	1.97	125.61	1.29	161.48	33	1052	0.50	0.118	0.06	11.89	0.05	0.000
10.59	1.99	122.86	1.30	159.83	33	1057	0.50	0.118	0.06	11.89	0.05	0.000
10.67	2.01	120.89	1.31	158.65	33	1061	0.50	0.119	0.06	11.89	0.05	0.000
10.71	2.00	121.94	1.31	159.75	33	1069	0.50	0.116	0.06	11.89	0.05	0.000
10.78	2.00	123.46	1.30	160.89	33	1078	0.50	0.115	0.06	11.89	0.05	0.000
10.86	1.98	125.53	1.29	162.49	34	1088	0.50	0.113	0.06	11.89	0.04	0.000
10.93	1.98	126.91	1.29	163.76	34	1098	0.50	0.111	0.06	11.89	0.04	0.000
10.97	1.97	129.16	1.28	165.55	34	1106	0.50	0.110	0.06	11.89	0.04	0.000
11.05	1.96	131.59	1.27	167.63	34	1118	0.50	0.107	0.06	11.89	0.04	0.000
11.12	1.94	134.49	1.27	170.27	35	1134	0.50	0.104	0.05	11.89	0.04	0.000
11.16	1.93	137.64	1.26	173.31	35	1150	0.50	0.101	0.05	11.89	0.04	0.000
11.24	1.93	139.25	1.26	174.87	35	1161	0.50	0.099	0.05	11.89	0.04	0.000
11.31	1.93	139.50	1.26	175.38	36	1171	0.50	0.098	0.05	11.89	0.04	0.000
11.39	1.94	138.16	1.26	174.57	36	1177	0.50	0.098	0.05	11.89	0.04	0.000
11.43	1.96	136.00	1.27	173.25	35	1181	0.50	0.097	0.05	11.89	0.04	0.000
11.50	1.97	133.46	1.29	171.62	35	1186	0.50	0.097	0.05	11.89	0.04	0.000
11.58	1.99	130.98	1.30	170.11	35	1191	0.50	0.097	0.05	11.89	0.04	0.000
11.62	2.01	128.89	1.32	169.51	35	1201	0.50	0.096	0.05	11.89	0.03	0.000
11.70	2.03	128.20	1.33	170.70	36	1224	0.50	0.092	0.05	11.89	0.03	0.000
11.77	2.05	127.25	1.36	172.44	37	1251	0.50	0.087	0.04	11.89	0.03	0.000
11.85	2.06	127.57	1.37	174.50	37	1277	0.50	0.083	0.04	11.89	0.03	0.000
11.88	2.06	128.56	1.37	175.95	38	1290	0.50	0.082	0.04	11.89	0.03	0.000
11.96	2.05	130.87	1.35	176.67	37	1295	0.50	0.082	0.04	11.89	0.03	0.000
12.03	2.02	134.26	1.33	178.17	37	1300	0.50	0.082	0.04	11.89	0.03	0.000
12.11	2.00	137.62	1.31	179.93	37	1305	0.50	0.082	0.04	11.89	0.03	0.000
12.15	1.97	143.31	1.28	184.03	38	1317	0.50	0.080	0.04	11.89	0.03	0.000
12.23	1.93	150.55	1.26	189.60	38	1334	0.50	0.079	0.04	11.89	0.03	0.000
12.30	1.90	158.85	1.23	195.99	39	1352	0.50	0.077	0.03	11.89	0.02	0.000
12.34	1.86	166.68	1.21	201.79	40	1370	0.50	0.074	0.03	11.89	0.02	0.000
12.42	1.84	172.08	1.19	205.16	40	1383	0.50	0.073	0.03	11.89	0.02	0.000
12.49	1.83	176.24	1.19	208.86	41	1409	0.50	0.071	0.03	11.89	0.02	0.000
12.57	1.82	181.33	1.18	213.46	42	1441	0.50	0.068	0.03	11.89	0.02	0.000
12.64	1.82	186.33	1.17	218.01	42	1473	0.50	0.065	0.03	11.89	0.02	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
12.68	1.81	190.46	1.16	220.79	43	1491	0.50	0.063	0.03	11.89	0.02	0.000
12.75	1.80	194.66	1.15	223.87	43	1515	0.50	0.062	0.02	11.89	0.02	0.000
12.83	1.78	198.24	1.13	224.56	43	1523	0.50	0.061	0.02	11.89	0.02	0.000
12.86	1.73	204.69	1.04	213.11	40	1475	0.50	0.067	0.03	11.89	0.02	0.000
12.94	1.68	213.20	1.00	213.20	40	1470	0.50	0.068	0.03	11.89	0.02	0.000
13.01	1.68	228.55	1.00	228.55	42	1565	0.50	0.059	0.02	11.89	0.02	0.000
13.09	1.71	243.48	1.01	246.39	46	1743	0.50	0.047	0.02	11.89	0.01	0.000
13.13	1.76	253.30	1.09	277.34	53	1913	0.50	0.040	0.01	11.89	0.01	0.000
13.21	1.79	259.14	1.14	295.74	57	2042	0.50	0.036	0.01	11.89	0.01	0.000
13.27	1.84	257.45	1.19	306.24	60	2149	0.50	0.033	0.01	11.89	0.01	0.000
13.35	1.88	248.07	1.23	304.30	61	2198	0.50	0.032	0.01	11.89	0.01	0.000
13.42	1.94	231.94	1.26	293.28	60	2204	0.50	0.032	0.01	11.89	0.01	0.000
13.46	1.99	218.55	1.30	283.85	59	2201	0.50	0.032	0.01	11.89	0.01	0.000
13.53	2.01	212.08	1.32	279.60	58	2203	0.50	0.032	0.01	11.89	0.01	0.000
13.62	2.02	209.77	1.32	277.83	58	2206	0.50	0.033	0.01	11.89	0.01	0.000
13.65	2.00	213.73	1.31	279.08	58	2196	0.50	0.033	0.01	11.89	0.01	0.000
13.73	1.96	222.00	1.28	283.51	58	2189	0.50	0.033	0.01	11.89	0.01	0.000
13.81	1.92	233.00	1.25	290.54	59	2187	0.50	0.034	0.01	11.89	0.01	0.000
13.88	1.88	243.83	1.22	297.75	59	2195	0.50	0.034	0.01	11.89	0.01	0.000
13.92	1.85	253.06	1.20	303.20	60	2203	0.50	0.034	0.01	11.89	0.01	0.000
13.99	1.82	261.48	1.18	307.73	60	2220	0.50	0.033	0.01	11.89	0.01	0.000
14.07	1.80	269.63	1.15	311.39	60	2240	0.50	0.033	0.01	11.89	0.01	0.000
14.14	1.79	276.04	1.14	314.02	60	2260	0.50	0.033	0.01	11.89	0.01	0.000
14.18	1.78	280.69	1.12	315.38	60	2273	0.50	0.033	0.01	11.89	0.01	0.000
14.26	1.77	283.64	1.11	315.60	60	2283	0.50	0.033	0.01	11.89	0.01	0.000
14.33	1.76	285.60	1.11	315.67	60	2292	0.50	0.033	0.01	11.89	0.01	0.000
14.37	1.76	285.60	1.11	315.95	60	2298	0.50	0.033	0.01	11.89	0.01	0.000
14.45	1.77	284.59	1.11	316.84	61	2310	0.50	0.033	0.01	11.89	0.01	0.000
14.52	1.77	285.08	1.12	318.93	61	2332	0.50	0.032	0.01	11.89	0.01	0.000
14.59	1.77	286.90	1.11	319.82	61	2346	0.50	0.032	0.01	11.89	0.01	0.000
14.63	1.76	288.46	1.11	319.02	61	2346	0.50	0.032	0.01	11.89	0.01	0.000
14.70	1.77	286.09	1.11	317.08	61	2338	0.50	0.033	0.01	11.89	0.01	0.000
14.79	1.78	280.21	1.13	315.94	61	2336	0.50	0.033	0.01	11.89	0.01	0.000
14.86	1.80	272.86	1.15	314.84	61	2342	0.50	0.033	0.01	11.89	0.01	0.000
14.93	1.82	266.27	1.17	312.46	61	2345	0.50	0.033	0.01	11.89	0.01	0.000
14.97	1.83	263.71	1.18	311.92	61	2354	0.50	0.033	0.01	11.89	0.01	0.000
15.05	1.83	265.77	1.18	314.53	61	2382	0.50	0.033	0.01	11.89	0.01	0.000
15.12	1.82	271.40	1.18	319.38	62	2419	0.50	0.032	0.01	11.89	0.01	0.000
15.19	1.82	276.02	1.17	322.82	63	2445	0.50	0.032	0.01	11.89	0.01	0.000
15.23	1.81	276.02	1.17	321.61	62	2436	0.50	0.032	0.01	11.89	0.01	0.000
15.31	1.81	272.20	1.16	317.02	62	2409	0.50	0.033	0.01	11.89	0.01	0.000
15.38	1.81	266.98	1.17	311.26	60	2373	0.50	0.034	0.01	11.89	0.01	0.000
15.46	1.81	262.73	1.17	306.56	60	2346	0.50	0.035	0.01	11.89	0.01	0.000
15.50	1.81	259.27	1.17	302.50	59	2318	0.50	0.036	0.01	11.89	0.01	0.000
15.57	1.81	257.58	1.17	300.52	58	2310	0.50	0.036	0.01	11.89	0.01	0.000
15.64	1.81	257.95	1.17	300.55	58	2315	0.50	0.036	0.01	11.89	0.01	0.000
15.68	1.80	262.31	1.15	301.52	58	2317	0.50	0.037	0.01	11.89	0.01	0.000
15.76	1.77	266.51	1.11	295.90	57	2274	0.50	0.038	0.01	11.89	0.01	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
15.84	1.74	271.22	1.06	288.46	55	2239	0.50	0.039	0.01	11.89	0.01	0.000
15.91	1.72	272.86	1.03	281.91	53	2215	0.50	0.040	0.01	11.89	0.01	0.000
15.95	1.73	271.86	1.04	283.45	53	2223	0.50	0.040	0.01	11.89	0.01	0.000
16.03	1.73	271.31	1.05	283.69	53	2229	0.50	0.040	0.01	11.89	0.01	0.000
16.09	1.76	262.50	1.10	287.86	55	2242	0.50	0.040	0.01	11.89	0.01	0.000
16.16	1.77	264.87	1.12	296.41	57	2311	0.50	0.038	0.01	11.89	0.01	0.000
16.23	1.78	273.42	1.13	308.74	59	2415	0.50	0.036	0.01	11.89	0.01	0.000
16.30	1.76	296.65	1.09	324.65	62	2549	0.50	0.033	0.01	11.89	0.01	0.000
16.34	1.73	321.85	1.05	338.37	64	2684	0.50	0.030	0.01	11.89	0.00	0.000
16.42	1.72	339.62	1.03	348.32	65	2794	0.50	0.029	0.01	11.89	0.00	0.000
16.49	1.72	346.03	1.03	357.68	67	2869	0.50	0.028	0.01	11.89	0.00	0.000
16.56	1.75	336.03	1.08	364.09	69	2889	0.50	0.028	0.01	11.89	0.00	0.000
16.63	1.78	320.89	1.13	362.41	70	2878	0.50	0.028	0.01	11.89	0.00	0.000
16.67	1.80	308.46	1.15	356.19	69	2844	0.50	0.029	0.01	11.89	0.00	0.000
16.75	1.80	304.73	1.15	350.21	68	2801	0.50	0.029	0.01	11.89	0.00	0.000
16.82	1.79	301.46	1.14	344.10	66	2755	0.50	0.030	0.01	11.89	0.00	0.000
16.89	1.78	304.28	1.12	341.45	65	2735	0.50	0.031	0.01	11.89	0.00	0.000
16.96	1.77	305.43	1.11	339.53	65	2727	0.50	0.031	0.01	11.89	0.00	0.000
17.00	1.74	314.69	1.07	336.25	64	2719	0.50	0.031	0.01	11.89	0.01	0.000
17.07	1.71	322.76	1.00	323.68	61	2681	0.50	0.032	0.01	11.89	0.01	0.000
17.15	1.68	326.64	1.00	326.64	61	2629	0.50	0.034	0.01	11.89	0.01	0.000
17.22	1.67	324.09	1.00	324.09	60	2577	0.50	0.035	0.01	11.89	0.01	0.000
17.26	1.68	313.88	1.00	313.88	58	2528	0.50	0.036	0.01	11.89	0.01	0.000
17.34	1.67	298.42	1.00	298.42	55	2389	0.50	0.040	0.01	11.89	0.01	0.000
17.41	1.64	278.62	1.00	278.62	51	2155	0.50	0.048	0.02	11.89	0.01	0.000
17.50	1.60	263.07	1.00	263.07	47	1936	0.50	0.060	0.02	11.89	0.01	0.000
17.54	1.59	256.26	1.00	256.26	46	1851	0.50	0.067	0.02	11.89	0.02	0.000
17.62	1.60	256.58	1.00	256.58	46	1895	0.50	0.064	0.02	11.89	0.01	0.000
17.65	1.61	264.63	1.00	264.63	48	1970	0.50	0.059	0.02	11.89	0.01	0.000
17.73	1.61	272.39	1.00	272.39	49	2039	0.50	0.055	0.02	11.89	0.01	0.000
17.80	1.59	291.08	1.00	291.08	52	2134	0.50	0.051	0.02	11.89	0.01	0.000
17.87	1.58	309.69	1.00	309.69	56	2250	0.50	0.046	0.01	11.89	0.01	0.000
17.94	1.58	328.73	1.00	328.73	59	2390	0.50	0.042	0.01	11.89	0.01	0.000
18.01	1.60	335.65	1.00	335.65	61	2506	0.50	0.039	0.01	11.89	0.01	0.000
18.05	1.63	337.22	1.00	337.22	62	2623	0.50	0.036	0.01	11.89	0.01	0.000
18.12	1.67	337.46	1.00	337.46	62	2752	0.50	0.034	0.01	11.89	0.01	0.000
18.20	1.70	340.23	1.00	340.23	64	2903	0.50	0.031	0.01	11.89	0.00	0.000
18.27	1.73	339.98	1.04	353.94	67	3004	0.50	0.030	0.01	11.89	0.00	0.000
18.32	1.75	336.40	1.08	362.48	69	3056	0.50	0.029	0.01	11.89	0.00	0.000
18.39	1.77	321.38	1.12	359.51	69	3029	0.50	0.030	0.01	11.89	0.00	0.000
18.46	1.80	304.10	1.15	350.52	68	2976	0.50	0.031	0.01	11.89	0.00	0.000
18.51	1.83	284.81	1.18	336.30	66	2893	0.50	0.032	0.01	11.89	0.00	0.000
18.58	1.84	273.22	1.19	325.40	64	2824	0.50	0.033	0.01	11.89	0.01	0.000
18.64	1.83	265.17	1.18	313.53	61	2712	0.50	0.036	0.01	11.89	0.01	0.000
18.74	1.80	261.65	1.16	302.87	59	2599	0.50	0.039	0.01	11.89	0.01	0.000
18.77	1.75	259.32	1.08	281.03	53	2401	0.50	0.044	0.01	11.89	0.01	0.000
18.85	1.68	253.20	1.00	253.20	47	2157	0.50	0.054	0.02	11.89	0.01	0.000
18.93	1.62	244.31	1.00	244.31	44	1913	0.51	0.070	0.03	11.89	0.02	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
19.00	1.59	234.56	1.00	234.56	42	1781	0.51	0.083	0.03	11.89	0.02	0.000
19.03	1.60	230.19	1.00	230.19	42	1768	0.51	0.085	0.04	11.89	0.02	0.000
19.11	1.61	228.26	1.00	228.26	41	1771	0.51	0.085	0.04	11.89	0.02	0.000
19.16	1.61	227.32	1.00	227.32	41	1784	0.51	0.084	0.04	11.89	0.02	0.000
19.26	1.61	229.00	1.00	229.00	41	1800	0.51	0.083	0.03	11.89	0.02	0.000
19.29	1.61	233.63	1.00	233.63	42	1838	0.51	0.079	0.03	11.89	0.02	0.000
19.36	1.62	238.80	1.00	238.80	43	1907	0.51	0.073	0.03	11.89	0.02	0.000
19.44	1.65	240.44	1.00	240.44	44	1995	0.51	0.067	0.03	11.89	0.02	0.000
19.51	1.68	240.28	1.00	240.28	44	2068	0.51	0.062	0.02	11.89	0.01	0.000
19.58	1.69	238.88	1.00	238.88	44	2102	0.51	0.061	0.02	11.89	0.01	0.000
19.65	1.69	239.20	1.00	239.20	45	2112	0.51	0.060	0.02	11.89	0.01	0.000
19.69	1.69	240.73	1.00	240.73	45	2109	0.51	0.061	0.02	11.89	0.01	0.000
19.76	1.69	242.11	1.00	242.11	45	2133	0.51	0.060	0.02	11.89	0.01	0.000
19.84	1.70	246.41	1.00	246.41	46	2208	0.51	0.056	0.02	11.89	0.01	0.000
19.91	1.72	249.90	1.03	256.96	48	2299	0.51	0.052	0.02	11.89	0.01	0.000
19.95	1.73	256.31	1.04	266.63	50	2379	0.51	0.049	0.02	11.89	0.01	0.000
20.03	1.72	260.46	1.04	270.36	51	2419	0.51	0.048	0.02	11.89	0.01	0.000
20.09	1.72	265.72	1.02	272.22	51	2451	0.51	0.047	0.02	11.89	0.01	0.000
20.14	1.70	276.51	1.00	276.51	52	2490	0.51	0.046	0.01	11.89	0.01	0.000
20.22	1.68	288.89	1.00	288.89	54	2539	0.51	0.045	0.01	11.89	0.01	0.000
20.28	1.66	301.14	1.00	301.14	55	2589	0.51	0.043	0.01	11.89	0.01	0.000
20.36	1.66	304.58	1.00	304.58	56	2618	0.51	0.043	0.01	11.89	0.01	0.000
20.41	1.66	305.12	1.00	305.12	56	2644	0.51	0.042	0.01	11.89	0.01	0.000
20.49	1.68	304.54	1.00	304.54	56	2692	0.51	0.041	0.01	11.89	0.01	0.000
20.56	1.70	305.24	1.00	305.24	57	2796	0.51	0.039	0.01	11.89	0.01	0.000
20.63	1.73	305.66	1.05	322.25	61	2921	0.51	0.036	0.01	11.89	0.01	0.000
20.71	1.76	305.35	1.10	334.57	64	3021	0.51	0.035	0.01	11.89	0.01	0.000
20.75	1.77	302.42	1.12	338.32	65	3060	0.51	0.034	0.01	11.89	0.00	0.000
20.83	1.79	295.96	1.14	336.47	65	3058	0.51	0.034	0.01	11.89	0.00	0.000
20.90	1.80	286.16	1.16	330.80	64	3028	0.51	0.035	0.01	11.89	0.01	0.000
20.97	1.82	276.47	1.17	323.88	63	2991	0.51	0.036	0.01	11.89	0.01	0.000
21.01	1.84	264.07	1.19	314.00	61	2934	0.51	0.037	0.01	11.89	0.01	0.000
21.09	1.85	252.34	1.20	303.57	60	2874	0.51	0.038	0.01	11.89	0.01	0.000
21.16	1.86	242.79	1.21	294.34	58	2817	0.51	0.040	0.01	11.89	0.01	0.000
21.20	1.86	239.99	1.21	290.24	57	2773	0.51	0.041	0.01	11.89	0.01	0.000
21.27	1.84	243.78	1.20	291.50	57	2758	0.51	0.041	0.01	11.89	0.01	0.000
21.35	1.82	251.17	1.17	294.89	57	2757	0.51	0.042	0.01	11.89	0.01	0.000
21.42	1.80	258.96	1.15	298.28	58	2768	0.52	0.042	0.01	11.89	0.01	0.000
21.46	1.79	263.26	1.14	299.63	58	2773	0.52	0.042	0.01	11.89	0.01	0.000
21.53	1.78	265.42	1.13	300.19	58	2779	0.52	0.042	0.01	11.89	0.01	0.000
21.60	1.77	269.50	1.12	302.04	58	2799	0.52	0.041	0.01	11.89	0.01	0.000
21.67	1.73	280.86	1.05	295.62	56	2758	0.52	0.043	0.01	11.89	0.01	0.000
21.75	1.68	296.40	1.00	296.40	55	2717	0.52	0.044	0.01	11.89	0.01	0.000
21.79	1.62	317.94	1.00	317.94	58	2680	0.52	0.045	0.01	11.89	0.01	0.000
21.87	1.58	333.13	1.00	333.13	60	2684	0.52	0.045	0.01	11.89	0.01	0.000
21.93	1.56	340.89	1.00	340.89	61	2687	0.52	0.045	0.01	11.89	0.01	0.000
22.01	1.57	333.53	1.00	333.53	60	2673	0.52	0.046	0.01	11.89	0.01	0.000
22.08	1.61	317.59	1.00	317.59	58	2678	0.52	0.046	0.01	11.89	0.01	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
22.12	1.65	303.43	1.00	303.43	56	2678	0.52	0.046	0.01	11.89	0.01	0.000
22.18	1.68	287.31	1.00	287.31	53	2666	0.52	0.046	0.01	11.89	0.01	0.000
22.26	1.72	268.52	1.03	275.67	52	2629	0.52	0.048	0.02	11.89	0.01	0.000
22.32	1.77	242.71	1.11	269.53	51	2543	0.52	0.051	0.02	11.89	0.01	0.000
22.38	1.79	224.98	1.15	257.65	50	2449	0.52	0.055	0.02	11.89	0.01	0.000
22.45	1.80	216.75	1.16	250.36	48	2392	0.52	0.058	0.02	11.89	0.01	0.000
22.51	1.80	217.06	1.15	249.50	48	2383	0.52	0.058	0.02	11.89	0.01	0.000
22.59	1.78	222.84	1.13	252.05	48	2401	0.52	0.058	0.02	11.89	0.01	0.000
22.64	1.75	235.93	1.08	254.96	48	2428	0.52	0.057	0.02	11.89	0.01	0.000
22.72	1.71	250.18	1.02	254.19	48	2461	0.52	0.055	0.02	11.89	0.01	0.000
22.77	1.71	254.87	1.00	255.72	48	2490	0.52	0.054	0.02	11.89	0.01	0.000
22.85	1.72	250.35	1.03	258.84	49	2500	0.52	0.054	0.02	11.89	0.01	0.000
22.91	1.75	241.07	1.08	259.56	49	2489	0.52	0.055	0.02	11.89	0.01	0.000
22.97	1.76	231.33	1.10	254.11	48	2438	0.52	0.057	0.02	11.89	0.01	0.000
23.05	1.77	221.96	1.11	247.04	47	2376	0.52	0.061	0.02	11.89	0.01	0.000
23.11	1.78	211.01	1.13	238.78	46	2305	0.52	0.064	0.02	11.89	0.01	0.000
23.17	1.80	199.66	1.16	230.78	45	2247	0.52	0.068	0.03	11.89	0.01	0.000
23.25	1.83	186.96	1.18	220.95	43	2185	0.52	0.073	0.03	11.89	0.02	0.000
23.30	1.83	178.39	1.18	210.82	41	2088	0.52	0.080	0.03	11.89	0.02	0.000
23.36	1.79	173.51	1.14	198.48	38	1934	0.52	0.096	0.04	11.89	0.02	0.000
23.43	1.76	169.35	1.10	185.92	35	1803	0.52	0.115	0.06	11.89	0.03	0.000
23.50	1.75	164.89	1.09	178.94	34	1740	0.52	0.127	0.07	11.89	0.04	0.000
23.57	1.78	160.02	1.13	181.17	35	1769	0.52	0.122	0.06	11.89	0.03	0.000
23.62	1.80	157.93	1.16	182.52	35	1797	0.52	0.117	0.06	11.89	0.03	0.000
23.69	1.82	156.73	1.17	183.66	36	1826	0.52	0.113	0.06	11.89	0.03	0.000
23.76	1.81	162.33	1.16	188.92	37	1873	0.52	0.107	0.05	11.89	0.03	0.000
23.83	1.79	175.73	1.14	199.50	38	1962	0.52	0.096	0.04	11.89	0.02	0.000
23.90	1.75	197.60	1.09	215.17	41	2111	0.52	0.081	0.03	11.89	0.02	0.000
23.97	1.71	226.08	1.02	230.08	43	2292	0.52	0.069	0.03	11.89	0.01	0.000
24.05	1.67	260.57	1.00	260.57	48	2483	0.52	0.059	0.02	11.89	0.01	0.000
24.11	1.62	299.79	1.00	299.79	54	2676	0.52	0.052	0.02	11.89	0.01	0.000
24.18	1.58	339.30	1.00	339.30	61	2893	0.52	0.045	0.01	11.89	0.01	0.000
24.25	1.56	371.08	1.00	371.08	66	3082	0.52	0.041	0.01	11.89	0.01	0.000
24.29	1.54	400.22	1.00	400.22	71	3262	0.52	0.038	0.01	11.89	0.00	0.000
24.37	1.53	420.61	1.00	420.61	74	3384	0.52	0.036	0.01	11.89	0.00	0.000
24.41	1.52	439.02	1.00	439.02	77	3485	0.52	0.034	0.01	11.89	0.00	0.000
24.48	1.52	447.64	1.00	447.64	79	3538	0.52	0.034	0.01	11.89	0.00	0.000
24.55	1.53	450.91	1.00	450.91	79	3627	0.52	0.032	0.01	11.89	0.00	0.000
24.61	1.55	447.33	1.00	447.33	79	3692	0.52	0.032	0.01	11.89	0.00	0.000
24.68	1.55	446.14	1.00	446.14	79	3686	0.53	0.032	0.01	11.89	0.00	0.000
24.74	1.54	441.73	1.00	441.73	78	3620	0.53	0.033	0.01	11.89	0.00	0.000
24.81	1.52	444.09	1.00	444.09	78	3558	0.53	0.034	0.01	11.89	0.00	0.000
24.88	1.52	444.98	1.00	444.98	78	3562	0.53	0.034	0.01	11.89	0.00	0.000
24.94	1.52	452.93	1.00	452.93	79	3612	0.53	0.033	0.01	11.89	0.00	0.000
25.01	1.53	453.63	1.00	453.63	80	3666	0.53	0.033	0.01	11.89	0.00	0.000
25.07	1.53	452.70	1.00	452.70	80	3697	0.53	0.032	0.01	11.89	0.00	0.000
25.14	1.54	448.68	1.00	448.68	79	3709	0.53	0.032	0.01	11.89	0.00	0.000
25.21	1.56	443.69	1.00	443.69	79	3759	0.53	0.032	0.01	11.89	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
25.27	1.57	436.14	1.00	436.14	78	3770	0.53	0.032	0.01	11.89	0.00	0.000
25.34	1.59	421.69	1.00	421.69	76	3747	0.53	0.032	0.01	11.89	0.00	0.000
25.41	1.61	403.20	1.00	403.20	73	3658	0.53	0.033	0.01	11.89	0.00	0.000
25.48	1.64	380.98	1.00	380.98	70	3589	0.53	0.034	0.01	11.89	0.00	0.000
25.53	1.68	347.51	1.00	347.51	64	3481	0.53	0.036	0.01	11.89	0.00	0.000
25.62	1.73	309.22	1.05	325.73	61	3340	0.53	0.039	0.01	11.89	0.01	0.000
25.69	1.79	269.48	1.14	308.10	59	3175	0.53	0.042	0.01	11.89	0.01	0.000
25.73	1.84	234.51	1.19	279.21	55	2956	0.53	0.047	0.01	11.89	0.01	0.000
25.80	1.89	200.62	1.23	246.42	49	2718	0.53	0.055	0.02	11.89	0.01	0.000
25.88	1.94	169.63	1.26	214.09	44	2478	0.53	0.066	0.03	11.89	0.01	0.000
25.95	1.98	149.26	1.29	192.97	40	2326	0.53	0.075	0.03	11.89	0.02	0.000
26.00	2.01	137.21	1.32	181.04	38	2243	0.53	0.081	0.04	11.89	0.02	0.000
26.07	2.05	128.47	1.35	173.65	37	2205	0.53	0.084	0.04	11.89	0.02	0.000
26.15	2.08	121.12	1.39	168.69	36	2189	0.53	0.086	0.04	11.89	0.02	0.000
26.18	2.10	117.05	1.42	166.64	36	2186	0.53	0.086	0.04	11.89	0.02	0.000
26.26	2.10	115.60	1.42	164.58	36	2163	0.53	0.089	0.04	11.89	0.02	0.000
26.34	2.10	115.08	1.41	162.64	35	2136	0.53	0.092	0.05	11.89	0.02	0.000
26.38	2.08	115.53	1.39	160.92	35	2101	0.53	0.096	0.05	11.89	0.02	0.000
26.46	2.08	115.04	1.39	159.44	34	2080	0.53	0.098	0.05	11.89	0.03	0.000
26.53	2.08	111.38	1.40	155.40	33	2039	0.53	0.103	0.06	11.89	0.03	0.000
26.60	2.10	105.53	1.42	150.04	33	1989	0.53	0.110	0.06	11.89	0.03	0.000
26.66	2.12	100.23	1.45	145.17	32	1939	0.53	0.118	0.07	11.89	0.03	0.000
26.73	2.13	96.67	1.46	141.32	31	1895	0.53	0.125	0.07	11.89	0.04	0.000
26.80	2.13	94.28	1.47	138.17	30	1858	0.53	0.133	0.08	11.89	0.04	0.000
26.87	2.14	91.65	1.48	135.47	30	1828	0.53	0.139	0.09	11.89	0.04	0.000
26.91	2.14	89.63	1.49	133.69	29	1809	0.53	0.143	0.09	11.89	0.04	0.000
26.98	2.15	87.85	1.51	132.67	29	1801	0.53	0.146	0.09	11.89	0.04	0.000
27.06	2.16	86.34	1.53	132.15	29	1800	0.53	0.147	0.09	11.89	0.05	0.000
27.10	2.17	85.68	1.55	132.55	30	1809	0.53	0.145	0.09	11.89	0.04	0.000
27.18	2.17	86.17	1.55	133.55	30	1826	0.53	0.142	0.09	11.89	0.04	0.000
27.26	2.17	88.30	1.54	135.55	30	1856	0.53	0.136	0.08	11.89	0.04	0.000
27.33	2.15	91.55	1.51	137.95	30	1889	0.53	0.131	0.08	11.89	0.04	0.000
27.37	2.12	97.23	1.46	141.78	31	1932	0.53	0.124	0.07	11.89	0.04	0.000
27.45	2.09	104.49	1.41	146.83	32	1978	0.53	0.117	0.07	11.89	0.03	0.000
27.52	2.05	112.91	1.36	153.30	33	2026	0.53	0.111	0.06	11.89	0.03	0.000
27.59	2.03	118.99	1.33	158.33	33	2058	0.53	0.107	0.06	11.89	0.03	0.000
27.63	2.02	121.09	1.32	160.19	34	2072	0.53	0.106	0.06	11.89	0.03	0.000
27.70	2.00	118.86	1.31	155.38	32	1984	0.53	0.118	0.07	11.89	0.03	0.000
27.78	1.97	113.21	1.29	145.75	30	1824	0.53	0.147	0.09	11.89	0.04	0.000
27.86	1.95	106.85	1.27	135.36	28	1652	0.53	0.197	0.13	11.89	0.06	0.001
27.90	1.96	99.28	1.28	127.05	26	1579	0.53	0.228	0.17	11.89	0.08	0.000
27.98	2.01	92.91	1.31	122.15	26	1581	0.53	0.228	0.17	11.89	0.08	0.001
28.02	2.07	85.48	1.38	117.55	25	1586	0.53	0.226	0.17	11.89	0.08	0.000
28.10	2.12	78.88	1.46	115.01	25	1596	0.53	0.223	0.17	11.89	0.08	0.001
28.16	2.17	74.85	1.54	115.62	26	1620	0.53	0.213	0.16	11.89	0.07	0.000
28.23	2.20	73.48	1.61	118.56	27	1665	0.53	0.196	0.14	11.89	0.07	0.001
28.30	2.22	73.46	1.68	123.32	28	1730	0.53	0.176	0.12	11.89	0.05	0.000
28.38	2.26	71.96	1.78	128.07	30	1785	0.53	0.162	0.10	11.89	0.05	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
28.42	2.29	70.07	1.89	132.48	31	1825	0.53	0.152	0.09	11.89	0.04	0.000
28.49	2.31	69.39	1.95	135.25	32	1852	0.53	0.147	0.08	11.89	0.04	0.000
28.58	2.32	68.88	1.99	137.25	33	1873	0.53	0.143	0.08	11.89	0.04	0.000
28.61	2.32	69.32	2.00	138.40	33	1890	0.53	0.140	0.08	11.89	0.04	0.000
28.69	2.33	68.59	2.03	139.50	33	1899	0.53	0.139	0.08	11.89	0.03	0.000
28.77	2.34	67.93	2.07	140.43	34	1907	0.53	0.138	0.07	11.89	0.03	0.000
28.81	2.34	67.45	2.09	140.99	34	1911	0.53	0.137	0.07	11.89	0.03	0.000
28.88	2.33	68.48	2.04	139.87	33	1911	0.53	0.138	0.07	11.89	0.03	0.000
28.95	2.30	71.22	1.93	137.72	32	1913	0.53	0.138	0.08	11.89	0.04	0.000
29.03	2.27	74.91	1.81	135.38	31	1913	0.53	0.138	0.08	11.89	0.04	0.000
29.11	2.24	77.88	1.72	133.89	31	1911	0.53	0.139	0.08	11.89	0.04	0.000
29.14	2.23	78.81	1.69	133.20	0	0	0.53	0.000	0.00	11.89	0.00	0.000
29.22	2.24	76.93	1.73	133.09	0	0	0.53	0.000	0.00	11.89	0.00	0.000
29.29	2.27	73.90	1.81	133.46	0	0	0.53	0.000	0.00	11.89	0.00	0.000
29.33	2.30	69.49	1.92	133.44	0	0	0.53	0.000	0.00	11.89	0.00	0.000
29.42	2.34	63.92	2.08	133.00	0	0	0.53	0.000	0.00	11.89	0.00	0.000
29.49	2.39	57.38	2.33	133.49	0	0	0.53	0.000	0.00	11.89	0.00	0.000
29.53	2.48	48.74	2.81	137.17	0	0	0.53	0.000	0.00	11.89	0.00	0.000
29.61	2.58	40.09	3.59	143.84	0	0	0.53	0.000	0.00	11.89	0.00	0.000
29.68	2.70	32.39	4.66	150.94	0	0	0.53	0.000	0.00	0.00	0.00	0.000
29.76	2.76	28.69	5.37	154.13	0	0	0.53	0.000	0.00	0.00	0.00	0.000
29.80	2.78	27.72	5.56	154.10	0	0	0.53	0.000	0.00	0.00	0.00	0.000
29.88	2.76	28.26	5.40	152.70	0	0	0.53	0.000	0.00	0.00	0.00	0.000
29.95	2.74	29.29	5.16	151.20	0	0	0.53	0.000	0.00	0.00	0.00	0.000
29.99	2.71	31.05	4.86	150.92	0	0	0.53	0.000	0.00	0.00	0.00	0.000
30.06	2.69	33.18	4.58	151.96	0	0	0.53	0.000	0.00	0.00	0.00	0.000
30.14	2.66	35.95	4.28	153.73	0	0	0.53	0.000	0.00	0.00	0.00	0.000
30.22	2.63	38.25	4.05	155.09	0	0	0.53	0.000	0.00	0.00	0.00	0.000
30.26	2.62	40.23	3.90	156.96	0	0	0.53	0.000	0.00	0.00	0.00	0.000
30.33	2.61	41.60	3.83	159.16	0	0	0.53	0.000	0.00	0.00	0.00	0.000
30.41	2.60	42.74	3.77	161.04	0	0	0.53	0.000	0.00	0.00	0.00	0.000
30.45	2.59	44.24	3.63	160.70	0	0	0.53	0.000	0.00	11.89	0.00	0.000
30.53	2.55	46.67	3.38	157.60	0	0	0.53	0.000	0.00	11.89	0.00	0.000
30.60	2.50	50.76	3.01	152.57	0	0	0.53	0.000	0.00	11.89	0.00	0.000
30.67	2.46	54.69	2.71	148.18	0	0	0.53	0.000	0.00	11.89	0.00	0.000
30.72	2.42	58.13	2.46	143.16	0	0	0.53	0.000	0.00	11.89	0.00	0.000
30.79	2.38	60.44	2.29	138.55	0	0	0.53	0.000	0.00	11.89	0.00	0.000
30.86	2.35	62.85	2.14	134.34	0	0	0.53	0.000	0.00	11.89	0.00	0.000
30.94	2.33	64.69	2.04	132.05	0	0	0.53	0.000	0.00	11.89	0.00	0.000
30.99	2.31	66.05	1.97	130.06	0	0	0.53	0.000	0.00	11.89	0.00	0.000
31.06	2.32	63.89	2.02	128.77	31	1867	0.53	0.163	0.10	11.89	0.04	0.000
31.11	2.32	63.15	2.02	127.61	30	1852	0.53	0.167	0.10	11.89	0.04	0.000
31.19	2.34	61.89	2.08	128.54	31	1855	0.53	0.167	0.10	11.89	0.04	0.000
31.27	2.33	63.10	2.06	130.13	0	0	0.53	0.000	0.00	11.89	0.00	0.000
31.31	2.36	62.30	2.18	135.62	0	0	0.53	0.000	0.00	11.89	0.00	0.000
31.38	2.40	60.74	2.36	143.24	0	0	0.53	0.000	0.00	11.89	0.00	0.000
31.45	2.45	57.61	2.66	153.28	0	0	0.53	0.000	0.00	11.89	0.00	0.000
31.53	2.50	54.00	3.00	162.23	0	0	0.53	0.000	0.00	11.89	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
31.57	2.56	50.00	3.44	171.79	0	0	0.53	0.000	0.00	11.89	0.00	0.000
31.65	2.61	46.68	3.86	180.16	0	0	0.53	0.000	0.00	0.00	0.00	0.000
31.73	2.64	45.30	4.11	186.34	0	0	0.53	0.000	0.00	0.00	0.00	0.000
31.80	2.67	43.70	4.37	191.09	0	0	0.53	0.000	0.00	0.00	0.00	0.000
31.84	2.66	44.72	4.28	191.28	0	0	0.53	0.000	0.00	0.00	0.00	0.000
31.91	2.62	47.81	3.94	188.50	0	0	0.53	0.000	0.00	0.00	0.00	0.000
31.99	2.55	54.47	3.34	182.17	0	0	0.53	0.000	0.00	11.89	0.00	0.000
32.03	2.47	63.57	2.77	175.97	0	0	0.53	0.000	0.00	11.89	0.00	0.000
32.11	2.39	73.66	2.32	170.94	0	0	0.53	0.000	0.00	11.89	0.00	0.000
32.18	2.32	83.41	2.01	168.04	0	0	0.53	0.000	0.00	11.89	0.00	0.000
32.22	2.27	90.88	1.83	166.27	0	0	0.53	0.000	0.00	11.89	0.00	0.000
32.29	2.24	94.71	1.73	164.04	0	0	0.53	0.000	0.00	11.89	0.00	0.000
32.37	2.20	98.95	1.62	160.64	0	0	0.53	0.000	0.00	11.89	0.00	0.000
32.45	2.17	102.56	1.54	157.66	0	0	0.53	0.000	0.00	11.89	0.00	0.000
32.48	2.12	107.19	1.45	155.26	0	0	0.53	0.000	0.00	11.89	0.00	0.000
32.56	2.08	109.46	1.39	152.36	0	0	0.53	0.000	0.00	11.89	0.00	0.000
32.63	2.06	107.84	1.36	146.97	0	0	0.53	0.000	0.00	11.89	0.00	0.000
32.70	2.07	100.03	1.38	138.28	30	2078	0.53	0.132	0.08	11.89	0.03	0.000
32.78	2.12	90.60	1.44	130.66	28	2009	0.53	0.144	0.09	11.89	0.04	0.000
32.82	2.17	81.45	1.55	125.93	28	1968	0.53	0.152	0.10	11.89	0.04	0.000
32.90	2.22	74.51	1.68	124.94	28	1957	0.53	0.155	0.10	11.89	0.04	0.000
32.98	2.27	68.75	1.83	126.07	29	1955	0.53	0.156	0.10	11.89	0.04	0.000
33.02	2.32	65.09	1.98	129.16	31	1972	0.53	0.153	0.09	11.89	0.04	0.000
33.10	2.33	64.08	2.05	131.52	31	1995	0.53	0.149	0.09	11.89	0.03	0.000
33.14	2.34	63.74	2.10	133.55	32	2016	0.53	0.145	0.08	11.89	0.03	0.000
33.21	2.33	65.56	2.03	133.40	32	2033	0.53	0.142	0.08	11.89	0.03	0.000
33.29	2.30	68.15	1.94	132.35	31	2043	0.53	0.141	0.08	11.89	0.03	0.000
33.36	2.27	71.38	1.83	130.59	30	2043	0.53	0.141	0.09	11.89	0.03	0.000
33.40	2.24	74.07	1.73	128.36	29	2026	0.53	0.144	0.09	11.89	0.04	0.000
33.47	2.21	76.63	1.64	125.67	28	1995	0.53	0.151	0.10	11.89	0.04	0.000
33.55	2.17	79.99	1.54	123.56	28	1961	0.53	0.158	0.11	11.89	0.04	0.000
33.62	2.13	83.67	1.47	122.92	27	1935	0.53	0.164	0.11	11.89	0.04	0.000
33.70	2.10	86.55	1.41	122.38	26	1902	0.53	0.173	0.12	11.89	0.05	0.000
33.74	2.05	88.69	1.35	119.83	25	1805	0.53	0.201	0.15	11.89	0.06	0.000
33.82	2.01	88.96	1.31	116.94	24	1711	0.53	0.237	0.19	11.89	0.07	0.001
33.89	1.98	88.36	1.29	114.34	24	1637	0.53	0.274	0.22	11.89	0.09	0.001
33.93	2.00	86.42	1.30	112.75	23	1635	0.53	0.275	0.23	11.89	0.09	0.000
34.00	2.02	82.93	1.32	109.71	23	1624	0.53	0.283	0.24	11.89	0.09	0.001
34.08	2.03	80.22	1.34	107.25	23	1609	0.53	0.292	0.25	11.89	0.10	0.001
34.15	2.04	78.57	1.35	105.72	22	1598	0.53	0.300	0.26	11.89	0.10	0.001
34.22	2.04	78.68	1.34	105.64	22	1596	0.53	0.302	0.26	11.89	0.10	0.001
34.26	2.04	77.70	1.35	104.85	22	1593	0.53	0.304	0.27	11.89	0.10	0.000
34.33	2.07	75.25	1.37	103.29	22	1595	0.53	0.304	0.27	11.89	0.10	0.001
34.41	2.09	72.39	1.41	101.97	22	1603	0.53	0.300	0.27	11.89	0.10	0.001
34.49	2.12	69.93	1.45	101.57	22	1621	0.53	0.290	0.26	11.89	0.10	0.001
34.53	2.15	67.91	1.50	102.11	23	1646	0.53	0.275	0.24	11.89	0.09	0.000
34.61	2.18	66.23	1.56	103.46	23	1680	0.53	0.259	0.22	11.89	0.08	0.001
34.68	2.20	64.94	1.62	105.42	24	1717	0.53	0.242	0.20	11.89	0.07	0.001

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
34.73	2.22	64.25	1.68	107.93	25	1757	0.53	0.226	0.18	11.89	0.07	0.000
34.80	2.24	63.79	1.73	110.60	25	1798	0.53	0.211	0.16	11.89	0.06	0.001
34.87	2.26	63.20	1.79	113.28	26	1837	0.53	0.199	0.14	11.89	0.05	0.000
34.91	2.28	62.46	1.86	116.18	27	1874	0.53	0.188	0.13	11.89	0.05	0.000
34.99	2.30	61.52	1.94	119.16	28	1910	0.53	0.179	0.12	11.89	0.04	0.000
35.07	2.32	60.93	2.00	122.15	29	1947	0.53	0.170	0.11	11.89	0.04	0.000
35.11	2.34	60.44	2.07	125.01	30	1979	0.53	0.163	0.10	11.89	0.04	0.000
35.18	2.35	60.25	2.12	127.91	31	2015	0.53	0.156	0.09	11.89	0.03	0.000
35.27	2.36	60.21	2.17	130.86	32	2052	0.53	0.149	0.09	11.89	0.03	0.000
35.31	2.36	61.46	2.17	133.46	32	2096	0.53	0.141	0.08	11.89	0.03	0.000
35.38	2.34	64.60	2.09	134.96	32	2144	0.53	0.134	0.08	11.89	0.03	0.000
35.46	2.32	68.53	1.98	136.02	32	2191	0.53	0.127	0.07	11.89	0.03	0.000
35.50	2.29	72.78	1.88	136.78	32	2230	0.53	0.122	0.07	11.89	0.02	0.000
35.58	2.28	73.87	1.86	137.57	0	0	0.53	0.000	0.00	11.89	0.00	0.000
35.65	2.30	71.61	1.94	138.82	0	0	0.53	0.000	0.00	11.89	0.00	0.000
35.73	2.34	67.11	2.09	140.50	0	0	0.53	0.000	0.00	11.89	0.00	0.000
35.77	2.38	62.52	2.28	142.57	0	0	0.53	0.000	0.00	11.89	0.00	0.000
35.84	2.40	60.13	2.39	143.80	0	0	0.53	0.000	0.00	11.89	0.00	0.000
35.92	2.42	58.79	2.46	144.71	0	0	0.53	0.000	0.00	11.89	0.00	0.000
35.99	2.42	58.82	2.47	145.04	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.03	2.42	58.79	2.48	146.06	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.11	2.42	59.39	2.48	147.13	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.18	2.40	61.91	2.37	147.00	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.26	2.37	66.08	2.20	145.49	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.30	2.31	73.06	1.95	142.79	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.37	2.25	80.77	1.75	141.00	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.44	2.19	88.61	1.59	140.86	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.51	2.15	93.39	1.51	141.28	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.55	2.14	95.34	1.48	140.86	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.62	2.12	95.94	1.45	139.29	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.70	2.09	97.36	1.41	137.00	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.78	2.06	99.26	1.37	135.66	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.82	2.04	100.83	1.34	135.33	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.89	2.04	99.04	1.35	133.56	28	2130	0.53	0.142	0.09	11.89	0.03	0.000
36.97	2.06	95.16	1.37	130.52	28	2116	0.53	0.145	0.10	11.89	0.03	0.000
37.01	2.10	89.10	1.42	126.15	27	2090	0.53	0.149	0.10	11.89	0.03	0.000
37.09	2.15	81.04	1.50	121.63	27	2062	0.53	0.155	0.11	11.89	0.04	0.000
37.15	2.17	77.00	1.55	119.16	27	2033	0.53	0.161	0.11	11.89	0.04	0.000
37.23	2.17	76.06	1.55	117.81	26	2013	0.53	0.166	0.12	11.89	0.04	0.000
37.30	2.14	79.60	1.49	118.40	26	2011	0.53	0.167	0.12	11.89	0.04	0.000
37.34	2.13	81.57	1.46	119.18	26	2014	0.53	0.166	0.12	11.89	0.04	0.000
37.41	2.12	82.45	1.45	119.74	26	2022	0.53	0.165	0.12	11.89	0.04	0.000
37.49	2.13	81.58	1.46	119.34	26	2023	0.53	0.165	0.12	11.89	0.04	0.000
37.57	2.14	79.25	1.49	118.24	26	2019	0.53	0.166	0.12	11.89	0.04	0.000
37.60	2.17	75.69	1.54	116.71	26	2008	0.53	0.169	0.12	11.89	0.04	0.000
37.68	2.19	72.26	1.60	115.59	26	1998	0.53	0.171	0.13	11.89	0.04	0.000
37.75	2.22	69.16	1.66	115.09	26	1993	0.53	0.173	0.13	11.89	0.04	0.000
37.83	2.23	67.56	1.71	115.23	26	1996	0.53	0.172	0.12	11.89	0.04	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
37.87	2.24	67.03	1.73	116.27	27	2013	0.53	0.169	0.12	11.89	0.04	0.000
37.95	2.25	66.73	1.77	117.88	27	2040	0.53	0.163	0.11	11.89	0.04	0.000
38.02	2.27	66.41	1.80	119.74	28	2070	0.53	0.157	0.11	11.89	0.03	0.000
38.06	2.28	65.76	1.85	121.88	28	2100	0.53	0.152	0.10	11.89	0.03	0.000
38.14	2.30	64.65	1.92	124.07	29	2128	0.53	0.147	0.09	11.89	0.03	0.000
38.21	2.32	63.25	2.01	126.91	30	2161	0.53	0.142	0.09	11.89	0.03	0.000
38.29	2.34	62.18	2.08	129.40	31	2188	0.53	0.138	0.08	11.89	0.03	0.000
38.33	2.35	61.74	2.14	132.06	32	2220	0.53	0.133	0.08	11.89	0.02	0.000
38.40	2.36	62.04	2.17	134.50	32	2257	0.53	0.128	0.07	11.89	0.02	0.000
38.48	2.36	62.76	2.18	136.76	33	2296	0.53	0.123	0.07	11.89	0.02	0.000
38.52	2.36	64.30	2.16	138.74	33	2337	0.53	0.119	0.06	11.89	0.02	0.000
38.59	2.35	66.61	2.11	140.51	34	2383	0.53	0.114	0.06	11.89	0.02	0.000
38.67	2.33	69.70	2.05	142.56	34	2439	0.53	0.108	0.06	11.89	0.02	0.000
38.75	2.32	72.39	1.99	144.40	34	2488	0.53	0.104	0.05	11.89	0.02	0.000
38.78	2.31	74.60	1.96	146.51	35	2534	0.53	0.100	0.05	11.89	0.02	0.000
38.85	2.31	76.58	1.95	148.98	35	2585	0.53	0.096	0.05	11.89	0.01	0.000
38.93	2.30	79.47	1.91	151.69	36	2646	0.53	0.091	0.05	11.89	0.01	0.000
39.00	2.28	82.84	1.86	153.87	36	2700	0.53	0.088	0.04	11.89	0.01	0.000
39.05	2.26	87.76	1.78	155.79	36	2753	0.53	0.085	0.04	11.89	0.01	0.000
39.13	2.23	93.33	1.69	157.91	36	2806	0.53	0.082	0.04	11.89	0.01	0.000
39.20	2.20	99.16	1.62	160.90	36	2864	0.52	0.079	0.04	11.89	0.01	0.000
39.27	2.19	103.20	1.58	163.49	37	2910	0.52	0.076	0.04	11.89	0.01	0.000
39.31	2.18	106.59	1.56	165.84	37	2949	0.52	0.075	0.04	11.89	0.01	0.000
39.38	2.16	110.81	1.51	167.86	37	2975	0.52	0.074	0.03	11.89	0.01	0.000
39.46	2.12	117.88	1.45	171.29	37	3003	0.52	0.072	0.03	11.89	0.01	0.000
39.53	2.09	125.41	1.40	175.62	38	3026	0.52	0.072	0.03	11.89	0.01	0.000
39.57	2.05	134.19	1.36	181.98	39	3058	0.52	0.070	0.03	11.89	0.01	0.000
39.65	2.02	141.88	1.32	187.80	39	3075	0.52	0.070	0.03	11.89	0.01	0.000
39.72	1.98	150.08	1.29	193.47	40	3045	0.52	0.071	0.03	11.89	0.01	0.000
39.79	1.95	155.54	1.27	197.22	40	3012	0.52	0.073	0.03	11.89	0.01	0.000
39.83	1.92	159.58	1.25	199.95	40	2981	0.52	0.074	0.03	11.89	0.01	0.000
39.91	1.91	162.11	1.25	201.94	41	2979	0.52	0.074	0.03	11.89	0.01	0.000
39.99	1.90	163.93	1.24	202.53	41	2943	0.52	0.076	0.03	11.89	0.01	0.000
40.06	1.90	160.41	1.24	198.12	40	2880	0.52	0.079	0.03	11.89	0.01	0.000
40.11	1.89	158.90	1.23	195.36	39	2818	0.52	0.083	0.04	11.89	0.01	0.000
40.18	1.88	157.80	1.22	193.02	38	2761	0.52	0.086	0.04	11.89	0.01	0.000
40.25	1.86	162.17	1.21	195.53	39	2734	0.52	0.088	0.04	11.89	0.01	0.000
40.32	1.84	166.78	1.19	198.38	39	2728	0.52	0.089	0.04	11.89	0.01	0.000
40.39	1.82	172.82	1.17	202.15	39	2736	0.52	0.088	0.04	11.89	0.01	0.000
40.43	1.78	182.45	1.13	206.33	40	2735	0.52	0.088	0.04	11.89	0.01	0.000
40.50	1.75	191.06	1.08	207.12	39	2723	0.52	0.089	0.04	11.89	0.01	0.000
40.58	1.73	196.61	1.04	205.26	39	2706	0.52	0.090	0.04	11.89	0.01	0.000
40.62	1.73	192.36	1.06	203.17	38	2677	0.52	0.093	0.04	11.89	0.01	0.000
40.69	1.77	178.83	1.11	198.25	38	2622	0.52	0.097	0.04	11.89	0.01	0.000
40.76	1.81	160.22	1.17	186.67	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.83	1.87	140.60	1.21	170.46	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.90	1.93	122.52	1.25	153.70	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.98	1.99	108.80	1.30	141.10	0	0	0.52	0.000	0.00	11.89	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
41.01	2.05	97.59	1.36	132.46	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.09	2.11	88.95	1.44	128.03	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.16	2.19	80.33	1.58	126.93	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.24	2.25	74.23	1.75	129.99	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.31	2.30	70.38	1.92	134.88	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.35	2.33	67.97	2.06	140.26	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.42	2.37	66.06	2.20	145.36	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.50	2.39	64.48	2.34	150.91	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.56	2.41	63.38	2.45	155.33	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.60	2.43	62.75	2.54	159.42	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.68	2.45	62.45	2.63	164.18	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.75	2.46	63.00	2.70	170.35	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.82	2.46	64.82	2.74	177.49	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.89	2.47	67.73	2.77	187.27	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.96	2.47	70.80	2.78	196.80	0	0	0.52	0.000	0.00	11.89	0.00	0.000
42.00	2.47	74.51	2.78	206.86	53	3491	0.52	0.058	0.02	11.89	0.00	0.000
42.07	2.46	78.54	2.73	214.68	54	3644	0.52	0.055	0.02	11.89	0.00	0.000
42.15	2.45	83.92	2.65	222.64	56	3818	0.52	0.051	0.01	11.89	0.00	0.000
42.22	2.43	89.16	2.56	228.04	57	3957	0.52	0.048	0.01	11.89	0.00	0.000
42.26	2.42	94.61	2.45	232.22	58	4078	0.52	0.046	0.01	11.89	0.00	0.000
42.32	2.40	99.51	2.37	235.65	58	4184	0.52	0.044	0.01	11.89	0.00	0.000
42.40	2.39	103.41	2.31	239.08	58	4278	0.52	0.043	0.01	11.89	0.00	0.000
42.47	2.40	102.69	2.36	242.46	60	4321	0.52	0.042	0.01	11.89	0.00	0.000
42.55	2.42	98.32	2.49	244.60	61	4305	0.52	0.043	0.01	11.89	0.00	0.000
42.62	2.43	93.93	2.56	240.89	60	4210	0.51	0.044	0.01	11.89	0.00	0.000
42.66	2.41	93.08	2.42	225.41	56	4005	0.51	0.048	0.01	11.89	0.00	0.000
42.73	2.35	96.97	2.14	207.51	50	3807	0.51	0.051	0.02	11.89	0.00	0.000
42.80	2.29	103.17	1.88	193.45	45	3645	0.51	0.055	0.02	11.89	0.01	0.000
42.88	2.23	110.54	1.70	188.16	43	3583	0.51	0.057	0.02	11.89	0.01	0.000
42.95	2.19	115.62	1.59	183.98	41	3502	0.51	0.059	0.02	11.89	0.01	0.000
42.99	2.15	119.52	1.51	179.99	40	3396	0.51	0.062	0.03	11.89	0.01	0.000
43.07	2.12	120.89	1.45	175.52	38	3275	0.51	0.066	0.03	11.89	0.01	0.000
43.14	2.10	121.28	1.41	171.21	37	3152	0.51	0.071	0.03	11.89	0.01	0.000
43.18	2.09	118.16	1.41	166.57	0	0	0.51	0.000	0.00	11.89	0.00	0.000
43.26	2.11	113.69	1.43	163.09	0	0	0.51	0.000	0.00	11.89	0.00	0.000
43.33	2.14	108.57	1.49	161.29	0	0	0.51	0.000	0.00	11.89	0.00	0.000
43.41	2.17	104.95	1.54	161.86	0	0	0.51	0.000	0.00	11.89	0.00	0.000
43.45	2.20	101.29	1.62	164.54	0	0	0.51	0.000	0.00	11.89	0.00	0.000
43.53	2.24	97.88	1.72	167.89	0	0	0.51	0.000	0.00	11.89	0.00	0.000
43.57	2.29	92.13	1.89	174.46	0	0	0.51	0.000	0.00	11.89	0.00	0.000
43.64	2.36	84.72	2.18	185.10	0	0	0.51	0.000	0.00	11.89	0.00	0.000
43.72	2.45	76.11	2.65	201.39	0	0	0.51	0.000	0.00	11.89	0.00	0.000
43.79	2.53	68.96	3.17	218.34	0	0	0.51	0.000	0.00	11.89	0.00	0.000
43.87	2.58	64.40	3.58	230.60	0	0	0.51	0.000	0.00	11.89	0.00	0.000
43.91	2.62	60.63	3.97	240.39	0	0	0.51	0.000	0.00	0.00	0.00	0.000
43.98	2.67	57.00	4.36	248.54	0	0	0.51	0.000	0.00	0.00	0.00	0.000
44.05	2.71	53.15	4.81	255.62	0	0	0.51	0.000	0.00	0.00	0.00	0.000
44.13	2.74	50.94	5.09	259.08	0	0	0.51	0.000	0.00	0.00	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
44.17	2.74	50.14	5.17	259.07	0	0	0.51	0.000	0.00	0.00	0.00	0.000
44.24	2.74	50.18	5.11	256.19	0	0	0.51	0.000	0.00	0.00	0.00	0.000
44.32	2.73	49.84	5.08	253.12	0	0	0.51	0.000	0.00	0.00	0.00	0.000
44.40	2.73	49.49	5.07	250.72	0	0	0.51	0.000	0.00	0.00	0.00	0.000
44.44	2.73	49.39	5.06	250.14	0	0	0.51	0.000	0.00	0.00	0.00	0.000
44.51	2.73	50.02	4.98	249.12	0	0	0.51	0.000	0.00	0.00	0.00	0.000
44.58	2.71	51.15	4.85	247.84	0	0	0.51	0.000	0.00	0.00	0.00	0.000
44.66	2.70	52.43	4.70	246.45	0	0	0.51	0.000	0.00	0.00	0.00	0.000
44.69	2.69	53.29	4.61	245.89	0	0	0.51	0.000	0.00	0.00	0.00	0.000
44.77	2.70	52.26	4.73	247.10	0	0	0.51	0.000	0.00	0.00	0.00	0.000
44.85	2.72	50.95	4.88	248.58	0	0	0.51	0.000	0.00	0.00	0.00	0.000
44.89	2.73	50.11	4.99	249.85	0	0	0.51	0.000	0.00	0.00	0.00	0.000
44.96	2.72	51.06	4.87	248.59	0	0	0.51	0.000	0.00	0.00	0.00	0.000
45.03	2.70	52.18	4.72	246.41	0	0	0.51	0.000	0.00	0.00	0.00	0.000
45.08	2.69	52.84	4.62	244.40	0	0	0.51	0.000	0.00	0.00	0.00	0.000
45.15	2.69	53.03	4.57	242.39	0	0	0.51	0.000	0.00	0.00	0.00	0.000
45.23	2.68	53.28	4.50	239.83	0	0	0.51	0.000	0.00	0.00	0.00	0.000
45.30	2.67	53.73	4.37	234.82	0	0	0.50	0.000	0.00	0.00	0.00	0.000
45.38	2.65	54.16	4.23	229.20	0	0	0.50	0.000	0.00	0.00	0.00	0.000
45.42	2.64	54.42	4.09	222.62	0	0	0.50	0.000	0.00	0.00	0.00	0.000
45.50	2.62	54.81	3.94	215.89	0	0	0.50	0.000	0.00	0.00	0.00	0.000
45.56	2.60	55.64	3.72	207.14	0	0	0.50	0.000	0.00	11.89	0.00	0.000
45.64	2.57	56.61	3.49	197.31	0	0	0.50	0.000	0.00	11.89	0.00	0.000
45.68	2.52	58.32	3.11	181.48	0	0	0.50	0.000	0.00	11.89	0.00	0.000
45.75	2.47	60.55	2.75	166.66	0	0	0.50	0.000	0.00	11.89	0.00	0.000
45.83	2.41	63.15	2.44	154.10	0	0	0.50	0.000	0.00	11.89	0.00	0.000
45.87	2.37	66.11	2.22	146.88	0	0	0.50	0.000	0.00	11.89	0.00	0.000
45.95	2.33	68.82	2.03	139.81	0	0	0.50	0.000	0.00	11.89	0.00	0.000
46.02	2.28	71.42	1.87	133.35	0	0	0.50	0.000	0.00	11.89	0.00	0.000
46.09	2.24	74.81	1.72	129.04	0	0	0.50	0.000	0.00	11.89	0.00	0.000
46.16	2.20	78.05	1.62	126.68	0	0	0.50	0.000	0.00	11.89	0.00	0.000
46.20	2.17	82.31	1.53	126.35	0	0	0.50	0.000	0.00	11.89	0.00	0.000
46.28	2.14	85.93	1.48	127.48	0	0	0.50	0.000	0.00	11.89	0.00	0.000
46.36	2.11	90.60	1.44	130.42	0	0	0.50	0.000	0.00	11.89	0.00	0.000
46.43	2.10	94.84	1.41	134.10	0	0	0.50	0.000	0.00	11.89	0.00	0.000
46.47	2.09	99.13	1.40	139.21	0	0	0.50	0.000	0.00	11.89	0.00	0.000
46.54	2.09	103.64	1.40	145.04	0	0	0.50	0.000	0.00	11.89	0.00	0.000
46.62	2.08	108.80	1.39	151.35	0	0	0.50	0.000	0.00	11.89	0.00	0.000
46.69	2.07	113.34	1.38	156.29	0	0	0.50	0.000	0.00	11.89	0.00	0.000
46.73	2.06	118.03	1.36	160.86	0	0	0.50	0.000	0.00	11.89	0.00	0.000
46.80	2.04	121.81	1.35	164.35	0	0	0.50	0.000	0.00	11.89	0.00	0.000
46.88	2.04	124.71	1.34	167.06	0	0	0.50	0.000	0.00	11.89	0.00	0.000
46.92	2.03	126.11	1.34	168.54	0	0	0.50	0.000	0.00	11.89	0.00	0.000
46.99	2.03	127.28	1.34	170.24	36	3171	0.50	0.073	0.04	11.89	0.01	0.000
47.06	2.03	129.23	1.34	172.55	36	3210	0.50	0.072	0.04	11.89	0.01	0.000
47.14	2.03	130.97	1.33	174.54	37	3243	0.50	0.071	0.03	11.89	0.01	0.000
47.18	2.02	132.90	1.33	176.42	37	3263	0.50	0.070	0.03	11.89	0.01	0.000
47.25	2.02	133.97	1.33	177.78	37	3290	0.50	0.069	0.03	11.89	0.01	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
47.33	2.02	134.93	1.33	179.14	38	3321	0.50	0.068	0.03	11.89	0.01	0.000
47.41	2.02	135.37	1.33	179.90	38	3343	0.50	0.067	0.03	11.89	0.01	0.000
47.45	2.02	136.44	1.33	180.99	38	3357	0.50	0.067	0.03	11.89	0.01	0.000
47.51	2.01	138.68	1.32	182.93	38	3369	0.50	0.066	0.03	11.89	0.01	0.000
47.59	2.00	141.58	1.31	185.52	39	3386	0.50	0.066	0.03	11.89	0.01	0.000
47.66	2.00	144.46	1.30	188.41	39	3416	0.50	0.065	0.03	11.89	0.01	0.000
47.74	1.99	146.43	1.30	190.59	40	3447	0.49	0.064	0.03	11.89	0.00	0.000
47.78	1.99	148.47	1.30	192.85	40	3477	0.49	0.063	0.03	11.89	0.00	0.000
47.85	1.99	149.93	1.30	194.26	40	3490	0.49	0.063	0.03	11.89	0.00	0.000
47.93	1.98	151.80	1.29	195.94	40	3499	0.49	0.063	0.03	11.89	0.00	0.000
48.00	1.97	153.31	1.29	197.23	41	3504	0.49	0.062	0.03	11.89	0.00	0.000
48.03	1.96	156.52	1.28	199.96	41	3505	0.49	0.062	0.03	11.89	0.00	0.000
48.12	1.95	160.11	1.27	203.19	41	3516	0.49	0.062	0.03	11.89	0.00	0.000
48.19	2.06	107.70	1.36	146.96	31	4120	0.49	0.049	0.03	11.89	0.00	0.000
48.27	2.05	108.91	1.36	147.61	31	4130	0.49	0.048	0.03	11.89	0.00	0.000
48.31	2.04	110.02	1.34	147.62	31	4109	0.49	0.049	0.03	11.89	0.00	0.000
48.38	2.02	111.85	1.32	148.16	31	4091	0.49	0.049	0.03	11.89	0.00	0.000
48.45	2.00	115.42	1.30	150.59	31	4107	0.49	0.049	0.03	11.89	0.00	0.000
48.52	1.98	119.54	1.29	154.07	32	4152	0.49	0.048	0.03	11.89	0.00	0.000
48.56	1.96	123.86	1.28	158.15	32	4216	0.49	0.047	0.03	11.89	0.00	0.000
48.63	1.94	127.08	1.27	160.78	33	4239	0.49	0.047	0.03	11.89	0.00	0.000
48.70	1.92	129.18	1.25	161.68	33	4205	0.49	0.047	0.03	11.89	0.00	0.000
48.78	1.91	129.77	1.24	161.52	33	4175	0.49	0.048	0.03	11.89	0.00	0.000
48.86	1.91	129.11	1.24	160.69	32	4160	0.49	0.048	0.03	11.89	0.00	0.000
48.89	1.92	128.48	1.25	160.68	32	4192	0.49	0.048	0.03	11.89	0.00	0.000
48.97	1.92	127.56	1.25	159.87	32	4190	0.49	0.048	0.03	11.89	0.00	0.000
49.04	1.93	127.35	1.25	159.69	32	4195	0.49	0.048	0.03	11.89	0.00	0.000
49.09	1.93	127.57	1.26	160.15	32	4217	0.49	0.047	0.03	11.89	0.00	0.000
49.18	1.92	128.69	1.25	161.28	33	4246	0.49	0.047	0.03	11.89	0.00	0.000
49.22	1.91	130.46	1.25	162.62	33	4253	0.49	0.047	0.03	11.89	0.00	0.000
49.29	1.90	132.14	1.24	163.21	33	4221	0.49	0.047	0.03	11.89	0.00	0.000
49.36	1.88	133.89	1.22	163.86	33	4194	0.49	0.048	0.03	11.89	0.00	0.000
49.43	1.87	134.77	1.22	163.76	32	4164	0.49	0.048	0.03	11.89	0.00	0.000
49.51	1.86	134.82	1.21	163.13	32	4136	0.49	0.049	0.03	11.89	0.00	0.000
49.55	1.85	134.86	1.20	162.06	32	4085	0.49	0.050	0.03	11.89	0.00	0.000
49.62	1.85	132.86	1.20	158.98	31	4000	0.49	0.051	0.03	11.89	0.00	0.000
49.70	1.85	127.91	1.20	153.90	30	3896	0.49	0.053	0.03	11.89	0.00	0.000
49.77	1.88	120.98	1.22	147.78	29	3807	0.49	0.055	0.03	11.89	0.00	0.000
49.81	1.93	112.48	1.26	141.49	29	3795	0.49	0.056	0.04	11.89	0.01	0.000
49.88	2.00	104.22	1.31	136.01	28	3826	0.49	0.055	0.04	11.89	0.01	0.000
49.95	2.10	92.60	1.41	130.82	28	3857	0.48	0.054	0.04	11.89	0.00	0.000
50.04	2.17	84.59	1.54	130.15	29	3863	0.48	0.054	0.03	11.89	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)

Total estimated settlement: 0.15

Abbreviations

Q_{tn}: Equivalent clean sand normalized cone resistance
K_c: Fines correction factor
$Q_{tn,cs}$: Post-liquefaction volumentric strain
G_{max}: Small strain shear modulus
CSR: Soil cyclic stress ratio
γ: Cyclic shear strain
$e_{vol(15)}$: Volumetric strain after 15 cycles
N_c: Equivalent number of cycles
e_v: Volumetric strain
Settle.: Calculated settlement

GeoTek, Inc.
1548 N. Maple Street
Corona, CA 92878
951-710-1160, www.geotekusa.com

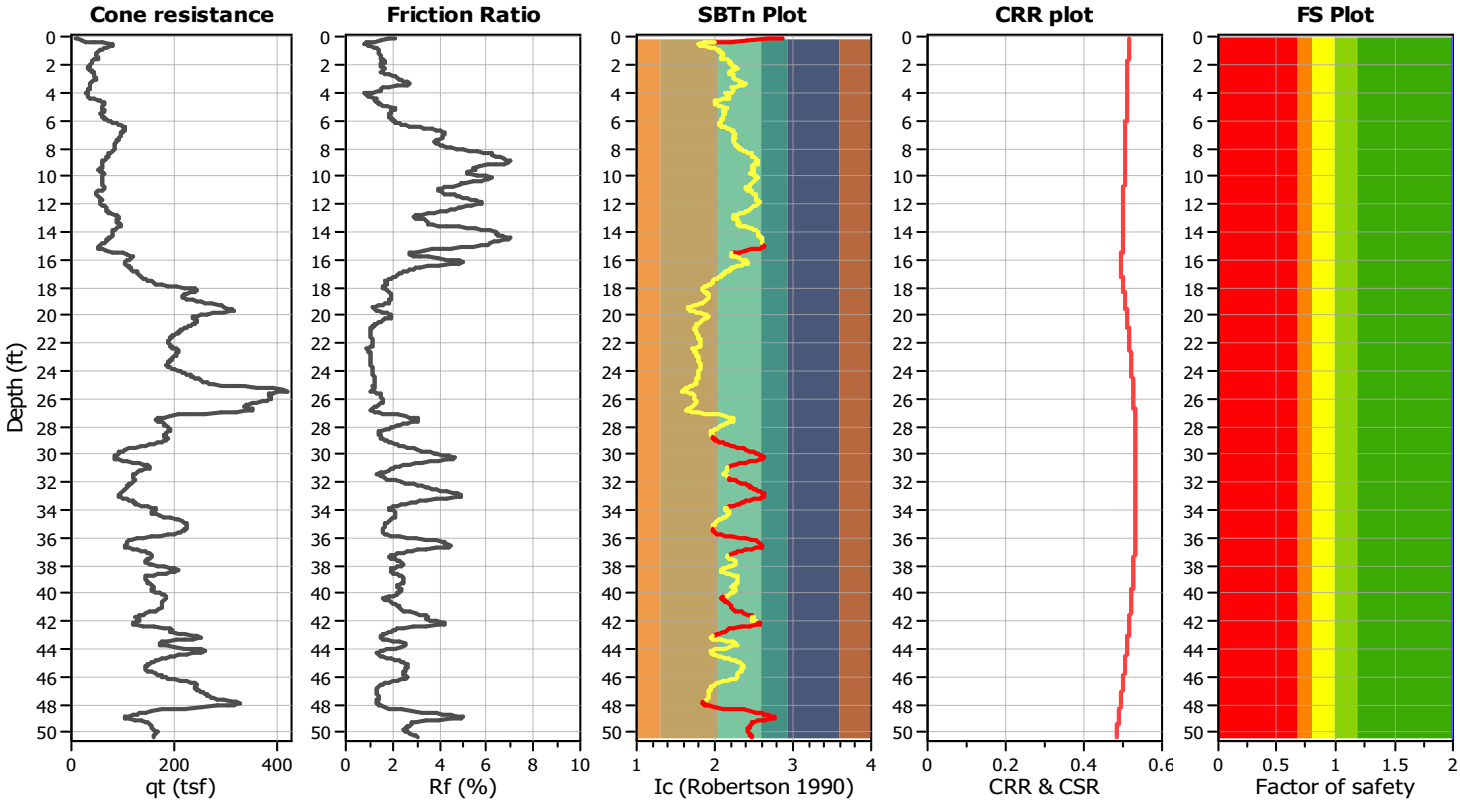
LIQUEFACTION ANALYSIS REPORT

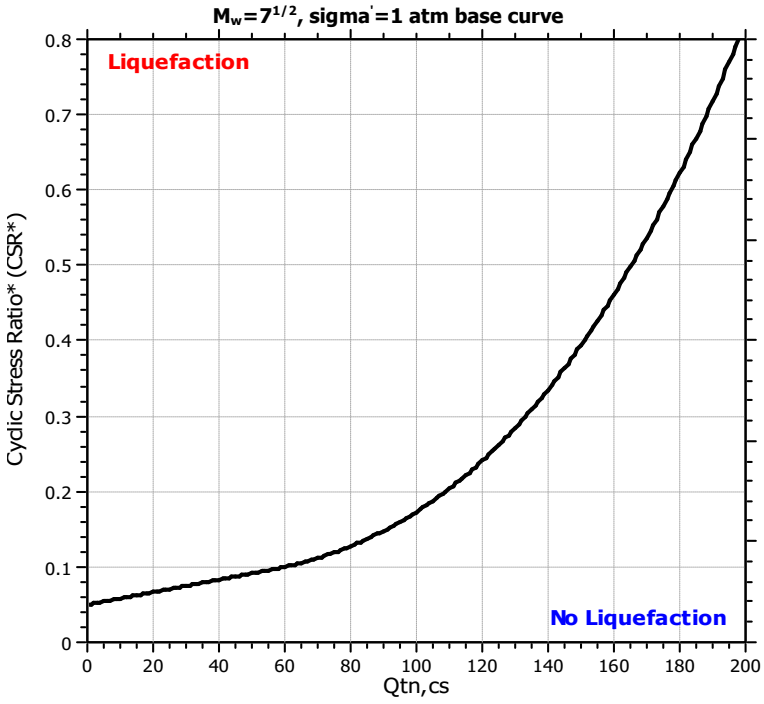
Project title : Xenia Site **Location : Beaumont, California**

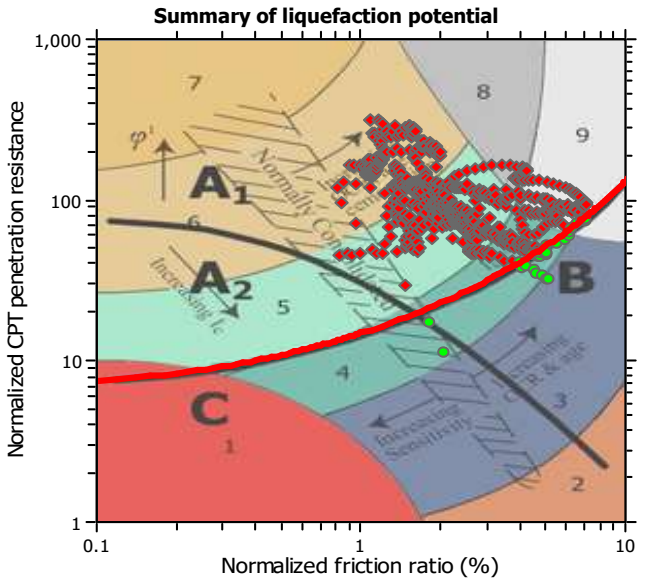
CPT file : CPT-3

Input parameters and analysis data

Analysis method:	NCEER (1998)	G.W.T. (in-situ):	100.00 ft	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	100.00 ft	Fill height:	N/A	Limit depth applied:	Yes
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	60.00 ft
Earthquake magnitude M_w:	7.13	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	0.90	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

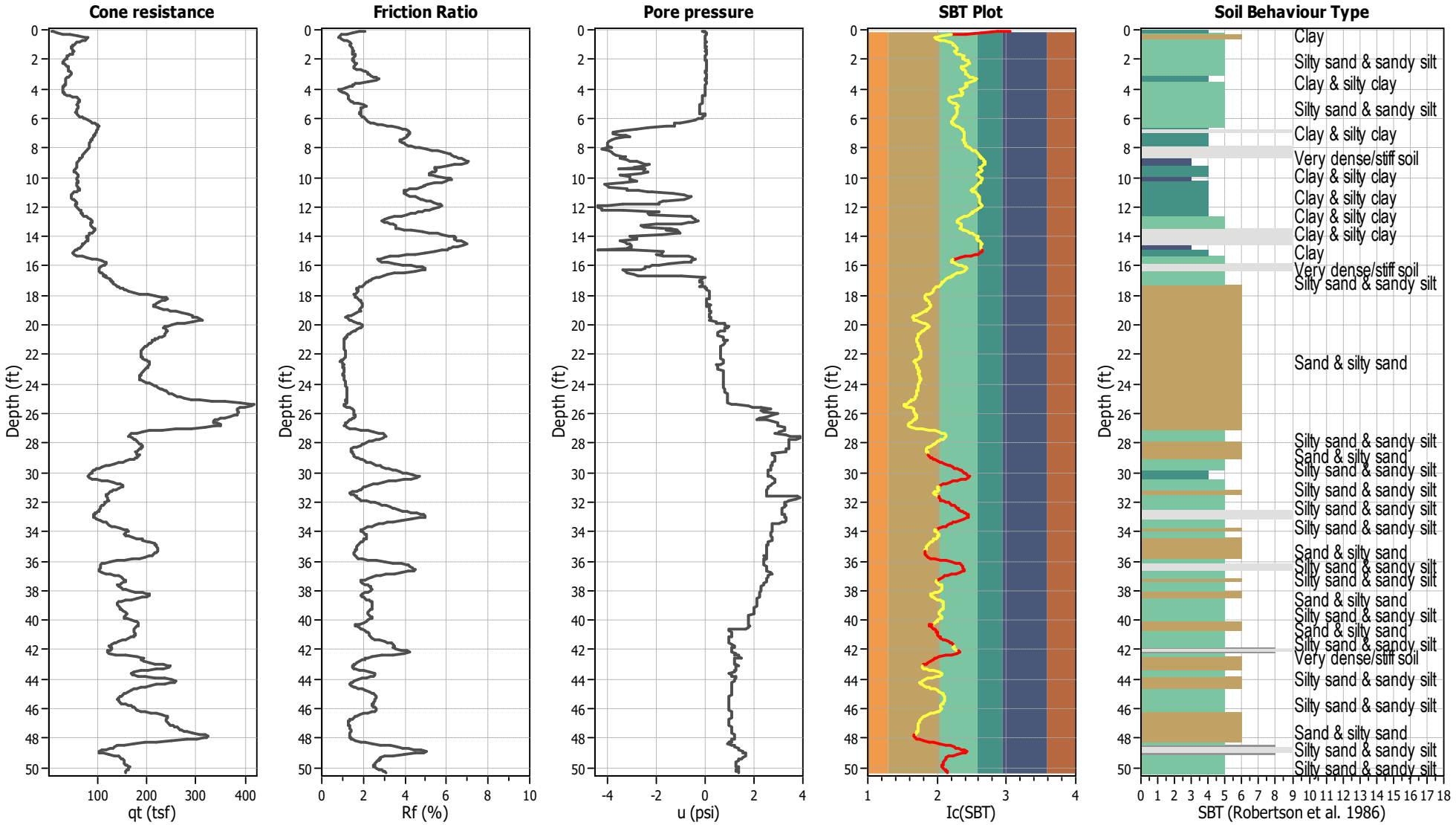






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plots



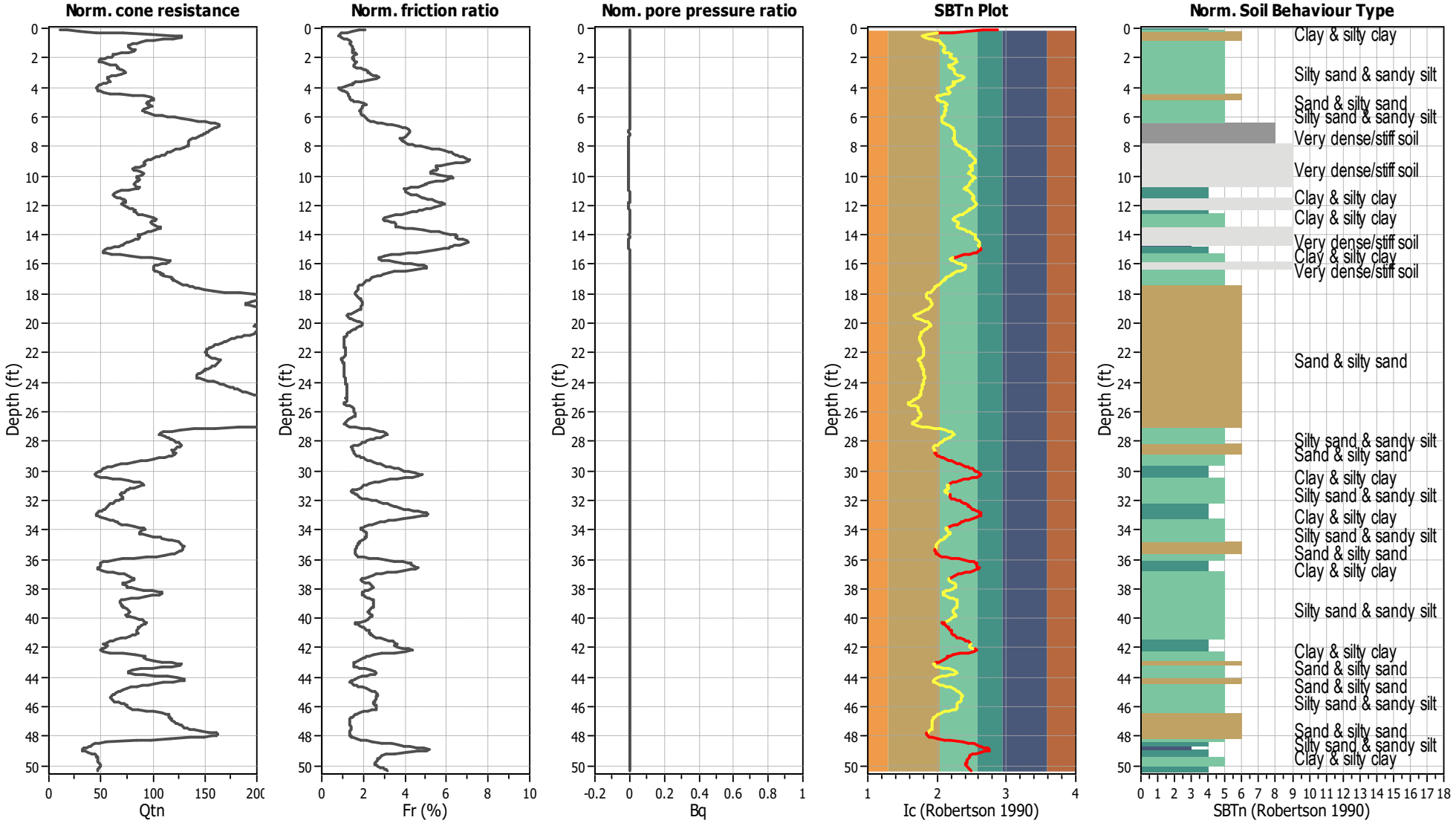
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	100.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.13	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.90	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	100.00 ft	Fill height:	N/A	Limit depth:	60.00 ft

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

CPT basic interpretation plots (normalized)



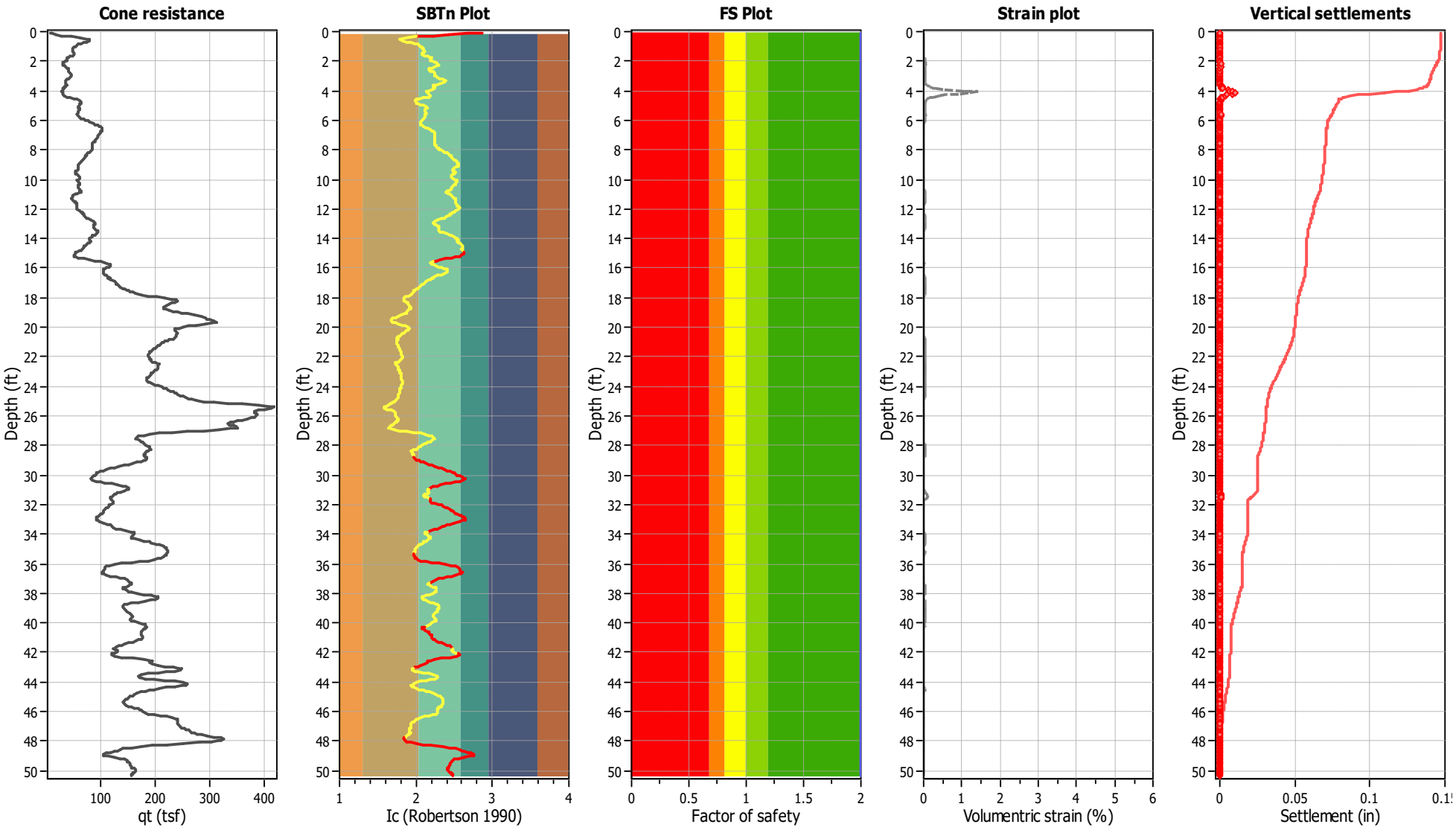
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	100.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.13	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.90	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	100.00 ft	Fill height:	N/A	Limit depth:	60.00 ft

SBTn legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

Estimation of post-earthquake settlements



Abbreviations

q_t:	Total cone resistance (cone resistance q_c corrected for pore water effects)
I_c:	Soil Behaviour Type Index
FS:	Calculated Factor of Safety against liquefaction
Volumentric strain:	Post-liquefaction volumentric strain

:: Post-earthquake settlement of dry sands ::

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
0.10	2.87	11.24	6.71	75.46	0	0	0.51	0.000	0.00	0.00	0.00	0.000
0.14	2.68	17.24	4.51	77.67	0	0	0.51	0.000	0.00	0.00	0.00	0.000
0.22	2.43	29.49	2.56	75.54	0	0	0.51	0.000	0.00	11.89	0.00	0.000
0.30	2.22	46.28	1.67	77.51	0	0	0.51	0.000	0.00	11.89	0.00	0.000
0.34	2.01	71.67	1.32	94.42	0	0	0.51	0.000	0.00	11.89	0.00	0.000
0.42	1.87	97.41	1.22	118.59	0	0	0.51	0.000	0.00	11.89	0.00	0.000
0.49	1.79	119.61	1.15	137.03	26	649	0.51	0.003	0.00	11.89	0.00	0.000
0.56	1.78	128.05	1.13	145.21	28	687	0.51	0.004	0.00	11.89	0.00	0.000
0.60	1.82	127.20	1.17	148.97	29	711	0.51	0.004	0.00	11.89	0.00	0.000
0.68	1.88	119.04	1.22	145.28	29	717	0.51	0.004	0.00	11.89	0.00	0.000
0.76	1.94	110.08	1.26	138.72	28	715	0.51	0.005	0.00	11.89	0.00	0.000
0.79	1.99	100.83	1.30	131.03	27	702	0.51	0.005	0.00	11.89	0.00	0.000
0.87	2.02	94.62	1.32	125.25	26	683	0.51	0.006	0.00	11.89	0.00	0.000
0.96	2.04	88.86	1.35	119.61	25	661	0.51	0.008	0.01	11.89	0.01	0.000
1.00	2.05	84.26	1.36	114.57	24	636	0.51	0.009	0.01	11.89	0.01	0.000
1.08	2.07	80.65	1.38	111.20	24	622	0.51	0.010	0.01	11.89	0.01	0.000
1.15	2.09	77.90	1.40	109.04	23	613	0.51	0.011	0.01	11.89	0.01	0.000
1.19	2.10	76.99	1.41	108.85	24	613	0.51	0.012	0.01	11.89	0.01	0.000
1.26	2.11	76.99	1.43	109.93	24	621	0.51	0.013	0.01	11.89	0.01	0.000
1.34	2.11	78.23	1.43	111.83	24	632	0.51	0.013	0.01	11.89	0.01	0.000
1.42	2.10	80.37	1.42	114.05	25	643	0.51	0.014	0.01	11.89	0.01	0.000
1.45	2.08	82.87	1.39	115.50	25	648	0.51	0.014	0.01	11.89	0.01	0.000
1.53	2.09	81.61	1.40	114.08	25	641	0.51	0.016	0.01	11.89	0.01	0.000
1.61	2.11	77.15	1.43	110.62	24	625	0.51	0.018	0.01	11.89	0.01	0.000
1.65	2.16	69.85	1.52	106.46	24	603	0.51	0.021	0.02	11.89	0.01	0.000
1.72	2.19	64.84	1.60	103.73	23	585	0.51	0.024	0.02	11.89	0.02	0.000
1.81	2.21	62.19	1.63	101.42	23	570	0.51	0.028	0.02	11.89	0.02	0.000
1.85	2.19	61.63	1.60	98.42	22	555	0.51	0.032	0.03	11.89	0.02	0.000
1.92	2.19	60.08	1.60	95.83	22	540	0.51	0.037	0.03	11.89	0.03	0.000
1.99	2.21	56.57	1.64	92.70	21	520	0.51	0.045	0.04	11.89	0.04	0.000
2.07	2.24	53.06	1.71	90.75	21	504	0.51	0.054	0.05	11.89	0.04	0.000
2.10	2.26	50.00	1.79	89.61	21	491	0.51	0.061	0.06	11.89	0.05	0.000
2.19	2.28	48.90	1.84	89.74	21	489	0.51	0.067	0.06	11.89	0.06	0.001
2.26	2.29	48.59	1.89	91.66	21	494	0.51	0.069	0.06	11.89	0.05	0.000
2.30	2.28	50.54	1.85	93.33	22	507	0.51	0.065	0.06	11.89	0.05	0.000
2.38	2.25	54.38	1.75	95.10	22	525	0.51	0.061	0.06	11.89	0.05	0.000
2.46	2.21	59.12	1.63	96.64	22	543	0.51	0.058	0.05	11.89	0.05	0.000
2.50	2.18	63.77	1.56	99.44	22	562	0.51	0.053	0.05	11.89	0.04	0.000
2.57	2.18	65.62	1.56	102.46	23	579	0.51	0.051	0.04	11.89	0.04	0.000
2.65	2.20	66.56	1.60	106.81	24	602	0.51	0.048	0.04	11.89	0.03	0.000
2.72	2.22	66.35	1.68	111.28	25	621	0.51	0.045	0.03	11.89	0.03	0.000
2.76	2.24	67.80	1.72	116.45	27	646	0.51	0.041	0.03	11.89	0.03	0.000
2.83	2.24	69.94	1.73	121.01	28	670	0.51	0.039	0.03	11.89	0.02	0.000
2.91	2.24	72.48	1.73	125.56	29	695	0.51	0.037	0.02	11.89	0.02	0.000
2.98	2.24	74.37	1.73	128.47	29	712	0.51	0.036	0.02	11.89	0.02	0.000
3.02	2.25	73.51	1.76	129.67	30	714	0.51	0.037	0.02	11.89	0.02	0.000
3.09	2.28	70.11	1.84	129.24	30	703	0.51	0.040	0.02	11.89	0.02	0.000
3.17	2.31	65.06	1.97	128.30	30	681	0.51	0.046	0.03	11.89	0.02	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
3.24	2.35	60.30	2.14	129.16	31	664	0.51	0.052	0.03	11.89	0.03	0.000
3.32	2.38	57.44	2.28	130.68	32	656	0.51	0.056	0.03	11.89	0.03	0.000
3.36	2.39	56.08	2.34	131.28	32	651	0.51	0.059	0.03	11.89	0.03	0.000
3.43	2.37	56.07	2.25	125.93	31	635	0.51	0.067	0.04	11.89	0.03	0.000
3.50	2.32	57.27	2.00	114.79	27	606	0.51	0.082	0.06	11.89	0.05	0.000
3.58	2.26	58.57	1.79	104.57	24	574	0.51	0.106	0.08	11.89	0.07	0.001
3.61	2.22	57.92	1.67	96.90	22	541	0.51	0.138	0.12	11.89	0.10	0.000
3.70	2.23	55.20	1.68	92.87	21	518	0.51	0.176	0.16	11.89	0.14	0.001
3.77	2.24	51.70	1.73	89.54	21	496	0.51	0.227	0.22	11.89	0.19	0.002
3.84	2.25	50.19	1.75	87.86	20	485	0.51	0.264	0.26	11.89	0.22	0.002
3.88	2.24	48.59	1.73	83.86	19	465	0.51	0.336	0.35	11.89	0.30	0.001
3.96	2.21	46.88	1.63	76.28	17	429	0.51	0.554	0.66	11.89	0.56	0.006
4.03	2.16	46.00	1.52	70.01	16	397	0.51	0.924	1.25	11.89	1.05	0.009
4.07	2.14	45.40	1.49	67.57	15	383	0.51	1.189	1.70	11.89	1.42	0.007
4.15	2.15	46.35	1.51	69.83	15	396	0.51	1.017	1.39	11.89	1.16	0.010
4.22	2.17	47.17	1.54	72.64	16	411	0.51	0.844	1.09	11.89	0.91	0.008
4.29	2.18	49.71	1.56	77.49	17	438	0.51	0.606	0.72	11.89	0.60	0.005
4.36	2.18	52.80	1.57	82.94	19	469	0.51	0.437	0.48	11.89	0.40	0.004
4.41	2.16	58.69	1.53	89.63	20	508	0.51	0.295	0.30	11.89	0.25	0.001
4.48	2.11	68.63	1.43	97.93	21	553	0.51	0.205	0.19	11.89	0.16	0.001
4.56	2.05	79.98	1.35	108.24	23	600	0.51	0.150	0.13	11.89	0.11	0.001
4.60	2.01	90.67	1.32	119.26	25	647	0.51	0.113	0.09	11.89	0.07	0.000
4.68	2.00	97.37	1.30	126.96	26	683	0.51	0.095	0.07	11.89	0.06	0.001
4.75	2.00	100.61	1.31	131.46	27	709	0.51	0.087	0.06	11.89	0.05	0.000
4.82	2.01	100.30	1.32	131.97	28	716	0.51	0.086	0.06	11.89	0.05	0.000
4.86	2.03	98.65	1.33	131.16	28	718	0.51	0.087	0.06	11.89	0.05	0.000
4.93	2.05	96.74	1.36	131.30	28	729	0.51	0.085	0.06	11.89	0.05	0.000
5.02	2.09	95.49	1.41	134.30	29	756	0.51	0.078	0.05	11.89	0.04	0.000
5.09	2.13	94.48	1.47	138.87	30	787	0.51	0.070	0.04	11.89	0.03	0.000
5.13	2.15	95.17	1.50	143.01	32	811	0.51	0.065	0.04	11.89	0.03	0.000
5.20	2.14	96.82	1.48	143.39	32	813	0.51	0.066	0.04	11.89	0.03	0.000
5.28	2.12	98.80	1.44	142.56	31	806	0.51	0.070	0.04	11.89	0.03	0.000
5.32	2.11	97.95	1.43	140.16	30	792	0.51	0.075	0.05	11.89	0.04	0.000
5.40	2.12	94.64	1.45	137.06	30	776	0.51	0.083	0.05	11.89	0.04	0.000
5.47	2.13	91.29	1.47	133.76	29	758	0.51	0.092	0.06	11.89	0.05	0.000
5.55	2.13	89.98	1.46	131.42	29	744	0.51	0.101	0.07	11.89	0.05	0.001
5.59	2.12	90.92	1.44	131.19	29	742	0.51	0.104	0.07	11.89	0.06	0.000
5.66	2.12	91.97	1.44	132.77	29	751	0.51	0.102	0.07	11.89	0.05	0.000
5.74	2.11	94.11	1.44	135.50	29	766	0.51	0.098	0.06	11.89	0.05	0.000
5.78	2.11	97.41	1.43	139.57	30	789	0.51	0.090	0.05	11.89	0.04	0.000
5.85	2.10	102.35	1.42	145.23	31	819	0.51	0.081	0.05	11.89	0.04	0.000
5.93	2.09	108.79	1.41	152.89	33	860	0.51	0.072	0.04	11.89	0.03	0.000
6.01	2.08	114.58	1.40	159.97	34	898	0.51	0.064	0.03	11.89	0.03	0.000
6.04	2.07	121.28	1.38	167.57	36	938	0.51	0.058	0.03	11.89	0.02	0.000
6.12	2.07	128.07	1.37	175.78	38	981	0.51	0.052	0.02	11.89	0.02	0.000
6.19	2.06	136.76	1.37	187.10	40	1043	0.51	0.045	0.02	11.89	0.02	0.000
6.27	2.06	144.04	1.37	197.42	42	1101	0.51	0.041	0.02	11.89	0.01	0.000
6.31	2.07	150.43	1.38	207.89	45	1163	0.51	0.036	0.01	11.89	0.01	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
6.39	2.09	155.72	1.40	218.47	47	1229	0.51	0.033	0.01	11.89	0.01	0.000
6.46	2.11	160.11	1.43	228.78	50	1292	0.51	0.030	0.01	11.89	0.01	0.000
6.50	2.13	163.15	1.46	238.83	52	1353	0.51	0.028	0.01	11.89	0.01	0.000
6.57	2.15	163.89	1.51	247.61	55	1404	0.51	0.026	0.01	11.89	0.01	0.000
6.65	2.18	163.17	1.57	256.94	58	1452	0.51	0.025	0.01	11.89	0.01	0.000
6.72	2.21	161.55	1.63	263.69	60	1481	0.51	0.025	0.01	11.89	0.01	0.000
6.77	2.22	159.39	1.68	267.59	61	1494	0.51	0.025	0.01	11.89	0.01	0.000
6.84	2.24	157.12	1.71	269.02	62	1494	0.51	0.025	0.01	11.89	0.01	0.000
6.92	2.25	154.61	1.74	269.01	62	1488	0.51	0.026	0.01	11.89	0.01	0.000
6.99	2.25	152.65	1.75	267.84	62	1478	0.51	0.026	0.01	11.89	0.01	0.000
7.03	2.25	151.30	1.76	265.64	61	1466	0.51	0.027	0.01	11.89	0.01	0.000
7.10	2.25	150.49	1.75	263.38	61	1454	0.51	0.028	0.01	11.89	0.01	0.000
7.18	2.25	149.24	1.75	260.81	60	1441	0.51	0.029	0.01	11.89	0.01	0.000
7.25	2.25	148.04	1.75	258.89	60	1430	0.51	0.030	0.01	11.89	0.01	0.000
7.29	2.25	146.08	1.76	256.62	59	1416	0.51	0.030	0.01	11.89	0.01	0.000
7.37	2.25	143.46	1.74	249.99	57	1382	0.51	0.032	0.01	11.89	0.01	0.000
7.45	2.24	140.55	1.72	242.14	56	1343	0.51	0.035	0.01	11.89	0.01	0.000
7.49	2.24	137.84	1.71	235.83	54	1310	0.51	0.037	0.01	11.89	0.01	0.000
7.57	2.24	136.03	1.73	235.36	54	1304	0.51	0.038	0.01	11.89	0.01	0.000
7.64	2.25	134.63	1.76	236.92	55	1306	0.51	0.039	0.01	11.89	0.01	0.000
7.68	2.26	133.92	1.78	238.98	55	1312	0.51	0.038	0.01	11.89	0.01	0.000
7.75	2.27	133.56	1.81	242.34	56	1324	0.51	0.038	0.01	11.89	0.01	0.000
7.82	2.28	134.20	1.84	247.42	58	1345	0.51	0.038	0.01	11.89	0.01	0.000
7.90	2.29	134.55	1.89	254.16	60	1370	0.51	0.037	0.01	11.89	0.01	0.000
7.97	2.30	134.54	1.94	260.70	61	1393	0.51	0.036	0.01	11.89	0.01	0.000
8.01	2.33	132.64	2.03	268.86	64	1413	0.51	0.035	0.01	11.89	0.01	0.000
8.09	2.35	129.78	2.14	277.91	67	1430	0.51	0.035	0.01	11.89	0.01	0.000
8.17	2.38	126.52	2.27	287.13	70	1443	0.51	0.035	0.01	11.89	0.01	0.000
8.21	2.41	122.72	2.41	295.59	73	1448	0.51	0.035	0.01	11.89	0.01	0.000
8.29	2.43	119.21	2.54	302.49	75	1449	0.51	0.035	0.01	11.89	0.01	0.000
8.37	2.45	116.30	2.65	308.28	78	1448	0.51	0.036	0.01	11.89	0.01	0.000
8.40	2.46	114.35	2.72	311.11	79	1445	0.51	0.036	0.01	11.89	0.01	0.000
8.48	2.47	112.85	2.77	312.19	79	1439	0.51	0.037	0.01	11.89	0.01	0.000
8.55	2.48	110.79	2.83	313.64	80	1431	0.50	0.038	0.01	11.89	0.01	0.000
8.63	2.49	109.08	2.89	315.12	81	1425	0.50	0.039	0.01	11.89	0.01	0.000
8.67	2.50	106.53	2.98	317.34	82	1415	0.50	0.040	0.01	11.89	0.01	0.000
8.74	2.52	103.52	3.08	319.25	83	1401	0.50	0.041	0.01	11.89	0.01	0.000
8.82	2.53	100.37	3.20	320.99	84	1386	0.50	0.043	0.01	11.89	0.01	0.000
8.86	2.54	97.57	3.30	321.79	85	1370	0.50	0.044	0.01	11.89	0.01	0.000
8.93	2.55	95.07	3.36	319.84	85	1350	0.50	0.046	0.01	11.89	0.01	0.000
9.01	2.56	92.56	3.39	313.64	83	1319	0.50	0.049	0.01	11.89	0.01	0.000
9.09	2.55	91.46	3.33	304.24	80	1290	0.50	0.053	0.01	11.89	0.01	0.000
9.13	2.53	91.80	3.18	291.98	76	1264	0.50	0.056	0.01	11.89	0.01	0.000
9.20	2.50	92.75	3.01	279.00	72	1239	0.50	0.060	0.01	11.89	0.01	0.000
9.28	2.49	91.72	2.89	264.85	68	1212	0.50	0.064	0.01	11.89	0.01	0.000
9.35	2.48	89.84	2.84	255.20	65	1187	0.50	0.069	0.02	11.89	0.01	0.000
9.39	2.49	86.78	2.89	250.65	64	1159	0.50	0.074	0.02	11.89	0.01	0.000
9.46	2.50	83.42	2.98	248.56	64	1137	0.50	0.079	0.02	11.89	0.01	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
9.55	2.51	80.78	3.06	246.91	64	1122	0.50	0.083	0.02	11.89	0.02	0.000
9.58	2.51	81.28	3.02	245.41	63	1127	0.50	0.083	0.02	11.89	0.02	0.000
9.66	2.49	84.20	2.89	243.42	62	1152	0.50	0.079	0.02	11.89	0.02	0.000
9.73	2.47	88.24	2.76	243.25	62	1190	0.50	0.073	0.02	11.89	0.01	0.000
9.81	2.46	91.06	2.69	245.02	62	1223	0.50	0.069	0.02	11.89	0.01	0.000
9.85	2.46	91.68	2.74	251.10	64	1245	0.50	0.066	0.02	11.89	0.01	0.000
9.93	2.49	89.39	2.91	259.79	67	1256	0.50	0.066	0.02	11.89	0.01	0.000
10.00	2.52	86.37	3.12	269.06	70	1261	0.50	0.066	0.01	11.89	0.01	0.000
10.04	2.54	84.38	3.27	275.62	72	1263	0.50	0.066	0.01	11.89	0.01	0.000
10.11	2.54	84.39	3.27	276.10	73	1272	0.50	0.066	0.01	11.89	0.01	0.000
10.19	2.53	85.61	3.19	273.32	71	1285	0.50	0.065	0.01	11.89	0.01	0.000
10.26	2.52	86.60	3.12	270.09	70	1294	0.50	0.065	0.01	11.89	0.01	0.000
10.34	2.51	86.33	3.06	263.74	68	1286	0.50	0.066	0.02	11.89	0.01	0.000
10.38	2.49	84.74	2.93	248.44	64	1243	0.50	0.073	0.02	11.89	0.01	0.000
10.45	2.47	83.70	2.81	234.87	60	1210	0.50	0.079	0.02	11.89	0.02	0.000
10.53	2.47	81.89	2.78	227.45	58	1186	0.50	0.085	0.02	11.89	0.02	0.000
10.57	2.47	82.38	2.78	229.16	58	1197	0.50	0.084	0.02	11.89	0.02	0.000
10.65	2.45	83.51	2.69	224.27	57	1202	0.50	0.084	0.02	11.89	0.02	0.000
10.72	2.43	84.91	2.56	217.76	54	1203	0.50	0.085	0.03	11.89	0.02	0.000
10.76	2.40	87.71	2.37	208.31	51	1201	0.50	0.086	0.03	11.89	0.02	0.000
10.84	2.39	86.54	2.33	201.51	49	1179	0.50	0.091	0.03	11.89	0.02	0.000
10.91	2.39	83.16	2.33	193.57	47	1140	0.50	0.102	0.04	11.89	0.03	0.000
10.99	2.42	76.29	2.48	189.20	47	1085	0.50	0.121	0.04	11.89	0.03	0.000
11.03	2.45	70.01	2.63	183.95	46	1026	0.50	0.147	0.05	11.89	0.04	0.000
11.10	2.46	65.72	2.74	180.02	46	988	0.50	0.170	0.06	11.89	0.05	0.000
11.17	2.49	62.56	2.88	180.17	46	969	0.50	0.185	0.07	11.89	0.05	0.000
11.25	2.50	61.48	3.00	184.28	48	977	0.50	0.183	0.06	11.89	0.05	0.000
11.29	2.52	61.56	3.12	192.07	50	1000	0.50	0.169	0.06	11.89	0.04	0.000
11.36	2.52	63.29	3.14	198.99	52	1037	0.50	0.150	0.05	11.89	0.03	0.000
11.45	2.52	65.38	3.14	205.56	54	1078	0.50	0.134	0.04	11.89	0.03	0.000
11.49	2.51	68.63	3.08	211.61	55	1125	0.50	0.118	0.03	11.89	0.03	0.000
11.56	2.52	70.92	3.09	219.10	57	1170	0.50	0.105	0.03	11.89	0.02	0.000
11.64	2.52	72.86	3.13	227.69	59	1216	0.50	0.095	0.03	11.89	0.02	0.000
11.71	2.53	73.57	3.19	235.00	61	1247	0.50	0.090	0.02	11.89	0.02	0.000
11.76	2.54	73.20	3.28	240.40	63	1262	0.50	0.087	0.02	11.89	0.02	0.000
11.83	2.56	71.78	3.39	243.60	65	1264	0.50	0.088	0.02	11.89	0.02	0.000
11.91	2.57	70.54	3.47	244.84	65	1263	0.50	0.089	0.02	11.89	0.02	0.000
11.94	2.57	70.45	3.46	244.01	65	1264	0.50	0.090	0.02	11.89	0.02	0.000
12.02	2.55	71.85	3.36	241.11	64	1277	0.50	0.088	0.02	11.89	0.02	0.000
12.10	2.52	74.86	3.15	236.02	62	1298	0.50	0.085	0.02	11.89	0.02	0.000
12.18	2.50	77.80	2.97	231.39	60	1318	0.50	0.083	0.02	11.89	0.02	0.000
12.21	2.48	80.64	2.82	227.26	58	1333	0.50	0.081	0.02	11.89	0.02	0.000
12.29	2.46	81.95	2.73	223.47	57	1340	0.50	0.080	0.02	11.89	0.02	0.000
12.36	2.45	82.56	2.65	218.43	55	1336	0.50	0.082	0.02	11.89	0.02	0.000
12.44	2.44	82.24	2.59	213.21	53	1325	0.50	0.085	0.03	11.89	0.02	0.000
12.48	2.42	82.73	2.50	206.84	51	1312	0.50	0.087	0.03	11.89	0.02	0.000
12.55	2.40	84.18	2.37	199.24	49	1304	0.50	0.090	0.03	11.89	0.02	0.000
12.62	2.37	86.35	2.22	191.45	46	1299	0.50	0.092	0.03	11.89	0.02	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
12.67	2.33	90.26	2.04	183.94	44	1300	0.50	0.092	0.04	11.89	0.03	0.000
12.75	2.29	95.08	1.88	178.71	42	1313	0.50	0.091	0.04	11.89	0.03	0.000
12.82	2.25	100.48	1.75	175.54	40	1331	0.50	0.088	0.04	11.89	0.03	0.000
12.90	2.23	103.39	1.69	174.74	40	1346	0.50	0.087	0.04	11.89	0.03	0.000
12.93	2.23	103.95	1.69	175.28	40	1353	0.50	0.086	0.04	11.89	0.03	0.000
13.01	2.24	101.94	1.74	176.96	41	1360	0.50	0.086	0.04	11.89	0.03	0.000
13.09	2.27	99.58	1.80	179.59	42	1368	0.50	0.085	0.04	11.89	0.02	0.000
13.13	2.29	98.16	1.87	183.85	43	1384	0.50	0.083	0.03	11.89	0.02	0.000
13.20	2.30	98.11	1.92	188.68	44	1411	0.50	0.080	0.03	11.89	0.02	0.000
13.27	2.30	99.37	1.94	192.53	45	1442	0.50	0.076	0.03	11.89	0.02	0.000
13.35	2.30	102.03	1.91	195.37	46	1477	0.50	0.072	0.03	11.89	0.02	0.000
13.42	2.29	104.57	1.89	197.79	46	1509	0.50	0.069	0.03	11.89	0.02	0.000
13.46	2.30	106.84	1.92	204.79	48	1558	0.50	0.065	0.02	11.89	0.02	0.000
13.54	2.32	106.88	2.02	216.01	51	1616	0.50	0.060	0.02	11.89	0.01	0.000
13.62	2.36	105.83	2.16	228.07	55	1667	0.50	0.056	0.02	11.89	0.01	0.000
13.65	2.40	101.67	2.39	243.26	60	1699	0.50	0.054	0.01	11.89	0.01	0.000
13.75	2.44	98.14	2.58	253.62	63	1718	0.50	0.054	0.01	11.89	0.01	0.000
13.78	2.47	94.72	2.79	264.41	67	1729	0.50	0.053	0.01	11.89	0.01	0.000
13.86	2.49	92.22	2.94	270.68	70	1736	0.50	0.053	0.01	11.89	0.01	0.000
13.94	2.52	88.80	3.14	278.57	73	1739	0.50	0.054	0.01	11.89	0.01	0.000
14.01	2.54	86.53	3.29	285.02	75	1746	0.50	0.054	0.01	11.89	0.01	0.000
14.08	2.55	86.47	3.32	287.40	76	1760	0.50	0.053	0.01	11.89	0.01	0.000
14.12	2.54	87.80	3.27	287.45	76	1778	0.50	0.052	0.01	11.89	0.01	0.000
14.20	2.54	87.89	3.27	287.54	76	1788	0.50	0.052	0.01	11.89	0.01	0.000
14.28	2.55	86.55	3.34	288.74	76	1788	0.50	0.052	0.01	11.89	0.01	0.000
14.32	2.57	83.40	3.50	291.78	78	1770	0.50	0.054	0.01	11.89	0.01	0.000
14.39	2.59	79.96	3.67	293.60	79	1749	0.50	0.056	0.01	11.89	0.01	0.000
14.47	2.61	76.72	3.81	292.60	0	0	0.50	0.000	0.00	0.00	0.00	0.000
14.54	2.61	74.57	3.87	288.74	0	0	0.50	0.000	0.00	0.00	0.00	0.000
14.58	2.61	73.11	3.84	280.64	0	0	0.50	0.000	0.00	0.00	0.00	0.000
14.66	2.60	71.54	3.77	270.05	0	0	0.50	0.000	0.00	0.00	0.00	0.000
14.74	2.60	69.77	3.72	259.56	70	1570	0.50	0.074	0.02	11.89	0.01	0.000
14.77	2.60	66.83	3.77	251.81	0	0	0.50	0.000	0.00	0.00	0.00	0.000
14.85	2.62	63.05	3.89	245.18	0	0	0.50	0.000	0.00	0.00	0.00	0.000
14.92	2.63	59.25	4.01	237.75	0	0	0.50	0.000	0.00	0.00	0.00	0.000
14.96	2.63	56.28	4.03	226.70	0	0	0.50	0.000	0.00	0.00	0.00	0.000
15.04	2.62	54.03	3.94	212.78	0	0	0.50	0.000	0.00	0.00	0.00	0.000
15.11	2.60	52.37	3.76	196.66	0	0	0.50	0.000	0.00	0.00	0.00	0.000
15.18	2.57	52.64	3.47	182.70	0	0	0.50	0.000	0.00	11.89	0.00	0.000
15.25	2.53	54.53	3.16	172.46	0	0	0.50	0.000	0.00	11.89	0.00	0.000
15.29	2.47	60.08	2.75	165.15	0	0	0.50	0.000	0.00	11.89	0.00	0.000
15.38	2.39	68.59	2.32	159.46	0	0	0.50	0.000	0.00	11.89	0.00	0.000
15.45	2.32	78.12	2.01	157.01	0	0	0.50	0.000	0.00	11.89	0.00	0.000
15.49	2.26	88.29	1.79	157.78	0	0	0.50	0.000	0.00	11.89	0.00	0.000
15.56	2.22	98.34	1.66	163.37	0	0	0.50	0.000	0.00	11.89	0.00	0.000
15.64	2.20	107.79	1.61	173.40	0	0	0.50	0.000	0.00	11.89	0.00	0.000
15.71	2.20	113.89	1.61	183.65	41	1661	0.50	0.072	0.03	11.89	0.02	0.000
15.75	2.22	116.19	1.68	195.01	44	1752	0.50	0.064	0.02	11.89	0.02	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
15.83	2.26	115.60	1.78	206.18	48	1827	0.50	0.059	0.02	11.89	0.01	0.000
15.90	2.30	112.70	1.94	218.55	52	1889	0.50	0.055	0.02	11.89	0.01	0.000
15.97	2.34	108.67	2.10	228.71	55	1922	0.50	0.054	0.02	11.89	0.01	0.000
16.02	2.38	105.00	2.27	237.87	58	1942	0.50	0.053	0.01	11.89	0.01	0.000
16.10	2.40	102.57	2.38	244.44	60	1961	0.50	0.052	0.01	11.89	0.01	0.000
16.17	2.42	101.20	2.46	248.57	62	1976	0.50	0.052	0.01	11.89	0.01	0.000
16.21	2.42	100.92	2.46	247.89	61	1974	0.50	0.052	0.01	11.89	0.01	0.000
16.28	2.41	100.45	2.42	243.36	60	1958	0.50	0.053	0.01	11.89	0.01	0.000
16.36	2.38	100.78	2.27	229.00	56	1901	0.50	0.057	0.02	11.89	0.01	0.000
16.44	2.34	101.61	2.08	210.99	50	1825	0.50	0.062	0.02	11.89	0.01	0.000
16.48	2.29	103.99	1.88	195.24	46	1756	0.50	0.068	0.03	11.89	0.02	0.000
16.55	2.25	106.84	1.75	187.12	43	1726	0.50	0.071	0.03	11.89	0.02	0.000
16.63	2.21	110.73	1.65	182.79	41	1718	0.50	0.073	0.03	11.89	0.02	0.000
16.70	2.22	107.12	1.67	178.76	41	1682	0.50	0.077	0.03	11.89	0.02	0.000
16.74	2.19	109.77	1.60	175.68	40	1669	0.50	0.079	0.03	11.89	0.02	0.000
16.83	2.18	110.71	1.56	173.11	39	1657	0.50	0.081	0.04	11.89	0.02	0.000
16.90	2.13	118.21	1.47	173.25	38	1667	0.50	0.080	0.04	11.89	0.02	0.000
16.94	2.12	118.75	1.45	172.25	38	1659	0.50	0.081	0.04	11.89	0.02	0.000
17.01	2.11	119.27	1.43	171.12	37	1650	0.50	0.083	0.04	11.89	0.03	0.000
17.09	2.10	119.92	1.42	170.07	37	1642	0.50	0.085	0.04	11.89	0.03	0.000
17.13	2.08	121.31	1.40	169.43	36	1631	0.50	0.086	0.04	11.89	0.03	0.000
17.21	2.07	123.10	1.38	169.51	36	1629	0.50	0.087	0.04	11.89	0.03	0.000
17.28	2.05	125.97	1.35	170.42	36	1628	0.50	0.088	0.04	11.89	0.03	0.000
17.36	2.03	128.67	1.33	171.61	36	1629	0.50	0.089	0.04	11.89	0.03	0.000
17.39	2.01	132.42	1.31	173.67	36	1626	0.50	0.089	0.04	11.89	0.03	0.000
17.47	1.99	135.34	1.30	175.44	36	1628	0.50	0.090	0.04	11.89	0.03	0.000
17.54	1.97	138.35	1.28	177.69	37	1635	0.50	0.089	0.04	11.89	0.03	0.000
17.59	1.96	141.13	1.28	180.61	37	1657	0.50	0.087	0.04	11.89	0.03	0.000
17.66	1.96	144.17	1.28	184.47	38	1696	0.50	0.083	0.04	11.89	0.02	0.000
17.73	1.95	149.42	1.27	190.10	39	1739	0.50	0.078	0.04	11.89	0.02	0.000
17.80	1.93	158.34	1.26	198.96	40	1793	0.50	0.074	0.03	11.89	0.02	0.000
17.88	1.90	169.01	1.24	208.81	42	1842	0.50	0.070	0.03	11.89	0.02	0.000
17.93	1.86	183.41	1.21	222.12	44	1915	0.50	0.064	0.03	11.89	0.02	0.000
18.00	1.85	197.17	1.20	236.27	46	2021	0.50	0.058	0.02	11.89	0.01	0.000
18.08	1.84	209.03	1.19	249.16	49	2127	0.50	0.053	0.02	11.89	0.01	0.000
18.12	1.84	216.11	1.20	258.34	51	2214	0.50	0.049	0.02	11.89	0.01	0.000
18.19	1.84	217.88	1.20	260.57	51	2240	0.50	0.048	0.02	11.89	0.01	0.000
18.26	1.85	216.50	1.20	260.63	51	2259	0.50	0.048	0.02	11.89	0.01	0.000
18.34	1.87	211.79	1.22	257.64	51	2264	0.50	0.048	0.02	11.89	0.01	0.000
18.38	1.89	206.10	1.23	253.56	51	2263	0.50	0.048	0.02	11.89	0.01	0.000
18.45	1.90	199.88	1.24	247.66	50	2238	0.50	0.049	0.02	11.89	0.01	0.000
18.53	1.91	194.81	1.24	242.51	49	2212	0.50	0.051	0.02	11.89	0.01	0.000
18.61	1.92	190.91	1.25	238.81	48	2200	0.50	0.051	0.02	11.89	0.01	0.000
18.64	1.93	189.12	1.26	237.41	48	2201	0.50	0.051	0.02	11.89	0.01	0.000
18.72	1.93	189.46	1.26	237.91	48	2213	0.50	0.051	0.02	11.89	0.01	0.000
18.80	1.92	191.46	1.25	239.68	48	2225	0.50	0.051	0.02	11.89	0.01	0.000
18.83	1.90	197.26	1.24	244.62	49	2242	0.50	0.050	0.02	11.89	0.01	0.000
18.91	1.89	204.28	1.23	250.66	50	2270	0.51	0.050	0.02	11.89	0.01	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
18.99	1.88	211.20	1.22	257.80	51	2325	0.51	0.048	0.02	11.89	0.01	0.000
19.07	1.87	217.19	1.22	264.25	52	2380	0.51	0.046	0.01	11.89	0.01	0.000
19.11	1.85	225.31	1.20	271.10	53	2415	0.51	0.045	0.01	11.89	0.01	0.000
19.18	1.81	236.99	1.17	276.76	54	2418	0.51	0.045	0.01	11.89	0.01	0.000
19.25	1.77	249.12	1.12	278.86	53	2414	0.51	0.045	0.01	11.89	0.01	0.000
19.32	1.73	255.19	1.05	268.29	51	2345	0.51	0.048	0.02	11.89	0.01	0.000
19.40	1.70	256.16	1.00	256.16	48	2250	0.51	0.052	0.02	11.89	0.01	0.000
19.44	1.67	257.07	1.00	257.07	47	2187	0.51	0.055	0.02	11.89	0.01	0.000
19.52	1.67	261.88	1.00	261.88	48	2235	0.51	0.053	0.02	11.89	0.01	0.000
19.59	1.68	268.11	1.00	268.11	50	2321	0.51	0.050	0.02	11.89	0.01	0.000
19.63	1.70	271.11	1.00	271.11	51	2403	0.51	0.047	0.02	11.89	0.01	0.000
19.70	1.73	265.99	1.04	276.94	52	2454	0.51	0.046	0.01	11.89	0.01	0.000
19.77	1.78	251.57	1.12	282.44	54	2485	0.51	0.045	0.01	11.89	0.01	0.000
19.84	1.82	235.46	1.18	277.14	54	2482	0.51	0.045	0.01	11.89	0.01	0.000
19.90	1.86	222.46	1.21	269.28	53	2477	0.51	0.046	0.01	11.89	0.01	0.000
19.97	1.89	213.56	1.23	262.33	52	2463	0.51	0.046	0.01	11.89	0.01	0.000
20.05	1.91	205.64	1.24	255.18	51	2437	0.51	0.047	0.02	11.89	0.01	0.000
20.09	1.92	198.82	1.25	248.00	50	2390	0.51	0.049	0.02	11.89	0.01	0.000
20.17	1.91	197.27	1.24	244.73	49	2345	0.51	0.051	0.02	11.89	0.01	0.000
20.24	1.89	198.13	1.23	243.22	49	2301	0.51	0.053	0.02	11.89	0.01	0.000
20.28	1.86	201.12	1.21	243.13	48	2259	0.51	0.055	0.02	11.89	0.01	0.000
20.36	1.84	202.47	1.19	241.77	47	2224	0.51	0.057	0.02	11.89	0.01	0.000
20.43	1.82	202.15	1.18	237.83	46	2168	0.51	0.061	0.02	11.89	0.01	0.000
20.50	1.80	200.25	1.16	231.56	45	2096	0.51	0.065	0.02	11.89	0.01	0.000
20.58	1.78	199.06	1.13	224.99	43	2028	0.51	0.071	0.03	11.89	0.02	0.000
20.62	1.76	199.59	1.10	220.22	42	1983	0.51	0.074	0.03	11.89	0.02	0.000
20.69	1.76	197.56	1.10	216.47	41	1954	0.51	0.077	0.03	11.89	0.02	0.000
20.77	1.76	193.68	1.10	212.61	40	1923	0.51	0.080	0.03	11.89	0.02	0.000
20.81	1.76	188.13	1.10	207.15	39	1876	0.51	0.085	0.04	11.89	0.02	0.000
20.88	1.75	184.81	1.09	201.61	38	1830	0.51	0.091	0.04	11.89	0.02	0.000
20.96	1.75	181.32	1.08	195.41	37	1780	0.51	0.098	0.05	11.89	0.03	0.000
21.04	1.74	178.86	1.07	191.51	36	1749	0.51	0.103	0.05	11.89	0.03	0.000
21.07	1.75	176.04	1.08	189.48	36	1731	0.51	0.106	0.05	11.89	0.03	0.000
21.15	1.75	173.41	1.09	188.80	36	1726	0.51	0.108	0.05	11.89	0.03	0.000
21.23	1.76	170.89	1.10	188.32	36	1724	0.51	0.109	0.05	11.89	0.03	0.000
21.27	1.77	168.63	1.11	187.45	36	1718	0.51	0.110	0.05	11.89	0.03	0.000
21.34	1.77	166.02	1.12	185.74	36	1707	0.51	0.112	0.06	11.89	0.03	0.000
21.42	1.78	162.93	1.13	183.51	35	1691	0.51	0.116	0.06	11.89	0.03	0.000
21.49	1.78	160.20	1.13	181.61	35	1679	0.52	0.119	0.06	11.89	0.03	0.000
21.53	1.79	157.85	1.14	180.07	35	1669	0.52	0.121	0.06	11.89	0.04	0.000
21.61	1.80	155.68	1.15	178.76	35	1664	0.52	0.123	0.06	11.89	0.04	0.000
21.68	1.80	153.94	1.15	177.72	34	1660	0.52	0.124	0.06	11.89	0.04	0.000
21.72	1.81	153.00	1.16	177.32	34	1661	0.52	0.125	0.07	11.89	0.04	0.000
21.80	1.81	152.24	1.16	176.86	34	1662	0.52	0.125	0.07	11.89	0.04	0.000
21.87	1.81	151.52	1.17	176.53	34	1665	0.52	0.125	0.07	11.89	0.04	0.000
21.95	1.81	150.96	1.17	176.32	34	1668	0.52	0.125	0.07	11.89	0.04	0.000
21.99	1.81	151.01	1.17	176.52	34	1673	0.52	0.125	0.07	11.89	0.04	0.000
22.06	1.81	151.19	1.17	176.59	34	1676	0.52	0.125	0.07	11.89	0.04	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
22.14	1.81	151.78	1.16	176.74	34	1678	0.52	0.125	0.07	11.89	0.04	0.000
22.21	1.81	152.42	1.16	176.89	34	1680	0.52	0.126	0.07	11.89	0.04	0.000
22.25	1.79	154.01	1.15	176.42	34	1668	0.52	0.128	0.07	11.89	0.04	0.000
22.33	1.76	156.73	1.11	173.59	33	1635	0.52	0.136	0.07	11.89	0.04	0.000
22.41	1.74	160.07	1.06	170.32	32	1612	0.52	0.143	0.08	11.89	0.05	0.000
22.45	1.72	163.52	1.04	169.53	32	1616	0.52	0.142	0.08	11.89	0.05	0.000
22.52	1.73	164.98	1.05	173.55	33	1651	0.52	0.135	0.07	11.89	0.04	0.000
22.60	1.75	164.00	1.08	177.62	34	1685	0.52	0.128	0.07	11.89	0.04	0.000
22.67	1.76	163.02	1.10	180.11	34	1710	0.52	0.124	0.06	11.89	0.04	0.000
22.72	1.77	161.92	1.12	180.62	35	1718	0.52	0.123	0.06	11.89	0.04	0.000
22.79	1.77	161.39	1.11	179.82	34	1713	0.52	0.124	0.06	11.89	0.04	0.000
22.87	1.77	159.62	1.12	178.31	34	1703	0.52	0.127	0.07	11.89	0.04	0.000
22.91	1.78	157.65	1.13	177.43	34	1698	0.52	0.128	0.07	11.89	0.04	0.000
22.98	1.78	155.41	1.13	176.20	34	1692	0.52	0.130	0.07	11.89	0.04	0.000
23.05	1.79	152.86	1.14	174.72	34	1684	0.52	0.133	0.07	11.89	0.04	0.000
23.13	1.80	150.85	1.15	173.50	34	1679	0.52	0.135	0.07	11.89	0.04	0.000
23.16	1.80	149.86	1.15	172.65	33	1673	0.52	0.136	0.07	11.89	0.04	0.000
23.24	1.80	148.90	1.15	171.15	33	1661	0.52	0.140	0.08	11.89	0.04	0.000
23.32	1.80	147.39	1.15	169.39	33	1646	0.52	0.144	0.08	11.89	0.04	0.000
23.40	1.80	145.62	1.15	167.82	32	1636	0.52	0.148	0.08	11.89	0.04	0.000
23.43	1.81	143.64	1.16	166.85	32	1634	0.52	0.148	0.08	11.89	0.05	0.000
23.51	1.81	142.94	1.17	166.67	32	1639	0.52	0.148	0.08	11.89	0.05	0.000
23.58	1.82	142.01	1.17	166.55	32	1646	0.52	0.147	0.08	11.89	0.04	0.000
23.65	1.82	142.43	1.18	167.46	33	1661	0.52	0.144	0.08	11.89	0.04	0.000
23.73	1.83	142.54	1.18	168.15	33	1675	0.52	0.141	0.08	11.89	0.04	0.000
23.77	1.82	144.76	1.18	170.23	33	1693	0.52	0.137	0.07	11.89	0.04	0.000
23.84	1.81	148.42	1.17	173.47	34	1722	0.52	0.132	0.07	11.89	0.04	0.000
23.92	1.81	152.78	1.16	177.30	34	1756	0.52	0.126	0.07	11.89	0.04	0.000
23.96	1.80	157.84	1.15	182.09	35	1800	0.52	0.118	0.06	11.89	0.03	0.000
24.04	1.80	161.75	1.15	186.06	36	1841	0.52	0.112	0.06	11.89	0.03	0.000
24.12	1.80	164.93	1.15	189.39	37	1876	0.52	0.108	0.05	11.89	0.03	0.000
24.16	1.79	167.71	1.15	192.17	37	1903	0.52	0.104	0.05	11.89	0.03	0.000
24.23	1.79	170.56	1.14	194.68	37	1929	0.52	0.101	0.05	11.89	0.03	0.000
24.30	1.79	174.09	1.14	197.78	38	1961	0.52	0.098	0.05	11.89	0.02	0.000
24.38	1.78	176.77	1.13	200.15	38	1986	0.52	0.095	0.04	11.89	0.02	0.000
24.41	1.78	179.17	1.13	202.47	39	2010	0.52	0.093	0.04	11.89	0.02	0.000
24.49	1.78	181.09	1.13	203.98	39	2027	0.52	0.092	0.04	11.89	0.02	0.000
24.57	1.77	183.27	1.12	205.52	39	2044	0.52	0.090	0.04	11.89	0.02	0.000
24.61	1.77	186.09	1.12	207.69	40	2066	0.52	0.088	0.04	11.89	0.02	0.000
24.68	1.77	189.33	1.11	210.88	40	2101	0.52	0.085	0.04	11.89	0.02	0.000
24.76	1.76	193.44	1.11	213.80	41	2133	0.52	0.083	0.04	11.89	0.02	0.000
24.83	1.76	197.92	1.10	217.09	41	2168	0.52	0.080	0.03	11.89	0.02	0.000
24.91	1.75	202.08	1.09	219.44	42	2196	0.52	0.078	0.03	11.89	0.02	0.000
24.94	1.74	208.45	1.07	222.54	42	2233	0.52	0.076	0.03	11.89	0.02	0.000
25.02	1.72	219.84	1.03	225.35	42	2286	0.53	0.073	0.03	11.89	0.02	0.000
25.10	1.70	234.07	1.00	234.07	44	2361	0.53	0.068	0.03	11.89	0.01	0.000
25.14	1.67	253.32	1.00	253.32	47	2484	0.53	0.062	0.02	11.89	0.01	0.000
25.21	1.66	274.36	1.00	274.36	50	2636	0.53	0.056	0.02	11.89	0.01	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
25.27	1.64	297.97	1.00	297.97	54	2792	0.53	0.050	0.02	11.89	0.01	0.000
25.35	1.61	313.75	1.00	313.75	57	2836	0.53	0.049	0.01	11.89	0.01	0.000
25.42	1.59	318.49	1.00	318.49	57	2797	0.53	0.051	0.01	11.89	0.01	0.000
25.46	1.59	313.76	1.00	313.76	56	2760	0.53	0.052	0.01	11.89	0.01	0.000
25.54	1.63	303.24	1.00	303.24	55	2818	0.53	0.050	0.01	11.89	0.01	0.000
25.62	1.68	292.95	1.00	292.95	54	2930	0.53	0.047	0.01	11.89	0.01	0.000
25.68	1.72	286.44	1.02	293.22	55	3020	0.53	0.045	0.01	11.89	0.01	0.000
25.74	1.73	285.25	1.05	300.11	57	3074	0.53	0.044	0.01	11.89	0.01	0.000
25.82	1.73	285.93	1.06	302.44	57	3100	0.53	0.044	0.01	11.89	0.01	0.000
25.85	1.73	286.75	1.05	302.42	57	3104	0.53	0.044	0.01	11.89	0.01	0.000
25.93	1.73	286.69	1.05	302.29	57	3108	0.53	0.044	0.01	11.89	0.01	0.000
26.00	1.74	284.83	1.07	303.57	57	3121	0.53	0.043	0.01	11.89	0.01	0.000
26.08	1.75	282.39	1.08	304.90	58	3136	0.53	0.043	0.01	11.89	0.01	0.000
26.12	1.76	277.43	1.10	304.54	58	3133	0.53	0.043	0.01	11.89	0.01	0.000
26.20	1.77	270.31	1.11	299.69	57	3090	0.53	0.045	0.01	11.89	0.01	0.000
26.27	1.77	262.39	1.11	290.76	56	3003	0.53	0.047	0.01	11.89	0.01	0.000
26.35	1.76	256.93	1.09	281.24	54	2908	0.53	0.050	0.02	11.89	0.01	0.000
26.38	1.74	251.68	1.07	270.47	51	2801	0.53	0.053	0.02	11.89	0.01	0.000
26.46	1.73	247.42	1.06	261.17	49	2716	0.53	0.056	0.02	11.89	0.01	0.000
26.53	1.72	245.30	1.03	251.54	47	2638	0.53	0.060	0.02	11.89	0.01	0.000
26.61	1.70	247.23	1.00	247.23	46	2589	0.53	0.062	0.02	11.89	0.01	0.000
26.64	1.68	252.56	1.00	252.56	47	2559	0.53	0.064	0.02	11.89	0.01	0.000
26.71	1.65	258.54	1.00	258.54	47	2537	0.53	0.065	0.02	11.89	0.01	0.000
26.79	1.64	259.87	1.00	259.87	48	2521	0.53	0.066	0.02	11.89	0.01	0.000
26.86	1.66	249.77	1.00	249.77	46	2499	0.53	0.067	0.02	11.89	0.01	0.000
26.94	1.71	231.92	1.00	232.03	43	2474	0.53	0.069	0.03	11.89	0.01	0.000
26.98	1.78	208.26	1.13	234.92	45	2472	0.53	0.069	0.03	11.89	0.01	0.000
27.05	1.87	183.00	1.22	222.58	44	2482	0.53	0.069	0.03	11.89	0.01	0.000
27.13	1.97	159.38	1.28	204.21	42	2489	0.53	0.069	0.03	11.89	0.01	0.000
27.17	2.06	139.66	1.36	190.29	40	2491	0.53	0.069	0.03	11.89	0.01	0.000
27.25	2.12	126.73	1.45	184.38	40	2494	0.53	0.069	0.03	11.89	0.01	0.000
27.33	2.18	117.50	1.56	182.91	41	2502	0.53	0.069	0.03	11.89	0.01	0.000
27.37	2.21	110.49	1.65	182.16	41	2489	0.53	0.069	0.03	11.89	0.01	0.000
27.44	2.23	107.11	1.70	182.62	42	2491	0.53	0.070	0.03	11.89	0.01	0.000
27.52	2.24	105.65	1.73	183.09	42	2496	0.53	0.070	0.03	11.89	0.01	0.000
27.60	2.23	107.78	1.70	183.35	42	2512	0.53	0.069	0.03	11.89	0.01	0.000
27.64	2.21	110.75	1.64	181.97	41	2506	0.53	0.070	0.03	11.89	0.01	0.000
27.71	2.19	113.63	1.58	179.56	40	2482	0.53	0.071	0.03	11.89	0.01	0.000
27.79	2.16	115.75	1.53	176.64	39	2443	0.53	0.074	0.03	11.89	0.02	0.000
27.83	2.14	117.20	1.48	173.26	38	2388	0.53	0.077	0.04	11.89	0.02	0.000
27.90	2.11	118.27	1.44	170.43	37	2338	0.53	0.081	0.04	11.89	0.02	0.000
27.97	2.09	120.33	1.40	168.55	36	2290	0.53	0.085	0.04	11.89	0.02	0.000
28.05	2.06	122.64	1.37	167.97	36	2256	0.53	0.088	0.04	11.89	0.02	0.000
28.12	2.04	124.58	1.35	167.87	36	2230	0.53	0.091	0.05	11.89	0.02	0.000
28.16	2.03	126.37	1.33	168.03	35	2206	0.53	0.093	0.05	11.89	0.02	0.000
28.23	2.00	127.10	1.31	165.87	34	2133	0.53	0.101	0.05	11.89	0.02	0.000
28.31	1.96	127.09	1.28	162.51	33	2030	0.53	0.114	0.06	11.89	0.03	0.000
28.35	1.94	125.71	1.26	158.84	32	1945	0.53	0.127	0.07	11.89	0.03	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
28.43	1.94	123.58	1.27	156.35	32	1923	0.53	0.132	0.08	11.89	0.04	0.000
28.50	1.96	121.63	1.27	154.91	32	1930	0.53	0.131	0.08	11.89	0.04	0.000
28.54	1.96	120.82	1.28	154.25	32	1932	0.53	0.131	0.08	11.89	0.04	0.000
28.62	1.97	118.27	1.29	152.24	31	1936	0.53	0.131	0.08	11.89	0.04	0.000
28.69	1.98	118.94	1.29	153.23	32	1954	0.53	0.128	0.07	11.89	0.03	0.000
28.77	1.98	119.56	1.29	154.15	32	1972	0.53	0.126	0.07	11.89	0.03	0.000
28.81	1.97	122.22	1.28	156.99	0	0	0.53	0.000	0.00	11.89	0.00	0.000
28.88	1.99	120.90	1.30	156.77	0	0	0.53	0.000	0.00	11.89	0.00	0.000
28.96	2.01	118.31	1.32	155.83	0	0	0.53	0.000	0.00	11.89	0.00	0.000
29.03	2.04	115.34	1.34	154.66	0	0	0.53	0.000	0.00	11.89	0.00	0.000
29.07	2.06	111.38	1.37	152.71	0	0	0.53	0.000	0.00	11.89	0.00	0.000
29.15	2.09	106.46	1.41	150.02	0	0	0.53	0.000	0.00	11.89	0.00	0.000
29.23	2.13	100.10	1.47	146.85	0	0	0.53	0.000	0.00	11.89	0.00	0.000
29.30	2.16	94.36	1.53	144.44	0	0	0.53	0.000	0.00	11.89	0.00	0.000
29.34	2.20	88.07	1.62	142.93	0	0	0.53	0.000	0.00	11.89	0.00	0.000
29.42	2.25	81.60	1.74	142.29	0	0	0.53	0.000	0.00	11.89	0.00	0.000
29.49	2.30	74.72	1.91	142.66	0	0	0.53	0.000	0.00	11.89	0.00	0.000
29.56	2.33	69.48	2.06	143.26	0	0	0.53	0.000	0.00	11.89	0.00	0.000
29.61	2.37	64.95	2.22	143.99	0	0	0.53	0.000	0.00	11.89	0.00	0.000
29.68	2.40	60.64	2.40	145.32	0	0	0.53	0.000	0.00	11.89	0.00	0.000
29.76	2.44	56.74	2.60	147.49	0	0	0.53	0.000	0.00	11.89	0.00	0.000
29.80	2.47	53.88	2.81	151.38	0	0	0.53	0.000	0.00	11.89	0.00	0.000
29.87	2.50	52.22	2.98	155.64	0	0	0.53	0.000	0.00	11.89	0.00	0.000
29.95	2.52	50.98	3.13	159.64	0	0	0.53	0.000	0.00	11.89	0.00	0.000
29.99	2.54	49.81	3.27	162.88	0	0	0.53	0.000	0.00	11.89	0.00	0.000
30.06	2.57	47.92	3.48	166.78	0	0	0.53	0.000	0.00	11.89	0.00	0.000
30.14	2.60	45.46	3.79	172.47	0	0	0.53	0.000	0.00	0.00	0.00	0.000
30.22	2.63	44.24	3.99	176.70	0	0	0.53	0.000	0.00	0.00	0.00	0.000
30.26	2.64	43.94	4.09	179.52	0	0	0.53	0.000	0.00	0.00	0.00	0.000
30.33	2.61	46.00	3.87	178.05	0	0	0.53	0.000	0.00	0.00	0.00	0.000
30.40	2.57	49.68	3.51	174.28	0	0	0.53	0.000	0.00	11.89	0.00	0.000
30.48	2.52	54.61	3.09	168.92	0	0	0.53	0.000	0.00	11.89	0.00	0.000
30.52	2.45	61.20	2.66	162.87	0	0	0.53	0.000	0.00	11.89	0.00	0.000
30.60	2.39	68.40	2.30	157.52	0	0	0.53	0.000	0.00	11.89	0.00	0.000
30.67	2.32	75.93	2.02	153.49	0	0	0.53	0.000	0.00	11.89	0.00	0.000
30.71	2.27	82.19	1.83	150.36	0	0	0.53	0.000	0.00	11.89	0.00	0.000
30.78	2.23	86.83	1.70	147.21	0	0	0.53	0.000	0.00	11.89	0.00	0.000
30.86	2.19	90.30	1.59	143.36	0	0	0.53	0.000	0.00	11.89	0.00	0.000
30.94	2.16	91.45	1.53	139.79	0	0	0.53	0.000	0.00	11.89	0.00	0.000
30.97	2.15	89.74	1.51	135.11	0	0	0.53	0.000	0.00	11.89	0.00	0.000
31.05	2.15	86.11	1.51	130.08	29	1945	0.53	0.145	0.09	11.89	0.04	0.000
31.13	2.16	81.64	1.53	124.72	28	1871	0.53	0.162	0.11	11.89	0.05	0.000
31.20	2.17	78.25	1.54	120.75	27	1816	0.53	0.176	0.12	11.89	0.05	0.000
31.24	2.14	76.49	1.49	114.25	25	1712	0.53	0.210	0.16	11.89	0.07	0.000
31.32	2.12	75.35	1.45	109.16	24	1626	0.53	0.248	0.20	11.89	0.09	0.001
31.39	2.10	74.02	1.42	105.05	23	1555	0.53	0.289	0.25	11.89	0.10	0.001
31.47	2.12	72.19	1.45	104.93	23	1570	0.53	0.281	0.24	11.89	0.10	0.001
31.51	2.15	70.19	1.50	105.41	23	1591	0.53	0.269	0.22	11.89	0.09	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
31.59	2.17	69.37	1.54	106.61	24	1617	0.53	0.256	0.21	11.89	0.09	0.001
31.64	2.18	68.84	1.57	108.28	24	1647	0.53	0.242	0.19	11.89	0.08	0.001
31.71	2.18	70.20	1.57	110.22	0	0	0.53	0.000	0.00	11.89	0.00	0.000
31.78	2.19	70.91	1.60	113.44	0	0	0.53	0.000	0.00	11.89	0.00	0.000
31.86	2.21	71.30	1.64	117.17	0	0	0.53	0.000	0.00	11.89	0.00	0.000
31.90	2.25	69.65	1.76	122.34	0	0	0.53	0.000	0.00	11.89	0.00	0.000
31.97	2.29	67.28	1.89	127.33	0	0	0.53	0.000	0.00	11.89	0.00	0.000
32.05	2.33	65.01	2.04	132.88	0	0	0.53	0.000	0.00	11.89	0.00	0.000
32.12	2.36	63.51	2.16	136.90	0	0	0.53	0.000	0.00	11.89	0.00	0.000
32.16	2.38	61.76	2.28	140.90	0	0	0.53	0.000	0.00	11.89	0.00	0.000
32.24	2.41	59.58	2.43	144.88	0	0	0.53	0.000	0.00	11.89	0.00	0.000
32.31	2.44	57.51	2.60	149.57	0	0	0.53	0.000	0.00	11.89	0.00	0.000
32.39	2.46	56.44	2.71	153.11	0	0	0.53	0.000	0.00	11.89	0.00	0.000
32.43	2.47	55.93	2.80	156.62	0	0	0.53	0.000	0.00	11.89	0.00	0.000
32.50	2.49	55.06	2.92	160.76	0	0	0.53	0.000	0.00	11.89	0.00	0.000
32.58	2.52	53.71	3.09	165.89	0	0	0.53	0.000	0.00	11.89	0.00	0.000
32.65	2.54	52.26	3.27	170.75	0	0	0.53	0.000	0.00	11.89	0.00	0.000
32.69	2.57	50.54	3.49	176.24	0	0	0.53	0.000	0.00	11.89	0.00	0.000
32.77	2.60	48.88	3.71	181.44	0	0	0.53	0.000	0.00	11.89	0.00	0.000
32.85	2.62	47.52	3.91	186.01	0	0	0.53	0.000	0.00	0.00	0.00	0.000
32.88	2.63	46.74	4.04	188.89	0	0	0.53	0.000	0.00	0.00	0.00	0.000
32.96	2.64	46.14	4.11	189.50	0	0	0.53	0.000	0.00	0.00	0.00	0.000
33.03	2.64	45.86	4.11	188.66	0	0	0.53	0.000	0.00	0.00	0.00	0.000
33.07	2.62	47.07	3.90	183.63	0	0	0.53	0.000	0.00	0.00	0.00	0.000
33.15	2.57	49.93	3.52	175.71	0	0	0.53	0.000	0.00	11.89	0.00	0.000
33.23	2.51	54.52	3.03	165.16	0	0	0.53	0.000	0.00	11.89	0.00	0.000
33.31	2.45	58.75	2.67	156.68	0	0	0.53	0.000	0.00	11.89	0.00	0.000
33.34	2.41	62.24	2.41	149.71	0	0	0.53	0.000	0.00	11.89	0.00	0.000
33.42	2.38	63.84	2.27	144.67	0	0	0.53	0.000	0.00	11.89	0.00	0.000
33.49	2.35	65.17	2.14	139.27	0	0	0.53	0.000	0.00	11.89	0.00	0.000
33.56	2.32	66.93	2.01	134.49	0	0	0.53	0.000	0.00	11.89	0.00	0.000
33.64	2.29	69.70	1.88	130.92	0	0	0.53	0.000	0.00	11.89	0.00	0.000
33.68	2.24	74.73	1.73	129.31	0	0	0.53	0.000	0.00	11.89	0.00	0.000
33.75	2.19	81.22	1.60	129.54	0	0	0.53	0.000	0.00	11.89	0.00	0.000
33.83	2.15	87.66	1.50	131.32	0	0	0.53	0.000	0.00	11.89	0.00	0.000
33.87	2.12	91.86	1.45	133.35	0	0	0.53	0.000	0.00	11.89	0.00	0.000
33.95	2.12	92.17	1.45	134.10	29	2115	0.53	0.131	0.08	11.89	0.03	0.000
34.01	2.14	90.62	1.48	134.24	30	2132	0.53	0.129	0.08	11.89	0.03	0.000
34.06	2.16	88.65	1.52	134.62	30	2151	0.53	0.127	0.08	11.89	0.03	0.000
34.14	2.18	86.96	1.56	135.47	30	2175	0.53	0.124	0.08	11.89	0.03	0.000
34.20	2.18	86.78	1.57	136.48	31	2196	0.53	0.121	0.07	11.89	0.03	0.000
34.28	2.18	87.36	1.57	137.07	31	2208	0.53	0.120	0.07	11.89	0.03	0.000
34.32	2.17	90.43	1.55	139.85	31	2252	0.53	0.114	0.07	11.89	0.03	0.000
34.40	2.15	95.49	1.51	144.13	32	2317	0.53	0.108	0.06	11.89	0.02	0.000
34.48	2.13	101.12	1.47	149.01	33	2386	0.53	0.101	0.06	11.89	0.02	0.000
34.52	2.10	107.74	1.42	153.35	33	2426	0.53	0.098	0.05	11.89	0.02	0.000
34.59	2.10	109.09	1.42	154.44	33	2440	0.53	0.096	0.05	11.89	0.02	0.000
34.67	2.07	114.86	1.38	158.21	34	2462	0.53	0.095	0.05	11.89	0.02	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
34.74	2.05	118.47	1.36	160.66	34	2472	0.53	0.094	0.05	11.89	0.02	0.000
34.81	2.02	124.86	1.32	165.33	35	2484	0.53	0.094	0.05	11.89	0.02	0.000
34.88	2.01	125.72	1.32	165.74	35	2480	0.53	0.094	0.05	11.89	0.02	0.000
34.92	2.00	126.79	1.31	166.24	35	2471	0.53	0.095	0.05	11.89	0.02	0.000
35.00	2.00	128.02	1.30	166.84	35	2462	0.53	0.096	0.05	11.89	0.02	0.000
35.08	1.99	129.04	1.30	167.35	35	2454	0.53	0.097	0.05	11.89	0.02	0.000
35.11	1.98	129.58	1.29	167.61	35	2449	0.53	0.097	0.05	11.89	0.02	0.000
35.19	1.98	129.36	1.29	167.21	35	2444	0.53	0.098	0.05	11.89	0.02	0.000
35.26	1.98	129.09	1.29	166.46	34	2426	0.53	0.100	0.05	11.89	0.02	0.000
35.33	1.97	128.41	1.29	165.11	34	2399	0.53	0.103	0.05	11.89	0.02	0.000
35.41	1.97	127.54	1.28	163.66	0	0	0.53	0.000	0.00	11.89	0.00	0.000
35.45	1.97	125.83	1.29	161.78	0	0	0.53	0.000	0.00	11.89	0.00	0.000
35.52	1.98	123.49	1.29	159.47	0	0	0.53	0.000	0.00	11.89	0.00	0.000
35.60	1.99	120.96	1.30	156.96	0	0	0.53	0.000	0.00	11.89	0.00	0.000
35.64	2.00	117.76	1.31	153.86	0	0	0.53	0.000	0.00	11.89	0.00	0.000
35.71	2.03	111.64	1.33	148.64	0	0	0.53	0.000	0.00	11.89	0.00	0.000
35.80	2.07	103.92	1.37	142.85	0	0	0.53	0.000	0.00	11.89	0.00	0.000
35.83	2.13	93.35	1.47	137.47	0	0	0.53	0.000	0.00	11.89	0.00	0.000
35.91	2.21	82.32	1.65	135.81	0	0	0.53	0.000	0.00	11.89	0.00	0.000
35.99	2.30	71.62	1.94	138.97	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.03	2.39	62.97	2.32	145.88	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.10	2.46	56.61	2.73	154.32	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.18	2.52	52.12	3.13	163.24	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.26	2.55	50.20	3.37	169.01	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.29	2.56	49.97	3.44	171.79	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.36	2.57	49.92	3.47	173.24	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.44	2.58	49.11	3.57	175.39	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.52	2.59	48.03	3.69	177.45	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.56	2.60	47.28	3.77	178.19	0	0	0.53	0.000	0.00	0.00	0.00	0.000
36.64	2.60	47.35	3.71	175.74	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.71	2.57	48.67	3.51	170.83	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.75	2.53	51.58	3.17	163.38	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.82	2.47	56.33	2.76	155.25	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.90	2.40	62.21	2.37	147.65	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.97	2.35	67.26	2.12	142.91	0	0	0.53	0.000	0.00	11.89	0.00	0.000
37.01	2.30	71.90	1.93	139.09	0	0	0.53	0.000	0.00	11.89	0.00	0.000
37.09	2.27	75.20	1.80	135.54	0	0	0.53	0.000	0.00	11.89	0.00	0.000
37.16	2.23	78.32	1.68	131.78	0	0	0.53	0.000	0.00	11.89	0.00	0.000
37.24	2.20	80.22	1.61	128.86	0	0	0.53	0.000	0.00	11.89	0.00	0.000
37.27	2.17	81.94	1.54	126.10	0	0	0.53	0.000	0.00	11.89	0.00	0.000
37.36	2.16	81.88	1.52	124.52	0	0	0.53	0.000	0.00	11.89	0.00	0.000
37.43	2.16	80.74	1.53	123.34	27	2111	0.53	0.147	0.10	11.89	0.03	0.000
37.47	2.19	77.84	1.59	123.45	28	2124	0.53	0.145	0.10	11.89	0.03	0.000
37.55	2.22	74.45	1.67	124.33	28	2144	0.53	0.142	0.09	11.89	0.03	0.000
37.62	2.25	71.37	1.77	126.20	29	2169	0.53	0.138	0.09	11.89	0.03	0.000
37.67	2.27	71.38	1.80	128.81	30	2210	0.53	0.132	0.08	11.89	0.03	0.000
37.74	2.27	72.61	1.81	131.17	30	2254	0.53	0.126	0.08	11.89	0.02	0.000
37.81	2.26	74.76	1.79	134.07	31	2309	0.53	0.120	0.07	11.89	0.02	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
37.89	2.27	75.73	1.80	136.57	32	2354	0.53	0.115	0.07	11.89	0.02	0.000
37.93	2.25	78.73	1.76	138.71	32	2400	0.53	0.110	0.06	11.89	0.02	0.000
38.00	2.22	84.22	1.67	140.42	32	2442	0.53	0.106	0.06	11.89	0.02	0.000
38.08	2.18	91.85	1.56	142.95	32	2484	0.53	0.102	0.06	11.89	0.02	0.000
38.15	2.13	99.82	1.47	146.35	32	2513	0.53	0.100	0.06	11.89	0.02	0.000
38.23	2.10	105.38	1.42	149.25	32	2529	0.53	0.099	0.06	11.89	0.02	0.000
38.26	2.08	108.77	1.39	151.29	32	2536	0.53	0.098	0.05	11.89	0.02	0.000
38.33	2.08	108.51	1.39	150.93	32	2534	0.53	0.099	0.06	11.89	0.02	0.000
38.41	2.09	105.82	1.41	148.72	32	2517	0.53	0.100	0.06	11.89	0.02	0.000
38.48	2.12	99.81	1.45	144.29	31	2480	0.53	0.104	0.06	11.89	0.02	0.000
38.55	2.15	93.22	1.50	139.96	31	2438	0.53	0.108	0.06	11.89	0.02	0.000
38.59	2.19	85.59	1.59	136.09	31	2393	0.53	0.113	0.07	11.89	0.02	0.000
38.66	2.23	78.59	1.70	133.40	30	2349	0.53	0.118	0.07	11.89	0.02	0.000
38.74	2.27	72.82	1.81	131.85	31	2311	0.53	0.122	0.07	11.89	0.02	0.000
38.78	2.29	69.58	1.88	131.15	31	2286	0.53	0.125	0.07	11.89	0.02	0.000
38.86	2.30	68.65	1.91	131.13	31	2284	0.53	0.126	0.08	11.89	0.02	0.000
38.93	2.30	68.70	1.91	131.32	31	2290	0.53	0.125	0.07	11.89	0.02	0.000
39.01	2.29	69.27	1.90	131.52	31	2300	0.53	0.124	0.07	11.89	0.02	0.000
39.04	2.29	69.96	1.88	131.86	31	2310	0.53	0.123	0.07	11.89	0.02	0.000
39.12	2.29	70.23	1.89	132.39	31	2323	0.53	0.122	0.07	11.89	0.02	0.000
39.20	2.29	70.78	1.88	132.73	31	2335	0.52	0.121	0.07	11.89	0.02	0.000
39.28	2.28	71.36	1.86	132.70	31	2341	0.52	0.120	0.07	11.89	0.02	0.000
39.31	2.27	72.79	1.81	131.93	31	2337	0.52	0.121	0.07	11.89	0.02	0.000
39.38	2.25	74.76	1.76	131.27	30	2337	0.52	0.121	0.07	11.89	0.02	0.000
39.46	2.23	77.06	1.70	131.11	30	2343	0.52	0.120	0.07	11.89	0.02	0.000
39.54	2.22	78.45	1.68	131.48	30	2355	0.52	0.119	0.07	11.89	0.02	0.000
39.58	2.23	78.39	1.68	131.98	30	2365	0.52	0.118	0.07	11.89	0.02	0.000
39.65	2.24	76.86	1.72	132.54	30	2375	0.52	0.117	0.07	11.89	0.02	0.000
39.73	2.26	75.07	1.77	133.25	31	2386	0.52	0.116	0.07	11.89	0.02	0.000
39.77	2.27	73.98	1.81	134.11	31	2397	0.52	0.115	0.07	11.89	0.02	0.000
39.85	2.26	74.96	1.79	134.46	31	2410	0.52	0.114	0.07	11.89	0.02	0.000
39.92	2.24	78.26	1.72	134.93	31	2430	0.52	0.112	0.07	11.89	0.02	0.000
39.99	2.21	83.01	1.64	136.15	31	2460	0.52	0.109	0.06	11.89	0.02	0.000
40.06	2.19	87.09	1.59	138.08	31	2494	0.52	0.106	0.06	11.89	0.02	0.000
40.11	2.18	89.50	1.57	140.26	31	2533	0.52	0.103	0.06	11.89	0.02	0.000
40.18	2.15	91.16	1.51	137.40	30	2468	0.52	0.109	0.07	11.89	0.02	0.000
40.26	2.11	92.60	1.44	133.30	29	2360	0.52	0.120	0.08	11.89	0.02	0.000
40.29	2.07	93.48	1.38	129.39	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.36	2.08	92.77	1.39	128.76	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.44	2.10	91.42	1.42	129.45	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.52	2.12	88.91	1.46	129.54	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.56	2.14	87.17	1.49	130.17	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.63	2.16	85.65	1.53	131.01	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.71	2.18	85.55	1.56	133.30	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.78	2.19	85.16	1.59	135.45	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.82	2.20	85.09	1.62	137.64	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.90	2.21	85.23	1.63	138.82	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.97	2.21	85.30	1.64	139.49	0	0	0.52	0.000	0.00	11.89	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
41.01	2.21	84.66	1.65	139.35	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.08	2.22	82.88	1.68	138.86	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.16	2.24	80.11	1.73	138.25	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.24	2.26	77.26	1.79	138.23	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.28	2.29	73.60	1.90	139.48	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.36	2.33	69.42	2.05	142.14	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.43	2.38	64.56	2.27	146.52	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.51	2.41	61.21	2.45	150.19	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.55	2.44	58.52	2.61	152.84	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.62	2.47	55.82	2.76	154.06	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.70	2.49	53.60	2.88	154.61	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.74	2.49	52.99	2.91	154.32	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.81	2.48	54.58	2.82	153.80	39	2572	0.52	0.102	0.05	11.89	0.01	0.000
41.89	2.47	55.98	2.76	154.37	39	2602	0.52	0.100	0.04	11.89	0.01	0.000
41.93	2.48	55.57	2.84	157.98	40	2641	0.52	0.097	0.04	11.89	0.01	0.000
42.00	2.52	52.92	3.10	163.87	43	2675	0.52	0.095	0.04	11.89	0.01	0.000
42.08	2.55	50.36	3.37	169.71	45	2706	0.52	0.093	0.04	11.89	0.01	0.000
42.16	2.57	49.00	3.53	172.80	0	0	0.52	0.000	0.00	11.89	0.00	0.000
42.20	2.57	49.05	3.50	171.90	0	0	0.52	0.000	0.00	11.89	0.00	0.000
42.28	2.53	51.83	3.21	166.17	0	0	0.52	0.000	0.00	11.89	0.00	0.000
42.35	2.44	59.50	2.62	155.69	0	0	0.52	0.000	0.00	11.89	0.00	0.000
42.42	2.34	70.68	2.07	146.57	0	0	0.52	0.000	0.00	11.89	0.00	0.000
42.46	2.24	83.18	1.72	142.82	0	0	0.52	0.000	0.00	11.89	0.00	0.000
42.53	2.18	90.70	1.57	142.45	0	0	0.52	0.000	0.00	11.89	0.00	0.000
42.61	2.16	93.22	1.52	141.25	0	0	0.51	0.000	0.00	11.89	0.00	0.000
42.68	2.15	91.55	1.51	138.50	0	0	0.51	0.000	0.00	11.89	0.00	0.000
42.72	2.14	90.92	1.49	135.57	0	0	0.51	0.000	0.00	11.89	0.00	0.000
42.80	2.11	93.79	1.44	134.96	0	0	0.51	0.000	0.00	11.89	0.00	0.000
42.87	2.07	100.83	1.37	138.41	0	0	0.51	0.000	0.00	11.89	0.00	0.000
42.95	2.03	108.88	1.33	144.81	0	0	0.51	0.000	0.00	11.89	0.00	0.000
42.99	1.99	118.03	1.30	153.14	0	0	0.51	0.000	0.00	11.89	0.00	0.000
43.06	1.97	123.94	1.28	158.87	0	0	0.51	0.000	0.00	11.89	0.00	0.000
43.14	1.95	127.49	1.27	162.34	0	0	0.51	0.000	0.00	11.89	0.00	0.000
43.18	1.96	125.76	1.28	160.47	33	2614	0.51	0.101	0.06	11.89	0.01	0.000
43.26	1.99	118.54	1.30	153.65	32	2580	0.51	0.104	0.06	11.89	0.01	0.000
43.33	2.03	109.35	1.33	145.62	31	2549	0.51	0.107	0.06	11.89	0.02	0.000
43.37	2.09	98.85	1.40	138.79	30	2553	0.51	0.107	0.07	11.89	0.02	0.000
43.44	2.16	88.39	1.53	135.21	30	2577	0.51	0.105	0.06	11.89	0.02	0.000
43.52	2.23	80.08	1.70	136.33	31	2622	0.51	0.101	0.06	11.89	0.01	0.000
43.59	2.28	76.10	1.84	139.68	33	2673	0.51	0.097	0.05	11.89	0.01	0.000
43.67	2.28	76.57	1.86	142.06	33	2719	0.51	0.094	0.05	11.89	0.01	0.000
43.71	2.27	78.41	1.83	143.50	33	2753	0.51	0.092	0.05	11.89	0.01	0.000
43.78	2.25	82.83	1.75	144.80	33	2793	0.51	0.089	0.05	11.89	0.01	0.000
43.86	2.20	91.54	1.60	146.87	33	2837	0.51	0.087	0.05	11.89	0.01	0.000
43.93	2.13	102.36	1.47	150.87	33	2868	0.51	0.085	0.05	11.89	0.01	0.000
43.97	2.06	114.62	1.37	157.28	34	2870	0.51	0.085	0.05	11.89	0.01	0.000
44.04	2.01	124.15	1.31	163.14	34	2834	0.51	0.087	0.05	11.89	0.01	0.000
44.12	1.96	129.99	1.28	166.32	34	2762	0.51	0.092	0.05	11.89	0.01	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
44.19	1.94	130.06	1.27	164.58	34	2675	0.51	0.098	0.05	11.89	0.01	0.000
44.23	1.94	126.13	1.26	159.09	32	2569	0.51	0.106	0.06	11.89	0.01	0.000
44.30	1.95	119.44	1.27	151.31	31	2469	0.51	0.116	0.07	11.89	0.02	0.000
44.38	1.97	110.18	1.29	141.74	29	2388	0.51	0.125	0.08	11.89	0.02	0.000
44.46	2.01	101.81	1.32	134.19	28	2357	0.51	0.129	0.09	11.89	0.02	0.000
44.49	2.05	95.12	1.36	129.00	27	2347	0.51	0.130	0.09	11.89	0.02	0.000
44.57	2.09	89.62	1.40	125.84	27	2359	0.51	0.129	0.09	11.89	0.02	0.000
44.65	2.13	84.41	1.47	123.87	27	2379	0.51	0.126	0.09	11.89	0.02	0.000
44.69	2.18	79.28	1.57	124.15	28	2425	0.51	0.121	0.08	11.89	0.02	0.000
44.77	2.22	75.15	1.67	125.71	29	2470	0.51	0.116	0.08	11.89	0.02	0.000
44.84	2.26	71.37	1.80	128.21	30	2513	0.51	0.112	0.07	11.89	0.02	0.000
44.91	2.29	68.84	1.89	130.10	30	2538	0.51	0.110	0.07	11.89	0.01	0.000
44.95	2.31	66.51	1.97	131.34	31	2546	0.51	0.109	0.06	11.89	0.01	0.000
45.03	2.33	64.32	2.06	132.19	32	2547	0.51	0.109	0.06	11.89	0.01	0.000
45.12	2.35	62.52	2.12	132.80	32	2545	0.51	0.110	0.06	11.89	0.01	0.000
45.15	2.36	61.40	2.16	132.74	32	2536	0.51	0.110	0.06	11.89	0.01	0.000
45.23	2.36	60.46	2.18	131.55	32	2513	0.50	0.113	0.06	11.89	0.01	0.000
45.30	2.36	59.74	2.18	129.94	31	2485	0.50	0.115	0.07	11.89	0.01	0.000
45.37	2.36	59.43	2.16	128.57	31	2465	0.50	0.118	0.07	11.89	0.01	0.000
45.41	2.35	59.61	2.15	127.99	31	2460	0.50	0.118	0.07	11.89	0.01	0.000
45.49	2.35	60.06	2.13	128.16	31	2470	0.50	0.117	0.07	11.89	0.01	0.000
45.56	2.34	61.54	2.09	128.62	31	2492	0.50	0.115	0.07	11.89	0.01	0.000
45.63	2.33	63.53	2.03	129.20	31	2520	0.50	0.112	0.07	11.89	0.01	0.000
45.67	2.31	66.58	1.95	129.91	31	2555	0.50	0.109	0.07	11.89	0.01	0.000
45.75	2.29	69.64	1.89	131.57	31	2603	0.50	0.105	0.06	11.89	0.01	0.000
45.83	2.28	72.48	1.85	134.38	31	2669	0.50	0.100	0.06	11.89	0.01	0.000
45.91	2.28	73.96	1.85	137.05	32	2726	0.50	0.096	0.05	11.89	0.01	0.000
45.94	2.29	74.67	1.87	139.62	33	2775	0.50	0.093	0.05	11.89	0.01	0.000
46.01	2.29	75.52	1.88	141.75	33	2820	0.50	0.090	0.05	11.89	0.01	0.000
46.08	2.28	77.79	1.85	143.76	34	2868	0.50	0.087	0.05	11.89	0.01	0.000
46.16	2.26	80.99	1.79	144.77	33	2902	0.50	0.085	0.05	11.89	0.01	0.000
46.20	2.22	86.53	1.67	144.61	33	2908	0.50	0.085	0.05	11.89	0.01	0.000
46.27	2.17	93.69	1.54	144.41	32	2885	0.50	0.086	0.05	11.89	0.01	0.000
46.35	2.11	101.22	1.44	145.76	32	2849	0.50	0.088	0.05	11.89	0.01	0.000
46.39	2.06	108.15	1.37	148.25	32	2803	0.50	0.091	0.05	11.89	0.01	0.000
46.47	2.03	112.98	1.33	150.56	32	2764	0.50	0.094	0.05	11.89	0.01	0.000
46.54	2.00	115.50	1.31	151.33	32	2714	0.50	0.097	0.06	11.89	0.01	0.000
46.60	1.99	115.83	1.30	150.43	31	2661	0.50	0.101	0.06	11.89	0.01	0.000
46.67	1.97	115.76	1.29	149.04	31	2597	0.50	0.107	0.06	11.89	0.01	0.000
46.74	1.96	116.61	1.27	148.50	30	2535	0.50	0.112	0.07	11.89	0.01	0.000
46.83	1.94	117.30	1.26	148.30	30	2495	0.50	0.116	0.07	11.89	0.01	0.000
46.87	1.94	117.61	1.26	148.38	30	2487	0.50	0.117	0.07	11.89	0.01	0.000
46.94	1.93	118.59	1.26	149.38	30	2497	0.50	0.116	0.07	11.89	0.01	0.000
47.02	1.93	120.24	1.26	151.14	31	2518	0.50	0.114	0.07	11.89	0.01	0.000
47.09	1.93	122.03	1.25	153.00	31	2537	0.50	0.112	0.07	11.89	0.01	0.000
47.13	1.92	124.07	1.25	155.32	31	2568	0.50	0.110	0.06	11.89	0.01	0.000
47.20	1.92	126.07	1.25	157.72	32	2607	0.50	0.106	0.06	11.89	0.01	0.000
47.28	1.92	127.82	1.25	159.94	32	2647	0.50	0.103	0.06	11.89	0.01	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
47.32	1.92	129.25	1.25	161.88	33	2686	0.50	0.100	0.06	11.89	0.01	0.000
47.39	1.92	130.49	1.25	163.54	33	2720	0.50	0.098	0.05	11.89	0.01	0.000
47.46	1.92	132.61	1.25	165.96	34	2755	0.50	0.095	0.05	11.89	0.01	0.000
47.54	1.92	135.03	1.25	168.48	34	2781	0.50	0.094	0.05	11.89	0.01	0.000
47.58	1.90	139.31	1.24	172.61	35	2808	0.49	0.092	0.05	11.89	0.01	0.000
47.65	1.88	145.85	1.23	178.78	36	2848	0.49	0.089	0.04	11.89	0.01	0.000
47.72	1.86	154.34	1.21	186.67	37	2905	0.49	0.086	0.04	11.89	0.01	0.000
47.80	1.85	160.78	1.20	192.68	38	2959	0.49	0.083	0.04	11.89	0.01	0.000
47.84	1.85	163.00	1.20	195.27	0	0	0.49	0.000	0.00	11.89	0.00	0.000
47.92	1.86	160.55	1.21	193.50	0	0	0.49	0.000	0.00	11.89	0.00	0.000
48.00	1.87	156.55	1.21	190.00	0	0	0.49	0.000	0.00	11.89	0.00	0.000
48.03	1.89	149.32	1.23	183.22	0	0	0.49	0.000	0.00	11.89	0.00	0.000
48.11	1.93	136.02	1.26	170.91	0	0	0.49	0.000	0.00	11.89	0.00	0.000
48.19	2.01	116.45	1.32	153.27	0	0	0.49	0.000	0.00	11.89	0.00	0.000
48.26	2.10	98.60	1.42	139.88	0	0	0.49	0.000	0.00	11.89	0.00	0.000
48.30	2.19	84.43	1.58	133.48	0	0	0.49	0.000	0.00	11.89	0.00	0.000
48.38	2.36	54.90	2.18	119.74	0	0	0.49	0.000	0.00	11.89	0.00	0.000
48.45	2.45	48.37	2.67	128.91	0	0	0.49	0.000	0.00	11.89	0.00	0.000
48.53	2.53	43.82	3.17	138.99	0	0	0.49	0.000	0.00	11.89	0.00	0.000
48.57	2.57	41.86	3.52	147.15	0	0	0.49	0.000	0.00	11.89	0.00	0.000
48.64	2.60	40.54	3.78	153.27	0	0	0.49	0.000	0.00	0.00	0.00	0.000
48.72	2.64	38.93	4.08	158.67	0	0	0.49	0.000	0.00	0.00	0.00	0.000
48.76	2.68	36.32	4.50	163.56	0	0	0.49	0.000	0.00	0.00	0.00	0.000
48.84	2.72	33.75	4.96	167.39	0	0	0.49	0.000	0.00	0.00	0.00	0.000
48.91	2.76	31.73	5.36	170.05	0	0	0.49	0.000	0.00	0.00	0.00	0.000
48.95	2.75	32.00	5.26	168.24	0	0	0.49	0.000	0.00	0.00	0.00	0.000
49.03	2.70	34.29	4.72	161.78	0	0	0.49	0.000	0.00	0.00	0.00	0.000
49.10	2.63	37.93	4.02	152.44	0	0	0.49	0.000	0.00	0.00	0.00	0.000
49.18	2.56	41.45	3.40	140.83	0	0	0.49	0.000	0.00	11.89	0.00	0.000
49.25	2.50	43.78	3.00	131.15	0	0	0.49	0.000	0.00	11.89	0.00	0.000
49.28	2.47	45.04	2.80	126.18	0	0	0.49	0.000	0.00	11.89	0.00	0.000
49.36	2.47	45.70	2.75	125.66	0	0	0.49	0.000	0.00	11.89	0.00	0.000
49.44	2.46	46.31	2.73	126.40	0	0	0.49	0.000	0.00	11.89	0.00	0.000
49.48	2.45	46.83	2.66	124.65	0	0	0.49	0.000	0.00	11.89	0.00	0.000
49.56	2.44	46.97	2.61	122.63	0	0	0.49	0.000	0.00	11.89	0.00	0.000
49.63	2.44	46.97	2.58	121.04	0	0	0.49	0.000	0.00	11.89	0.00	0.000
49.69	2.43	47.23	2.54	119.91	0	0	0.49	0.000	0.00	11.89	0.00	0.000
49.78	2.42	47.66	2.50	119.24	0	0	0.49	0.000	0.00	11.89	0.00	0.000
49.81	2.41	48.58	2.45	118.83	0	0	0.49	0.000	0.00	11.89	0.00	0.000
49.88	2.41	49.36	2.42	119.68	0	0	0.48	0.000	0.00	11.89	0.00	0.000
49.96	2.41	49.89	2.43	121.18	0	0	0.48	0.000	0.00	11.89	0.00	0.000
50.00	2.42	49.63	2.49	123.83	0	0	0.48	0.000	0.00	11.89	0.00	0.000
50.08	2.44	48.79	2.59	126.60	0	0	0.48	0.000	0.00	11.89	0.00	0.000
50.15	2.46	47.80	2.71	129.64	0	0	0.48	0.000	0.00	11.89	0.00	0.000
50.23	2.47	47.42	2.77	131.46	0	0	0.48	0.000	0.00	11.89	0.00	0.000
50.27	2.48	47.12	2.84	133.72	0	0	0.48	0.000	0.00	11.89	0.00	0.000
50.34	2.48	47.00	2.88	135.18	0	0	0.48	0.000	0.00	11.89	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)

Total estimated settlement: 0.15

Abbreviations

Q_{tn}: Equivalent clean sand normalized cone resistance
K_c: Fines correction factor
$Q_{tn,cs}$: Post-liquefaction volumentric strain
G_{max}: Small strain shear modulus
CSR: Soil cyclic stress ratio
γ: Cyclic shear strain
$e_{vol(15)}$: Volumetric strain after 15 cycles
N_c: Equivalent number of cycles
e_v: Volumetric strain
Settle.: Calculated settlement

GeoTek, Inc.
1548 N. Maple Street
Corona, CA 92878
951-710-1160, www.geotekusa.com

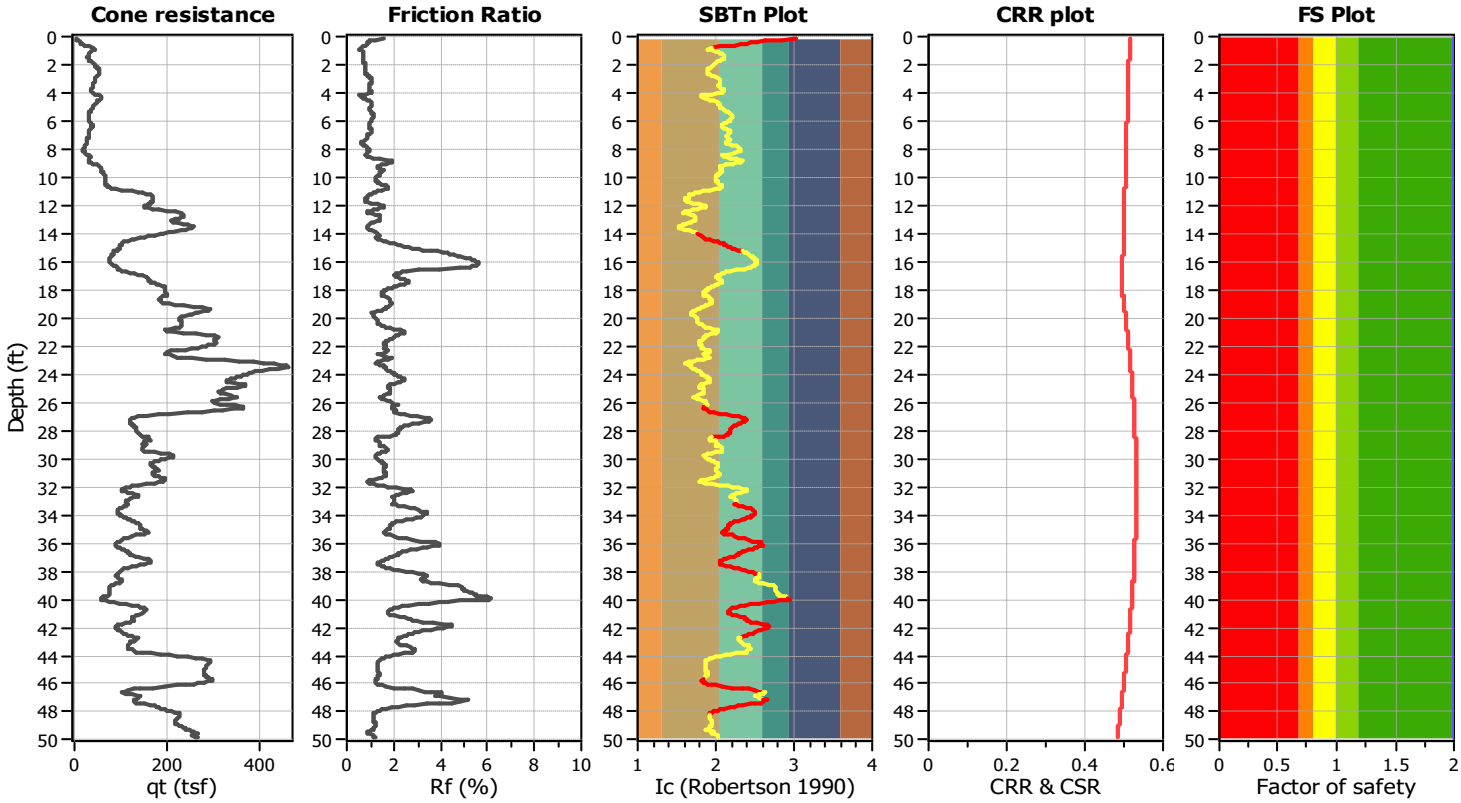
LIQUEFACTION ANALYSIS REPORT

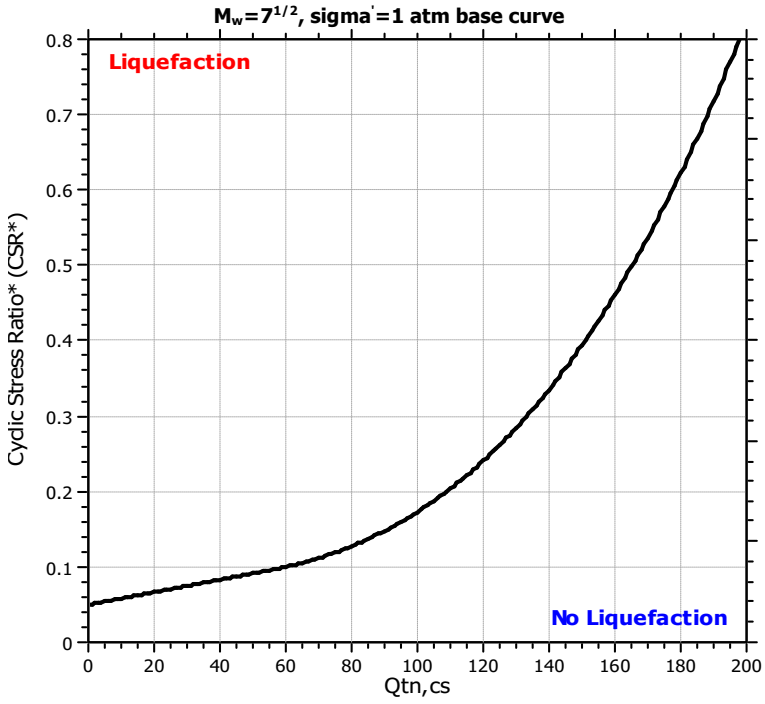
Project title : Xenia Site **Location : Beaumont, California**

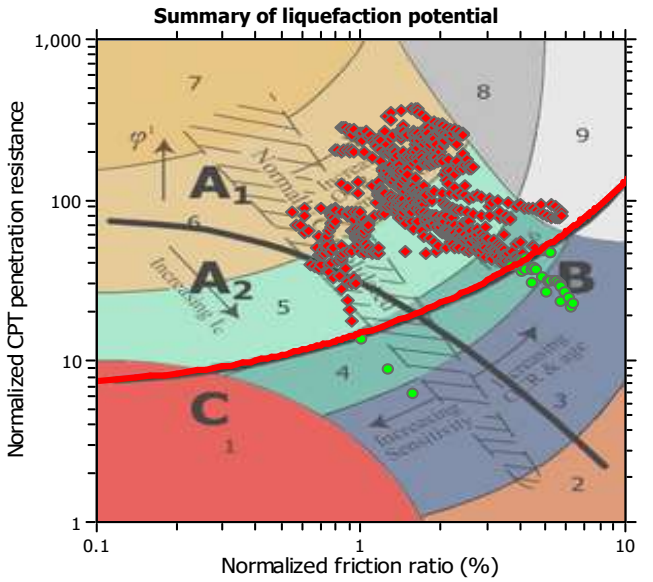
CPT file : CPT-4

Input parameters and analysis data

Analysis method:	NCEER (1998)	G.W.T. (in-situ):	100.00 ft	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	100.00 ft	Fill height:	N/A	Limit depth applied:	Yes
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	60.00 ft
Earthquake magnitude M_w:	7.13	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	0.90	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

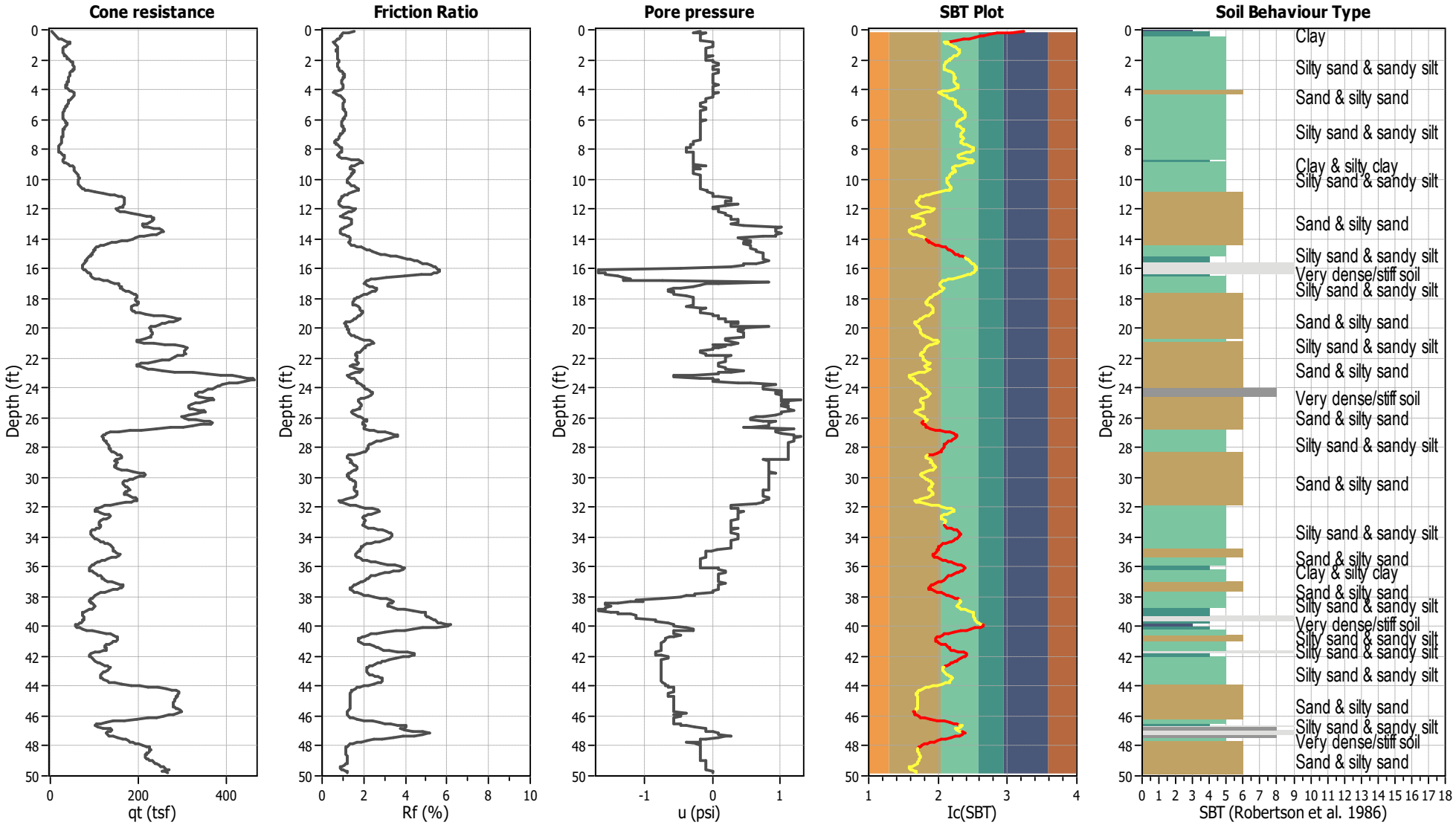






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plots



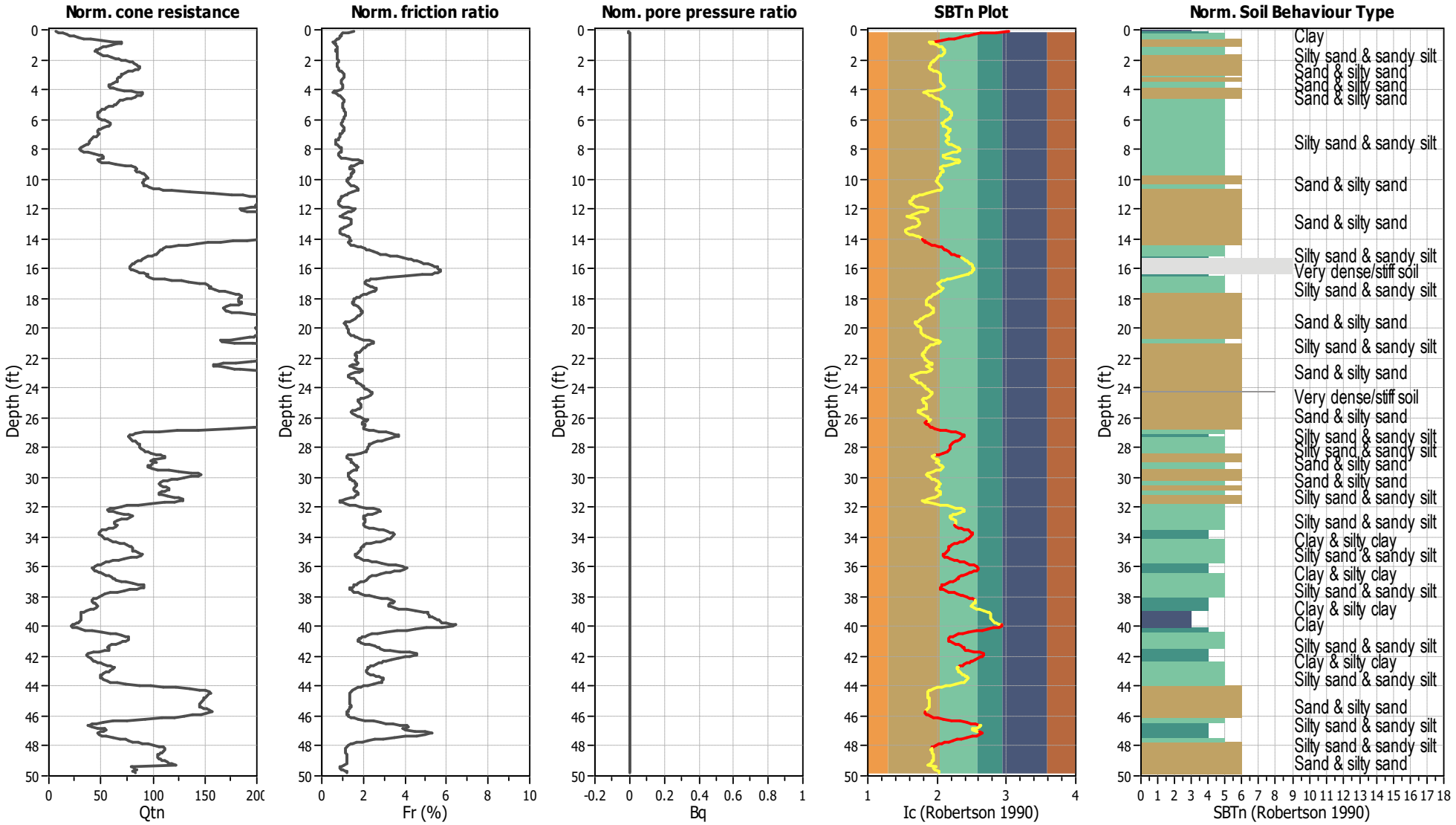
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	100.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.13	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.90	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	100.00 ft	Fill height:	N/A	Limit depth:	60.00 ft

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

CPT basic interpretation plots (normalized)



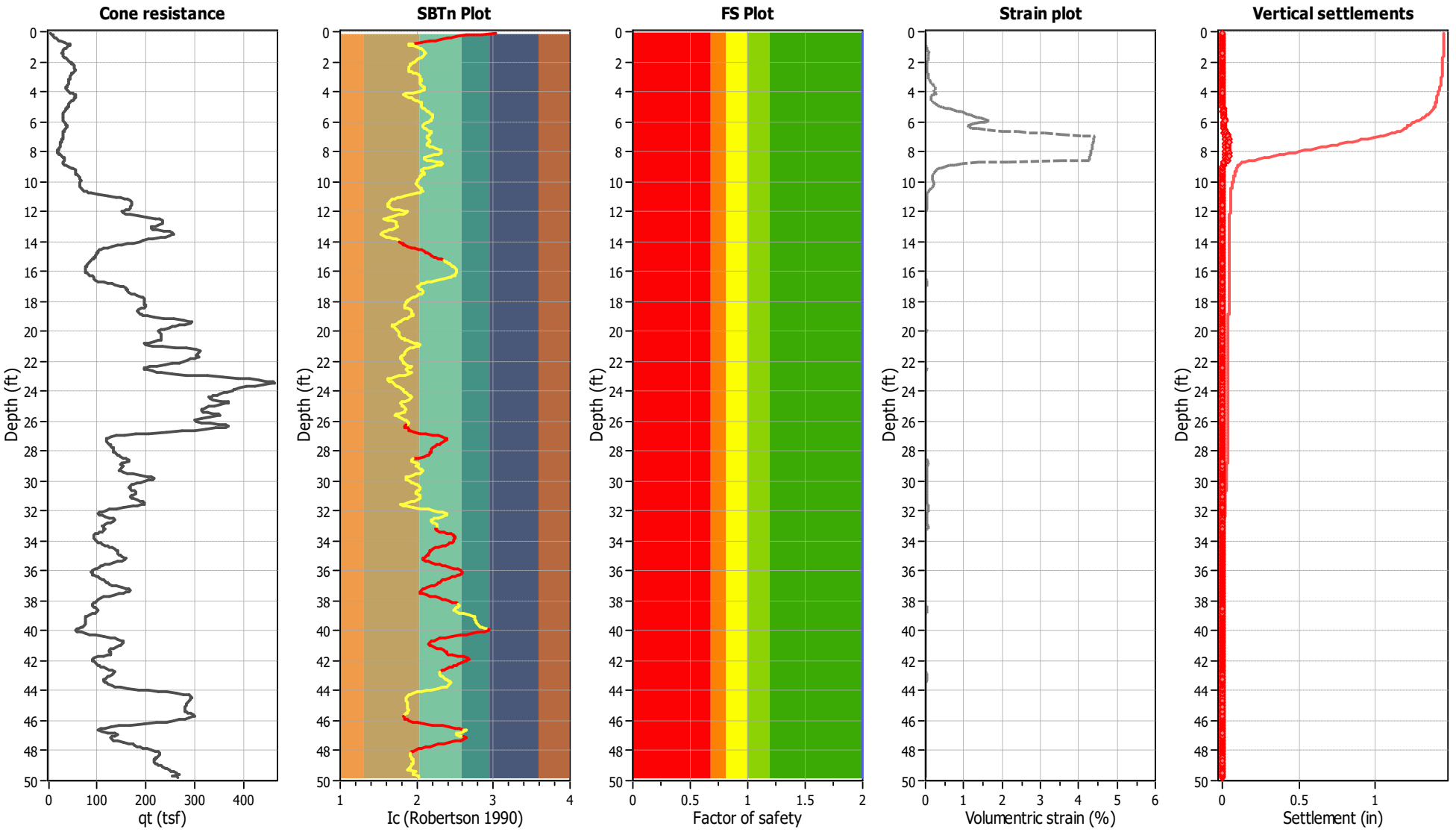
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	100.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.13	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.90	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	100.00 ft	Fill height:	N/A	Limit depth:	60.00 ft

SBTn legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

Estimation of post-earthquake settlements



Abbreviations

q_t:	Total cone resistance (cone resistance q_c corrected for pore water effects)
I_c:	Soil Behaviour Type Index
FS:	Calculated Factor of Safety against liquefaction
Volumentric strain:	Post-liquefaction volumentric strain

:: Post-earthquake settlement of dry sands ::

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
0.07	3.03	6.14	9.36	57.47	0	0	0.51	0.000	0.00	0.00	0.00	0.000
0.14	2.85	8.84	6.49	57.33	0	0	0.51	0.000	0.00	0.00	0.00	0.000
0.22	2.64	13.53	4.11	55.56	0	0	0.51	0.000	0.00	0.00	0.00	0.000
0.29	2.52	17.52	3.14	54.98	0	0	0.51	0.000	0.00	11.89	0.00	0.000
0.33	2.45	20.77	2.68	55.63	0	0	0.51	0.000	0.00	11.89	0.00	0.000
0.41	2.40	23.56	2.39	56.27	0	0	0.51	0.000	0.00	11.89	0.00	0.000
0.48	2.32	28.06	2.02	56.70	0	0	0.51	0.000	0.00	11.89	0.00	0.000
0.56	2.25	33.05	1.75	57.75	0	0	0.51	0.000	0.00	11.89	0.00	0.000
0.59	2.16	40.20	1.53	61.62	0	0	0.51	0.000	0.00	11.89	0.00	0.000
0.67	2.06	50.34	1.36	68.69	0	0	0.51	0.000	0.00	11.89	0.00	0.000
0.74	1.95	62.39	1.27	79.39	0	0	0.51	0.000	0.00	11.89	0.00	0.000
0.82	1.89	70.08	1.23	86.42	0	0	0.51	0.000	0.00	11.89	0.00	0.000
0.86	1.90	70.38	1.24	87.02	17	437	0.51	0.014	0.02	11.89	0.01	0.000
0.93	1.95	65.32	1.27	82.81	17	430	0.51	0.016	0.02	11.89	0.02	0.000
1.01	2.00	59.87	1.31	78.17	16	421	0.51	0.020	0.03	11.89	0.02	0.000
1.05	2.04	55.61	1.34	74.50	16	410	0.51	0.023	0.03	11.89	0.03	0.000
1.12	2.06	52.56	1.36	71.71	15	399	0.51	0.029	0.04	11.89	0.04	0.000
1.19	2.08	49.40	1.39	68.60	15	385	0.51	0.037	0.05	11.89	0.05	0.000
1.26	2.09	46.65	1.41	65.84	14	371	0.51	0.048	0.07	11.89	0.06	0.001
1.33	2.10	45.56	1.42	64.61	14	364	0.51	0.058	0.09	11.89	0.08	0.001
1.41	2.11	44.91	1.43	64.27	14	363	0.51	0.068	0.10	11.89	0.09	0.001
1.45	2.10	45.80	1.42	65.24	14	368	0.51	0.068	0.10	11.89	0.09	0.000
1.52	2.10	46.82	1.42	66.53	14	375	0.51	0.070	0.10	11.89	0.09	0.001
1.59	2.08	49.76	1.39	69.27	15	389	0.51	0.068	0.10	11.89	0.08	0.001
1.67	2.06	52.60	1.37	72.00	15	401	0.51	0.066	0.09	11.89	0.08	0.001
1.71	2.04	56.30	1.34	75.49	16	416	0.51	0.061	0.08	11.89	0.07	0.000
1.79	2.01	60.25	1.32	79.39	17	431	0.51	0.058	0.07	11.89	0.06	0.001
1.86	1.99	64.14	1.30	83.39	17	447	0.51	0.056	0.07	11.89	0.06	0.001
1.90	1.98	67.43	1.29	87.07	18	463	0.51	0.051	0.06	11.89	0.05	0.000
1.98	1.97	70.43	1.28	90.45	19	478	0.51	0.050	0.05	11.89	0.05	0.000
2.06	1.95	74.12	1.27	94.36	19	493	0.51	0.048	0.05	11.89	0.04	0.000
2.13	1.94	77.32	1.26	97.53	20	504	0.51	0.049	0.05	11.89	0.04	0.000
2.17	1.92	80.22	1.25	100.24	20	511	0.51	0.048	0.05	11.89	0.04	0.000
2.24	1.91	82.36	1.24	102.25	21	516	0.51	0.050	0.05	11.89	0.04	0.000
2.32	1.90	84.41	1.23	104.21	21	522	0.51	0.051	0.05	11.89	0.04	0.000
2.40	1.89	85.80	1.23	105.64	21	527	0.51	0.053	0.05	11.89	0.04	0.000
2.43	1.89	86.89	1.23	106.85	21	533	0.51	0.053	0.05	11.89	0.04	0.000
2.51	1.89	87.13	1.23	107.27	21	535	0.51	0.056	0.05	11.89	0.04	0.000
2.58	1.91	85.67	1.24	106.27	21	536	0.51	0.059	0.05	11.89	0.05	0.000
2.66	1.93	83.27	1.25	104.40	21	534	0.51	0.063	0.06	11.89	0.05	0.000
2.69	1.95	80.02	1.27	101.87	21	533	0.51	0.066	0.06	11.89	0.05	0.000
2.76	1.99	76.67	1.30	99.33	21	531	0.51	0.070	0.07	11.89	0.06	0.000
2.84	2.02	73.31	1.32	96.90	20	528	0.51	0.076	0.07	11.89	0.06	0.001
2.91	2.04	71.04	1.34	95.32	20	525	0.51	0.082	0.08	11.89	0.07	0.001
2.99	2.04	70.38	1.35	94.83	20	524	0.51	0.088	0.09	11.89	0.08	0.001
3.03	2.04	70.13	1.35	94.53	20	522	0.51	0.092	0.09	11.89	0.08	0.000
3.10	2.05	69.03	1.35	93.48	20	518	0.51	0.100	0.10	11.89	0.09	0.001
3.17	2.05	67.58	1.36	91.91	20	511	0.51	0.113	0.12	11.89	0.10	0.001

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
3.26	2.06	66.37	1.36	90.44	19	503	0.51	0.127	0.13	11.89	0.11	0.001
3.28	2.05	66.02	1.35	89.40	19	495	0.51	0.139	0.15	11.89	0.13	0.000
3.37	2.04	65.76	1.35	88.53	19	489	0.51	0.156	0.17	11.89	0.14	0.001
3.44	2.04	65.30	1.34	87.61	19	483	0.51	0.175	0.19	11.89	0.16	0.002
3.48	2.05	63.85	1.35	86.28	18	478	0.51	0.190	0.21	11.89	0.18	0.001
3.56	2.06	61.84	1.37	84.76	18	473	0.51	0.211	0.24	11.89	0.20	0.002
3.64	2.08	59.69	1.40	83.28	18	468	0.51	0.235	0.27	11.89	0.23	0.002
3.68	2.10	58.28	1.41	82.30	18	464	0.51	0.253	0.29	11.89	0.25	0.001
3.75	2.10	58.07	1.42	82.39	18	465	0.51	0.263	0.30	11.89	0.25	0.002
3.83	2.10	59.26	1.41	83.72	18	472	0.51	0.258	0.29	11.89	0.24	0.002
3.90	2.08	61.66	1.40	86.08	19	483	0.51	0.240	0.26	11.89	0.22	0.002
3.94	2.04	66.36	1.34	89.00	19	490	0.51	0.230	0.25	11.89	0.21	0.001
4.02	1.95	72.60	1.27	92.26	19	481	0.51	0.266	0.29	11.89	0.24	0.002
4.10	1.87	79.29	1.21	96.16	19	472	0.51	0.310	0.33	11.89	0.28	0.002
4.14	1.81	85.19	1.17	99.57	19	475	0.51	0.306	0.32	11.89	0.27	0.001
4.21	1.82	89.63	1.17	105.14	20	503	0.51	0.243	0.24	11.89	0.20	0.002
4.29	1.86	89.57	1.21	108.01	21	527	0.51	0.204	0.19	11.89	0.16	0.001
4.35	1.89	88.66	1.23	109.15	22	545	0.51	0.181	0.16	11.89	0.14	0.001
4.42	1.93	85.16	1.26	107.15	22	551	0.51	0.179	0.16	11.89	0.14	0.001
4.49	1.95	83.60	1.27	106.24	22	554	0.51	0.182	0.16	11.89	0.14	0.001
4.53	1.98	79.35	1.29	102.73	21	548	0.51	0.195	0.18	11.89	0.15	0.001
4.61	2.02	75.14	1.32	99.20	21	540	0.51	0.218	0.21	11.89	0.17	0.001
4.68	2.04	71.68	1.34	96.32	20	531	0.51	0.246	0.24	11.89	0.20	0.002
4.72	2.06	68.98	1.36	93.86	20	522	0.51	0.275	0.28	11.89	0.23	0.001
4.80	2.06	66.98	1.37	91.75	20	511	0.51	0.315	0.32	11.89	0.27	0.002
4.88	2.07	65.32	1.37	89.64	19	500	0.51	0.370	0.39	11.89	0.32	0.003
4.95	2.06	64.26	1.37	88.09	19	491	0.51	0.423	0.46	11.89	0.38	0.003
4.99	2.06	63.36	1.37	86.78	19	484	0.51	0.471	0.52	11.89	0.43	0.002
5.07	2.08	61.20	1.39	84.81	18	475	0.51	0.544	0.61	11.89	0.50	0.005
5.14	2.10	58.29	1.41	82.47	18	465	0.51	0.642	0.74	11.89	0.61	0.005
5.22	2.12	55.44	1.45	80.42	18	455	0.51	0.755	0.88	11.89	0.73	0.006
5.26	2.14	53.03	1.49	78.88	17	447	0.51	0.859	1.02	11.89	0.84	0.004
5.34	2.16	51.23	1.52	78.01	17	442	0.51	0.966	1.15	11.89	0.94	0.009
5.41	2.18	49.57	1.56	77.42	17	438	0.51	1.069	1.27	11.89	1.04	0.009
5.48	2.19	48.46	1.59	77.22	17	435	0.51	1.150	1.36	11.89	1.11	0.009
5.52	2.20	47.56	1.62	76.97	17	433	0.51	1.220	1.44	11.89	1.18	0.006
5.60	2.21	46.95	1.64	76.82	17	431	0.51	1.308	1.55	11.89	1.26	0.012
5.68	2.21	46.65	1.64	76.67	17	430	0.51	1.392	1.65	11.89	1.34	0.013
5.72	2.21	46.69	1.63	76.15	17	428	0.51	1.473	1.76	11.89	1.43	0.007
5.79	2.20	47.08	1.61	75.65	17	426	0.51	1.574	1.91	11.89	1.55	0.014
5.87	2.18	47.77	1.58	75.27	17	425	0.51	1.665	2.04	11.89	1.66	0.015
5.94	2.17	48.81	1.55	75.54	17	428	0.51	1.669	2.05	11.89	1.66	0.014
5.98	2.15	50.61	1.51	76.32	17	433	0.51	1.577	1.93	11.89	1.57	0.008
6.06	2.13	53.15	1.46	77.83	17	441	0.51	1.454	1.76	11.89	1.42	0.013
6.14	2.10	56.15	1.42	79.93	17	451	0.51	1.307	1.55	11.89	1.25	0.011
6.21	2.09	58.40	1.40	81.69	18	459	0.51	1.215	1.42	11.89	1.14	0.010
6.25	2.08	59.70	1.39	82.73	18	463	0.51	1.169	1.35	11.89	1.09	0.005
6.32	2.08	59.49	1.39	82.67	18	464	0.51	1.208	1.39	11.89	1.12	0.010

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
6.40	2.09	58.33	1.41	82.01	18	462	0.51	1.291	1.50	11.89	1.20	0.011
6.44	2.11	55.88	1.44	80.56	18	456	0.51	1.426	1.67	11.89	1.34	0.006
6.51	2.14	52.87	1.49	78.78	17	447	0.51	1.684	2.00	11.89	1.60	0.014
6.59	2.17	50.02	1.54	76.93	17	436	0.51	2.069	2.50	11.89	2.00	0.019
6.67	2.18	48.16	1.57	75.52	17	427	0.51	2.470	3.02	11.89	2.42	0.022
6.71	2.18	47.45	1.57	74.62	17	422	0.51	2.747	3.41	11.89	2.72	0.013
6.78	2.18	47.24	1.56	73.71	16	417	0.51	3.081	3.89	11.89	3.10	0.026
6.86	2.17	47.38	1.54	72.82	16	412	0.51	3.467	4.47	11.89	3.56	0.035
6.90	2.15	47.73	1.50	71.75	16	407	0.51	3.899	5.16	11.89	4.10	0.017
6.97	2.14	47.83	1.48	70.82	16	401	0.51	4.462	6.03	11.89	4.41	0.040
7.04	2.14	46.98	1.48	69.41	15	393	0.51	5.376	7.45	11.89	4.40	0.038
7.13	2.15	45.52	1.49	68.02	15	386	0.51	6.532	9.23	11.89	4.40	0.043
7.16	2.16	43.57	1.52	66.43	15	376	0.51	8.062	11.63	11.89	4.39	0.021
7.24	2.17	42.05	1.55	65.07	14	368	0.51	9.967	14.66	11.89	4.39	0.039
7.31	2.17	40.64	1.54	62.45	14	354	0.51	14.448	22.38	11.89	4.38	0.036
7.39	2.15	39.94	1.51	60.20	13	341	0.51	20.551	33.51	11.89	4.37	0.044
7.43	2.14	39.54	1.48	58.47	13	331	0.51	27.183	46.24	11.89	4.37	0.019
7.51	2.14	39.23	1.49	58.33	13	331	0.51	28.882	49.16	11.89	4.36	0.041
7.58	2.15	38.87	1.50	58.50	13	332	0.51	29.194	49.29	11.89	4.36	0.037
7.62	2.17	38.12	1.54	58.69	13	332	0.51	29.266	48.81	11.89	4.35	0.021
7.69	2.21	35.86	1.64	58.65	13	329	0.51	33.164	54.25	11.89	4.35	0.040
7.76	2.25	33.51	1.76	58.99	14	325	0.51	38.465	61.12	11.89	4.34	0.033
7.83	2.30	31.15	1.92	59.73	14	320	0.51	46.117	70.50	11.89	4.34	0.041
7.90	2.31	30.50	1.98	60.32	14	320	0.51	48.464	72.61	11.89	4.33	0.037
7.95	2.32	30.04	2.02	60.77	14	320	0.51	49.970	73.77	11.89	4.33	0.022
8.03	2.32	30.38	2.01	61.17	15	322	0.51	48.157	70.62	11.89	4.32	0.043
8.10	2.31	31.23	1.97	61.53	15	327	0.51	43.855	64.23	11.89	4.31	0.037
8.14	2.28	33.17	1.87	62.01	14	336	0.51	35.043	51.56	11.89	4.31	0.021
8.21	2.23	37.37	1.68	62.81	14	351	0.51	24.473	36.56	11.89	4.30	0.037
8.30	2.16	42.36	1.53	64.82	14	367	0.51	16.961	25.16	11.89	4.30	0.043
8.34	2.11	47.86	1.43	68.36	15	386	0.51	11.390	16.30	11.89	4.29	0.022
8.42	2.09	50.55	1.40	70.99	15	399	0.51	8.974	12.37	11.89	4.29	0.040
8.47	2.09	52.35	1.41	73.76	16	415	0.51	6.772	8.90	11.89	4.28	0.029
8.54	2.13	52.24	1.46	76.23	17	432	0.51	5.201	6.47	11.89	4.28	0.035
8.61	2.18	50.48	1.58	79.56	18	449	0.50	3.998	4.59	11.89	3.53	0.030
8.66	2.26	48.48	1.78	86.22	20	474	0.50	2.812	2.83	11.89	2.17	0.014
8.74	2.32	47.27	1.99	94.28	22	499	0.50	2.058	1.80	11.89	1.38	0.012
8.81	2.34	48.51	2.07	100.38	24	523	0.50	1.547	1.24	11.89	0.95	0.008
8.86	2.32	51.61	1.99	102.79	24	544	0.50	1.247	0.98	11.89	0.75	0.005
8.93	2.26	57.70	1.79	103.49	24	567	0.50	0.995	0.80	11.89	0.61	0.005
9.01	2.20	64.80	1.63	105.38	24	592	0.50	0.799	0.65	11.89	0.49	0.004
9.06	2.14	73.20	1.48	108.10	24	619	0.50	0.635	0.52	11.89	0.39	0.002
9.14	2.09	78.83	1.41	110.88	24	643	0.50	0.536	0.43	11.89	0.33	0.003
9.19	2.06	83.71	1.36	113.97	24	662	0.50	0.470	0.37	11.89	0.28	0.002
9.27	2.05	84.89	1.36	115.30	24	673	0.50	0.442	0.35	11.89	0.26	0.002
9.32	2.07	84.44	1.38	116.56	25	685	0.50	0.413	0.32	11.89	0.24	0.002
9.40	2.09	83.84	1.40	117.61	25	696	0.50	0.391	0.29	11.89	0.22	0.002
9.47	2.09	84.73	1.41	119.07	26	709	0.50	0.367	0.27	11.89	0.21	0.002

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
9.53	2.07	87.35	1.38	120.34	26	718	0.50	0.350	0.26	11.89	0.20	0.001
9.59	2.05	89.46	1.36	121.62	26	728	0.50	0.335	0.25	11.89	0.19	0.001
9.65	2.05	90.81	1.35	122.68	26	737	0.50	0.322	0.23	11.89	0.18	0.001
9.72	2.04	92.36	1.34	123.91	26	746	0.50	0.309	0.22	11.89	0.17	0.001
9.79	2.02	94.07	1.33	124.74	26	752	0.50	0.305	0.22	11.89	0.17	0.001
9.87	2.01	94.81	1.31	124.45	26	750	0.50	0.314	0.23	11.89	0.17	0.002
9.91	2.00	93.78	1.31	122.51	25	739	0.50	0.341	0.25	11.89	0.19	0.001
9.99	2.00	92.36	1.31	120.61	25	731	0.50	0.365	0.28	11.89	0.21	0.002
10.06	2.00	91.13	1.30	118.90	25	724	0.50	0.390	0.30	11.89	0.23	0.002
10.14	2.00	90.68	1.30	118.26	25	724	0.50	0.399	0.31	11.89	0.23	0.002
10.18	2.00	90.55	1.31	118.72	25	730	0.50	0.385	0.30	11.89	0.22	0.001
10.25	2.02	90.50	1.32	119.47	25	742	0.50	0.366	0.28	11.89	0.21	0.002
10.33	2.03	90.88	1.33	121.23	26	760	0.50	0.333	0.25	11.89	0.18	0.002
10.40	2.04	91.60	1.34	122.93	26	776	0.50	0.309	0.23	11.89	0.17	0.001
10.44	2.05	93.35	1.36	126.92	27	807	0.50	0.264	0.18	11.89	0.14	0.001
10.52	2.07	95.98	1.38	132.23	28	847	0.50	0.219	0.14	11.89	0.11	0.001
10.59	2.07	100.79	1.38	139.13	30	897	0.50	0.179	0.11	11.89	0.08	0.001
10.67	2.06	106.17	1.36	144.86	31	936	0.50	0.155	0.09	11.89	0.07	0.001
10.71	2.05	109.95	1.35	148.54	31	960	0.50	0.143	0.08	11.89	0.06	0.000
10.78	2.01	118.50	1.31	155.51	32	996	0.50	0.127	0.07	11.89	0.05	0.000
10.85	1.93	136.20	1.25	170.80	35	1057	0.50	0.106	0.06	11.89	0.04	0.000
10.91	1.84	158.84	1.19	189.36	37	1131	0.50	0.088	0.04	11.89	0.03	0.000
10.99	1.78	175.53	1.13	199.07	38	1184	0.50	0.078	0.04	11.89	0.03	0.000
11.03	1.74	186.11	1.08	200.09	38	1206	0.50	0.075	0.03	11.89	0.03	0.000
11.11	1.71	193.95	1.00	194.12	36	1212	0.50	0.075	0.04	11.89	0.03	0.000
11.18	1.67	201.20	1.00	201.20	37	1215	0.50	0.076	0.04	11.89	0.03	0.000
11.26	1.65	205.04	1.00	205.04	38	1222	0.50	0.075	0.04	11.89	0.03	0.000
11.30	1.65	206.41	1.00	206.41	38	1231	0.50	0.074	0.03	11.89	0.03	0.000
11.37	1.65	206.36	1.00	206.36	38	1224	0.50	0.076	0.04	11.89	0.03	0.000
11.45	1.63	205.44	1.00	205.44	37	1204	0.50	0.081	0.04	11.89	0.03	0.000
11.48	1.61	205.67	1.00	205.67	37	1180	0.50	0.086	0.04	11.89	0.03	0.000
11.56	1.61	204.77	1.00	204.77	37	1179	0.50	0.088	0.04	11.89	0.03	0.000
11.64	1.62	202.43	1.00	202.43	37	1187	0.50	0.087	0.04	11.89	0.03	0.000
11.71	1.63	200.09	1.00	200.09	37	1192	0.50	0.087	0.04	11.89	0.03	0.000
11.75	1.66	199.15	1.00	199.15	37	1221	0.50	0.082	0.04	11.89	0.03	0.000
11.83	1.70	198.30	1.00	198.30	37	1282	0.50	0.073	0.03	11.89	0.03	0.000
11.90	1.78	194.18	1.12	218.28	42	1364	0.50	0.063	0.03	11.89	0.02	0.000
11.98	1.84	187.50	1.19	223.63	44	1419	0.50	0.058	0.02	11.89	0.02	0.000
12.02	1.87	183.54	1.22	223.42	44	1440	0.50	0.056	0.02	11.89	0.02	0.000
12.10	1.86	184.80	1.21	223.00	44	1434	0.50	0.058	0.02	11.89	0.02	0.000
12.17	1.82	190.45	1.17	223.65	44	1424	0.50	0.059	0.02	11.89	0.02	0.000
12.21	1.77	200.46	1.11	223.40	43	1420	0.50	0.060	0.02	11.89	0.02	0.000
12.29	1.71	216.36	1.01	218.44	41	1442	0.50	0.058	0.02	11.89	0.02	0.000
12.36	1.65	234.67	1.00	234.67	43	1462	0.50	0.057	0.02	11.89	0.02	0.000
12.43	1.59	252.49	1.00	252.49	45	1478	0.50	0.056	0.02	11.89	0.01	0.000
12.47	1.57	264.66	1.00	264.66	47	1504	0.50	0.054	0.02	11.89	0.01	0.000
12.54	1.62	267.64	1.00	267.64	49	1628	0.50	0.046	0.02	11.89	0.01	0.000
12.62	1.67	270.80	1.00	270.80	50	1757	0.50	0.040	0.01	11.89	0.01	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
12.69	1.72	269.79	1.04	279.34	53	1859	0.50	0.036	0.01	11.89	0.01	0.000
12.73	1.73	271.05	1.04	281.79	53	1876	0.50	0.036	0.01	11.89	0.01	0.000
12.81	1.73	267.90	1.04	279.88	53	1867	0.50	0.037	0.01	11.89	0.01	0.000
12.89	1.74	259.23	1.06	274.45	52	1828	0.50	0.039	0.01	11.89	0.01	0.000
12.96	1.74	250.70	1.07	269.04	51	1790	0.50	0.040	0.01	11.89	0.01	0.000
13.00	1.75	240.77	1.08	261.08	50	1736	0.50	0.043	0.01	11.89	0.01	0.000
13.08	1.72	239.70	1.03	247.39	47	1679	0.50	0.047	0.02	11.89	0.01	0.000
13.15	1.68	240.31	1.00	240.31	45	1621	0.50	0.051	0.02	11.89	0.01	0.000
13.19	1.65	249.90	1.00	249.90	46	1614	0.50	0.051	0.02	11.89	0.01	0.000
13.26	1.61	262.88	1.00	262.88	48	1633	0.50	0.051	0.02	11.89	0.01	0.000
13.34	1.58	274.33	1.00	274.33	49	1640	0.50	0.051	0.02	11.89	0.01	0.000
13.42	1.55	281.35	1.00	281.35	50	1621	0.50	0.052	0.02	11.89	0.01	0.000
13.46	1.53	282.94	1.00	282.94	50	1605	0.50	0.054	0.02	11.89	0.01	0.000
13.54	1.54	280.91	1.00	280.91	50	1609	0.50	0.054	0.02	11.89	0.01	0.000
13.60	1.56	273.99	1.00	273.99	49	1624	0.50	0.053	0.02	11.89	0.01	0.000
13.68	1.60	263.41	1.00	263.41	48	1649	0.50	0.052	0.02	11.89	0.01	0.000
13.72	1.65	252.43	1.00	252.43	46	1667	0.50	0.051	0.02	11.89	0.01	0.000
13.79	1.70	234.24	1.00	234.24	44	1652	0.50	0.053	0.02	11.89	0.01	0.000
13.85	1.73	223.45	1.05	234.72	44	1638	0.50	0.054	0.02	11.89	0.01	0.000
13.92	1.76	211.23	1.11	233.64	45	1614	0.50	0.056	0.02	11.89	0.01	0.000
13.99	1.78	204.55	1.12	229.74	44	1590	0.50	0.059	0.02	11.89	0.02	0.000
14.07	1.81	190.87	1.16	221.33	0	0	0.50	0.000	0.00	11.89	0.00	0.000
14.11	1.82	177.33	1.18	208.41	0	0	0.50	0.000	0.00	11.89	0.00	0.000
14.19	1.83	164.58	1.18	195.00	0	0	0.50	0.000	0.00	11.89	0.00	0.000
14.27	1.84	152.88	1.19	182.53	0	0	0.50	0.000	0.00	11.89	0.00	0.000
14.31	1.88	142.27	1.22	174.06	0	0	0.50	0.000	0.00	11.89	0.00	0.000
14.39	1.93	132.98	1.25	166.76	0	0	0.50	0.000	0.00	11.89	0.00	0.000
14.47	1.97	124.30	1.29	159.92	0	0	0.50	0.000	0.00	11.89	0.00	0.000
14.50	2.02	117.19	1.33	155.30	0	0	0.50	0.000	0.00	11.89	0.00	0.000
14.58	2.06	113.05	1.36	154.30	0	0	0.50	0.000	0.00	11.89	0.00	0.000
14.66	2.09	110.37	1.41	155.51	0	0	0.50	0.000	0.00	11.89	0.00	0.000
14.73	2.11	109.22	1.44	157.45	0	0	0.50	0.000	0.00	11.89	0.00	0.000
14.77	2.14	107.82	1.48	159.47	0	0	0.50	0.000	0.00	11.89	0.00	0.000
14.85	2.16	106.26	1.53	162.37	0	0	0.50	0.000	0.00	11.89	0.00	0.000
14.93	2.19	104.79	1.59	167.12	0	0	0.50	0.000	0.00	11.89	0.00	0.000
15.00	2.22	103.64	1.66	171.86	0	0	0.50	0.000	0.00	11.89	0.00	0.000
15.04	2.25	101.59	1.75	177.56	0	0	0.50	0.000	0.00	11.89	0.00	0.000
15.12	2.28	99.03	1.85	183.02	0	0	0.50	0.000	0.00	11.89	0.00	0.000
15.16	2.32	95.78	1.99	190.60	0	0	0.50	0.000	0.00	11.89	0.00	0.000
15.23	2.35	92.57	2.14	197.91	0	0	0.50	0.000	0.00	11.89	0.00	0.000
15.31	2.38	90.17	2.28	205.29	0	0	0.50	0.000	0.00	11.89	0.00	0.000
15.38	2.40	89.32	2.36	210.42	52	1552	0.50	0.073	0.02	11.89	0.02	0.000
15.42	2.41	88.05	2.44	214.92	53	1563	0.50	0.072	0.02	11.89	0.01	0.000
15.50	2.43	86.36	2.53	218.10	54	1569	0.50	0.072	0.02	11.89	0.01	0.000
15.57	2.45	83.70	2.66	222.23	56	1568	0.50	0.073	0.02	11.89	0.01	0.000
15.65	2.46	81.95	2.75	225.11	57	1570	0.50	0.073	0.02	11.89	0.01	0.000
15.69	2.48	79.92	2.88	229.82	59	1572	0.50	0.073	0.02	11.89	0.01	0.000
15.76	2.50	78.56	2.99	234.69	61	1584	0.50	0.073	0.02	11.89	0.01	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
15.84	2.51	77.92	3.07	239.18	62	1601	0.50	0.071	0.02	11.89	0.01	0.000
15.88	2.52	77.91	3.11	242.52	63	1617	0.50	0.070	0.02	11.89	0.01	0.000
15.96	2.52	78.03	3.13	244.48	64	1632	0.50	0.069	0.02	11.89	0.01	0.000
16.03	2.52	79.03	3.14	248.17	65	1662	0.50	0.067	0.02	11.89	0.01	0.000
16.11	2.52	80.88	3.11	251.26	65	1699	0.50	0.064	0.02	11.89	0.01	0.000
16.15	2.51	83.98	3.03	254.77	66	1746	0.50	0.061	0.01	11.89	0.01	0.000
16.22	2.49	87.38	2.92	255.40	66	1789	0.50	0.058	0.01	11.89	0.01	0.000
16.29	2.47	91.37	2.78	254.35	65	1830	0.50	0.056	0.01	11.89	0.01	0.000
16.37	2.45	93.85	2.68	251.22	63	1848	0.50	0.055	0.01	11.89	0.01	0.000
16.41	2.42	94.98	2.48	235.58	58	1799	0.50	0.058	0.02	11.89	0.01	0.000
16.49	2.36	94.41	2.16	204.03	49	1661	0.50	0.070	0.02	11.89	0.02	0.000
16.57	2.27	96.47	1.81	174.99	41	1529	0.50	0.087	0.04	11.89	0.02	0.000
16.64	2.19	100.62	1.60	161.14	36	1460	0.50	0.099	0.05	11.89	0.03	0.000
16.68	2.14	111.50	1.48	165.13	36	1511	0.50	0.091	0.04	11.89	0.03	0.000
16.75	2.10	118.43	1.43	168.88	37	1545	0.50	0.086	0.04	11.89	0.03	0.000
16.82	2.07	127.01	1.38	174.71	37	1588	0.50	0.081	0.04	11.89	0.02	0.000
16.88	2.04	134.44	1.35	181.34	38	1637	0.50	0.076	0.03	11.89	0.02	0.000
16.96	2.02	144.40	1.32	190.73	40	1702	0.50	0.070	0.03	11.89	0.02	0.000
17.00	2.01	150.56	1.32	198.32	41	1769	0.50	0.064	0.03	11.89	0.02	0.000
17.08	2.02	153.06	1.33	203.08	43	1828	0.50	0.060	0.02	11.89	0.02	0.000
17.15	2.04	154.56	1.34	207.63	44	1891	0.50	0.056	0.02	11.89	0.01	0.000
17.22	2.05	155.79	1.36	211.44	45	1943	0.50	0.054	0.02	11.89	0.01	0.000
17.27	2.07	155.01	1.38	213.84	46	1983	0.50	0.052	0.02	11.89	0.01	0.000
17.34	2.08	156.18	1.39	216.76	47	2021	0.50	0.050	0.02	11.89	0.01	0.000
17.42	2.07	159.14	1.38	220.02	47	2056	0.50	0.049	0.02	11.89	0.01	0.000
17.46	2.06	164.19	1.36	223.44	48	2077	0.50	0.048	0.02	11.89	0.01	0.000
17.54	2.03	168.73	1.34	225.67	48	2083	0.50	0.048	0.02	11.89	0.01	0.000
17.60	2.00	174.36	1.31	228.32	48	2077	0.49	0.049	0.02	11.89	0.01	0.000
17.68	1.97	179.46	1.29	230.76	48	2064	0.49	0.050	0.02	11.89	0.01	0.000
17.72	1.94	183.14	1.27	231.95	47	2038	0.49	0.051	0.02	11.89	0.01	0.000
17.80	1.92	185.09	1.25	231.58	47	2005	0.49	0.053	0.02	11.89	0.01	0.000
17.87	1.90	185.19	1.24	229.13	46	1959	0.49	0.056	0.02	11.89	0.01	0.000
17.95	1.88	184.24	1.23	226.00	45	1916	0.50	0.059	0.02	11.89	0.01	0.000
17.99	1.87	183.09	1.22	222.95	44	1877	0.50	0.062	0.02	11.89	0.01	0.000
18.06	1.86	182.23	1.21	220.60	44	1850	0.50	0.064	0.03	11.89	0.02	0.000
18.15	1.85	181.89	1.20	219.05	43	1833	0.50	0.066	0.03	11.89	0.02	0.000
18.19	1.85	182.22	1.20	218.74	43	1828	0.50	0.067	0.03	11.89	0.02	0.000
18.26	1.84	185.33	1.19	220.34	43	1832	0.50	0.067	0.03	11.89	0.02	0.000
18.33	1.84	184.61	1.19	220.03	43	1837	0.50	0.067	0.03	11.89	0.02	0.000
18.41	1.85	182.07	1.20	218.65	43	1842	0.50	0.067	0.03	11.89	0.02	0.000
18.44	1.89	175.07	1.23	214.91	43	1857	0.50	0.066	0.03	11.89	0.02	0.000
18.52	1.91	170.47	1.25	212.29	43	1875	0.50	0.065	0.03	11.89	0.02	0.000
18.59	1.93	167.54	1.26	210.90	43	1897	0.50	0.064	0.03	11.89	0.02	0.000
18.67	1.94	167.26	1.26	211.08	43	1912	0.50	0.063	0.03	11.89	0.02	0.000
18.72	1.94	168.92	1.26	213.19	43	1934	0.50	0.062	0.02	11.89	0.02	0.000
18.79	1.94	170.54	1.26	215.67	44	1968	0.50	0.060	0.02	11.89	0.01	0.000
18.86	1.95	172.09	1.27	218.29	45	2005	0.50	0.058	0.02	11.89	0.01	0.000
18.90	1.95	175.55	1.27	222.45	45	2044	0.50	0.056	0.02	11.89	0.01	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
18.98	1.93	183.61	1.26	230.50	47	2095	0.50	0.054	0.02	11.89	0.01	0.000
19.06	1.90	195.20	1.24	241.76	48	2160	0.50	0.051	0.02	11.89	0.01	0.000
19.10	1.87	212.52	1.22	258.62	51	2262	0.50	0.047	0.02	11.89	0.01	0.000
19.17	1.84	231.23	1.19	275.27	54	2363	0.50	0.044	0.01	11.89	0.01	0.000
19.25	1.80	249.16	1.16	288.53	56	2445	0.50	0.041	0.01	11.89	0.01	0.000
19.32	1.78	259.79	1.13	293.10	56	2474	0.50	0.041	0.01	11.89	0.01	0.000
19.36	1.76	264.69	1.11	292.56	56	2470	0.50	0.041	0.01	11.89	0.01	0.000
19.43	1.75	260.11	1.08	280.40	53	2379	0.50	0.044	0.01	11.89	0.01	0.000
19.51	1.71	251.16	1.02	255.88	48	2212	0.50	0.051	0.02	11.89	0.01	0.000
19.59	1.69	240.15	1.00	240.15	45	2041	0.50	0.060	0.02	11.89	0.01	0.000
19.63	1.68	232.74	1.00	232.74	43	1954	0.50	0.066	0.03	11.89	0.02	0.000
19.71	1.69	226.31	1.00	226.31	42	1942	0.50	0.067	0.03	11.89	0.02	0.000
19.79	1.70	219.83	1.00	219.83	41	1926	0.50	0.069	0.03	11.89	0.02	0.000
19.83	1.73	209.69	1.05	219.36	41	1897	0.50	0.071	0.03	11.89	0.02	0.000
19.90	1.74	203.29	1.07	216.82	41	1870	0.50	0.074	0.03	11.89	0.02	0.000
19.98	1.76	198.10	1.10	217.08	41	1869	0.50	0.074	0.03	11.89	0.02	0.000
20.05	1.76	199.85	1.10	219.94	42	1897	0.50	0.072	0.03	11.89	0.02	0.000
20.08	1.77	200.80	1.12	223.98	43	1934	0.50	0.070	0.03	11.89	0.02	0.000
20.16	1.77	201.53	1.12	225.37	43	1950	0.51	0.069	0.03	11.89	0.02	0.000
20.24	1.77	202.31	1.12	225.64	43	1957	0.51	0.069	0.03	11.89	0.02	0.000
20.31	1.77	202.17	1.12	226.01	43	1965	0.51	0.068	0.03	11.89	0.02	0.000
20.36	1.79	200.71	1.14	228.02	44	1989	0.51	0.067	0.03	11.89	0.02	0.000
20.43	1.81	199.37	1.16	231.78	45	2041	0.51	0.064	0.02	11.89	0.01	0.000
20.50	1.83	198.28	1.19	235.08	46	2099	0.51	0.060	0.02	11.89	0.01	0.000
20.58	1.85	197.52	1.20	236.93	47	2142	0.51	0.058	0.02	11.89	0.01	0.000
20.62	1.87	193.74	1.22	235.61	47	2164	0.51	0.057	0.02	11.89	0.01	0.000
20.69	1.91	184.35	1.24	229.41	46	2180	0.51	0.057	0.02	11.89	0.01	0.000
20.77	1.96	173.88	1.28	222.12	46	2202	0.51	0.056	0.02	11.89	0.01	0.000
20.81	2.01	165.44	1.32	218.35	46	2253	0.51	0.054	0.02	11.89	0.01	0.000
20.88	2.04	166.33	1.34	223.42	47	2347	0.51	0.050	0.02	11.89	0.01	0.000
20.95	2.03	178.88	1.33	238.01	50	2487	0.51	0.045	0.02	11.89	0.01	0.000
21.03	1.99	196.43	1.30	255.29	53	2612	0.51	0.042	0.01	11.89	0.01	0.000
21.07	1.94	219.57	1.27	277.81	57	2742	0.51	0.039	0.01	11.89	0.01	0.000
21.14	1.91	238.12	1.24	295.70	59	2843	0.51	0.037	0.01	11.89	0.01	0.000
21.21	1.88	254.21	1.22	310.36	62	2919	0.51	0.035	0.01	11.89	0.01	0.000
21.29	1.86	260.63	1.21	315.29	62	2940	0.51	0.035	0.01	11.89	0.01	0.000
21.33	1.85	261.13	1.20	314.00	62	2912	0.51	0.036	0.01	11.89	0.01	0.000
21.41	1.85	257.80	1.20	308.80	61	2860	0.51	0.037	0.01	11.89	0.01	0.000
21.49	1.83	254.96	1.19	302.39	59	2784	0.51	0.039	0.01	11.89	0.01	0.000
21.56	1.82	254.15	1.17	297.57	58	2722	0.51	0.041	0.01	11.89	0.01	0.000
21.59	1.80	255.30	1.15	294.47	57	2677	0.51	0.042	0.01	11.89	0.01	0.000
21.67	1.78	258.31	1.13	292.26	56	2648	0.51	0.043	0.01	11.89	0.01	0.000
21.74	1.78	255.75	1.13	288.14	55	2615	0.51	0.044	0.01	11.89	0.01	0.000
21.82	1.78	250.71	1.13	283.71	54	2582	0.51	0.045	0.01	11.89	0.01	0.000
21.85	1.81	240.79	1.16	279.09	54	2562	0.51	0.046	0.01	11.89	0.01	0.000
21.93	1.81	235.37	1.17	274.71	53	2536	0.51	0.047	0.01	11.89	0.01	0.000
22.01	1.82	228.17	1.17	267.52	52	2481	0.51	0.049	0.02	11.89	0.01	0.000
22.09	1.82	221.57	1.17	259.70	51	2414	0.51	0.052	0.02	11.89	0.01	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
22.12	1.84	209.42	1.19	249.15	49	2343	0.51	0.055	0.02	11.89	0.01	0.000
22.20	1.87	194.58	1.21	236.37	47	2276	0.51	0.058	0.02	11.89	0.01	0.000
22.28	1.90	179.89	1.24	222.70	45	2207	0.51	0.062	0.02	11.89	0.01	0.000
22.32	1.92	168.27	1.25	210.85	43	2132	0.51	0.067	0.03	11.89	0.02	0.000
22.39	1.92	161.82	1.25	201.99	41	2035	0.51	0.074	0.03	11.89	0.02	0.000
22.47	1.89	158.09	1.23	194.15	39	1912	0.51	0.086	0.04	11.89	0.02	0.000
22.51	1.85	158.87	1.20	191.23	38	1838	0.51	0.095	0.04	11.89	0.02	0.000
22.58	1.85	164.15	1.20	197.34	39	1898	0.51	0.088	0.04	11.89	0.02	0.000
22.67	1.88	171.27	1.22	209.49	42	2063	0.51	0.074	0.03	11.89	0.02	0.000
22.74	1.91	178.11	1.24	220.95	44	2226	0.51	0.063	0.02	11.89	0.01	0.000
22.78	1.93	184.17	1.26	231.43	47	2383	0.52	0.055	0.02	11.89	0.01	0.000
22.86	1.90	202.48	1.24	250.45	50	2521	0.52	0.050	0.02	11.89	0.01	0.000
22.94	1.85	227.45	1.20	272.73	54	2643	0.52	0.046	0.01	11.89	0.01	0.000
22.98	1.77	262.65	1.11	291.49	56	2731	0.52	0.044	0.01	11.89	0.01	0.000
23.05	1.71	290.19	1.00	290.19	54	2783	0.52	0.043	0.01	11.89	0.01	0.000
23.12	1.65	317.57	1.00	317.57	58	2825	0.52	0.042	0.01	11.89	0.01	0.000
23.19	1.62	336.13	1.00	336.13	61	2872	0.52	0.041	0.01	11.89	0.01	0.000
23.23	1.62	353.30	1.00	353.30	64	3027	0.52	0.038	0.01	11.89	0.01	0.000
23.31	1.65	364.11	1.00	364.11	67	3233	0.52	0.034	0.01	11.89	0.00	0.000
23.37	1.67	373.57	1.00	373.57	69	3444	0.52	0.031	0.01	11.89	0.00	0.000
23.44	1.69	374.09	1.00	374.09	70	3530	0.52	0.030	0.01	11.89	0.00	0.000
23.50	1.70	368.73	1.00	368.73	69	3522	0.52	0.031	0.01	11.89	0.00	0.000
23.56	1.71	354.53	1.00	355.12	66	3449	0.52	0.032	0.01	11.89	0.00	0.000
23.63	1.73	338.97	1.04	352.70	66	3389	0.52	0.033	0.01	11.89	0.00	0.000
23.69	1.76	322.54	1.09	352.62	67	3366	0.52	0.033	0.01	11.89	0.00	0.000
23.77	1.79	309.41	1.14	352.38	68	3385	0.52	0.033	0.01	11.89	0.00	0.000
23.82	1.81	301.89	1.16	351.38	68	3411	0.52	0.033	0.01	11.89	0.00	0.000
23.90	1.82	298.52	1.17	350.39	68	3426	0.52	0.032	0.01	11.89	0.00	0.000
23.96	1.83	294.25	1.18	347.51	68	3418	0.52	0.033	0.01	11.89	0.00	0.000
24.02	1.85	286.04	1.20	342.42	67	3413	0.52	0.033	0.01	11.89	0.00	0.000
24.10	1.86	278.80	1.21	337.89	67	3422	0.52	0.033	0.01	11.89	0.00	0.000
24.16	1.89	272.52	1.23	334.32	67	3449	0.52	0.033	0.01	11.89	0.00	0.000
24.23	1.91	266.11	1.24	330.12	66	3472	0.52	0.032	0.01	11.89	0.00	0.000
24.30	1.92	258.17	1.25	323.37	65	3462	0.52	0.033	0.01	11.89	0.00	0.000
24.38	1.93	254.34	1.26	319.34	65	3440	0.52	0.033	0.01	11.89	0.00	0.000
24.41	1.93	251.52	1.25	315.34	64	3392	0.52	0.034	0.01	11.89	0.00	0.000
24.49	1.91	252.96	1.25	315.08	63	3359	0.52	0.034	0.01	11.89	0.00	0.000
24.56	1.89	258.11	1.23	317.39	63	3322	0.52	0.035	0.01	11.89	0.00	0.000
24.64	1.84	271.67	1.20	324.99	64	3291	0.52	0.036	0.01	11.89	0.00	0.000
24.70	1.81	283.10	1.16	328.47	64	3257	0.52	0.037	0.01	11.89	0.00	0.000
24.74	1.79	285.13	1.14	324.55	62	3197	0.52	0.038	0.01	11.89	0.01	0.000
24.82	1.79	279.97	1.14	318.39	61	3141	0.52	0.039	0.01	11.89	0.01	0.000
24.89	1.80	269.35	1.15	310.13	60	3079	0.52	0.040	0.01	11.89	0.01	0.000
24.97	1.81	260.45	1.17	303.64	59	3039	0.52	0.041	0.01	11.89	0.01	0.000
25.01	1.83	250.11	1.19	296.38	58	3004	0.52	0.042	0.01	11.89	0.01	0.000
25.09	1.84	243.41	1.20	291.06	57	2981	0.52	0.043	0.01	11.89	0.01	0.000
25.17	1.85	238.57	1.20	286.83	56	2960	0.52	0.044	0.01	11.89	0.01	0.000
25.20	1.85	236.55	1.20	284.48	56	2940	0.52	0.044	0.01	11.89	0.01	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
25.28	1.85	236.71	1.20	283.80	56	2929	0.52	0.045	0.01	11.89	0.01	0.000
25.36	1.84	238.34	1.19	284.35	56	2926	0.52	0.045	0.01	11.89	0.01	0.000
25.40	1.82	245.71	1.17	287.25	56	2911	0.52	0.045	0.01	11.89	0.01	0.000
25.47	1.77	255.77	1.12	285.98	55	2856	0.52	0.047	0.01	11.89	0.01	0.000
25.55	1.73	265.24	1.06	280.39	53	2812	0.52	0.049	0.02	11.89	0.01	0.000
25.62	1.72	268.38	1.02	274.75	52	2782	0.52	0.050	0.02	11.89	0.01	0.000
25.66	1.73	264.18	1.05	276.68	52	2788	0.52	0.050	0.02	11.89	0.01	0.000
25.73	1.76	250.80	1.10	275.79	53	2768	0.52	0.050	0.02	11.89	0.01	0.000
25.79	1.80	235.73	1.15	272.23	53	2767	0.52	0.051	0.02	11.89	0.01	0.000
25.89	1.84	223.42	1.19	266.61	52	2780	0.52	0.050	0.02	11.89	0.01	0.000
25.93	1.86	220.52	1.21	266.89	53	2830	0.52	0.049	0.02	11.89	0.01	0.000
26.01	1.88	223.72	1.22	272.97	54	2933	0.52	0.046	0.01	11.89	0.01	0.000
26.08	1.89	230.20	1.23	283.25	57	3088	0.52	0.043	0.01	11.89	0.01	0.000
26.12	1.90	241.57	1.24	298.87	60	3290	0.52	0.039	0.01	11.89	0.01	0.000
26.19	1.88	254.93	1.22	311.97	62	3381	0.52	0.037	0.01	11.89	0.00	0.000
26.26	1.85	266.22	1.20	320.39	63	3403	0.53	0.037	0.01	11.89	0.00	0.000
26.34	1.83	270.24	1.19	320.51	0	0	0.53	0.000	0.00	11.89	0.00	0.000
26.41	1.84	266.89	1.19	318.34	0	0	0.53	0.000	0.00	11.89	0.00	0.000
26.44	1.87	250.82	1.22	304.94	0	0	0.53	0.000	0.00	11.89	0.00	0.000
26.52	1.89	233.86	1.23	287.91	0	0	0.53	0.000	0.00	11.89	0.00	0.000
26.59	1.90	217.53	1.24	269.08	0	0	0.53	0.000	0.00	11.89	0.00	0.000
26.66	1.92	196.86	1.25	246.31	0	0	0.53	0.000	0.00	11.89	0.00	0.000
26.73	1.97	172.69	1.28	221.15	0	0	0.53	0.000	0.00	11.89	0.00	0.000
26.79	2.05	143.90	1.36	195.02	0	0	0.53	0.000	0.00	11.89	0.00	0.000
26.86	2.12	124.08	1.45	180.22	0	0	0.53	0.000	0.00	11.89	0.00	0.000
26.92	2.20	106.02	1.61	171.02	0	0	0.53	0.000	0.00	11.89	0.00	0.000
26.99	2.28	91.62	1.84	168.73	0	0	0.53	0.000	0.00	11.89	0.00	0.000
27.05	2.33	83.81	2.05	172.05	0	0	0.53	0.000	0.00	11.89	0.00	0.000
27.11	2.37	79.94	2.20	176.06	0	0	0.53	0.000	0.00	11.89	0.00	0.000
27.19	2.38	77.71	2.29	177.76	0	0	0.53	0.000	0.00	11.89	0.00	0.000
27.26	2.39	76.46	2.32	177.17	0	0	0.53	0.000	0.00	11.89	0.00	0.000
27.30	2.38	76.36	2.27	172.97	0	0	0.53	0.000	0.00	11.89	0.00	0.000
27.38	2.36	77.37	2.15	166.59	0	0	0.53	0.000	0.00	11.89	0.00	0.000
27.45	2.32	79.03	2.01	159.03	0	0	0.53	0.000	0.00	11.89	0.00	0.000
27.52	2.29	80.70	1.90	153.23	0	0	0.53	0.000	0.00	11.89	0.00	0.000
27.56	2.26	82.67	1.80	148.55	0	0	0.53	0.000	0.00	11.89	0.00	0.000
27.64	2.24	84.49	1.72	145.00	0	0	0.53	0.000	0.00	11.89	0.00	0.000
27.71	2.21	86.11	1.65	142.26	0	0	0.53	0.000	0.00	11.89	0.00	0.000
27.76	2.20	87.06	1.62	140.80	0	0	0.53	0.000	0.00	11.89	0.00	0.000
27.84	2.20	87.27	1.60	140.04	0	0	0.53	0.000	0.00	11.89	0.00	0.000
27.91	2.19	87.33	1.60	139.54	0	0	0.53	0.000	0.00	11.89	0.00	0.000
27.99	2.19	87.40	1.59	139.22	0	0	0.53	0.000	0.00	11.89	0.00	0.000
28.03	2.19	88.03	1.58	139.16	0	0	0.53	0.000	0.00	11.89	0.00	0.000
28.10	2.18	89.01	1.56	139.20	0	0	0.53	0.000	0.00	11.89	0.00	0.000
28.18	2.17	90.65	1.54	139.59	0	0	0.53	0.000	0.00	11.89	0.00	0.000
28.25	2.16	92.38	1.52	140.17	0	0	0.53	0.000	0.00	11.89	0.00	0.000
28.29	2.14	94.91	1.49	141.23	0	0	0.53	0.000	0.00	11.89	0.00	0.000
28.37	2.10	98.61	1.41	139.23	0	0	0.53	0.000	0.00	11.89	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
28.44	2.03	102.99	1.33	137.26	0	0	0.53	0.000	0.00	11.89	0.00	0.000
28.48	1.96	107.61	1.28	137.32	0	0	0.53	0.000	0.00	11.89	0.00	0.000
28.56	1.93	110.38	1.26	138.70	0	0	0.53	0.000	0.00	11.89	0.00	0.000
28.63	1.93	111.59	1.26	140.23	28	1683	0.53	0.183	0.12	11.89	0.06	0.000
28.71	1.94	111.16	1.26	140.16	28	1695	0.53	0.180	0.12	11.89	0.05	0.001
28.75	1.99	102.44	1.30	132.88	28	1685	0.53	0.183	0.13	11.89	0.06	0.000
28.82	2.00	100.21	1.31	131.12	27	1686	0.53	0.184	0.13	11.89	0.06	0.000
28.89	2.02	97.94	1.32	129.47	27	1688	0.53	0.184	0.13	11.89	0.06	0.000
28.96	1.99	102.86	1.30	134.02	28	1719	0.53	0.175	0.12	11.89	0.05	0.000
29.04	2.01	101.22	1.32	133.43	28	1740	0.53	0.170	0.11	11.89	0.05	0.000
29.08	2.03	99.55	1.34	133.08	28	1763	0.53	0.164	0.11	11.89	0.05	0.000
29.15	2.05	97.73	1.36	132.57	28	1782	0.53	0.159	0.11	11.89	0.05	0.000
29.23	2.07	95.93	1.38	132.04	28	1797	0.53	0.156	0.10	11.89	0.05	0.000
29.27	2.08	94.66	1.39	132.01	28	1813	0.53	0.153	0.10	11.89	0.05	0.000
29.35	2.09	95.18	1.40	133.19	29	1836	0.53	0.148	0.10	11.89	0.04	0.000
29.43	2.07	99.15	1.38	136.60	29	1869	0.53	0.142	0.09	11.89	0.04	0.000
29.50	2.04	105.26	1.34	141.45	30	1902	0.53	0.136	0.08	11.89	0.04	0.000
29.53	1.99	115.13	1.30	149.59	31	1935	0.53	0.130	0.08	11.89	0.03	0.000
29.61	1.94	125.45	1.26	158.66	32	1968	0.53	0.125	0.07	11.89	0.03	0.000
29.68	1.90	136.42	1.23	168.33	34	2000	0.53	0.121	0.06	11.89	0.03	0.000
29.76	1.87	143.20	1.21	173.88	34	2018	0.53	0.119	0.06	11.89	0.03	0.000
29.80	1.85	145.98	1.20	175.74	35	2018	0.53	0.119	0.06	11.89	0.03	0.000
29.87	1.86	143.31	1.21	173.15	34	2000	0.53	0.122	0.06	11.89	0.03	0.000
29.95	1.88	137.26	1.22	167.79	33	1974	0.53	0.126	0.07	11.89	0.03	0.000
30.03	1.91	130.15	1.24	161.48	32	1951	0.53	0.131	0.07	11.89	0.03	0.000
30.07	1.93	123.54	1.26	155.54	32	1932	0.53	0.134	0.08	11.89	0.03	0.000
30.15	1.96	118.53	1.27	151.08	31	1922	0.53	0.137	0.08	11.89	0.04	0.000
30.19	1.98	113.45	1.29	146.81	30	1916	0.53	0.138	0.08	11.89	0.04	0.000
30.26	2.01	109.90	1.31	144.19	30	1921	0.53	0.138	0.08	11.89	0.04	0.000
30.34	2.03	107.13	1.33	142.52	30	1934	0.53	0.136	0.08	11.89	0.04	0.000
30.41	2.04	106.15	1.34	142.21	30	1946	0.53	0.134	0.08	11.89	0.04	0.000
30.45	2.04	106.38	1.34	142.78	30	1959	0.53	0.132	0.08	11.89	0.04	0.000
30.52	2.03	107.53	1.34	143.91	30	1973	0.53	0.130	0.08	11.89	0.03	0.000
30.60	2.02	109.92	1.33	145.87	31	1985	0.53	0.129	0.08	11.89	0.03	0.000
30.68	2.01	112.48	1.31	147.85	31	1993	0.53	0.128	0.08	11.89	0.03	0.000
30.71	1.99	115.30	1.30	150.17	31	2001	0.53	0.127	0.07	11.89	0.03	0.000
30.79	1.99	115.81	1.30	150.68	31	2008	0.53	0.126	0.07	11.89	0.03	0.000
30.87	2.00	114.60	1.31	149.81	31	2013	0.53	0.126	0.07	11.89	0.03	0.000
30.91	2.02	110.96	1.33	147.08	31	2012	0.53	0.126	0.07	11.89	0.03	0.000
30.98	2.04	108.07	1.34	145.07	31	2015	0.53	0.126	0.08	11.89	0.03	0.000
31.06	2.05	106.20	1.36	143.98	31	2021	0.53	0.126	0.08	11.89	0.03	0.000
31.13	2.05	106.65	1.35	144.43	31	2029	0.53	0.125	0.07	11.89	0.03	0.000
31.17	2.04	109.34	1.34	146.42	31	2037	0.53	0.124	0.07	11.89	0.03	0.000
31.24	2.01	114.35	1.31	150.17	31	2047	0.53	0.123	0.07	11.89	0.03	0.000
31.32	1.97	120.40	1.29	154.87	32	2051	0.53	0.122	0.07	11.89	0.03	0.000
31.40	1.94	125.09	1.26	157.78	32	2022	0.53	0.127	0.07	11.89	0.03	0.000
31.44	1.87	128.75	1.22	156.78	31	1890	0.53	0.152	0.09	11.89	0.04	0.000
31.51	1.82	129.29	1.17	151.39	29	1749	0.53	0.190	0.12	11.89	0.05	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
31.59	1.78	126.59	1.13	143.53	28	1632	0.53	0.236	0.16	11.89	0.07	0.001
31.66	1.82	120.35	1.17	140.78	27	1629	0.53	0.238	0.16	11.89	0.07	0.001
31.70	1.87	111.60	1.21	135.50	27	1634	0.53	0.236	0.17	11.89	0.07	0.000
31.78	1.96	97.34	1.28	124.22	25	1638	0.53	0.235	0.18	11.89	0.07	0.001
31.83	2.05	85.42	1.36	115.77	25	1652	0.53	0.229	0.18	11.89	0.07	0.000
31.91	2.15	74.72	1.49	111.68	25	1670	0.53	0.222	0.17	11.89	0.07	0.001
31.99	2.20	70.24	1.61	113.07	25	1703	0.53	0.210	0.16	11.89	0.06	0.001
32.03	2.28	63.65	1.84	117.19	27	1739	0.53	0.198	0.14	11.89	0.06	0.000
32.10	2.34	58.93	2.10	123.68	30	1782	0.53	0.185	0.12	11.89	0.05	0.000
32.18	2.38	56.97	2.29	130.60	32	1838	0.53	0.170	0.10	11.89	0.04	0.000
32.25	2.39	57.74	2.33	134.42	33	1886	0.53	0.158	0.09	11.89	0.04	0.000
32.29	2.37	61.31	2.20	134.96	33	1928	0.53	0.150	0.08	11.89	0.03	0.000
32.37	2.33	65.87	2.03	133.66	32	1956	0.53	0.144	0.08	11.89	0.03	0.000
32.44	2.27	71.89	1.83	131.65	31	1976	0.53	0.141	0.08	11.89	0.03	0.000
32.51	2.23	76.88	1.69	130.26	30	1980	0.53	0.141	0.09	11.89	0.04	0.000
32.55	2.20	79.94	1.61	128.77	29	1965	0.53	0.144	0.09	11.89	0.04	0.000
32.63	2.19	79.93	1.59	126.73	28	1937	0.53	0.150	0.10	11.89	0.04	0.000
32.71	2.19	78.33	1.59	124.38	28	1905	0.53	0.157	0.11	11.89	0.04	0.000
32.75	2.21	74.76	1.63	121.97	28	1869	0.53	0.166	0.11	11.89	0.05	0.000
32.82	2.23	70.22	1.70	119.53	27	1829	0.53	0.177	0.12	11.89	0.05	0.000
32.90	2.26	65.57	1.79	117.12	27	1784	0.53	0.190	0.13	11.89	0.05	0.000
32.98	2.27	63.68	1.81	115.16	27	1754	0.53	0.201	0.14	11.89	0.06	0.001
33.02	2.27	62.72	1.82	113.99	26	1736	0.53	0.208	0.15	11.89	0.06	0.000
33.09	2.26	63.57	1.78	113.39	26	1735	0.53	0.209	0.15	11.89	0.06	0.001
33.17	2.26	63.82	1.77	113.22	26	1737	0.53	0.208	0.15	11.89	0.06	0.001
33.21	2.25	65.20	1.75	114.04	0	0	0.53	0.000	0.00	11.89	0.00	0.000
33.28	2.27	64.24	1.81	116.43	0	0	0.53	0.000	0.00	11.89	0.00	0.000
33.36	2.30	61.94	1.93	119.72	0	0	0.53	0.000	0.00	11.89	0.00	0.000
33.40	2.35	58.08	2.14	124.28	0	0	0.53	0.000	0.00	11.89	0.00	0.000
33.47	2.40	54.42	2.37	128.76	0	0	0.53	0.000	0.00	11.89	0.00	0.000
33.55	2.44	51.10	2.61	133.54	0	0	0.53	0.000	0.00	11.89	0.00	0.000
33.62	2.47	49.21	2.80	137.63	0	0	0.53	0.000	0.00	11.89	0.00	0.000
33.70	2.49	48.39	2.91	140.63	0	0	0.53	0.000	0.00	11.89	0.00	0.000
33.74	2.50	48.11	2.99	143.89	0	0	0.53	0.000	0.00	11.89	0.00	0.000
33.82	2.51	48.19	3.03	146.02	0	0	0.53	0.000	0.00	11.89	0.00	0.000
33.86	2.50	48.97	3.00	146.91	0	0	0.53	0.000	0.00	11.89	0.00	0.000
33.93	2.49	50.38	2.91	146.55	0	0	0.53	0.000	0.00	11.89	0.00	0.000
34.01	2.47	52.20	2.80	146.00	0	0	0.53	0.000	0.00	11.89	0.00	0.000
34.08	2.46	53.85	2.71	145.68	0	0	0.53	0.000	0.00	11.89	0.00	0.000
34.13	2.44	56.02	2.57	144.09	0	0	0.53	0.000	0.00	11.89	0.00	0.000
34.20	2.41	58.62	2.41	141.03	0	0	0.53	0.000	0.00	11.89	0.00	0.000
34.28	2.37	61.95	2.22	137.32	0	0	0.53	0.000	0.00	11.89	0.00	0.000
34.35	2.33	65.07	2.05	133.28	0	0	0.53	0.000	0.00	11.89	0.00	0.000
34.39	2.28	68.67	1.86	127.69	0	0	0.53	0.000	0.00	11.89	0.00	0.000
34.46	2.24	72.12	1.73	124.44	0	0	0.53	0.000	0.00	11.89	0.00	0.000
34.54	2.20	75.64	1.63	122.96	0	0	0.53	0.000	0.00	11.89	0.00	0.000
34.61	2.19	77.78	1.59	123.83	0	0	0.53	0.000	0.00	11.89	0.00	0.000
34.65	2.18	79.37	1.56	123.62	0	0	0.53	0.000	0.00	11.89	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
34.72	2.17	79.99	1.54	123.09	0	0	0.53	0.000	0.00	11.89	0.00	0.000
34.80	2.16	80.28	1.53	122.55	0	0	0.53	0.000	0.00	11.89	0.00	0.000
34.86	2.16	80.45	1.52	122.23	0	0	0.53	0.000	0.00	11.89	0.00	0.000
34.94	2.15	80.85	1.51	122.22	0	0	0.53	0.000	0.00	11.89	0.00	0.000
34.97	2.14	82.55	1.49	122.86	0	0	0.53	0.000	0.00	11.89	0.00	0.000
35.06	2.12	85.40	1.45	123.92	0	0	0.53	0.000	0.00	11.89	0.00	0.000
35.14	2.10	88.50	1.42	125.23	0	0	0.53	0.000	0.00	11.89	0.00	0.000
35.17	2.08	90.53	1.39	125.98	0	0	0.53	0.000	0.00	11.89	0.00	0.000
35.24	2.09	89.23	1.40	124.78	0	0	0.53	0.000	0.00	11.89	0.00	0.000
35.32	2.11	84.58	1.44	121.67	0	0	0.53	0.000	0.00	11.89	0.00	0.000
35.40	2.15	78.66	1.51	118.56	0	0	0.53	0.000	0.00	11.89	0.00	0.000
35.44	2.20	72.32	1.61	116.29	0	0	0.53	0.000	0.00	11.89	0.00	0.000
35.52	2.24	67.12	1.72	115.78	0	0	0.53	0.000	0.00	11.89	0.00	0.000
35.59	2.29	61.91	1.90	117.48	0	0	0.53	0.000	0.00	11.89	0.00	0.000
35.67	2.34	58.35	2.07	120.62	0	0	0.53	0.000	0.00	11.89	0.00	0.000
35.70	2.38	55.43	2.27	125.79	0	0	0.53	0.000	0.00	11.89	0.00	0.000
35.78	2.43	52.58	2.52	132.60	0	0	0.53	0.000	0.00	11.89	0.00	0.000
35.86	2.48	49.62	2.83	140.51	0	0	0.53	0.000	0.00	11.89	0.00	0.000
35.90	2.53	46.69	3.18	148.37	0	0	0.53	0.000	0.00	11.89	0.00	0.000
35.97	2.57	44.19	3.49	154.18	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.05	2.59	43.01	3.66	157.26	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.12	2.60	42.10	3.76	158.10	0	0	0.53	0.000	0.00	0.00	0.00	0.000
36.16	2.59	42.71	3.64	155.27	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.24	2.56	43.71	3.45	150.94	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.32	2.53	45.82	3.17	145.42	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.35	2.50	47.77	2.95	140.71	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.43	2.46	49.58	2.74	135.98	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.50	2.42	52.36	2.48	129.98	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.58	2.38	55.17	2.27	124.98	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.62	2.34	57.97	2.09	121.28	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.70	2.32	59.93	1.99	119.43	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.77	2.30	61.43	1.93	118.41	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.81	2.29	62.76	1.88	118.12	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.89	2.27	64.86	1.81	117.61	0	0	0.53	0.000	0.00	11.89	0.00	0.000
36.96	2.23	69.33	1.69	117.34	0	0	0.53	0.000	0.00	11.89	0.00	0.000
37.04	2.19	74.47	1.58	117.97	0	0	0.53	0.000	0.00	11.89	0.00	0.000
37.08	2.14	80.87	1.49	120.21	0	0	0.53	0.000	0.00	11.89	0.00	0.000
37.15	2.10	86.29	1.42	122.83	0	0	0.53	0.000	0.00	11.89	0.00	0.000
37.23	2.07	90.63	1.38	125.26	0	0	0.53	0.000	0.00	11.89	0.00	0.000
37.28	2.06	91.90	1.37	125.49	0	0	0.53	0.000	0.00	11.89	0.00	0.000
37.36	2.05	90.66	1.35	122.64	0	0	0.53	0.000	0.00	11.89	0.00	0.000
37.43	2.04	88.35	1.34	118.82	0	0	0.53	0.000	0.00	11.89	0.00	0.000
37.47	2.05	84.37	1.35	114.16	0	0	0.53	0.000	0.00	11.89	0.00	0.000
37.55	2.08	78.49	1.40	109.59	0	0	0.53	0.000	0.00	11.89	0.00	0.000
37.63	2.13	72.15	1.47	105.72	0	0	0.53	0.000	0.00	11.89	0.00	0.000
37.67	2.18	66.03	1.56	102.71	0	0	0.53	0.000	0.00	11.89	0.00	0.000
37.75	2.24	58.86	1.72	101.41	0	0	0.53	0.000	0.00	11.89	0.00	0.000
37.80	2.29	54.26	1.89	102.79	0	0	0.53	0.000	0.00	11.89	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
37.87	2.34	51.08	2.08	106.45	0	0	0.53	0.000	0.00	11.89	0.00	0.000
37.94	2.37	50.55	2.21	111.56	0	0	0.53	0.000	0.00	11.89	0.00	0.000
38.02	2.42	47.99	2.48	119.00	0	0	0.53	0.000	0.00	11.89	0.00	0.000
38.09	2.47	45.65	2.76	126.22	0	0	0.52	0.000	0.00	11.89	0.00	0.000
38.13	2.51	43.47	3.05	132.73	0	0	0.52	0.000	0.00	11.89	0.00	0.000
38.20	2.54	42.03	3.28	137.81	0	0	0.52	0.000	0.00	11.89	0.00	0.000
38.28	2.56	41.44	3.41	141.20	0	0	0.52	0.000	0.00	11.89	0.00	0.000
38.36	2.56	41.73	3.40	141.99	38	2040	0.52	0.158	0.07	11.89	0.02	0.000
38.39	2.54	42.60	3.30	140.45	37	2040	0.52	0.158	0.08	11.89	0.02	0.000
38.47	2.52	43.97	3.14	138.19	36	2041	0.52	0.158	0.08	11.89	0.02	0.000
38.54	2.50	45.82	2.99	137.06	35	2060	0.52	0.154	0.08	11.89	0.02	0.000
38.61	2.49	47.31	2.91	137.76	35	2091	0.52	0.149	0.08	11.89	0.02	0.000
38.66	2.50	47.40	2.97	140.56	36	2123	0.52	0.143	0.07	11.89	0.02	0.000
38.73	2.53	45.65	3.17	144.57	38	2143	0.52	0.140	0.07	11.89	0.02	0.000
38.81	2.56	43.20	3.45	148.97	40	2153	0.52	0.139	0.06	11.89	0.02	0.000
38.85	2.62	39.87	3.89	155.08	0	0	0.52	0.000	0.00	0.00	0.00	0.000
38.92	2.67	36.27	4.45	161.42	0	0	0.52	0.000	0.00	0.00	0.00	0.000
39.00	2.73	33.11	5.03	166.60	0	0	0.52	0.000	0.00	0.00	0.00	0.000
39.08	2.76	31.42	5.37	168.55	0	0	0.52	0.000	0.00	0.00	0.00	0.000
39.12	2.76	31.07	5.40	167.91	0	0	0.52	0.000	0.00	0.00	0.00	0.000
39.19	2.76	31.00	5.41	167.63	0	0	0.52	0.000	0.00	0.00	0.00	0.000
39.26	2.76	31.09	5.42	168.45	0	0	0.52	0.000	0.00	0.00	0.00	0.000
39.34	2.77	31.25	5.44	169.93	0	0	0.52	0.000	0.00	0.00	0.00	0.000
39.38	2.77	31.47	5.47	172.06	0	0	0.52	0.000	0.00	0.00	0.00	0.000
39.45	2.78	31.31	5.57	174.44	0	0	0.52	0.000	0.00	0.00	0.00	0.000
39.53	2.79	31.06	5.69	176.80	0	0	0.52	0.000	0.00	0.00	0.00	0.000
39.60	2.80	30.70	5.80	178.19	0	0	0.52	0.000	0.00	0.00	0.00	0.000
39.64	2.81	29.90	5.95	177.80	0	0	0.52	0.000	0.00	0.00	0.00	0.000
39.72	2.82	28.68	6.16	176.64	0	0	0.52	0.000	0.00	0.00	0.00	0.000
39.76	2.86	26.63	6.58	175.27	0	0	0.52	0.000	0.00	0.00	0.00	0.000
39.84	2.90	24.41	7.16	174.74	0	0	0.52	0.000	0.00	0.00	0.00	0.000
39.91	2.93	22.37	7.71	172.48	0	0	0.52	0.000	0.00	0.00	0.00	0.000
39.99	2.94	21.58	7.82	168.81	0	0	0.52	0.000	0.00	0.00	0.00	0.000
40.03	2.89	23.06	7.09	163.56	0	0	0.52	0.000	0.00	0.00	0.00	0.000
40.12	2.81	26.49	5.96	157.99	0	0	0.52	0.000	0.00	0.00	0.00	0.000
40.19	2.73	30.67	5.00	153.39	0	0	0.52	0.000	0.00	0.00	0.00	0.000
40.23	2.65	35.51	4.24	150.43	0	0	0.52	0.000	0.00	0.00	0.00	0.000
40.30	2.57	42.16	3.46	145.96	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.38	2.46	51.11	2.70	137.84	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.46	2.36	59.34	2.20	130.50	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.50	2.30	65.09	1.94	126.10	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.57	2.26	69.26	1.80	124.37	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.65	2.22	73.69	1.67	122.96	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.72	2.19	76.09	1.60	121.59	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.75	2.17	76.93	1.56	119.64	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.82	2.17	76.32	1.54	117.40	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.90	2.16	75.89	1.52	115.59	0	0	0.52	0.000	0.00	11.89	0.00	0.000
40.97	2.17	74.10	1.54	114.29	0	0	0.52	0.000	0.00	11.89	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
41.04	2.19	71.38	1.59	113.46	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.08	2.22	67.82	1.67	113.37	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.15	2.27	63.91	1.80	115.11	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.22	2.32	60.03	1.99	119.62	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.30	2.36	57.70	2.17	125.10	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.37	2.38	57.03	2.26	129.06	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.41	2.38	57.62	2.28	131.55	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.49	2.39	57.86	2.33	134.88	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.56	2.41	57.10	2.44	139.35	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.60	2.46	53.98	2.71	146.26	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.67	2.53	48.51	3.18	154.49	0	0	0.52	0.000	0.00	11.89	0.00	0.000
41.76	2.61	42.57	3.81	162.23	0	0	0.52	0.000	0.00	0.00	0.00	0.000
41.83	2.67	38.15	4.36	166.21	0	0	0.51	0.000	0.00	0.00	0.00	0.000
41.87	2.68	36.89	4.46	164.65	0	0	0.51	0.000	0.00	0.00	0.00	0.000
41.94	2.67	36.48	4.42	161.23	0	0	0.51	0.000	0.00	0.00	0.00	0.000
42.03	2.65	37.04	4.23	156.54	0	0	0.51	0.000	0.00	0.00	0.00	0.000
42.07	2.63	37.82	4.00	151.12	0	0	0.51	0.000	0.00	0.00	0.00	0.000
42.14	2.59	39.62	3.64	144.11	0	0	0.51	0.000	0.00	11.89	0.00	0.000
42.22	2.54	41.52	3.29	136.76	0	0	0.51	0.000	0.00	11.89	0.00	0.000
42.30	2.51	42.97	3.06	131.69	0	0	0.51	0.000	0.00	11.89	0.00	0.000
42.33	2.49	44.51	2.89	128.63	0	0	0.51	0.000	0.00	11.89	0.00	0.000
42.41	2.46	46.42	2.73	126.68	0	0	0.51	0.000	0.00	11.89	0.00	0.000
42.48	2.43	49.28	2.53	124.63	0	0	0.51	0.000	0.00	11.89	0.00	0.000
42.55	2.40	52.26	2.36	123.08	0	0	0.51	0.000	0.00	11.89	0.00	0.000
42.59	2.36	55.84	2.18	121.70	0	0	0.51	0.000	0.00	11.89	0.00	0.000
42.66	2.33	59.16	2.04	120.55	0	0	0.51	0.000	0.00	11.89	0.00	0.000
42.74	2.30	61.79	1.94	119.61	0	0	0.51	0.000	0.00	11.89	0.00	0.000
42.79	2.29	62.50	1.90	118.54	0	0	0.51	0.000	0.00	11.89	0.00	0.000
42.86	2.30	61.33	1.91	117.00	27	2160	0.51	0.149	0.10	11.89	0.03	0.000
42.94	2.30	59.24	1.94	114.91	27	2119	0.51	0.157	0.11	11.89	0.03	0.000
43.01	2.31	57.14	1.98	113.00	27	2079	0.51	0.164	0.12	11.89	0.03	0.000
43.05	2.33	54.99	2.03	111.83	27	2048	0.51	0.171	0.12	11.89	0.03	0.000
43.13	2.35	52.93	2.12	112.24	27	2040	0.51	0.173	0.12	11.89	0.03	0.000
43.21	2.37	51.03	2.23	113.74	28	2046	0.51	0.172	0.12	11.89	0.03	0.000
43.24	2.40	49.87	2.35	117.23	29	2082	0.51	0.164	0.11	11.89	0.03	0.000
43.32	2.42	49.36	2.46	121.45	30	2133	0.51	0.155	0.09	11.89	0.02	0.000
43.39	2.43	49.28	2.56	126.00	31	2193	0.51	0.145	0.08	11.89	0.02	0.000
43.47	2.44	49.43	2.62	129.47	32	2242	0.51	0.137	0.08	11.89	0.02	0.000
43.51	2.44	50.49	2.62	132.22	33	2291	0.51	0.131	0.07	11.89	0.02	0.000
43.59	2.43	52.80	2.54	134.16	33	2348	0.51	0.124	0.07	11.89	0.02	0.000
43.66	2.41	56.26	2.41	135.85	34	2414	0.51	0.116	0.06	11.89	0.01	0.000
43.73	2.39	58.96	2.33	137.18	34	2465	0.51	0.111	0.06	11.89	0.01	0.000
43.77	2.34	65.47	2.09	136.78	33	2523	0.51	0.106	0.06	11.89	0.01	0.000
43.84	2.27	74.30	1.83	136.30	32	2576	0.51	0.101	0.06	11.89	0.01	0.000
43.92	2.19	87.56	1.58	138.69	31	2635	0.51	0.097	0.06	11.89	0.01	0.000
43.99	2.13	98.29	1.46	143.38	31	2675	0.51	0.094	0.05	11.89	0.01	0.000
44.03	2.06	110.40	1.37	151.23	32	2716	0.51	0.091	0.05	11.89	0.01	0.000
44.10	2.01	122.50	1.31	160.92	34	2756	0.51	0.089	0.05	11.89	0.01	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
44.18	1.95	135.26	1.27	172.11	35	2789	0.51	0.087	0.04	11.89	0.01	0.000
44.26	1.92	144.52	1.25	180.30	36	2806	0.51	0.086	0.04	11.89	0.01	0.000
44.30	1.89	150.96	1.23	185.68	37	2809	0.51	0.086	0.04	11.89	0.01	0.000
44.36	1.87	154.21	1.22	187.97	37	2799	0.51	0.086	0.04	11.89	0.01	0.000
44.44	1.86	155.32	1.21	188.22	37	2778	0.51	0.088	0.04	11.89	0.01	0.000
44.52	1.86	154.56	1.21	186.94	37	2753	0.51	0.089	0.04	11.89	0.01	0.000
44.56	1.86	153.29	1.21	185.49	37	2735	0.51	0.091	0.04	11.89	0.01	0.000
44.64	1.86	152.29	1.21	184.52	36	2730	0.50	0.091	0.04	11.89	0.01	0.000
44.71	1.87	151.12	1.21	183.60	36	2731	0.50	0.091	0.04	11.89	0.01	0.000
44.78	1.87	150.04	1.22	182.85	36	2738	0.50	0.091	0.04	11.89	0.01	0.000
44.82	1.88	149.12	1.22	182.11	36	2738	0.50	0.091	0.04	11.89	0.01	0.000
44.89	1.88	148.40	1.22	181.26	36	2729	0.50	0.091	0.05	11.89	0.01	0.000
44.97	1.88	147.81	1.22	180.44	36	2717	0.50	0.092	0.05	11.89	0.01	0.000
45.01	1.88	147.18	1.22	179.70	36	2708	0.50	0.093	0.05	11.89	0.01	0.000
45.10	1.88	146.27	1.22	178.98	36	2711	0.50	0.093	0.05	11.89	0.01	0.000
45.17	1.88	145.40	1.23	178.36	36	2717	0.50	0.092	0.05	11.89	0.01	0.000
45.25	1.89	144.88	1.23	178.01	36	2723	0.50	0.092	0.05	11.89	0.01	0.000
45.29	1.89	144.73	1.23	177.86	35	2724	0.50	0.092	0.05	11.89	0.01	0.000
45.36	1.89	145.54	1.23	178.57	36	2729	0.50	0.092	0.05	11.89	0.01	0.000
45.44	1.88	146.78	1.22	179.67	36	2737	0.50	0.091	0.05	11.89	0.01	0.000
45.48	1.87	149.01	1.22	181.64	36	2747	0.50	0.091	0.04	11.89	0.01	0.000
45.55	1.86	151.45	1.21	183.48	36	2749	0.50	0.091	0.04	11.89	0.01	0.000
45.63	1.85	154.93	1.20	185.57	36	2735	0.50	0.092	0.04	11.89	0.01	0.000
45.71	1.83	157.55	1.18	186.39	36	2708	0.50	0.094	0.05	11.89	0.01	0.000
45.75	1.82	157.27	1.18	185.00	0	0	0.50	0.000	0.00	11.89	0.00	0.000
45.82	1.83	152.27	1.19	180.54	0	0	0.50	0.000	0.00	11.89	0.00	0.000
45.90	1.85	146.10	1.20	175.19	0	0	0.50	0.000	0.00	11.89	0.00	0.000
45.93	1.87	138.88	1.22	168.88	0	0	0.50	0.000	0.00	11.89	0.00	0.000
46.01	1.90	130.47	1.24	161.62	0	0	0.50	0.000	0.00	11.89	0.00	0.000
46.09	1.95	120.79	1.27	153.02	0	0	0.50	0.000	0.00	11.89	0.00	0.000
46.13	2.01	108.28	1.31	142.16	0	0	0.50	0.000	0.00	11.89	0.00	0.000
46.20	2.09	93.05	1.41	130.91	0	0	0.50	0.000	0.00	11.89	0.00	0.000
46.28	2.21	75.26	1.65	124.08	0	0	0.50	0.000	0.00	11.89	0.00	0.000
46.35	2.33	61.30	2.05	125.97	0	0	0.50	0.000	0.00	11.89	0.00	0.000
46.40	2.42	51.95	2.51	130.27	0	0	0.50	0.000	0.00	11.89	0.00	0.000
46.48	2.49	45.88	2.92	133.96	0	0	0.50	0.000	0.00	11.89	0.00	0.000
46.56	2.55	41.27	3.34	137.98	0	0	0.50	0.000	0.00	11.89	0.00	0.000
46.60	2.60	38.51	3.76	144.75	0	0	0.50	0.000	0.00	0.00	0.00	0.000
46.67	2.64	37.42	4.11	153.69	0	0	0.50	0.000	0.00	0.00	0.00	0.000
46.74	2.61	41.03	3.88	159.14	0	0	0.50	0.000	0.00	0.00	0.00	0.000
46.81	2.56	47.01	3.45	162.43	43	2771	0.50	0.091	0.04	11.89	0.01	0.000
46.88	2.51	53.66	3.04	163.30	42	2892	0.50	0.083	0.03	11.89	0.01	0.000
46.92	2.52	55.11	3.08	169.98	44	3001	0.50	0.078	0.03	11.89	0.01	0.000
47.00	2.56	52.36	3.45	180.45	48	3093	0.50	0.074	0.03	11.89	0.00	0.000
47.08	2.61	49.15	3.88	190.86	0	0	0.50	0.000	0.00	0.00	0.00	0.000
47.12	2.65	47.14	4.17	196.67	0	0	0.49	0.000	0.00	0.00	0.00	0.000
47.19	2.64	47.14	4.15	195.86	0	0	0.49	0.000	0.00	0.00	0.00	0.000
47.26	2.62	48.50	3.91	189.67	0	0	0.49	0.000	0.00	0.00	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
47.34	2.58	50.86	3.56	180.90	0	0	0.49	0.000	0.00	11.89	0.00	0.000
47.38	2.51	55.60	3.04	169.08	0	0	0.49	0.000	0.00	11.89	0.00	0.000
47.45	2.44	61.38	2.57	157.76	0	0	0.49	0.000	0.00	11.89	0.00	0.000
47.52	2.35	68.17	2.14	145.60	0	0	0.49	0.000	0.00	11.89	0.00	0.000
47.60	2.28	73.20	1.87	136.82	0	0	0.49	0.000	0.00	11.89	0.00	0.000
47.64	2.23	77.07	1.68	129.50	0	0	0.49	0.000	0.00	11.89	0.00	0.000
47.72	2.17	80.61	1.55	124.82	0	0	0.49	0.000	0.00	11.89	0.00	0.000
47.79	2.11	85.40	1.44	122.58	0	0	0.49	0.000	0.00	11.89	0.00	0.000
47.87	2.06	89.96	1.37	123.18	0	0	0.49	0.000	0.00	11.89	0.00	0.000
47.91	2.02	95.30	1.32	126.10	0	0	0.49	0.000	0.00	11.89	0.00	0.000
47.99	1.98	100.88	1.29	130.31	0	0	0.49	0.000	0.00	11.89	0.00	0.000
48.06	1.95	106.34	1.27	134.85	0	0	0.49	0.000	0.00	11.89	0.00	0.000
48.10	1.93	110.12	1.25	138.10	0	0	0.49	0.000	0.00	11.89	0.00	0.000
48.18	1.92	111.58	1.25	139.33	0	0	0.49	0.000	0.00	11.89	0.00	0.000
48.26	1.91	112.03	1.25	139.67	0	0	0.49	0.000	0.00	11.89	0.00	0.000
48.30	1.92	111.39	1.25	139.03	28	2291	0.49	0.137	0.09	11.89	0.01	0.000
48.37	1.92	110.18	1.25	137.84	28	2284	0.49	0.138	0.09	11.89	0.02	0.000
48.45	1.93	108.53	1.25	136.19	28	2275	0.49	0.140	0.09	11.89	0.02	0.000
48.52	1.93	106.92	1.26	134.62	27	2267	0.49	0.141	0.10	11.89	0.02	0.000
48.56	1.94	105.52	1.26	133.28	27	2262	0.49	0.142	0.10	11.89	0.02	0.000
48.63	1.94	104.58	1.27	132.45	27	2262	0.49	0.142	0.10	11.89	0.02	0.000
48.71	1.95	104.20	1.27	132.19	27	2269	0.49	0.141	0.10	11.89	0.02	0.000
48.78	1.95	104.72	1.27	132.84	27	2281	0.49	0.139	0.10	11.89	0.02	0.000
48.85	1.95	105.63	1.27	133.86	27	2296	0.49	0.137	0.09	11.89	0.01	0.000
48.89	1.94	107.18	1.26	135.54	28	2315	0.49	0.134	0.09	11.89	0.01	0.000
48.96	1.94	108.98	1.26	137.40	28	2334	0.49	0.132	0.09	11.89	0.01	0.000
49.03	1.93	111.47	1.26	139.93	28	2356	0.49	0.129	0.09	11.89	0.01	0.000
49.11	1.92	113.64	1.25	142.07	29	2373	0.49	0.127	0.08	11.89	0.01	0.000
49.15	1.91	115.97	1.24	144.34	29	2389	0.49	0.125	0.08	11.89	0.01	0.000
49.22	1.90	118.12	1.24	146.43	29	2405	0.49	0.124	0.08	11.89	0.01	0.000
49.30	1.87	122.04	1.22	148.48	29	2352	0.49	0.130	0.08	11.89	0.01	0.000
49.37	1.98	79.42	1.29	102.62	21	2754	0.48	0.094	0.09	11.89	0.01	0.000
49.41	1.95	80.91	1.27	102.76	21	2700	0.48	0.097	0.09	11.89	0.01	0.000
49.49	1.95	82.22	1.27	104.27	21	2738	0.48	0.095	0.09	11.89	0.01	0.000
49.57	1.96	83.36	1.28	106.34	22	2820	0.48	0.089	0.08	11.89	0.01	0.000
49.61	1.97	84.51	1.28	108.33	22	2893	0.48	0.085	0.07	11.89	0.01	0.000
49.68	2.02	80.00	1.32	105.88	22	2928	0.48	0.083	0.07	11.89	0.01	0.000
49.75	2.03	81.87	1.33	108.89	23	3028	0.48	0.078	0.07	11.89	0.01	0.000
49.81	2.03	83.14	1.33	110.87	23	3093	0.48	0.076	0.06	11.89	0.01	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)

Total estimated settlement: 1.44

Abbreviations

Q_{tn}: Equivalent clean sand normalized cone resistance
K_c: Fines correction factor
$Q_{tn,cs}$: Post-liquefaction volumentric strain
G_{max}: Small strain shear modulus
CSR: Soil cyclic stress ratio
γ: Cyclic shear strain
$e_{vol(15)}$: Volumetric strain after 15 cycles
N_c: Equivalent number of cycles
e_v: Volumetric strain
Settle.: Calculated settlement

APPENDIX G

GENERAL GRADING GUIDELINES

Updated Geotechnical and Infiltration Evaluation
Xenia Apartment Project, Beaumont, California
Project No. 2784-CR

GEOTEK

GENERAL GRADING GUIDELINES

Guidelines presented herein are intended to address general construction procedures for earthwork construction. Specific situations and conditions often arise which cannot reasonably be discussed in general guidelines, when anticipated these are discussed in the text of the report. Often unanticipated conditions are encountered which may necessitate modification or changes to these guidelines. It is our hope that these will assist the contractor to more efficiently complete the project by providing a reasonable understanding of the procedures that would be expected during earthwork and the testing and observation used to evaluate those procedures.

General

Grading should be performed to at least the minimum requirements of governing agencies, Chapters 18 and 33 of the California Building Code, CBC (2019) and the guidelines presented below.

Preconstruction Meeting

A preconstruction meeting should be held prior to site earthwork. Any questions the contractor has regarding our recommendations, general site conditions, apparent discrepancies between reported and actual conditions and/or differences in procedures the contractor intends to use should be brought up at that meeting. The contractor (including the main onsite representative) should review our report and these guidelines in advance of the meeting. Any comments the contractor may have regarding these guidelines should be brought up at that meeting.

Grading Observation and Testing

1. Observation of the fill placement should be provided by our representative during grading. Verbal communication during the course of each day will be used to inform the contractor of test results. The contractor should receive a copy of the "Daily Field Report" indicating results of field density tests that day. If our representative does not provide the contractor with these reports, our office should be notified.
2. Testing and observation procedures are, by their nature, specific to the work or area observed and location of the tests taken, variability may occur in other locations. The contractor is responsible for the uniformity of the grading operations; our observations and test results are intended to evaluate the contractor's overall level of efforts during grading. The contractor's personnel are the only individuals participating in all aspect of site work. Compaction testing and observation should not be considered as relieving the contractor's responsibility to properly compact the fill.
3. Cleanouts, processed ground to receive fill, key excavations, and subdrains should be observed by our representative prior to placing any fill. It will be the contractor's responsibility to notify our representative or office when such areas are ready for observation.
4. Density tests may be made on the surface material to receive fill, as considered warranted by this firm.
5. In general, density tests would be made at maximum intervals of two feet of fill height or every 1,000 cubic yards of fill placed. Criteria will vary depending on soil conditions and size of the fill. More frequent testing may be performed. In any case, an adequate number of field density tests should be made to evaluate the required compaction and moisture content is generally being obtained.

6. Laboratory testing to support field test procedures will be performed, as considered warranted, based on conditions encountered (e.g. change of material sources, types, etc.) Every effort will be made to process samples in the laboratory as quickly as possible and in progress construction projects are our first priority. However, laboratory workloads may cause in delays and some soils may require a **minimum of 48 to 72 hours to complete test procedures**. Whenever possible, our representative(s) should be informed in advance of operational changes that might result in different source areas for materials.
7. Procedures for testing of fill slopes are as follows:
   a) Density tests should be taken periodically during grading on the flat surface of the fill, three to five feet horizontally from the face of the slope.
   b) If a method other than over building and cutting back to the compacted core is to be employed, slope compaction testing during construction should include testing the outer six inches to three feet in the slope face to determine if the required compaction is being achieved.
8. Finish grade testing of slopes and pad surfaces should be performed after construction is complete.

Site Clearing

1. All vegetation, and other deleterious materials, should be removed from the site. If material is not immediately removed from the site it should be stockpiled in a designated area(s) well outside of all current work areas and delineated with flagging or other means. Site clearing should be performed in advance of any grading in a specific area.
2. Efforts should be made by the contractor to remove all organic or other deleterious material from the fill, as even the most diligent efforts may result in the incorporation of some materials. This is especially important when grading is occurring near the natural grade. All equipment operators should be aware of these efforts. Laborers may be required as root pickers.
3. Nonorganic debris or concrete may be placed in deeper fill areas provided the procedures used are observed and found acceptable by our representative.

Treatment of Existing Ground

1. Following site clearing, all surficial deposits of alluvium and colluvium as well as weathered or creep effected bedrock, should be removed unless otherwise specifically indicated in the text of this report.
2. In some cases, removal may be recommended to a specified depth (e.g. flat sites where partial alluvial removals may be sufficient). The contractor should not exceed these depths unless directed otherwise by our representative.
3. Groundwater existing in alluvial areas may make excavation difficult. Deeper removals than indicated in the text of the report may be necessary due to saturation during winter months.
4. Subsequent to removals, the natural ground should be processed to a depth of six inches, moistened to near optimum moisture conditions and compacted to fill standards.
5. Exploratory back hoe or dozer trenches still remaining after site removal should be excavated and filled with compacted fill if they can be located.

Fill Placement

1. Unless otherwise indicated, all site soil and bedrock may be reused for compacted fill; however, some special processing or handling may be required (see text of report).

2. Material used in the compacting process should be evenly spread, moisture conditioned, processed, and compacted in thin lifts six (6) to eight (8) inches in compacted thickness to obtain a uniformly dense layer. The fill should be placed and compacted on a nearly horizontal plane, unless otherwise found acceptable by our representative.
3. If the moisture content or relative density varies from that recommended by this firm, the contractor should rework the fill until it is in accordance with the following:
   a) Moisture content of the fill should be at or above optimum moisture. Moisture should be evenly distributed without wet and dry pockets. Pre-watering of cut or removal areas should be considered in addition to watering during fill placement, particularly in clay or dry surficial soils. The ability of the contractor to obtain the proper moisture content will control production rates.
   b) Each six-inch layer should be compacted to at least 90 percent of the maximum dry density in compliance with the testing method specified by the controlling governmental agency. In most cases, the testing method is ASTM Test Designation D 1557.
4. Rock fragments less than eight inches in diameter may be utilized in the fill, provided:
   a) They are not placed in concentrated pockets;
   b) There is a sufficient percentage of fine-grained material to surround the rocks;
   c) The distribution of the rocks is observed by, and acceptable to, our representative.
5. Rocks exceeding eight (8) inches in diameter should be taken off site, broken into smaller fragments, or placed in accordance with recommendations of this firm in areas designated suitable for rock disposal. On projects where significant large quantities of oversized materials are anticipated, alternate guidelines for placement may be included. If significant oversize materials are encountered during construction, these guidelines should be requested.
6. In clay soil, dry or large chunks or blocks are common. If in excess of eight (8) inches minimum dimension, then they are considered as oversized. Sheepsfoot compactors or other suitable methods should be used to break up blocks. When dry, they should be moisture conditioned to provide a uniform condition with the surrounding fill.

Slope Construction

1. The contractor should obtain a minimum relative compaction of 90 percent out to the finished slope face of fill slopes. This may be achieved by either overbuilding the slope and cutting back to the compacted core, or by direct compaction of the slope face with suitable equipment.
2. Slopes trimmed to the compacted core should be overbuilt by at least three (3) feet with compaction efforts out to the edge of the false slope. Failure to properly compact the outer edge results in trimming not exposing the compacted core and additional compaction after trimming may be necessary.
3. If fill slopes are built "at grade" using direct compaction methods, then the slope construction should be performed so that a constant gradient is maintained throughout construction. Soil should not be "spilled" over the slope face nor should slopes be "pushed out" to obtain grades. Compaction equipment should compact each lift along the immediate top of slope. Slopes should be back rolled or otherwise compacted at approximately every 4 feet vertically as the slope is built.
4. Corners and bends in slopes should have special attention during construction as these are the most difficult areas to obtain proper compaction.
5. Cut slopes should be cut to the finished surface. Excessive undercutting and smoothing of the face with fill may necessitate stabilization.

UTILITY TRENCH CONSTRUCTION AND BACKFILL

Utility trench excavation and backfill is the contractors responsibility. The geotechnical consultant typically provides periodic observation and testing of these operations. While efforts are made to make sufficient observations and tests to verify that the contractors' methods and procedures are adequate to achieve proper compaction, it is typically impractical to observe all backfill procedures. As such, it is critical that the contractor use consistent backfill procedures.

Compaction methods vary for trench compaction and experience indicates many methods can be successful. However, procedures that "worked" on previous projects may or may not prove effective on a given site. The contractor(s) should outline the procedures proposed, so that we may discuss them **prior** to construction. We will offer comments based on our knowledge of site conditions and experience.

1. Utility trench backfill in slopes, structural areas, in streets and beneath flat work or hardscape should be brought to at least optimum moisture and compacted to at least 90 percent of the laboratory standard. Soil should be moisture conditioned prior to placing in the trench.
2. Flooding and jetting are not typically recommended or acceptable for native soils. Flooding or jetting may be used with select sand having a Sand Equivalent (SE) of 30 or higher. This is typically limited to the following uses:
   a) shallow (12 + inches) under slab interior trenches and,
   b) as bedding in pipe zone.

   The water should be allowed to dissipate prior to pouring slabs or completing trench compaction.
3. Care should be taken not to place soils at high moisture content within the upper three feet of the trench backfill in street areas, as overly wet soils may impact subgrade preparation. Moisture may be reduced to 2% below optimum moisture in areas to be paved within the upper three feet below sub grade.
4. Sand backfill should not be allowed in exterior trenches adjacent to and within an area extending below a 1:1 projection from the outside bottom edge of a footing, unless it is similar to the surrounding soil.
5. Trench compaction testing is generally at the discretion of the geotechnical consultant. Testing frequency will be based on trench depth and the contractors procedures. A probing rod would be used to assess the consistency of compaction between tested areas and untested areas. If zones are found that are considered less compact than other areas, this would be brought to the contractors attention.

JOB SAFETY

General

Personnel safety is a primary concern on all job sites. The following summaries are safety considerations for use by all our employees on multi-employer construction sites. On ground personnel are at highest risk of injury and possible fatality on grading construction projects. The company recognizes that construction activities will vary on each site and that job site safety is the contractor's responsibility. However, it is, imperative that all personnel be safety conscious to avoid accidents and potential injury.

In an effort to minimize risks associated with geotechnical testing and observation, the following precautions are to be implemented for the safety of our field personnel on grading and construction projects.

1. Safety Meetings: Our field personnel are directed to attend the contractor's regularly scheduled safety meetings.
2. Safety Vests: Safety vests are provided for and are to be worn by our personnel while on the job site.
3. Safety Flags: Safety flags are provided to our field technicians; one is to be affixed to the vehicle when on site, the other is to be placed atop the spoil pile on all test pits.

In the event that the contractor's representative observes any of our personnel not following the above, we request that it be brought to the attention of our office.

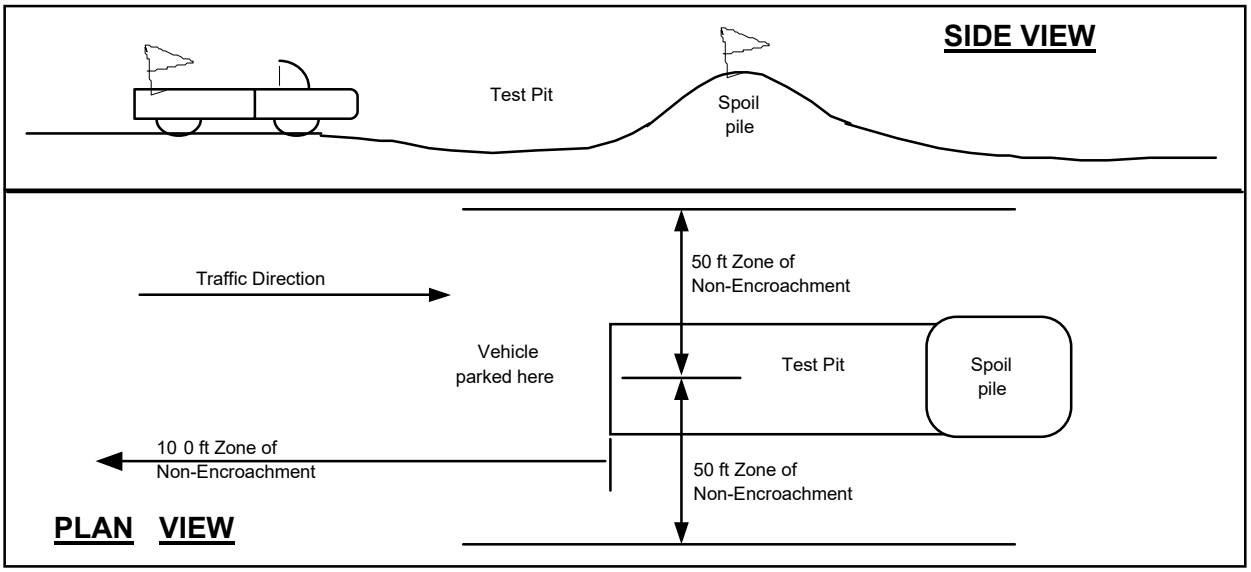
Test Pits Location, Orientation and Clearance

The technician is responsible for selecting test pit locations. The primary concern is the technician's safety. However, it is necessary to take sufficient tests at various locations to obtain a representative sampling of the fill. As such, efforts will be made to coordinate locations with the grading contractors authorized representatives (e.g. dump man, operator, supervisor, grade checker, etc.), and to select locations following or behind the established traffic pattern, preferably outside of current traffic. The contractors authorized representative should direct excavation of the pit and safety during the test period. Again, safety is the paramount concern.

Test pits should be excavated so that the spoil pile is placed away from oncoming traffic. The technician's vehicle is to be placed next to the test pit, opposite the spoil pile. This necessitates that the fill be maintained in a drivable condition. Alternatively, the contractor may opt to park a piece of equipment in front of test pits, particularly in small fill areas or those with limited access.

A zone of non-encroachment should be established for all test pits (see diagram below). No grading equipment should enter this zone during the test procedure. The zone should extend outward to the sides approximately 50 feet from the center of the test pit and 100 feet in the direction of traffic flow. This zone is established both for safety and to avoid excessive ground vibration, which typically decreases test results.

TEST PIT SAFETY PLAN



Slope Tests

When taking slope tests, the technician should park their vehicle directly above or below the test location on the slope. The contractor's representative should effectively keep all equipment at a safe operation distance (e.g. 50 feet) away from the slope during testing.

The technician is directed to withdraw from the active portion of the fill as soon as possible following testing. The technician's vehicle should be parked at the perimeter of the fill in a highly visible location.

Trench Safety

It is the contractor's responsibility to provide safe access into trenches where compaction testing is needed. Trenches for all utilities should be excavated in accordance with CAL-OSHA and any other applicable safety standards. Safe conditions will be required to enable compaction testing of the trench backfill.

All utility trench excavations in excess of 5 feet deep, which a person enters, are to be shored or laid back. Trench access should be provided in accordance with OSHA standards. Our personnel are directed not to enter any trench by being lowered or "riding down" on the equipment.

Our personnel are directed not to enter any excavation which;

1. is 5 feet or deeper unless shored or laid back,
2. exit points or ladders are not provided,
3. displays any evidence of instability, has any loose rock or other debris which could fall into the trench, or
4. displays any other evidence of any unsafe conditions regardless of depth.

If the contractor fails to provide safe access to trenches for compaction testing, our company policy requires that the soil technician withdraws and notifies their supervisor. The contractors representative will then be contacted in an effort to effect a solution. All backfill not tested due to safety concerns or other reasons is subject to reprocessing and/or removal.

Procedures

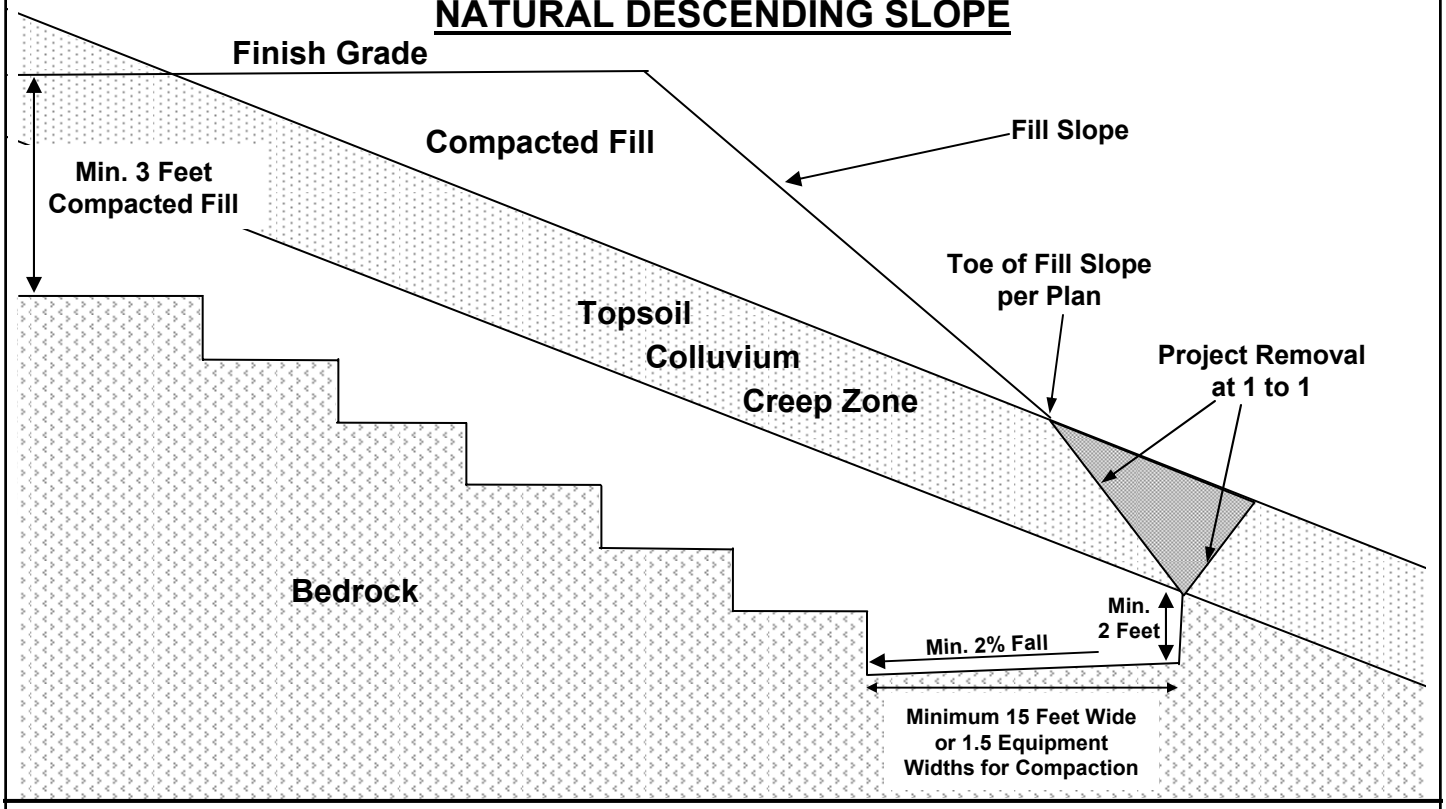
In the event that the technician's safety is jeopardized or compromised as a result of the contractor's failure to comply with any of the above, the technician is directed to inform both the developer's and contractor's representatives. If the condition is not rectified, the technician is required, by company policy, to immediately withdraw and notify their supervisor. The contractor's representative will then be contacted in an effort to effect a solution. No further testing will be performed until the situation is rectified. Any fill placed in the interim can be considered unacceptable and subject to reprocessing, recompaction or removal.

In the event that the soil technician does not comply with the above or other established safety guidelines, we request that the contractor bring this to technicians attention and notify our project manager or office. Effective communication and coordination between the contractors' representative and the field technician(s) is strongly encouraged in order to implement the above safety program and safety in general.

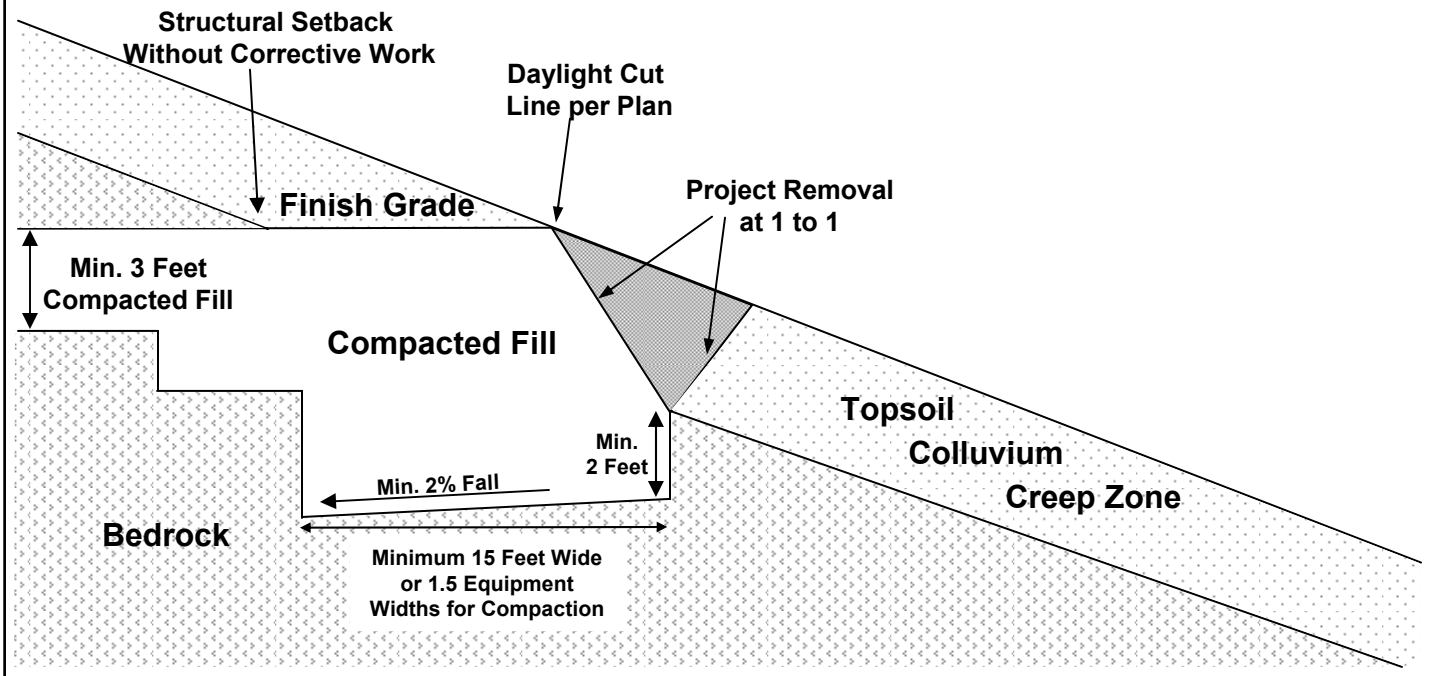
The safety procedures outlined above should be discussed at the contractor's safety meetings. This will serve to inform and remind equipment operators of these safety procedures particularly the zone of non-encroachment.

The safety procedures outlined above should be discussed at the contractor's safety meetings. This will serve to inform and remind equipment operators of these safety procedures particularly the zone of non-encroachment.

TYPICAL FILL SLOPE OVER NATURAL DESCENDING SLOPE



DAYLIGHT CUT AREA OVER NATURAL DESCENDING SLOPE



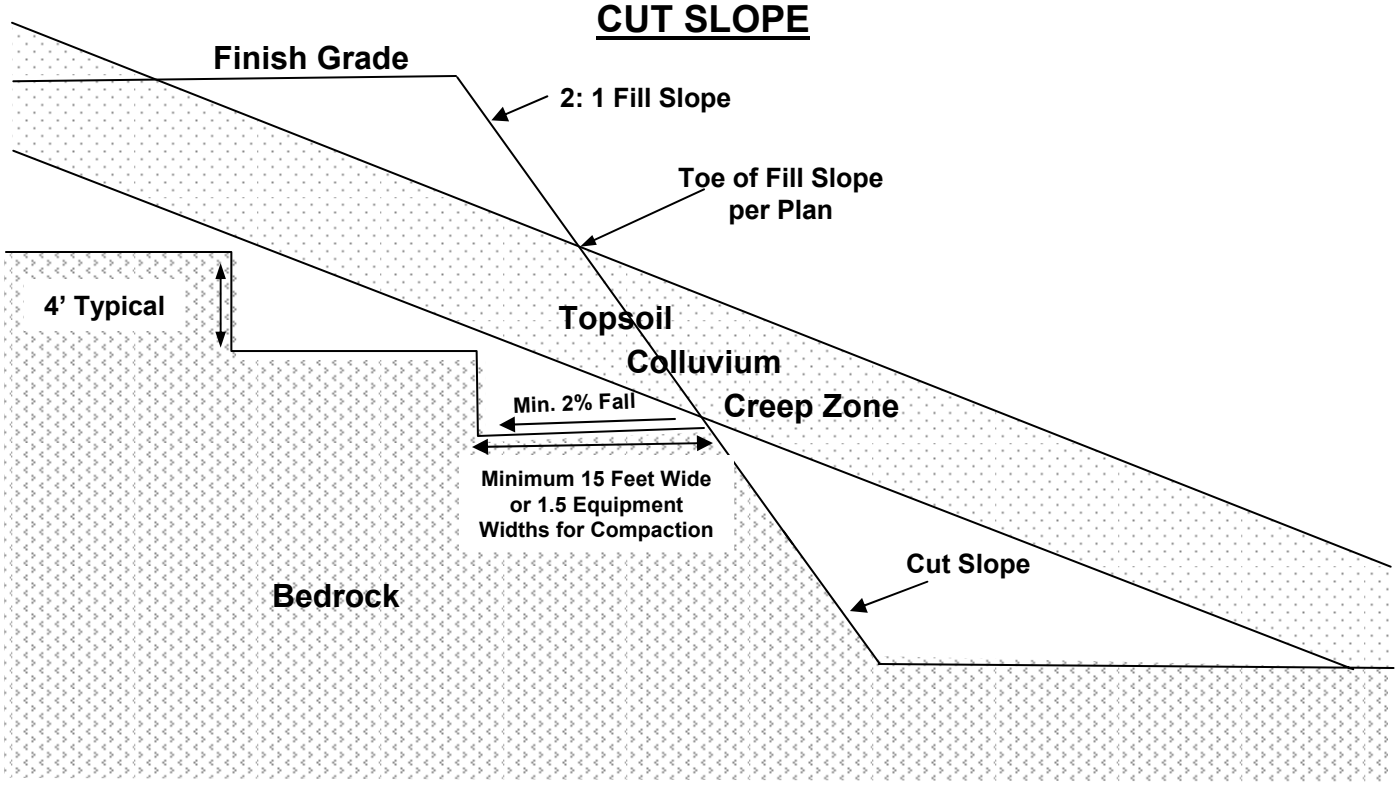
GEOTEK
1548 North Maple Street
Corona, California 92880

TREATMENT ABOVE NATURAL SLOPES

STANDARD GRADING GUIDELINES

PLATE G-1

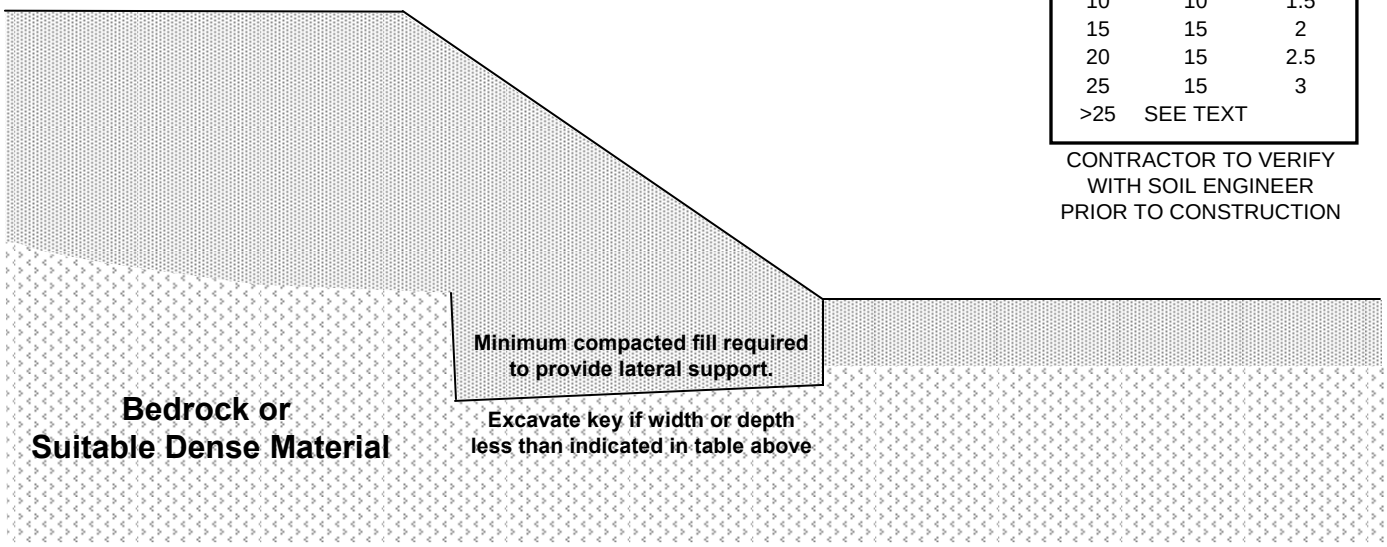
TYPICAL FILL SLOPE OVER CUT SLOPE



TYPICAL FILL SLOPE

SLOPE HEIGHT	MIN. KEY WIDTH	MIN. KEY DEPTH
5	7	1
10	10	1.5
15	15	2
20	15	2.5
25	15	3
>25	SEE TEXT	

CONTRACTOR TO VERIFY WITH SOIL ENGINEER PRIOR TO CONSTRUCTION



GEOTEK
1548 North Maple Street
Corona, California 92880

COMMON FILL SLOPE KEYS

STANDARD GRADING GUIDELINES

PLATE G-2

Appendix 4: Historical Site Conditions

Not Applicable

Appendix 5: LID Infeasibility

Not Applicable

Appendix 6: BMP Design Details

Santa Ana Watershed - BMP Design Volume, V_{BMP}

(Rev. 10-2011)

Legend: Required Entries / Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name: SP2 | Date: 5/26/2022

Designed by: A. Jaramillo | Case No: PW2021-0822

Company Project Number/Name: Xenia Apartments

BMP Identification

BMP NAME / ID: DMA 1

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth, from the Isohyetal Map in Handbook Appendix E

D_{85} = 0.85 inches

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
Imperv: Roofs, Sidewalks & Parking/ Streets	*201,250*	*Concrete or Asphalt*	*1*	*0.89*	*179515*			
Pervious: Open Space/Landscaping	*44,922*	*Ornamental Landscaping*	*0.1*	*0.11*	*4962*			
Basin	*21341*	*Ornamental Landscaping*	*0.1*	*0.11*	*2357.3*			

Extended Detention Basin Design Procedure	BMP Subarea No. Basin "A"	Legend:	Required Entries / Calculated Cells

Company Name: SP2 Date: 9/18/2022

Designed by: Alex Jaramillo County/City Case No.: W2021-082

Design Volume

Tributary Area (BMP Subarea) A_T = 6.14 acres

Enter V_{BMP}, determined from Section 2.1 of this Handbook V_{BMP} = 13,234 ft^3

Basin Footprint

Overall Geometry

Length at Basin Bottom Surface Length = 241 ft

Width at Basin Bottom Surface Width = 87 ft

Meets 1.5 : 1 requirement? ✓

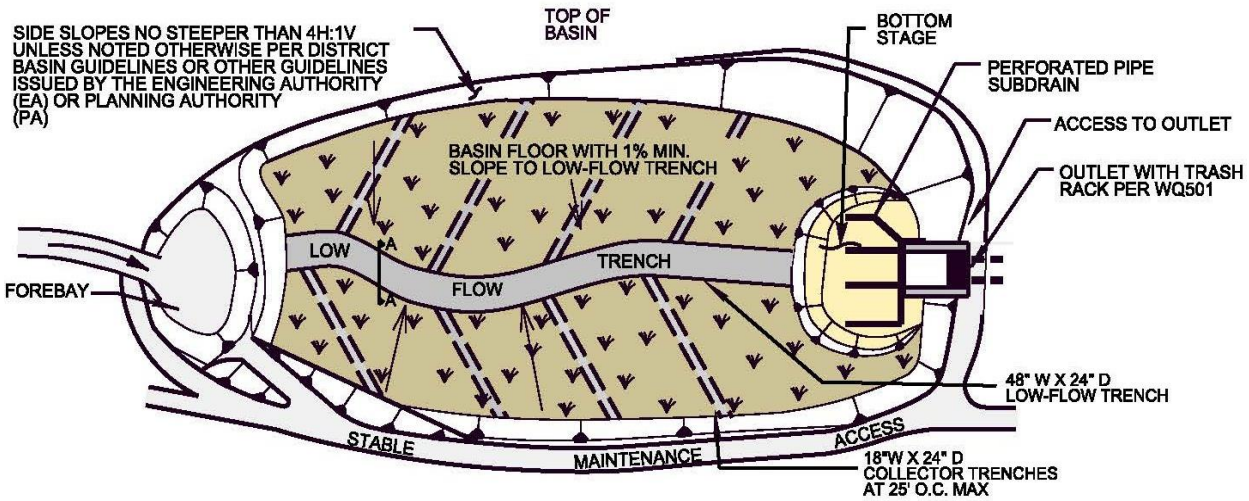
Side Slopes per "Basin Guidelines", Sect. 1.2 z = 4 :1

Proposed Basin Depth (with no freeboard) D_B = 3.00 ft

Depth of freeboard (if used) D_{FB} = 1.00 ft

Minimum Required Allowance for Total Depth (including proposed basin depth, freeboard, minimum depth of bottom stage (D_{BS}=0.33') and minimum filter depth (D_{FD}=2.33')) D_{REQ} = 6.7 ft

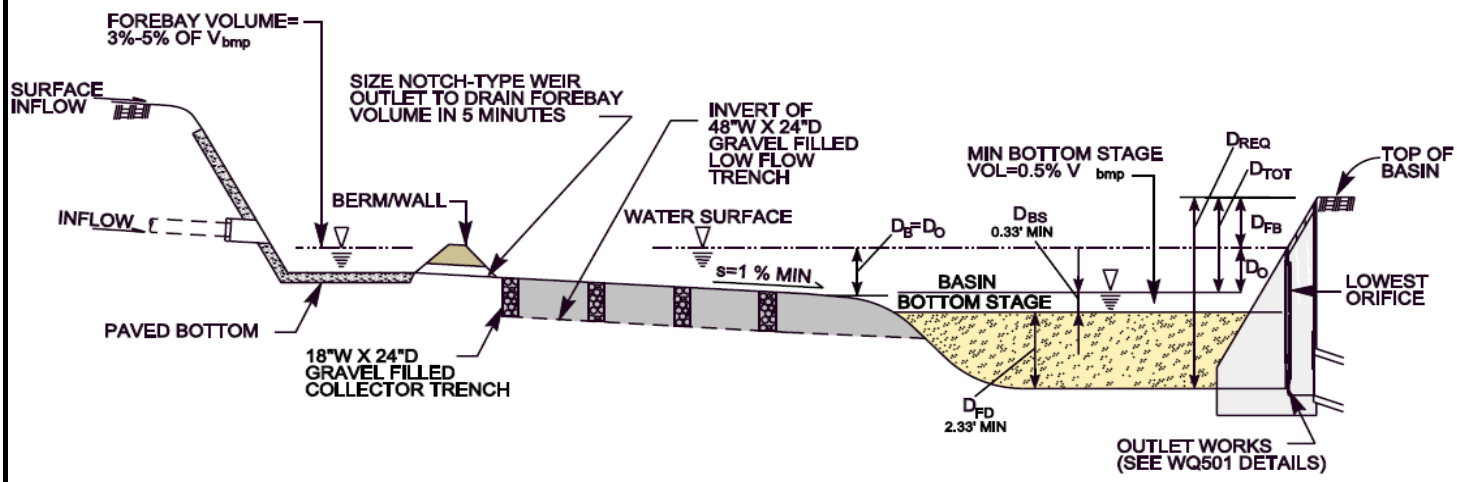
Depth from design water surface elevation to lowest orifice D_O = 3.0 ft



Basin Design

Basin Design

Proposed Total Basin Depth (proposed depth plus freeboard)	D_{TOT} =	4.00	ft
Basin Invert Longitudinal Slope	Slope =	1.00	%
Basin Invert Transverse Slope (1% min)	Slope =	1	%
Basin Volume	V_{Basin} =	89066	ft^3



Forebay Design

Forebay Volume (3 - 5% V_{BMP})	V_{FB} =	530	ft^3
Forebay Depth (height of berm)	D_{FBY} =	1	ft
Minimum Forebay Surface Area	A_{FB} =	530	ft^2
Rectangular weir (notch)	W =	6.00	in

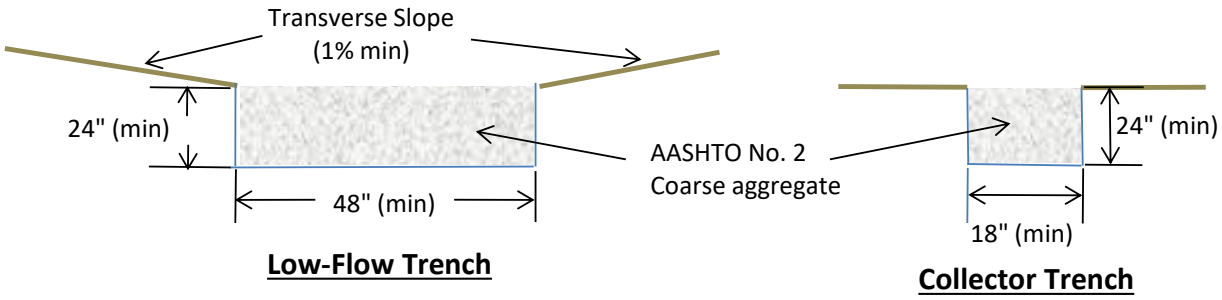
Dry Weather and Low-Flow Management

Low-Flow Trench (see graphic below)

Depth (24 inches minimum, gravel filled)	Depth =	24	inches
Width (48 inches minimum)	Width =	48	inches
Trench Invert Longitudinal Slope	Slope =	1	%

Collector Trenches (see graphic below)

Depth (24 inches minimum)	Depth =	24	inches
Width (18 inches minimum)	Width =	18	inches
Trench Invert Longitudinal Slope	Slope =	1	%
Spacing (25 feet on center maximum)	S =	20	feet



Low-Flow Trench **Collector Trench**

Bottom Stage (Sand Filter) Design

Depth of the Bottom Stage (4" minimum ponding)	D_{BS} =	6	in
Surface Area of Bottom Stage	A_{BS} =	132	ft^2
Dry Weather Ponded Volume (above sand layer)	V_{BS} =	66	ft^3

Is V_{BS} no less than 0.5% V_{BMP}? OK

Depth of ASTM-C33 sand (18 inch minimum)

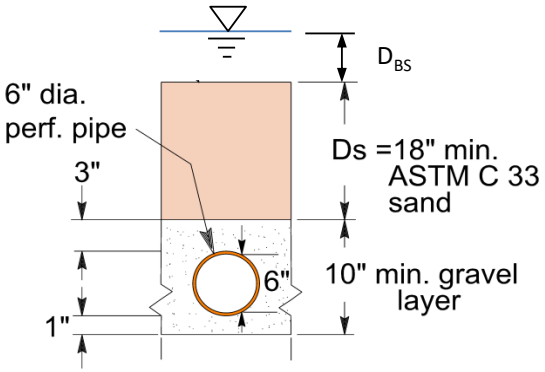
Ds = 18 inches

Diameter of Subdrains

ϕ = 6 in

Subdrain Spacing

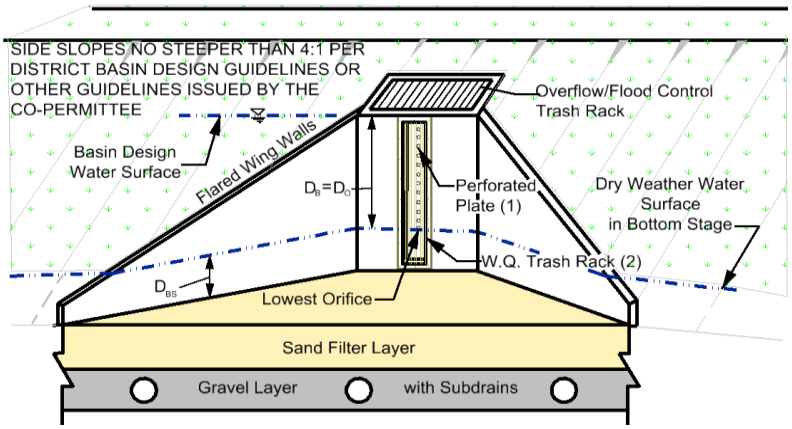
s = 10 ft. on center



Basin Outlet Design

Outlet Design

Assume an orifice area. Based on the information provided above, the spreadsheet provides discharge vs. stage data. Enter the volume vs. stage data for each interval. This information is used to route the volume through the basin. The size of the orifice is acceptable when the data shows that less than 50% of V_{BMP} has drained in 24 hours, and that 100% drawdown occurs within 72 hours.



Flow Rate, Q (cfs)

$$Q=CA[2g(H-H_o)]^{0.5}$$

Discharge Coefficient,

Default, C = 0.66

Other, C =

Orifice Area (ft^2)

Orifice Diameter, d; number of orifices per row, n; and number of orifice rows, N (from the bottom up).

d = 1.85 inches

n = 1 per row

N = 1 rows

Aeff = 0.019 ft^2 per row

or

Aeff = 2.687 in^2 per row

From outflow hydrograph, the time where 50% of V_{BMP} has drained from the basin (24 hour minimum):

Time (50%) = 24.93 hrs

OK

From outflow hydrograph, the time where 100% V_{BMP} has drained from the basin(within 72 hours):

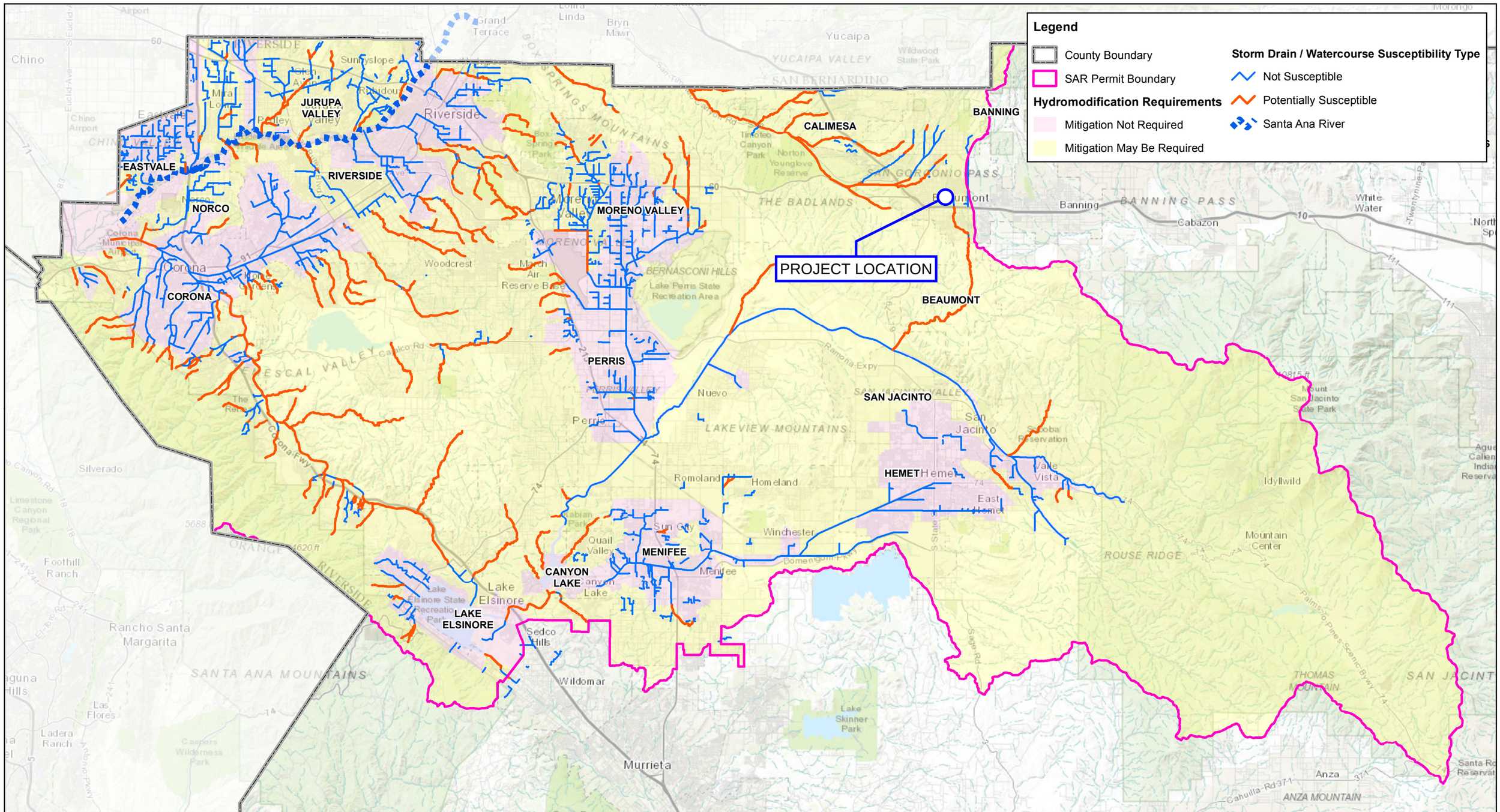
Time (100 %) = 68.55 hrs

OK

Headwater Elev. / Stage (ft)	Discharge (cfs)	Volume (acre-ft)	Δt (hrs.)
0	0.0000	0.0000	
0.33	0.0570	0.070	29.71
0.67	0.0807	0.140	12.30
1.00	0.0988	0.210	9.44
1.33	0.1141	0.290	9.09
1.67	0.1276	0.370	8.01
2.00	*0.1398*	*0.450*	
2.33	*0.1509*	*0.540*	
2.67	*0.1614*	*0.630*	
3.00	*0.1712*	*0.730*	
3.33			
3.67			
4.00			
4.33			
4.67			
5.00			
5.33			
5.67			
6.00			
6.33			
6.67			
7.00			
7.33			
7.67			
8.00			
8.33			
8.67			
9.00			
9.33			
9.67			
10.00			
		∑ =	68.55

Notes:

Appendix 7: Hydromodification


Legend
County Boundary
SAR Permit Boundary
Hydromodification Requirements
Mitigation Not Required
Mitigation May Be Required
Storm Drain / Watercourse Susceptibility Type
Not Susceptible
Potentially Susceptible
Santa Ana River
PROJECT LOCATION
EASTVALE
JURUPA VALLEY
RIVERSIDE
NORCO
CORONA
MORENO VALLEY
PERRIS
CALIMESA
BANNING
BEAUMONT
SAN JACINTO
HEMET
MENIFEE
CANYON LAKE
LAKE ELSINORE
Riverside
Corona
Norco
Eastvale
Jurupa Valley
Moreno Valley
Perris
Calimesa
Banning
Beaumont
San Jacinto
Hemet
Menifee
Canyon Lake
Lake Elsinore
Murrieta
Wildomar
Temecula
Yucaipa
Chino
Silverado
Rancho Santa Margarita
Foothill Ranch
Ladera Ranch
Las Flores
Idyllwild
Mountain Center
Anza
Cahuilla
Romoland
Homeland
Winchester
Sun City
Quail Valley
Sedco Hills
Lake Skinner Park
Lake Elsinore State Recreation Park
Lake Perris State Recreation Area
March Air Reserve Base
Woodcrest
Nuevo
Lakeview Mountains
San Bernardino Mountains
Santa Ana Mountains
Box Spring Mountains
Bernasconi Hills
The Badlands
San Gorgonio Pass
Banning Pass
Rouse Ridge
Anza Mountain
Cajalco Rd
Ramona Expy
Temescal Valley
Riverside
Orange
San Diego
N
0 2.5 5 10 Miles
Updated February 2017
HCOC Applicability Map
SAR Permittees
Map 2

XENIA - PRESENT CONDITION



Xenia Unit Hydrograph Flow Rates

Undeveloped								
Area X1	2Y 1H	2Y 3H	2Y 6H	2Y 24H	100Y 1H	100Y 3H	100Y 6H	100Y 24H
Peak Flow (cfs) 3.81 Ac.	3.1	1.6	1.1	0.3	10.3	6.7	6.2	2.9
Volume (cf)	3,258	3,730	4,127	7,480	15,457	23,173	29,060	53,504
Volume (ac/ft)	0.07	0.09	0.09	0.17	0.35	0.53	0.67	1.23
Area X2	2Y 1H	2Y 3H	2Y 6H	2Y 24H	100Y 1H	100Y 3H	100Y 6H	100Y 24H
Peak Flow (cfs) 10.08 Ac.	8.7	3.8	2.6	0.7	28.1	16.9	15.2	7.6
Volume (cf)	8,512	9,630	10,561	18,959	40,916	61,375	77,008	141,320
Volume (ac/ft)	0.20	0.22	0.24	0.44	0.94	1.41	1.77	3.24
Area X3	2Y 1H	2Y 3H	2Y 6H	2Y 24H	100Y 1H	100Y 3H	100Y 6H	100Y 24H
Peak Flow (cfs) 1.41 Ac.	1.4	0.6	0.5	0.2	4.2	2.5	2.4	1.1
Volume (cf)	1,427	1,857	2,254	4,382	5,668	8,432	10,530	20,422
Volume (ac/ft)	0.03	0.04	0.05	0.10	0.13	0.19	0.24	0.47

Xenia Unit Hydrograph Flow Rates

Developed								
Area D1	2Y 1H	2Y 3H	2Y 6H	2Y 24H	100Y 1H	100Y 3H	100Y 6H	100Y 24H
Peak Flow (cfs) 0.27 Ac.	0.4	0.2	0.2	0.07	1.0	0.5	0.5	0.2
Volume (cf)	443	718	923	1,835	1,161	1,841	2,488	5,240
Volume (ac/ft)	0.01	0.02	0.02	0.04	0.03	0.04	0.06	0.12
Area D2	2Y 1H	2Y 3H	2Y 6H	2Y 24H	2Y 1H	2Y 3H	2Y 6H	2Y 24H
Peak Flow (cfs) 14.83 Ac.	16.2	8.9	7.3	3.4	41.9	25.6	23.8	11.8
Volume (cf)	22,544	35,641	45,689	90,759	62,432	97,213	129,550	270,069
Volume (ac/ft)	0.52	0.82	1.05	2.08	1.43	2.23	2.97	6.20
Area D3	2Y 1H	2Y 3H	2Y 6H	2Y 24H	2Y 1H	2Y 3H	2Y 6H	2Y 24H
Peak Flow (cfs) 0.14 Ac.	0.16	0.04	0.02	0.01	0.5	0.3	0.2	0.1
Volume (cf)	85	66	69	129	514	694	782	1,419
Volume (ac/ft)	0.002	0.002	0.002	0.003	0.012	0.016	0.018	0.033
Area D2 w/Detention	2Y 1H	2Y 3H	2Y 6H	2Y 24H	2Y 1H	2Y 3H	2Y 6H	2Y 24H
Peak Flow 14.83 Ac.	0.6	0.8	0.9	1.2	5.7	24.4	22.5	11.7
Peak Basin Depth	2.2	3.1	3.8	5.3	5.6	6.0	5.9	5.7

Xenia - Preliminary Drainage Study

Preliminary Extended Detention Basin "A"

Input	Basin Depth (ft)	El. (ft)	Contour Area (sf)	Inc. Vol (cf)	Inc. Vol (af)	Total Vol. (af)	WQ Orifice Outflow (cfs) [D=2.06"]	Stage 1: Orifice Outflow (cfs) [d=4.1"]	Stage 2: CB110 Rec. Weir Outflow (cfs) [L=20 ft]	Stage 3: V-Ditch (cfs)	Total Q_{out} (cfs)
1	0	2,597.50	8,640				0.00				**0.00**
2	0.33	2,597.83	9,067	2,921	0.07	**0.07**	0.06				**0.06**
3	0.67	2,598.17	9,532	3,069	0.07	**0.14**	0.08				**0.08**
4	1	2,598.50	9,984	3,220	0.07	**0.21**	0.10				**0.10**
5	1.33	2,598.83	10,440	3,370	0.08	**0.29**	0.11				**0.11**
6	1.67	2,599.17	10,907	3,522	0.08	**0.37**	0.13	0.27			**0.39**
7	2	2,599.50	11,394	3,679	0.08	**0.45**	0.14	0.39			**0.53**
8	2.33	2,599.83	11,904	3,844	0.09	**0.54**	0.15	0.48			**0.63**
9	2.67	2,600.17	12,385	4,007	0.09	**0.63**	0.16	0.55			**0.72**
10	3	2,600.50	12,900	4,172	0.10	**0.73**	0.17	0.62			**0.79**
11	3.5	2,601.00	13,696	4,388	0.10	**0.83**	0.18	0.71			**0.89**
12	4	2,601.50	14,522	4,655	0.11	**0.94**	0.20	0.79			**0.99**
13	4.5	2,602.00	15,372	4,932	0.11	**1.05**	0.21	0.86			**1.07**
14	5	2,602.50	16,235	5,215	0.12	**1.17**	0.22	0.93			**1.15**
15	5.5	2,603.00	17,110	5,501	0.13	**1.30**	0.23	0.99	0.00		**1.22**
16	6	2,603.50	17,998	5,792	0.13	**1.43**	0.24	1.04	23.55	0.59	**25.42**
17	6.5	2,604.00	18,900	6,088	0.14	**1.57**	0.25	1.10	66.60	3.73	**71.68**
18	7	2,604.50	19,824	6,389	0.15	**1.72**	0.26	1.15	122.35	8.71	**132.48**
19	7.5	2,605.00	20,768	6,697	0.15	**1.87**	0.27	1.20	188.37	16.57	**206.42**

Weir Flow	Q=(Cw)(L)(	Stage 1	Stage 2
	L (ft)	0	20
	Cw	3.33	3.33

Orifice Outflow	Q=Ca(2gh)^0.5	
d (in)=	1.85	4.1
C=	0.66	0.66
A (ft^2)=	0.019	0.092

Site Flow Rate Summary								
Undeveloped	2Y 1H	2Y 3H	2Y 6H	2Y 24H	100Y 1H	100Y 3H	100Y 6H	100Y 24H
Total Site Peak Flow (cfs) 15.3 Ac.	13.2	6.0	4.2	1.2	42.7	26.1	23.9	11.6
Developed	2Y 1H	2Y 3H	2Y 6H	2Y 24H	100Y 1H	100Y 3H	100Y 6H	100Y 24H
Total Site Peak Flow (cfs) 15.3 Ac.	16.8	9.2	7.5	3.5	43.5	26.4	24.5	12.1
Mitigation Status	Fail	Fail	Fail	Fail	Fail	Fail	Fail	Fail
Developed w/ Detention Routing	2Y 1H	2Y 3H	2Y 6H	2Y 24H	100Y 1H	100Y 3H	100Y 6H	100Y 24H
Total Site Peak Flow (cfs) 68.7 Ac.	1.2	1.0	1.1	1.3	7.3	25.2	23.2	12.0
Percent Difference	-91%	-83%	-73%	6%	-83%	-3%	-3%	4%
Mitigation Status	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Maximum Basin W.S.E. (ft)	2600.7	2601.6	2602.3	2603.8	2604.1	2604.5	2604.4	2604.2

See drainage report for supporting model output files and calculations for unit hydrographs and basin routing.

Appendix 8: Source Control Checklist

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

How to use this worksheet (also see instructions in Section G of the WQMP Template):

1. Review Column 1 and identify which of these potential sources of stormwater pollutants apply to your site. Check each box that applies.
2. Review Column 2 and incorporate all of the corresponding applicable BMPs in your WQMP Exhibit.
3. Review Columns 3 and 4 and incorporate all of the corresponding applicable permanent controls and operational BMPs in your WQMP. Use the format shown in Table G.1on page 23 of this WQMP Template. Describe your specific BMPs in an accompanying narrative, and explain any special conditions or situations that required omitting BMPs or substituting alternative BMPs for those shown here.

IF THESE SOURCES WILL BE ON THE PROJECT SITE …	… THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 **Potential Sources of Runoff Pollutants**	**2** **Permanent Controls—Show on WQMP Drawings**	**3** **Permanent Controls—List in WQMP Table and Narrative**	**4** **Operational BMPs—Include in WQMP Table and Narrative**
☒ **A. On-site storm drain inlets**	☒ **Locations of inlets.** **(shown on Rough Grading Plans)**	☒ **Mark all inlets with the words "Only Rain Down the Storm Drain" or similar. Catch Basin Markers may be available from the Riverside County Flood Control and Water Conservation District, call 951.955.1200 to verify.**	☒ **Maintain and periodically repaint or replace inlet markings.** ☒ **Provide stormwater pollution prevention information to new site owners, lessees, or operators.** ☒ **See applicable operational BMPs in Fact Sheet SC-44, "Drainage System Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com**
☐ **B. Interior floor drains and elevator shaft sump pumps**		☐ **State that interior floor drains and elevator shaft sump pumps will be plumbed to sanitary sewer.**	☐ **Inspect and maintain drains to prevent blockages and overflow.**
☐ **C. Interior parking garages**		☐ **State that parking garage floor drains will be plumbed to the sanitary sewer.**	☐ **Inspect and maintain drains to prevent blockages and overflow.**

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE …	… THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 **Potential Sources of Runoff Pollutants**	2 **Permanent Controls—Show on WQMP Drawings**	3 **Permanent Controls—List in WQMP Table and Narrative**	4 **Operational BMPs—Include in WQMP Table and Narrative**
☒ **D1.** Need for future indoor & structural pest control		☒ Note building design features that discourage entry of pests.	☒ Provide Integrated Pest Management information to owners, lessees, and operators.
☒ **D2.** Landscape/ Outdoor Pesticide Use	☒ Show locations of native trees or areas of shrubs and ground cover to be undisturbed and retained. ☐ Show self-retaining landscape areas, if any. ☐ Show stormwater treatment and hydrograph modification management BMPs. (See instructions in Chapter 3, Step 5 and guidance in Chapter 5.)	State that final landscape plans will accomplish all of the following. ☐ Preserve existing native trees, shrubs, and ground cover to the maximum extent possible. ☒ Design landscaping to minimize irrigation and runoff, to promote surface infiltration where appropriate, and to minimize the use of fertilizers and pesticides that can contribute to stormwater by following manufacturers guidelines. ☒ pollution. Where landscaped areas are used to retain or detain stormwater, specify plants that are tolerant of saturated ☒ soil conditions. ☒ Consider using pest-resistant plants, especially adjacent to hardscape. To insure successful establishment, select plants appropriate to site soils, slopes, climate, sun, wind, rain, land use, air movement, ecological consistency, and plant interactions.	☒ Maintain landscaping using minimum or no pesticides. ☒ See applicable operational BMPs in **"What you should know for…..Landscape and Gardening"** at http://rcflood.org/stormwater/**Error! Hyperlink reference not valid.** Provide IPM information to new ☐ owners, lessees and operators.

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 **Potential Sources of Runoff Pollutants**	**2** **Permanent Controls—Show on WQMP Drawings**	**3** **Permanent Controls—List in WQMP Table and Narrative**	**4** **Operational BMPs—Include in WQMP Table and Narrative**
☒ **E.** Pools, spas, ponds, decorative fountains, and other water features.	☒ Show location of water feature and a sanitary sewer cleanout in an accessible area within 10 feet. (Exception: Public pools must be plumbed according to County Department of Environmental Health Guidelines.)	If the Co-Permittee requires pools to be plumbed to the sanitary sewer, place a note on the plans and state in the narrative that this connection will be made according to local requirements.	☒ See applicable operational BMPs in "Guidelines for Maintaining Your Swimming Pool, Jacuzzi and Garden Fountain" at http://rcflood.org/stormwater/
☐ **F.** Food service	☐ For restaurants, grocery stores, and other food service operations, show location (indoors or in a covered area outdoors) of a floor sink or other area for cleaning floor mats, containers, and equipment. ☐ On the drawing, show a note that this drain will be connected to a grease interceptor before discharging to the sanitary sewer.	☐ Describe the location and features of the designated cleaning area. ☐ Describe the items to be cleaned in this facility and how it has been sized to insure that the largest items can be accommodated.	☐ See the brochure, "The Food Service Industry Best Management Practices for: Restaurants, Grocery Stores, Delicatessens and Bakeries" at http://rcflood.org/stormwater/ Provide this brochure to new site owners, lessees, and operators.

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

☒ **G.** Refuse areas	☒ Show where site refuse and recycled materials will be handled and stored securely for pickup. See local municipal requirements for sizes and other details of refuse areas. ☒ If dumpsters or other receptacles are outdoors, show how the designated area will be covered, graded, and paved to prevent run-on and show locations of berms to prevent runoff from the area.	☒ State how site refuse will be handled and provide supporting detail to what is shown on plans. ☒ State that signs will be posted on or near dumpsters with the words "Do not dump hazardous materials here" or similar.	☒ State how the following will be implemented: Provide adequate number of receptacles. Inspect receptacles regularly; repair or replace leaky receptacles. Keep receptacles covered. Prohibit/prevent dumping of liquid or hazardous wastes. Post "no hazardous materials" signs. Inspect and pick up litter daily and clean up spills immediately. See Fact Sheet WM-4 "Spill Prevention and Control" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com Keep spill control materials available on-site. See Fact Sheet SC-34, "Waste Handling and Disposal" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 **Potential Sources of Runoff Pollutants**	**2** **Permanent Controls—Show on WQMP Drawings**	**3** **Permanent Controls—List in WQMP Table and Narrative**	**4** **Operational BMPs—Include in WQMP Table and Narrative**
☐ **H.** Industrial processes.	☐ Show process area.	☐ If industrial processes are to be located on site, state: "All process activities to be performed indoors. No processes to drain to exterior or to storm drain system."	☐ See Fact Sheet SC-10, "Non-Stormwater Discharges" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com See the brochure "Industrial & Commercial Facilities Best Management Practices for: Industrial, Commercial Facilities" at http://rcflood.org/stormwater/

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 **Potential Sources of Runoff Pollutants**	2 **Permanent Controls—Show on WQMP Drawings**	3 **Permanent Controls—List in WQMP Table and Narrative**	4 **Operational BMPs—Include in WQMP Table and Narrative**
☐ **I.** Outdoor storage of equipment or materials. (See rows J and K for source control measures for vehicle cleaning, repair, and maintenance.)	☐ Show any outdoor storage areas, including how materials will be covered. Show how areas will be graded and bermed to prevent run-on or run-off from area. ☐ Storage of non-hazardous liquids shall be covered by a roof and/or drain to the sanitary sewer system, and be contained by berms, dikes, liners, or vaults. ☐ Storage of hazardous materials and wastes must be in compliance with the local hazardous materials ordinance and a Hazardous Materials Management Plan for the site.	Include a detailed description of materials to be stored, storage areas, and structural features to prevent pollutants from entering storm drains. Where appropriate, reference documentation of compliance with the requirements of Hazardous Materials Programs for: ▪ Hazardous Waste Generation ▪ Hazardous Materials Release Response and Inventory ▪ California Accidental Release (CalARP) ▪ Aboveground Storage Tank ▪ Uniform Fire Code Article 80 Section 103(b) & (c) 1991 ▪ Underground Storage Tank www.cchealth.org/groups/hazmat	☐ See the Fact Sheets SC-31, "Outdoor Liquid Container Storage" and SC-33, "Outdoor Storage of Raw Materials " in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 **Potential Sources of Runoff Pollutants**	**2** **Permanent Controls—Show on WQMP Drawings**	**3** **Permanent Controls—List in WQMP Table and Narrative**	**4** **Operational BMPs—Include in WQMP Table and Narrative**
☐ **J.** Vehicle and Equipment Cleaning	☐ **Show on drawings as appropriate:** **(1) Commercial/industrial facilities having vehicle/equipment cleaning needs shall either provide a covered, bermed area for washing activities or discourage vehicle/equipment washing by removing hose bibs and installing signs prohibiting such uses.** **(2) Multi-dwelling complexes shall have a paved, bermed, and covered car wash area (unless car washing is prohibited on-site and hoses are provided with an automatic shut-off to discourage such use).** **(3) Washing areas for cars, vehicles, and equipment shall be paved, designed to prevent run-on to or runoff from the area, and plumbed to drain to the sanitary sewer.** **(4) Commercial car wash facilities shall be designed such that no runoff from the facility is discharged to the storm drain system. Wastewater from the facility shall discharge to the sanitary sewer, or a wastewater reclamation system shall be installed.**	☐ **If a car wash area is not provided, describe any measures taken to discourage on-site car washing and explain how these will be enforced.**	**Describe operational measures to implement the following (if applicable):** ☐ **Washwater from vehicle and equipment washing operations shall not be discharged to the storm drain system.** Refer to "Outdoor Cleaning Activities and Professional Mobile Service Providers" for many of the Potential Sources of Runoff Pollutants categories below. Brochure can be found at http://rcflood.org/stormwater/ ❑**Car dealerships and similar may rinse cars with water only.**

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE …	… THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 **Potential Sources of Runoff Pollutants**	2 **Permanent Controls—Show on WQMP Drawings**	3 **Permanent Controls—List in WQMP Table and Narrative**	4 **Operational BMPs—Include in WQMP Table and Narrative**
☐ **K.** Vehicle/Equipment Repair and Maintenance	☐ Accommodate all vehicle equipment repair and maintenance indoors. Or designate an outdoor work area and design the area to prevent run-on and runoff of stormwater. ☐ Show secondary containment for exterior work areas where motor oil, brake fluid, gasoline, diesel fuel, radiator fluid, acid-containing batteries or other hazardous materials or hazardous wastes are used or stored. Drains shall not be installed within the secondary containment areas. ☐ Add a note on the plans that states either (1) there are no floor drains, or (2) floor drains are connected to wastewater pretreatment systems prior to discharge to the sanitary sewer and an industrial waste discharge permit will be obtained.	☐ State that no vehicle repair or maintenance will be done outdoors, or else describe the required features of the outdoor work area. ☐ State that there are no floor drains or if there are floor drains, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements. ☐ State that there are no tanks, containers or sinks to be used for parts cleaning or rinsing or, if there are, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements.	In the Stormwater Control Plan, note that all of the following restrictions apply to use the site: ☐ No person shall dispose of, nor permit the disposal, directly or indirectly of vehicle fluids, hazardous materials, or rinsewater from parts cleaning into storm drains. ☐ No vehicle fluid removal shall be performed outside a building, nor on asphalt or ground surfaces, whether inside or outside a building, except in such a manner as to ensure that any spilled fluid will be in an area of secondary containment. Leaking vehicle fluids shall be contained or drained from the vehicle immediately. ☐ No person shall leave unattended drip parts or other open containers containing vehicle fluid, unless such containers are in use or in an area of secondary containment. Refer to "Automotive Maintenance & Car Care Best Management Practices for Auto Body Shops, Auto Repair Shops, Car Dealerships, Gas Stations and Fleet Service Operations". Brochure can be found at http://rcflood.org/stormwater/ Refer to Outdoor Cleaning Activities and Professional Mobile Service Providers for many of the Potential Sources of Runoff Pollutants categories below. Brochure can be found at http://rcflood.org/stormwater/

IF THESE SOURCES WILL BE ON THE PROJECT SITE …	… THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 **Potential Sources of Runoff Pollutants**	2 **Permanent Controls—Show on WQMP Drawings**	3 **Permanent Controls—List in WQMP Table and Narrative**	4 **Operational BMPs—Include in WQMP Table and Narrative**
☐ **L.** Fuel Dispensing Areas	☐ Fueling areas[6] shall have impermeable floors (i.e., portland cement concrete or equivalent smooth impervious surface) that are: a) graded at the minimum slope necessary to prevent ponding; and b) separated from the rest of the site by a grade break that prevents run-on of stormwater to the maximum extent practicable. ☐ Fueling areas shall be covered by a canopy that extends a minimum of ten feet in each direction from each pump. [Alternative: The fueling area must be covered and the cover's minimum dimensions must be equal to or greater than the area within the grade break or fuel dispensing area[1].] The canopy [or cover] shall not drain onto the fueling area.		☐ The property owner shall dry sweep the fueling area routinely. ☐ See the Fact Sheet SD-30 , "Fueling Areas" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com

[6] The fueling area shall be defined as the area extending a minimum of 6.5 feet from the corner of each fuel dispenser or the length at which the hose and nozzle assembly may be operated plus a minimum of one foot, whichever is greater.

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
☐ **M.** Loading Docks	☐ Show a preliminary design for the loading dock area, including roofing and drainage. Loading docks shall be covered and/or graded to minimize run-on to and runoff from the loading area. Roof downspouts shall be positioned to direct stormwater away from the loading area. Water from loading dock areas shall be drained to the sanitary sewer, or diverted and collected for ultimate discharge to the sanitary sewer. ☐ Loading dock areas draining directly to the sanitary sewer shall be equipped with a spill control valve or equivalent device, which shall be kept closed during periods of operation. ☐ Provide a roof overhang over the loading area or install door skirts (cowling) at each bay that enclose the end of the trailer.		☐ Move loaded and unloaded items indoors as soon as possible. ☐ See Fact Sheet SC-30, "Outdoor Loading and Unloading," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 **Potential Sources of Runoff Pollutants**	**2** **Permanent Controls—Show on WQMP Drawings**	**3** **Permanent Controls—List in WQMP Table and Narrative**	**4** **Operational BMPs—Include in WQMP Table and Narrative**
☒ **N.** Fire Sprinkler Test Water		☒ Provide a means to drain fire sprinkler test water to the sanitary sewer.	☒ See the note in Fact Sheet SC-41, "Building and Grounds Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com
O. Miscellaneous Drain or Wash Water or Other Sources ☐ Boiler drain lines ☐ Condensate drain lines ☐ Rooftop equipment ☐ Drainage sumps ☒ Roofing, gutters, and trim. ☐ Other sources		☐ Boiler drain lines shall be directly or indirectly connected to the sanitary sewer system and may not discharge to the storm drain system. ☐ Condensate drain lines may discharge to landscaped areas if the flow is small enough that runoff will not occur. Condensate drain lines may not discharge to the storm drain system. ☐ Rooftop equipment with potential to produce pollutants shall be roofed and/or have secondary containment. ☐ Any drainage sumps on-site shall feature a sediment sump to reduce the quantity of sediment in pumped water. ☒ Avoid roofing, gutters, and trim made of copper or other unprotected metals that may leach into runoff. Include controls for other sources as specified by local reviewer.	

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
☒ **P.** Plazas, sidewalks, and parking lots.			☒ Sweep plazas, sidewalks, and parking lots regularly to prevent accumulation of litter and debris. Use absorbent to collect fluids, oil and greases and dispose of properly to prevent entry into the storm drain system. In the event washwater is required, it is to be contained and collected without entering the storm drain system.

Appendix 9: O&M

Section 6
Long-term Maintenance of BMPs

6.1 Introduction

The long-term performance of BMPs hinges on ongoing and proper maintenance. In order for this to occur, detailed maintenance plans are needed that include specific maintenance activities and frequencies for each type of BMP. In addition, these should include indicators for assessing when "as needed" maintenance activities are required. The fact sheets included in this volume contain the basic information needed to develop these maintenance plans, but municipalities and other regulatory agencies also need to identify the responsible party and potentially to address funding requirements. The following discussion is based primarily on data developed by Horner et al. (1994) and information available at http://www.stormwatercenter.net/

6.2 Critical Regulatory Components

Critical regulatory components identified by Horner et al. (1994) include:

- Regulations should officially designate a responsible party, frequently the development site owner, to have ultimate responsibility for the continued maintenance of stormwater facilities. This official designation provides the opportunity for appropriate preparation and budgeting prior to actually assuming responsibilities. It also facilitates enforcement or other legal remedies necessary to address compliance or performance problems once the facility has been constructed.

- Regulations should clearly state the inspection and maintenance requirements. Inspection and maintenance requirements should also comply with all applicable statutes and be based on the needs and priorities of the individual measure or facility. A clear presentation will help owners and builders comply, and inspectors enforce requirements.

- Regulations should contain comprehensive requirements for documenting and detailing maintenance. A facility operation and maintenance manual should be prepared containing accurate and comprehensive drawings or plans of the completed facility and detailed descriptions and schedules of inspection and maintenance.

- The regulations should delineate the procedure for maintenance noncompliance. This process should provide informal, discretionary measures to deal with periodic, inadvertent noncompliance and formal and severe measures to address chronic noncompliance or performance problems. In either case, the primary goal of enforcement is to maintain an effective BMP – the enforcement action should not become an end in itself.

- Regulations should also address the possibility of total default by the owner or builder by providing a way to complete construction and continue maintenance. For example, the public might assume maintenance responsibility. If so, the designated public agency must be alerted and possess the necessary staffing, equipment, expertise, and funding to assume this responsibility. Default can be addressed through bonds and other performance

guarantees obtained before the project is approved and construction begins. These bonds can then be used to fund the necessary maintenance activities.

- The regulations must recognize that adequate and secure funding is needed for facility inspection and maintenance, and provide for such funding.

6.3 Enforcement Options

A public agency will sometimes need to compel those responsible for facility construction or maintenance to fulfill their obligations. Therefore, the maintenance program must have enforcement options for quick corrective action. Rather than a single enforcement measure, the program should have a variety of techniques, each with its own degree of formality and legal weight. The inspection program should provide for nonconforming performance and even default, and contain suitable means to address all stages.

Prior to receiving construction approval, the developer or builder can be forced to provide performance guarantees. The public agency overseeing the construction can use these guarantees, usually a performance bond or other surety in an amount equal to some fraction of the facility's construction cost, to fund maintenance activities.

Enforcement of maintenance requirements can be accomplished through a stormwater maintenance agreement, which is a formal contract between a local government and a property owner designed to guarantee that specific maintenance functions are performed in exchange for permission to develop that property (http://www.stormwatercenter.net/). Local governments benefit from these agreements in that responsibility for regular maintenance of the BMPs can be placed upon the property owner or other legally recognized party, allowing agency staff more time for plan review and inspection.

6.4 Maintenance Agreements

Maintenance agreements can be an effective tool for ensuring long-term maintenance of on-site BMPs. The most important aspect of creating these maintenance agreements is to clearly define the responsibilities of each party entering into the agreement. Basic language that should be incorporated into an agreement includes the following:

1. Performance of Routine Maintenance

Local governments often find it easier to have a property owner perform all maintenance according to the requirements of a Design Manual. Other communities require that property owners do aesthetic maintenance (i.e., mowing, vegetation removal) and implement pollution prevention plans, but elect to perform structural maintenance and sediment removal themselves.

2. Maintenance Schedules

Maintenance requirements may vary, but usually governments require that all BMP owners perform at least an annual inspection and document the maintenance and repairs performed. An annual report must then be submitted to the government, who may then choose to perform an inspection of the facility.

3. Inspection Requirements

Local governments may obligate themselves to perform an annual inspection of a BMP, or may choose to inspect when deemed necessary instead. Local governments may also wish to include language allowing maintenance requirements to be increased if deemed necessary to ensure proper functioning of the BMP.

4. Access to BMPs

The agreement should grant permission to a local government or its authorized agent to enter onto property to inspect BMPs. If deficiencies are noted, the government should then provide a copy of the inspection report to the property owner and provide a timeline for repair of these deficiencies.

5. Failure to Maintain

In the maintenance agreement, the government should repeat the steps available for addressing a failure to maintain situation. Language allowing access to BMPs cited as not properly maintained is essential, along with the right to charge any costs for repairs back to the property owner. The government may wish to include deadlines for repayment of maintenance costs, and provide for liens against property up to the cost of the maintenance plus interest.

6. Recording Of The Maintenance Agreement

An important aspect to the recording of the maintenance agreement is that the agreement be recorded into local deed records. This helps ensure that the maintenance agreement is bound to the property in perpetuity.

Finally, some communities elect to include easement requirements into their maintenance agreements. While easement agreements are often secured through a separate legal agreement, recording public access easements for maintenance in a maintenance agreement reinforces a local government's right to enter and inspect a BMP.

Examples of maintenance agreements include several available on the web at http://www.stormwatercenter.net/

6.5 Public Funding Sources

If local agencies are willing to assume responsibility for stormwater BMPs, it is essential to identify the long-term funding sources. Several of these are described below:

General Tax Revenues

Tax revenues are an obvious source of funding, particularly for the long-term inspection and maintenance of existing runoff and drainage facilities. The benefits and protection to the public from continued safe and effective operation of the facility justifies using revenues from general funds.

To use tax revenues, particularly from a general fund, the inspection and maintenance program must annually compete with all other programs included in the government's annual operating budget. This inconsistent and unreliable funding makes securing a long-term financial

commitment to inspection and maintenance difficult and subject to political pressures. Nevertheless, tax revenues remain a popular funding source because the collection and disbursement system is already in place and familiar.

Utility Charges

Using utility charges to fund inspection and maintenance is a somewhat recent application of an already established financing technique. In addition, several municipalities and counties throughout the country have runoff management, drainage, and flood control authorities or districts to provide residents with runoff related services.

Using utility charge financing has several advantages. By addressing only runoff needs and benefits, utility funding avoids competing with other programs and needs. Utility funding also demonstrates a direct link between the funding and the services it provides. This approach can require an entirely new operating system and organization that needs legal authorization to exist, operate, and assess charges. The effort required to create such an entity can deter many, although the continued success of established authorities and growth of new ones have done much to allay concerns over the effort required.

In a runoff utility, the user charges are often based on the need for services rather than the benefits derived from them. While charges are based on actual costs to inspect and maintain runoff facilities and measures within the service area, the assessed rate structure should relate to site characteristics. These include property area size, extent of impervious coverage, and other factors with a direct and demonstrable effect on runoff. To be fair, the rate structure should also remain simple and understandable to the ratepayer.

To finance the stormwater utility in Prince William County, Virginia, residential and nonresidential owners of developed property pay based on the amount of impervious area (rooftops, paved areas, etc.) on their property. Residents pay $10.38 billed twice a year ($20.76 total annual fee) for detached singe-family homes. Town home and condominium owners will pay $7.785 billed twice a year ($15.57 total annual fee). Nonresidential property owners pay $0.84 per 1,000 ft2 of impervious area per month. Fee adjustments or credits may be available if a stormwater management system is already in place. The fee will be on the real estate bills.

Fees for the stormwater utility in Austin, Texas are higher with residential users billed $5.79/mo, while commercial users pay $94.62/mo/acre of impervious cover. These fees cover not only maintenance of existing BMPs, but also capital improvement projects related to the drainage infrastructure.

Permit Fees

Collecting permit fees to finance runoff inspection and maintenance is a long standing funding procedure. Most governmental entities, local, county, and state, can establish and collect fees and other charges to obtain operating funds for programs and services. Many inspection services, most notably the construction inspection of both ESC measures and permanent drainage and runoff management facilities, are financed at least in part through fees collected by permitting agencies. Unlike taxes or some utility charges, inspection costs are borne by those who need them.

The permit fee collection program should have a demonstrable link to the runoff management or drainage systems. The public agency should demonstrate a direct link between the permit fees collected and the permitted project. One method is using dedicated accounts for individual projects and facilities. Finally, the rate structure should reflect site characteristics such as area size or imperviousness that directly relate to the measure or facility by affecting runoff or erosion.

Dedicated Contributions

Public agencies at times have used developer contributions to fund long-term facility maintenance. This approach is particularly appropriate in single-family residential subdivisions, where numerous individual property owners served by a single runoff facility can result in confusion over who has maintenance responsibility.

The exact funding technique depends on many factors, including community attitude and knowledge, economic and political viability, and program needs and costs. Some techniques, including permit fees and dedicated contributions, may be more appropriate for short-term activities, such as construction inspection. Other utility charges and specialized tax revenues may apply to all phases of an inspection and maintenance program but require considerable effort and special legal authorization to operate.

TO BE COMPLETE PRIOR TO FINAL APPROVAL

Recording requested by and mail to:

City Clerk
City of Beaumont
550 E. Sixth Street
Beaumont, CA 92223

SPACE ABOVE THIS LINE FOR RECORDER'S USE
EXEMPT FROM RECORDER'S FEES PURSUANT TO GOVERNMENT CODE SECTION 6103 AND 27383

APN:

STORM WATER MANAGEMENT WQMP/BMP FACILITIES

COVENANT AND AGREEMENT NO. _

City of Beaumont, Riverside County, California

THIS COVENANT AND AGREEMENT is made and entered into this of 2019, by and between _____, ("Owner"), and the City of Beaumont, California, ("City").

The Owner hereby certifies I am (we are) the sole owner of certain real property located at _____(Site Address) in the City of Beaumont, County of Riverside, State of California, more specifically described in **Exhibit "A"** and depicted in **Exhibit "B" (**"Property").

The Owner covenants and agrees to comply with the Project Water Quality Management Plan ("WQMP"), attached hereto as **Exhibit "C"**, providing for storm water quality treatment within the confines of the Property.

The Owner covenants and agrees that the health, safety and welfare of the residents of the City of Beaumont, require that the Best Management Practice ("BMP") facilities, more specifically described in the WQMP (for example bio- swales, catch basins, roof drains and appurtenances) be constructed and maintained to minimize pollutants in urban runoff by the Owner.

The Owner further covenants and agrees as follows:

1. The on-site storm water management/BMP facilities mentioned above shall be constructed by the Owner at its sole cost and expense, in accordance with the plans and specifications identified in the WQMP approved by City.

2. The Owner shall adequately maintain the storm water management/BMP facilities in a manner assuring peak performance at all times, including source control BMPs at all times as its sole responsibility, at its sole cost and expense. This includes all pipes and channels built to convey storm water on the Property, including

catch basin inserts, underground detention ponds, swales and vegetation provided to control the quantity and quality of the storm water. Adequate maintenance is herein defined as good working condition so that these facilities are performing in accordance with their design functions continuously at all times.

3. The Owner shall annually inspect the storm water management/BMP facilities mentioned above and submit an inspection report annually to the Public Works Department by the anniversary of the date of this Agreement of each year. The purpose of the inspection is to assure safe and proper functioning of the facilities. The inspection shall cover the storm water management BMPs listed in the WQMP such as bio-swales, catch basins and related filter units, etc. Deficiencies shall be noted in the inspection report and corrected by Owner promptly.

4. The Owner hereby grants permission to City, its authorized agents and employees, to enter upon the Property and to inspect the storm water management/BMP facilities, take samples and perform testing whenever the City deems necessary and as required by the City's most current National Pollutant Discharge Elimination System (NPDES) Permit. The purpose of the inspection, testing and sampling is to follow up on apparent and reported deficiencies and/or to respond to citizen complaints and meet the requirements of the City's NPDES Permit issued by the State Water Resources Control Board – Santa Ana River Region. The City shall provide the Owner with advanced notice of entering upon the Property, except in the event of an emergency, as determined by the City. The City shall provide the Owner copies of the inspection findings and a directive to commence with the repairs if necessary. Owner or Owner's successors or assigns shall pay City for all costs incurred by City in the inspection, sampling, testing of the BMPs within thirty (30) calendar days of City invoice.

5. In the event the Owner fails to maintain the storm water management/BMP facilities in good working condition acceptable to the City, upon five (5) days advanced written notice, the City may enter upon the Property and take whatever steps necessary to correct deficiencies identified in any inspection report and to charge the costs of such repairs to the Owner the cost of which shall constitute a lien against the Property. In the event of an emergency, as determined by City, advanced notice as aforesaid, shall not be required. Notwithstanding the forgoing, it is expressly understood and agreed that the City is under no obligation to maintain or repair said facilities, and in no event shall this Agreement be construed to impose any such obligation to the City.

6. The Owner will perform the work necessary to keep these facilities in good working order as appropriate. The maintenance schedule for the storm water management BMP facilities (including sediment removal) is outlined in the approved WQMP and the schedule must be followed at all times. In the future, City of Beaumont may adopt an annual Stormwater Inspection Fee that would be assessed to the Owner.

7. In the event the City, pursuant to this Agreement, performs work of any nature, or expends any funds in performance of said work for labor, use of equipment, supplies, materials and the like, the Owner, its successors and assigns shall reimburse the City upon demand, within thirty (30) days of receipt thereof for all actual costs incurred by the City hereunder.

8. This Agreement imposes no liability of any kind whatsoever on the City. Owner agrees to indemnify, defend (with counsel reasonably approved by the City) and hold harmless the City and its authorized officers, employees, agents and volunteers from any and all claims, actions, losses, damages, and/or liability arising out of this Agreement from any cause whatsoever, including the acts, errors or omissions of any person and

TO BE COMPLETE PRIOR TO FINAL APPROVAL

for any costs or expenses incurred by the City on account of any claim except where such indemnification is prohibited by law. This indemnification provision shall apply regardless of the existence or degree of fault of indemnitees. The Owner's indemnification obligation applies to the City's "active" as well as "passive" negligence but does not apply to the City's "sole negligence" or "willful misconduct" within the meaning of Civil Code Section 2782, or to any claims, actions, losses, damages, and/or liabilities, to the extent caused by the acts or omissions of any third party contractors undertaking any work (other than field inspections) or other maintenance on the Property on behalf of the City under this Agreement.

9. This Agreement shall be recorded with the County Recorder for the County of Riverside and shall constitute a covenant running with the land, equitable servitude and lien against the Property, and shall be binding on the Owner, its successors, assigns, transferees, administrators, executors, heirs, encumbrancers and any other successors in interests, including any homeowner's association.

10. In addition to any remedy available to City under this Agreement, if Owner violates any term of this Agreement and does not cure the violation within the time already provided in this Agreement, or, if not provided, within thirty (30) calendar days, or within such time authorized by the City if said cure reasonably requires more than the subject time, the City may bring an action at law or in equity in a court of competent jurisdiction to enforce compliance by the Owner with the terms of this Agreement. In such action, the City may recover any damages to which the City may be entitled for the violation, enjoin the violation by temporary or permanent injunction without the necessity of proving actual damages or the inadequacy of otherwise available legal remedies, or obtain other equitable relief, including, but not limited to, the restoration of the Property and/or the BMPs identified in the WQMP to the condition in which it/they existed prior to any such violation or injury.

11. Owner shall provide printed educational materials with any sale of the Property which provide information on what storm water management facilities are present, the types and locations of maintenance signs that are required and how the necessary maintenance can be maintained.

12. Owner shall provide actual notice of this Agreement and its terms to any respective buyers or successor(s) in interest.

13. In order to be valid, amendment or change to this Agreement including the WQMP and BMPs requires an amendment executed by the City and Owner which is recorded with the Riverside County Recorder.

WITNESS the following signatures:

OWNER:

By: _____ By: _____

Name: _____ Name: _____

Title: _____ Title: _____

TO BE COMPLETE PRIOR TO FINAL APPROVAL

CITY OF BEAUMONT

By: _____
Director of Public Works, Beaumont

ATTEST:

_____
City Clerk, City of Beaumont

All signatures on this Agreement on behalf of the Owner must be acknowledged before a Notary Public. In the event that the owner is a corporation, the President/Vice President and the corporate secretary of the corporation must sign.

TO BE COMPLETE PRIOR TO FINAL APPROVAL

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California)
County of Riverside)

On _____, 2019, before me, _____, notary public, personally appeared _____ who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature: _____ (Seal)

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California)
County of Riverside)

On _____, 2019, before me, _____, notary public, personally appeared _____ who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

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WITNESS my hand and official seal.

Signature: (Seal)

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Signature: (Seal)

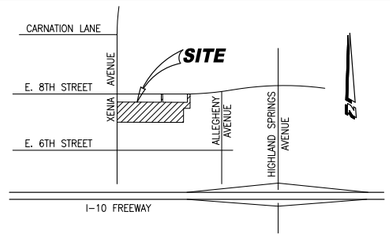
TO BE COMPLETE PRIOR TO FINAL APPROVAL

EXHIBIT "A"
LEGAL DESCRIPTION

TO BE COMPLETE PRIOR TO FINAL APPROVAL

EXHIBIT "B"
DIAGRAM OF PROPERTY





VICINITY MAP

NTS

OWNER/APPLICANT:

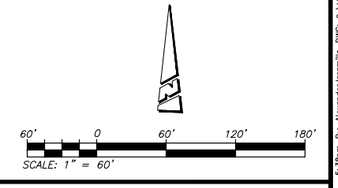
BEAUMONT LAND PARTNERS, LLC
16133 VENTURA BLVD. #633
ENCINO, CA 91436
CONTACT: PAUL ONUFER
OFFICE PH: 626-263-4205
EMAIL: PONUFER@AVPRE.NET

GENERAL MAP NOTES:

1. ASSESSOR'S PARCEL NUMBER:
   419-160-005, 419-160-024, 419-170-016, 419-170-017, 419-170-018, 419-170-022, & 419-170-027.
2. SITE ZONING:
   - (R-MF) RESIDENTIAL MULTI-FAMILY (20 DU ACRE)
3. SITE GENERAL PLAN DESIGNATION:
   -MULTI-FAMILY RESIDENTIAL
4. LAND USE:
   -EXIST: VACANT
   -PROPOSED: APARTMENTS
5. SITE ACREAGE:
   - GROSS AREA: 10.931 ACRES (476,164.12 SF)
   - NET AREA: 10.927 NET (475,964.1 SF)
6. NO OFF-SITE RIGHT-OF-WAY IS REQUIRED FOR FOR SITE ACCESSIBILITY.
7. THIS PARCEL MAP INCLUDES THE ENTIRE CONTIGUOUS OWNERSHIP OF THE LAND DIVIDER.
8. WATER QUALITY AND DETENTION AREAS TO BE MAINTAINED BY LAND OWNER.
9. NO HAZARDOUS MATERIALS HAVE BEEN KNOWN TO BE STORED ON SITE.
10. THE PROPERTY IS NOT SUBJECT TO LIQUEFACTION OR GEOLOGICAL HAZARDS. OR SUBJECT TO OVERFLOW, INUNDATION, OR FLOOD HAZARDS.
11. THERE ARE NO KNOWN WELLS ON-SITE OR WITHIN 200' OF THE SITE.

LEGEND:

- FLOW ARROW
- DMA BOUNDARY
- SELF-RETAINING AREA BOUNDARY
- IMPERVIOUS AREAS: (STREET, PARKING, AND SIDEWALKS)
- IMPERVIOUS AREAS: (ROOFS)
- PERVIOUS AREAS: (OPEN SPACE AND LANDSCAPING)
- PERVIOUS AREAS: (SELF-RETAINING LANDSCAPED AREAS)
- PROPOSED BMP AREAS
- PROPOSED STORM DRAIN
- (7) PROPOSED TRASH ENCLOSURE
- PROPOSED INLETS (TYPICAL)

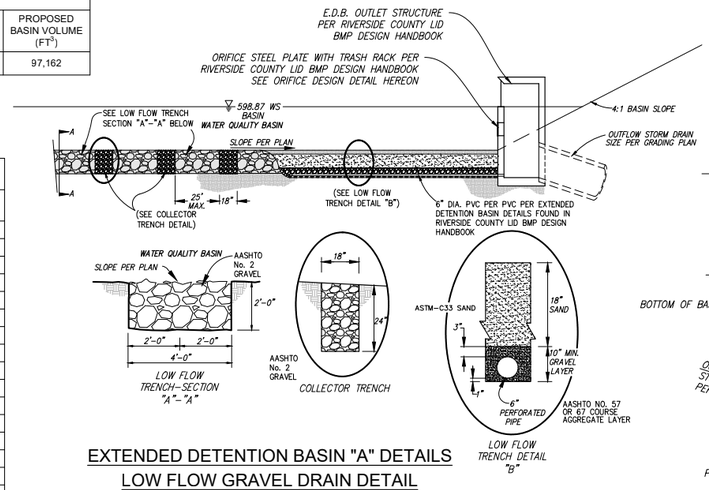


BMP DESIGN VOLUME SUMMARY: DMA 1

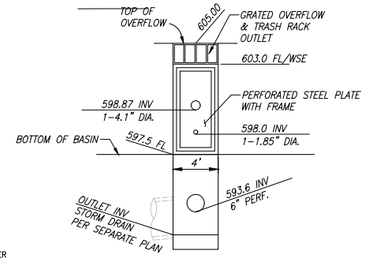
IMPERVIOUS AREAS: ROOFS, SIDEWALKS, & STREETS/PARKING (FT^2)	PERVIOUS AREAS: OPEN SPACES & LANDSCAPING (FT^2)	BASIN AREA (FT^2)	TOTAL AREA (AC.)	VBMP (FT^3)	PROPOSED BASIN VOLUME (FT^3)
201,250	44,922	21,341	6.14	13,234	97,162

SELF-RETAINING AREA SUMMARY

AREA ID	PERVIOUS AREA (SQ-FT.)	IMPERVIOUS AREA (SQ-FT.)	TOTAL AREA (SQ-FT.)	REQ. RETENTION DEPTH (IN)	RATIO
SRA-1	6,410	7,780	14,190	1.88	1.12 < 2
SRA-2	3,354	6,615	9,969	2.53	1.97 < 2
SRA-3	3,683	7,137	10,820	2.50	1.94 < 2
SRA-4	4,008	7,471	11,479	2.43	1.86 < 2
SRA-5	4,439	7,811	12,250	2.35	1.76 < 2
SRA-6	4,777	7,671	12,448	2.21	1.61 < 2
SRA-7	4,258	7,430	11,688	2.33	1.74 < 2
SRA-8	4,610	7,445	12,055	2.22	1.61 < 2
SRA-9	4,124	7,664	11,788	2.43	1.86 < 2
SRA-10	3,961	7,640	11,601	2.49	1.93 < 2
SRA-11	4,703	7,438	12,141	2.19	1.58 < 2
SRA-12	4,824	7,457	12,281	2.16	1.55 < 2
SRA-13	4,151	7,760	11,911	2.44	1.87 < 2
SRA-14	4015	7,598	11,613	2.46	1.89 < 2
SRA-15	4,672	7,412	12,084	2.20	1.59 < 2
SRA-16	4,802	7,192	11,994	2.12	1.50 < 2



EXTENDED DETENTION BASIN "A" DETAILS
LOW FLOW GRAVEL DRAIN DETAIL
N.T.S.



BASIN "A" OUTLET DETAIL
PER RIVERSIDE COUNTY LID BMP DESIGN HANDBOOK

SOURCE CONTROL

- LANDSCAPED AREAS WITHIN THE RESIDENTIAL LOTS AND RIGHT-OF-WAYS SHALL BE MAINTAINED USING MINIMUM TO NO PESTICIDES
- POOLS SHALL BE PLUMBED TO THE SANITARY SEWER IF REQUESTED BY THE CO-PERMITTEE.
- PROPERTY OWNERS SHALL KEEP TRASH RECEPTACLES CLOSE AT ALL TIMES.
- CAR WASHING AND MAINTENANCE SHALL BE PROHIBITED ONSITE.
- FIRE SPRINKLERS TEST WATER SHALL DRAIN TO THE SANITARY SEWER.
- CONDENSATION DRAIN LINES MAY DISCHARGE TO LANDSCAPED AREAS IF THE FLOW IS SMALL ENOUGH THAT RUNOFF WILL NOT OCCUR. CONDENSATE DRAIN LINES MAY NOT DISCHARGE TO THE STORM DRAIN SYSTEM.
- AVOID ROOFING, GUTTERS, AND TRIM MADE OF COPPER OR OTHER UNPROTECTED METALS THAT MAY LEACH INTO RUNOFF.
- STREET SHALL BE SWEPT BY A PRIVATE CONTRACTOR EVERY TWO WEEKS.

85^{TH} PERCENTILE, 24-HOUR RAIN FALL DEPTH FROM ISOHYETAL MAP: D_{85} = 0.85 IN

PREPARED BY:
SP2 & Co.
A LAND DEVELOPMENT SERVICES COMPANY
265 S. RANDOLPH AVENUE #105
BREA, CA 92821
PHONE: (714) 490-1500
"SERVING THE DEVELOPMENT COMMUNITY SINCE 1985"

XENIA APARTMENTS

PRELIMINARY WATER QUALITY MANAGEMENT PLAN
SITE PLAN

Plotted: Sep 16, 2022 - 5:38pm By: Alexander.Jaramillo DWG: C:\Users\Alexander.Jaramillo\OneDrive - sp2inc.com\Projects\Xenia\Beaumont-10\Stormwater\Water Quality\Drawings\Xenia-PWQMP Site Plan.dwg

EXHIBIT "C"
WQMP

Preliminary Operation and Maintenance Plan for the Stormwater Quality BMP Facilities for Xenia

May 27, 2022

I. PURPOSE

The primary purpose of this Operations & Maintenance Plan (O&M Plan) shall be to provide a routine maintenance program that maintains the treatment facilities effectiveness.

II. COVERAGE AREA

This project will utilize one (1) primary treatment facility type located on-site:

1. Bioretention Basin "A" – Located in the middle of the southern property line, adjacent to the southern property line.
   Lat: 33.931031
   Long: -116.952433

These facilities treat stormwater runoff from the site and outlet into existing drainage patterns located in the adjacent golf course. Ultimately, the runoff drains to the Santa Ana River through San Timoteo Creek before ending up at the Pacific Ocean.

III. ROUTINE MAINTENANCE ACTIVITIES

The POA will be responsible for the O&M of the extend detention basin. Primary maintenance activities include vegetation management, trash and sediment removal, irrigation maintenance and storm drain outlet inspections. Although mosquito abatement is a concern, the basins and swales are designed to fully drain within 24-72 hours and not include permanent pools or standing water. Routine maintenance activities, and the frequency at which they will be conducted, are shown in Table 1 below.

NOTE: Landscape Maintenance Plan should also be reviewed for consistency with vegetation maintenance and any applicable needs for specific plants, shrubs or trees.

Table 1 Routine Maintenance Activities for Basins		
No.	**Maintenance Task**	**Frequency of Task**
1	Conduct annual vegetation management during the summer, removing weeds and harvesting vegetation. Remove all grass cuttings and other green waste.	Once a year prior to the beginning of the wet season (September)
2	Trim vegetation at beginning and end of wet season to prevent establishment of woody vegetation, and for aesthetics and mosquito control.	Twice a year (spring and fall)
3	Evaluate health of vegetation and remove or replace any dead or dying plants. Remove all green waste and dispose of properly.	Twice a year
4	If turf grass is included in basin/swale design, conduct regular mowing and remove all grass cuttings. Avoid producing ruts when mowing.	As necessary to not allow grass over-growth
7	Remove accumulated trash and debris from the middle and end of the wet season and dispose of trash and debris properly.	Twice a year (January and April)
8	Irrigate during dry weather.	Per Landscape Plans
9	Inspect basins and swales using the attached inspection checklists.	Quarterly, or as needed

IV. PROHIBITIONS

The use of pesticides and quick release fertilizers shall be minimized, and the principles of integrated pest management (IPM) followed:

1. Employ non-chemical controls (biological, physical and cultural controls) before using chemicals to treat a pest problem.
2. Prune plants properly and at the appropriate time of year.
3. Provide adequate irrigation for landscape plants. Do not over water.
4. Limit fertilizer use unless soil testing indicates a deficiency. Slow-release or organic fertilizer is preferable. Check with municipality for specific requirements.
5. Pest control should avoid harming non-target organisms, or negatively affecting air and water quality and public health. Apply chemical controls only when monitoring indicates that preventative and non-chemical methods are not keeping pests below acceptable levels. When pesticides are required, apply the least toxic and the least persistent pesticide that will provide adequate pest control. Do not apply pesticides on a prescheduled basis.
6. Sweep up spilled fertilizer and pesticides. Do not wash away or bury such spills.
7. Do not over apply pesticide. Spray only where the infestation exists. Follow the manufacturer's instructions for mixing and applying materials.
8. Only licensed, trained pesticide applicators shall apply pesticides.

9. Apply pesticides at the appropriate time to maximize their effectiveness and minimize the likelihood of discharging pesticides into runoff. With the exception of pre-emergent pesticides, avoid application if rain is expected.

10. Unwanted/unused pesticides shall be disposed as hazardous waste.

Standing water shall not remain in the treatment and/or hydromodification management measures for more than five days, to prevent mosquito generation. Should any mosquito issues arise, contact the City of Beaumont for the appropriate contact for Mosquito Abatement, as needed for assistance. Mosquito larvicides shall be applied only when absolutely necessary and then only by a licensed professional or contractor. Contact information for the Riverside County Environmental Health – Vector Control is provided below.

Riverside County Department of Environmental Health – Vector Control

Downtown Riverside Office
3880 Lemon Street, 2nd Floor
Riverside, CA 92501
Phone: (951) 955-8980
Emergency After Hours: (951) 782-2968
http://www.rivcoeh.org/opencms/rivcoeh/ProgServices/Food_Program/Vector.html

V. INSPECTIONS

The attached Inspection and Maintenance Checklists shall be used to conduct inspections monthly (or as needed), identify needed maintenance, and record maintenance that is conducted.

Basin Inspection and Maintenance Checklist

Property Address: _____ Property Owner: _____

Treatment Measure No.: _____ Date of Inspection: _____ Type of Inspection: □ Monthly □ Pre-Wet Season
□ After heavy runoff □ End of Wet Season

Inspector(s): _____ □ Other:_____

Defect	Conditions When Maintenance Is Needed	Maintenance Needed? (Y/N)	Comments (Describe maintenance completed and if any needed maintenance was not conducted, note when it will be done.)	Results Expected When Maintenance Is Performed
General				
Trash & Debris	• Trash and debris accumulated in basin. • Visual evidence of dumping.			Trash and debris cleared from site and disposed of properly.
Poisonous Vegetation and noxious weeds	Poisonous or nuisance vegetation or noxious weeds, e.g., morning glory, English ivy, reed canary grass, Japanese knotweed, purple loosestrife, blackberry, Scotch broom, poison oak, stinging nettles, or devil's club.			Use Integrated Pest Management techniques to control noxious weeds or invasive species.
Contaminants and Pollution	Any evidence of oil, gasoline, contaminants or other pollutants.			No contaminants or pollutants present.
Rodent Holes	If facility acts as a dam or berm, any evidence of rodent holes, or any evidence of water piping through dam, berm or into slopes via rodent holes.			The design specifications are not compromised by holes. Any rodent control activities are in accordance with applicable laws and do not affect any protected species.
Insects	Insects such as wasps and hornets interfere with maintenance activities.			Insects do not interfere with maintenance activities.

Basin & Swales Inspection and Maintenance Checklist

Date of Inspection:_____

Property Address: _____

Treatment Measure No.:_____

Defect	**Conditions When Maintenance Is Needed**	**Maintenance Needed? (Y/N)**	**Comments** (Describe maintenance completed and if any needed maintenance was not conducted, note when it will be done.)	**Results Expected When Maintenance Is Performed**
Tree/Brush Growth and Hazard Trees	• Growth does not allow maintenance access or interferes with maintenance activity. • Dead, diseased, or dying trees/shrubs.			• Trees do not hinder maintenance activities. • Remove hazard trees as approved by the City. (Use a certified Arborist to determine health of tree or removal requirements).
Drainage time	Standing water remains in basin more than five days.			Correct any circumstances that restrict the flow of water from the system. Restore drainage to design condition. If the problem cannot be corrected and problems with standing water recur, then mosquitoes should be controlled with larvicides, applied by a licensed pesticide applicator.
Outfall structure	Debris or silt build-up obstructs an outfall structure.			Remove debris and/or silt build-up and dispose of properly.
Side Slopes				
Erosion	• Eroded over 2 in. deep where cause of damage is still present or where there is potential for continued erosion. • Any erosion on a compacted berm embankment.			Cause of erosion is managed appropriately. Side slopes or berm are restored to design specifications, as needed.
Storage Area				
Sediment	Accumulated sediment >10% of designed basin depth or affects inletting or outletting condition of the facility.			Sediment cleaned out to designed basin shape and depth; basin reseeded if necessary to control erosion. Sediment disposed of properly.
Liner (If Applicable)	Liner is visible and has more than three 1/4-inch holes in it.			Liner repaired or replaced. Liner is fully covered.
Emergency Overflow / Spillway and Berms				
Settlement	Berm settlement 4 inches lower than the design elevation.			Dike is built back to the design elevation.

Basin & Swales Inspection and Maintenance Checklist

Date of Inspection:_____

Property Address: _____

Treatment Measure No.:_____

Defect	Conditions When Maintenance Is Needed	Maintenance Needed? (Y/N)	Comments (Describe maintenance completed and if any needed maintenance was not conducted, note when it will be done.)	Results Expected When Maintenance Is Performed
Tree Growth	Tree growth on berms or emergency spillway >4 ft in height or covering more than 10% of spillway.			• Trees should be removed. If root system is small (base less than 4 inches) the root system may be left in place. Otherwise the roots should be removed and the berm restored. • A civil engineer should be consulted for proper berm/spillway restoration.
Emergency Overflow/ Spillway	Rock is missing and soil is exposed at top of spillway or outside slope.			Rocks and pad depth are restored to design standards.
Debris Barriers (e.g., Trash Racks)				
Trash and Debris	Trash or debris is plugging openings in the barrier.			Trash or debris is removed and disposed of properly.
Damaged/ Missing Bars	Bars are missing, loose, bent out of shape, or deteriorating due to excessive rust.			Bars are repaired or replaced to allow proper functioning of trash rack.
Inlet/Outlet Pipe	Debris barrier is missing or not attached to pipe.			Debris barrier is repaired or replaced to allow proper functioning of trash rack.
Fencing and Gates				
Missing or broken parts	Any defect in or damage to the fence or gate that permits easy entry to a facility.			Fencing and gate are restored to design specifications.
Deteriorating Paint or Protective Coating	Part or parts that have a rusting or scaling condition that has affected structural adequacy.			Paint or protective coating is sufficient to protect structural adequacy of fence or gate.
Flow Duration Control Outlet (if included in design to meet Hydromodification Management Standard)				
Risers, orifices and screens	Any debris or clogging			Restore unobstructed flow through discharge structure; to meet original design; dispose of debris properly.
Drawdown time	Noticeable ponding exceeding 72-hours after a design storm event			Restore infiltration and ponded waters permeate. Scarification should only be performed when there are signs of clogging rather than on a routine basis. Always remove deposited sediments before scarification and use a hand-guided rotary tiller.
Swales (in addition to general items listed above)				

Basin & Swales Inspection and Maintenance Checklist

Date of Inspection:_____

Property Address: _____

Treatment Measure No.:_____

Defect	**Conditions When Maintenance Is Needed**	**Maintenance Needed? (Y/N)**	**Comments** (Describe maintenance completed and if any needed maintenance was not conducted, note when it will be done.)	**Results Expected When Maintenance Is Performed**
Impeded Flow	Twice annually at beginning and end of wet season. After heavy runoff. Visible blockage or impediments.			Trash and debris cleared from swale and disposed of properly especially prior to mowing.
Landscaping or Vegetative Overgrowth	Twice annually at beginning and end of wet season or as needed for aesthetics.			Maintained flow and healthy vegetation.
Miscellaneous				
Miscellaneous	Any condition not covered above that needs attention to restore infiltration basin to design conditions.			Meets the design specifications.

Maintenance for Self-Treating Areas.		
Area ID	Location	Maintenance
SRA-1	Landscaped areas around building 1	• Grassed areas to trimmed weekly. • Landscape overflow inlets and drains to be cleared of debris weekly. • Check irrigation sprinkler heads for leaks and over spray weekly
SRA-2	Landscaped areas around building 2	
SRA-3	Landscaped areas around building 3	
SRA-4	Landscaped areas around building 4	
SRA-5	Landscaped areas around building 5	
SRA-6	Landscaped areas around building 6	
SRA-7	Landscaped areas around building 7	
SRA-8	Landscaped areas around building 8	
SRA-9	Landscaped areas around building 9	
SRA-10	Landscaped areas around building 10	
SRA-11	Landscaped areas around building 11	
SRA-12	Landscaped areas around building 12	
SRA-13	Landscaped areas around building 13	
SRA-14	Landscaped areas around building 14	
SRA-15	Landscaped areas around building 15	
SRA-16	Landscaped areas around building 16	

Drainage System Maintenance SC-44



Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize

Description

As a consequence of its function, the stormwater conveyance system collects and transports urban runoff and stormwater that may contain certain pollutants. The protocols in this fact sheet are intended to reduce pollutants reaching receiving waters through proper conveyance system operation and maintenance.

Targeted Constituents

Sediment	✓
Nutrients	
Trash	✓
Metals	
Bacteria	✓
Oil and Grease	
Organics	

Approach

Pollution Prevention

Maintain catch basins, stormwater inlets, and other stormwater conveyance structures on a regular basis to remove pollutants, reduce high pollutant concentrations during the first flush of storms, prevent clogging of the downstream conveyance system, restore catch basins' sediment trapping capacity, and ensure the system functions properly hydraulically to avoid flooding.

Suggested Protocols

Catch Basins/Inlet Structures

- Staff should regularly inspect facilities to ensure compliance with the following:
  - Immediate repair of any deterioration threatening structural integrity.
  - Cleaning before the sump is 40% full. Catch basins should be cleaned as frequently as needed to meet this standard.
  - Stenciling of catch basins and inlets (see SC34 Waste Handling and Disposal).

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- Clean catch basins, storm drain inlets, and other conveyance structures before the wet season to remove sediments and debris accumulated during the summer.
- Conduct inspections more frequently during the wet season for problem areas where sediment or trash accumulates more often. Clean and repair as needed.
- Keep accurate logs of the number of catch basins cleaned.
- Store wastes collected from cleaning activities of the drainage system in appropriate containers or temporary storage sites in a manner that prevents discharge to the storm drain.
- Dewater the wastes if necessary with outflow into the sanitary sewer if permitted. Water should be treated with an appropriate filtering device prior to discharge to the sanitary sewer. If discharge to the sanitary sewer is not allowed, water should be pumped or vacuumed to a tank and properly disposed. Do not dewater near a storm drain or stream.

Storm Drain Conveyance System

- Locate reaches of storm drain with deposit problems and develop a flushing schedule that keeps the pipe clear of excessive buildup.
- Collect and pump flushed effluent to the sanitary sewer for treatment whenever possible.

Pump Stations

- Clean all storm drain pump stations prior to the wet season to remove silt and trash.
- Do not allow discharge to reach the storm drain system when cleaning a storm drain pump station or other facility.
- Conduct routine maintenance at each pump station.
- Inspect, clean, and repair as necessary all outlet structures prior to the wet season.

Open Channel

- Modify storm channel characteristics to improve channel hydraulics, increase pollutant removals, and enhance channel/creek aesthetic and habitat value.
- Conduct channel modification/improvement in accordance with existing laws. Any person, government agency, or public utility proposing an activity that will change the natural (emphasis added) state of any river, stream, or lake in California, must enter into a Steam or Lake Alteration Agreement with the Department of Fish and Game. The developer-applicant should also contact local governments (city, county, special districts), other state agencies (SWRCB, RWQCB, Department of Forestry, Department of Water Resources), and Federal Corps of Engineers and USFWS.

Illicit Connections and Discharges

- Look for evidence of illegal discharges or illicit connections during routine maintenance of conveyance system and drainage structures:
  - Is there evidence of spills such as paints, discoloring, etc?

- Are there any odors associated with the drainage system?
- Record locations of apparent illegal discharges/illicit connections?
- Track flows back to potential dischargers and conduct aboveground inspections. This can be done through visual inspection of upgradient manholes or alternate techniques including zinc chloride smoke testing, fluorometric dye testing, physical inspection testing, or television camera inspection.
- Eliminate the discharge once the origin of flow is established.

- Stencil or demarcate storm drains, where applicable, to prevent illegal disposal of pollutants. Storm drain inlets should have messages such as "Dump No Waste Drains to Stream" stenciled next to them to warn against ignorant or intentional dumping of pollutants into the storm drainage system.
- Refer to fact sheet SC-10 Non-Stormwater Discharges.

Illegal Dumping

- Inspect and clean up hot spots and other storm drainage areas regularly where illegal dumping and disposal occurs.
- Establish a system for tracking incidents. The system should be designed to identify the following:
  - Illegal dumping hot spots
  - Types and quantities (in some cases) of wastes
  - Patterns in time of occurrence (time of day/night, month, or year)
  - Mode of dumping (abandoned containers, "midnight dumping" from moving vehicles, direct dumping of materials, accidents/spills)
  - Responsible parties
- Post "No Dumping" signs in problem areas with a phone number for reporting dumping and disposal. Signs should also indicate fines and penalties for illegal dumping.
- Refer to fact sheet SC-10 Non-Stormwater Discharges.

Training

- Train crews in proper maintenance activities, including record keeping and disposal.
- Allow only properly trained individuals to handle hazardous materials/wastes.
- Have staff involved in detection and removal of illicit connections trained in the following:
  - OSHA-required Health and Safety Training (29 CFR 1910.120) plus annual refresher training (as needed).

- OSHA Confined Space Entry training (Cal-OSHA Confined Space, Title 8 and Federal OSHA 29 CFR 1910.146).
- Procedural training (field screening, sampling, smoke/dye testing, TV inspection).

Spill Response and Prevention

- Investigate all reports of spills, leaks, and/or illegal dumping promptly.
- Clean up all spills and leaks using "dry" methods (with absorbent materials and/or rags) or dig up, remove, and properly dispose of contaminated soil.
- Refer to fact sheet SC-11 Spill Prevention, Control, and Cleanup.

Other Considerations (Limitations and Regulations)

- Clean-up activities may create a slight disturbance for local aquatic species. Access to items and material on private property may be limited. Trade-offs may exist between channel hydraulics and water quality/riparian habitat. If storm channels or basins are recognized as wetlands, many activities, including maintenance, may be subject to regulation and permitting.
- Storm drain flushing is most effective in small diameter pipes (36-inch diameter pipe or less, depending on water supply and sediment collection capacity). Other considerations associated with storm drain flushing may include the availability of a water source, finding a downstream area to collect sediments, liquid/sediment disposal, and prohibition against disposal of flushed effluent to sanitary sewer in some areas.
- Regulations may include adoption of substantial penalties for illegal dumping and disposal.
- Local municipal codes may include sections prohibiting discharge of soil, debris, refuse, hazardous wastes, and other pollutants into the storm drain system.

Requirements

Costs

- An aggressive catch basin cleaning program could require a significant capital and O&M budget.
- The elimination of illegal dumping is dependent on the availability, convenience, and cost of alternative means of disposal. The primary cost is for staff time. Cost depends on how aggressively a program is implemented. Other cost considerations for an illegal dumping program include:
  - Purchase and installation of signs.
  - Rental of vehicle(s) to haul illegally-disposed items and material to landfills.
  - Rental of heavy equipment to remove larger items (e.g., car bodies) from channels.
  - Purchase of landfill space to dispose of illegally-dumped items and material.

- Methods used for illicit connection detection (smoke testing, dye testing, visual inspection, and flow monitoring) can be costly and time-consuming. Site-specific factors, such as the level of impervious area, the density and ages of buildings, and type of land use will determine the level of investigation necessary.

Maintenance

- Two-person teams may be required to clean catch basins with vactor trucks.
- Teams of at least two people plus administrative personnel are required to identify illicit discharges, depending on the complexity of the storm sewer system.
- Arrangements must be made for proper disposal of collected wastes.
- Technical staff are required to detect and investigate illegal dumping violations.

Supplemental Information

Further Detail of the BMP

Storm Drain Flushing

Flushing is a common maintenance activity used to improve pipe hydraulics and to remove pollutants in storm drainage systems. Flushing may be designed to hydraulically convey accumulated material to strategic locations, such as an open channel, another point where flushing will be initiated, or the sanitary sewer and the treatment facilities, thus preventing resuspension and overflow of a portion of the solids during storm events. Flushing prevents "plug flow" discharges of concentrated pollutant loadings and sediments. Deposits can hinder the designed conveyance capacity of the storm drain system and potentially cause backwater conditions in severe cases of clogging.

Storm drain flushing usually takes place along segments of pipe with grades that are too flat to maintain adequate velocity to keep particles in suspension. An upstream manhole is selected to place an inflatable device that temporarily plugs the pipe. Further upstream, water is pumped into the line to create a flushing wave. When the upstream reach of pipe is sufficiently full to cause a flushing wave, the inflated device is rapidly deflated with the assistance of a vacuum pump, thereby releasing the backed up water and resulting in the cleaning of the storm drain segment.

To further reduce impacts of stormwater pollution, a second inflatable device placed well downstream may be used to recollect the water after the force of the flushing wave has dissipated. A pump may then be used to transfer the water and accumulated material to the sanitary sewer for treatment. In some cases, an interceptor structure may be more practical or required to recollect the flushed waters.

It has been found that cleansing efficiency of periodic flush waves is dependent upon flush volume, flush discharge rate, sewer slope, sewer length, sewer flow rate, sewer diameter, and population density. As a rule of thumb, the length of line to be flushed should not exceed 700 feet. At this maximum recommended length, the percent removal efficiency ranges between 65-75% for organics and 55-65% for dry weather grit/inorganic material. The percent removal efficiency drops rapidly beyond that. Water is commonly supplied by a water truck, but fire hydrants can also supply water. To make the best use of water, it is recommended that reclaimed water be used or that fire hydrant line flushing coincide with storm sewer flushing.

References and Resources

California's Nonpoint Source Program Plan http://www.swrcb.ca.gov/nps/index.html

Clark County Storm Water Pollution Control Manual
http://www.co.clark.wa.us/pubworks/bmpman.pdf

Ferguson, B.K. 1991. Urban Stream Reclamation, p. 324-322, Journal of Soil and Water Conservation.

King County Storm Water Pollution Control Manual http://dnr.metrokc.gov/wlr/dss/spcm.htm

Oregon Association of Clean Water Agencies. Oregon Municipal Stormwater Toolbox for Maintenance Practices. June 1998.

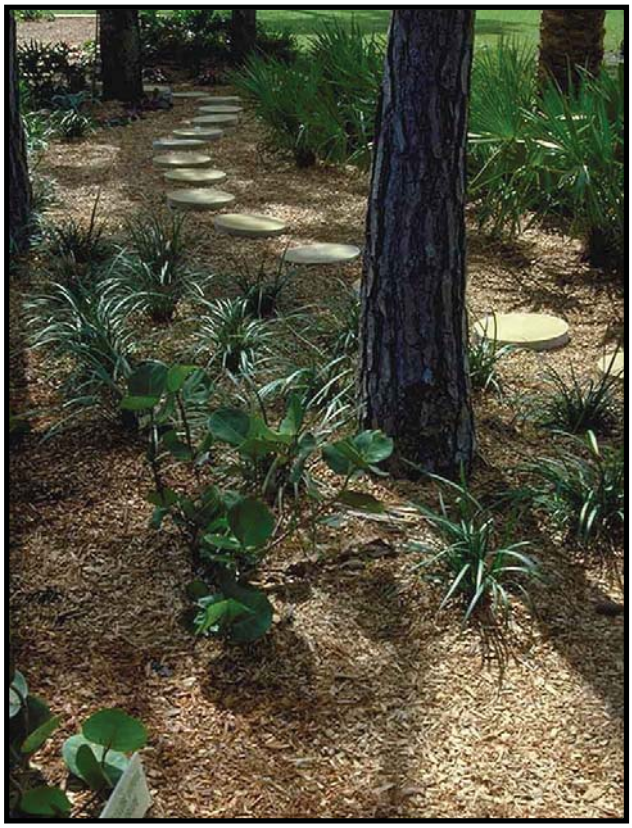
Santa Clara Valley Urban Runoff Pollution Prevention Program http://www.scvurppp.org

The Storm Water Managers Resource Center http://www.stormwatercenter.net

United States Environmental Protection Agency (USEPA). 2002. Pollution Prevention/Good Housekeeping for Municipal Operations Storm Drain System Cleaning. On line:
http://www.epa.gov/npdes/menuofbmps/poll_16.htm

Appendix 10: Education Materials

Site Design & Landscape Planning SD-10



Design Objectives

- ✓ Maximize Infiltration
- ✓ Provide Retention
- ✓ Slow Runoff
- ✓ Minimize Impervious Land Coverage
- Prohibit Dumping of Improper Materials
- Contain Pollutants
- Collect and Convey

Description

Each project site possesses unique topographic, hydrologic, and vegetative features, some of which are more suitable for development than others. Integrating and incorporating appropriate landscape planning methodologies into the project design is the most effective action that can be done to minimize surface and groundwater contamination from stormwater.

Approach

Landscape planning should couple consideration of land suitability for urban uses with consideration of community goals and projected growth. Project plan designs should conserve natural areas to the extent possible, maximize natural water storage and infiltration opportunities, and protect slopes and channels.

Suitable Applications

Appropriate applications include residential, commercial and industrial areas planned for development or redevelopment.

Design Considerations

Design requirements for site design and landscapes planning should conform to applicable standards and specifications of agencies with jurisdiction and be consistent with applicable General Plan and Local Area Plan policies.

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Designing New Installations

Begin the development of a plan for the landscape unit with attention to the following general principles:

- Formulate the plan on the basis of clearly articulated community goals. Carefully identify conflicts and choices between retaining and protecting desired resources and community growth.

- Map and assess land suitability for urban uses. Include the following landscape features in the assessment: wooded land, open unwooded land, steep slopes, erosion-prone soils, foundation suitability, soil suitability for waste disposal, aquifers, aquifer recharge areas, wetlands, floodplains, surface waters, agricultural lands, and various categories of urban land use. When appropriate, the assessment can highlight outstanding local or regional resources that the community determines should be protected (e.g., a scenic area, recreational area, threatened species habitat, farmland, fish run). Mapping and assessment should recognize not only these resources but also additional areas needed for their sustenance.

Project plan designs should conserve natural areas to the extent possible, maximize natural water storage and infiltration opportunities, and protect slopes and channels.

Conserve Natural Areas during Landscape Planning

If applicable, the following items are required and must be implemented in the site layout during the subdivision design and approval process, consistent with applicable General Plan and Local Area Plan policies:

- Cluster development on least-sensitive portions of a site while leaving the remaining land in a natural undisturbed condition.

- Limit clearing and grading of native vegetation at a site to the minimum amount needed to build lots, allow access, and provide fire protection.

- Maximize trees and other vegetation at each site by planting additional vegetation, clustering tree areas, and promoting the use of native and/or drought tolerant plants.

- Promote natural vegetation by using parking lot islands and other landscaped areas.

- Preserve riparian areas and wetlands.

Maximize Natural Water Storage and Infiltration Opportunities Within the Landscape Unit

- Promote the conservation of forest cover. Building on land that is already deforested affects basin hydrology to a lesser extent than converting forested land. Loss of forest cover reduces interception storage, detention in the organic forest floor layer, and water losses by evapotranspiration, resulting in large peak runoff increases and either their negative effects or the expense of countering them with structural solutions.

- Maintain natural storage reservoirs and drainage corridors, including depressions, areas of permeable soils, swales, and intermittent streams. Develop and implement policies and

regulations to discourage the clearing, filling, and channelization of these features. Utilize them in drainage networks in preference to pipes, culverts, and engineered ditches.

- Evaluating infiltration opportunities by referring to the stormwater management manual for the jurisdiction and pay particular attention to the selection criteria for avoiding groundwater contamination, poor soils, and hydrogeological conditions that cause these facilities to fail. If necessary, locate developments with large amounts of impervious surfaces or a potential to produce relatively contaminated runoff away from groundwater recharge areas.

Protection of Slopes and Channels during Landscape Design

- Convey runoff safely from the tops of slopes.
- Avoid disturbing steep or unstable slopes.
- Avoid disturbing natural channels.
- Stabilize disturbed slopes as quickly as possible.
- Vegetate slopes with native or drought tolerant vegetation.
- Control and treat flows in landscaping and/or other controls prior to reaching existing natural drainage systems.
- Stabilize temporary and permanent channel crossings as quickly as possible, and ensure that increases in run-off velocity and frequency caused by the project do not erode the channel.
- Install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion. Energy dissipaters shall be installed in such a way as to minimize impacts to receiving waters.
- Line on-site conveyance channels where appropriate, to reduce erosion caused by increased flow velocity due to increases in tributary impervious area. The first choice for linings should be grass or some other vegetative surface, since these materials not only reduce runoff velocities, but also provide water quality benefits from filtration and infiltration. If velocities in the channel are high enough to erode grass or other vegetative linings, riprap, concrete, soil cement, or geo-grid stabilization are other alternatives.
- Consider other design principles that are comparable and equally effective.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define “redevelopment” in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of “ redevelopment” must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under “designing new installations” above should be followed.

Redevelopment may present significant opportunity to add features which had not previously been implemented. Examples include incorporation of depressions, areas of permeable soils, and swales in newly redeveloped areas. While some site constraints may exist due to the status of already existing infrastructure, opportunities should not be missed to maximize infiltration, slow runoff, reduce impervious areas, disconnect directly connected impervious areas.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Stormwater Management Manual for Western Washington, Washington State Department of Ecology, August 2001.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.

Roof Runoff Controls SD-11



Rain Garden

Design Objectives

- ✓ Maximize Infiltration
- ✓ Provide Retention
- ✓ Slow Runoff
- Minimize Impervious Land Coverage
- Prohibit Dumping of Improper Materials
- ✓ Contain Pollutants
- Collect and Convey

Description

Various roof runoff controls are available to address stormwater that drains off rooftops. The objective is to reduce the total volume and rate of runoff from individual lots, and retain the pollutants on site that may be picked up from roofing materials and atmospheric deposition. Roof runoff controls consist of directing the roof runoff away from paved areas and mitigating flow to the storm drain system through one of several general approaches: cisterns or rain barrels; dry wells or infiltration trenches; pop-up emitters, and foundation planting. The first three approaches require the roof runoff to be contained in a gutter and downspout system. Foundation planting provides a vegetated strip under the drip line of the roof.

Approach

Design of individual lots for single-family homes as well as lots for higher density residential and commercial structures should consider site design provisions for containing and infiltrating roof runoff or directing roof runoff to vegetative swales or buffer areas. Retained water can be reused for watering gardens, lawns, and trees. Benefits to the environment include reduced demand for potable water used for irrigation, improved stormwater quality, increased groundwater recharge, decreased runoff volume and peak flows, and decreased flooding potential.

Suitable Applications

Appropriate applications include residential, commercial and industrial areas planned for development or redevelopment.

Design Considerations

Designing New Installations

Cisterns or Rain Barrels

One method of addressing roof runoff is to direct roof downspouts to cisterns or rain barrels. A cistern is an above ground storage vessel with either a manually operated valve or a permanently open outlet. Roof runoff is temporarily stored and then released for irrigation or infiltration between storms. The number of rain

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barrels needed is a function of the rooftop area. Some low impact developers recommend that every house have at least 2 rain barrels, with a minimum storage capacity of 1000 liters. Roof barrels serve several purposes including mitigating the first flush from the roof which has a high volume, amount of contaminants, and thermal load. Several types of rain barrels are commercially available. Consideration must be given to selecting rain barrels that are vector proof and childproof. In addition, some barrels are designed with a bypass valve that filters out grit and other contaminants and routes overflow to a soak-away pit or rain garden.

If the cistern has an operable valve, the valve can be closed to store stormwater for irrigation or infiltration between storms. This system requires continual monitoring by the resident or grounds crews, but provides greater flexibility in water storage and metering. If a cistern is provided with an operable valve and water is stored inside for long periods, the cistern must be covered to prevent mosquitoes from breeding.

A cistern system with a permanently open outlet can also provide for metering stormwater runoff. If the cistern outlet is significantly smaller than the size of the downspout inlet (say ¼ to ½ inch diameter), runoff will build up inside the cistern during storms, and will empty out slowly after peak intensities subside. This is a feasible way to mitigate the peak flow increases caused by rooftop impervious land coverage, especially for the frequent, small storms.

Dry wells and Infiltration Trenches

Roof downspouts can be directed to dry wells or infiltration trenches. A dry well is constructed by excavating a hole in the ground and filling it with an open graded aggregate, and allowing the water to fill the dry well and infiltrate after the storm event. An underground connection from the downspout conveys water into the dry well, allowing it to be stored in the voids. To minimize sedimentation from lateral soil movement, the sides and top of the stone storage matrix can be wrapped in a permeable filter fabric, though the bottom may remain open. A perforated observation pipe can be inserted vertically into the dry well to allow for inspection and maintenance.

In practice, dry wells receiving runoff from single roof downspouts have been successful over long periods because they contain very little sediment. They must be sized according to the amount of rooftop runoff received, but are typically 4 to 5 feet square, and 2 to 3 feet deep, with a minimum of 1-foot soil cover over the top (maximum depth of 10 feet).

To protect the foundation, dry wells must be set away from the building at least 10 feet. They must be installed in solids that accommodate infiltration. In poorly drained soils, dry wells have very limited feasibility.

Infiltration trenches function in a similar manner and would be particularly effective for larger roof areas. An infiltration trench is a long, narrow, rock-filled trench with no outlet that receives stormwater runoff. These are described under Treatment Controls.

Pop-up Drainage Emitter

Roof downspouts can be directed to an underground pipe that daylights some distance from the building foundation, releasing the roof runoff through a pop-up emitter. Similar to a pop-up irrigation head, the emitter only opens when there is flow from the roof. The emitter remains flush to the ground during dry periods, for ease of lawn or landscape maintenance.

Foundation Planting

Landscape planting can be provided around the base to allow increased opportunities for stormwater infiltration and protect the soil from erosion caused by concentrated sheet flow coming off the roof. Foundation plantings can reduce the physical impact of water on the soil and provide a subsurface matrix of roots that encourage infiltration. These plantings must be sturdy enough to tolerate the heavy runoff sheet flows, and periodic soil saturation.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of " redevelopment" must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under "designing new installations" above should be followed.

Supplemental Information

Examples

- City of Ottawa's Water Links Surface –Water Quality Protection Program
- City of Toronto Downspout Disconnection Program
- City of Boston, MA, Rain Barrel Demonstration Program

Other Resources

Hager, Marty Catherine, Stormwater, "Low-Impact Development", January/February 2003. www.stormh2o.com

Low Impact Urban Design Tools, Low Impact Development Design Center, Beltsville, MD. www.lid-stormwater.net

Start at the Source, Bay Area Stormwater Management Agencies Association, 1999 Edition

Efficient Irrigation SD-12



Design Objectives

- ✓ Maximize Infiltration
- ✓ Provide Retention
- ✓ Slow Runoff
- Minimize Impervious Land Coverage
- Prohibit Dumping of Improper Materials
- Contain Pollutants
- Collect and Convey

Description

Irrigation water provided to landscaped areas may result in excess irrigation water being conveyed into stormwater drainage systems.

Approach

Project plan designs for development and redevelopment should include application methods of irrigation water that minimize runoff of excess irrigation water into the stormwater conveyance system.

Suitable Applications

Appropriate applications include residential, commercial and industrial areas planned for development or redevelopment. (Detached residential single-family homes are typically excluded from this requirement.)

Design Considerations

Designing New Installations

The following methods to reduce excessive irrigation runoff should be considered, and incorporated and implemented where determined applicable and feasible by the Permittee:

- Employ rain-triggered shutoff devices to prevent irrigation after precipitation.
- Design irrigation systems to each landscape area's specific water requirements.
- Include design featuring flow reducers or shutoff valves triggered by a pressure drop to control water loss in the event of broken sprinkler heads or lines.
- Implement landscape plans consistent with County or City water conservation resolutions, which may include provision of water sensors, programmable irrigation times (for short cycles), etc.

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- Design timing and application methods of irrigation water to minimize the runoff of excess irrigation water into the storm water drainage system.
- Group plants with similar water requirements in order to reduce excess irrigation runoff and promote surface filtration. Choose plants with low irrigation requirements (for example, native or drought tolerant species). Consider design features such as:
  - Using mulches (such as wood chips or bar) in planter areas without ground cover to minimize sediment in runoff
  - Installing appropriate plant materials for the location, in accordance with amount of sunlight and climate, and use native plant materials where possible and/or as recommended by the landscape architect
  - Leaving a vegetative barrier along the property boundary and interior watercourses, to act as a pollutant filter, where appropriate and feasible
  - Choosing plants that minimize or eliminate the use of fertilizer or pesticides to sustain growth
- Employ other comparable, equally effective methods to reduce irrigation water runoff.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of " redevelopment" must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under "designing new installations" above should be followed.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.

Storm Drain Signage SD-13



Design Objectives

- Maximize Infiltration
- Provide Retention
- Slow Runoff
- Minimize Impervious Land Coverage
- ✓ Prohibit Dumping of Improper Materials
- Contain Pollutants
- Collect and Convey

Description

Waste materials dumped into storm drain inlets can have severe impacts on receiving and ground waters. Posting notices regarding discharge prohibitions at storm drain inlets can prevent waste dumping. Storm drain signs and stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets.

Approach

The stencil or affixed sign contains a brief statement that prohibits dumping of improper materials into the urban runoff conveyance system. Storm drain messages have become a popular method of alerting the public about the effects of and the prohibitions against waste disposal.

Suitable Applications

Stencils and signs alert the public to the destination of pollutants discharged to the storm drain. Signs are appropriate in residential, commercial, and industrial areas, as well as any other area where contributions or dumping to storm drains is likely.

Design Considerations

Storm drain message markers or placards are recommended at all storm drain inlets within the boundary of a development project. The marker should be placed in clear sight facing toward anyone approaching the inlet from either side. All storm drain inlet locations should be identified on the development site map.

Designing New Installations

The following methods should be considered for inclusion in the project design and show on project plans:

- Provide stenciling or labeling of all storm drain inlets and catch basins, constructed or modified, within the project area with prohibitive language. Examples include "NO DUMPING –

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DRAINS TO OCEAN" and/or other graphical icons to discourage illegal dumping.

- Post signs with prohibitive language and/or graphical icons, which prohibit illegal dumping at public access points along channels and creeks within the project area.

Note - Some local agencies have approved specific signage and/or storm drain message placards for use. Consult local agency stormwater staff to determine specific requirements for placard types and methods of application.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. If the project meets the definition of "redevelopment", then the requirements stated under " designing new installations" above should be included in all project design plans.

Additional Information

Maintenance Considerations

- Legibility of markers and signs should be maintained. If required by the agency with jurisdiction over the project, the owner/operator or homeowner's association should enter into a maintenance agreement with the agency or record a deed restriction upon the property title to maintain the legibility of placards or signs.

Placement

- Signage on top of curbs tends to weather and fade.
- Signage on face of curbs tends to be worn by contact with vehicle tires and sweeper brooms.

Supplemental Information

Examples

- Most MS4 programs have storm drain signage programs. Some MS4 programs will provide stencils, or arrange for volunteers to stencil storm drains as part of their outreach program.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.

Helpful telephone numbers and links:

Riverside County Stormwater Protection Partners

Flood Control District	(951) 955-1200
County of Riverside	(951) 955-1000
City of Banning	(951) 922-3105
City of Beaumont	(951) 769-8520
City of Calimesa	(909) 795-9801
City of Canyon Lake	(951) 244-2955
Cathedral City	(760) 770-0327
City of Coachella	(760) 398-4978
City of Corona	(951) 736-2447
City of Desert Hot Springs	(760) 329-6411
City of Eastvale	(951) 361-0900
City of Hemet	(951) 765-2300
City of Indian Wells	(760) 346-2489
City of Indio	(760) 391-4000
City of Lake Elsinore	(951) 674-3124
City of La Quinta	(760) 777-7000
City of Menifee	(951) 672-6777
City of Moreno Valley	(951) 413-3000
City of Murrieta	(951) 304-2489
City of Norco	(951) 270-5607
City of Palm Desert	(760) 346-0611
City of Palm Springs	(760) 323-8299
City of Perris	(951) 943-6100
City of Rancho Mirage	(760) 324-4511
City of Riverside	(951) 361-0900
City of San Jacinto	(951) 654-7337
City of Temecula	(951) 694-6444
City of Wildomar	(951) 677-7751

REPORT ILLEGAL STORM DRAIN DISPOSAL
1-800-506-2555 or e-mail us at
fcnpdes@rcflood.org

- Riverside County Flood Control and Water Conservation District
  www.rcflood.org

Online resources include:

- California Storm Water Quality Association
  www.casqa.org
- State Water Resources Control Board
  www.waterboards.ca.gov
- Power Washers of North America
  www.thepwna.org

Stormwater Pollution

What you should know for...

Outdoor Cleaning Activities and Professional Mobile Service Providers



Storm drain pollution prevention information for:

- Car Washing / Mobile Detailers
- Window and Carpet Cleaners
- Power Washers
- Waterproofers / Street Sweepers
- Equipment cleaners or degreasers and all mobile service providers

Do you know where street flows actually go?

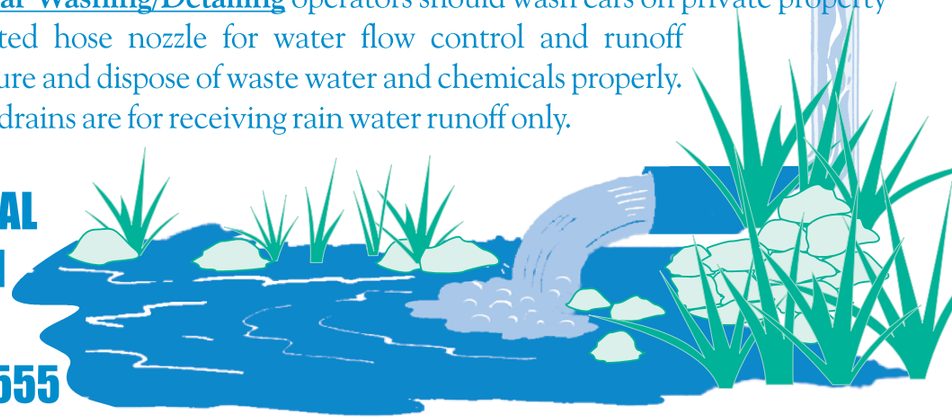
Storm drains are NOT connected to sanitary sewer systems and treatment plants!



The primary purpose of storm drains is to carry *rain* water away from developed areas to prevent flooding. Pollutants discharged to storm drains are transported directly into rivers, lakes and streams. Soaps, degreasers, automotive fluids, litter and a host of materials are washed off buildings, sidewalks, plazas and parking areas. Vehicles and equipment must be properly managed to prevent the pollution of local waterways.

Unintentional spills by mobile service operators can flow into storm drains and pollute our waterways. **Avoid mishaps.** *Always* have a **Spill Response Kit** on hand to clean up unintentional spills. Only emergency **Mechanical** repairs should be done in City streets, using drip pans for spills. **Plumbing** should be done on private property. Always store chemicals in a leak-proof container and keep covered when not in use. **Window/Power Washing** waste water shouldn't be released into the streets, but should be disposed of in a sanitary sewer, landscaped area or in the soil. Soiled **Carpet Cleaning** wash water should be filtered before being discharged into the sanitary sewer. Dispose of all filter debris properly. **Car Washing/Detailing** operators should wash cars on private property and use a regulated hose nozzle for water flow control and runoff prevention. Capture and dispose of waste water and chemicals properly. Remember, storm drains are for receiving rain water runoff only.

REPORT ILLEGAL STORM DRAIN DISPOSAL 1-800-506-2555



Help Protect Our Waterways!

Use these guidelines for Outdoor Cleaning Activities and Wash Water Disposal

Did you know that disposing of pollutants into the street, gutter, storm drain or body of water is *PROHIBITED* by law and can result in stiff penalties?

Best Management Practices

Waste wash water from Mechanics, Plumbers, Window/Power Washers, Carpet Cleaners, Car Washing and Mobile Detailing activities may contain significant quantities of motor oil, grease, chemicals, dirt, detergents, brake pad dust, litter and other materials.

Best Management Practices, or BMPs as they are known, are guides to prevent pollutants from entering the storm drains. ***Each of us*** can do our part to keep stormwater clean by using the suggested BMPs below:

Simple solutions for both light and heavy duty jobs:

Do...consider dry cleaning methods first such as a mop, broom, rag or wire brush. Always keep a spill response kit on site.

Do...prepare the work area before power cleaning by using sand bags, rubber mats, vacuum booms, containment pads or temporary berms to keep wash water away from the gutters and storm drains.

Do...use vacuums or other machines to remove and collect loose debris or litter before applying water.

Do...obtain the property owner's permission to dispose of ***small amounts*** of power washing waste water on to landscaped, gravel or unpaved surfaces.

Do...check your local sanitary sewer agency's policies on wash water disposal regulations before disposing of wash water into the sewer. (See list on reverse side)

Do...be aware that if discharging to landscape areas, soapy wash water may damage landscaping. Residual wash water may remain on paved surfaces to evaporate. Sweep up solid residuals and dispose of properly. Vacuum booms are another option for capturing and collecting wash water.

Do...check to see if local ordinances prevent certain activities.

Do not let...wash or waste water from sidewalk, plaza or building cleaning go into a street or storm drain.



Report illegal storm drain disposal
Call Toll Free
1-800-506-2555

Using Cleaning Agents

Try using biodegradable/phosphate-free products. They are easier on the environment, but don't confuse them with being toxic free. Soapy water entering the storm drain system can impact the delicate aquatic environment.



When cleaning surfaces with a ***high-pressure washer*** or ***steam cleaner***, additional precautions should be taken to prevent the discharge of pollutants into the storm drain system. These two methods of surface cleaning can loosen additional material that can contaminate local waterways.

Think Water Conservation

Minimize water use by using high pressure, low volume nozzles. Be sure to check all hoses for leaks. Water is a precious resource, don't let it flow freely and be sure to shut it off in between uses.

Screening Wash Water

Conduct thorough dry cleanup before washing exterior surfaces, such as buildings and decks ***with loose paint***, sidewalks or plaza areas. Keep debris from entering the storm drain after cleaning by first passing the wash water through a "20 mesh" or finer screen to catch the solid materials, then dispose of the mesh in a refuse container. Do not let the remaining wash water enter a street, gutter or storm drain.

Drain Inlet Protection & Collection of Wash Water

- Prior to any washing, block all storm drains with an impervious barrier such as sandbags or berms, or seal the storm drain with plugs or other appropriate materials.
- Create a containment area with berms and traps or take advantage of a low spot to keep wash water contained.
- Wash vehicles and equipment on grassy or gravel areas so that the wash water can seep into the ground.
- Pump or vacuum up all wash water in the contained area.

Concrete/Coring/Saw Cutting and Drilling Projects

Protect any down-gradient inlets by using dry activity techniques whenever possible. If water is used, minimize the amount of water used during the coring/drilling or saw cutting process. Place a barrier of sandbags and/or absorbent berms to protect the storm drain inlet or watercourse. Use a shovel or wet vacuum to remove the residue from the pavement. Do not wash residue or particulate matter into a storm drain inlet or watercourse.

Why is stormwater runoff a problem?



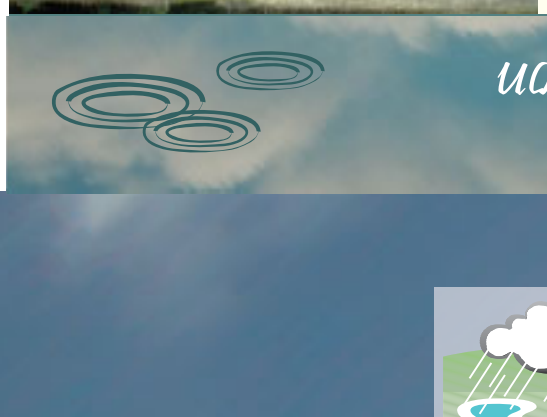
Stormwater can pick up debris, chemicals, dirt, and other pollutants and flow into a storm sewer system or directly to a lake, stream, river, wetland, or coastal water. Anything that enters a storm sewer system is discharged untreated into the waterbodies we use for swimming, fishing, and providing drinking water.

What is stormwater runoff?



Stormwater runoff occurs when precipitation from rain or snowmelt flows over the ground. Impervious surfaces like driveways, sidewalks, and streets prevent stormwater from naturally soaking into the ground.

The effects of pollution



Polluted stormwater runoff can have many adverse effects on plants, fish, animals, and people.

- Sediment can cloud the water and make it difficult or impossible for aquatic plants to grow. Sediment also can destroy aquatic habitats.
- Excess nutrients can cause algae blooms. When algae die, they sink to the bottom and decompose in a process that removes oxygen from the water. Fish and other aquatic organisms can't exist in water with low dissolved oxygen levels.
- Bacteria and other pathogens can wash into swimming areas and create health hazards, often making beach closures necessary.

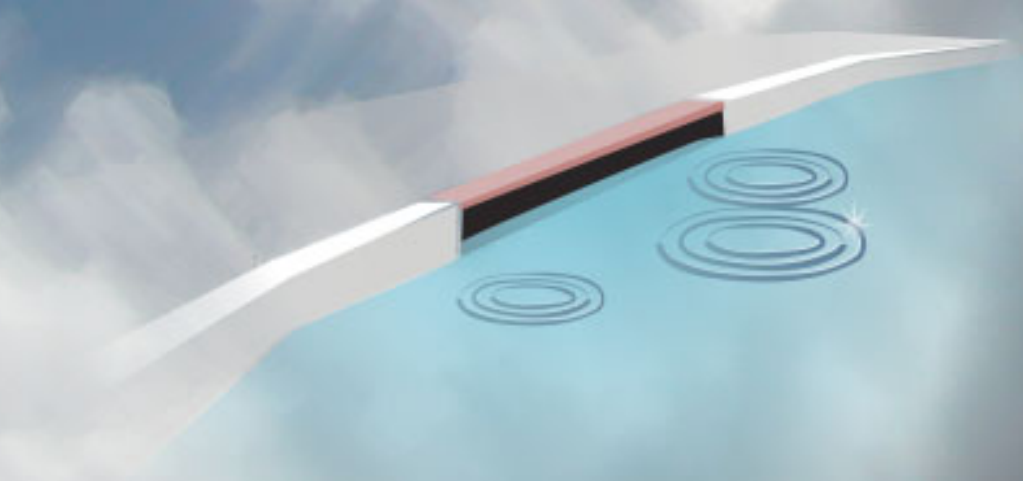


- Debris—plastic bags, six-pack rings, bottles, and cigarette butts—washed into waterbodies can choke, suffocate, or disable aquatic life like ducks, fish, turtles, and birds.
- Household hazardous wastes like insecticides, pesticides, paint, solvents, used motor oil, and other auto fluids can poison aquatic life. Land animals and people can become sick or die from eating diseased fish and shellfish or ingesting polluted water.
- Polluted stormwater often affects drinking water sources. This, in turn, can affect human health and increase drinking water treatment costs.



WHEN IT RAINS IT DRAINS

After the Storm



For more information contact:

or visit
www.epa.gov/npdes/stormwater
www.epa.gov/nps

United States Environmental Protection Agency

EPA 833-B-03-002

January 2003

THE YEAR OF CLEAN WATER
Celebration & Recommitment

A Citizen's Guide to Understanding Stormwater

WHEN IT RAINS IT DRAINS

Internet Address (URL) ● HTTP://www.epa.gov
Recycled/Recyclable ● Printed With Vegetable Oil Based Inks on 100% Postconsumer, Process Chlorine Free Recycled Paper

Stormwater Pollution Solutions



Residential

Recycle or properly dispose of household products that contain chemicals, such as insecticides, pesticides, paint, solvents, and used motor oil and other auto fluids. Don't pour them onto the ground or into storm drains.

Lawn care



Excess fertilizers and pesticides applied to lawns and gardens wash off and pollute streams. In addition, yard clippings and leaves can wash into storm drains and contribute nutrients and organic matter to streams.

- Don't overwater your lawn. Consider using a soaker hose instead of a sprinkler.
- Use pesticides and fertilizers sparingly. When use is necessary, use these chemicals in the recommended amounts. Use organic mulch or safer pest control methods whenever possible.
- Compost or mulch yard waste. Don't leave it in the street or sweep it into storm drains or streams.
- Cover piles of dirt or mulch being used in landscaping projects.

Septic systems



Leaking and poorly maintained septic systems release nutrients and pathogens (bacteria and viruses) that can be picked up by stormwater and discharged into nearby waterbodies. Pathogens can cause public health problems and environmental concerns.

- Inspect your system every 3 years and pump your tank as necessary (every 3 to 5 years).
- Don't dispose of household hazardous waste in sinks or toilets.

Auto care



Washing your car and degreasing auto parts at home can send detergents and other contaminants through the storm sewer system. Dumping automotive fluids into storm drains has the same result as dumping the materials directly into a waterbody.

- Use a commercial car wash that treats or recycles its wastewater, or wash your car on your yard so the water infiltrates into the ground.
- Repair leaks and dispose of used auto fluids and batteries at designated drop-off or recycling locations.

Pet waste



Pet waste can be a major source of bacteria and excess nutrients in local waters.

- When walking your pet, remember to pick up the waste and dispose of it properly. Flushing pet waste is the best disposal method. Leaving pet waste on the ground increases public health risks by allowing harmful bacteria and nutrients to wash into the storm drain and eventually into local waterbodies.



Education is essential to changing people's behavior. Signs and markers near storm drains warn residents that pollutants entering the drains will be carried untreated into a local waterbody.

Residential landscaping

Permeable Pavement—Traditional concrete and asphalt don't allow water to soak into the ground. Instead these surfaces rely on storm drains to divert unwanted water. Permeable pavement systems allow rain and snowmelt to soak through, decreasing stormwater runoff.



Rain Barrels—You can collect rainwater from rooftops in mosquito-proof containers. The water can be used later on lawn or garden areas.

Rain Gardens and Grassy Swales—Specially designed areas planted with native plants can provide natural places for rainwater to collect and soak into the ground. Rain from rooftop areas or paved areas can be diverted into these areas rather than into storm drains.



Vegetated Filter Strips—Filter strips are areas of native grass or plants created along roadways or streams. They trap the pollutants stormwater picks up as it flows across driveways and streets.



Commercial

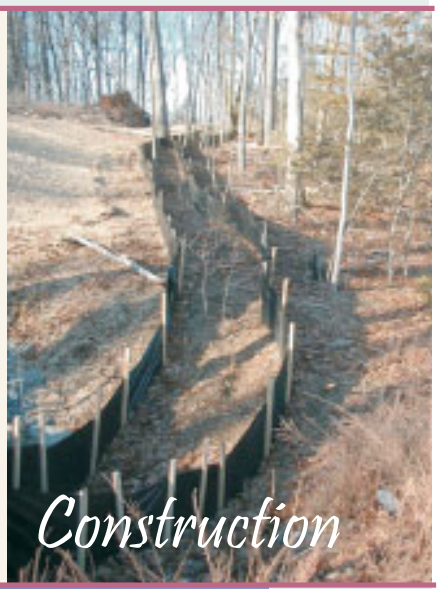
Dirt, oil, and debris that collect in parking lots and paved areas can be washed into the storm sewer system and eventually enter local waterbodies.

- Sweep up litter and debris from sidewalks, driveways and parking lots, especially around storm drains.
- Cover grease storage and dumpsters and keep them clean to avoid leaks.
- Report any chemical spill to the local hazardous waste cleanup team. They'll know the best way to keep spills from harming the environment.

Construction

Erosion controls that aren't maintained can cause excessive amounts of sediment and debris to be carried into the stormwater system. Construction vehicles can leak fuel, oil, and other harmful fluids that can be picked up by stormwater and deposited into local waterbodies.

- Divert stormwater away from disturbed or exposed areas of the construction site.
- Install silt fences, vehicle mud removal areas, vegetative cover, and other sediment and erosion controls and properly maintain them, especially after rainstorms.
- Prevent soil erosion by minimizing disturbed areas during construction projects, and seed and mulch bare areas as soon as possible.



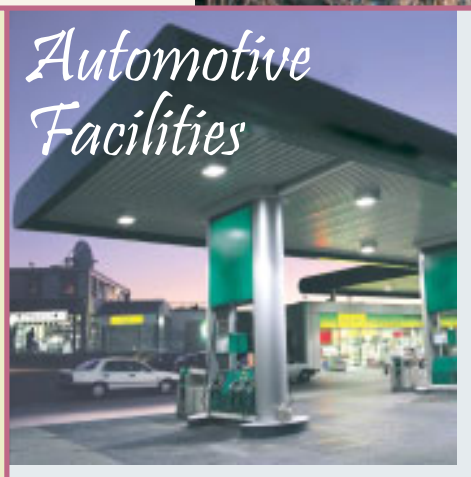


Agriculture

Lack of vegetation on streambanks can lead to erosion. Overgrazed pastures can also contribute excessive amounts of sediment to local waterbodies. Excess fertilizers and pesticides can poison aquatic animals and lead to destructive algae blooms. Livestock in streams can contaminate waterways with bacteria, making them unsafe for human contact.



- Keep livestock away from streambanks and provide them a water source away from waterbodies.
- Store and apply manure away from waterbodies and in accordance with a nutrient management plan.
- Vegetate riparian areas along waterways.
- Rotate animal grazing to prevent soil erosion in fields.
- Apply fertilizers and pesticides according to label instructions to save money and minimize pollution.



Automotive Facilities

Uncovered fueling stations allow spills to be washed into storm drains. Cars waiting to be repaired can leak fuel, oil, and other harmful fluids that can be picked up by stormwater.

- Clean up spills immediately and properly dispose of cleanup materials.
- Provide cover over fueling stations and design or retrofit facilities for spill containment.
- Properly maintain fleet vehicles to prevent oil, gas, and other discharges from being washed into local waterbodies.
- Install and maintain oil/water separators.

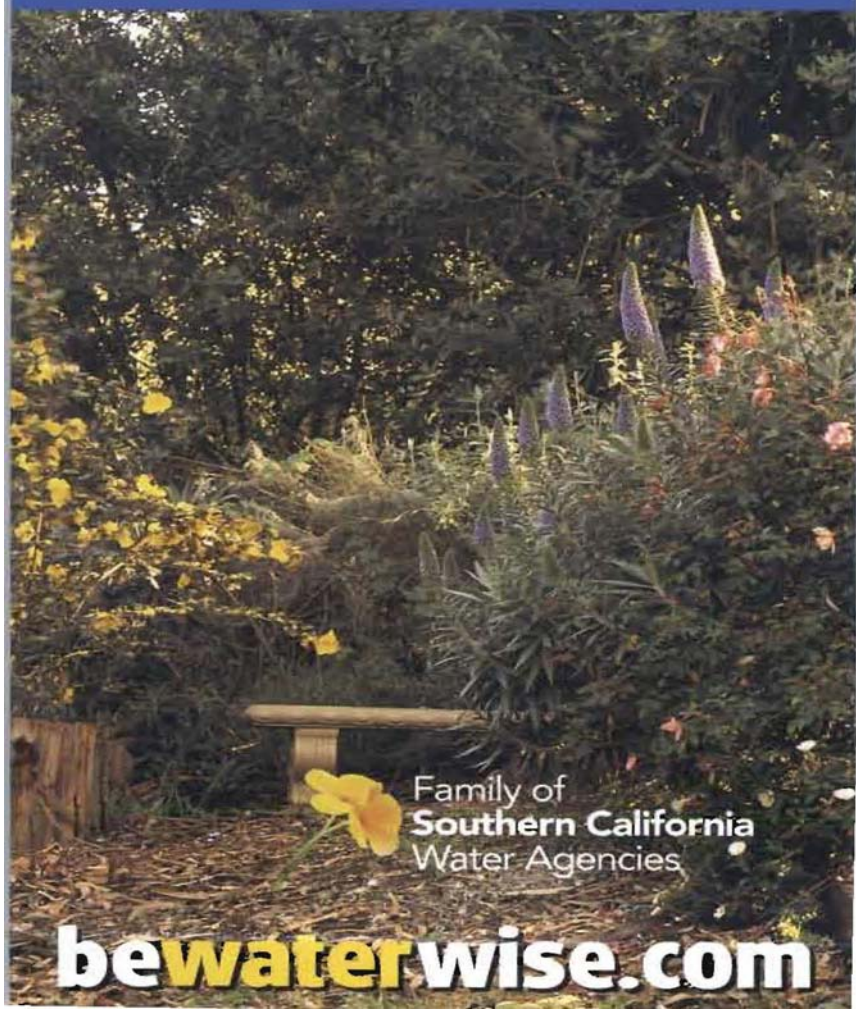


Forestry

Improperly managed logging operations can result in erosion and sedimentation.

- Conduct preharvest planning to prevent erosion and lower costs.
- Use logging methods and equipment that minimize soil disturbance.
- Plan and design skid trails, yard areas, and truck access roads to minimize stream crossings and avoid disturbing the forest floor.
- Construct stream crossings so that they minimize erosion and physical changes to streams.
- Expedite revegetation of cleared areas.

10 Ways to Save Water Outdoors



TIP #1 The average homeowner uses twice the amount of water needed to keep plants healthy. Use the watering calculator and index at **bewaterwise.com** to know exactly how much water your plants need.

TIP #2 Check your sprinkler system for leaks, overspray and broken sprinkler heads. Update with drip or other more water-efficient sprinklers where appropriate.

TIP #3 This fall, plant a portion of your garden with beautiful native and California Friendly plants. Browse the plant database at **bewaterwise.com** to find just the right look for your outdoor spaces.

TIP #4 Reduce the amount of water-thirsty grass. Keep only what you need and replace the rest with less-thirsty plants or permeable paving.

TIP #5 For the grass you keep, set your lawnmower blade higher.

TIP #6 Adjust your sprinkler timer downward in September. Plants need less water when days are shorter.

TIP #7 Use a broom instead of the hose for cleaning sidewalks and patios.

TIP #8 Mulch! A layer of bark, gravel, compost, sawdust or low-growing groundcover evens out soil temperature and allows better water retention.

TIP #9 Check the list of invasive plants that hurt our environment at **caleppc.org** and remove any from your garden.

TIP #10 Share these tips with your gardener, neighbors and friends. Water conservation should be a part of every Southern Californian's lifestyle, but that doesn't mean we can't have lush and beautiful outdoor spaces.

bewaterwise.com

3.5 Bioretention Facility

Type of BMP	LID – Bioretention
Treatment Mechanisms	Infiltration, Evapotranspiration, Evaporation, Biofiltration
Maximum Drainage Area	This BMP is intended to be integrated into a project's landscaped area in a distributed manner. Typically, contributing drainage areas to Bioretention Facilities range from less than 1 acre to a maximum of around 10 acres.
Other Names	Rain Garden, Bioretention Cell, Bioretention Basin, Biofiltration Basin, Landscaped Filter Basin, Porous Landscape Detention

Description

Bioretention Facilities are shallow, vegetated basins underlain by an engineered soil media. Healthy plant and biological activity in the root zone maintain and renew the macro-pore space in the soil and maximize plant uptake of pollutants and runoff. This keeps the Best Management Practice (BMP) from becoming clogged and allows more of the soil column to function as both a sponge (retaining water) and a highly effective and self-maintaining biofilter. In most cases, the bottom of a Bioretention Facility is unlined, which also provides an opportunity for infiltration to the extent the underlying onsite soil can accommodate. When the infiltration rate of the underlying soil is exceeded, fully biotreated flows are discharged via underdrains. Bioretention Facilities therefore will inherently achieve the maximum feasible level of infiltration and evapotranspiration and achieve the minimum feasible (but highly biotreated) discharge to the storm drain system.

Siting Considerations

These facilities work best when they are designed in a relatively level area. Unlike other BMPs, Bioretention Facilities can be used in smaller landscaped spaces on the site, such as:

- ✓ Parking islands
- ✓ Medians
- ✓ Site entrances

Landscaped areas on the site (such as may otherwise be required through minimum landscaping ordinances), can often be designed as Bioretention Facilities. This can be accomplished by:

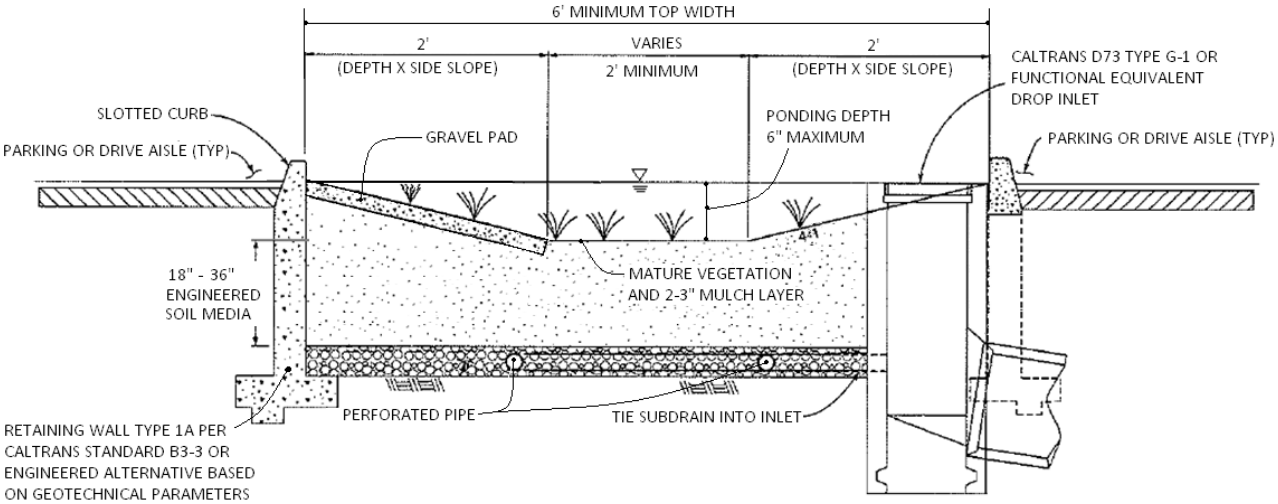
- *Depressing* landscaped areas below adjacent impervious surfaces, rather than elevating those areas
- Grading the site to direct runoff from those impervious surfaces *into* the Bioretention Facility, rather than away from the landscaping
- Sizing and designing the depressed landscaped area as a Bioretention Facility as described in this Fact Sheet

Bioretention Facilities should however not be used downstream of areas where large amounts of sediment can clog the system. Placing a Bioretention Facility at the toe of a steep slope should also be avoided due to the potential for clogging the engineered soil media with erosion from the slope, as well as the potential for damaging the vegetation.

Design and Sizing Criteria

The recommended cross section necessary for a Bioretention Facility includes:

- Vegetated area
- 18' minimum depth of engineered soil media
- 12' minimum gravel layer depth with 6' perforated pipes (added flow control features such as orifice plates may be required to mitigate for HCOC conditions)



While the 18-inch minimum engineered soil media depth can be used in some cases, it is recommended to use 24 inches or a preferred 36 inches to provide an adequate root zone for the chosen plant palate. Such a design also provides for improved removal effectiveness for nutrients. The recommended ponding depth inside of a Bioretention Facility is 6 inches; measured from the flat bottom surface to the top of the water surface as shown in Figure 1.

Because this BMP is filled with an engineered soil media, pore space in the soil and gravel layer is assumed to provide storage volume. However, several considerations must be noted:

- Surcharge storage above the soil surface (6 inches) is important to assure that design flows do not bypass the BMP when runoff exceeds the soil's absorption rate.
- In cases where the Bioretention Facility contains engineered soil media deeper than 36 inches, the pore space within the engineered soil media can only be counted to the 36-inch depth.
- A maximum of 30 percent pore space can be used for the soil media whereas a maximum of 40 percent pore space can be use for the gravel layer.

Figure 1: Standard Layout for a Bioretention Facility

Engineered Soil Media Requirements

The engineered soil media shall be comprised of 85 percent mineral component and 15 percent organic component, by volume, drum mixed prior to placement. The mineral component shall be a Class A sandy loam topsoil that meets the range specified in Table 1 below. The organic component shall be nitrogen stabilized compost[1], such that nitrogen does not leach from the media.

Table 1: Mineral Component Range Requirements

Percent Range	Component
70-80	Sand
15-20	Silt
5-10	Clay

The trip ticket, or certificate of compliance, shall be made available to the inspector to prove the engineered mix meets this specification.

Vegetation Requirements

Vegetative cover is important to minimize erosion and ensure that treatment occurs in the Bioretention Facility. The area should be designed for at least 70 percent mature coverage throughout the Bioretention Facility. To prevent the BMP from being used as walkways, Bioretention Facilities shall be planted with a combination of small trees, densely planted shrubs, and natural grasses. Grasses shall be native or ornamental; preferably ones that do not need to be mowed. The application of fertilizers and pesticides should be minimal. To maintain oxygen levels for the vegetation and promote biodegradation, it is important that vegetation not be completely submerged for any extended period of time. Therefore, a maximum of 6 inches of ponded water shall be used in the design to ensure that plants within the Bioretention Facility remain healthy.

A 2 to 3-inch layer of standard shredded aged hardwood mulch shall be placed as the top layer inside the Bioretention Facility. The 6-inch ponding depth shown in Figure 1 above shall be measured from the top surface of the 2 to 3-inch mulch layer.

Curb Cuts

To allow water to flow into the Bioretention Facility, 1-foot-wide (minimum) curb cuts should be placed approximately every 10 feet around the perimeter of the Bioretention Facility. Figure 2 shows a curb cut in a Bioretention Facility. Curb cut flow lines must be at or above the V_{BMP} water surface level.

[1] For more information on compost, visit the US Composting Council website at: http://compostingcouncil.org/



Figure 2: Curb Cut located in a Bioretention Facility

To reduce erosion, a gravel pad shall be placed at each inlet point to the Bioretention Facility. The gravel should be 1- to 1.5-inch diameter in size. The gravel should overlap the curb cut opening a minimum of 6 inches. The gravel pad inside the Bioretention Facility should be flush with the finished surface at the curb cut and extend to the bottom of the slope.

In addition, place an apron of stone or concrete, a foot square or larger, inside each inlet to prevent vegetation from growing up and blocking the inlet. See Figure 3.

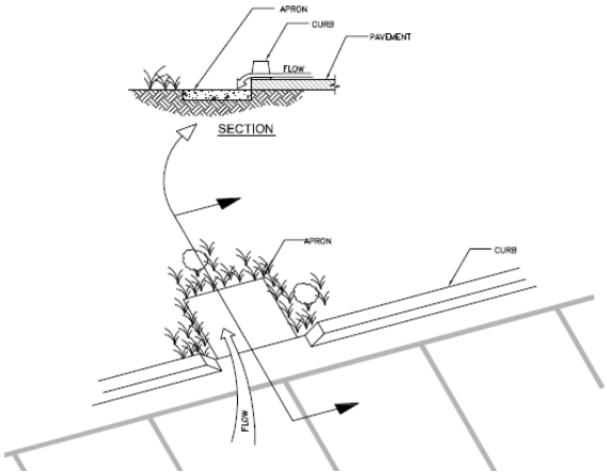


Figure 3: Apron located in a Bioretention Facility

Terracing the Landscaped Filter Basin

It is recommended that Bioretention Facilities be level. In the event the facility site slopes and lacks proper design, water would fill the lowest point of the BMP and then discharge from the basin without being treated. To ensure that the water will be held within the Bioretention Facility on sloped sites, the BMP must be terraced with nonporous check dams to provide the required storage and treatment capacity.

The terraced version of this BMP shall be used on non-flat sites with no more than a 3 percent slope. The surcharge depth cannot exceed 0.5 feet, and side slopes shall not exceed 4:1. Table 2 below shows the spacing of the check dams, and slopes shall be rounded up (i.e., 2.5 percent slope shall use 10' spacing for check dams).

Table 2: Check Dam Spacing

6" Check Dam Spacing	
Slope	**Spacing**
1%	*25'*
2%	*15'*
3%	*10'*

Roof Runoff

Roof downspouts may be directed towards Bioretention Facilities. However, the downspouts must discharge onto a concrete splash block to protect the Bioretention Facility from erosion.

Retaining Walls

It is recommended that Retaining Wall Type 1A, per Caltrans Standard B3-3 or equivalent, be constructed around the entire perimeter of the Bioretention Facility. This practice will protect the sides of the Bioretention Facility from collapsing during construction and maintenance or from high service loads adjacent to the BMP. Where such service loads would not exist adjacent to the BMP, an engineered alternative may be used if signed by a licensed civil engineer.

Side Slope Requirements

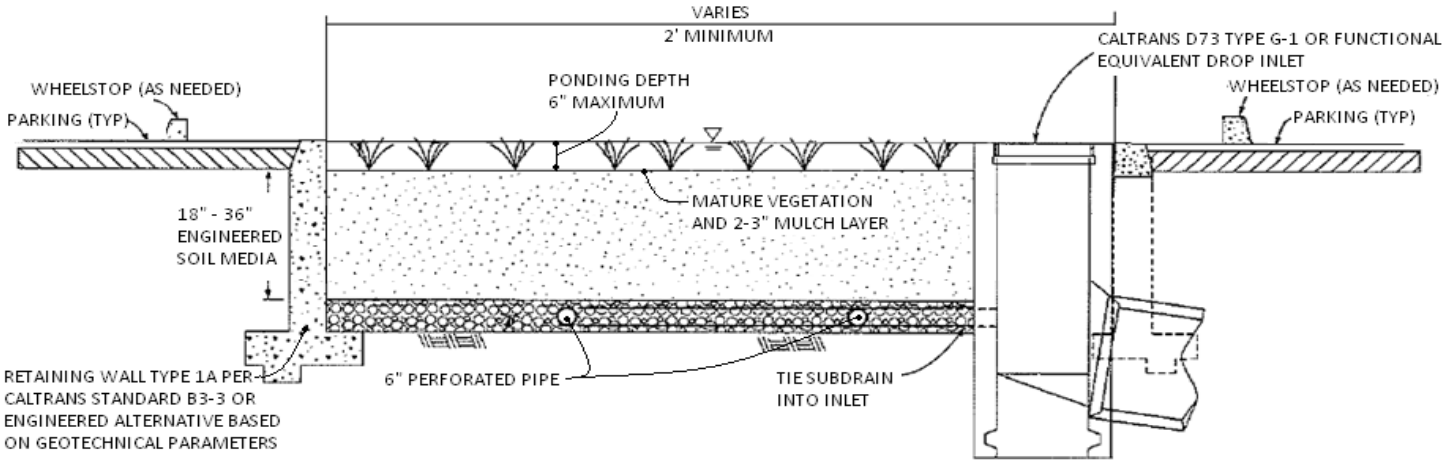
Bioretention Facilities Requiring Side Slopes

The design should assure that the Bioretention Facility does not present a tripping hazard. Bioretention Facilities proposed near pedestrian areas, such as areas parallel to parking spaces or along a walkway, must have a gentle slope to the bottom of the facility. Side slopes inside of a Bioretention Facility shall be 4:1. A typical cross section for the Bioretention Facility is shown in Figure 1.

Bioretention Facilities Not Requiring Side Slopes

Where cars park perpendicular to the Bioretention Facility, side slopes are not required. A 6-inch maximum drop may be used, and the Bioretention Facility must be planted with trees and shrubs to prevent pedestrian access. In this case, a curb is not placed around the Bioretention Facility,

but wheel stops shall be used to prevent vehicles from entering the Bioretention Facility, as shown in Figure 4.



Planter Boxes

Bioretention Facilities can also be placed above ground as planter boxes. Planter boxes must have a minimum width of 2 feet, a maximum surcharge depth of 6 inches, and no side slopes are necessary. Planter boxes must be constructed so as to ensure that the top surface of the engineered soil media will remain level. This option may be constructed of concrete, brick, stone or other stable materials that will not warp or bend. Chemically treated wood or galvanized steel, which has the ability to contaminate stormwater, should not be used. Planter boxes must be lined with an impermeable liner on all sides, including the bottom. Due to the impermeable liner, the inside bottom of the planter box shall be designed and constructed with a cross fall, directing treated flows within the subdrain layer toward the point where subdrain exits the planter box, and subdrains shall be oriented with drain holes oriented down. These provisions will help avoid excessive stagnant water within the gravel underdrain layer. Similar to the in-ground Bioretention Facility versions, this BMP benefits from healthy plants and biological activity in the root zone. Planter boxes should be planted with appropriately selected vegetation.



Figure 5: Planter Box
Source: LA Team Effort

Overflow

An overflow route is needed in the Bioretention Facility design to bypass stored runoff from storm events larger than V_{BMP} or in the event of facility or subdrain clogging. Overflow systems must connect to an acceptable discharge point, such as a downstream conveyance system as shown in Figure 1 and Figure 4. The inlet to the overflow structure shall be elevated inside the Bioretention Facility to be flush with the ponding surface for the design capture volume (V_{BMP}) as shown in Figure 4. This will allow the design capture volume to be fully treated by the Bioretention Facility, and for larger events to safely be conveyed to downstream systems. The overflow inlet shall **not** be located in the entrance of a Bioretention Facility, as shown in Figure 6.

Underdrain Gravel and Pipes

An underdrain gravel layer and pipes shall be provided in accordance with Appendix B – Underdrains.



Figure 6: Incorrect Placement of an Overflow Inlet.

Inspection and Maintenance Schedule

The Bioretention Facility area shall be inspected for erosion, dead vegetation, soggy soils, or standing water. The use of fertilizers and pesticides on the plants inside the Bioretention Facility should be minimized.

Schedule	Activity
Ongoing	• Keep adjacent landscape areas maintained. Remove clippings from landscape maintenance activities. • Remove trash and debris • Replace damaged grass and/or plants • Replace surface mulch layer as needed to maintain a 2-3 inch soil cover.
After storm events	• Inspect areas for ponding
Annually	• Inspect/clean inlets and outlets

Bioretention Facility Design Procedure

1) Enter the area tributary, A_T, to the Bioretention Facility.

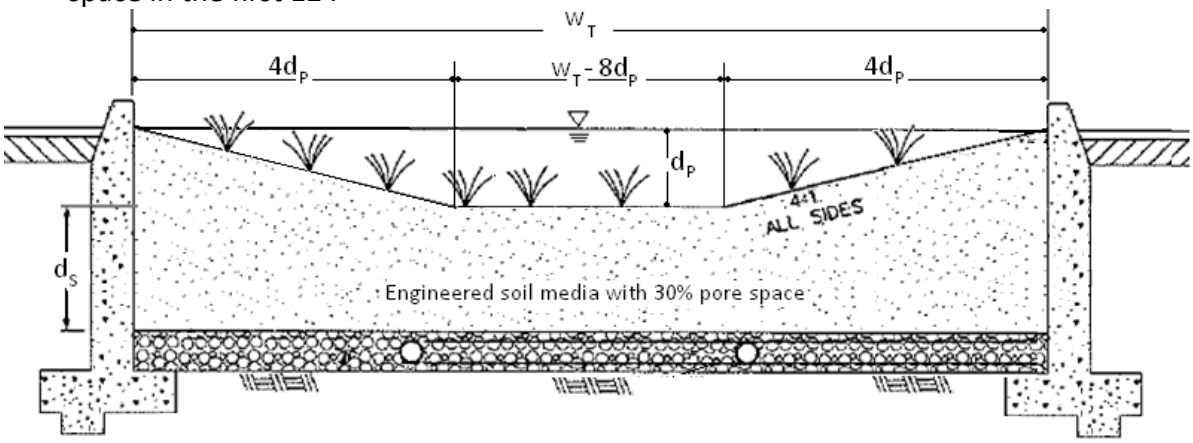
2) Enter the Design Volume, $V_{BMP,}$ determined from Section 2.1 of this Handbook.

3) Select the type of design used. There are two types of Bioretention Facility designs: the standard design used for most project sites that include side slopes, and the modified design used when the BMP is located perpendicular to the parking spaces or with planter boxes that do not use side slopes.

4) Enter the depth of the engineered soil media, d_S. The minimum depth for the engineered soil media can be 18' in limited cases, but it is recommended to use 24' or a preferred 36' to provide an adequate root zone for the chosen plant palette. Engineered soil media deeper than 36' will only get credit for the pore space in the first 36'.

5) Enter the top width of the Bioretention Facility.

6) Calculate the total effective depth, d_E, within the Bioretention Facility. The maximum allowable pore space of the soil media is 30% while the maximum allowable pore space for the gravel layer is 40%. Gravel layer deeper than 12' will only get credit for the pore space in the first 12'.



a. For the design with side slopes the following equation shall be used to determine the total effective depth. Where, d_P is the depth of ponding within the basin.

$$d_E(\text{ft}) = \frac{0.3 \times \left[\left(w_T(\text{ft}) \times d_S(\text{ft})\right) + 4\left(d_P(\text{ft})\right)^2\right] + 0.4 \times 1(\text{ft}) + d_P(\text{ft})\left[4d_P(\text{ft}) + \left(w_T(\text{ft}) - 8d_P(\text{ft})\right)\right]}{w_T(\text{ft})}$$

This above equation can be simplified if the maximum ponding depth of 0.5' is used. The equation below is used on the worksheet to find the minimum area required for the Bioretention Facility:

$$d_E(\text{ft}) = (0.3 \times d_S(\text{ft}) + 0.4 \text{ x } 1(\text{ft})) - \left(\frac{0.7\ (\text{ft}^2)}{w_T(\text{ft})}\right) + 0.5(\text{ft})$$

b. For the design without side slopes the following equation shall be used to determine the total effective depth:

$$d_E(\text{ft}) = d_P(\text{ft}) + [(0.3) \times d_S(\text{ft}) + (0.4) \times 1(\text{ft})]$$

The equation below, using the maximum ponding depth of 0.5', is used on the worksheet to find the minimum area required for the Bioretention Facility:

$$d_E(\text{ft}) = 0.5\ (\text{ft}) + [(0.3) \times d_S(\text{ft}) + (0.4) \times 1(\text{ft})]$$

7) Calculate the minimum surface area, A_M, required for the Bioretention Facility. This does not include the curb surrounding the Bioretention Facility or side slopes.

$$A_M(\text{ft}^2) = \frac{V_{BMP}(\text{ft}^3)}{d_E\ (\text{ft})}$$

8) Enter the proposed surface area. This area shall not be less than the minimum required surface area.

9) Verify that side slopes are no steeper than 4:1 in the standard design, and are not required in the modified design.

10) Provide the diameter, minimum 6 inches, of the perforated underdrain used in the Bioretention Facility. See Appendix B for specific information regarding perforated pipes.

11) Provide the slope of the site around the Bioretention Facility, if used. The maximum slope is 3 percent for a standard design.

12) Provide the check dam spacing, if the site around the Bioretention Facility is sloped.

13) Describe the vegetation used within the Bioretention Facility.

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Appendix G

Phase I Environmental Site Assessment
West Coast Environmental and Engineering
June 1, 2006

WEST COAST
ENVIRONMENTAL
AND ENGINEERING

PHASE I ENVIRONMENTAL SITE ASSESSMENT

Xenia Townhomes Project

APN 419-160-005, 024 and 419-170-016, 017, 018, 022 and 027 Beaumont, Riverside County, California

WCE File ID# PHO100-024-06

June 1, 2006

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June 1, 2006





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Xenia Townhomes Project
APN 419-160-005, 024 and
419-170-016, 017, 018, 022 and 027
Beaumont, Riverside County, California

1.0 INTRODUCTION

This report presents the results of a Phase I Environmental Site Assessment for the Xenia Townhomes Project Site, identified by Assessor's Parcel Numbers (APN) 419-160-005, 024 and 419-170-016, 017, 018, 022 and 027and located near the intersection of 8th and Xenia Streets, in the City of Beaumont, California. See Figure 1 for a Site Location Map and Figure 2 for a Site Plan.

1.1 Purpose

This report details the results of an investigation into previous and current land use to identify potential environmental concerns as revealed by a records review, a Site reconnaissance, and interviews with regulatory agency officials and individuals associated with the Site. This report has been prepared for Phoenix Housing Partners West, LLC, for purposes of assessing potential environmental liabilities associated with the property.

1.2 Scope of Assessment

The scope of this assessment was identified in West Coast Environmental and Engineering's (WCE) proposal dated April 19, 2006. The scope of this project is to update a current Phase I completed by Earth Systems Southwest, dated December 28, 2006, to meet the ASTM Practice E 1527-05 for Phase I Environmental Site Assessments. WCE performed the following services as part of this assessment:

Site Reconnaissance: A Site reconnaissance was conducted by a WCE representative on April 25, 2006 for evidence of hazardous materials storage and usage, existing signs of contamination, hazardous waste generation, waste disposal activity, and similar environmental concerns. Color photographs of the Site taken during our reconnaissance appear in Appendix 1.

Records Review: A review of selected records and information was conducted to identify environmental concerns associated with past land use and operations conducted on the Site. Included in the background investigation was a review of the following sources:

Regulatory Agencies Contacted

- City of Beaumont Building and Safety Department.
- Riverside County Fire Department (Beaumont Station)- Fire Prevention.
- South Coast Air Quality Management Division.

Other Sources of Information

- EDR Aerial Photography Print Service provided aerial photographs of the Site.
- Division of Oil, Gas and Geothermal Resources – Oil Well Maps.
- USGS - 7.5 Minute Series Topographic Map (Beaumont, CA Quadrangle).
- EDR Sanborn, Inc. reviewed their historic map collection for coverage of the Site.
- Regulatory agency databases were reviewed by EDR for listed properties located within a one mile radius of the Site. The EDR database search included a review of lists compiled by various federal, state, and local agencies. See Appendix 2 for a copy of the EDR database report.
- California department of Water Resources (DWR); *California's Groundwater, Bulletin 118*; October, 2003 (DWR-2003)

2.0 ENVIRONMENTAL SETTING

2.1 Regional Geology

The subject site lies in the City of Beaumont, Riverside County, California. The site is bounded by the San Bernardino Mountains to the north and east, and the San Jacinto Mountains to the south. The city of Beaumont lies at the easternmost tip of the Transverse Ranges geomorphic province of California. The Transverse Ranges are an east-west trending series of steep mountain ranges and valleys. The east-west trend of the Transverse Ranges is oblique to the normal northwest trend of the coastal ranges, hence the name "Transverse." The province extends from the channel islands of Santa Rosa, Santa Cruz and San Miguel east to the San Bernardino Mountains, which have been displaced to the south along the San Andreas Fault. Intense north-south compression is squeezing the transverse ranges, as a result it is one of the most rapidly rising regions on earth. Petroleum rich sedimentary rocks have been faulted and folded making this one of the most important oil producing areas of the United States (CGS Note 36).

2.2 Site Geology

The site is situated on recent-age alluvium (California Division of Mines and Geology, Geologic Map of California, Santa Ana Sheet, 1966, reprinted 1991) and is bounded on the north by the Banning Fault and on the south by the San Jacinto Mountains. The oldest rock formations are basement rocks which are found in the San Bernardino Mountains to the north and include Precambrian Igneous and Metamorphic Rocks. To the south Mesozoic granitic rocks comprise the San Jacinto Mountains.

2.3 Topography

The site elevation is at approximately 2620 feet above mean sea level (msl).

2.4 Hydrologic Conditions

The subject site lies within the Coachella Valley Groundwater Basin, San Gorgonio Pass Sub-basin. This subbasin is bounded on the north by the San Bernardino Mountains and by semi-permeable rocks, and on the south by the San Jacinto Mountains. A surface drainage divide

between the Colorado River and South Coastal Hydrologic Study Areas bounds the subbasin on the west. The eastern boundary is formed by a bedrock constriction that creates a groundwater cascade into the Indio Subbasin. Average annual rainfall over the subbasin ranges from 15 to 18 inches. The San Gorgonio River flows intermittently over the subbasin and is the main surface drainage feature for the subbasin (Bloyd 1971). Precipitation in the northern San Bernardino Mountains contributes its runoff to the San Gorgonio River (DWR-2003).

The main water bearing deposits in the subbasin are Holocene and Pleistocene age alluvium and Pliocene to Pleistocene age San Timoteo Formation.

Alluvium: Holocene alluvium is mostly gravel and sand and, where saturated, would yield water readily to wells. Within the subbasin, these deposits lie largely above the water table and contribute little water to wells. Holocene alluvium is found in the tributaries of the subbasin and allows runoff to infiltrate and recharge the subbasin. Older, Pleistocene age alluvium contains sand and gravel, but also large amounts of clay and silt. These deposits yield moderate amounts of water to wells (DWR-2003).

San Timoteo Formation: The Pliocene to Pleistocene age San Timoteo Formation consists of poorly sorted to sorted, partly consolidated, fine to coarse sandstone along with layers of gravel and thin interbeds of clay. Well yield from these deposits is typically poor, but some deep wells have pumped more than 1,000 gallons per minute. The San Timoteo Formation may extend to over 2,000 feet below the surface and is one of the major water-bearing deposits in the subbasin. The subbasin has a complex geologic and hydrogeologic history along with a scarcity of historical data for certain parts of the subbasin. A steep groundwater gradient is present in most of the subbasin because of construction of the San Jacinto Tunnel during 1933 through 1939. Intense de-watering increased the groundwater gradient and changed groundwater movement from westward to southeastward (DWR-2003).

2.5 Groundwater Depth

According to the Cooperative well Measurement Program covering the Upper Santa Ana River, San Jacinto and Santa Margarita Watersheds, well numbers 3S1W03J located approximately ¼ mile to the northeast was had a depth to groundwater of 420 feet and a groundwater surface elevation of 2222.80 feet above msl. Measurement of well # 3S1W03K03S located approximately ¾ mile to the east northeast of the site had a depth to groundwater of 419 feet and a groundwater surface elevation of 2215 feet above msl.

2.6 Groundwater Gradient

Based on a review of USGS Topographic map for the Beaumont, California 1953, photorevised 1988, groundwater should migrate toward the southwest in the vicinity of the site. Surface runoff and subsurface inflows are significant sources of recharge to the sub-basin.

2.7 Beneficial Uses of Groundwater

The Water Quality Control Plan for San Jacinto Basin, 1995, lists groundwater in the San Gorgonio sub-basin as having existing municipal, industrial, and agricultural beneficial uses.

2.8 Regional Impairments to Groundwater

No regional impairments to groundwater were identified in association with solvents, hydrocarbons, or related chemicals.

3.0 SITE INFORMATION

3.1 Site Location

The site is located approximately 100 feet south of 8th Street fronting Xenia Avenue in the City of Beaumont, Riverside County, California. See Figure 1 for a site location map.

3.2 Current Site Use

The Site is currently a vacant lot. Several former structures previously occupied the site and a broken up concrete foundation is visible in the western central portion of the site. All structures were associated with the homes located adjacent to the north of the subject site. No addresses exist for any of the parcels comprising the site.

3.3 Legal Description

The Assessor's Parcel Numbers are 419-160-005, 024 and 419-017-016, 017, 018, 022, and 027. See Appendix 4 for a copy of the Assessor's Parcel Map.

3.4 Zoning

C1-C2: Vacant residential.

3.5 Utilities

Sewer - City of Beaumont.
Natural Gas - Southern California Gas.
Water - Beaumont- Cherry Valley Water District.
Power - Southern California Edison.

4.0 SITE RECONNAISSANCE

4.1 Methodology and Limiting Conditions

A Site reconnaissance was undertaken by Larry Levee of WCE on March 15, 2006. Color photographs of the Site taken during the reconnaissance appear in Appendix 1. The following items were noted:

4.1.1 Hazardous Materials Storage and Use

None found.

4.1.2 Waste Generation, Storage & Disposal

None found.

4.1.3 Aboveground Storage Tanks (ASTs)

None found.

4.1.4 Underground Storage Tanks (USTs)

None found.

4.1.5 Suspect Fill Connections and Vents

None found.

4.1.6 Unidentified Cover Plates, Pipes, Drains, etc.

None found.

4.1.7 Sumps, Pits, Clarifiers, etc.

None found.

4.1.8 Waste or Trash Piles

A concrete pile from a destroyed building foundation is found in the western central portion of the site.

4.1.9 Onsite Landfills

None found.

4.1.10 Disturbed Surface Areas

None found.

4.1.11 Distressed Vegetation Areas

The site was grass/weed covered, no areas appeared to be distressed.

4.1.12 Discolored Soil, Asphalt, etc.

None found.

4.1.13 Odors

None found.

4.1.14 Fill Material Used

None found.

4.1.15 Onsite Wells

None found.

4.1.16 High Power Transmission Lines

None found.

4.1.17 PCBs/Electrical Transformers

None found.

4.1.18 Asbestos Survey

No buildings on the Site.

4.2 Survey of Surrounding Properties

The following table identifies the surrounding land use in all directions (also see Figure 2):

Table 4-1 Surrounding Land Use

DIRECTION	ADJACENT LAND USE	CONCERNS
North	Residential properties fronting 8th Street.	None noted.
South	Vacant parcel and Ace Hardware fronting 6th Street.	None noted.
East	Vacant parcel currently being graded for residential construction.	None noted.
West	Residential property across Xenia Avenue.	None noted.

5.0 RECORDS REVIEW

5.1 Historical Records Review

The following historical records were reviewed.

5.1.1 Topographic Map Review

The USGS - 7.5 Minute Series Topographic Quadrangle Map of Beaumont, California was reviewed. The map is dated 1953, photorevised in 1988. The map shows the Site to have several structures located on or adjacent to it. See Figure 1 for a copy of the Topographic Map.

5.1.2 Sanborn Map Review

No Sanborn map coverage exists for the Site.

5.1.3 Interviews

An impromptu interview was conducted with Mr. Ramiro Cabrera, a property owner along the northern boundary of the site. Mr. Cabrera stated that the entire property was once used as an airstrip for the contractor/owner who built all of the houses along the northern boundary. This was confirmed by the 1938 aerial photo showing a dirt landing strip. The strip was gone in the 1953 photo. The property was then divided into stable area and grazing areas for horses. He knows of no other development on the site.

5.1.4 Division of Oil, Gas and Geothermal Resources – Oil and Gas Maps

No oil or gas wells were identified on the Site. The closest well is located to the southeast approximately 0.5 miles. The Beaumont Exploration Company "John Drew" well and the Riverside County Oil Company Well #21 appear to be located south of the 60 freeway and east of the subject site. See Appendix 3 for a copy of the DOGGR map.

5.1.5 Previous reports

Previous reports reviewed for this assessment included the following:

- Earth Systems Southwest (ESS); *Report of Phase I Environmental Site Assessment, East Side of Xenia Avenue between 6th Street and 8th Street, APNs 419-160-005 and 024 and 419-170-016, 017, 018, 022 ,027, Beaumont, California*; December 28, 2005 (ESS-P1)

- ESS; Report of Phase II Investigation, *APNs 419-160-005 and 024 and 419-170-016, 017, 018, 022 ,027, East Side of Xenia Avenue between 6th Street and 8th Street, Beaumont, California*, February 23, 2006 (ESS-P2)

The ESS-P1 report identified the property as currently vacant, with several areas of debris and a slab foundation on it. The report identified the following Recognized Environmental Conditions in association with the property:

- Potential use for agriculture and/or grazing land. A concrete foundation surrounded by fruit trees was observed on the site near the northwest corner. This corresponds to a view of the property in the 1980 aerial photo (see Table 5-1 or photo in Appendix 3). Agricultural soil sampling recommended.

- Several dirt piles adjacent to small excavations were apparent on the site warranting further assessment.

- Six foundations/buildings were observed on the site. A geophysical survey was recommended to identify potential subsurface features potentially associated with the foundations.

The ESS-P2 report was reviewed. The investigation was conducted to meet the scope identified in the ESS-P1 report. No features were identified by the geophysical survey, no hydrocarbons were identified in soil samples and minimal concentrations, well below regulatory guidelines, of organochlorine pesticides were detected. No further investigation was warranted.

5.1.6 Aerial Photo Review

EDR provided aerial photographs of the Site and surrounding areas covering the years 1945, 1959, 1964, 1977, 1989, and 1994. A 2004 aerial was obtained from the Googlemaps.com website. These photos were studied for evidence of previous land use, signs of contamination,

hazardous materials storage, and other concerns. The following table summarizes the results of the review:

Table 5-1 Aerial Photograph Review

YEAR FLIGHT SCALE	SITE LAND USE	SURROUNDING LAND USE	CONCERNS
1938 Laval 1"=555'	The eastern end of the subject site appears to be the end of a dirt airstrip. No structures are visible, one house appears to be located on the northern boundary of the site.	Vacant land surrounds the site, a single residence is apparent on the northern edge east of the site. A dirt road and a structure are also viewed southeast of the property. A large ranch house and cultivated field appear across 8th Street from the site.	None noted.
1953 Pacific Air 1"=555'	The site is now vacant with no apparent use or structures.	Five or 6 houses now appear in the strip along 8th street north of the site. The ranch across 8th street remains, however, no cultivated field. Several structures are apparent south of the site. An orchard is apparent west of the site across what will be Xenia Avenue.	None noted.
1967 Western 1"=666'	No significant change from previous photograph.	More houses have now appeared along the northern boundary of the site, a total of ten houses are now present. A small structure is located along the southern boundary of the site.	None noted.
1980 AMI 1"=600'	Some of the properties on the northern boundary have encroached onto the site, extending their yard, no structures are apparent. Otherwise, no significant changes from the previous photograph.	Additional properties are now present along the northern boundary of the site. Some of the properties have extended their yard into the subject site.	None noted.
1984 WSA 1"=690'	No significant change from previous photograph.	The south half of the orchard across Xenia Avenue is now buildings (potentially the apartments currently located there)	None noted.
1996 USGS 1"=666'	No significant change from previous photograph.	The entire former orchard is now occupied by the apartment buildings. The south now has the Ace Hardware building occupying the site.	None noted.
2002 USGS 1"=666'	No significant change from previous photograph.	No significant change from previous photograph.	None noted.

5.2 Regulatory Agency Records Review

The following regulatory agencies were contacted regarding file materials for the Site. Our findings are summarized below.

5.2.1 City of Beaumont Department of Building and Safety

This agency was contacted for information regarding permits, certificates of occupancy, and related information. A representative of this agency Ms. Ashley Thompson indicated no records exist for properties identified only by assessors parcel numbers. No addresses were identified for the parcels comprising the subject site, neither by our research, nor by the City of Beaumont Planning Office.

5.2.2 Riverside County Fire Department, Beaumont Office - Fire Prevention/ (ESS)

No records regarding hazardous materials are known to exist or have been stored on the subject site.

5.3 Regulatory Agency Database Review

Regulatory agency databases were reviewed by Environmental Data Resources (EDR). These databases include lists of contaminated sites or sites under assessment for contamination, as well as other compilation lists. The complete EDR database report appears in Appendix 2. This report includes a radius map of listed sites located within the specified search radius of the Site. The table below shows the databases reviewed and the minimum search radius covered by the EDR report.

Table 5-2 Database Search Radius

DATABASE	MINIMUM SEARCH DISTANCE (in miles)
National Priorities List **(NPL)**	1.0
Comprehensive Environmental Response, Compensation and Liability Information System **(CERCLIS)**	0.5
CERCLIS – No further remedial action Planned **(CERCLIS - NFRAP)**	0.5
Emergency Response Notification System **(ERNS)**	0.125
Resource Conservation and Recovery Information System **(RCRIS)**	
RCRIS **CORRACTS**	1.0
RCRIS **TSDF**	0.5
RCRIS Large & Small Quantity Generators **(LQG/SQG)**	0.25
Cal/EPA DTSC - Hazardous Waste Information System **(HAZNET)**	0.125
Cal/EPA DTSC - Annual Workplan **(AWP)**	1.0
Cal/EPA DTSC - Contaminated or potentially contaminated hazardous waste sites **(CALSITES)**	1.0
Hazardous Waste and Substances Sites List - Cal/EPA **(CORTESE)**	0.5
CIWMB Solid Waste Information System **(SWIS)**	0.5
Solid Waste Assessment Test **(SWAT)**	0.5
Regional Water Quality Control Board **(RWQCB)**	
RWQCB - Leaking Underground Storage Tank List **(LUST)**	0.5
RWQCB – Spills, Leaks, Investigations & Cleanups List **(SLIC)**	0.5
Registered Underground Storage Tanks **(UST)**	0.25
Facility Inventory Database **(FID)**	0.25

5.3.2 Site

The Site was not identified on any of the databases in the EDR report.

5.3.3 Surrounding Sites

Surrounding listed sites with contamination problems that pose a significant threat to the Site would be those sites that:

- Are located immediately adjacent to the Site.

- Have a known or potential groundwater contamination problem and are located up gradient and near the Site.
- By their size or nature pose a threat to a large area (i.e., landfills, Superfund sites, etc.).

The following table lists the total number of sites found within the previously identified search radius, with the potentially significant sites listed based on the above criteria.

Table 5-3 Summary of Listed Surrounding Sites

DATABASE	TOTAL SITES IDENTIFIED	POTENTIALLY SIGNIFICANT LISTED SITES
NPL	0	None.
CERCLIS	1	None.
ERNS	0	None.
RCRIS CORRACTS	1	None.
RCRIS TSDF	1	None.
RCRIS LQG/SQG	0/0	None.
HAZNET	3	None.
AWP	0	None.
CALSITES	0	None.
CORTESE	1	None.
State Landfill	0	None.
SWAT	0	None.
LUST	4	None.
SLIC	4	None.
UST	0	None.
FID	0	None.

Potentially Significant Listed Sites: No potentially significant listed sites were identified.

6.0 FINDINGS

6.1 Current Conditions

The site is currently a vacant lot. Evidence suggests that several structures have been located on the site at various times throughout its history, however building records are non-existent and no addresses were identified for the parcels. The property has historically been used by the property owners to the north, however, such use has been discontinued. Building pad and demolition debris were noted on the site, nothing of concern was noted in a brief scan of the rubble piles.

6.2 Historic Conditions

The site was historically devoted to agricultural uses which may have included crops and livestock grazing. Use of the Site for agricultural purposes indicates the potential for agricultural chemicals (pesticides, herbicides, etc.) to have been applied that may still be present in Site soils. Pesticide sampling in the ESS-P2 report did not identify any concentrations of concern. Debris and soil piles investigated on the site did not contain concentrations of concern of metals, pesticides or petroleum hydrocarbons.

7.0 CONCLUSIONS AND RECOMMENDATIONS

We have performed a Phase I Environmental Site Assessment in conformance with the scope and limitations of ASTM Practice E1527-05 of the Xenia Townhomes Project Site, identified by Assessor's Parcel Numbers (APN) 419-160-005, 024 and 419-170-016, 017, 018, 022 and 027and located near the intersection of 8th and Xenia Streets, in the City of Beaumont, California. Any exceptions to, or deletions from, this practice are described in this report where applicable. This assessment has revealed no evidence of recognized environmental conditions currently in association with the property.

7.1 Current RECs

No RECs were identified on the property.

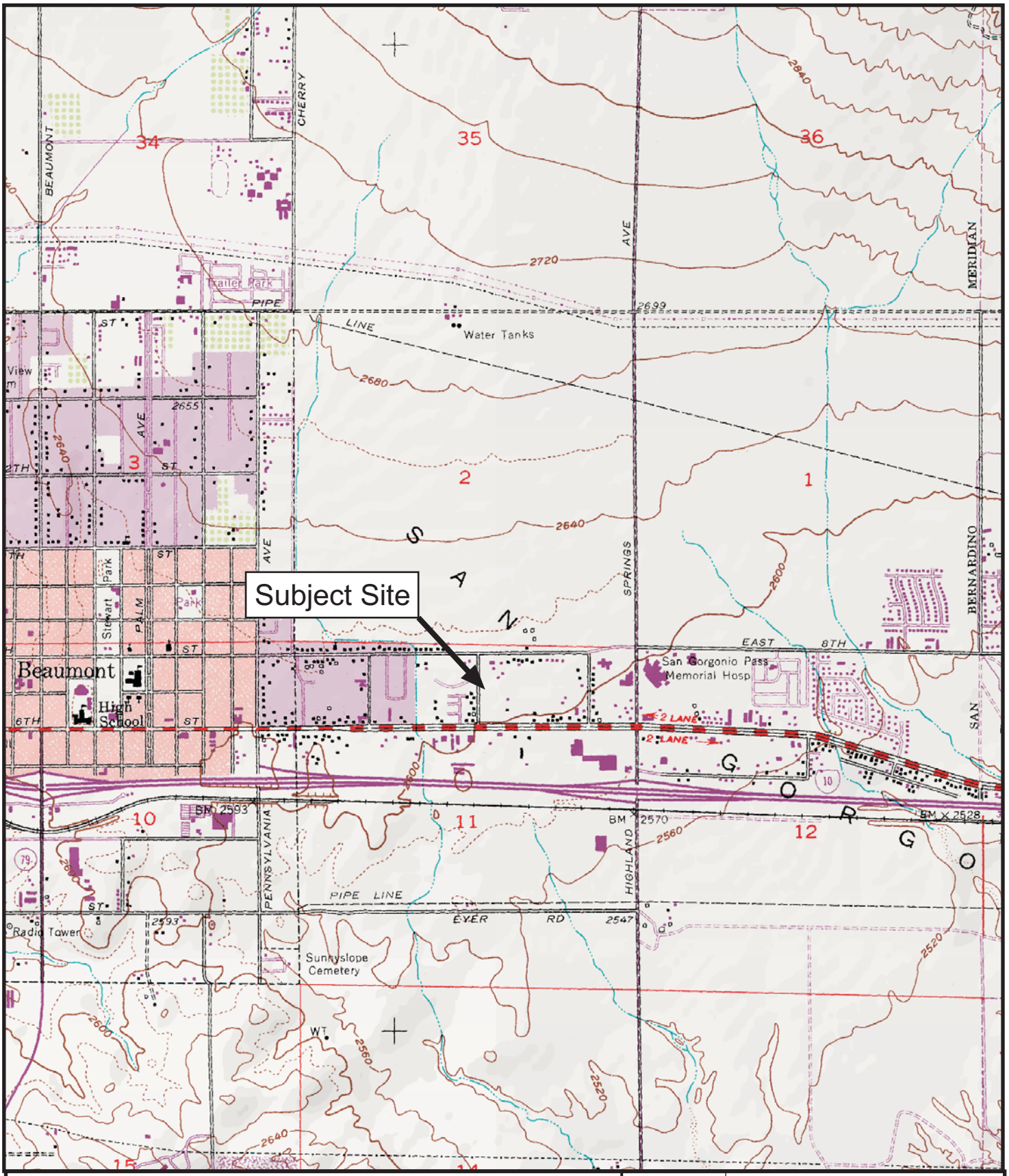
7.2 Historic RECs

Potential historic RECs were assessed in the ESS-P2 assessment and reported on. No historic RECs were identified.

8.0 QUALITY AND LIMITATIONS STATEMENT

This report has been prepared for the exclusive use Phoenix realty Group, LLC, as it pertains to the Xenia Townhomes Project Site, identified by Assessor's Parcel Numbers (APN) 419-160-005, 024 and 419-170-016, 017, 018, 022 and 027and located near the intersection of 8th and Xenia Streets, in the City of Beaumont, California. Any use of this report and supporting data, by a party other than specifically named above, shall be solely at the risk of such third party. With the prior written consent of Phoenix realty Group, LLC, and the payment of the standard charges, WCE will prepare a letter of reliance for a specifically named third party.

All interpretations made by West Coast Environmental and Engineering are opinions based on evaluation of the research information collected and visual assessment of the location. These procedures have limitations, and as such, should not be construed that all possible site conditions were identified. It should be recognized that there is no guarantee this study has covered all possible environmental issues at the Site. In performing our professional services, we have applied present professional and scientific judgment and used a level of effort consistent with the standard practice measured on the date of this report and in the locale of the project Site for similar type studies.



Source: USGS 7.5 Minute Topographic Quadrangle
Beaumont, California 1953
Photorevised 1988
(C)2002 DeLorme, XMap(R) 3.5

N

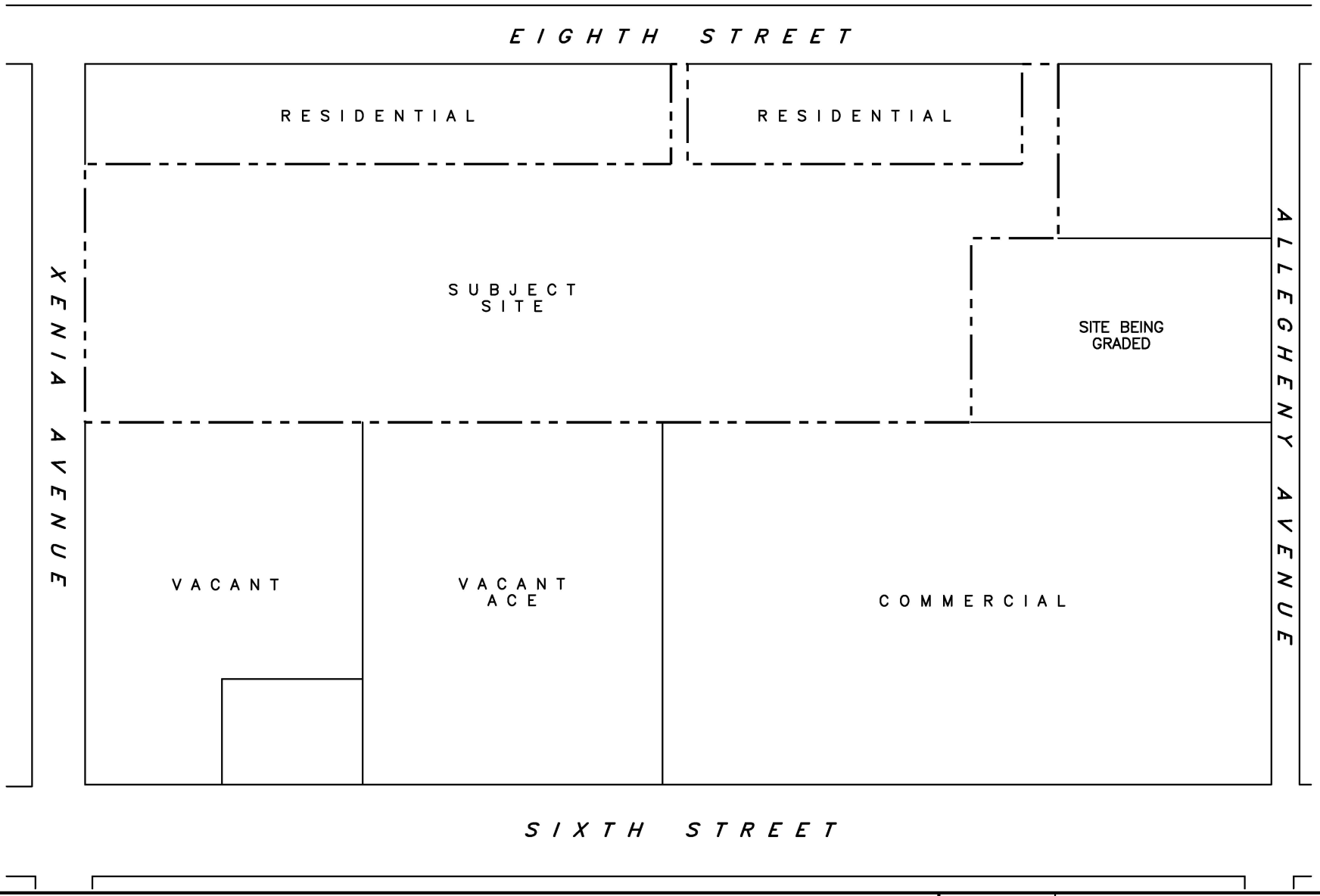
0 1000' 2000'
0' Contour Interval
National Geodetic Vertical Datum 1929

West Coast Environmental and Engineering

SITE LOCATION MAP

Xenia Avenue Between 6th and 8th Streets Beaumont, California

PROJECT: PHO100-024-06		**FIGURE 1**
DRAWN BY: LNL	DATE: 5/18/2006	REVISION:
APPROVED BY: LNL	DATE: 5/18/2006	PRINTED: 5/18/2006
DRAWING: PHO100-024_fig1.FH10		



LEGEND:

SUBJECT SITE

0 200

SCALE IN FEET

N

WEST COAST ENVIRONMENTAL AND ENGINEERING

Site Plot Plan

Xenia Ave. Between 6th and 8th Street
Beaumont, CA

PROJECT: PHO100-024	FIGURE 2
DRAWN BY: CB DATE: 5/23/06	REVISION: -
APPROVED BY: - DATE: -	PRINTED: 5/23/06
DRAWING: PHO100-ST.dwg	SCALE: As Shown

Appendix 1

Color Photographs of Site Reconnaissance



1. View of the western property boundary along Xenia Avenue.



2. View looking north from the southern property boundary near the center of the site.



3. View looking east along the northern property boundary.



4. View of the foundation debris pile located in the north central portion of the site.



5. View looking northwest from the southeast corner of the site.



6. View of some debris noted on the site. This was concrete and wood located near the foundation pile



7. View looking north at piles near the central portion of the site.



8. View of the adjacent site to the east currently being graded for residential development.

Appendix 2

EDR Regulatory Agency Database Report



The EDR Radius Map™ Report

Xenia Townhomes Project
6th Street and Xenia Avenue
Beaumont, CA 92223

Inquiry Number: 01674606.2r

May 12, 2006

The Standard in Environmental Risk Management Information

440 Wheelers Farms Road
Milford, Connecticut 06461

Nationwide Customer Service

Telephone: 1-800-352-0050
Fax: 1-800-231-6802
Internet: www.edrnet.com

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SECTION	PAGE
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Overview Map	2
Detail Map	3
Map Findings Summary	4
Map Findings	6
Orphan Summary	21
Government Records Searched/Data Currency Tracking	GR-1

GEOCHECK ADDENDUM

GeoCheck - Not Requested

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

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EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-05) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

6TH STREET AND XENIA AVENUE
BEAUMONT, CA 92223

COORDINATES

Latitude (North):	33.930900 - 33° 55' 51.2"
Longitude (West):	116.954200 - 116° 57' 15.1"
Universal Tranverse Mercator:	Zone 11
UTM X (Meters):	504233.1
UTM Y (Meters):	3754301.0
Elevation:	2609 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map:	33116-H8 BEAUMONT, CA
Most Recent Revision:	1988

TARGET PROPERTY SEARCH RESULTS

The target property was not listed in any of the databases searched by EDR.

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

FEDERAL RECORDS

NPL..... National Priority List
Proposed NPL..... Proposed National Priority List Sites
Delisted NPL..... National Priority List Deletions
NPL RECOVERY..... Federal Superfund Liens
CERCLIS..... Comprehensive Environmental Response, Compensation, and Liability Information System
CERC-NFRAP..... CERCLIS No Further Remedial Action Planned
RCRA-LQG..... Resource Conservation and Recovery Act Information
RCRA-SQG..... Resource Conservation and Recovery Act Information
ERNS..... Emergency Response Notification System

EXECUTIVE SUMMARY

HMIRS	Hazardous Materials Information Reporting System
US ENG CONTROLS	Engineering Controls Sites List
US INST CONTROL	Sites with Institutional Controls
DOD	Department of Defense Sites
FUDS	Formerly Used Defense Sites
US BROWNFIELDS	A Listing of Brownfields Sites
CONSENT	Superfund (CERCLA) Consent Decrees
ROD	Records Of Decision
UMTRA	Uranium Mill Tailings Sites
ODI	Open Dump Inventory
TRIS	Toxic Chemical Release Inventory System
TSCA	Toxic Substances Control Act
FTTS	FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
SSTS	Section 7 Tracking Systems
ICIS	Integrated Compliance Information System
PADS	PCB Activity Database System
MLTS	Material Licensing Tracking System
MINES	Mines Master Index File
FINDS	Facility Index System/Facility Registry System
RAATS	RCRA Administrative Action Tracking System

STATE AND LOCAL RECORDS

AWP	Annual Workplan Sites
Cal-Sites	Calsites Database
CA BOND EXP. PLAN	Bond Expenditure Plan
NFA	No Further Action Determination
NFE	Properties Needing Further Evaluation
REF	Unconfirmed Properties Referred to Another Agency
SCH	School Property Evaluation Program
Toxic Pits	Toxic Pits Cleanup Act Sites
SWF/LF	Solid Waste Information System
CA WDS	Waste Discharge System
WMUDS/SWAT	Waste Management Unit Database
CA FID UST	Facility Inventory Database
SLIC	Statewide SLIC Cases
UST	Active UST Facilities
HIST UST	Hazardous Substance Storage Container Database
AST	Aboveground Petroleum Storage Tank Facilities
SWEEPS UST	SWEEPS UST Listing
CHMIRS	California Hazardous Material Incident Report System
Notify 65	Proposition 65 Records
DEED	Deed Restriction Listing
CLEANERS	Cleaner Facilities
WIP	Well Investigation Program Case List
CDL	Clandestine Drug Labs
EMI	Emissions Inventory Data

TRIBAL RECORDS

INDIAN RESERV	Indian Reservations
INDIAN LUST	Leaking Underground Storage Tanks on Indian Land
INDIAN UST	Underground Storage Tanks on Indian Land

EDR PROPRIETARY RECORDS

Manufactured Gas Plants	EDR Proprietary Manufactured Gas Plants

EXECUTIVE SUMMARY

EDR Historical Auto StationsEDR Proprietary Historic Gas Stations
EDR Historical Cleaners.... EDR Proprietary Historic Dry Cleaners

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified.

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.
Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

FEDERAL RECORDS

CORRACTS: CORRACTS is a list of handlers with RCRA Corrective Action Activity. This report shows which nationally-defined corrective action core events have occurred for every handler that has had corrective action activity.

A review of the CORRACTS list, as provided by EDR, and dated 03/15/2006 has revealed that there is 1 CORRACTS site within approximately 1 mile of the target property.

Lower Elevation	Address	Dist / Dir	Map ID	Page
SQUARE D CO	*1060 E THIRD ST*	*1/2 - 1 WSW*	*10*	*16*

RCRAInfo: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. RCRAInfo replaces the data recording and reporting abilities of the Resource Conservation and Recovery Information System(RCRIS). The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month. Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month Large quantity generators generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month. Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

A review of the RCRA-TSDF list, as provided by EDR, and dated 02/21/2006 has revealed that there is 1 RCRA-TSDF site within approximately 1 mile of the target property.

Lower Elevation	Address	Dist / Dir	Map ID	Page
SQUARE D CO	*1060 E THIRD ST*	*1/2 - 1 WSW*	*10*	*16*

EXECUTIVE SUMMARY

STATE AND LOCAL RECORDS

CORTESE: This database identifies public drinking water wells with detectable levels of contamination, hazardous substance sites selected for remedial action, sites with known toxic material identified through the abandoned site assessment program, sites with USTs having a reportable release and all solid waste disposal facilities from which there is known migration. The source is the California Environmental Protection Agency/Office of Emergency Information.

A review of the Cortese list, as provided by EDR, and dated 04/01/2001 has revealed that there is 1 Cortese site within approximately 0.5 miles of the target property.

Lower Elevation	Address	Dist / Dir	Map ID	Page
ARCO #5463	*1696 6TH ST*	*1/4 - 1/2 ESE*	*B5*	*8*

SWRCY: A listing of recycling facilities in California.

A review of the SWRCY list, as provided by EDR, and dated 04/07/2006 has revealed that there is 1 SWRCY site within approximately 0.5 miles of the target property.

Lower Elevation	Address	Dist / Dir	Map ID	Page
EARTH WIZE RECYCLING/STATER BR	1661 E 6TH ST	1/4 - 1/2 ESE	4	8

LUST: The Leaking Underground Storage Tank Incident Reports contain an inventory of reported leaking underground storage tank incidents. The data come from the State Water Resources Control Board Leaking Underground Storage Tank Information System.

A review of the LUST list, as provided by EDR, and dated 04/10/2006 has revealed that there are 4 LUST sites within approximately 0.5 miles of the target property.

Lower Elevation	Address	Dist / Dir	Map ID	Page
ARCO #5463 Facility Status: Case Closed	*1696 6TH ST*	*1/4 - 1/2 ESE*	*B5*	*8*
ARCO #5463	1696 SIXTH ST	1/4 - 1/2 ESE	B6	10
ULTRAMAR SERVICE STATION	501 HIGHLAND SPRINGS AV	1/4 - 1/2 ESE	C8	14
ULTRAMAR S S Facility Status: Case Closed	501 HIGHLAND SPRINGS AV	1/4 - 1/2 ESE	C9	14

VCP: Contains low threat level properties with either confirmed or unconfirmed releases and the project proponents have request that DTSC oversee investigation and/or cleanup activities and have agreed to provide coverage for DTSC's costs.

A review of the VCP list, as provided by EDR, and dated 08/08/2005 has revealed that there is 1 VCP site within approximately 0.5 miles of the target property.

Lower Elevation	Address	Dist / Dir	Map ID	Page
SAN GORGONIO MEMORIAL HOSPITAL	*600 N HIGHLAND SPRINGS*	*1/4 - 1/2 ESE*	*B7*	*11*

EXECUTIVE SUMMARY

HAZNET: The data is extracted from the copies of hazardous waste manifests received each year by the DTSC. The annual volume of manifests is typically 700,000-1,000,000 annually, representing approximately 350,000-500,000 shipments. Data from non-California manifests & continuation sheets are not included at the present time. Data are from the manifests submitted without correction, and therefore many contain some invalid values for data elements such as generator ID, TSD ID, waste category, & disposal method. The source is the Department of Toxic Substance Control is the agency

A review of the HAZNET list, as provided by EDR, and dated 12/31/2003 has revealed that there are 3 HAZNET sites within approximately 0.125 miles of the target property.

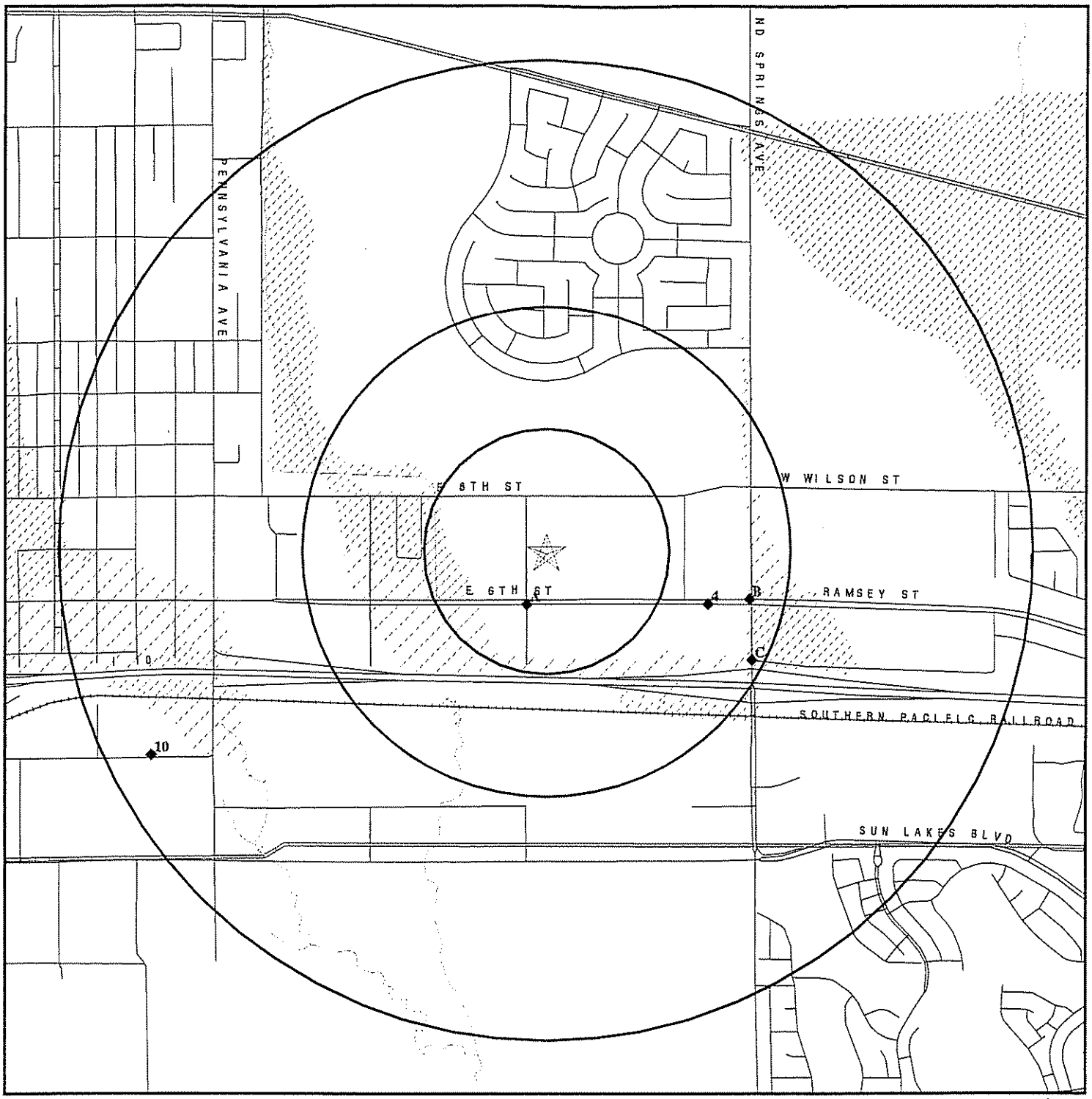
Lower Elevation	Address	Dist / Dir	Map ID	Page
ANDREW SHUBIN	1499 EAST 6TH ST.	0 - 1/8 SSW	A1	6
BEAUMONT TIRE SVC	1493 E 6TH ST	0 - 1/8 SSW	A2	6
CONTINENTAL BAKING CO	1493 6TH ST	0 - 1/8 SSW	A3	7

EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped:

Site Name	Database(s)
CHEVRON STATION #9-4886	LUST, Cortese
BEAUMONT CONCRETE COMPANY	LUST, Cortese, EMI
LOMA LINDA UNIVERSITY	CERCLIS, FINDS
GOLD ZONE ENTERPRISES (CAL D FUEL)	LUST
AZ MINIMART & GAS	LUST
CAL TRANS	LUST
BROOKFIELD CALIFORNIA LAND HOLDINGS INC	HAZNET

OVERVIEW MAP - 01674606.2r



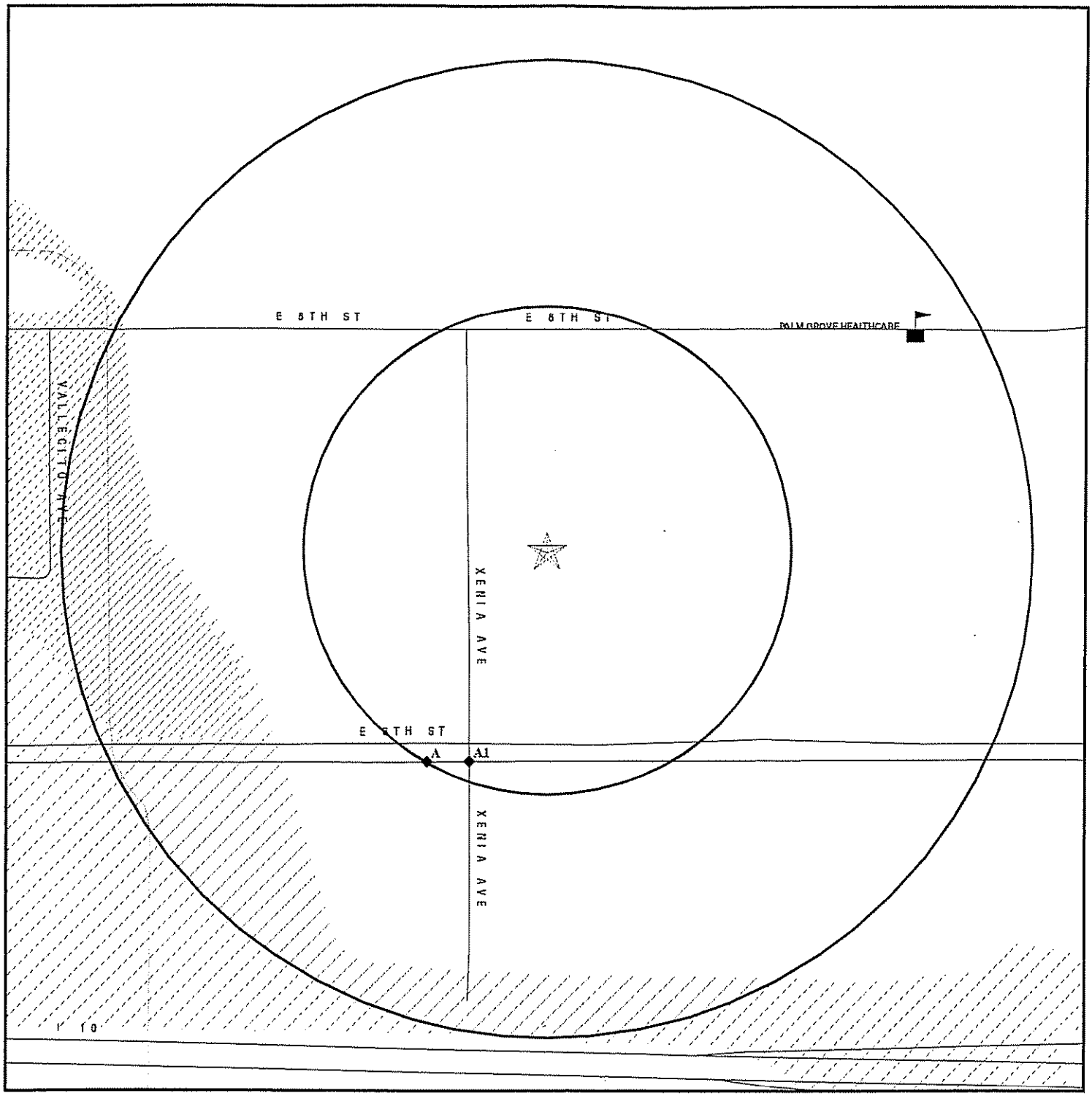
- ☆ Target Property
- ▲ Sites at elevations higher than or equal to the target property
- ◆ Sites at elevations lower than the target property
- Manufactured Gas Plants
- National Priority List Sites
- Landfill Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Oil & Gas pipelines
- 100-year flood zone
- 500-year flood zone
- Areas of Concern

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: Xenia Townhomes Project ADDRESS: 6th Street and Xenia Avenue Beaumont CA 92223 LAT/LONG: 33.9309 / 116.9542	CLIENT: West Coast Environmental CONTACT: Larry Levee INQUIRY #: 01674606.2r DATE: May 12, 2006

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DETAIL MAP - 01674606.2r



- ☆ Target Property
- ▲ Sites at elevations higher than or equal to the target property
- ◆ Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Landfill Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Oil & Gas pipelines
- 100-year flood zone
- 500-year flood zone
- Areas of Concern

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: Xenia Townhomes Project ADDRESS: 6th Street and Xenia Avenue Beaumont CA 92223 LAT/LONG: 33.9309 / 116.9542	CLIENT: West Coast Environmental CONTACT: Larry Levee INQUIRY #: 01674606.2r DATE: May 12, 2006

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MAP FINDINGS SUMMARY

Database	Target Property	Search Distance (Miles)	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
FEDERAL RECORDS								
NPL		1.000	0	0	0	0	NR	0
Proposed NPL		TP	NR	NR	NR	NR	NR	0
Delisted NPL		1.000	0	0	0	0	NR	0
NPL RECOVERY		1.000	0	0	0	0	NR	0
CERCLIS		0.500	0	0	0	NR	NR	0
CERC-NFRAP		TP	NR	NR	NR	NR	NR	0
CORRACTS		1.000	0	0	0	1	NR	1
RCRA TSD		1.000	0	0	0	1	NR	1
RCRA Lg. Quan. Gen.		0.125	0	NR	NR	NR	NR	0
RCRA Sm. Quan. Gen.		0.125	0	NR	NR	NR	NR	0
ERNS		0.125	0	NR	NR	NR	NR	0
HMIRS		TP	NR	NR	NR	NR	NR	0
US ENG CONTROLS		0.500	0	0	0	NR	NR	0
US INST CONTROL		0.500	0	0	0	NR	NR	0
DOD		TP	NR	NR	NR	NR	NR	0
FUDS		1.000	0	0	0	0	NR	0
US BROWNFIELDS		TP	NR	NR	NR	NR	NR	0
CONSENT		1.000	0	0	0	0	NR	0
ROD		1.000	0	0	0	0	NR	0
UMTRA		0.500	0	0	0	NR	NR	0
ODI		TP	NR	NR	NR	NR	NR	0
TRIS		0.125	0	NR	NR	NR	NR	0
TSCA		0.500	0	0	0	NR	NR	0
FTTS		TP	NR	NR	NR	NR	NR	0
SSTS		TP	NR	NR	NR	NR	NR	0
ICIS		TP	NR	NR	NR	NR	NR	0
PADS		TP	NR	NR	NR	NR	NR	0
MLTS		TP	NR	NR	NR	NR	NR	0
MINES		TP	NR	NR	NR	NR	NR	0
FINDS		TP	NR	NR	NR	NR	NR	0
RAATS		0.125	0	NR	NR	NR	NR	0
STATE AND LOCAL RECORDS								
AWP		1.000	0	0	0	0	NR	0
Cal-Sites		0.125	0	NR	NR	NR	NR	0
CA Bond Exp. Plan		0.500	0	0	0	NR	NR	0
NFA		TP	NR	NR	NR	NR	NR	0
NFE		TP	NR	NR	NR	NR	NR	0
REF		TP	NR	NR	NR	NR	NR	0
SCH		TP	NR	NR	NR	NR	NR	0
Toxic Pits		0.500	0	0	0	NR	NR	0
State Landfill		0.500	0	0	0	NR	NR	0
CA WDS		TP	NR	NR	NR	NR	NR	0
WMUDS/SWAT		0.500	0	0	0	NR	NR	0
Cortese		0.500	0	0	1	NR	NR	1
SWRCY		0.500	0	0	1	NR	NR	1
LUST		0.500	0	0	4	NR	NR	4

MAP FINDINGS SUMMARY

Database	Target Property	Search Distance (Miles)	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
CA FID UST		0.125	0	NR	NR	NR	NR	0
SLIC		0.500	0	0	0	NR	NR	0
UST		0.250	0	0	NR	NR	NR	0
HIST UST		TP	NR	NR	NR	NR	NR	0
AST		0.125	0	NR	NR	NR	NR	0
SWEEPS UST		0.250	0	0	NR	NR	NR	0
CHMIRS		TP	NR	NR	NR	NR	NR	0
Notify 65		0.500	0	0	0	NR	NR	0
DEED		TP	NR	NR	NR	NR	NR	0
VCP		0.500	0	0	1	NR	NR	1
DRYCLEANERS		TP	NR	NR	NR	NR	NR	0
WIP		0.250	0	0	NR	NR	NR	0
CDL		TP	NR	NR	NR	NR	NR	0
HAZNET		0.125	3	NR	NR	NR	NR	3
EMI		TP	NR	NR	NR	NR	NR	0
TRIBAL RECORDS								
INDIAN RESERV		1.000	0	0	0	0	NR	0
INDIAN LUST		0.500	0	0	0	NR	NR	0
INDIAN UST		TP	NR	NR	NR	NR	NR	0
EDR PROPRIETARY RECORDS								
Manufactured Gas Plants		TP	NR	NR	NR	NR	NR	0
EDR Historical Auto Stations		0.250	0	0	NR	NR	NR	0
EDR Historical Cleaners		0.250	0	0	NR	NR	NR	0

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

A1
SSW
< 1/8
608 ft.

Relative:
Lower

Actual:
2602 ft.

ANDREW SHUBIN
1499 EAST 6TH ST.
BEAUMONT, CA 92223

HAZNET **S103631578**
N/A

Site 1 of 3 in cluster A

HAZNET:

Gepaid:	CAC000980320
TSD EPA ID:	CAD982484933
Gen County:	Riverside
Tsd County:	7
Tons:	3.0000
Facility Address 2:	Not reported
Waste Category:	Other empty containers 30 gallons or more
Disposal Method:	Recycler
Contact:	ANDREW SHUBIN
Telephone:	(000) 000-0000
Mailing Name:	Not reported
Mailing Address:	1499 EAST 6TH ST. BEAUMONT, CA 92223
County	Riverside

Gepaid:	CAC000980320
TSD EPA ID:	CAT080013352
Gen County:	Riverside
Tsd County:	Los Angeles
Tons:	.4170
Facility Address 2:	Not reported
Waste Category:	Waste oil and mixed oil
Disposal Method:	Recycler
Contact:	ANDREW SHUBIN
Telephone:	(000) 000-0000
Mailing Name:	Not reported
Mailing Address:	1499 EAST 6TH ST. BEAUMONT, CA 92223
County	Riverside

A2
SSW
< 1/8
657 ft.

Relative:
Lower

Actual:
2603 ft.

BEAUMONT TIRE SVC
1493 E 6TH ST
BEAUMONT, CA 92223

HAZNET **1000426295**
N/A

Site 2 of 3 in cluster A

HAZNET:

Gepaid:	CAL000251187
TSD EPA ID:	Not reported
Gen County:	Riverside
Tsd County:	Los Angeles
Tons:	0.57
Facility Address 2:	Not reported
Waste Category:	Unspecified oil-containing waste
Disposal Method:	Recycler
Contact:	mary treas
Telephone:	(909) 845-1675
Mailing Name:	Not reported
Mailing Address:	1493 e 6th st BEAUMONT, CA 92223
County	Not reported

BEAUMONT TIRE SVC (Continued) **1000426295**

Gepaid:	CAL000003137
TSD EPA ID:	CAD028409019
Gen County:	Riverside
Tsd County:	Los Angeles
Tons:	4.1700
Facility Address 2:	Not reported
Waste Category:	Unspecified aqueous solution
Disposal Method:	Treatment, Tank
Contact:	Not reported
Telephone:	(000) 000-0000
Mailing Name:	Not reported
Mailing Address:	1493 E 6TH ST
	BEAUMONT, CA 92223 - 2505
County	Riverside

Gepaid:	CAD982317349
TSD EPA ID:	CAD093459485
Gen County:	Riverside
Tsd County:	Fresno
Tons:	.0166
Facility Address 2:	Not reported
Waste Category:	Unspecified solvent mixture Waste
Disposal Method:	Transfer Station
Contact:	Not reported
Telephone:	(000) 000-0000
Mailing Name:	Not reported
Mailing Address:	1493 E 6TH ST
	BEAUMONT, CA 92223 - 2505
County	Riverside

A3 **CONTINENTAL BAKING CO** HAZNET S105088716
SSW **1493 6TH ST** N/A
< 1/8 **BEAUMONT, CA 92223**
657 ft.

Site 3 of 3 in cluster A

Relative:
Lower

Actual:
2603 ft.

HAZNET:

Gepaid:	CAD982316507
TSD EPA ID:	CAT000613927
Gen County:	Riverside
Tsd County:	San Bernardino
Tons:	.0792
Facility Address 2:	Not reported
Waste Category:	Aqueous solution with less than 10% total organic residues
Disposal Method:	Transfer Station
Contact:	Not reported
Telephone:	(000) 000-0000
Mailing Name:	Not reported
Mailing Address:	1493 6TH ST
	BEAUMONT, CA 92223
County	Riverside

CONTINENTAL BAKING CO (Continued) **S105088716**

Gepaid: CAD982316507
TSD EPA ID: Not reported
Gen County: Riverside
Tsd County: San Bernardino
Tons: 0.36
Facility Address 2: Not reported
Waste Category: Aqueous solution with less than 10% total organic residues
Disposal Method: Transfer Station
Contact: --
Telephone: --
Mailing Name: Not reported
Mailing Address: 1493 6TH ST
BEAUMONT, CA 92223
County Not reported

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4 **EARTH WIZE RECYCLING/STATER BROTHERS #086** **SWRCY** **S107136929**
ESE **1661 E 6TH ST** **N/A**
1/4-1/2 **BEAUMONT, CA 92223**
1834 ft.

Relative:
Lower

Actual:
2593 ft.

CA SWRCY
Certification Status : O
Facility Phone Number : Not reported
Whether The Facility Is Grandfathered : Not reported
Convenience Zone Where Faciltiy Located : 1602
Convenience Zone Where Faciltiy Located 2 : 3974
Convenience Zone Where Faciltiy Located 3 : 4615
Convenience Zone Where Faciltiy Located 4 : 0
Convenience Zone Where Faciltiy Located 5 : 0
Convenience Zone Where Faciltiy Located 6 : 0
Convenience Zone Where Faciltiy Located 7 : 0
Aluminum Beverage Containers Redeemed : AL
Glass Beverage Containers Redeemed : GL
Plastic Beverage Containers Redeemed : PL
Other mat beverage containers redeemed : Not Accepted
Refillable Beverage Containers Redeemed : Not Accepted
Date facility became certified : 05/15/03
Date facility began operating (no date indicates never operational) : 06/04/03
Date facility ceased operating (no date indicates still operating) : / /

B5 **ARCO #5463** **LUST** **S105022735**
ESE **1696 6TH ST** **Cortese** **N/A**
1/4-1/2 **BEAUMONT, CA 92223**
2256 ft.

Site 1 of 3 in cluster B

Relative:
Lower

Actual:
2590 ft.

State LUST:
Cross Street: HIGHLAND SPRINGS
Qty Leaked: Not reported
Case Number 083302431T
Reg Board: Santa Ana Region
Chemical: Gasoline
Lead Agency: Local Agency
Local Agency : 33000L
Case Type: Soil only
Status: **Case Closed**
Abate Method: Excavate and Treat - remove contaminated soil and treat (includes spreading or land farming)

ARCO #5463 (Continued) **S105022735**

Review Date: Not reported
Workplan: Not reported
Pollution Char: Not reported
Remed Action: Not reported
Monitoring: Not reported
Close Date: 1994-09-07 00:00:00
Release Date: 1994-02-01 00:00:00
Cleanup Fund Id : Not reported
Discover Date : Not reported
Enforcement Dt : Not reported
Enf Type: Not reported
Enter Date : 1994-04-13 00:00:00
Funding: Not reported
Staff Initials: UNK
How Discovered: Tank Closure
How Stopped: Not reported
Interim : Not reported
Leak Cause: UNK
Leak Source: Tank
MTBE Date : Not reported
Max MTBE GW : Not reported
MTBE Tested: Site NOT Tested for MTBE.Includes Unknown and Not Analyzed.
Priority: Not reported
Local Case # : Not reported
Beneficial: Not reported
Staff : VJB
GW Qualifier : Not reported
Max MTBE Soil : Not reported
Soil Qualifier : Not reported
Hydr Basin #: UPPER SANTA ANA VALL
Operator : Not reported
Oversight Prgm: LUST
Review Date : 1995-09-15 00:00:00
Stop Date : Not reported
Work Suspended : Not reported
Responsible Party: ARCO PETROLEUM PRODUCTS CO.
RP Address: P.O. BOX 6037, ARTESIA, CA 90702-6037
Global Id: T0606500368
Org Name: Not reported
Contact Person: Not reported
MTBE Conc: 0
Mtbe Fuel: 1
Water System Name: Not reported
Well Name: Not reported
Distance To Lust: 0
Waste Discharge Global ID: Not reported
Waste Disch Assigned Name: Not reported
Summary : Not reported

Confirm Leak: Not reported
Prelim Assess: Not reported
Remed Plan: Not reported

LUST Region 8:
Region: 8
Regional Board: 08
Local Case Num: Not reported
Facility Status: Case Closed
Staff: VJJ
Facility Contact: Not reported
Lead Agency: Local Agency
Local Agency: 33000L

Cross Street: HIGHLAND SPRINGS

ARCO #5463 (Continued) **S105022735**

Abate Method:	Excavate and Treat - remove contaminated soil and treat (includes spreading or land farming)		
Qty Leaked:	Not reported		
County:	Riverside		
Cleanup Fund Id :	Not reported		
Review Date:	Not reported	Confirm Leak:	Not reported
Workplan:	Not reported	Prelim Assess:	Not reported
Pollution Char:	Not reported	Remed Plan:	Not reported
Remed Action:	Not reported	Monitoring:	Not reported
Close Date:	9/7/1994		
Discover Date :	Not reported		
Enforcement Dt :	Not reported		
Enf Type:	Not reported		
Enter Date :	4/13/1994		
Funding:	Not reported		
Staff Initials:	UNK		
How Discovered:	Tank Closure		
How Stopped:	Not reported		
Interim :	Not reported		
Lat/Lon :	33.9517257 / -116.970595		
Leak Cause:	UNK		
Leak Source:	Tank		
Beneficial:	Not reported		
MTBE Date :	Not reported		
MTBE Tested :	NT		
Max MTBE GW :	Not reported		
GW Qualifies :	Not reported		
Max MTBE Soil :	Not reported		
Soil Qualifies :	Not reported		
Hydr Basin #:	UPPER SANTA ANA VALL		
Oversight Prgm :	LUST		
Global ID:	T0606500368		
Organization Name:	Not reported		
Priority :	Not reported		
Work Suspended :	Not reported		
MTBE Class:	*		
Case Type:	S		
How Stopped Date:	Not reported		
MTBE Concentration:	0		
MTBE Fuel:	1		
Case Number:	083302431T		
Substance:	8006619		
Staff:	VJJ		
Summary :	Not reported		

CORTESE:

Region:	CORTESE
Fac Address 2:	1696 6TH ST

B6 **ARCO #5463** LUST S104970820
ESE **1696 SIXTH ST** N/A
1/4-1/2 **BEAUMONT, CA**
2260 ft.

Site 2 of 3 in cluster B

Relative:
Lower

Actual:
2590 ft.

ARCO #5463 (Continued) **S104970820**

LUST Region RV:
- Facility ID: 94069
- Region: RIVERSIDE
- Status: Case Closed
- Site Closed: Yes
- Employee ID: 12
- Case Type: Undefined

B7 **SAN GORGONIO MEMORIAL HOSPITAL** **HAZNET S100571375**
ESE **600 N HIGHLAND SPRINGS AVE** **VCP N/A**
1/4-1/2 **BANNING, CA 92220** **SWEEPS UST**
2276 ft.

Site 3 of 3 in cluster B

Relative: Lower

Actual: 2590 ft.

VCP:

Facility ID	33800001
Dtsc Region Code :	4
Region Code Definition :	CYPRESS
County Code :	33
Site Name Under :	Not reported
Current Status Date :	03271995
Current Status Code :	NA
Current Status :	NO ACTION - FOR CALMORTGAGE ONLY
Lead Agency Code :	DTSC
Lead Agency :	DEPT OF TOXIC SUBSTANCES CONTROL
Site Type Code :	CMORT
Site Type :	CALMORTGAGE ONLY
National Priorities List :	N
Tier :	Not reported
Source Of Funding Code :	Not reported
Staff Member :	SKARINEN
Supervisor :	Not reported
Sic Code :	80
Sic Code Definition :	HEALTH SERVICES
Site Mitigatn & Brnflds Reuse Prog (SMBR) Code :	CM
SMBR Branch :	CALMORTGAGE
Regional Water Quality Control Board :	CR
RWQCB Definition :	COLORADO RIVER
Site Access Controlled :	Not reported
Listed In Haz Wst & Substncs Sites List (CORTESE):	Not reported
Date Hazard Ranked :	Not reported
GW Contamination Suspected :	Not reported
# Of Sources Contributing To Contamination :	0
Lat/Long :	0° 0' 0" / 0° 0' 0"
Direction Lat :	Not reported
Direction Long :	Not reported
Lat/long Method :	Not reported
Entity Lat/long Coordinates Refer To :	Not reported
State Assembly Distt Code :	65
State Senate Distt Code :	37
Identifying Code:	CSTAR
ID Value:	400528-00
Other ID Desc:	CALSTARS CODE
Alternate Name(s):	SAN GORGONIO MEMORIAL HOSPITAL
Address(es) :	600 NORTH HIGHLAND SPRINGS AVENUE BANNING, CA 92220
Background Info :	Not reported

SAN GORGONIO MEMORIAL HOSPITAL (Continued) **S100571375**

Facility Id :	33800001
AWP Activities Code :	1
DTSC Site Activity Code :	PHSE1
Activity Code Def:	PHASE 1 - CALMORTGAGE AND SCHOOL SITE PROPERTIES
AWP Activity Id :	PHSE1
Dt Activity Due For Completion :	Not reported
Revised Due Date :	Not reported
Date Activity Completed :	03271995
Est # Of Person-years To Complete :	0
Est. Size Of An Activity Code :	Not reported
Site Status When Activity Commitment Made :	NA
Status Code Definition :	NO ACTION - FOR CALMORTGAGE ONLY
Cubic Yards Of Solids Removed At Completion :	0
Gallons Of Liquid Removed Upon Completion :	0
Cubic Yards Of Solids Treated Upon Completion :	0
Actvty Deleted Via Commitmnt/Completns Screen :	Not reported
Special Program Code:	Not reported
Special Program :	Not reported
Comments Date :	03271995
Comments :	Pursuant to the MOU, DTSC has prepared a Phase I Environmental Assessment for the San Gorgonio Hospital. The property contains an acute care hosptial and medical office buildings. A Phase I Report was prepared by DTSC and concluded that no action was needed for this property; there is no contamination on the property.

HAZNET:

Gepaid:	CAL000059736
TSD EPA ID:	CAD982524613
Gen County:	Riverside
Tsd County:	Orange
Tons:	.0416
Facility Address 2:	Not reported
Waste Category:	Metal sludge - Alkaline solution (pH <UN-> 12.5) with metals (antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, lead, mercury, molybdenum, nickel, selenium, silver, thallium, vanadium, and zinc)
Disposal Method:	Recycler
Contact:	SAN GORGONIO MEMORIAL HOSP
Telephone:	(909) 845-1121
Mailing Name:	Not reported
Mailing Address:	600 N HIGHLAND SPRINGS AVE BANNING, CA 92220 - 3046
County	Riverside

Gepaid:	CAL000059736
TSD EPA ID:	CAD982524613
Gen County:	Riverside
Tsd County:	Orange
Tons:	.0416
Facility Address 2:	Not reported
Waste Category:	Photochemicals/photoprocessing waste
Disposal Method:	Not reported
Contact:	SAN GORGONIO MEMORIAL HOSP
Telephone:	(909) 845-1121
Mailing Name:	Not reported
Mailing Address:	600 N HIGHLAND SPRINGS AVE BANNING, CA 92220 - 3046

SAN GORGONIO MEMORIAL HOSPITAL (Continued) **S100571375**

County Riverside

Gepaid: CAL000059736
TSD EPA ID: CAD982524613
Gen County: Riverside
Tsd County: Orange
Tons: .0208
Facility Address 2: Not reported
Waste Category: Photochemicals/photoprocessing waste
Disposal Method: Recycler
Contact: SAN GORGONIO MEMORIAL HOSP
Telephone: (909) 845-1121
Mailing Name: Not reported
Mailing Address: 600 N HIGHLAND SPRINGS AVE
BANNING, CA 92220 - 3046
County Riverside

Gepaid: CAL000059736
TSD EPA ID: CAD883604000
Gen County: Riverside
Tsd County: 0
Tons: .0060
Facility Address 2: Not reported
Waste Category: Photochemicals/photoprocessing waste
Disposal Method: Recycler
Contact: SAN GORGONIO MEMORIAL HOSP
Telephone: (909) 845-1121
Mailing Name: Not reported
Mailing Address: 600 N HIGHLAND SPRINGS AVE
BANNING, CA 92220 - 3046
County Riverside

Gepaid: CAL000059736
TSD EPA ID: CAD983604000
Gen County: Riverside
Tsd County: San Bernardino
Tons: .0050
Facility Address 2: Not reported
Waste Category: Photochemicals/photoprocessing waste
Disposal Method: Not reported
Contact: SAN GORGONIO MEMORIAL HOSP
Telephone: (909) 845-1121
Mailing Name: Not reported
Mailing Address: 600 N HIGHLAND SPRINGS AVE
BANNING, CA 92220 - 3046
County Riverside

Click this hyperlink while viewing on your computer to access
14 additional CA HAZNET record(s) in the EDR Site Report.

SWEEPS:
Status : A
Comp Number : 1812
Number : 1
Board Of Equalization : Not reported
Ref Date : 11-18-92
Act Date : 11-18-92
Created Date : 08-22-91
Tank Status : A

SAN GORGONIO MEMORIAL HOSPITAL (Continued) S100571375

Owner Tank Id : Not reported
Swrcb Tank Id : 33-000-001812-000001
Actv Date : 11-18-92
Capacity : 12000
Tank Use : M.V. FUEL
Stg : P
Content : DIESEL
Number Of Tanks : 1

C8 **ULTRAMAR SERVICE STATION** LUST S103821071
ESE **501 HIGHLAND SPRINGS AVE** N/A
1/4-1/2 **BEAUMONT, CA**
2510 ft.

Site 1 of 2 in cluster C

Relative:
Lower

LUST Region RV:
Facility ID: 970500
Region: RIVERSIDE
Actual: Status: Case Closed
2581 ft. Site Closed: Yes
Employee ID: 12
Case Type: Soil only

C9 **ULTRAMAR S S** LUST S103249153
ESE **501 HIGHLAND SPRINGS AVE** N/A
1/4-1/2 **BEAUMONT, CA 92220**
2510 ft.

Site 2 of 2 in cluster C

Relative:
Lower

State LUST:
Cross Street: 05TH
Actual: Qty Leaked: Not reported
2581 ft. Case Number 083303001T
Reg Board: Santa Ana Region
Chemical: Gasoline
Lead Agency: Local Agency
Local Agency : 33000L
Case Type: Soil only
Status: Case Closed
Review Date: 1997-05-12 00:00:00 Confirm Leak: 1997-05-12 00:00:00
Workplan: 1997-05-12 00:00:00 Prelim Assess: 1997-05-12 00:00:00
Pollution Char: Not reported Remed Plan: Not reported
Remed Action: Not reported
Monitoring: Not reported
Close Date: 1997-10-29 00:00:00
Release Date: 1997-06-09 00:00:00
Cleanup Fund Id : Not reported
Discover Date : 1997-05-12 00:00:00
Enforcement Dt : Not reported
Enf Type: CLOS
Enter Date : 1997-06-20 00:00:00
Funding: Not reported
Staff Initials: UNK
How Discovered: Tank Closure
How Stopped: Not reported
Interim : Not reported
Leak Cause: Not reported
Leak Source: Not reported

ULTRAMAR S S (Continued) **S103249153**

MTBE Date : Not reported
Max MTBE GW : Not reported
MTBE Tested: MTBE Detected. Site tested for MTBE & MTBE detected
Priority: Not reported
Local Case # : 970500
Beneficial: Not reported
Staff : RS
GW Qualifier : Not reported
Max MTBE Soil : ND Parts per Million
Soil Qualifier : =
Hydr Basin #: UPPER SANTA ANA VALL
Operator : Not reported
Oversight Prgm: LUST
Review Date : Not reported
Stop Date : 1997-05-12 00:00:00
Work Suspended :Not reported
Responsible PartyLOMA LINDA OIL CO.
RP Address: 10260 MOUNTAIN AVE, LOMA LINDA CA 92354
Global Id: T0606500491
Org Name: Not reported
Contact Person: Not reported
MTBE Conc: 2
Mtbe Fuel: 1
Water System Name: Not reported
Well Name: Not reported
Distance To Lust: 0
Waste Discharge Global ID: Not reported
Waste Disch Assigned Name: Not reported
Summary : DIESEL ALSO

LUST Region 8:

Region:	8	Cross Street:	05TH
Regional Board:	08		
Local Case Num:	970500		
Facility Status:	Case Closed		
Staff:	RS		
Facility Contact:	Not reported		
Lead Agency:	Local Agency		
Local Agency:	33000L		
Qty Leaked:	Not reported		
County:	Riverside		
Cleanup Fund Id :	Not reported		
Review Date:	5/12/1997	Confirm Leak:	5/12/1997
Workplan:	5/12/1997	Prelim Assess:	5/12/1997
Pollution Char:	Not reported	Remed Plan:	Not reported
Remed Action:	Not reported	Monitoring:	Not reported
Close Date:	10/29/1997		
Discover Date :	5/12/1997		
Enforcement Dt :	Not reported		
Enf Type:	CLOS		
Enter Date :	6/20/1997		
Funding:	Not reported		
Staff Initials:	UNK		
How Discovered:	Tank Closure		
How Stopped:	Not reported		
Interim :	Not reported		
Lat/Lon :	33.929407 / -116.9471428		
Leak Cause:	Not reported		

ULTRAMAR S S (Continued) **S103249153**

Leak Source: Not reported
Beneficial: Not reported
MTBE Date : Not reported
MTBE Tested : YES
Max MTBE GW : Not reported
GW Qualifies : Not reported
Max MTBE Soil : 680
Soil Qualifies : =
Hydr Basin #: UPPER SANTA ANA VALL
Oversight Prgm : LUST
Global ID: T0606500491
Organization Name: Not reported
Priority : Not reported
Work Suspended :Not reported
MTBE Class: *
Case Type: S
How Stopped Date: 5/12/1997
MTBE Concentration: 2
MTBE Fuel: 1
Case Number: 083303001T
Substance: 8006619
Staff: RS
Summary : DIESEL ALSO

10
WSW
1/2-1
4802 ft.

SQUARE D CO
1060 E THIRD ST
BEAUMONT, CA 92223

FINDS **1000221045**
RCRA-LQG **CAD050746775**
RCRA-TSDF
CORRACTS

Relative:
Lower

Actual:
2605 ft.

CORRACTS Data:

EPA Id: CAD050746775
Region: 09
Area Name: ENTIRE FACILITY
Actual Date: 01/26/1999
Corrective Action: CA772PR
2002 NAICS Title: Current-Carrying Wiring Device Manufacturing
Switchgear and Switchboard Apparatus Manufacturing

EPA Id: CAD050746775
Region: 09
Area Name: PHASE II/PARCEL 1
Actual Date: 01/31/1995
Corrective Action: CA500 - CMI Workplan Approved
2002 NAICS Title: Current-Carrying Wiring Device Manufacturing
Switchgear and Switchboard Apparatus Manufacturing

EPA Id: CAD050746775
Region: 09
Area Name: ENTIRE FACILITY
Actual Date: 03/01/1995
Corrective Action: CA400 - Date For Remedy Selection (CM Imposed)
2002 NAICS Title: Current-Carrying Wiring Device Manufacturing
Switchgear and Switchboard Apparatus Manufacturing

EPA Id: CAD050746775
Region: 09
Area Name: ENTIRE FACILITY
Actual Date: 03/15/1995

SQUARE D CO (Continued) **1000221045**

Corrective Action: CA350 - CMS Approved
2002 NAICS Title: Current-Carrying Wiring Device Manufacturing
Switchgear and Switchboard Apparatus Manufacturing

EPA Id: CAD050746775
Region: 09
Area Name: PHASE II, PARCEL 2
Actual Date: 03/15/1995
Corrective Action: CA350 - CMS Approved
2002 NAICS Title: Current-Carrying Wiring Device Manufacturing
Switchgear and Switchboard Apparatus Manufacturing

Click this hyperlink while viewing on your computer to access
27 additional CORRACTS record(s) in the EDR Site Report.

RCRAInfo Corrective Action Summary:

Event: CA Prioritization, Facility or area was assigned a low corrective action priority.
Event Date: Not reported

Event: Certification Of Remedy Completion Or Construction Completion
Event Date: 06/27/2000

Event: Current Human Exposures under Control, Yes, Current Human Exposures Under Control has been verified. Based on a review of information contained in the EI determination, current human exposures are expected to be under control at the facility under current and reasonably expected conditions. This determination will be re-evaluated when the Agency/State becomes aware of significant changes at the facility.
Event Date: 05/17/2000

Event: Igration of Contaminated Groundwater under Control, Yes, Migration of Contaminated Groundwater Under Control has been verified. Based on a review of information contained in the EI determination, it has been determined that migration of contaminated groundwater is under control at the facility. Specifically, this determination indicates that the migration of contaminated groundwater is under control, and that monitoring will be conducted to confirm that contaminated groundwater remains within the existing area of contaminated groundwater. This determination will be re-evaluated when the Agency becomes aware of significant changes at the facility.
Event Date: 05/17/2000

Event: Current Human Exposures under Control, Yes, Current Human Exposures Under Control has been verified. Based on a review of information contained in the EI determination, current human exposures are expected to be under control at the facility under current and reasonably expected conditions. This determination will be re-evaluated when the Agency/State becomes aware of significant changes at the facility.
Event Date: 05/06/1999

Event: Igration of Contaminated Groundwater under Control, Yes, Migration of Contaminated Groundwater Under Control has been verified. Based on a review of information contained in the EI determination, it has been determined that migration of contaminated groundwater is under control at the facility. Specifically, this determination indicates that the migration of contaminated groundwater is under control, and that monitoring will be conducted to confirm that contaminated groundwater remains within the existing area of contaminated groundwater. This determination will be re-evaluated when the Agency becomes aware of significant changes at the facility.

SQUARE D CO (Continued) **1000221045**

Event Date: 05/06/1999

Event: Certification Of Remedy Completion Or Construction Completion
Event Date: 07/31/1998

Event: Certification Of Remedy Completion Or Construction Completion
Event Date: 04/29/1996

Event: CMS Approved
Event Date: 03/15/1995

Event: Date For Remedy Selection (CM Imposed)
Event Date: 03/01/1995

Event: CMI Workplan Approved
Event Date: 01/31/1995

Event: RFI Workplan Approved
Event Date: 09/30/1994

Event: CMS Workplan Approved
Event Date: 09/30/1994

Event: RFI Approved
Event Date: 08/26/1994

Event: RFI Imposition
Event Date: 05/04/1994

Event: CA Prioritization, Facility or area was assigned a low corrective action priority.
Event Date: 09/29/1992

Event: Stabilization Measures Evaluation,This facility is not amenable to stabilization activity at the present time for reasons other than 1) it appears to be technically infeasible or inappropriate (NF) or 2) there is a lack of technical information (IN). Reasons for this conclusion may be the status of closure at the facility, the degree of risk, timing considerations, the status of corrective action work at the facility, or other administrative considerations.
Event Date: 09/29/1992

RCRAInfo:
Owner: YATES INDUSTRIES INC
(714) 845-3111
EPA ID: CAD050746775

Contact: Not reported

Classification: Large Quantity Generator, TSDF
TSDF Activities: Not reported

Violation Status: Violations exist

Regulation Violated: Not reported
Area of Violation: TSD-CLOSURE/POST-CLOSURE REQUIREMENTS
Date Violation Determined: 08/20/2001
Actual Date Achieved Compliance: 12/31/2001

Enforcement Action: WRITTEN INFORMAL
Enforcement Action Date: 08/20/2001
Penalty Type: Not reported

Regulation Violated: Not reported
Area of Violation: TSD-GENERAL STANDARDS
Date Violation Determined: 08/20/2001

SQUARE D CO (Continued) **1000221045**

Actual Date Achieved Compliance: 12/31/2001

Regulation Violated: Not reported
Area of Violation: TSD-GOUNDWATER MONITORING REQUIREMENTS
Date Violation Determined: 08/29/2000
Actual Date Achieved Compliance: 09/03/2002

Enforcement Action: WRITTEN INFORMAL
Enforcement Action Date: 03/14/2001
Penalty Type: Proposed Monetary Penalty

Enforcement Action: INITIAL 3008(A) COMPLIANCE ORDER
Enforcement Action Date: 05/12/2002
Penalty Type: Proposed Monetary Penalty

Enforcement Action: FINAL 3008(A) COMPLIANCE ORDER
Enforcement Action Date: 06/05/2002
Penalty Type: Proposed Monetary Penalty

Regulation Violated: Not reported
Area of Violation: TSD-GOUNDWATER MONITORING REQUIREMENTS
Date Violation Determined: 08/29/2000
Actual Date Achieved Compliance: 09/03/2002

Enforcement Action: WRITTEN INFORMAL
Enforcement Action Date: 03/14/2001
Penalty Type: Not reported

Regulation Violated: 264.90-94.F
Area of Violation: TSD-GOUNDWATER MONITORING REQUIREMENTS
Date Violation Determined: 03/26/1992
Actual Date Achieved Compliance: 06/10/1993

Enforcement Action: INITIAL 3008(A) COMPLIANCE ORDER
Enforcement Action Date: 06/12/1992
Penalty Type: Proposed Monetary Penalty

Regulation Violated: 264.140-150.H
Area of Violation: TSD-FINANCIAL RESPONSIBILITY REQUIREMENTS
Date Violation Determined: 11/22/1991
Actual Date Achieved Compliance: 02/10/1992

Enforcement Action: WRITTEN INFORMAL
Enforcement Action Date: 12/30/1987
Penalty Type: Not reported

Regulation Violated: 264.140-150.H
Area of Violation: TSD-FINANCIAL RESPONSIBILITY REQUIREMENTS
Date Violation Determined: 03/21/1990
Actual Date Achieved Compliance: 03/27/1990

Enforcement Action: WRITTEN INFORMAL
Enforcement Action Date: 03/21/1990
Penalty Type: Not reported

Regulation Violated: 270
Area of Violation: TSD-OTHER REQUIREMENTS (OVERSIGHT)
Date Violation Determined: 10/13/1988
Actual Date Achieved Compliance: 01/29/1989

Enforcement Action: WRITTEN INFORMAL
Enforcement Action Date: 11/03/1988
Penalty Type: Proposed Monetary Penalty

Enforcement Action: INITIAL 3008(A) COMPLIANCE ORDER

SQUARE D CO (Continued) **1000221045**

Enforcement Action Date: 01/20/1989
Penalty Type: Proposed Monetary Penalty

Regulation Violated: 264.90-94.F
Area of Violation: TSD-GOUNDWATER MONITORING REQUIREMENTS
Date Violation Determined: 09/12/1988
Actual Date Achieved Compliance: 01/29/1989

Enforcement Action: INITIAL 3008(A) COMPLIANCE ORDER
Enforcement Action Date: 01/20/1989
Penalty Type: Proposed Monetary Penalty

Regulation Violated: 270
Area of Violation: TSD-OTHER REQUIREMENTS (OVERSIGHT)
Date Violation Determined: 03/01/1988
Actual Date Achieved Compliance: 03/16/1988

Enforcement Action: WRITTEN INFORMAL
Enforcement Action Date: 03/16/1988
Penalty Type: Not reported

Regulation Violated: 264.140-150.H
Area of Violation: TSD-FINANCIAL RESPONSIBILITY REQUIREMENTS
Date Violation Determined: 11/19/1987
Actual Date Achieved Compliance: 01/26/1988

Enforcement Action: WRITTEN INFORMAL
Enforcement Action Date: 12/30/1987
Penalty Type: Not reported

Penalty Summary:

Penalty Description	Penalty Date	Penalty Amount	Lead Agency
Final Monetary Penalty	5/13/2002	5000	STATE
Final Monetary Penalty	6/12/1992	50000	STATE
Proposed Monetary Penalty	6/12/1992	178000	STATE

There are 11 violation record(s) reported at this site:

Evaluation	Area of Violation	Date of Compliance
Compliance Evaluation Inspection	TSD-CLOSURE/POST-CLOSURE REQUIREMENTS	20011231
	TSD-GENERAL STANDARDS	20011231
Compliance GW Monitoring Evaluation	TSD-GOUNDWATER MONITORING REQUIREMENTS	20020903
	TSD-GOUNDWATER MONITORING REQUIREMENTS	20020903
Operation and Maintenance Inspection	TSD-GOUNDWATER MONITORING REQUIREMENTS	19930610
Financial Record Review	TSD-FINANCIAL RESPONSIBILITY REQUIREMENTS	19920210
Financial Record Review	TSD-FINANCIAL RESPONSIBILITY REQUIREMENTS	19900327
Compliance Evaluation Inspection	TSD-OTHER REQUIREMENTS (OVERSIGHT)	19890129
Compliance GW Monitoring Evaluation	TSD-GOUNDWATER MONITORING REQUIREMENTS	19890129
Compliance Evaluation Inspection	TSD-OTHER REQUIREMENTS (OVERSIGHT)	19880316
Financial Record Review	TSD-FINANCIAL RESPONSIBILITY REQUIREMENTS	19880126

FINDS:
Other Pertinent Environmental Activity Identified at Site:
HAZARDOUS WASTE TRACKING SYSTEM-DATAMART
RESOURCE CONSERVATION AND RECOVERY ACT INFORMATION SYSTEM
TOXIC CHEMICAL RELEASE INVENTORY SYSTEM

ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
BANNING	S106152917	GOLD ZONE ENTERPRISES (CAL D FUEL)	5861 FIFTH STREET	92220	LUST
BANNING	S102427779	CHEVRON STATION #9-4886	13366 (290) HIGHLAND SPRINGS	92220	LUST, Cortese
BANNING	S106716257	AZ MINIMART & GAS	EAST RAMSEY	92220	LUST
BEAUMONT	S104566400	BROOKFIELD CALIFORNIA LAND HOLDINGS INC	399/352 / 354/356 & 358 8TH ST	92223	HAZNET
BEAUMONT	S105842779	CAL TRANS	BEAUMONT AVE / I-10	92223	LUST
BEAUMONT	1001491831	LOMA LINDA UNIVERSITY	NEAR PENNSYLVANIA AND 3RD ST.	92223	CERCLIS, FINDS
BEAUMONT	S105036229	BEAUMONT CONCRETE COMPANY	452 5TH ST	92223	LUST, Cortese, EMI

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Number of Days to Update: Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

FEDERAL RECORDS

NPL: National Priority List

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 02/24/2006
Date Data Arrived at EDR: 03/01/2006
Date Made Active in Reports: 03/31/2006
Number of Days to Update: 30

Source: EPA
Telephone: N/A
Last EDR Contact: 05/05/2006
Next Scheduled EDR Contact: 07/31/2006
Data Release Frequency: Quarterly

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 6
Telephone: 214-655-6659

EPA Region 3
Telephone 215-814-5418

EPA Region 8
Telephone: 303-312-6774

EPA Region 4
Telephone 404-562-8033

Proposed NPL: Proposed National Priority List Sites

Date of Government Version: 02/24/2006
Date Data Arrived at EDR: 03/01/2006
Date Made Active in Reports: 03/31/2006
Number of Days to Update: 30

Source: EPA
Telephone: N/A
Last EDR Contact: 05/05/2006
Next Scheduled EDR Contact: 07/31/2006
Data Release Frequency: Quarterly

DELISTED NPL: National Priority List Deletions

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 02/24/2006
Date Data Arrived at EDR: 03/01/2006
Date Made Active in Reports: 03/31/2006
Number of Days to Update: 30

Source: EPA
Telephone: N/A
Last EDR Contact: 05/05/2006
Next Scheduled EDR Contact: 07/31/2006
Data Release Frequency: Quarterly

NPL RECOVERY: Federal Superfund Liens

Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991
Date Data Arrived at EDR: 02/02/1994
Date Made Active in Reports: 03/30/1994
Number of Days to Update: 56

Source: EPA
Telephone: 202-564-4267
Last EDR Contact: 03/06/2006
Next Scheduled EDR Contact: 05/22/2006
Data Release Frequency: No Update Planned

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

CERCLIS: Comprehensive Environmental Response, Compensation, and Liability Information System

CERCLIS contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). CERCLIS contains sites which are either proposed to or on the National Priorities List (NPL) and sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 02/01/2006
Date Data Arrived at EDR: 03/21/2006
Date Made Active in Reports: 04/13/2006
Number of Days to Update: 23

Source: EPA
Telephone: 703-413-0223
Last EDR Contact: 03/21/2006
Next Scheduled EDR Contact: 06/19/2006
Data Release Frequency: Quarterly

CERCLIS-NFRAP: CERCLIS No Further Remedial Action Planned

Archived sites are sites that have been removed and archived from the inventory of CERCLIS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list this site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. This decision does not necessarily mean that there is no hazard associated with a given site; it only means that, based upon available information, the location is not judged to be a potential NPL site.

Date of Government Version: 02/01/2006
Date Data Arrived at EDR: 03/21/2006
Date Made Active in Reports: 04/13/2006
Number of Days to Update: 23

Source: EPA
Telephone: 703-413-0223
Last EDR Contact: 03/21/2006
Next Scheduled EDR Contact: 06/19/2006
Data Release Frequency: Quarterly

CORRACTS: Corrective Action Report

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 03/15/2006
Date Data Arrived at EDR: 03/17/2006
Date Made Active in Reports: 04/13/2006
Number of Days to Update: 27

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 03/06/2006
Next Scheduled EDR Contact: 06/05/2006
Data Release Frequency: Quarterly

RCRA: Resource Conservation and Recovery Act Information

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. RCRAInfo replaces the data recording and reporting abilities of the Resource Conservation and Recovery Information System (RCRIS). The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month. Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month. Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month. Transporters are individuals or entities that move hazardous waste from the generator off-site to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 02/21/2006
Date Data Arrived at EDR: 03/01/2006
Date Made Active in Reports: 03/31/2006
Number of Days to Update: 30

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 04/27/2006
Next Scheduled EDR Contact: 06/26/2006
Data Release Frequency: Quarterly

ERNS: Emergency Response Notification System

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 01/12/2006
Date Made Active in Reports: 02/21/2006
Number of Days to Update: 40

Source: National Response Center, United States Coast Guard
Telephone: 202-260-2342
Last EDR Contact: 04/26/2006
Next Scheduled EDR Contact: 07/24/2006
Data Release Frequency: Annually

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

HMIRS: Hazardous Materials Information Reporting System
Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 01/16/2006
Date Made Active in Reports: 02/21/2006
Number of Days to Update: 36

Source: U.S. Department of Transportation
Telephone: 202-366-4555
Last EDR Contact: 04/14/2006
Next Scheduled EDR Contact: 07/17/2006
Data Release Frequency: Annually

US ENG CONTROLS: Engineering Controls Sites List
A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 08/02/2005
Date Data Arrived at EDR: 08/12/2005
Date Made Active in Reports: 10/06/2005
Number of Days to Update: 55

Source: Environmental Protection Agency
Telephone: 703-603-8905
Last EDR Contact: 03/03/2006
Next Scheduled EDR Contact: 07/03/2006
Data Release Frequency: Varies

US INST CONTROL: Sites with Institutional Controls
A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 01/10/2005
Date Data Arrived at EDR: 02/11/2005
Date Made Active in Reports: 04/06/2005
Number of Days to Update: 54

Source: Environmental Protection Agency
Telephone: 703-603-8905
Last EDR Contact: 03/03/2006
Next Scheduled EDR Contact: 07/03/2006
Data Release Frequency: Varies

DOD: Department of Defense Sites
This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 12/31/2004
Date Data Arrived at EDR: 02/08/2005
Date Made Active in Reports: 08/04/2005
Number of Days to Update: 177

Source: USGS
Telephone: 703-692-8801
Last EDR Contact: 05/12/2006
Next Scheduled EDR Contact: 08/07/2006
Data Release Frequency: Semi-Annually

FUDS: Formerly Used Defense Sites
The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 12/05/2005
Date Data Arrived at EDR: 01/19/2006
Date Made Active in Reports: 02/21/2006
Number of Days to Update: 33

Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
Last EDR Contact: 04/03/2006
Next Scheduled EDR Contact: 07/03/2006
Data Release Frequency: Varies

US BROWNFIELDS: A Listing of Brownfields Sites

Included in the listing are brownfields properties addresses by Cooperative Agreement Recipients and brownfields properties addressed by Targeted Brownfields Assessments. Targeted Brownfields Assessments-EPA's Targeted Brownfields Assessments (TBA) program is designed to help states, tribes, and municipalities--especially those without EPA Brownfields Assessment Demonstration Pilots--minimize the uncertainties of contamination often associated with brownfields. Under the TBA program, EPA provides funding and/or technical assistance for environmental assessments at brownfields sites throughout the country. Targeted Brownfields Assessments supplement and work with other efforts under EPA's Brownfields Initiative to promote cleanup and redevelopment of brownfields. Cooperative Agreement Recipients-States, political subdivisions, territories, and Indian tribes become Brownfields Cleanup Revolving Loan Fund (BCRLF) cooperative agreement recipients when they enter into BCRLF cooperative agreements with the U.S. EPA. EPA selects BCRLF cooperative agreement recipients based on a proposal and application process. BCRLF cooperative agreement recipients must use EPA funds provided through BCRLF cooperative agreement for specified brownfields-related cleanup activities.

Date of Government Version: 11/29/2005
Date Data Arrived at EDR: 12/05/2005
Date Made Active in Reports: 01/30/2006
Number of Days to Update: 56

Source: Environmental Protection Agency
Telephone: 202-566-2777
Last EDR Contact: 03/13/2006
Next Scheduled EDR Contact: 06/12/2006
Data Release Frequency: Semi-Annually

CONSENT: Superfund (CERCLA) Consent Decrees

Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 12/14/2004
Date Data Arrived at EDR: 02/15/2005
Date Made Active in Reports: 04/25/2005
Number of Days to Update: 69

Source: Department of Justice, Consent Decree Library
Telephone: Varies
Last EDR Contact: 03/13/2006
Next Scheduled EDR Contact: 07/24/2006
Data Release Frequency: Varies

ROD: Records Of Decision

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 12/07/2005
Date Data Arrived at EDR: 01/06/2006
Date Made Active in Reports: 02/21/2006
Number of Days to Update: 46

Source: EPA
Telephone: 703-416-0223
Last EDR Contact: 04/05/2006
Next Scheduled EDR Contact: 07/03/2006
Data Release Frequency: Annually

UMTRA: Uranium Mill Tailings Sites

Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

Date of Government Version: 11/04/2005
Date Data Arrived at EDR: 11/28/2005
Date Made Active in Reports: 01/30/2006
Number of Days to Update: 63

Source: Department of Energy
Telephone: 505-845-0011
Last EDR Contact: 03/20/2006
Next Scheduled EDR Contact: 06/19/2006
Data Release Frequency: Varies

ODI: Open Dump Inventory

An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985
Date Data Arrived at EDR: 08/09/2004
Date Made Active in Reports: 09/17/2004
Number of Days to Update: 39

Source: Environmental Protection Agency
Telephone: 800-424-9346
Last EDR Contact: 06/09/2004
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

TRIS: Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2003
Date Data Arrived at EDR: 07/13/2005
Date Made Active in Reports: 08/17/2005
Number of Days to Update: 35

Source: EPA
Telephone: 202-566-0250
Last EDR Contact: 03/21/2006
Next Scheduled EDR Contact: 06/19/2006
Data Release Frequency: Annually

TSCA: Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2002
Date Data Arrived at EDR: 04/27/2004
Date Made Active in Reports: 05/21/2004
Number of Days to Update: 24

Source: EPA
Telephone: 202-260-5521
Last EDR Contact: 04/12/2006
Next Scheduled EDR Contact: 07/17/2006
Data Release Frequency: Every 4 Years

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 01/17/2006
Date Data Arrived at EDR: 01/24/2006
Date Made Active in Reports: 02/27/2006
Number of Days to Update: 34

Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-566-1667
Last EDR Contact: 03/20/2006
Next Scheduled EDR Contact: 06/19/2006
Data Release Frequency: Quarterly

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

Date of Government Version: 01/17/2006
Date Data Arrived at EDR: 01/24/2006
Date Made Active in Reports: 02/27/2006
Number of Days to Update: 34

Source: EPA
Telephone: 202-566-1667
Last EDR Contact: 03/20/2006
Next Scheduled EDR Contact: 06/19/2006
Data Release Frequency: Quarterly

SSTS: Section 7 Tracking Systems

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 12/31/2003
Date Data Arrived at EDR: 01/03/2005
Date Made Active in Reports: 01/25/2005
Number of Days to Update: 22

Source: EPA
Telephone: 202-564-4203
Last EDR Contact: 03/06/2006
Next Scheduled EDR Contact: 07/17/2006
Data Release Frequency: Annually

ICIS: Integrated Compliance Information System

The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 02/13/2006
Date Data Arrived at EDR: 03/21/2006
Date Made Active in Reports: 05/11/2006
Number of Days to Update: 51

Source: Environmental Protection Agency
Telephone: 202-564-5088
Last EDR Contact: 04/11/2006
Next Scheduled EDR Contact: 07/17/2006
Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

PADS: PCB Activity Database System

PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 12/27/2005
Date Data Arrived at EDR: 02/08/2006
Date Made Active in Reports: 02/27/2006
Number of Days to Update: 19

Source: EPA
Telephone: 202-566-0500
Last EDR Contact: 05/08/2006
Next Scheduled EDR Contact: 08/07/2006
Data Release Frequency: Annually

MLTS: Material Licensing Tracking System

MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 02/10/2006
Date Data Arrived at EDR: 02/16/2006
Date Made Active in Reports: 03/31/2006
Number of Days to Update: 43

Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
Last EDR Contact: 04/03/2006
Next Scheduled EDR Contact: 07/03/2006
Data Release Frequency: Quarterly

MINES: Mines Master Index File

Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 11/08/2005
Date Data Arrived at EDR: 12/27/2005
Date Made Active in Reports: 01/30/2006
Number of Days to Update: 34

Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959
Last EDR Contact: 03/29/2006
Next Scheduled EDR Contact: 06/26/2006
Data Release Frequency: Semi-Annually

FINDS: Facility Index System/Facility Registry System

Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 01/09/2006
Date Data Arrived at EDR: 01/16/2006
Date Made Active in Reports: 02/21/2006
Number of Days to Update: 36

Source: EPA
Telephone: N/A
Last EDR Contact: 04/03/2006
Next Scheduled EDR Contact: 07/03/2006
Data Release Frequency: Quarterly

RAATS: RCRA Administrative Action Tracking System

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995
Date Data Arrived at EDR: 07/03/1995
Date Made Active in Reports: 08/07/1995
Number of Days to Update: 35

Source: EPA
Telephone: 202-564-4104
Last EDR Contact: 03/06/2006
Next Scheduled EDR Contact: 06/05/2006
Data Release Frequency: No Update Planned

BRS: Biennial Reporting System

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2003
Date Data Arrived at EDR: 06/17/2005
Date Made Active in Reports: 08/04/2005
Number of Days to Update: 48

Source: EPA/NTIS
Telephone: 800-424-9346
Last EDR Contact: 03/17/2006
Next Scheduled EDR Contact: 06/12/2006
Data Release Frequency: Biennially

STATE AND LOCAL RECORDS

AWP: Annual Workplan Sites

Known Hazardous Waste Sites. California DTSC's Annual Workplan (AWP), formerly BEP, identifies known hazardous substance sites targeted for cleanup.

Date of Government Version: 08/08/2005
Date Data Arrived at EDR: 08/29/2005
Date Made Active in Reports: 09/21/2005
Number of Days to Update: 23

Source: California Environmental Protection Agency
Telephone: 916-323-3400
Last EDR Contact: 04/05/2006
Next Scheduled EDR Contact: 05/29/2006
Data Release Frequency: Annually

CAL-SITES: Calsites Database

The Calsites database contains potential or confirmed hazardous substance release properties. In 1996, California EPA reevaluated and significantly reduced the number of sites in the Calsites database.

Date of Government Version: 08/08/2005
Date Data Arrived at EDR: 08/29/2005
Date Made Active in Reports: 09/21/2005
Number of Days to Update: 23

Source: Department of Toxic Substance Control
Telephone: 916-323-3400
Last EDR Contact: 05/10/2006
Next Scheduled EDR Contact: 08/28/2006
Data Release Frequency: Quarterly

CA BOND EXP. PLAN: Bond Expenditure Plan

Department of Health Services developed a site-specific expenditure plan as the basis for an appropriation of Hazardous Substance Cleanup Bond Act funds. It is not updated.

Date of Government Version: 01/01/1989
Date Data Arrived at EDR: 07/27/1994
Date Made Active in Reports: 08/02/1994
Number of Days to Update: 6

Source: Department of Health Services
Telephone: 916-255-2118
Last EDR Contact: 05/31/1994
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

NFA: No Further Action Determination

This category contains properties at which DTSC has made a clear determination that the property does not pose a problem to the environment or to public health.

Date of Government Version: 08/08/2005
Date Data Arrived at EDR: 08/29/2005
Date Made Active in Reports: 10/06/2005
Number of Days to Update: 38

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 04/05/2006
Next Scheduled EDR Contact: 05/29/2006
Data Release Frequency: Quarterly

NFE: Properties Needing Further Evaluation

This category contains properties that are suspected of being contaminated. These are unconfirmed contaminated properties that need to be assessed using the PEA process. PEA in Progress indicates properties where DTSC is currently conducting a PEA. PEA Required indicates properties where DTSC has determined a PEA is required, but not currently underway.

Date of Government Version: 08/08/2005
Date Data Arrived at EDR: 08/29/2005
Date Made Active in Reports: 09/21/2005
Number of Days to Update: 23

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 04/05/2006
Next Scheduled EDR Contact: 05/29/2006
Data Release Frequency: Quarterly

REF: Unconfirmed Properties Referred to Another Agency

This category contains properties where contamination has not been confirmed and which were determined as not requiring direct DTSC Site Mitigation Program action or oversight. Accordingly, these sites have been referred to another state or local regulatory agency.

Date of Government Version: 08/08/2005
Date Data Arrived at EDR: 08/29/2005
Date Made Active in Reports: 10/06/2005
Number of Days to Update: 38

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 04/05/2006
Next Scheduled EDR Contact: 05/29/2006
Data Release Frequency: Quarterly

SCH: School Property Evaluation Program

This category contains proposed and existing school sites that are being evaluated by DTSC for possible hazardous materials contamination. In some cases, these properties may be listed in the CalSites category depending on the level of threat to public health and safety or the environment they pose.

Date of Government Version: 08/08/2005
Date Data Arrived at EDR: 08/29/2005
Date Made Active in Reports: 10/06/2005
Number of Days to Update: 38

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 04/05/2006
Next Scheduled EDR Contact: 05/29/2006
Data Release Frequency: Quarterly

TOXIC PITS: Toxic Pits Cleanup Act Sites

Toxic PITS Cleanup Act Sites. TOXIC PITS identifies sites suspected of containing hazardous substances where cleanup has not yet been completed.

Date of Government Version: 07/01/1995
Date Data Arrived at EDR: 08/30/1995
Date Made Active in Reports: 09/26/1995
Number of Days to Update: 27

Source: State Water Resources Control Board
Telephone: 916-227-4364
Last EDR Contact: 05/01/2006
Next Scheduled EDR Contact: 07/31/2006
Data Release Frequency: No Update Planned

SWF/LF (SWIS): Solid Waste Information System

Active, Closed and Inactive Landfills. SWF/LF records typically contain an inve ntory of solid waste disposal facilities or landfills. These may be active or i nactive facilities or open dumps that failed to meet RCRA Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 03/13/2006
Date Data Arrived at EDR: 03/15/2006
Date Made Active in Reports: 04/13/2006
Number of Days to Update: 29

Source: Integrated Waste Management Board
Telephone: 916-341-6320
Last EDR Contact: 03/15/2006
Next Scheduled EDR Contact: 06/12/2006
Data Release Frequency: Quarterly

CA WDS: Waste Discharge System

Sites which have been issued waste discharge requirements.

Date of Government Version: 03/20/2006
Date Data Arrived at EDR: 03/21/2006
Date Made Active in Reports: 04/13/2006
Number of Days to Update: 23

Source: State Water Resources Control Board
Telephone: 916-341-5227
Last EDR Contact: 03/21/2006
Next Scheduled EDR Contact: 06/19/2006
Data Release Frequency: Quarterly

WMUDS/SWAT: Waste Management Unit Database

Waste Management Unit Database System. WMUDS is used by the State Water Resources Control Board staff and the Regional Water Quality Control Boards for program tracking and inventory of waste management units. WMUDS is composed of the following databases: Facility Information, Scheduled Inspections Information, Waste Management Unit Information, SWAT Program Information, SWAT Report Summary Information, SWAT Report Summary Data, Chapter 15 (formerly Subchapter 15) Information, Chapter 15 Monitoring Parameters, TPCA Program Information, RCRA Program Information, Closure Information, and Interested Parties Information.

Date of Government Version: 04/01/2000
Date Data Arrived at EDR: 04/10/2000
Date Made Active in Reports: 05/10/2000
Number of Days to Update: 30

Source: State Water Resources Control Board
Telephone: 916-227-4448
Last EDR Contact: 03/06/2006
Next Scheduled EDR Contact: 06/05/2006
Data Release Frequency: Quarterly

CORTESE: "Cortese" Hazardous Waste & Substances Sites List
The sites for the list are designated by the State Water Resource Control Board (LUST), the Integrated Waste Board (SWF/LS), and the Department of Toxic Substances Control (Cal-Sites). This listing is no longer updated by the state agency.

Date of Government Version: 04/01/2001
Date Data Arrived at EDR: 05/29/2001
Date Made Active in Reports: 07/26/2001
Number of Days to Update: 58

Source: CAL EPA/Office of Emergency Information
Telephone: 916-323-9100
Last EDR Contact: 04/25/2006
Next Scheduled EDR Contact: 07/24/2006
Data Release Frequency: No Update Planned

SWRCY: Recycler Database
A listing of recycling facilities in California.

Date of Government Version: 04/07/2006
Date Data Arrived at EDR: 04/11/2006
Date Made Active in Reports: 05/11/2006
Number of Days to Update: 30

Source: Department of Conservation
Telephone: 916-323-3836
Last EDR Contact: 04/11/2006
Next Scheduled EDR Contact: 07/10/2006
Data Release Frequency: Quarterly

LUST: Geotracker's Leaking Underground Fuel Tank Report
Leaking Underground Storage Tank Incident Reports. LUST records contain an inventory of reported leaking underground storage tank incidents. Not all states maintain these records, and the information stored varies by state.

Date of Government Version: 04/10/2006
Date Data Arrived at EDR: 04/11/2006
Date Made Active in Reports: 05/11/2006
Number of Days to Update: 30

Source: State Water Resources Control Board
Telephone: 916-341-5752
Last EDR Contact: 04/11/2006
Next Scheduled EDR Contact: 07/10/2006
Data Release Frequency: Quarterly

LUST REG 4: Underground Storage Tank Leak List
Los Angeles, Ventura counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/07/2004
Date Data Arrived at EDR: 09/07/2004
Date Made Active in Reports: 10/12/2004
Number of Days to Update: 35

Source: California Regional Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6600
Last EDR Contact: 03/28/2006
Next Scheduled EDR Contact: 06/26/2006
Data Release Frequency: No Update Planned

LUST REG 6L: Leaking Underground Storage Tank Case Listing
For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/09/2003
Date Data Arrived at EDR: 09/10/2003
Date Made Active in Reports: 10/07/2003
Number of Days to Update: 27

Source: California Regional Water Quality Control Board Lahontan Region (6)
Telephone: 916-542-5424
Last EDR Contact: 03/06/2006
Next Scheduled EDR Contact: 06/05/2006
Data Release Frequency: No Update Planned

LUST REG 9: Leaking Underground Storage Tank Report
Orange, Riverside, San Diego counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 03/01/2001
Date Data Arrived at EDR: 04/23/2001
Date Made Active in Reports: 05/21/2001
Number of Days to Update: 28

Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-467-2980
Last EDR Contact: 04/11/2006
Next Scheduled EDR Contact: 07/17/2006
Data Release Frequency: No Update Planned

LUST REG 8: Leaking Underground Storage Tanks

California Regional Water Quality Control Board Santa Ana Region (8). For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/14/2005
Date Data Arrived at EDR: 02/15/2005
Date Made Active in Reports: 03/28/2005
Number of Days to Update: 41

Source: California Regional Water Quality Control Board Santa Ana Region (8)
Telephone: 951-782-4130
Last EDR Contact: 05/08/2006
Next Scheduled EDR Contact: 08/07/2006
Data Release Frequency: Varies

LUST REG 7: Leaking Underground Storage Tank Case Listing

Date of Government Version: 02/26/2004
Date Data Arrived at EDR: 02/26/2004
Date Made Active in Reports: 03/24/2004
Number of Days to Update: 27

Source: California Regional Water Quality Control Board Colorado River Basin Region (7)
Telephone: 760-346-7491
Last EDR Contact: 12/27/2005
Next Scheduled EDR Contact: 03/27/2006
Data Release Frequency: No Update Planned

LUST REG 6V: Leaking Underground Storage Tank Case Listing

Date of Government Version: 06/07/2005
Date Data Arrived at EDR: 06/07/2005
Date Made Active in Reports: 06/29/2005
Number of Days to Update: 22

Source: California Regional Water Quality Control Board Victorville Branch Office (6)
Telephone: 760-346-7491
Last EDR Contact: 04/03/2006
Next Scheduled EDR Contact: 07/03/2006
Data Release Frequency: No Update Planned

LUST REG 5: Leaking Underground Storage Tank Database

Date of Government Version: 01/15/2006
Date Data Arrived at EDR: 01/16/2006
Date Made Active in Reports: 02/21/2006
Number of Days to Update: 36

Source: California Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-3291
Last EDR Contact: 04/27/2006
Next Scheduled EDR Contact: 07/03/2006
Data Release Frequency: Quarterly

LUST REG 3: Leaking Underground Storage Tank Database

Date of Government Version: 05/19/2003
Date Data Arrived at EDR: 05/19/2003
Date Made Active in Reports: 06/02/2003
Number of Days to Update: 14

Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-549-3147
Last EDR Contact: 02/13/2006
Next Scheduled EDR Contact: 05/15/2006
Data Release Frequency: No Update Planned

LUST REG 1: Active Toxic Site Investigation

Del Norte, Humboldt, Lake, Mendocino, Modoc, Siskiyou, Sonoma, Trinity counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/01/2001
Date Data Arrived at EDR: 02/28/2001
Date Made Active in Reports: 03/29/2001
Number of Days to Update: 29

Source: California Regional Water Quality Control Board North Coast (1)
Telephone: 707-576-2220
Last EDR Contact: 02/20/2006
Next Scheduled EDR Contact: 05/22/2006
Data Release Frequency: No Update Planned

LUST REG 2: Fuel Leak List

Date of Government Version: 09/30/2004
Date Data Arrived at EDR: 10/20/2004
Date Made Active in Reports: 11/19/2004
Number of Days to Update: 30

Source: California Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-286-0457
Last EDR Contact: 04/10/2006
Next Scheduled EDR Contact: 07/10/2006
Data Release Frequency: Quarterly

CA FID UST: Facility Inventory Database

The Facility Inventory Database (FID) contains a historical listing of active and inactive underground storage tank locations from the State Water Resource Control Board. Refer to local/county source for current data.

Date of Government Version: 10/31/1994
Date Data Arrived at EDR: 09/05/1995
Date Made Active in Reports: 09/29/1995
Number of Days to Update: 24

Source: California Environmental Protection Agency
Telephone: 916-341-5851
Last EDR Contact: 12/28/1998
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

SLIC: Statewide SLIC Cases

The Spills, Leaks, Investigations, and Cleanups (SLIC) listings includes unauthorized discharges from spills and leaks, other than from underground storage tanks or other regulated sites.

Date of Government Version: 04/10/2006
Date Data Arrived at EDR: 04/11/2006
Date Made Active in Reports: 05/11/2006
Number of Days to Update: 30

Source: State Water Resources Control Board
Telephone: 916-341-5752
Last EDR Contact: 04/11/2006
Next Scheduled EDR Contact: 07/10/2006
Data Release Frequency: Varies

SLIC REG 1: Active Toxic Site Investigations

Date of Government Version: 04/03/2003
Date Data Arrived at EDR: 04/07/2003
Date Made Active in Reports: 04/25/2003
Number of Days to Update: 18

Source: California Regional Water Quality Control Board, North Coast Region (1)
Telephone: 707-576-2220
Last EDR Contact: 02/20/2006
Next Scheduled EDR Contact: 05/22/2006
Data Release Frequency: No Update Planned

SLIC REG 2: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

Any contaminated site that impacts groundwater or has the potential to impact groundwater.

Date of Government Version: 09/30/2004
Date Data Arrived at EDR: 10/20/2004
Date Made Active in Reports: 11/19/2004
Number of Days to Update: 30

Source: Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-286-0457
Last EDR Contact: 04/10/2006
Next Scheduled EDR Contact: 07/10/2006
Data Release Frequency: Quarterly

SLIC REG 3: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

Any contaminated site that impacts groundwater or has the potential to impact groundwater.

Date of Government Version: 02/17/2006
Date Data Arrived at EDR: 02/17/2006
Date Made Active in Reports: 03/13/2006
Number of Days to Update: 24

Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-549-3147
Last EDR Contact: 02/13/2006
Next Scheduled EDR Contact: 05/15/2006
Data Release Frequency: Semi-Annually

SLIC REG 4: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

Any contaminated site that impacts groundwater or has the potential to impact groundwater.

Date of Government Version: 11/17/2004
Date Data Arrived at EDR: 11/18/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 47

Source: Region Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6600
Last EDR Contact: 04/26/2006
Next Scheduled EDR Contact: 07/24/2006
Data Release Frequency: Varies

SLIC REG 5: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
Unregulated sites that impact groundwater or have the potential to impact groundwater.

Date of Government Version: 04/01/2005
Date Data Arrived at EDR: 04/05/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 16

Source: Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-3291
Last EDR Contact: 04/05/2006
Next Scheduled EDR Contact: 07/03/2006
Data Release Frequency: Semi-Annually

SLIC REG 6V: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

Date of Government Version: 05/24/2005
Date Data Arrived at EDR: 05/25/2005
Date Made Active in Reports: 06/16/2005
Number of Days to Update: 22

Source: Regional Water Quality Control Board, Victorville Branch
Telephone: 619-241-6583
Last EDR Contact: 04/03/2006
Next Scheduled EDR Contact: 07/03/2006
Data Release Frequency: Semi-Annually

SLIC REG 6L: SLIC Sites

Date of Government Version: 09/07/2004
Date Data Arrived at EDR: 09/07/2004
Date Made Active in Reports: 10/12/2004
Number of Days to Update: 35

Source: California Regional Water Quality Control Board, Lahontan Region
Telephone: 530-542-5574
Last EDR Contact: 03/06/2006
Next Scheduled EDR Contact: 06/05/2006
Data Release Frequency: No Update Planned

SLIC REG 7: SLIC List

Date of Government Version: 11/24/2004
Date Data Arrived at EDR: 11/29/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 36

Source: California Regional Quality Control Board, Colorado River Basin Region
Telephone: 760-346-7491
Last EDR Contact: 03/06/2006
Next Scheduled EDR Contact: 05/22/2006
Data Release Frequency: No Update Planned

SLIC REG 8: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

Date of Government Version: 04/06/2006
Date Data Arrived at EDR: 04/06/2006
Date Made Active in Reports: 05/11/2006
Number of Days to Update: 35

Source: California Region Water Quality Control Board Santa Ana Region (8)
Telephone: 951-782-3298
Last EDR Contact: 04/05/2006
Next Scheduled EDR Contact: 07/03/2006
Data Release Frequency: Semi-Annually

SLIC REG 9: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

Date of Government Version: 03/14/2006
Date Data Arrived at EDR: 03/14/2006
Date Made Active in Reports: 04/13/2006
Number of Days to Update: 30

Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-467-2980
Last EDR Contact: 03/13/2006
Next Scheduled EDR Contact: 05/29/2006
Data Release Frequency: Annually

UST: Active UST Facilities
Active UST facilities gathered from the local regulatory agencies

Date of Government Version: 04/10/2006
Date Data Arrived at EDR: 04/11/2006
Date Made Active in Reports: 05/01/2006
Number of Days to Update: 20

Source: SWRCB
Telephone: 916-341-5851
Last EDR Contact: 04/11/2006
Next Scheduled EDR Contact: 07/10/2006
Data Release Frequency: Semi-Annually

HIST UST: Hazardous Substance Storage Container Database
The Hazardous Substance Storage Container Database is a historical listing of UST sites. Refer to local/county source for current data.

Date of Government Version: 10/15/1990
Date Data Arrived at EDR: 01/25/1991
Date Made Active in Reports: 02/12/1991
Number of Days to Update: 18

Source: State Water Resources Control Board
Telephone: 916-341-5851
Last EDR Contact: 07/26/2001
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

AST: Aboveground Petroleum Storage Tank Facilities
Registered Aboveground Storage Tanks.

Date of Government Version: 01/30/2006
Date Data Arrived at EDR: 01/30/2006
Date Made Active in Reports: 02/17/2006
Number of Days to Update: 18

Source: State Water Resources Control Board
Telephone: 916-341-5712
Last EDR Contact: 05/01/2006
Next Scheduled EDR Contact: 07/31/2006
Data Release Frequency: Quarterly

SWEEPS UST: SWEEPS UST Listing
Statewide Environmental Evaluation and Planning System. This underground storage tank listing was updated and maintained by a company contacted by the SWRCB in the early 1980's. The listing is no longer updated or maintained. The local agency is the contact for more information on a site on the SWEEPS list.

Date of Government Version: 06/01/1994
Date Data Arrived at EDR: 07/07/2005
Date Made Active in Reports: 08/11/2005
Number of Days to Update: 35

Source: State Water Resources Control Board
Telephone: N/A
Last EDR Contact: 06/03/2005
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

CHMIRS: California Hazardous Material Incident Report System
California Hazardous Material Incident Reporting System. CHMIRS contains information on reported hazardous material incidents (accidental releases or spills).

Date of Government Version: 12/31/2004
Date Data Arrived at EDR: 11/30/2005
Date Made Active in Reports: 01/19/2006
Number of Days to Update: 50

Source: Office of Emergency Services
Telephone: 916-845-8400
Last EDR Contact: 02/20/2006
Next Scheduled EDR Contact: 05/22/2006
Data Release Frequency: Varies

NOTIFY 65: Proposition 65 Records
Proposition 65 Notification Records. NOTIFY 65 contains facility notifications about any release which could impact drinking water and thereby expose the public to a potential health risk.

Date of Government Version: 10/21/1993
Date Data Arrived at EDR: 11/01/1993
Date Made Active in Reports: 11/19/1993
Number of Days to Update: 18

Source: State Water Resources Control Board
Telephone: 916-445-3846
Last EDR Contact: 04/11/2006
Next Scheduled EDR Contact: 07/17/2006
Data Release Frequency: No Update Planned

DEED: Deed Restriction Listing

Site Mitigation and Brownfields Reuse Program Facility Sites with Deed Restrictions & Hazardous Waste Management Program Facility Sites with Deed / Land Use Restriction. The DTSC Site Mitigation and Brownfields Reuse Program (SMBRP) list includes sites cleaned up under the program's oversight and generally does not include current or former hazardous waste facilities that required a hazardous waste facility permit. The list represents deed restrictions that are active. Some sites have multiple deed restrictions. The DTSC Hazardous Waste Management Program (HWMP) has developed a list of current or former hazardous waste facilities that have a recorded land use restriction at the local county recorder's office. The land use restrictions on this list were required by the DTSC HWMP as a result of the presence of hazardous substances that remain on site after the facility (or part of the facility) has been closed or cleaned up. The types of land use restriction include deed notice, deed restriction, or a land use restriction that binds current and future owners.

Date of Government Version: 04/04/2006
Date Data Arrived at EDR: 04/05/2006
Date Made Active in Reports: 05/11/2006
Number of Days to Update: 36

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 04/05/2006
Next Scheduled EDR Contact: 07/03/2006
Data Release Frequency: Semi-Annually

VCP: Voluntary Cleanup Program Properties

Contains low threat level properties with either confirmed or unconfirmed releases and the project proponents have request that DTSC oversee investigation and/or cleanup activities and have agreed to provide coverage for DTSC's costs.

Date of Government Version: 08/08/2005
Date Data Arrived at EDR: 08/29/2005
Date Made Active in Reports: 09/21/2005
Number of Days to Update: 23

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 04/05/2006
Next Scheduled EDR Contact: 05/29/2006
Data Release Frequency: Quarterly

DRYCLEANERS: Cleaner Facilities

A list of drycleaner related facilities that have EPA ID numbers. These are facilities with certain SIC codes: power laundries, family and commercial; garment pressing and cleaner's agents; linen supply; coin-operated laundries and cleaning; drycleaning plants, except rugs; carpet and upholster cleaning; industrial launderers; laundry and garment services.

Date of Government Version: 04/18/2005
Date Data Arrived at EDR: 04/18/2005
Date Made Active in Reports: 05/06/2005
Number of Days to Update: 18

Source: Department of Toxic Substance Control
Telephone: 916-327-4498
Last EDR Contact: 04/03/2006
Next Scheduled EDR Contact: 07/03/2006
Data Release Frequency: Annually

WIP: Well Investigation Program Case List

Well Investigation Program case in the San Gabriel and San Fernando Valley area.

Date of Government Version: 01/23/2006
Date Data Arrived at EDR: 01/24/2006
Date Made Active in Reports: 02/21/2006
Number of Days to Update: 28

Source: Los Angeles Water Quality Control Board
Telephone: 213-576-6726
Last EDR Contact: 04/26/2006
Next Scheduled EDR Contact: 07/24/2006
Data Release Frequency: Varies

CDL: Clandestine Drug Labs

A listing of drug lab locations. Listing of a location in this database does not indicate that any illegal drug lab materials were or were not present there, and does not constitute a determination that the location either requires or does not require additional cleanup work.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 02/10/2006
Date Made Active in Reports: 03/13/2006
Number of Days to Update: 31

Source: Department of Toxic Substances Control
Telephone: 916-255-6504
Last EDR Contact: 05/08/2006
Next Scheduled EDR Contact: 07/24/2006
Data Release Frequency: Varies

HAZNET: Facility and Manifest Data

Facility and Manifest Data. The data is extracted from the copies of hazardous waste manifests received each year by the DTSC. The annual volume of manifests is typically 700,000 - 1,000,000 annually, representing approximately 350,000 - 500,000 shipments. Data are from the manifests submitted without correction, and therefore many contain some invalid values for data elements such as generator ID, TSD ID, waste category, and disposal method.

Date of Government Version: 12/31/2003
Date Data Arrived at EDR: 10/11/2005
Date Made Active in Reports: 10/31/2005
Number of Days to Update: 20

Source: California Environmental Protection Agency
Telephone: 916-255-1136
Last EDR Contact: 05/11/2006
Next Scheduled EDR Contact: 08/07/2006
Data Release Frequency: Annually

EMI: Emissions Inventory Data

Toxics and criteria pollutant emissions data collected by the ARB and local air pollution agencies.

Date of Government Version: 12/31/2004
Date Data Arrived at EDR: 04/14/2006
Date Made Active in Reports: 05/11/2006
Number of Days to Update: 27

Source: California Air Resources Board
Telephone: 916-322-2990
Last EDR Contact: 04/14/2006
Next Scheduled EDR Contact: 07/17/2006
Data Release Frequency: Varies

TRIBAL RECORDS

INDIAN RESERV: Indian Reservations

This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2004
Date Data Arrived at EDR: 02/08/2005
Date Made Active in Reports: 08/04/2005
Number of Days to Update: 177

Source: USGS
Telephone: 202-208-3710
Last EDR Contact: 05/12/2006
Next Scheduled EDR Contact: 08/07/2006
Data Release Frequency: Semi-Annually

INDIAN LUST: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 09/07/2005
Date Data Arrived at EDR: 09/08/2005
Date Made Active in Reports: 10/31/2005
Number of Days to Update: 53

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 01/10/2006
Next Scheduled EDR Contact: 05/22/2006
Data Release Frequency: Varies

INDIAN LUST: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 03/01/2006
Date Data Arrived at EDR: 03/22/2006
Date Made Active in Reports: 04/13/2006
Number of Days to Update: 22

Source: Environmental Protection Agency
Telephone: 415-972-3372
Last EDR Contact: 02/20/2006
Next Scheduled EDR Contact: 05/22/2006
Data Release Frequency: Varies

INDIAN UST: Underground Storage Tanks on Indian Land

Date of Government Version: 03/01/2006
Date Data Arrived at EDR: 03/22/2006
Date Made Active in Reports: 04/13/2006
Number of Days to Update: 22

Source: EPA Region 9
Telephone: 415-972-3368
Last EDR Contact: 02/20/2006
Next Scheduled EDR Contact: 05/22/2006
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

EDR PROPRIETARY RECORDS

Manufactured Gas Plants: EDR Proprietary Manufactured Gas Plants

The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

EDR Historical Auto Stations: EDR Proprietary Historic Gas Stations

EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR Historical Cleaners: EDR Proprietary Historic Dry Cleaners

EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

COUNTY RECORDS

ALAMEDA COUNTY:

Contaminated Sites

A listing of contaminated sites overseen by the Toxic Release Program (oil and groundwater contamination from chemical releases and spills) and the Leaking Underground Storage Tank Program (soil and ground water contamination from leaking petroleum USTs).

Date of Government Version: 02/16/2006
Date Data Arrived at EDR: 02/17/2006
Date Made Active in Reports: 03/13/2006
Number of Days to Update: 24

Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
Last EDR Contact: 04/25/2006
Next Scheduled EDR Contact: 07/24/2006
Data Release Frequency: Semi-Annually

Underground Tanks

Date of Government Version: 02/27/2006
Date Data Arrived at EDR: 02/28/2006
Date Made Active in Reports: 03/23/2006
Number of Days to Update: 23

Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
Last EDR Contact: 04/25/2006
Next Scheduled EDR Contact: 07/24/2006
Data Release Frequency: Semi-Annually

CONTRA COSTA COUNTY:

Site List

List includes sites from the underground tank, hazardous waste generator and business plan/2185 programs.

Date of Government Version: 03/20/2006
Date Data Arrived at EDR: 03/21/2006
Date Made Active in Reports: 04/13/2006
Number of Days to Update: 23

Source: Contra Costa Health Services Department
Telephone: 925-646-2286
Last EDR Contact: 03/13/2006
Next Scheduled EDR Contact: 05/29/2006
Data Release Frequency: Semi-Annually

FRESNO COUNTY:

CUPA Resources List

Certified Unified Program Agency. CUPA's are responsible for implementing a unified hazardous materials and hazardous waste management regulatory program. The agency provides oversight of businesses that deal with hazardous materials, operate underground storage tanks or aboveground storage tanks.

Date of Government Version: 04/10/2006
Date Data Arrived at EDR: 04/10/2006
Date Made Active in Reports: 05/11/2006
Number of Days to Update: 31

Source: Dept. of Community Health
Telephone: 559-445-3271
Last EDR Contact: 04/10/2006
Next Scheduled EDR Contact: 08/07/2006
Data Release Frequency: Semi-Annually

KERN COUNTY:

Underground Storage Tank Sites & Tank Listing

Kern County Sites and Tanks Listing.

Date of Government Version: 03/27/2006
Date Data Arrived at EDR: 03/28/2006
Date Made Active in Reports: 05/01/2006
Number of Days to Update: 34

Source: Kern County Environment Health Services Department
Telephone: 661-862-8700
Last EDR Contact: 03/27/2006
Next Scheduled EDR Contact: 06/05/2006
Data Release Frequency: Quarterly

LOS ANGELES COUNTY:

San Gabriel Valley Areas of Concern

San Gabriel Valley areas where VOC contamination is at or above the MCL as designated by region 9 EPA office.

Date of Government Version: 12/31/1998
Date Data Arrived at EDR: 07/07/1999
Date Made Active in Reports: N/A
Number of Days to Update: 0

Source: EPA Region 9
Telephone: 415-972-3178
Last EDR Contact: 07/06/1999
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

City of El Segundo Underground Storage Tank

Date of Government Version: 02/27/2006
Date Data Arrived at EDR: 02/28/2006
Date Made Active in Reports: 03/23/2006
Number of Days to Update: 23

Source: City of El Segundo Fire Department
Telephone: 310-524-2236
Last EDR Contact: 02/27/2006
Next Scheduled EDR Contact: 05/15/2006
Data Release Frequency: Semi-Annually

City of Long Beach Underground Storage Tank

Date of Government Version: 03/28/2003
Date Data Arrived at EDR: 10/23/2003
Date Made Active in Reports: 11/26/2003
Number of Days to Update: 34

Source: City of Long Beach Fire Department
Telephone: 562-570-2563
Last EDR Contact: 02/24/2006
Next Scheduled EDR Contact: 05/22/2006
Data Release Frequency: Annually

City of Torrance Underground Storage Tank

Date of Government Version: 02/27/2006
Date Data Arrived at EDR: 02/28/2006
Date Made Active in Reports: 03/23/2006
Number of Days to Update: 23

Source: City of Torrance Fire Department
Telephone: 310-618-2973
Last EDR Contact: 02/27/2006
Next Scheduled EDR Contact: 05/15/2006
Data Release Frequency: Semi-Annually

HMS: Street Number List

Industrial Waste and Underground Storage Tank Sites.

Date of Government Version: 01/31/2006
Date Data Arrived at EDR: 03/24/2006
Date Made Active in Reports: 04/13/2006
Number of Days to Update: 20

Source: Department of Public Works
Telephone: 626-458-3517
Last EDR Contact: 02/13/2006
Next Scheduled EDR Contact: 05/15/2006
Data Release Frequency: Semi-Annually

List of Solid Waste Facilities

Date of Government Version: 02/14/2006
Date Data Arrived at EDR: 02/28/2006
Date Made Active in Reports: 03/13/2006
Number of Days to Update: 13

Source: La County Department of Public Works
Telephone: 818-458-5185
Last EDR Contact: 02/15/2006
Next Scheduled EDR Contact: 05/15/2006
Data Release Frequency: Varies

City of Los Angeles Landfills

Date of Government Version: 03/01/2006
Date Data Arrived at EDR: 04/06/2006
Date Made Active in Reports: 05/11/2006
Number of Days to Update: 35

Source: Engineering & Construction Division
Telephone: 213-473-7869
Last EDR Contact: 03/15/2006
Next Scheduled EDR Contact: 06/12/2006
Data Release Frequency: Varies

Site Mitigation List

Industrial sites that have had some sort of spill or complaint.

Date of Government Version: 01/05/2006
Date Data Arrived at EDR: 02/16/2006
Date Made Active in Reports: 03/13/2006
Number of Days to Update: 25

Source: Community Health Services
Telephone: 323-890-7806
Last EDR Contact: 02/03/2006
Next Scheduled EDR Contact: 05/15/2006
Data Release Frequency: Annually

MARIN COUNTY:

Underground Storage Tank Sites

Currently permitted USTs in Marin County.

Date of Government Version: 02/10/2006
Date Data Arrived at EDR: 02/28/2006
Date Made Active in Reports: 03/23/2006
Number of Days to Update: 23

Source: Public Works Department Waste Management
Telephone: 415-499-6647
Last EDR Contact: 05/01/2006
Next Scheduled EDR Contact: 07/31/2006
Data Release Frequency: Semi-Annually

NAPA COUNTY:

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Sites With Reported Contamination

Date of Government Version: 04/03/2006
Date Data Arrived at EDR: 04/04/2006
Date Made Active in Reports: 04/13/2006
Number of Days to Update: 9

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 03/27/2006
Next Scheduled EDR Contact: 06/26/2006
Data Release Frequency: Semi-Annually

Closed and Operating Underground Storage Tank Sites

Date of Government Version: 04/03/2006
Date Data Arrived at EDR: 04/04/2006
Date Made Active in Reports: 05/01/2006
Number of Days to Update: 27

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 03/27/2006
Next Scheduled EDR Contact: 06/26/2006
Data Release Frequency: Annually

ORANGE COUNTY:

List of Industrial Site Cleanups

Petroleum and non-petroleum spills.

Date of Government Version: 02/01/2006
Date Data Arrived at EDR: 03/27/2006
Date Made Active in Reports: 04/13/2006
Number of Days to Update: 17

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 03/08/2006
Next Scheduled EDR Contact: 06/05/2006
Data Release Frequency: Annually

List of Underground Storage Tank Cleanups

Orange County Underground Storage Tank Cleanups (LUST).

Date of Government Version: 03/01/2006
Date Data Arrived at EDR: 03/29/2006
Date Made Active in Reports: 04/13/2006
Number of Days to Update: 15

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 03/08/2006
Next Scheduled EDR Contact: 06/05/2006
Data Release Frequency: Quarterly

List of Underground Storage Tank Facilities

Orange County Underground Storage Tank Facilities (UST).

Date of Government Version: 03/01/2006
Date Data Arrived at EDR: 03/28/2006
Date Made Active in Reports: 05/01/2006
Number of Days to Update: 34

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 03/08/2006
Next Scheduled EDR Contact: 06/05/2006
Data Release Frequency: Quarterly

PLACER COUNTY:

Master List of Facilities

List includes aboveground tanks, underground tanks and cleanup sites.

Date of Government Version: 04/03/2006
Date Data Arrived at EDR: 04/04/2006
Date Made Active in Reports: 04/13/2006
Number of Days to Update: 9

Source: Placer County Health and Human Services
Telephone: 530-889-7312
Last EDR Contact: 03/20/2006
Next Scheduled EDR Contact: 06/19/2006
Data Release Frequency: Semi-Annually

RIVERSIDE COUNTY:

Underground Storage Tank Tank List

Date of Government Version: 02/09/2006
Date Data Arrived at EDR: 02/10/2006
Date Made Active in Reports: 03/09/2006
Number of Days to Update: 27

Source: Health Services Agency
Telephone: 951-358-5055
Last EDR Contact: 04/11/2006
Next Scheduled EDR Contact: 07/17/2006
Data Release Frequency: Quarterly

Listing of Underground Tank Cleanup Sites

Riverside County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 02/09/2006
Date Data Arrived at EDR: 02/10/2006
Date Made Active in Reports: 03/13/2006
Number of Days to Update: 31

Source: Department of Public Health
Telephone: 951-358-5055
Last EDR Contact: 04/11/2006
Next Scheduled EDR Contact: 07/17/2006
Data Release Frequency: Quarterly

SACRAMENTO COUNTY:

CS - Contaminated Sites

Date of Government Version: 02/02/2006
Date Data Arrived at EDR: 02/13/2006
Date Made Active in Reports: 03/13/2006
Number of Days to Update: 28

Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 05/12/2006
Next Scheduled EDR Contact: 07/31/2006
Data Release Frequency: Quarterly

ML - Regulatory Compliance Master List

Any business that has hazardous materials on site - hazardous material storage sites, underground storage tanks, waste generators.

Date of Government Version: 02/02/2006
Date Data Arrived at EDR: 02/10/2006
Date Made Active in Reports: 03/13/2006
Number of Days to Update: 31

Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 05/12/2006
Next Scheduled EDR Contact: 07/31/2006
Data Release Frequency: Quarterly

SAN BERNARDINO COUNTY:

Hazardous Material Permits

This listing includes underground storage tanks, medical waste handlers/generators, hazardous materials handlers, hazardous waste generators, and waste oil generators/handlers.

Date of Government Version: 03/22/2006
Date Data Arrived at EDR: 03/23/2006
Date Made Active in Reports: 04/13/2006
Number of Days to Update: 21

Source: San Bernardino County Fire Department Hazardous Materials Division
Telephone: 909-387-3041
Last EDR Contact: 03/06/2006
Next Scheduled EDR Contact: 06/05/2006
Data Release Frequency: Quarterly

SAN DIEGO COUNTY:

Hazardous Materials Management Division Database

The database includes: HE58 - This report contains the business name, site address, business phone number, establishment 'H' permit number, type of permit, and the business status. HE17 - In addition to providing the same information provided in the HE58 listing, HE17 provides inspection dates, violations received by the establishment, hazardous waste generated, the quantity, method of storage, treatment/disposal of waste and the hauler, and information on underground storage tanks. Unauthorized Release List - Includes a summary of environmental contamination cases in San Diego County (underground tank cases, non-tank cases, groundwater contamination, and soil contamination are included.)

Date of Government Version: 05/16/2005
Date Data Arrived at EDR: 05/18/2005
Date Made Active in Reports: 06/16/2005
Number of Days to Update: 29

Source: Hazardous Materials Management Division
Telephone: 619-338-2268
Last EDR Contact: 04/28/2006
Next Scheduled EDR Contact: 07/03/2006
Data Release Frequency: Quarterly

Solid Waste Facilities

San Diego County Solid Waste Facilities.

Date of Government Version: 11/01/2005
Date Data Arrived at EDR: 12/29/2005
Date Made Active in Reports: 01/19/2006
Number of Days to Update: 21

Source: Department of Health Services
Telephone: 619-338-2209
Last EDR Contact: 02/20/2006
Next Scheduled EDR Contact: 05/22/2006
Data Release Frequency: Varies

SAN FRANCISCO COUNTY:

Local Oversite Facilities

Date of Government Version: 03/16/2006
Date Data Arrived at EDR: 03/17/2006
Date Made Active in Reports: 04/13/2006
Number of Days to Update: 27

Source: Department Of Public Health San Francisco County
Telephone: 415-252-3920
Last EDR Contact: 03/06/2006
Next Scheduled EDR Contact: 06/05/2006
Data Release Frequency: Quarterly

Underground Storage Tank Information

Date of Government Version: 03/16/2006
Date Data Arrived at EDR: 03/17/2006
Date Made Active in Reports: 04/13/2006
Number of Days to Update: 27

Source: Department of Public Health
Telephone: 415-252-3920
Last EDR Contact: 03/06/2006
Next Scheduled EDR Contact: 06/05/2006
Data Release Frequency: Quarterly

SAN JOAQUIN COUNTY:

San Joaquin Co. UST

A listing of underground storage tank locations in San Joaquin county.

Date of Government Version: 02/28/2006
Date Data Arrived at EDR: 03/17/2006
Date Made Active in Reports: 04/13/2006
Number of Days to Update: 27

Source: Environmental Health Department
Telephone: N/A
Last EDR Contact: 03/17/2006
Next Scheduled EDR Contact: 07/17/2006
Data Release Frequency: Semi-Annually

SAN MATEO COUNTY:

Business Inventory

List includes Hazardous Materials Business Plan, hazardous waste generators, and underground storage tanks.

Date of Government Version: 01/09/2006
Date Data Arrived at EDR: 01/10/2006
Date Made Active in Reports: 01/31/2006
Number of Days to Update: 21

Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 04/26/2006
Next Scheduled EDR Contact: 07/10/2006
Data Release Frequency: Annually

Fuel Leak List

Date of Government Version: 04/17/2006
Date Data Arrived at EDR: 04/24/2006
Date Made Active in Reports: 05/11/2006
Number of Days to Update: 17

Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 04/10/2006
Next Scheduled EDR Contact: 07/10/2006
Data Release Frequency: Semi-Annually

SANTA CLARA COUNTY:

Fuel Leak Site Activity Report

A listing of open and closed leaking underground storage tanks. This listing is no longer updated by the county. Leaking underground storage tanks are now handled by the Department of Environmental Health.

Date of Government Version: 03/29/2005
Date Data Arrived at EDR: 03/30/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 22

Source: Santa Clara Valley Water District
Telephone: 408-265-2600
Last EDR Contact: 03/28/2006
Next Scheduled EDR Contact: 06/26/2006
Data Release Frequency: No Update Planned

LOP Listing

A listing of open leaking underground storage tanks.

Date of Government Version: 03/29/2006
Date Data Arrived at EDR: 03/30/2006
Date Made Active in Reports: 04/13/2006
Number of Days to Update: 14

Source: Department of Environmental Health
Telephone: 408-918-3417
Last EDR Contact: 03/28/2006
Next Scheduled EDR Contact: 06/26/2006
Data Release Frequency: Varies

Hazardous Material Facilities

Date of Government Version: 03/09/2006
Date Data Arrived at EDR: 03/13/2006
Date Made Active in Reports: 04/13/2006
Number of Days to Update: 31

Source: City of San Jose Fire Department
Telephone: 408-277-4659
Last EDR Contact: 03/06/2006
Next Scheduled EDR Contact: 06/05/2006
Data Release Frequency: Annually

SOLANO COUNTY:

Leaking Underground Storage Tanks

Date of Government Version: 04/10/2006
Date Data Arrived at EDR: 04/10/2006
Date Made Active in Reports: 05/11/2006
Number of Days to Update: 31

Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 03/27/2006
Next Scheduled EDR Contact: 06/12/2006
Data Release Frequency: Quarterly

Underground Storage Tanks

Date of Government Version: 10/13/2005
Date Data Arrived at EDR: 10/31/2005
Date Made Active in Reports: 12/08/2005
Number of Days to Update: 38

Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 04/13/2006
Next Scheduled EDR Contact: 06/12/2006
Data Release Frequency: Quarterly

SONOMA COUNTY:

Leaking Underground Storage Tank Sites

Date of Government Version: 01/23/2006
Date Data Arrived at EDR: 01/23/2006
Date Made Active in Reports: 02/21/2006
Number of Days to Update: 29

Source: Department of Health Services
Telephone: 707-565-6565
Last EDR Contact: 04/26/2006
Next Scheduled EDR Contact: 07/24/2006
Data Release Frequency: Quarterly

SUTTER COUNTY:

Underground Storage Tanks

Date of Government Version: 12/31/0005
Date Data Arrived at EDR: 01/05/2006
Date Made Active in Reports: 01/31/2006
Number of Days to Update: 26

Source: Sutter County Department of Agriculture
Telephone: 530-822-7500
Last EDR Contact: 05/08/2006
Next Scheduled EDR Contact: 07/03/2006
Data Release Frequency: Semi-Annually

VENTURA COUNTY:

Business Plan, Hazardous Waste Producers, and Operating Underground Tanks

The BWT list indicates by site address whether the Environmental Health Division has Business Plan (B), Waste Producer (W), and/or Underground Tank (T) information.

Date of Government Version: 02/24/2006
Date Data Arrived at EDR: 03/31/2006
Date Made Active in Reports: 04/13/2006
Number of Days to Update: 13

Source: Ventura County Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 03/15/2006
Next Scheduled EDR Contact: 06/12/2006
Data Release Frequency: Quarterly

Inventory of Illegal Abandoned and Inactive Sites

Ventura County Inventory of Closed, Illegal Abandoned, and Inactive Sites.

Date of Government Version: 08/01/2005
Date Data Arrived at EDR: 09/20/2005
Date Made Active in Reports: 10/06/2005
Number of Days to Update: 16

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 02/20/2006
Next Scheduled EDR Contact: 05/22/2006
Data Release Frequency: Annually

Listing of Underground Tank Cleanup Sites

Ventura County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 02/24/2006
Date Data Arrived at EDR: 03/27/2006
Date Made Active in Reports: 04/13/2006
Number of Days to Update: 17

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 03/15/2006
Next Scheduled EDR Contact: 06/12/2006
Data Release Frequency: Quarterly

Underground Tank Closed Sites List

Ventura County Operating Underground Storage Tank Sites (UST)/Underground Tank Closed Sites List.

Date of Government Version: 12/29/2005
Date Data Arrived at EDR: 01/20/2006
Date Made Active in Reports: 02/15/2006
Number of Days to Update: 26

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 04/11/2006
Next Scheduled EDR Contact: 07/10/2006
Data Release Frequency: Quarterly

YOLO COUNTY:

Underground Storage Tank Comprehensive Facility Report

Date of Government Version: 01/18/2006
Date Data Arrived at EDR: 02/09/2006
Date Made Active in Reports: 03/09/2006
Number of Days to Update: 28

Source: Yolo County Department of Health
Telephone: 530-666-8646
Last EDR Contact: 04/11/2006
Next Scheduled EDR Contact: 07/17/2006
Data Release Frequency: Annually

OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

CT MANIFEST: Hazardous Waste Manifest Data
Facility and manifest data. Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a tsd facility.

Date of Government Version: 12/31/2004
Date Data Arrived at EDR: 02/17/2006
Date Made Active in Reports: 04/07/2006
Number of Days to Update: 49

Source: Department of Environmental Protection
Telephone: 860-424-3375
Last EDR Contact: 03/13/2006
Next Scheduled EDR Contact: 06/12/2006
Data Release Frequency: Annually

NJ MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2004
Date Data Arrived at EDR: 04/24/2006
Date Made Active in Reports: 05/02/2006
Number of Days to Update: 8

Source: Department of Environmental Protection
Telephone: N/A
Last EDR Contact: 03/17/2006
Next Scheduled EDR Contact: 07/03/2006
Data Release Frequency: Annually

NY MANIFEST: Facility and Manifest Data
Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 03/01/2006
Date Made Active in Reports: 04/20/2006
Number of Days to Update: 50

Source: Department of Environmental Conservation
Telephone: 518-402-8651
Last EDR Contact: 03/01/2006
Next Scheduled EDR Contact: 05/29/2006
Data Release Frequency: Annually

WI MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 03/17/2006
Date Made Active in Reports: 05/02/2006
Number of Days to Update: 46

Source: Department of Natural Resources
Telephone: N/A
Last EDR Contact: 03/17/2006
Next Scheduled EDR Contact: 07/10/2006
Data Release Frequency: Annually

Oil/Gas Pipelines: This data was obtained by EDR from the USGS in 1994. It is referred to by USGS as GeoData Digital Line Graphs from 1:100,000-Scale Maps. It was extracted from the transportation category including some oil, but primarily gas pipelines.

Electric Power Transmission Line Data
Source: PennWell Corporation
Telephone: (800) 823-6277
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GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:
Source: American Hospital Association, Inc.
Telephone: 312-280-5991
The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing
Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000
A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes
Source: National Institutes of Health
Telephone: 301-594-6248
Information on Medicare and Medicaid certified nursing homes in the United States.

Public Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

Private Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on private school locations in the United States.

Daycare Centers: Licensed Facilities
Source: Department of Social Services
Telephone: 916-657-4041

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 1999 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002 from the U.S. Fish and Wildlife Service.

Scanned Digital USGS 7.5' Topographic Map (DRG)
Source: United States Geologic Survey
A digital raster graphic (DRG) is a scanned image of a U.S. Geological Survey topographic map. The map images are made by scanning published paper maps on high-resolution scanners. The raster image is georeferenced and fit to the Universal Transverse Mercator (UTM) projection.

STREET AND ADDRESS INFORMATION

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EDR® Environmental
Data Resources Inc

"Linking Technology with Tradition"®

Sanborn® Map Report

Ship To: Larry Levee
West Coast Environmental
1838 Eastman Avenue
Ventura, CA 93003

Order Date: 5/12/2006 **Completion Date:** 5/12/2006
Inquiry #: 1674606.3
P.O. #: NA
Site Name: Xenia Townhomes Project
Address: 6th Street and Xenia Avenue
City/State: Beaumont, CA 92223
Cross Streets:

Customer Project: NA

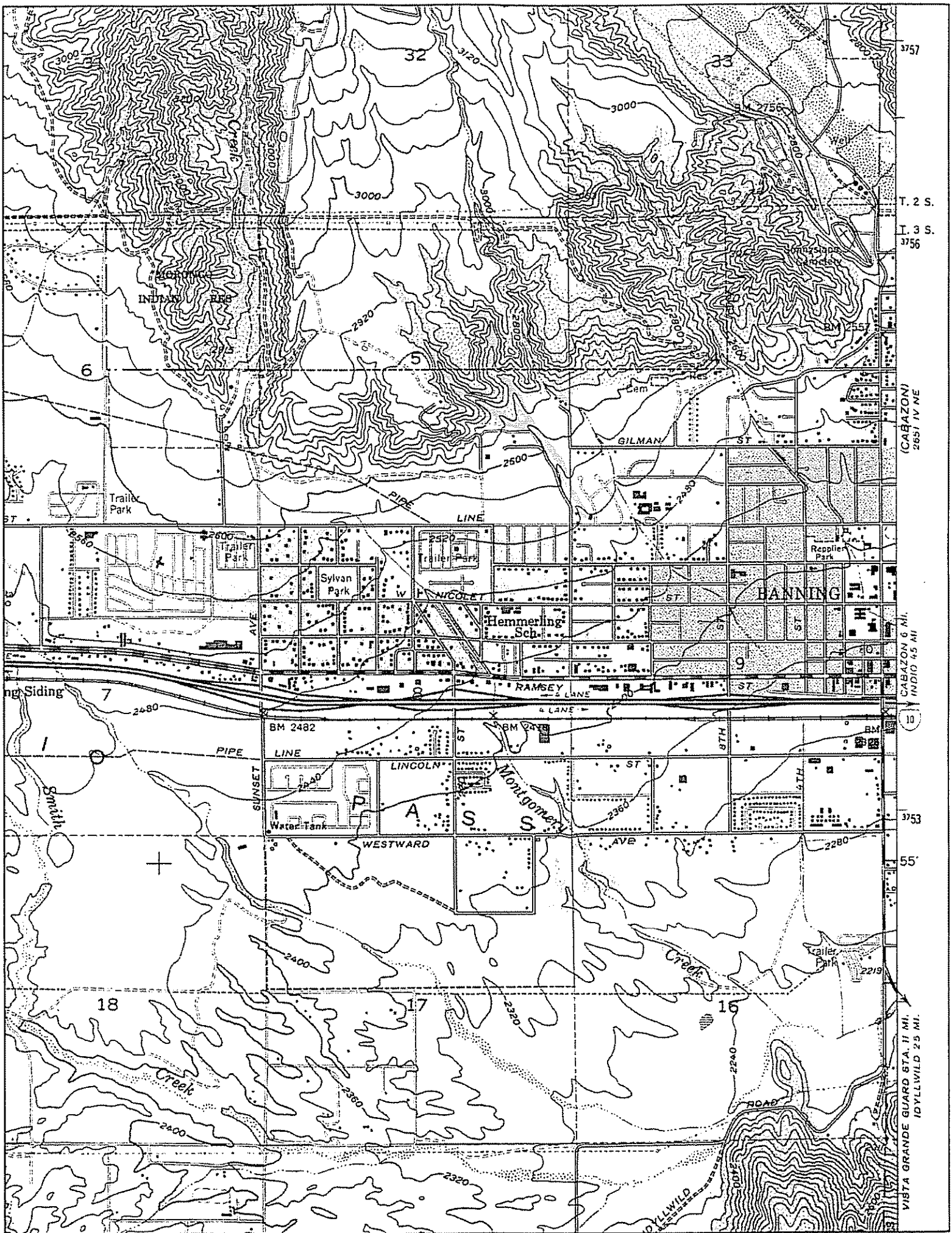
1013581PEP 805-644-7976

This document reports that the largest and most complete collection of Sanborn fire insurance maps has been reviewed based on client supplied information, and fire insurance maps depicting the target property at the specified address were not identified.

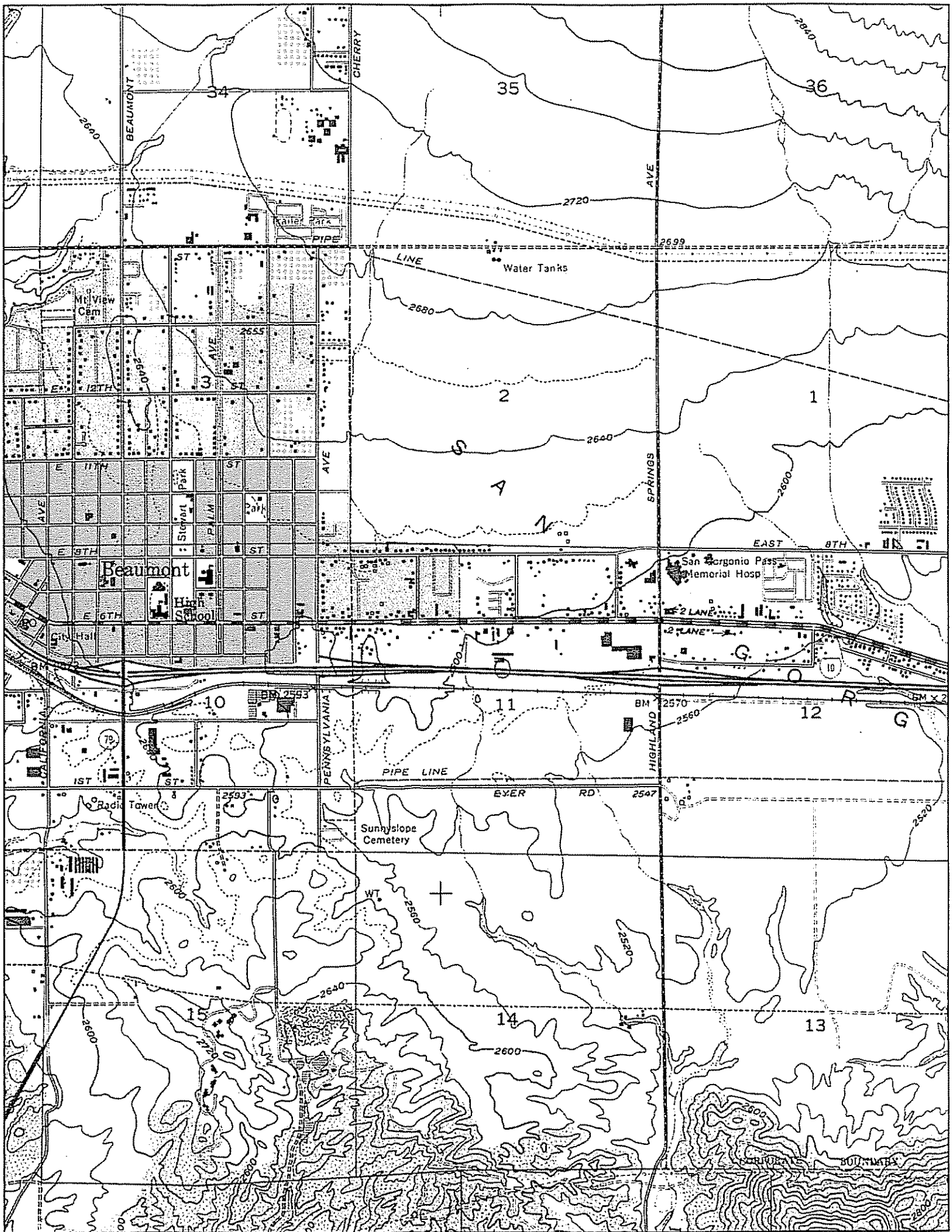
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Appendix 3

Supporting Documentation

The EDR Aerial Photo Decade Package

Xenia Townhomes Project
6th Street and Xenia Avenue
Beaumont, CA 92223

Inquiry Number: 1674606.5

May 15, 2006

EDR® Environmental Data Resources Inc

The Standard in Environmental Risk Management Information

440 Wheelers Farms Road
Milford, Connecticut 06461

Nationwide Customer Service

Telephone: 1-800-352-0050
Fax: 1-800-231-6802
Internet: www.edrnet.com

EDR Aerial Photo Decade Package

Environmental Data Resources, Inc. (EDR) Aerial Photo Decade Package is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDRs professional researchers provide digitally reproduced historical aerial photographs, and when available, provide one photo per decade.

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with any questions or comments.

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Date EDR Searched Historical Sources:

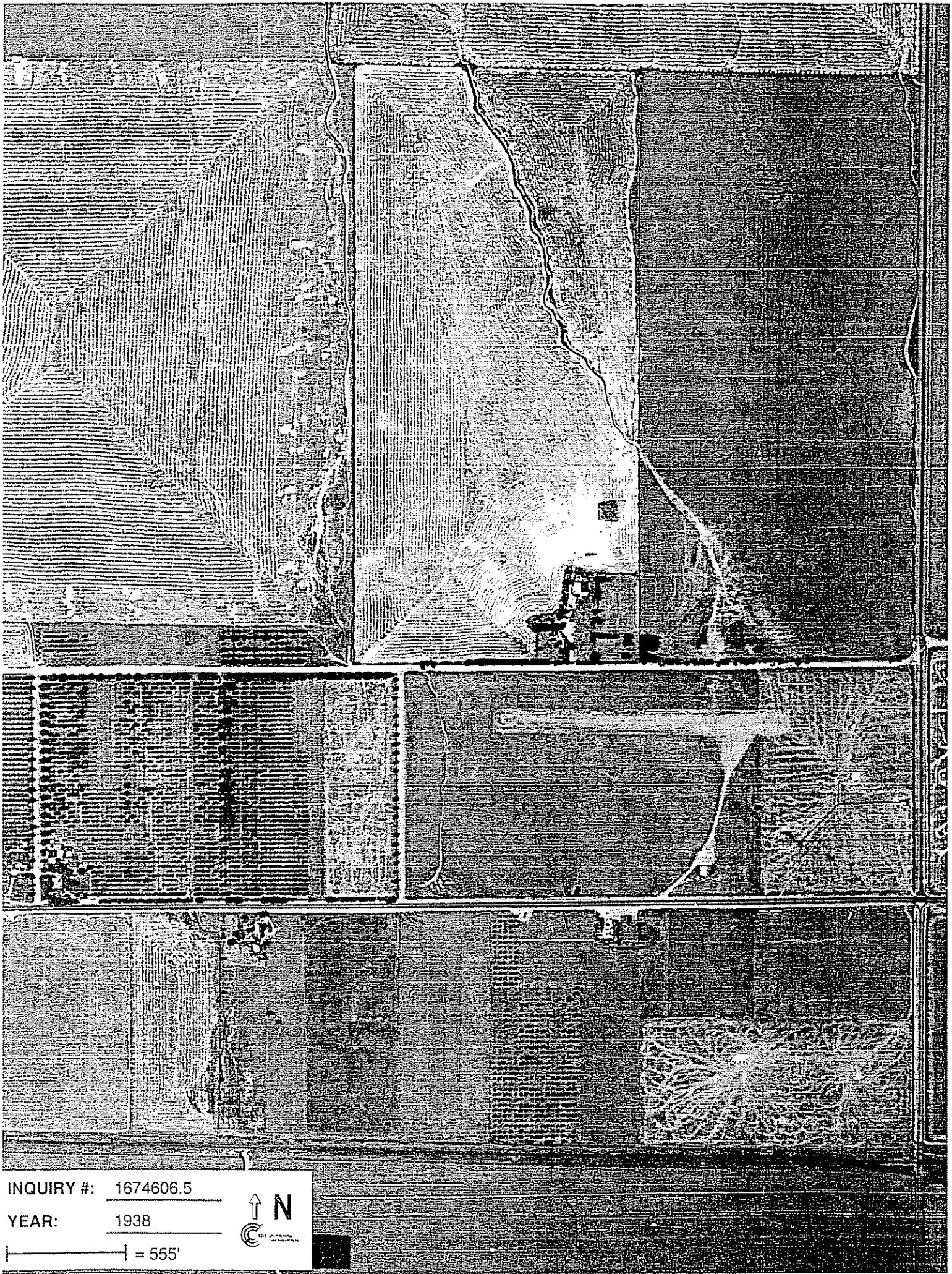
Aerial Photography May 15, 2006

Target Property:

6th Street and Xenia Avenue

Beaumont, CA 92223

Year	*Scale*	*Details*	*Source*
1938	Aerial Photograph. Scale: 1"=555'	Flight Year: 1938	Laval
1953	Aerial Photograph. Scale: 1"=555'	Flight Year: 1953	Pacific Air
1967	Aerial Photograph. Scale: 1"=555'	Flight Year: 1967	Western
1980	Aerial Photograph. Scale: 1"=600'	Flight Year: 1980	AMI
1984	Aerial Photograph. Scale: 1"=690'	Flight Year: 1984	WSA
1996	Aerial Photograph. Scale: 1"=666'	Flight Year: 1996	USGS
2002	Aerial Photograph. Scale: 1"=666'	Flight Year: 2002	USGS

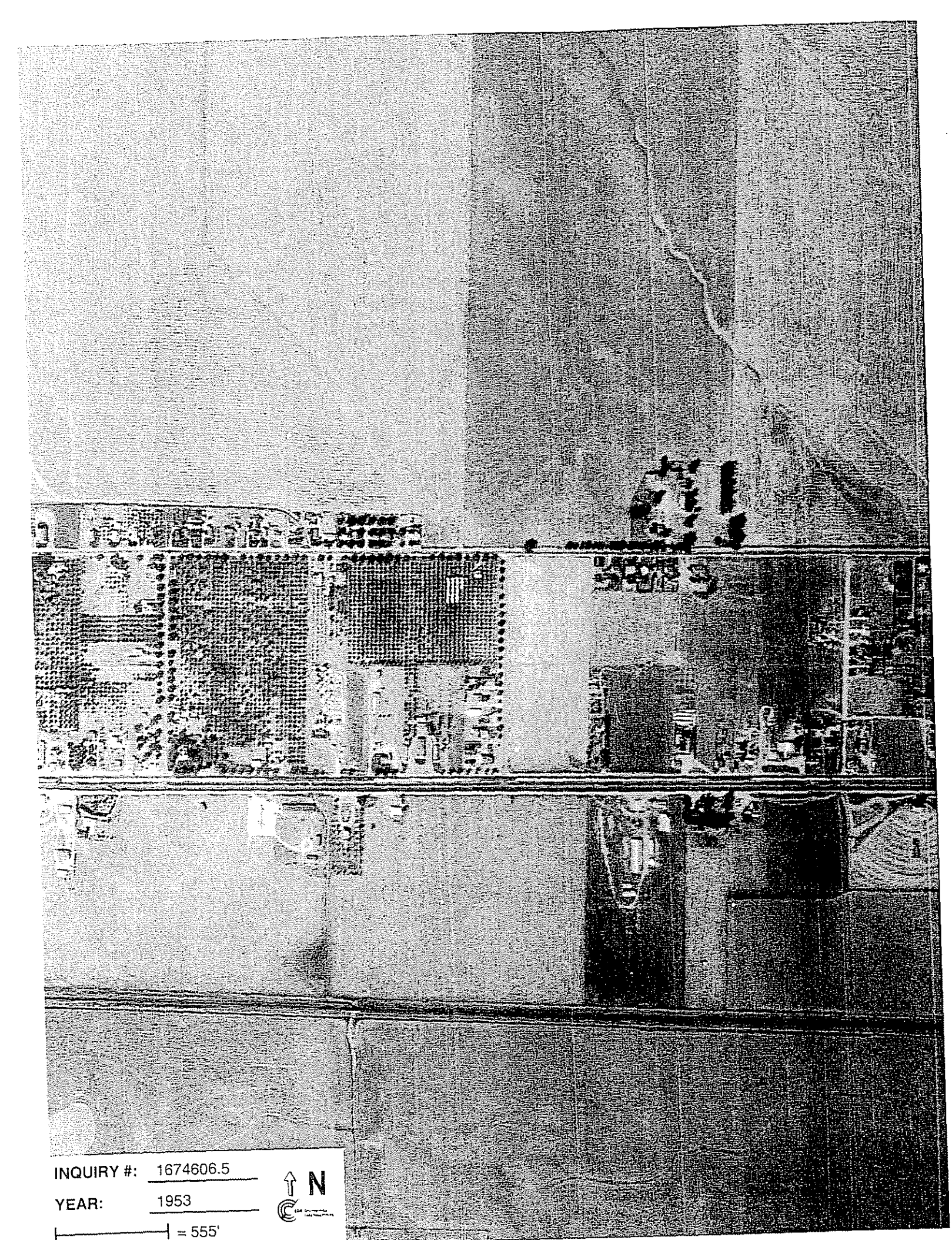


INQUIRY #: 1674606.5

YEAR: 1938

= 555'

N

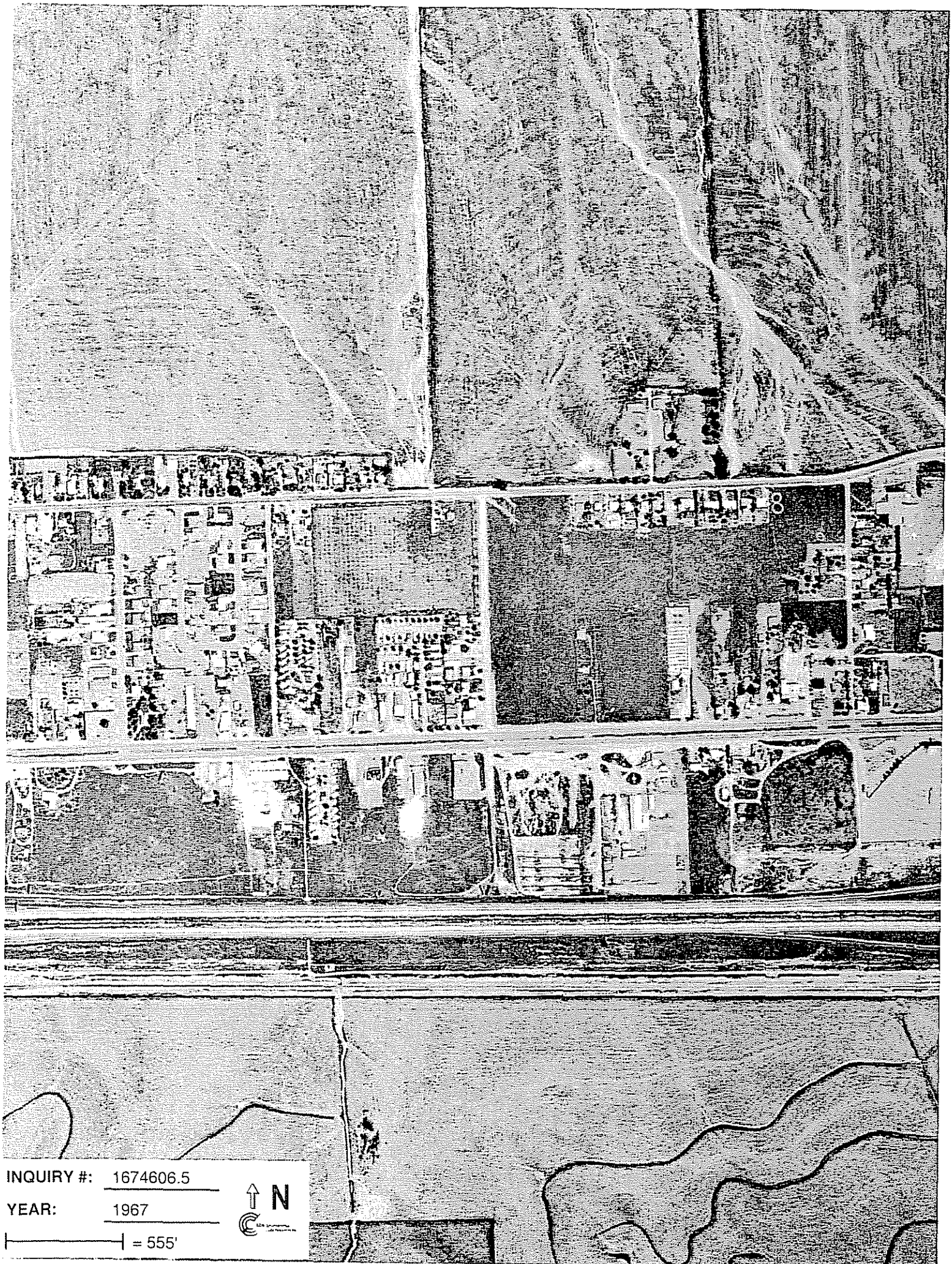


INQUIRY #: 1674606.5

YEAR: 1953

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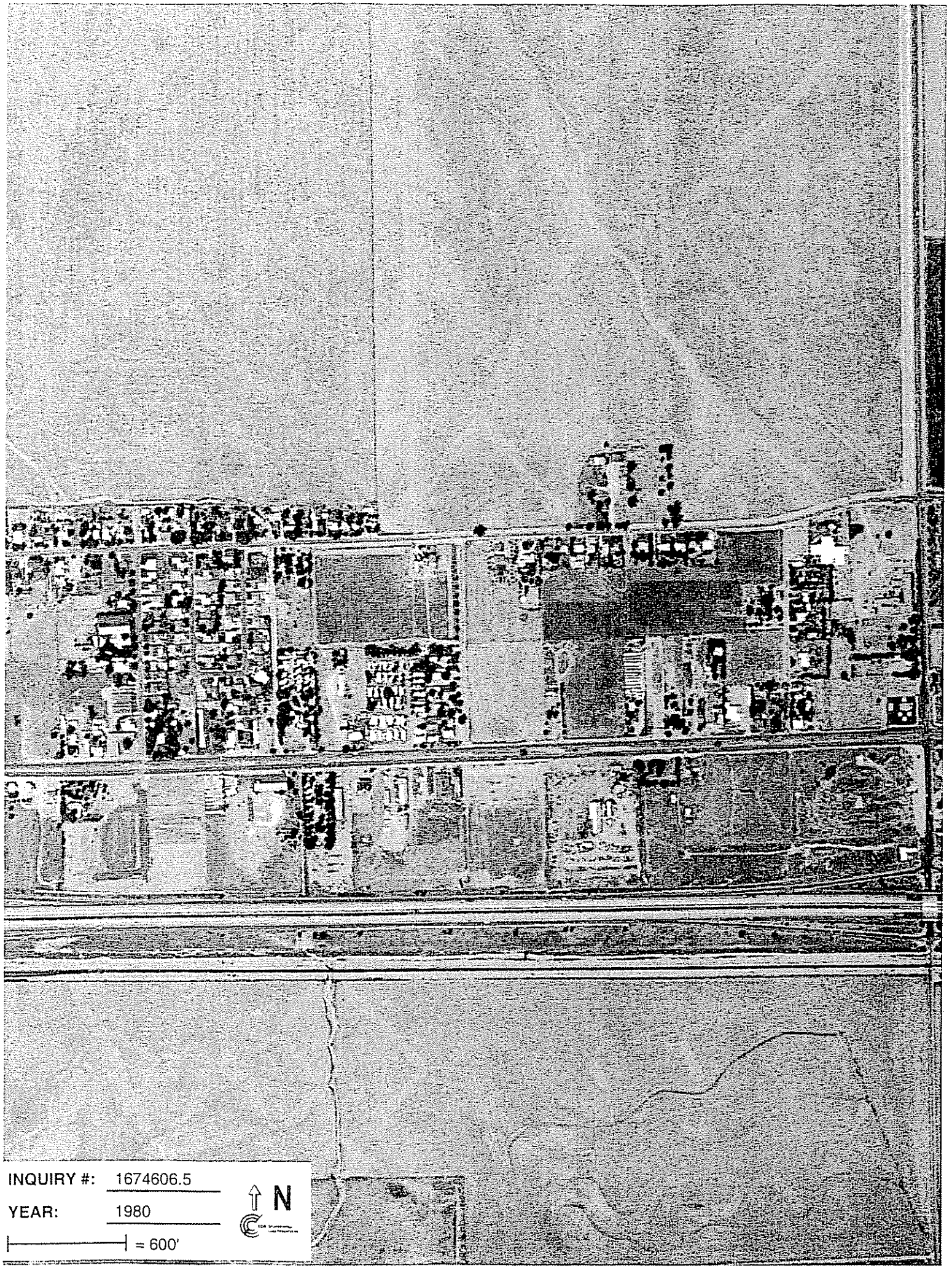


INQUIRY #: 1674606.5

YEAR: 1967

= 555'

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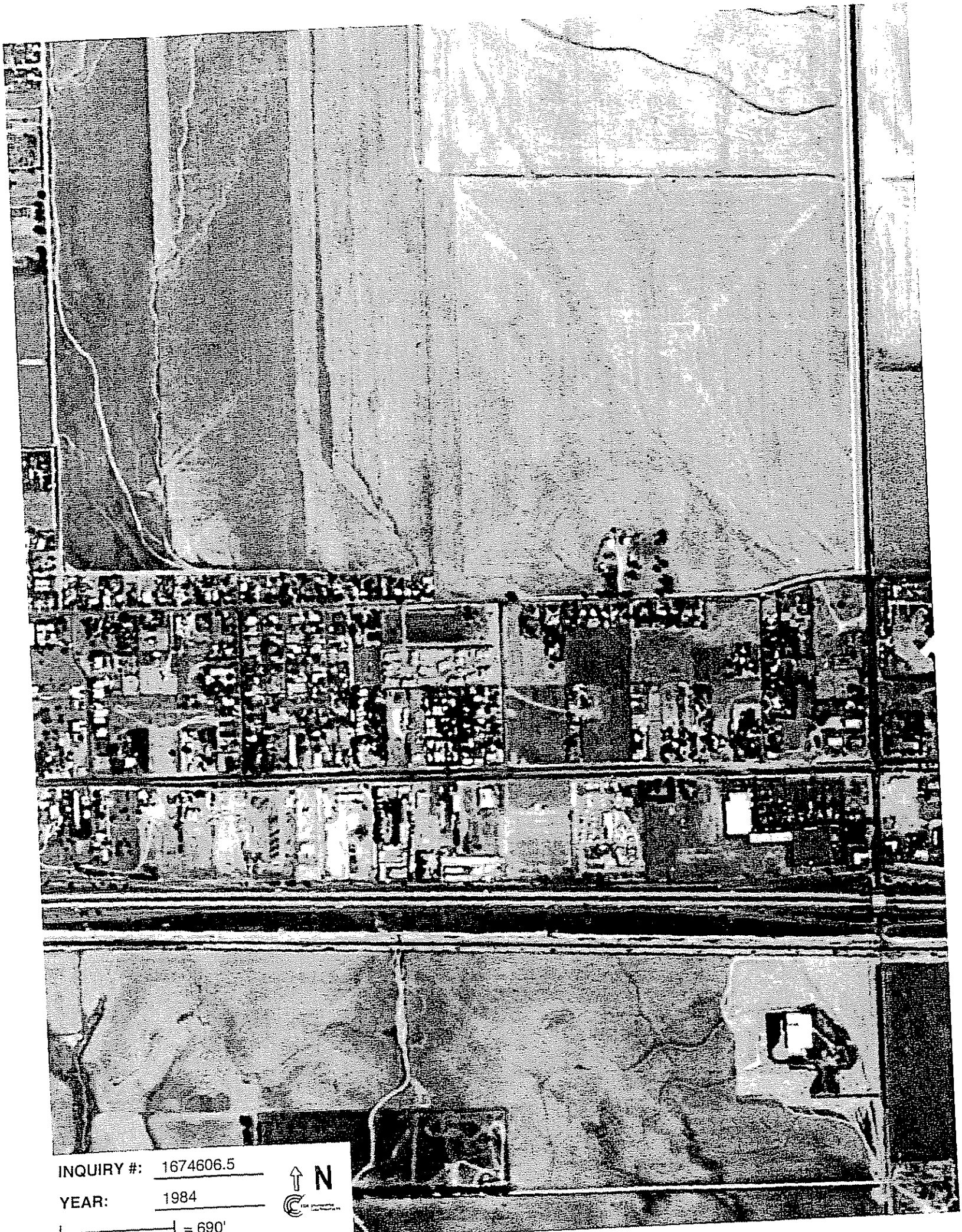


INQUIRY #: 1674606.5

YEAR: 1980

N

= 600'

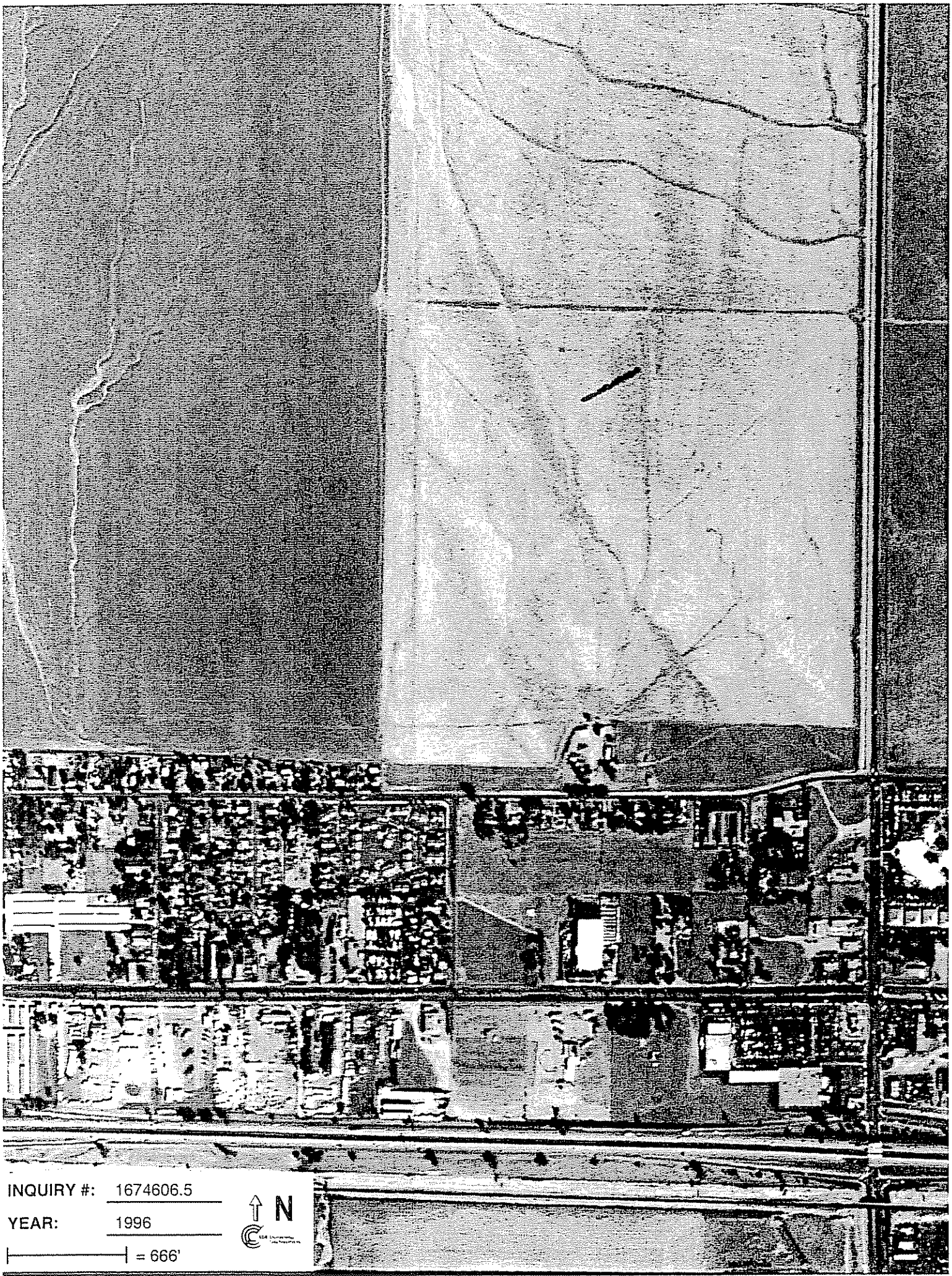


INQUIRY #: 1674606.5

YEAR: 1984

= 690'

N

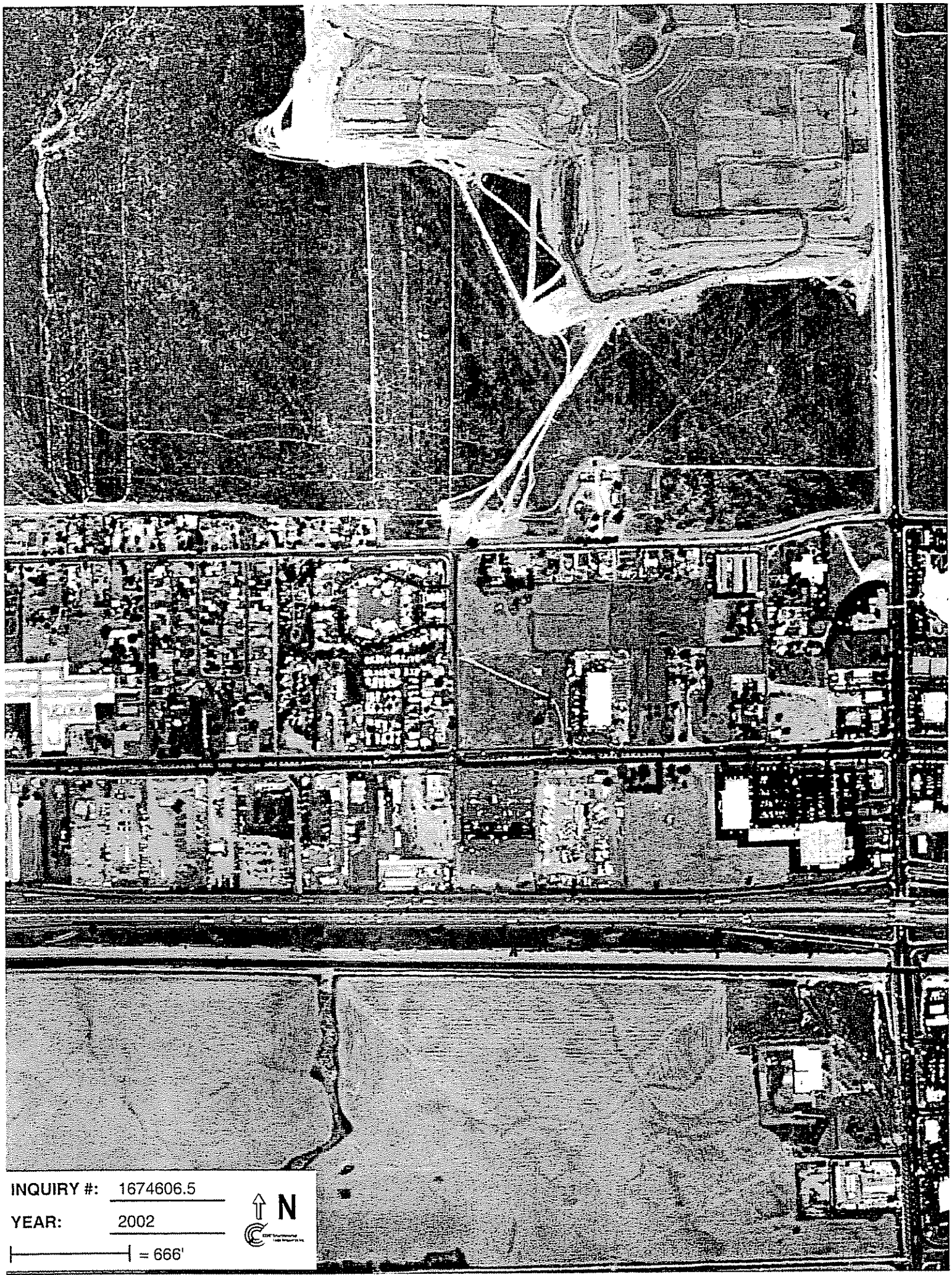


INQUIRY #: 1674606.5

YEAR: 1996

= 666'

N



INQUIRY #: 1674606.5

YEAR: 2002

= 666'

N



EDR™ Environmental
Data Resources Inc

EDR Historical Topographic Map Report

Xenia Townhomes Project
6th Street and Xenia Avenue
Beaumont, CA 92223

Inquiry Number: 1674606.4

May 12, 2006

The Standard in Environmental Risk Management Information

440 Wheelers Farms Road
Milford, Connecticut 06460

Nationwide Customer Service

Telephone: 1-800-352-0050
Fax: 1-800-231-6802
Internet: www.edrnet.com

Form-PEP

EDR Historical Topographic Map Report

Environmental Data Resources, Inc.'s (EDR) Historical Topographic Map Report is designed to assist professionals in evaluating potential liability on a target property, and its surrounding area, resulting from past activities. ASTM E 1527-00, Section 7.3 on Historical Use Information, identifies the prior use requirements for a Phase I environmental site assessment. The ASTM standard requires a review of *reasonably ascertainable standard historical sources. Reasonably ascertainable is defined as information that is publicly available, obtainable from a source with reasonable time and cost constraints, and practically reviewable.* To meet the prior use requirements of ASTM E 1527-00, Section 7.3.4, the following *standard historical sources* may be used: aerial photographs, city directories, fire insurance maps, topographic maps, property tax files, land title records (although these cannot be the sole historical source consulted), building department records, or zoning/and use records. ASTM E 1527-00 requires *"All obvious uses of the property shall be identified from the present, back to the property's obvious first developed use, or back to 1940, whichever is earlier. This task requires reviewing only as many of the standard historical sources as are necessary, and that are reasonably ascertainable and likely to be useful."* (ASTM E 1527-00, Section 7.3.2 page 12.)

EDR's Historical Topographic Map Report includes a search of available public and private color historical topographic map collections.

Topographic Maps
A topographic map (topo) is a color coded line-and-symbol representation of natural and selected artificial features plotted to a scale. Topos show the shape, elevation, and development of the terrain in precise detail by using contour lines and color coded symbols. Many features are shown by lines that may be straight, curved, solid, dashed, dotted, or in any combination. The colors of the lines usually indicate similar classes of information. For example, topographic contours (brown); lakes, streams, irrigation ditches, etc. (blue); land grids and important roads (red); secondary roads and trails, railroads, boundaries, etc. (black); and features that have been updated using aerial photography, but not field verified, such as disturbed land areas (e.g., gravel pits) and newly developed water bodies (purple).

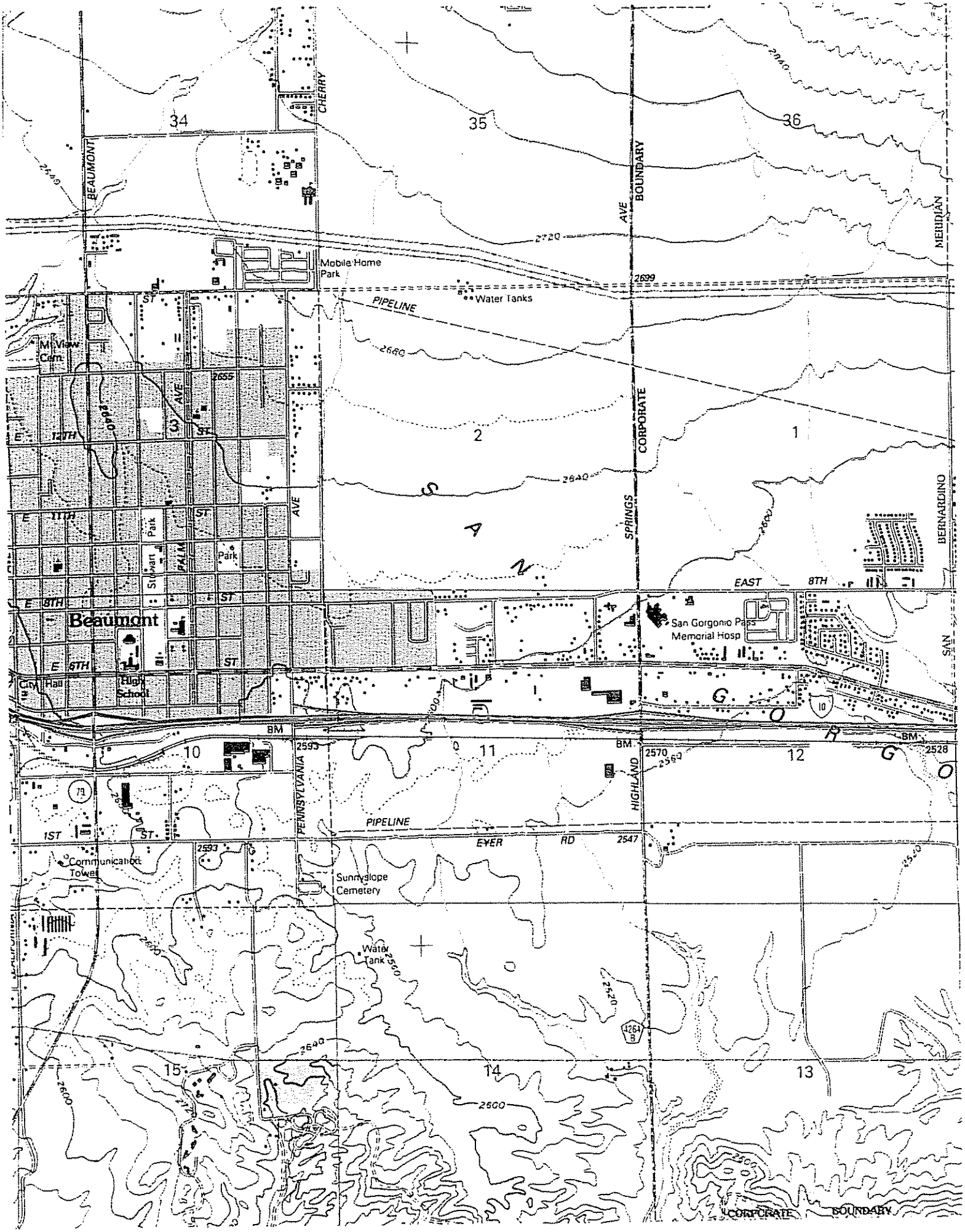
For more than a century, the USGS has been creating and revising topographic maps for the entire country at a variety of scales. There are about 60,000 U.S. Geological Survey (USGS) produced topo maps covering the United States. Each map covers a specific quadrangle (quad) defined as a four-sided area bounded by latitude and longitude. Historical topographic maps are a valuable historical resource for documenting the prior use of a property and its surrounding area, and due to their frequent availability can be particularly helpful when other standard historical sources (such as city directories, fire insurance maps, or aerial photographs) are not reasonably ascertainable.

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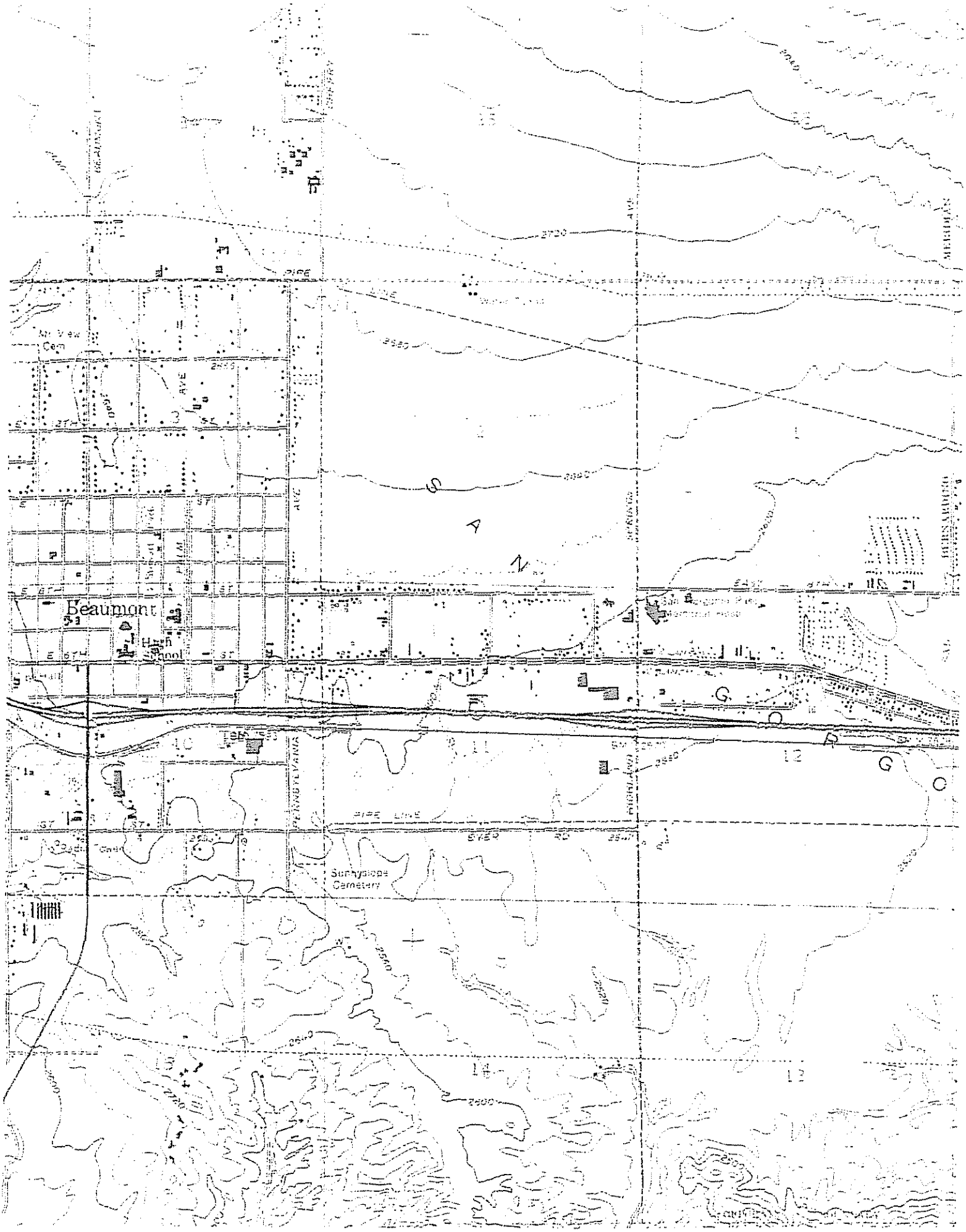
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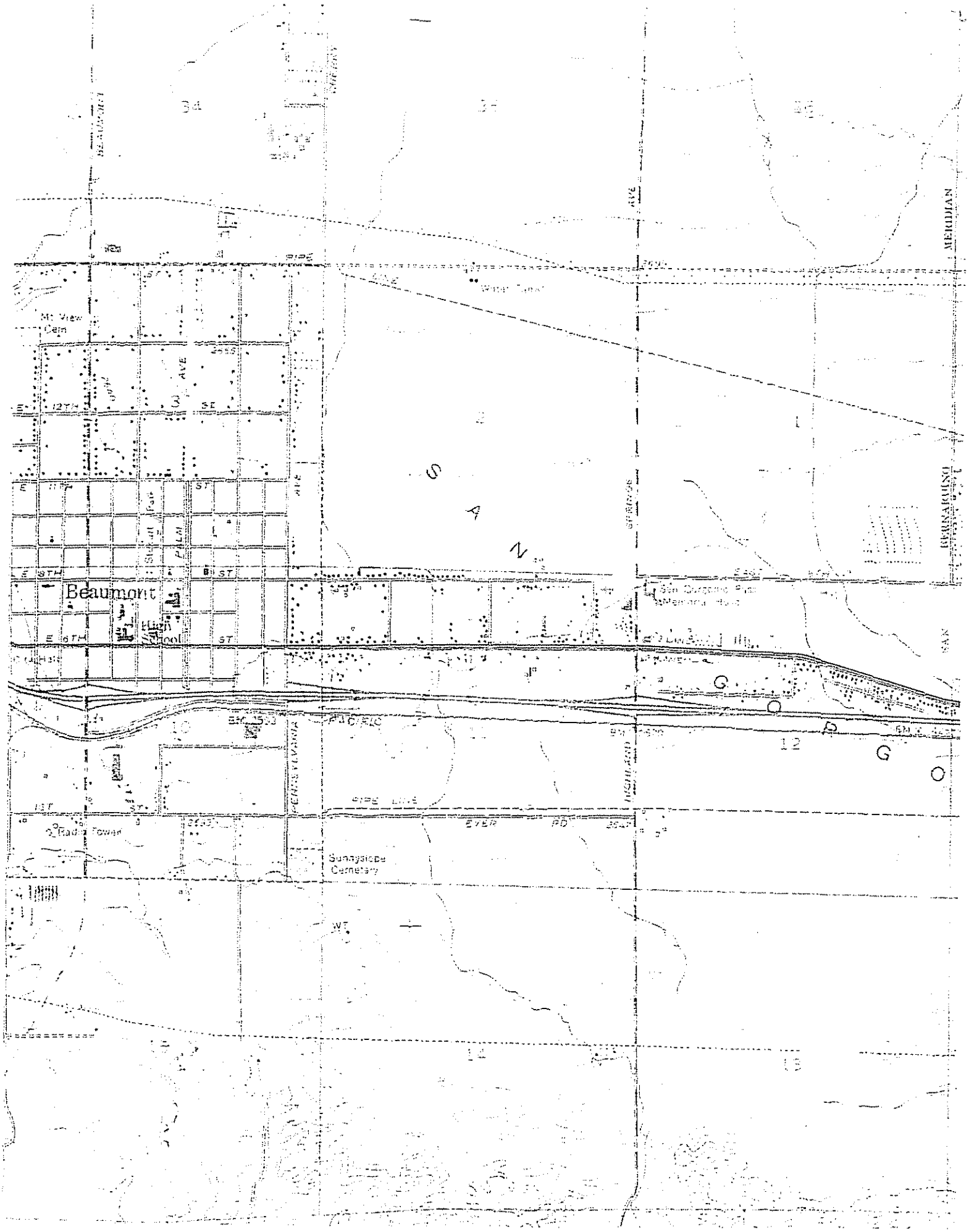
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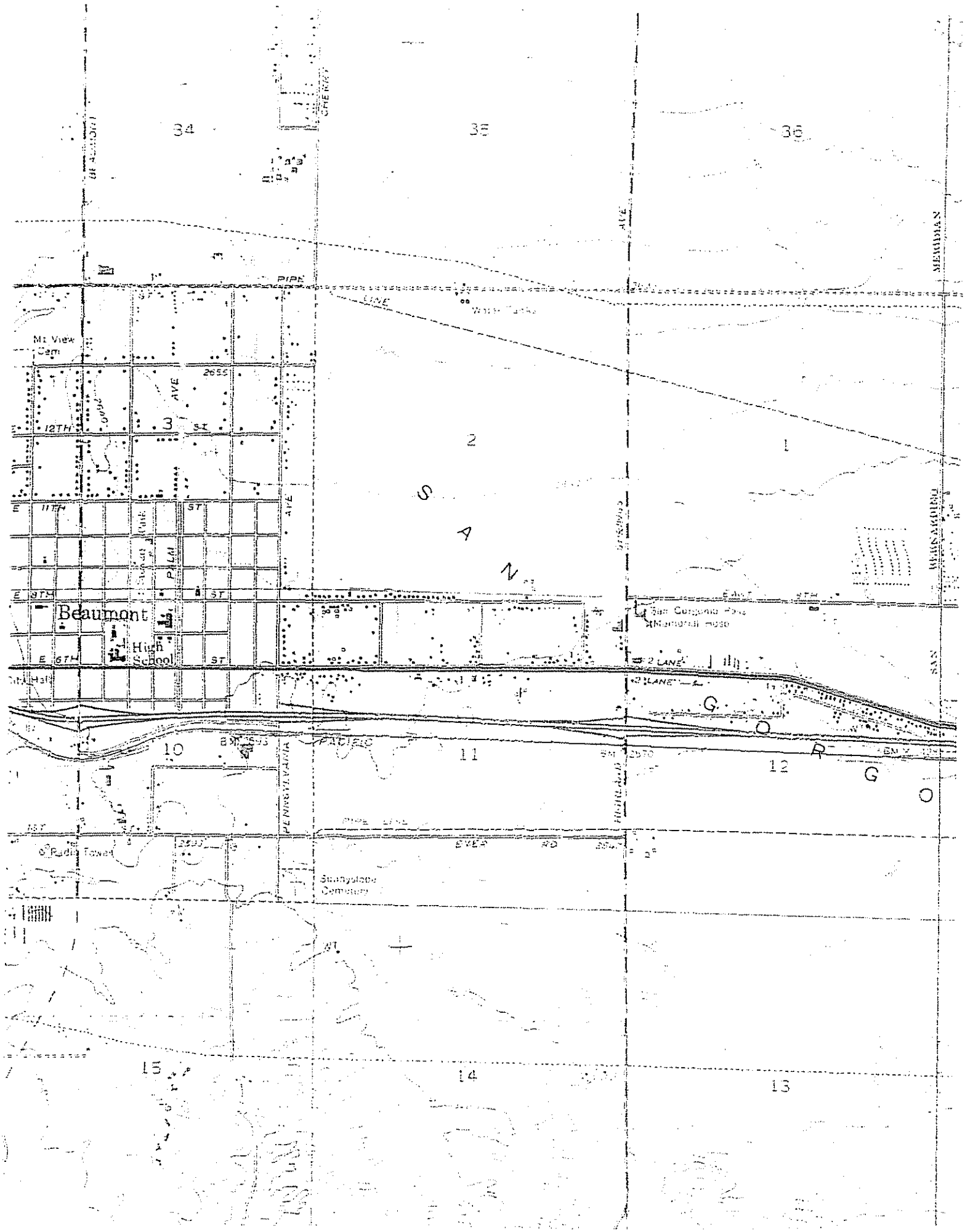
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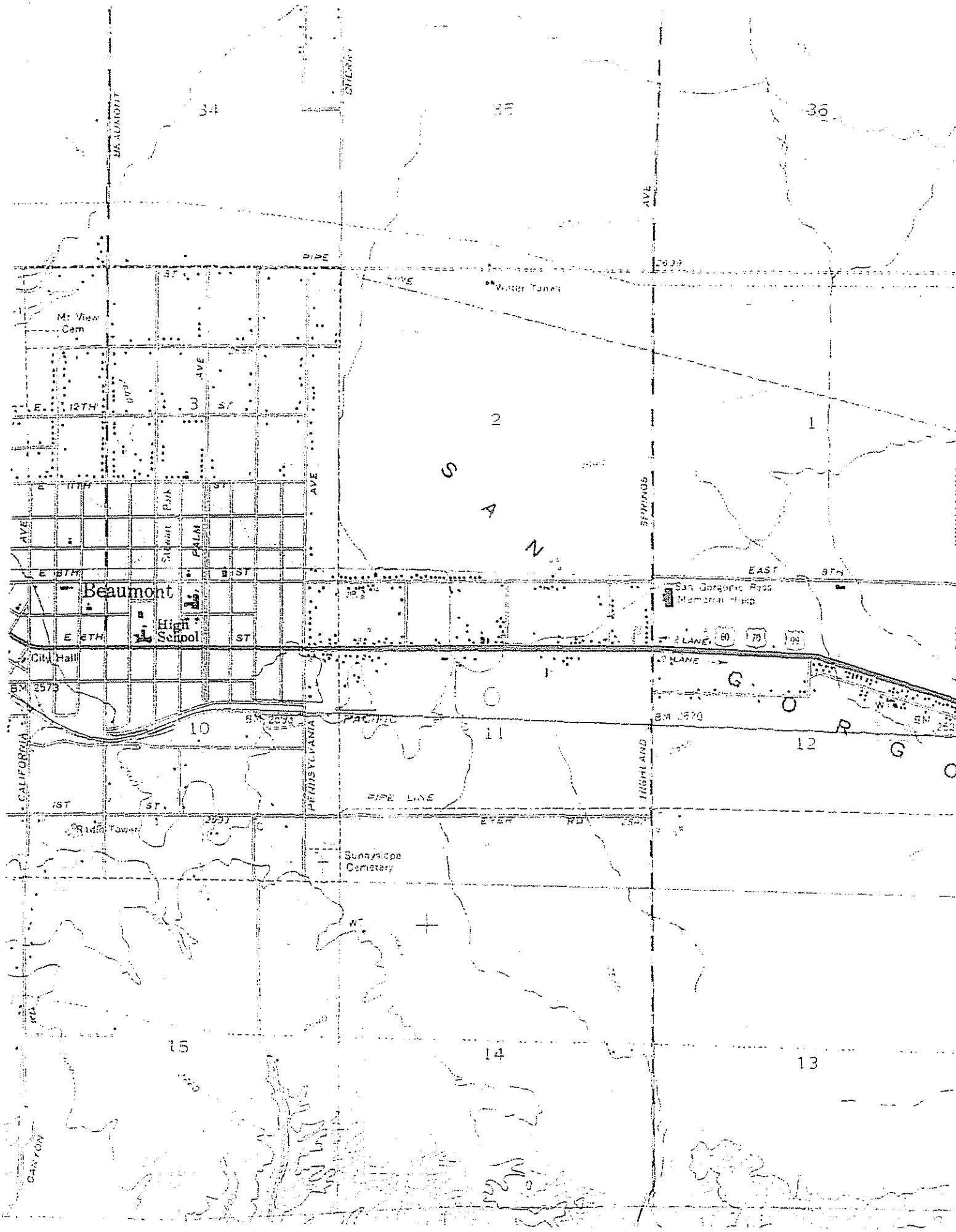
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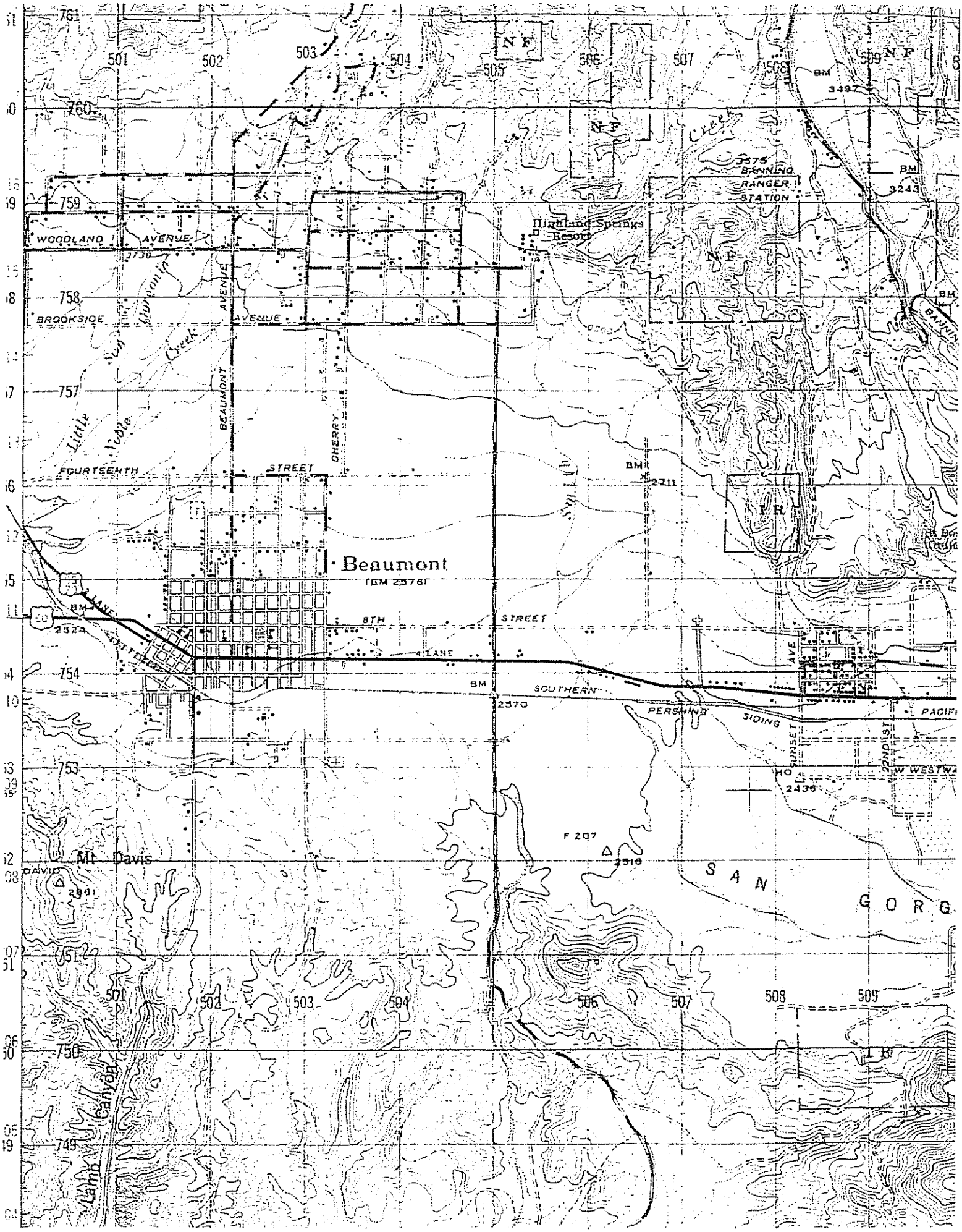
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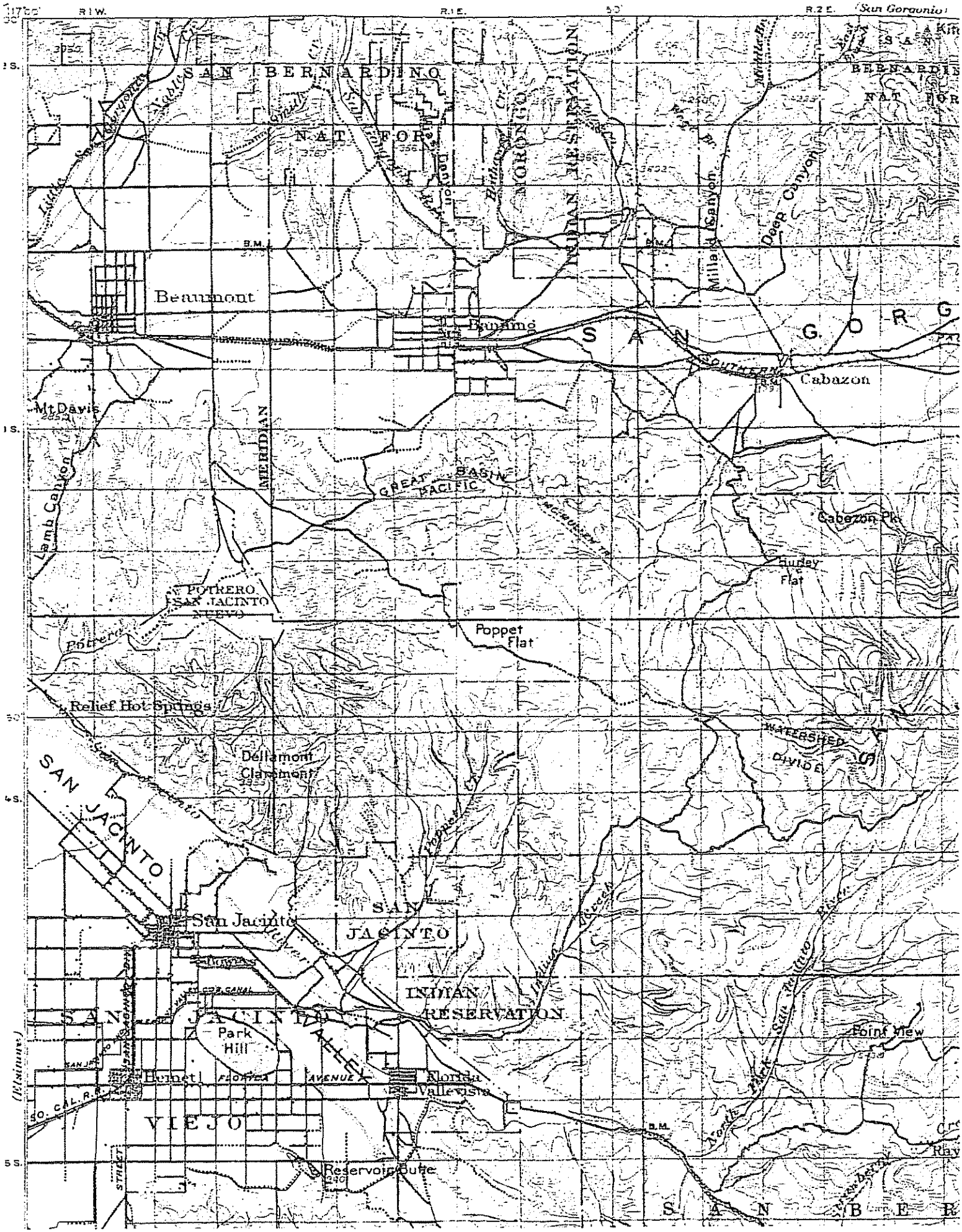
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N ^ EDR INQUIRY# 1674606.4 TARGET QUAD: BANNING YEAR: 1948 Series: 15' Scale: 1:50,000



N ^ EDR INQUIRY# 1674606.4 TARGET QUAD: SANJACINTO YEAR: 1901 Series: 30' Scale: 1:125,000

Owner Name	Parcel Number / Property Tax ID	Site Address	Mail Address
HOSSEINIOUN,ABOLFATH / SHOOSHTARY,SHAHDEH	419-160-005	CA	32 EAGLE ROCK RD MILL VALLEY, CA 94941-1609

Ownership Summary

Ownership Information

Primary Owner	HOSSEINIOUN,ABOLFATH
Secondary Owner	SHOOSHTARY,SHAHDEH
Ownership Description	
Site Address	
Site City, St Zip	CA
State	CALIFORNIA
County	RIVERSIDE
Mail Address	32 EAGLE ROCK RD
Mail City, St Zip	MILL VALLEY, CA 94941-1609
Assessor's Parcel Number / Tax ID	419-160-005
Assessed Value	$435,000
Telephone	
Use Description	VACANT RESIDENTIAL
Legal Description	3.27 ACRES M/L IN POR LOT 5 BLK 5 MB 009/010 SB SUB SEC 11 T3S R1W

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Owner Name	Parcel Number / Property Tax ID	Site Address	Mail Address
HOSSEINIOUN,ABOLFATH / SHOOSHTARY,SHAHDEH	419-160-005	CA	32 EAGLE ROCK RD MILL VALLEY, CA 94941-1609

Property Profile

Ownership Information

Primary Owner	HOSSEINIOUN,ABOLFATH
Secondary Owner	SHOOSHTARY,SHAHDEH
Ownership Description	
Site Address	
Site City, St Zip	CA
Mail Address	32 EAGLE ROCK RD
Mail City, St Zip	MILL VALLEY, CA 94941-1609
Telephone	
Census Tract	0438.035
Legal Description	3.27 ACRES M/L IN POR LOT 5 BLK 5 MB 009/010 SB SUB SEC 11 T3S R1W
Lot/Block	5/5
Housing Tract / Subdivision Name	

Property Details

Use Description	VACANT RESIDENTIAL		
State	CALIFORNIA	**County/Municipality**	RIVERSIDE
RTSQ		**Total Rooms**	
Zoning	C1	**Bedrooms**	
Number Of Units		**Bathrooms**	
Year Built		**Basement Square Feet**	
# Of Stories		**Parking**	
Lot Size	142,441 SQFT / 3.2700 Acres	**Parking Square Feet**	
Lot Depth		**View**	
Lot Width		**Pool**	
Square Feet		**FirePlace**	
Square Ft 1st Flr		**HT/AC**	
Square Ft 2nd Flr		**Cooling Detail**	
Square Ft 3rd Flr		**Heating Detail**	
Additions - Square Feet		**Roof Type**	
Building Shape		**Construction Quality**	
New Page Grid		**Construction Type**	
Map Page Grid			

Tax Information

Assessor's Parcel Number / Tax ID	419-160-005	**Assessor's Market Value**	$0
Assessed Total	$435,000	**Tax Amount**	$5,214.56
Land Total	$435,000	**Tax Status**	Current
Improvement		**Year Delinquent**	
Percent Improvement		**Tax Rate Area**	2027
Exemption			

Sale Information

Last Sales Date	August 25, 2004	**Lender**	
Document Number	0000670632	**1st Loan Amount**	
Sale Value	$500,000 (Full)	**First Loan Type**	
Last Transaction W/O		**2nd Loan Amount**	
Last Transaction W/O Doc		**Cost / Square feet**	
Title Company	STEWART TITLE		

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Owner Name	Parcel Number / Property Tax ID	Site Address	Mail Address
HOSSEINIOUN,ABOLFATH / SHOOSHTARY,SHAHDEH	419-160-024	CA	32 EAGLE ROCK RD MILL VALLEY, CA 94941-1609

Ownership Summary

Ownership Information

Primary Owner	HOSSEINIOUN,ABOLFATH
Secondary Owner	SHOOSHTARY,SHAHDEH
Ownership Description	
Site Address	
Site City, St Zip	CA
State	CALIFORNIA
County	RIVERSIDE
Mail Address	32 EAGLE ROCK RD
Mail City, St Zip	MILL VALLEY, CA 94941-1609
Assessor's Parcel Number / Tax ID	419-160-024
Assessed Value	$65,000
Telephone	
Use Description	VACANT RESIDENTIAL
Legal Description	.48 ACRES M/L IN POR LOT 7 BLK 5 MB 009/010 SB SUB SEC 11 T3S R1W

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Owner Name	Parcel Number / Property Tax ID	Site Address	Mail Address
HOSSEINIOUN,ABOLFATH / SHOOSHTARY,SHAHDEH	419-160-024	CA	32 EAGLE ROCK RD MILL VALLEY, CA 94941-1609

Property Profile

Ownership Information

Primary Owner	HOSSEINIOUN,ABOLFATH
Secondary Owner	SHOOSHTARY,SHAHDEH
Ownership Description	
Site Address	
Site City, St Zip	CA
Mail Address	32 EAGLE ROCK RD
Mail City, St Zip	MILL VALLEY, CA 94941-1609
Telephone	
Census Tract	0438.035
Legal Description	.48 ACRES M/L IN POR LOT 7 BLK 5 MB 009/010 SB SUB SEC 11 T3S R1W
Lot/Block	7/5
Housing Tract / Subdivision Name	

Property Details

Use Description	VACANT RESIDENTIAL		
State	CALIFORNIA	**County/Municipality**	RIVERSIDE
RTSQ		**Total Rooms**	
Zoning	C2	**Bedrooms**	
Number Of Units		**Bathrooms**	
Year Built		**Basement Square Feet**	
# Of Stories		**Parking**	
Lot Size	20,908 SQFT / 0.4800 Acres	**Parking Square Feet**	
Lot Depth		**View**	
Lot Width		**Pool**	
Square Feet		**FirePlace**	
Square Ft 1st Flr		**HT/AC**	
Square Ft 2nd Flr		**Cooling Detail**	
Square Ft 3rd Flr		**Heating Detail**	
Additions - Square Feet		**Roof Type**	
Building Shape		**Construction Quality**	
New Page Grid		**Construction Type**	
Map Page Grid			

Tax Information

Assessor's Parcel Number / Tax ID	419-160-024	**Assessor's Market Value**	$0
Assessed Total	$65,000	**Tax Amount**	$815.14
Land Total	$65,000	**Tax Status**	Current
Improvement		**Year Delinquent**	
Percent Improvement		**Tax Rate Area**	2013
Exemption			

Sale Information

Last Sales Date	August 25, 2004	**Lender**	
Document Number	0000670632	**1st Loan Amount**	
Sale Value	$500,000 (Full)	**First Loan Type**	
Last Transaction W/O		**2nd Loan Amount**	
Last Transaction W/O Doc		**Cost / Square feet**	
Title Company	STEWART TITLE		

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Owner Name	Parcel Number / Property Tax ID	Site Address	Mail Address
HOSSEINIOUN,ABOLFATH / SHOOSHTARY,SHAHDEH	419-170-027	419 BEAUMONT AVE BEAUMONT, CA 92223	32 EAGLE ROCK RD MILL VALLEY, CA 94941-1609

Ownership Summary

Ownership Information

Primary Owner	HOSSEINIOUN,ABOLFATH
Secondary Owner	SHOOSHTARY,SHAHDEH
Ownership Description	
Site Address	419 BEAUMONT AVE — NOT Site Address
Site City, St Zip	BEAUMONT, CA 92223
State	CALIFORNIA
County	RIVERSIDE
Mail Address	32 EAGLE ROCK RD
Mail City, St Zip	MILL VALLEY, CA 94941-1609
Assessor's Parcel Number / Tax ID	419-170-027
Assessed Value	$442,940
Telephone	
Use Description	VACANT RESIDENTIAL
Legal Description	2.78 ACRES NET IN POR PAR 1 PM 138/033 PM 21136

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Owner Name	Parcel Number / Property Tax ID	Site Address	Mail Address
HOSSEINIOUN,ABOLFATH / SHOOSHTARY,SHAHDEH	419-170-027	419 BEAUMONT AVE BEAUMONT, CA 92223	32 EAGLE ROCK RD MILL VALLEY, CA 94941-1609

Property Profile

Ownership Information

Primary Owner	HOSSEINIOUN,ABOLFATH
Secondary Owner	SHOOSHTARY,SHAHDEH
Ownership Description	
Site Address	419 BEAUMONT AVE – Not Site Address
Site City, St Zip	BEAUMONT, CA 92223
Mail Address	32 EAGLE ROCK RD
Mail City, St Zip	MILL VALLEY, CA 94941-1609
Telephone	
Census Tract	0440.003
Legal Description	2.78 ACRES NET IN POR PAR 1 PM 138/033 PM 21136
Lot/Block	1/5
Housing Tract / Subdivision Name	CAROTHER S

Property Details

Use Description	VACANT RESIDENTIAL		
State	CALIFORNIA	**County/Municipality**	RIVERSIDE
RTSQ		**Total Rooms**	
Zoning	C2	**Bedrooms**	
Number Of Units		**Bathrooms**	
Year Built		**Basement Square Feet**	
# Of Stories		**Parking**	
Lot Size	121,096 SQFT / 2.7800 Acres	**Parking Square Feet**	
Lot Depth		**View**	
Lot Width		**Pool**	
Square Feet		**FirePlace**	
Square Ft 1st Flr		**HT/AC**	
Square Ft 2nd Flr		**Cooling Detail**	
Square Ft 3rd Flr		**Heating Detail**	
Additions - Square Feet		**Roof Type**	
Building Shape		**Construction Quality**	
New Page Grid		**Construction Type**	
Map Page Grid			

Tax Information

Assessor's Parcel Number / Tax ID	419-170-027	**Assessor's Market Value**	$0
Assessed Total	$442,940	**Tax Amount**	$5,308.96
Land Total	$442,940	**Tax Status**	Current
Improvement		**Year Delinquent**	
Percent Improvement		**Tax Rate Area**	2013
Exemption			

Sale Information

Last Sales Date	July 8, 2004	**Lender**	
Document Number	0000530570	**1st Loan Amount**	
Sale Value	$1,144,000 (Full)	**First Loan Type**	
Last Transaction W/O		**2nd Loan Amount**	
Last Transaction W/O Doc		**Cost / Square feet**	
Title Company	ORANGE COAST TITLE		

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Owner Name	Parcel Number / Property Tax ID	Site Address	Mail Address
HOSSEINIOUN,ABOLFATH / SHOOSHTARY,SHAHDEH	419-170-022	419 BEAUMONT AVE BEAUMONT, CA 92223	32 EAGLE ROCK RD MILL VALLEY, CA 94941-1609

Ownership Summary

Ownership Information

Primary Owner	HOSSEINIOUN,ABOLFATH
Secondary Owner	SHOOSHTARY,SHAHDEH
Ownership Description	
Site Address	419 BEAUMONT AVE Not Site Address
Site City, St Zip	BEAUMONT, CA 92223
State	CALIFORNIA
County	RIVERSIDE
Mail Address	32 EAGLE ROCK RD
Mail City, St Zip	MILL VALLEY, CA 94941-1609
Assessor's Parcel Number / Tax ID	419-170-022
Assessed Value	$73,292
Telephone	
Use Description	VACANT RESIDENTIAL
Legal Description	.46 ACRES NET IN POR PAR 1 PM 138/033 PM 21136

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Owner Name	Parcel Number / Property Tax ID	Site Address	Mail Address
HOSSEINIOUN,ABOLFATH / SHOOSHTARY,SHAHDEH	419-170-022	419 BEAUMONT AVE BEAUMONT, CA 92223	32 EAGLE ROCK RD MILL VALLEY, CA 94941-1609

Property Profile

Ownership Information

Primary Owner	HOSSEINIOUN,ABOLFATH
Secondary Owner	SHOOSHTARY,SHAHDEH
Ownership Description	
Site Address	419 BEAUMONT AVE
Site City, St Zip	BEAUMONT, CA 92223
Mail Address	32 EAGLE ROCK RD
Mail City, St Zip	MILL VALLEY, CA 94941-1609
Telephone	
Census Tract	0440.003
Legal Description	.46 ACRES NET IN POR PAR 1 PM 138/033 PM 21136
Lot/Block	1/NA
Housing Tract / Subdivision Name	

Property Details

Use Description	VACANT RESIDENTIAL		
State	CALIFORNIA	**County/Municipality**	RIVERSIDE
RTSQ		**Total Rooms**	
Zoning	C2	**Bedrooms**	
Number Of Units		**Bathrooms**	
Year Built		**Basement Square Feet**	
# Of Stories		**Parking**	
Lot Size	20,037 SQFT / 0.4600 Acres	**Parking Square Feet**	
Lot Depth		**View**	
Lot Width		**Pool**	
Square Feet		**FirePlace**	
Square Ft 1st Flr		**HT/AC**	
Square Ft 2nd Flr		**Cooling Detail**	
Square Ft 3rd Flr		**Heating Detail**	
Additions - Square Feet		**Roof Type**	
Building Shape		**Construction Quality**	
New Page Grid		**Construction Type**	
Map Page Grid			

Tax Information

Assessor's Parcel Number / Tax ID	419-170-022	**Assessor's Market Value**	$0
Assessed Total	$73,292	**Tax Amount**	$913.74
Land Total	$73,292	**Tax Status**	Current
Improvement		**Year Delinquent**	
Percent Improvement		**Tax Rate Area**	2013
Exemption			

Sale Information

Last Sales Date	July 8, 2004	**Lender**	
Document Number	0000530570	**1st Loan Amount**	
Sale Value	$1,144,000 (Full)	**First Loan Type**	
Last Transaction W/O		**2nd Loan Amount**	
Last Transaction W/O Doc		**Cost / Square feet**	
Title Company	ORANGE COAST TITLE		

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This information is compiled from public documents and is not guaranteed.

Owner Name	Parcel Number / Property Tax ID	Site Address	Mail Address
HOSSEINIOUN,ABOLFATH / SHOOSHTARY,SHAHDEH	419-170-016	419 BEAUMONT AVE BEAUMONT, CA 92223	32 EAGLE ROCK RD MILL VALLEY, CA 94941-1609

Ownership Summary

Ownership Information

Primary Owner	HOSSEINIOUN,ABOLFATH
Secondary Owner	SHOOSHTARY,SHAHDEH
Ownership Description	
Site Address	419 BEAUMONT AVE
Site City, St Zip	BEAUMONT, CA 92223
State	CALIFORNIA
County	RIVERSIDE
Mail Address	32 EAGLE ROCK RD
Mail City, St Zip	MILL VALLEY, CA 94941-1609
Assessor's Parcel Number / Tax ID	419-170-016
Assessed Value	$417,450
Telephone	
Use Description	VACANT RESIDENTIAL
Legal Description	2.62 ACRES M/L IN POR LOT 3 BLK 5 MB 009/010 SB SUB SEC 11 T3S R1W

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Owner Name	Parcel Number / Property Tax ID	Site Address	Mail Address
HOSSEINIOUN,ABOLFATH / SHOOSHTARY,SHAHDEH	419-170-016	419 BEAUMONT AVE BEAUMONT, CA 92223	32 EAGLE ROCK RD MILL VALLEY, CA 94941-1609

Property Profile

Ownership Information

Primary Owner	HOSSEINIOUN,ABOLFATH
Secondary Owner	SHOOSHTARY,SHAHDEH
Ownership Description	
Site Address	419 BEAUMONT AVE
Site City, St Zip	BEAUMONT, CA 92223
Mail Address	32 EAGLE ROCK RD
Mail City, St Zip	MILL VALLEY, CA 94941-1609
Telephone	
Census Tract	0440.003
Legal Description	2.62 ACRES M/L IN POR LOT 3 BLK 5 MB 009/010 SB SUB SEC 11 T3S R1W
Lot/Block	3/5
Housing Tract / Subdivision Name	

Property Details

Use Description	VACANT RESIDENTIAL		
State	CALIFORNIA	**County/Municipality**	RIVERSIDE
RTSQ		**Total Rooms**	
Zoning	R3	**Bedrooms**	
Number Of Units		**Bathrooms**	
Year Built		**Basement Square Feet**	
# Of Stories		**Parking**	
Lot Size	114,127 SQFT / 2.6200 Acres	**Parking Square Feet**	
Lot Depth		**View**	
Lot Width		**Pool**	
Square Feet		**FirePlace**	
Square Ft 1st Flr		**HT/AC**	
Square Ft 2nd Flr		**Cooling Detail**	
Square Ft 3rd Flr		**Heating Detail**	
Additions - Square Feet		**Roof Type**	
Building Shape		**Construction Quality**	
New Page Grid		**Construction Type**	
Map Page Grid			

Tax Information

Assessor's Parcel Number / Tax ID	419-170-016	**Assessor's Market Value**	$0
Assessed Total	$417,450	**Tax Amount**	$5,005.88
Land Total	$417,450	**Tax Status**	Current
Improvement		**Year Delinquent**	
Percent Improvement		**Tax Rate Area**	2004
Exemption			

Sale Information

Last Sales Date	July 8, 2004	**Lender**	
Document Number	0000530570	**1st Loan Amount**	
Sale Value	$1,144,000 (Full)	**First Loan Type**	
Last Transaction W/O		**2nd Loan Amount**	
Last Transaction W/O Doc		**Cost / Square feet**	
Title Company	ORANGE COAST TITLE		

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The EDR Environmental Lien Search Report

XENIA TOWNHOMES PROJECT
6TH STREET AND XENIA AVENUE
BEAUMONT, CALIFORNIA

Tuesday, May 30, 2006

Project Number: L06-3188

The Standard In Environmental Risk Management Information

440 Wheelers Farm Road
Milford, Connecticut 06460

Nationwide Customer Service

Telephone: 1-800-352-0050
Fax: 1-800-231-6802

ENVIRONMENTAL LIEN REPORT

The EDR Environmental Lien Search Report is intended to assist in the search for environmental liens filed in land title records.

TARGET PROPERTY INFORMATION

ADDRESS

XENIA TOWNHOMES PROJECT
6TH STREET AND XENIA AVENUE
BEAUMONT, CALIFORNIA

DEED INFORMATION

Type of Deed: WD ☐ QCD ☐ Other ☒ GRANT DEED

Title is vested in: Abolfath Hosseinioun and Shahdeh Shooshtary, husband and wife as joint tenants

Title received from: Victoria Homes, Inc., a California Corporation

Deed Dated: 03-15-2004
Deed Recorded: 07-08-2004
Instrument: 2004-0530570

LEGAL DESCRIPTION

Description: All that certain piece or parcel of land being Lot 1 of Parcel Map 21136, as shown by map on file in Book 138, Page 33 of Parcel Maps, lying and situate in the City of Beaumont, County of Riverside, State of California.

Assessor's Parcel Number: 419-170-027

ENVIRONMENTAL LIEN

Environmental Lien: **Yes** ☐ **No** ☒

If yes:

1st Party:

2nd Party:

Dated:
Recorded:
Book:
Page:
Comments:

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

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Appendix H

Report of Phase II Investigation
Earth Systems Southwest
February 23, 2006

Earth Systems
Southwest

79-811B Country Club Drive
Bermuda Dunes, CA 92203
(760) 345-1588
(800) 924-7015
FAX (760) 345-7315

February 23, 2006

File No.: 10437-02
06-02-791

Manors Construction and Development Company, Inc.
127 Business Park Drive, Suite C
Corona, California 92882

Attention: Mr. Paul Minnick

Subject: **Report of Phase II Investigation**

Project: **APNs 419-160-005 and -024, 419-170-016, -017, -018, -022, and -027**
East Side of Xenia Avenue between 6th and 8th Streets
Beaumont, California

References:

1. Earth Systems Southwest, Report of Phase I Environmental Site Assessment, East Side of Xenia Avenue Between 6th Street and 8th Street, Assessors Parcel Numbers 419-160-005 and -024, 419-170-016, -017, -018, -022, and -027, Beaumont, California, File No.: 10437-01, Document No.: 05-12-595, dated December 28, 2005.

2. Earth Systems Southwest, Proposal for Phase II Investigation, East Side of Xenia Avenue between 6th Street and 8th Street, APNs 419-160-005 and -024, 419-170-016, -017, -018, -022, and 0-27, Beaumont, California, Proposal No.: SWP-06-616, dated January 13, 2006.

Dear Mr. Minnick:

Pursuant to your request and authorization, Earth Systems Southwest [ESSW] has completed a Phase II Investigation at the site referenced above, in accordance with our proposal dated January 13, 2006 and signed on January 25, 2006 (referenced above). Note that this report was prepared for your exclusive use. It was prepared to stand as a whole and no part should be excerpted or used in exclusion of any other part.

This report presents the findings of the Phase II Investigation conducted by Earth Systems Southwest [ESSW] for approximately 11 acres of land located on the east side of Xenia Road between 6th Street and 8th Street in the City of Beaumont, California. The site consists of former agricultural (grazing) land. The site is identified as Assessors Parcel Numbers [APNs] 419-160-005 and -024, 419-170-016, -017, -018, -022, and -027. Figures depicting the site location and layout are presented in Appendix A.

Background

ESSW completed a Phase I Environmental Site Assessment [ESA] of the site in December, 2005 (referenced above) that identified several issues of potential concern, including the following:

1. Sixteen dirt piles and two excavations were observed northeast of the slab foundation, adjacent to the northern boundary. It was not clear whether the dirt piles originated onsite.

2. The site had been used for agriculture or grazing from at least 1949, the earliest historical reference available. Therefore, the potential exists for residues of presently banned Organochlorine Pesticides [OCPs], such as DDT, to be present in soils at the site.

3. Based on an historical aerial photograph review, at least six buildings and/or sheds have been onsite. Four of the buildings/sheds were in the northwest quarter of the site; one building was within a fenced enclosure east of the center of the site; and a shed was near the center of the south boundary. Rural residences and farms often have onsite fuel storage tanks, either above ground or underground [ASTs and USTs, respectively]. The concern with USTs is that a release can occur and go unnoticed until the UST is removed.

Summary of Activities

The purpose of this Phase II investigation was to evaluate the issues stated above. ESSW personnel conducted the fieldwork at the site on February 6, 2006. Work at the site is summarized below. The site location and a map of the sample and survey locations are presented on Figures 1 and 2. The laboratory reports and chain-of-custody forms are included in Appendix A. The methods used are summarized in Appendix B.

1. The geophysical survey consisted of using a Terrain Conductivity Meter [TCM] (a type of metal detector) to locate possible USTs. The surveyed area consisted of the area around the former building locations. The locations of the survey are presented on Figure 2.

2. Six surface soil samples were collected from the dirt piles, four were collected from the former building locations, and twelve were collected in the agricultural fields. Samples were analyzed as follows:

   - The six dirt-pile samples (SS-1 through SS-6) were made into two composite samples by the laboratory. Each composite sample was analyzed for the following:
     - Total Petroleum Hydrocarbons fuel screen [TPHfs] using EPA Method 8015M,
     - Title 22 (CAM) metals using EPA method 6010B/7471A, and
     - OCPs using EPA method 8081A.
   - The sixteen surface samples from the agricultural fields (SS-101 through SS-112) and building areas (SS-7 through SS-10) were analyzed for OCPs using EPA method 8081A.

Summary of Findings

Buried metallic objects were not identified during the geophysical survey. Other indications of USTs were not observed.

TPH and OCPs were not detected in the samples from the dirt piles. Heavy metals were detected below the regulatory limits for hazardous waste [TTLCs] and residential preliminary remediation goals [PRGs]. The heavy metals appear consistent with naturally occuring background concentrations.

Trace concentrations of OCPs were detected in two of the agricultural area and building area samples. Chlordane was detected at 0.036 mg/kg in building area sample SS-10. DDE (a breakdown product of DDT) was detected at 0.002 mg/kg in agricultural area sample SS-112. These results are well below the TTLCs and PRGs.

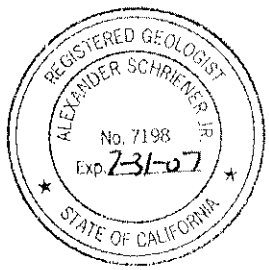
Issues beyond those identified during the Phase I Investigation were not observed. Based on the activities and findings summarized above, **further investigations do not appear warranted.**

-o0o-

We appreciate the opportunity to assist you on this project. If we can be of further assistance, or if you have any questions concerning this report, please feel free to contact us. Note that this report was prepared for the exclusive use of Manors Construction and Development, Inc. Limitations on the use of this report are presented in Appendix C.

Sincerely,
EARTH SYSTEMS SOUTHWEST

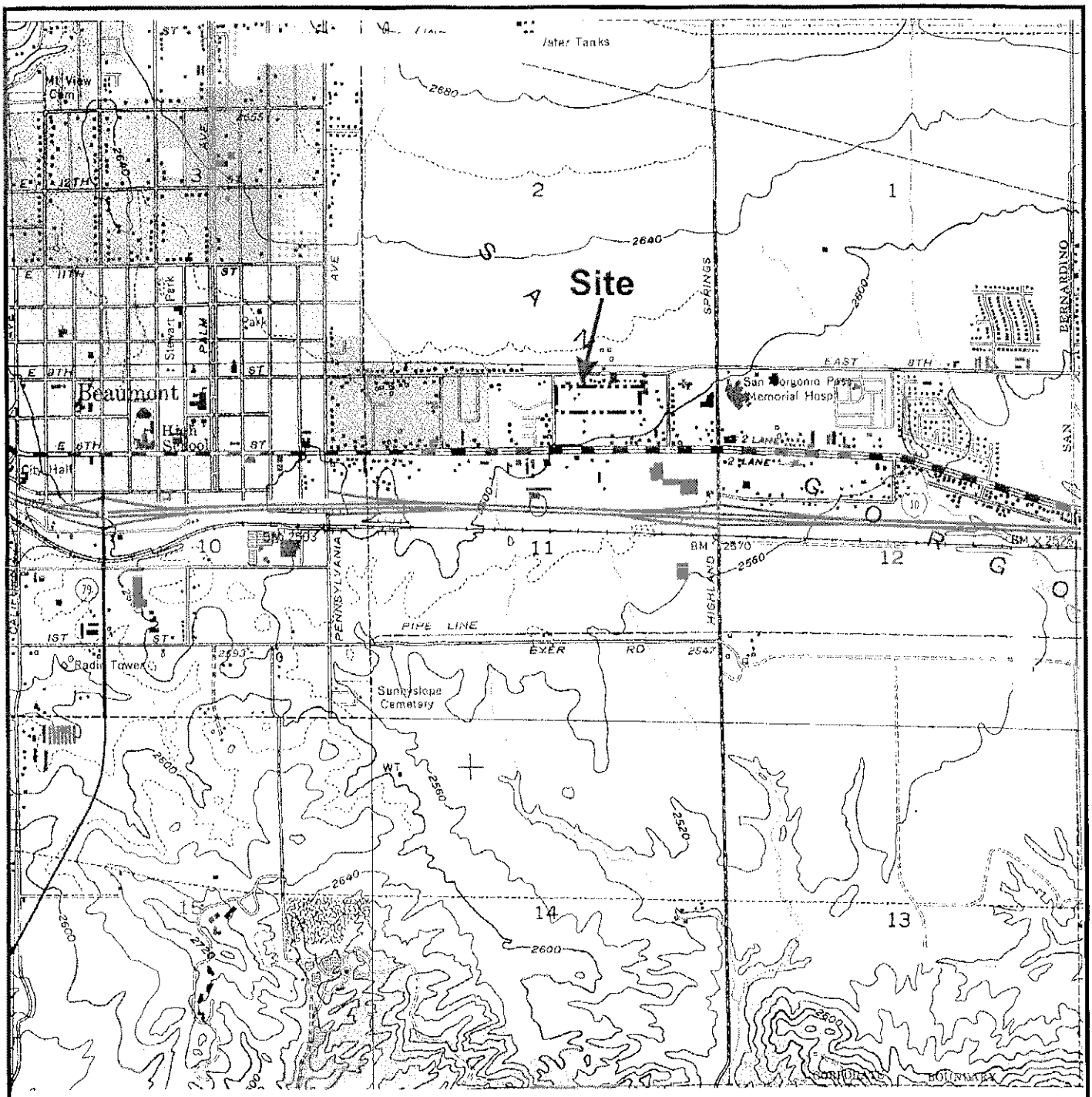
Alexander Schriener, Jr., PG 7198
Senior Geologist



Phase II/as/ajf

Distribution: 6/Manors Construction & Development Company, Inc.
1/SAS
1/RC File
2/BD File

Enclosures: Figure 1 – Site Location
Figure 2 – Sample Locations
Table 1 – TPH Results
Table 2 – CAM 17 Heavy Metals Results
Table 3 – OCP Results
Appendix A – Laboratory Reports
Appendix B – Methods
Appendix C – Limitations



Base Map: USGS 7-1/2' Quadrangle, *Beaumont, California, 1953*, photo-revised 1979.

Site Boundary

Scale: 1" = 2,000'

0 2,000' 4,000'

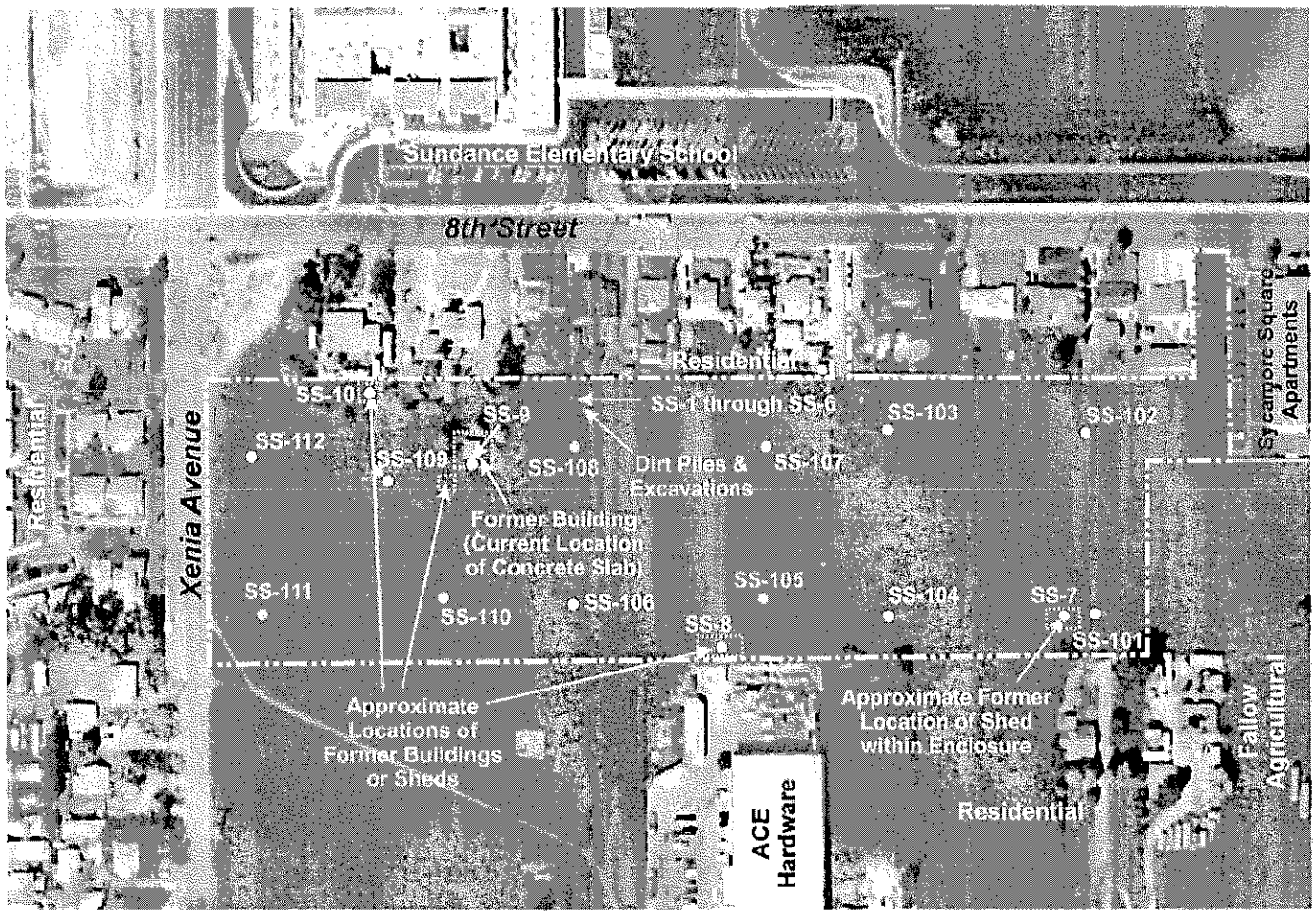
N

Figure 1
Site Location

East Side of Xenia Ave. Between 6th St. & 8th St.
Beaumont, Riverside County, California

Earth Systems
Southwest

02/23/06	10437-02



Approximate Scale: 1" = 190'

0 190' 380'

Reference: GlobeXplorer aerial photograph, dated 2004.

LEGEND

- Site Boundary
- Approximate Boundaries of Geophysical Survey
- ● SS-112 Surface Sample Location

Figure 2
Site Layout

East Side of Xenia Ave. Between 6th St. & 8th St.
Beaumont, Riverside County, California

Earth Systems Southwest

02/23/06	10437-02

Table 1
East Side of Xenia Road - TPH results
EPA Method 8015 Fuel Screen

Sample ID	Gasoline	Jet Fuel	Diesel	Motor Oil	Extractable Hydrocarbons
SS-1	ND<10	ND<10	ND<10	ND<10	ND<10
SS-2					
SS-3					
SS-4	ND<10	ND<10	ND<10	ND<10	ND<10
SS-5					
SS-6					

Notes: All concentrations in mg/kg.
Samples SS-1,-2,-3 and SS-4,-5,-6 were made into composite samples by the laboratory.

Definitions:

ND - not detected greater than the listed detection limit.
TPH - Total Petroleum Hydrocarbons.

Table 2
East Side of Xenia Road - CAM 17 Heavy Metals Results
EPA Method 6010

Sample ID	As	Ba	Cr	Co	Cu	Pb	Ni	V	Zn	Others
SS-1	ND<1.0	70	20	11	19	9.5	14	40	56	ND
SS-2										
SS-3										
SS-4	1.3	64	18	11	17	8.1	13	37	48	ND
SS-5										
SS-6										
TTLC	500	10,000	2,500	8,000	2,500	1,000	2,000	2,400	5,000	Various
Residential PRG	22	5,400	210	900	3,100	150	1,600	550	23,000	Various

Notes:

Concentrations are in mg/kg unless otherwise noted

"Others" includes Antimony, Beryllium, Cadmium, Mercury, Molybdenum, Selenium, Silver, and Thallium, which were all "not detected."

Samples SS-1,-2,-3 and SS-4,-5,-6 were made into composite samples by the laboratory.

Definitions:

PRG = Preliminary Remediation Goal

ND = not detected (see Appendix C for itemized constituents and corresponding Detection Limits, by sample)

TTLC = Total Threshold Limit Concentration (a California criteria for defining a waste as hazardous)

Table 3
East Side of Xenia Road - OCP results
EPA Method 8081

Sample ID	4,4-DDT	4,4-DDE	4,4-DDD	Chlordane	All Other OCPs
SS-1	ND<0.002	ND<0.002	ND<0.002	ND<0.020	ND
SS-2					
SS-3					
SS-4	ND<0.002	ND<0.002	ND<0.002	ND<0.020	ND
SS-5					
SS-6					
SS-7	ND<0.002	ND<0.002	ND<0.002	ND<0.002	ND
SS-8	ND<0.002	ND<0.002	ND<0.002	ND<0.002	ND
SS-9	ND<0.002	ND<0.002	ND<0.002	ND<0.002	ND
SS-10	ND<0.002	ND<0.002	ND<0.002	**0.036**	ND
SS-101	ND<0.002	ND<0.002	ND<0.002	ND<0.002	ND
SS-102	ND<0.002	ND<0.002	ND<0.002	ND<0.002	ND
SS-103	ND<0.002	ND<0.002	ND<0.002	ND<0.002	ND
SS-104	ND<0.002	ND<0.002	ND<0.002	ND<0.002	ND
SS-105	ND<0.002	ND<0.002	ND<0.002	ND<0.002	ND
SS-106	ND<0.002	ND<0.002	ND<0.002	ND<0.002	ND
SS-107	ND<0.002	ND<0.002	ND<0.002	ND<0.002	ND
SS-108	ND<0.002	ND<0.002	ND<0.002	ND<0.002	ND
SS-109	ND<0.002	ND<0.002	ND<0.002	ND<0.002	ND
SS-110	ND<0.002	ND<0.002	ND<0.002	ND<0.002	ND
SS-111	ND<0.002	ND<0.002	ND<0.002	ND<0.002	ND
SS-112	ND<0.002	**0.002**	ND<0.002	ND<0.002	ND
TTLC	1.0 mg/kg as sum total of DDT, DDE, DDD (TDE)			2.5 mg/kg	Various
Residential PRG	1.7 mg/kg	1.7 mg/kg	2.4 mg/kg	1.6 mg/kg	Various

Notes: All concentrations in mg/kg.
Samples SS-1,-2,-3 and SS-4,-5,-6 were made into composite samples by the laboratory.

Definitions:

PRG = Preliminary Remediation Goal

ND = not detected greater than the listed detection limit.
listed detection limit.

TTLC = Total Threshold Limit Concentration (a California criteria for defining a waste as hazardous)

Appendix A

Laboratory Report

Centrum
Analytical
Laboratories, Inc.

Client:	Earth Systems 79-811B Country Club Drive Bermuda Dunes, CA 92203	Date Sampled: Date Received: Job Number:	02/06/06 02/07/06 27557

Project: East Side Xenia Road

CASE NARRATIVE

The following information applies to samples which were received on 02/07/06:

The samples were received at the laboratory chilled and sample containers were intact.

Unless otherwise noted below, the Quality Control acceptance criteria were met for all samples for every analysis requested. The date of issue for this report is 02/14/06.

Report approved by:

Tom Wilson 2006.02.14 15:28:49 -08'00'

Tom Wilson
Laboratory Director

ELAP Lab# 2419, 2479, 2527, 2373, 2562

RL: Reporting Limit -- The lowest level at which the compound can be reliably detected under normal laboratory conditions.
ND: Not Detected -- The compound was analyzed for, but was not found to be present at or above the Reporting Limit.
NA: Not Analyzed -- This compound was not on the list of compounds requested for analysis.

951•779•0310 or 800•798•9336 fax 951•779•0344
www.centrum-labs.com 1401 Research Park Drive, Suite 100, Riverside, CA 92507

Centrum Analytical Laboratories, Inc.

Metals by EPA 6010B and EPA 7471A

Client:	Earth Systems	Date Sampled:	02/06/06
Project:	East Side Xenia Road	Date Received:	02/07/06
Job No:	27557	Date Digested:	02/08/06
Matrix:	Soil	Date Analyzed:	02/08/06
Analyst:	TLB	Batch Number:	6010S3564
			7471S1367

		Sample ID:	Blank	Composite: SS-1,2,3	Composite: SS-4,5,6
Metals	**Method**	RL	mg/Kg	mg/Kg	mg/Kg
Antimony	6010B	5.0	ND	ND	ND
Arsenic	6010B	1.0	ND	ND	**1.3**
Barium	6010B	0.50	ND	**70**	**64**
Beryllium	6010B	0.50	ND	ND	ND
Cadmium	6010B	0.50	ND	ND	ND
Chromium	6010B	0.50	ND	**20**	**18**
Cobalt	6010B	0.50	ND	**11**	**11**
Copper	6010B	1.0	ND	**19**	**17**
Lead	6010B	1.0	ND	**9.5**	**8.1**
Molybdenum	6010B	5.0	ND	ND	ND
Nickel	6010B	1.0	ND	**14**	**13**
Selenium	6010B	5.0	ND	ND	ND
Silver	6010B	2.0	ND	ND	ND
Thallium	6010B	10	ND	ND	ND
Vanadium	6010B	5.0	ND	**40**	**37**
Zinc	6010B	10	ND	**56**	**48**
Mercury	7471A	0.02	ND	ND	ND

Centrum Analytical Laboratories, Inc.

QC Sample Report - Metals by EPA 6010B and EPA 7471A

Matrix: Soil

Metals by EPA 6010B

Batch Number: 6010S3564
Spike Sample ID: Laboratory Control Sample
MS/MSD Sample ID: Composite: SS-4,5,6

Analytical Notes:

Compound	Batch Accuracy Results				Batch Precision Results				
	Spike Concentration (mg/Kg)	Spike Sample % Recovery	% Recovery Acceptance Limits	Pass/Fail	MS Sample Result (mg/Kg)	MSD Sample Result (mg/Kg)	Relative Percent Difference (RPD)	RPD Acceptance Limit	Pass/Fail
Antimony	50	102	75 - 125	Pass	42.54	42.68	0%	20%	Pass
Arsenic	50	102	75 - 125	Pass	45.01	45.74	2%	20%	Pass
Barium	50	102	75 - 125	Pass	106.8	100.7	6%	20%	Pass
Beryllium	50	100	75 - 125	Pass	44.32	46.12	4%	20%	Pass
Cadmium	50	103	75 - 125	Pass	43.86	44.71	2%	20%	Pass
Chromium	50	104	75 - 125	Pass	62.48	62.42	0%	20%	Pass
Cobalt	50	104	75 - 125	Pass	52.22	52.69	1%	20%	Pass
Copper	50	102	75 - 125	Pass	63.56	63.79	0%	20%	Pass
Lead	50	102	75 - 125	Pass	50.46	51.19	1%	20%	Pass
Molybdenum	50	100	75 - 125	Pass	41.48	42.35	2%	20%	Pass
Nickel	50	104	75 - 125	Pass	55.31	55.80	1%	20%	Pass
Selenium	50	101	75 - 125	Pass	41.68	42.78	3%	20%	Pass
Silver	50	91	75 - 125	Pass	39.39	40.00	2%	20%	Pass
Thallium	50	102	75 - 125	Pass	39.60	41.29	4%	20%	Pass
Vanadium	50	101	75 - 125	Pass	79.88	78.29	2%	20%	Pass
Zinc	50	107	75 - 125	Pass	92.67	91.52	1%	20%	Pass

Mercury by EPA 7471A

Batch Number: 7471S1367
Spike Sample ID: Laboratory Control Sample
MS/MSD Sample ID: Composite: SS-4,5,6

Analytical Notes:

Compound	Batch Accuracy Results				Batch Precision Results				
	Spike Concentration (mg/Kg)	Spike Sample % Recovery	% Recovery Acceptance Limits	Pass/Fail	MS Sample Result (mg/Kg)	MSD Sample Result (mg/Kg)	Relative Percent Difference (RPD)	RPD Acceptance Limit	Pass/Fail
Mercury	0.42	99	75 - 125	Pass	0.446	0.449	1%	20%	Pass

MS: Matrix Spike
MSD: Matrix Spike Duplicate
LCS: Laboratory Control Sample
LCSD: Laboratory Control Sample Duplicate

Centrum Analytical Laboratories, Inc.

Fuel Screen by GC/FID

Client:	Earth Systems	Date Sampled:	02/06/06
Project:	East Side Xenia Road	Date Received:	02/07/06
Job No.:	27557	Date Extracted:	02/09/06
Matrix:	Soil	Date Analyzed:	02/10/06
Analyst:	JT	Batch Number:	M48015DS1363

Fuel Identified:	Gasoline	Jet Fuel	Diesel	Motor Oil	Extractable Hydrocarbons	Reporting Limits
Units:	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/kg
Method Blank	ND	ND	ND	ND	ND	10
Composite: SS-1, SS-2, SS-3	ND	ND	ND	ND	ND	10
Composite: SS-4, SS-5, SS-6	ND	ND	ND	ND	ND	10

Centrum Analytical Laboratories, Inc.

QC Sample Report - Extractable Hydrocarbons as Diesel by GC/FID

Matrix: Soil
Batch Number: M48015DS1363

Batch Accuracy Results

Spike Sample ID: Laboratory Control Sample

Compound	Spike Concentration (mg/Kg)	Spike Sample % Recovery	% Recovery Acceptance Limits	Pass/Fail
Diesel	500	91	70 - 130	Pass

Analytical Notes:

Batch Precision Results

MS/MSD Sample ID: 27564-1

Compound	MS Sample Result (mg/Kg)	MSD Sample Result (mg/Kg)	Relative Percent Difference (RPD)	RPD Acceptance Limit	Pass/Fail
Diesel	475.4	494.9	4%	25%	Pass

Analytical Notes:

MS: Matrix Spike
MSD: Matrix Spike Duplicate
LCS: Laboratory Control Sample
LCSD: Laboratory Control Sample Duplicate

Centrum Analytical Laboratories, Inc.

Organochlorine Pesticides by EPA 8081A

Client:	Earth Systems	Date Sampled:	02/06/06
Project:	East Side Xenia Road	Date Received:	02/07/06
Job No.:	27557	Date Extracted:	02/10/06
Matrix:	Soil	Date Analyzed:	02/10-11/06
Analyst:	SEC/LB	Batch Number:	PESTS0990

	Sample ID:	Method Blank	SS-7	SS-8	SS-9	SS-10	SS-101
Pesticides	RL	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Aldrin	0.001	ND	ND	ND	ND	ND	ND
Alpha-BHC	0.001	ND	ND	ND	ND	ND	ND
Beta-BHC	0.001	ND	ND	ND	ND	ND	ND
Delta-BHC	0.001	ND	ND	ND	ND	ND	ND
Gamma-BHC (Lindane)	0.001	ND	ND	ND	ND	ND	ND
Technical Chlordane	0.020	ND	ND	ND	ND	**0.036**	ND
4,4'-DDD	0.002	ND	ND	ND	ND	ND	ND
4,4'-DDE	0.002	ND	ND	ND	ND	ND	ND
4,4'-DDT	0.002	ND	ND	ND	ND	ND	ND
Dieldrin	0.002	ND	ND	ND	ND	ND	ND
Endosulfan I	0.001	ND	ND	ND	ND	ND	ND
Endosulfan II	0.002	ND	ND	ND	ND	ND	ND
Endosulfan sulfate	0.002	ND	ND	ND	ND	ND	ND
Endrin	0.002	ND	ND	ND	ND	ND	ND
Endrin Aldehyde	0.002	ND	ND	ND	ND	ND	ND
Endrin Ketone	0.010	ND	ND	ND	ND	ND	ND
Heptachlor	0.001	ND	ND	ND	ND	ND	ND
Heptachlor Epoxide	0.001	ND	ND	ND	ND	ND	ND
Methoxychlor	0.010	ND	ND	ND	ND	ND	ND
Toxaphene	0.020	ND	ND	ND	ND	ND	ND

Surrogates in % Recovery (Acceptance Limits: 50 - 150%)

Sample ID:	Method Blank	SS-7	SS-8	SS-9	SS-10	SS-101
Tetrachloro-m-xylene	75	91	83	71	61	87

Centrum Analytical Laboratories, Inc.

Organochlorine Pesticides by EPA 8081A

Client:	Earth Systems	Date Sampled:	02/06/06
Project:	East Side Xenia Road	Date Received:	02/07/06
Job No.:	27557	Date Extracted:	02/10/06
Matrix:	Soil	Date Analyzed:	02/10-11/06
Analyst:	SEC/LB	Batch Number:	PESTS0990

	Sample ID:	SS-102	SS-103	SS-104	SS-105	SS-106	SS-107
Pesticides	**RL**	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Aldrin	0.001	ND	ND	ND	ND	ND	ND
Alpha-BHC	0.001	ND	ND	ND	ND	ND	ND
Beta-BHC	0.001	ND	ND	ND	ND	ND	ND
Delta-BHC	0.001	ND	ND	ND	ND	ND	ND
Gamma-BHC (Lindane)	0.001	ND	ND	ND	ND	ND	ND
Technical Chlordane	0.020	ND	ND	ND	ND	ND	ND
4,4'-DDD	0.002	ND	ND	ND	ND	ND	ND
4,4'-DDE	0.002	ND	ND	ND	ND	ND	ND
4,4'-DDT	0.002	ND	ND	ND	ND	ND	ND
Dieldrin	0.002	ND	ND	ND	ND	ND	ND
Endosulfan I	0.001	ND	ND	ND	ND	ND	ND
Endosulfan II	0.002	ND	ND	ND	ND	ND	ND
Endosulfan sulfate	0.002	ND	ND	ND	ND	ND	ND
Endrin	0.002	ND	ND	ND	ND	ND	ND
Endrin Aldehyde	0.002	ND	ND	ND	ND	ND	ND
Endrin Ketone	0.010	ND	ND	ND	ND	ND	ND
Heptachlor	0.001	ND	ND	ND	ND	ND	ND
Heptachlor Epoxide	0.001	ND	ND	ND	ND	ND	ND
Methoxychlor	0.010	ND	ND	ND	ND	ND	ND
Toxaphene	0.020	ND	ND	ND	ND	ND	ND

Surrogates in % Recovery (Acceptance Limits: 50 - 150%)

Sample ID:	SS-102	SS-103	SS-104	SS-105	SS-106	SS-107
Tetrachloro-m-xylene	86	91	90	81	84	81

Centrum Analytical Laboratories, Inc.

Organochlorine Pesticides by EPA 8081A

Client:	Earth Systems	Date Sampled:	02/06/06
Project:	East Side Xenia Road	Date Received:	02/07/06
Job No.:	27557	Date Extracted:	02/10/06
Matrix:	Soil	Date Analyzed:	02/10-11/06
Analyst:	SEC/LB	Batch Number:	PESTS0990

	Sample ID:	SS-108	SS-109	SS-110	SS-111	SS-112	Composite: SS-1,2,3
Pesticides	**RL**	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Aldrin	0.001	ND	ND	ND	ND	ND	ND
Alpha-BHC	0.001	ND	ND	ND	ND	ND	ND
Beta-BHC	0.001	ND	ND	ND	ND	ND	ND
Delta-BHC	0.001	ND	ND	ND	ND	ND	ND
Gamma-BHC (Lindane)	0.001	ND	ND	ND	ND	ND	ND
Technical Chlordane	0.020	ND	ND	ND	ND	ND	ND
4,4'-DDD	0.002	ND	ND	ND	ND	ND	ND
4,4'-DDE	0.002	ND	ND	ND	ND	**0.002**	ND
4,4'-DDT	0.002	ND	ND	ND	ND	ND	ND
Dieldrin	0.002	ND	ND	ND	ND	ND	ND
Endosulfan I	0.001	ND	ND	ND	ND	ND	ND
Endosulfan II	0.002	ND	ND	ND	ND	ND	ND
Endosulfan sulfate	0.002	ND	ND	ND	ND	ND	ND
Endrin	0.002	ND	ND	ND	ND	ND	ND
Endrin Aldehyde	0.002	ND	ND	ND	ND	ND	ND
Endrin Ketone	0.010	ND	ND	ND	ND	ND	ND
Heptachlor	0.001	ND	ND	ND	ND	ND	ND
Heptachlor Epoxide	0.001	ND	ND	ND	ND	ND	ND
Methoxychlor	0.010	ND	ND	ND	ND	ND	ND
Toxaphene	0.020	ND	ND	ND	ND	ND	ND

Surrogates in % Recovery (Acceptance Limits: 50 - 150%)

Sample ID:	SS-108	SS-109	SS-110	SS-111	SS-112	Composite: SS-1,2,3
Tetrachloro-m-xylene	80	84	87	79	86	72

Centrum Analytical Laboratories, Inc.

Organochlorine Pesticides by EPA 8081A

Client:	Earth Systems	Date Sampled:	02/06/06
Project:	East Side Xenia Road	Date Received:	02/07/06
Job No.:	27557	Date Extracted:	02/10/06
Matrix:	Soil	Date Analyzed:	02/10-11/06
Analyst:	SEC/LB	Batch Number:	PESTS0990

	Sample ID: Composite: SS-4,5,6	
Pesticides	RL	mg/Kg
Aldrin	0.001	ND
Alpha-BHC	0.001	ND
Beta-BHC	0.001	ND
Delta-BHC	0.001	ND
Gamma-BHC (Lindane)	0.001	ND
Technical Chlordane	0.020	ND
4,4'-DDD	0.002	ND
4,4'-DDE	0.002	ND
4,4'-DDT	0.002	ND
Dieldrin	0.002	ND
Endosulfan I	0.001	ND
Endosulfan II	0.002	ND
Endosulfan sulfate	0.002	ND
Endrin	0.002	ND
Endrin Aldehyde	0.002	ND
Endrin Ketone	0.010	ND
Heptachlor	0.001	ND
Heptachlor Epoxide	0.001	ND
Methoxychlor	0.010	ND
Toxaphene	0.020	ND

Surrogates in % Recovery (Acceptance Limits: 50 - 150%)

	Sample ID: Composite: SS-4,5,6
Tetrachloro-m-xylene	83

Centrum Analytical Laboratories, Inc.

QC Sample Report - Organochlorine Pesticides by EPA 8081A

Matrix: Soil
Batch Number: PESTS0990

Batch Accuracy Results

Spike Sample ID: Laboratory Control Sample

Compound	Spike Concentration (mg/Kg)	Spike Sample % Recovery	% Recovery Acceptance Limits	Pass/Fail
Lindane	0.0067	**82**	61 - 114	**Pass**
Heptachlor	0.0067	**100**	78 - 129	**Pass**
Aldrin	0.0067	**89**	71 - 123	**Pass**
Dieldrin	0.027	**84**	73 - 123	**Pass**
Endrin	0.027	**90**	72 - 133	**Pass**
DDT	0.027	**94**	76 - 128	**Pass**

Analytical Notes:

Batch Precision Results

MS/MSD Sample ID: Laboratory Control Sample

Compound	MS Sample Result (mg/Kg)	MSD Sample Result (mg/Kg)	Relative Percent Difference (RPD)	RPD Acceptance Limit	Pass/Fail
Lindane	0.0055	0.0069	**24%**	25%	**Pass**
Heptachlor	0.0067	0.0078	**16%**	25%	**Pass**
Aldrin	0.0059	0.0071	**17%**	25%	**Pass**
Dieldrin	0.0223	0.0285	**24%**	25%	**Pass**
Endrin	0.0241	0.0305	**24%**	25%	**Pass**
DDT	0.0251	0.0311	**21%**	25%	**Pass**

Analytical Notes:

MS: Matrix Spike
MSD: Matrix Spike Duplicate
LCS: Laboratory Control Sample
LCSD: Laboratory Control Sample Duplicate

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Fax: 562.498.8617

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Chain of Custody Record

Centrum Job # 27557

Please Circle Analyses Requested

Project No:	Project Name:
10437-02	East Side Xenia Road
Project Manager: A. Schriever	**Phone:** (760)345-1588 **Fax:** **email:** aschriever@earthsys.com
Client Name: (Report and Billing) ESSW	**Address:** (Report and Billing) Bermuda Dunes **Note: Reports and Invoice will be sent here**

Centrum ID (Lab use only)	Sample ID (As it should appear on report)	Date sampled	Time sampled	Sample matrix	Site location	Containers: # and type	LUFT Diesel, or EPA 8015B DRO	LUFT Gas, or EPA 8015B GRO	fuel ID (TVH, TEH), Carbon Chain (specify ranges)	8021B: BTEX/MtBE Only	VOCs: 8260B, or 624	VOCs: BTEX/Oxygenates Only	SVOCs: 8270C, or 625	8081A/8082: Pesticides, or PCBs, or Pest/PCB	Metals: Title 22 (CAM), or RCRA, or PP	Metals: TCLP, STLC	pH, TDS, TSS	418.1 (TRPH), or 413.2, or 1664
1	SS-1	2/6/06	0905	S		4oz jar x 2			X					X	X			
2	SS-2		0910						X					X	X			
3	SS-3		0912						X					X	X			
4	SS-4		0920						X					X	X			
5	SS-5		0925						X					X	X			
6	SS-6		0928						X					X	X			
7	SS-7		1035			4oz jar								X				
8	SS-8		1055											X				
9	SS-9		1108											X				
10	SS-10		1115											X				

Composite (23)

Composite (24)

Turn-Around Time see note *
- ☐ 24 Hr. RUSH *
- ☐ 48 Hr. RUSH *
- ☒ Normal TAT
- ☐ Other _____

* Requires PRIOR approval, additional charges apply

Requested due date: _____

Remarks/Special Instructions

	Date:	Time:
1) Relinquished by: (Sampler's Signature)	2/6	0935
2) Received by:	2/7	0935
3) Relinquished by:	2/6	1055
4) Received by:		
5) Relinquished by:		
6) Received for Laboratory by:	2/7/06	10:55

The delivery of samples and the signature on this chain of custody form constitutes authorization to perform the analyses specified above under the Terms and Conditions set forth on the back hereof.

Laboratory Notes:

To be completed by Laboratory personnel:
- Chilled? ☐ Yes Temp ____C ☐ From Field
- Custody seals? ☐ Yes ☐ No
- All sample containers intact? ☐ Yes ☐ No
- ☐ Courier ☐ UPS/Fed Ex ☐ Hand carried

Sample Disposal
- ☐ Client will pick up
- ☐ Return to client
- ☐ Lab disposal

Sample Locator Number: _____

Report Formats: Check all applicable
- ☐ Paper report ☒ PDF report (include email address)
- ☐ LARWQCB ☐ EDF (include global ID) ☐ EDD (GISKEY) ☐ EDD (Other) *

* with prior approval only

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Voice: 562.498.7005
Fax: 562.498.8617

www.centrum-labs.com lab@centrum-labs.com

Chain of Custody Record

Centrum Job # 27557

Project No: 10437-02	Project Name: East side Xenia 2d
Project Manager: A. Schiemer	Phone: (760) 345-1588 Fax: email: aschiemer@earthsys.com
Client Name: (Report and Billing) ESSW	Address: (Report and Billing) Bermuda Dunes Note: Reports and Invoice will be sent here

Please Circle Analyses Requested

Centrum ID (Lab use only)	Sample ID (As it should appear on report)	Date sampled	Time sampled	Sample matrix	Site location	Containers: # and type	LUFT Diesel, or EPA 8015B DRO	LUFT Gas, or EPA 8015B GRO	Fuel ID (V/H, TEH), Carbon Chain (specify ranges)	8021B: BTEX/MTBE Only	VOCs: 8260B, or 624	VOCs: BTEX/Oxygenates Only	SVOCs: 8270C, or 625	Pesticides, or PCBs, or Pest/PCB 8081A/8082:	Metals: Title 22 (CAM), or RCRA, or PP	Metals: TCLP, STLC	pH, TDS, TSS	418.1 (TRPH), or 413.2, or 1664	Remarks/Special Instructions
11	SS-101	2/6/06	1038	S		4oz jar								X					
12	SS-102		1040											X					
13	SS-103		1045											X					
14	SS-104		1050											X					
15	SS-105		1100											X					
16	SS-106		1102											X					
17	SS-107		1104											X					
18	SS-108		1106											X					
19	SS-109		1118											X					
20	SS-110		1120											X					

Turn-Around Time see note *
- ☐ 24 Hr. RUSH *
- ☐ 48 Hr. RUSH *
- ☒ Normal TAT
- ☐ Other _____

* Requires PRIOR approval, additional charges apply

Requested due date: _____

Remarks/Special Instructions

	Date:	Time:
1) Relinquished by: (Sampler's Signature)	2/7	0815
2) Received by:	2/7	0935
3) Relinquished by:	2/7	1055
4) Received by:		
5) Relinquished by:		
6) Received for Laboratory by: A. Jimenez	2/7/06	1055

The delivery of samples and the signature on this chain of custody form constitutes authorization to perform the analyses specified above under the Terms and Conditions set forth on the back hereof.

To be completed by Laboratory personnel:
Chilled? ☐ Yes Temp ___C ☐ From Field
Custody seals? ☐ Yes ☐ No
All sample containers intact? ☐ Yes ☐ No
☐ Courier ☐ UPS/Fed Ex ☐ Hand carried

Sample Disposal
- ☐ Client will pick up
- ☐ Return to client
- ☐ Lab disposal

Sample Locator Number: _____

Laboratory Notes:

Report Formats: Check all applicable
☐ Paper report ☒ PDF report (include email address)
☐ LARWQCB ☐ EDF (include global ID) ☐ EDD (GISKEY) ☐ EDD (Other) *
* with prior approval only

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Signal Hill, CA 90755
Voice: 562.498.7005
Fax: 562.498.8617

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Chain of Custody Record

Centrum Job # 27557

Project No: 10437 - 02	Project Name: East Side Xenia Rd
Project Manager: A. Schriener	Phone: (760)345-1588 Fax: email: aschriener@southsys.com
Client Name: (Report and Billing) ESSW	Address: (Report and Billing) Bermuda Dunes Note: Reports and Invoice will be sent here

Please Circle Analyses Requested

Centrum ID (Lab use only)	Sample ID (As it should appear on report)	Date sampled	Time sampled	Sample matrix	Site location	Containers: # and type	LUFT Diesel, or EPA 8015B DRO	LUFT Gas, or EPA 8015B GRO	Fuel ID (DVH, TEH), Carbon Chain (specify ranges)	8021B: BTEX/MtBE Only	VOCs: 8260B, or 624	VOCs: BTEX/Oxygenates Only	SVOCs: 8270C, or 625	8081/8082: Pesticides, or PCBs, or Pest/PCB	Metals: Title 22 (CAM), or RCRA, or PP	Metals: TCLP, STLC	pH, TDS, TSS	418.1 (TRPH), or 413.2, or 1664	Remarks/Special Instructions
21	SS-111	3/6/06	1123	S		4oz jar								X					
22	SS-112	↓	1126	S		↓								X					

	Date:	Time:		Date:	Time:
1) Relinquished by: (Sampler's Signature)	3/7	0735	3) Relinquished by:	3/7	1055
2) Received by:	3/7	0735	4) Received by:		
			5) Relinquished by:		
			6) Received for Laboratory by:	3/7/06	10:55

The delivery of samples and the signature on this chain of custody form constitutes authorization to perform the analyses specified above under the Terms and Conditions set forth on the back hereof.

Laboratory Notes:

Turn-Around Time (see note *)

- ☐ 24 Hr. RUSH *
- ☐ 48 Hr. RUSH *
- ☒ Normal TAT
- ☐ Other _____

* Requires PRIOR approval, additional charges apply

Requested due date: _____

To be completed by Laboratory personnel:

Chilled? ☐ Yes Temp ___C ☐ From Field

Custody seals? ☐ Yes ☐ No

All sample containers intact? ☐ Yes ☐ No

☐ Courier ☐ UPS/Fed Ex ☐ Hand carried

Sample Disposal

- ☐ Client will pick up
- ☐ Return to client
- ☐ Lab disposal

Sample Locator Number: _____

Report Formats: Check all applicable

☐ Paper report ☒ PDF report (include email address)

☐ LARWQCB ☐ EDF (include global ID) ☐ EDD (GISKEY) ☐ EDD (Other) *

* with prior approval only

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Appendix B

Methods

Appendix B

Methods

Surface soil samples were collected by driving laboratory-supplied glass jars into the soil. The jars were sealed with Teflon-lined lids. All samples were labeled, logged onto a chain-of-custody form, placed in an ice-cooled chest, and delivered to Centrum Analytical Laboratory. Centrum is a California-certified hazardous waste laboratory.

The geophysical survey was conducted by holding the TCM approximately 3 feet above ground and walking in a grid pattern across the former building locations. The grid spacing was approximately 5 feet. The functionality of the TCM was checked by holding it near other metal objects.

Appendix C

Limitations

Appendix C

Limitations

This report has been prepared for the exclusive use of Manors Construction and Development, Inc. The conclusions rendered in this report are opinions based on readily available information obtained to date within the scope of the work authorized by the client. The scope of work for this project was developed to address the needs of the client as part of a property transaction (buy, sell, refinance, etc.) and may not meet the needs of other users. Other parties participating in the transaction for which this project was conducted may also use the information presented in this report, provided said parties agree that ESSW shall have no additional liability arising from such use than described in the contract under which this project was conducted (a copy of that contract will be provided upon request). Any other use of or reliance on the information and opinions contained in this report without the written authorization of ESSW is at the sole risk of the user.

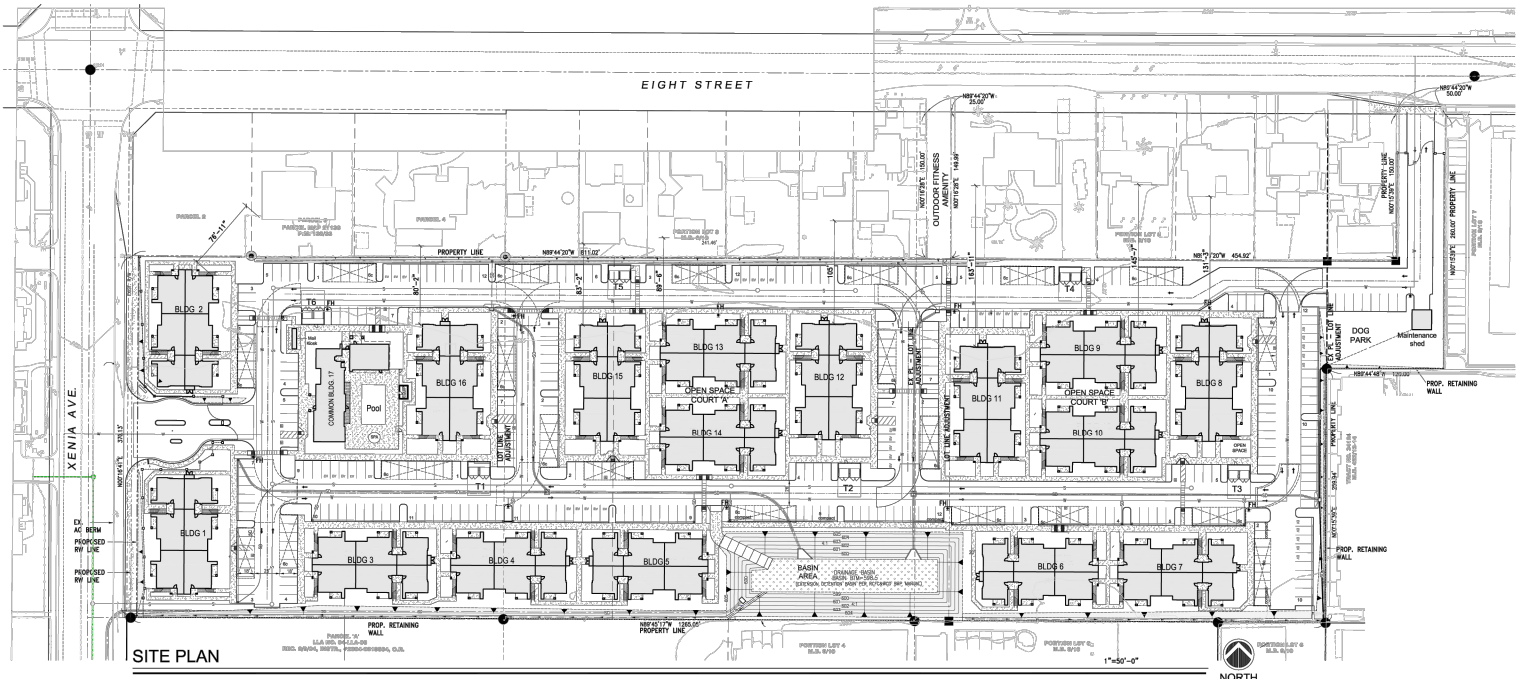
The results contained in this report are based upon the information acquired during the assessment. It should be noted that any level of assessment cannot ascertain that a property is completely free of chemical or toxic substances. It is possible that variations exist beyond or between points explored during the course of the investigation, and that changes in conditions can occur in the future due to the works of man, contaminant migration, variations in rainfall, temperature, and/or other factors not apparent at the time of the field investigation. We believe the scope of work has been appropriate to allow the client to make an informed business decision.

The services performed by ESSW have been conducted in a manner consistent with the level of care and skill ordinarily exercised by members of our profession currently practicing under similar conditions in the site vicinity. No warranty is expressed or implied.

Appendix I

Xenia Multifamily Residential Project Noise Impact Study
RK Engineering Group, Inc.
December 21, 2022

XENIA MULTIFAMILY RESIDENTIAL PROJECT
NOISE IMPACT STUDY
City of Beaumont



XENIA MULTIFAMILY RESIDENTIAL PROJECT
NOISE IMPACT STUDY
City of Beaumont, California

Prepared for:

Mr. Paul Onufer
BEAUMONT LAND PARTNERS, LLC.
556 South Fair Oaks Avenue, Suite 337
Pasadena, CA 91105

Prepared by:

RK ENGINEERING GROUP, INC.
1401 Dove Street, Suite 540
Newport Beach, CA 92660

Bryan Estrada, AICP
Becca Morrison

December 21, 2022

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1.0 Introduction

1.1 Purpose of Analysis and Study Objectives

The purpose of this report is to evaluate the potential noise impacts from the proposed Xenia Multifamily Residential Project (project) and provide recommendations, if necessary, to minimize any project noise impacts. The assessment was conducted within the context of the California Environmental Quality Act (CEQA) and utilizes the noise standards set forth by the applicable Federal, State, and local agencies.

The following is provided in this report:

- A description of the study area and the proposed project
- Information regarding the fundamentals of noise
- Identification of the regulatory setting and applicable noise standards
- Analysis of the existing noise environment
- Analysis of the project's operational noise impact to adjacent receptors
- Analysis of the project's construction noise and vibration impact to adjacent sensitive receptors
- Summary of recommended mitigation measures and project design features to reduce noise level impacts.

1.2 Site Location

The proposed project is located near the southeast corner of Xenia Avenue and Eighth Street, in the City of Beaumont. The project site is located approximately 2,604 feet above sea level and the topography is relatively flat.

The project site location map is provided in Exhibit A.

The project site is currently zoned for Downtown Residential Multi-Family in the City of Beaumont Zoning Map. The City of Beaumont General Plan land use map designates the project site as Downtown Mixed Use.

Several noise sensitive land use areas are present surrounding the project site, including;

- Existing single family residential uses located adjacent to the project site to the north, approximately 50 feet from the nearest building façade (Building-2).

- Existing multifamily residential uses located adjacent to the project site to the east, approximately 100 feet from the nearest building façade (Building-8).

- Existing multifamily residential uses located across Xenia Avenue approximately 149 feet to the west from the nearest building façade (Building-2).

- Existing Sundance Elementary School located across Eighth Street approximately 250 feet to the north of the project site.

1.3 Project Description

The project proposes to construct and operate 192 multifamily residential homes on an approximately 10.93 acre vacant site. The project will also provide ancillary amenities such as a community club and swimming pool. The site plan used for this analysis, provided by SJA DESIGN GROUP, is illustrated in Exhibit B. Table 1 summarizes the proposed project land uses.

Table 1
Land Use Summary

Land Use	Quantity	Metric[1]
Multifamily Housing	192	D.U.

[1]D.U. – Dwelling units; T.S.F. – Thousand Square Feet

The project is proposing to build a six (6) foot noise barrier wall along the northern, southern, eastern and western property lines during the first phase of construction.

This report analyzes long-term and short-term noise impacts associated with the day-to-day operation of the project. The primary sources of long-term noise impacts would be increases in on-site circulation and parking lot noise, dog park activity, and mechanical HVAC units. The project will include an on-site community club/swimming pool that are also a potential source of operational noise. The club and swimming pool will be located near the center of the western end of the site, approximately 130 feet from the nearest property line, and will be blocked from sensitive receptors by the surrounding on-site buildings and equipment will be enclosed within an equipment room. Due to the location of the proposed on-site community club/swimming pool the noise impacts to adjacent properties surrounding the site would be less than significant.

1.4 Summary of Analysis Results

Table 2 provides a summary of the noise analysis results, per the CEQA impact criteria checklist. With the implementation of the recommended mitigation measures, the project is not expected to result in generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

Table 2
CEQA Noise Impact Criteria

Noise Impact Criteria	Potentially Significant	Potentially Significant Unless Mitigated	Less Than Significant Impact	No Impact
Would the project result in?				
a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?			X	
b) Generation of excessive groundborne vibration or groundborne noise levels?			X	
c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?				X

1.5 Recommended Design Features

The following recommended design features are provided to help ensure the project's noise levels remain less than significant and do not adversely impact the adjacent noise sensitive land uses. Design features are typically included in the conditions of approval for the project and are not considered mitigation under CEQA.

DF-1 Prior to the issuance of building permits, the project shall demonstrate building construction will achieve the minimum interior noise standard of 45 dBA CNEL for all residential units, per the California Building Standards Code.

DF-2 The project shall comply with California Title 24 building insulation requirements for exterior walls, roofs and common separating assemblies (e.g. floor/ceiling assemblies and demising walls).

DF-3 For proper acoustical performance, all exterior windows, doors, and sliding glass doors should have a positive seal and leaks/cracks must be kept to a minimum.

DF-4 All HVAC equipment shall be shielded behind parapet walls or enclosed from the line of sight of all adjacent residential properties.

DF-5 Deliveries, loading and unloading activities, and trash pick-up hours should be limited to daytime hours only (7 a.m. – 10 p.m.).

DF-6 Hours of operation for the pool and spa recreation area and dog park should be limited to daytime hours only (7 a.m. – 10 p.m.).

DF-7 Construct a six (6) foot high noise barrier wall along the property lines in the beginning phases of construction to provide shielding to the adjacent noise sensitive receptors. The designed noise screening will only be accomplished if the barrier's weight is at least 3.5 pounds per square foot of face area without decorative cutouts or line-of-site openings between the shielded areas and the project site. All gaps (except for weep holes) should be filled with grout or caulking to avoid flanking.

Noise control barrier may be constructed using one, or any combination of the following materials:

- Masonry block;
- Stucco veneer over wood framing (or foam core), or 1-inch-thick tongue and groove wood of sufficient weight per square foot;
- Transparent glass (3/8-inch-thick), acrylic, polycarbonate, or other transparent material with sufficient weight per square foot.

DF-8 All pool/spa equipment will be enclosed from line of sight behind a solid block wall.

DF-9 Prepare a construction management plan and obtain a construction work permit from the City of Beaumont prior to starting construction. The construction management plan shall ensure all contractors implement

construction best management practices to reduce construction noise levels, such as:

- Construction activities shall not take place between the hours of 6:00 p.m. and 7:00 a.m. on weekdays, including Saturday, or at any time on Sunday or a Federal holiday.

- All construction equipment shall be equipped with muffles and other suitable noise attenuation devices (e.g., engine shields).

- Grading and construction contractors shall use quieter equipment as opposed to noisier equipment (such as rubber-tired equipment rather than track equipment), to the maximum extent feasible.

- If feasible, electric hook-ups shall be provided to avoid the use of generators. If electric service is determined to be infeasible for the site, only whisper-quiet generators shall be used (i.e., inverter generators capable of providing variable load.

- Use electric air compressors and similar power tools rather than diesel equipment, where feasible.

- Locate staging area, generators and stationary construction equipment as far from the adjacent residential homes as feasible.

- Construction-related equipment, including heavy-duty equipment, motor vehicles, and portable equipment, shall be turned off when not in use for more than 5 minutes.

- Provide notifications and signage in readily visible locations along the perimeter of construction sites that indicate the dates and duration of construction activities, as well as provide a telephone number where neighbors can enquire about the construction process and register complaints to a designated construction noise disturbance coordinator.

DF-10 No impact pile driving or blasting activities will be performed on the project site during construction.

2.0 Fundamentals of Noise

This section of the report provides basic information about noise and vibration and presents some of the terms used in the report.

2.1 Sound, Noise, and Acoustics

The sound is a disturbance created by a moving or vibrating source and is capable of being detected by the hearing organs. The sound may be thought of as mechanical energy of a moving object transmitted by pressure waves through a medium to a human ear. For traffic or stationary noise, the medium of concern is air. *Noise* is defined as sound that is loud, unpleasant, unexpected, or unwanted.

2.2 Frequency and Hertz

A continuous sound is described by its *frequency* (pitch) and its *amplitude* (loudness). Frequency relates to the number of pressure oscillations per second. Low-frequency sounds are low in pitch (bass sounding) and high-frequency sounds are high in pitch (squeak). These oscillations per second (cycles) are commonly referred to as Hertz (Hz). The human ear can hear from the bass pitch starting out at 20 Hz all the way to the high pitch of 20,000 Hz.

2.3 Sound Pressure Levels and Decibels

The *amplitude* of a sound determines its loudness. The loudness of sound increases or decreases, as the amplitude increases or decreases. Sound pressure amplitude is measured in units of micro-Newton per square inch meter (N/m2), also called micro-Pascal (μPa). One μPa is approximately one hundred billionths (0.00000000001) of normal atmospheric pressure. Sound pressure level (SPL or L_p) is used to describe in logarithmic units the ratio of actual sound pressures to a reference pressure squared. These units are called decibels and abbreviated as dB.

2.4 Addition of Decibels

Because decibels are on a logarithmic scale, sound pressure levels cannot be added or subtracted by simple plus or minus addition. When two (2) sounds of equal SPL are combined, they will produce an SPL 3 dB greater than the original single SPL. In other words, sound energy must be doubled to produce a 3dB increase.

If two (2) sounds differ by approximately 10 dB the higher sound level is the predominant sound.

2.5 Human Response to Changes in Noise Levels[1]

In general, the healthy human ear is most sensitive to sounds between 1,000 Hz and 5,000 Hz, (A-weighted scale) and it perceives a sound within that range as being more intense than a sound with a higher or lower frequency with the same magnitude. For purposes of this report as well as with most environmental documents, the A-scale weighing is typically reported in terms of A-weighted decibel (dBA). Typically, the human ear can barely perceive the change in the noise level of 3 dB. A change in 5 dB is readily perceptible, and a change in 10 dB is perceived as being twice or half as loud. As previously discussed, a doubling of sound energy results in a 3 dB increase in sound, which means that a doubling of sound energy (e.g. doubling the volume of traffic on a highway), would result in a barely perceptible change in sound level.

2.6 Noise Descriptors

Noise in our daily environment fluctuates over time. Some noise levels occur in regular patterns, others are random. Some noise levels are constant, while others are sporadic. Noise descriptors were created to describe the different time-varying noise levels. Following are the most commonly used noise descriptors along with brief definitions.

A-Weighted Sound Level

The sound pressure level in decibels as measured on a sound level meter using the A-weighted filter network. The A-weighting filter de-emphasizes the very low and very high-frequency components of the sound in a manner similar to the response of the human ear. A numerical method of rating human judgment of loudness.

Ambient Noise Level

The composite of noise from all sources, near and far. In this context, the ambient noise level constitutes the normal or existing level of environmental noise at a given location.

[1] Technical Noise Supplement to the Traffic Noise Analysis Protocol, September 2013.

Community Noise Equivalent Level (CNEL)

The average equivalent A-weighted sound level during a 24-hour day, obtained after addition of five (5) decibels to sound levels in the evening from 7:00 to 10:00 PM and after addition of ten (10) decibels to sound levels in the night before 7:00 AM and after 10:00 PM.

Decibel (dB)

A unit for measuring the amplitude of a sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micro-pascals.

dB(A)

A-weighted sound level (see definition above).

Equivalent Sound Level (LEQ)

The sound level corresponding to a steady noise level over a given sample period with the same amount of acoustic energy as the actual time-varying noise level. The energy average noise level during the sample period.

Habitable Room

Any room meeting the requirements of the Uniform Building Code or other applicable regulations which is intended to be used for sleeping, living, cooking or dining purposes, excluding such enclosed spaces as closets, pantries, bath or toilet rooms, service rooms, connecting corridors, laundries, unfinished attics, foyers, storage spaces, cellars, utility rooms, and similar spaces.

L(n)

The A-weighted sound level exceeded during a certain percentage of the sample time. For example, L10 in the sound level exceeded 10 percent of the sample time. Similarly, L50, L90, and L99, etc.

Noise

Any unwanted sound or sound which is undesirable because it interferes with speech and hearing, or is intense enough to damage hearing, or is otherwise annoying. The State Noise Control Act defines noise as "...excessive undesirable sound...".

Percent Noise Levels

See L(n).

Sound Level (Noise Level)

The weighted sound pressure level obtained by use of a sound level meter having a standard frequency-filter for attenuating part of the sound spectrum.

Sound Level Meter

An instrument, including a microphone, an amplifier, an output meter, and frequency weighting networks for the measurement and determination of noise and sound levels.

Single Event Noise Exposure Level (SENEL)

The dBA level which, if it lasted for one (1) second, would produce the same A-weighted sound energy as the actual event.

2.7 Sound Propagation

As sound propagates from a source it spreads geometrically. The sound from a small, localized source (i.e., a point source) radiates uniformly outward as it travels away from the source in a spherical pattern. The sound level attenuates at a rate of 6 dB per doubling of distance. The movement of vehicles down a roadway makes the source of the sound appear to propagate from a line (i.e., line source) rather than a point source. This line source results in the noise propagating from a roadway in a cylindrical spreading versus a spherical spreading that results from a point source. The sound level attenuates for a line source at a rate of 3 dB per doubling of distance.

As noise propagates from the source, it is affected by the ground and atmosphere. Noise models use the hard site (reflective surfaces) and soft site (absorptive surfaces) to help calculate predicted noise levels. Hard site conditions assume no excessive ground

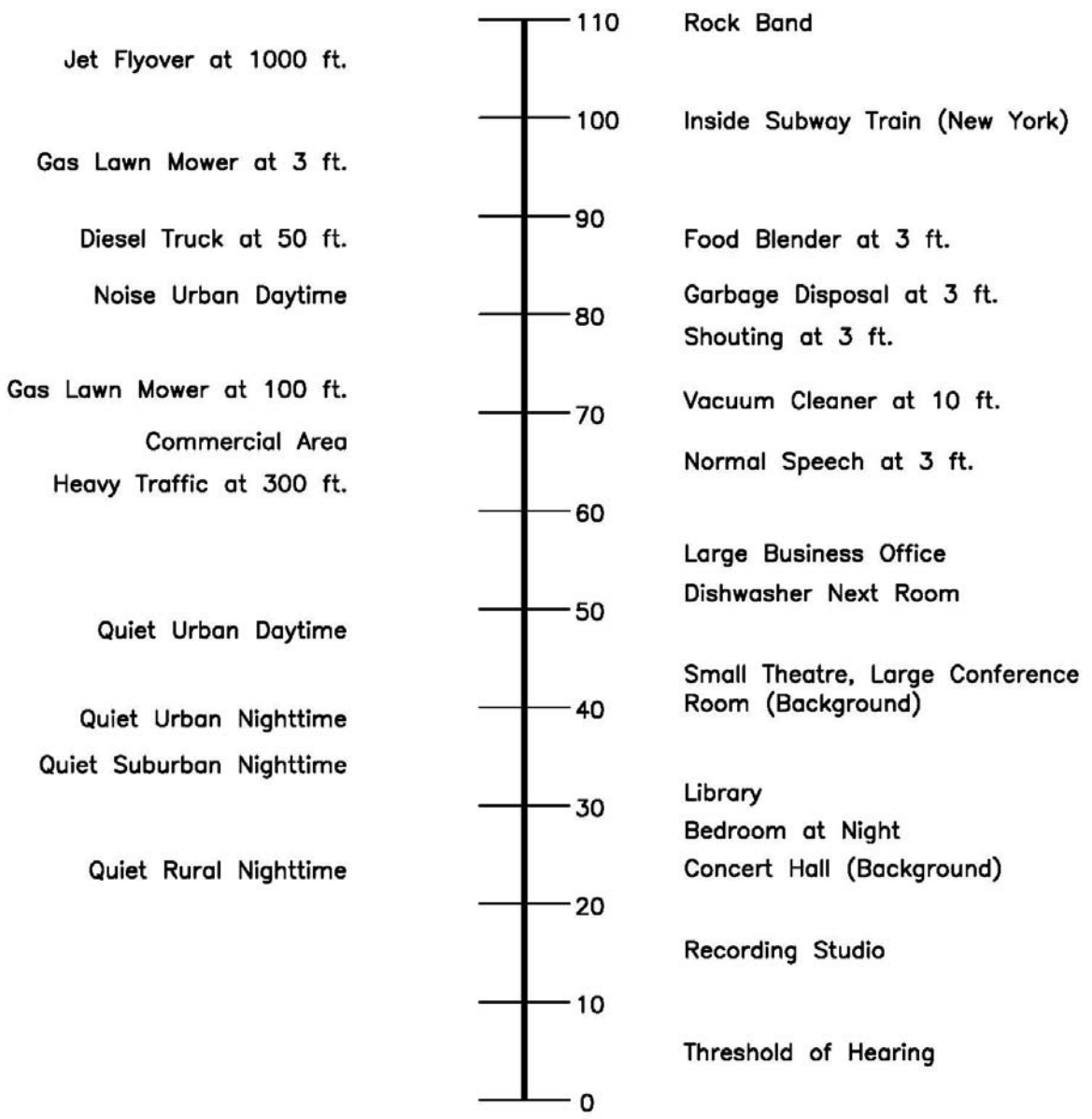
absorption between the noise source and the receiver. Soft site conditions such as grass, soft dirt or landscaping attenuate noise at an additional rate of 1.5 dB per doubling of distance. When added to the geometric spreading, the excess ground attenuation results in an overall noise attenuation of 4.5 dB per doubling of distance for a line source and 6.0 dB per doubling of distance for a point source.

Research has demonstrated that atmospheric conditions can have a significant effect on noise levels when noise receivers are located 200 feet and greater from a noise source. Wind, temperature, air humidity, and turbulence can further impact how far sound can travel.

Figure 1 shows typical sound levels from indoor and outdoor noise sources.

Figure 1[2]

TYPICAL SOUND LEVELS FROM
INDOOR AND OUTDOOR NOISE SOURCES



[2] Technical Noise Supplement to the Traffic Noise Analysis Protocol, September 2013.

2.8 Vibration Descriptors

Ground-borne vibrations consist of rapidly fluctuating motions within the ground that have an average motion of zero. The effects of ground-borne vibrations typically only cause a nuisance to people, but at extreme vibration levels, damage to buildings may occur. Although ground-borne vibration can be felt outdoors, it is typically only an annoyance to people indoors where the associated effects of the shaking of a building can be notable. Ground-borne noise is an effect of ground-borne vibration and only exists indoors since it is produced from noise radiated from the motion of the walls and floors of a room and may also consist of the rattling of windows or dishes on shelves.

Several different methods are used to quantify vibration amplitude.

PPV

Known as the peak particle velocity (PPV) which is the maximum instantaneous peak in vibration velocity, typically given in inches per second.

RMS

Known as the root mean squared (RMS) can be used to denote vibration amplitude.

VdB

A commonly used abbreviation to describe the vibration level (VdB) for a vibration source.

2.9 Vibration Perception

Typically, developed areas are continuously affected by vibration velocities of 50 VdB or lower. These continuous vibrations are not noticeable to humans whose threshold of perception is around 65 VdB. Outdoor sources that may produce perceptible vibrations are usually caused by construction equipment, steel-wheeled trains, and traffic on rough roads, while smooth roads rarely produce perceptible ground-borne noise or vibration. To counter the effects of ground-borne vibration, the Federal Transit Administration (FTA) has published guidance relative to vibration impacts.

2.10 Vibration Propagation

There are three main types of vibration propagation: surface, compression, and shear waves. Surface waves, or Rayleigh waves, travel along the ground's surface. These waves carry most of their energy along an expanding circular wavefront, similar to ripples produced by throwing a rock into a pool of water. P-waves, or compression waves, are body waves that carry their energy along an expanding spherical wavefront. The particle motion in these waves is longitudinal (i.e., in a "push-pull" fashion). P-waves are analogous to airborne sound waves. S-waves, or shear waves, are also body waves that carry energy along an expanding spherical wavefront. However, unlike P-waves, the particle motion is transverse, or side-to-side and perpendicular to the direction of propagation.

As vibration waves propagate from a source, the vibration energy decreases in a logarithmic nature and the vibration levels typically decrease by 6 VdB per doubling of the distance from the vibration source. As stated above, this drop-off rate can vary greatly depending on the soil but has been shown to be effective enough for screening purposes, in order to identify potential vibration impacts that may need to be studied through actual field tests.

2.11 Construction-Related Vibration Level Prediction[3]

Operational activities are separated into two different categories. The vibration can be transient or continuous in nature. Each category can result in varying degrees of ground vibration, depending on the equipment used on the site. Operation of equipment causes ground vibrations that spread through the ground and diminish in strength with distance. Buildings in the vicinity of the project area site respond to these vibrations with varying results ranging from no perceptible effects at the low levels to slight damage at the highest levels. The thresholds from Caltrans Transportation and Construction Vibration Guidance Manual, April 2020, in the table below provide general guidelines as to the maximum vibration limits for when vibration becomes potentially annoying.

[3] Caltrans Transportation and Construction Vibration Guidance Manual, April 2020

Table 3
Vibration Annoyance Potential Criteria

Human Response	PPV (in/sec)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Barely perceptible	0.04	0.01
Distinctly perceptible	0.25	0.04
Strongly perceptible	0.90	0.10
Severe	2.00	0.40

Note: Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

The Caltrans Transportation and Construction Vibration Guidance Manual, April 2020 provides general thresholds and guidelines as to the vibration damage potential from vibratory impacts. The table below provides general vibration damage potential thresholds:

Table 4
Vibration Damage Potential Threshold Criteria

Structure and Condition	PPV (in/sec)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Extremely fragile historic buildings ruin ancient monuments	0.12	0.08
Fragile buildings	0.20	0.10
Historic and some old buildings	0.50	0.25
Older residential structures	0.50	0.30
New residential structures	1.00	0.50
Modern industrial/commercial buildings	2.00	0.50

Soil conditions have an impact on how vibration propagates through the ground. The Caltrans Transportation and Construction Vibration Guidance Manual, April 2020 provides suggested "n" values based on soil class. The table below outlines the manual's suggested values and description.

Table 5
Suggested "n" Values Based on Soil Classes

Soil Class	Description of Soil Material	Suggested Value of "n"
I	Weak or soft soils: loose soils, dry or partially saturated peat and muck, mud, loose beach sand, and dune sand.	1.4
II	Most sands, sandy clays, silty clays, gravel, silts, weathered rock.	1.3
III	Hard soils: densely compacted sand, dry consolidated clay, consolidated glacial till, some exposed rock.	1.1
IV	Hard, component rock: bedrock, freshly exposed hard rock.	1.0

3.0 Regulatory Setting

The proposed project is located in the City of Beaumont and noise regulations are addressed through the various federal, state, and local government agencies. The agencies responsible for regulating noise are discussed below.

3.1 Federal Regulations

The adverse impact of noise was officially recognized by the federal government in the Noise Control Act of 1972, which serves three (3) purposes:

- Publicize noise emission standards for interstate commerce
- Assist state and local abatement efforts
- Promote noise education and research

The Federal Office of Noise Abatement and Control (ONAC) was originally tasked with implementing the Noise Control Act. However, it was eventually eliminated leaving other federal agencies and committees to develop noise policies and programs. Some examples of these agencies are as follows: The Department of Transportation (DOT) assumed a significant role in noise control through its various agencies. The Federal Aviation Agency (FAA) is responsible to regulate noise from aircraft and airports. The Federal Highway Administration (FHWA) is responsible to regulate noise from the interstate highway system. The Occupational Safety and Health Administration (OSHA) is responsible for the prohibition of excessive noise exposure to workers.

The Federal government and the State advocate that local jurisdiction use their land use regulatory authority to arrange new development in such a way that "noise sensitive" uses are either prohibited from being constructed adjacent to a highway or, or alternatively that the developments are planned and constructed in such a manner that potential noise impacts are minimized.

Since the Federal government and the State have preempted the setting of standards for noise levels that can be emitted by the transportation source, the City is restricted to regulating the noise generated by the transportation system through nuisance abatement ordinances and land use planning.

3.2 State Regulations

Established in 1973, the California Department of Health Services Office of Noise Control (ONC) was instrumental in developing regularity tools to control and abate noise for use by local agencies. One significant model is the "Land Use Compatibility for Community Noise Environments Matrix." The matrix allows the local jurisdiction to clearly delineate compatibility of sensitive uses with various incremental levels of noise.

The State of California has established noise insulation standards as outlined in Title 24 and the Uniform Building Code (UBC) which in some cases requires acoustical analyses to outline exterior noise levels and to ensure interior noise levels do not exceed the interior threshold. The State mandates that the legislative body of each county and city adopt a noise element as part of its comprehensive general plan. The local noise element must recognize the land use compatibility guidelines published by the State Department of Health Services. The guidelines rank noise land use compatibility in terms of normally acceptable, conditionally acceptable, normally unacceptable, and clearly unacceptable.

Noise insulation design standards for residences have been established by the State of California Uniform Building Code (UBC) Chapter 12, Division II and by the Title 24 noise insulation standards of the California Administrative Code. The City is required by the State Housing Law to adopt these State codes as minimum performance standards. The City may enact stricter noise standards throughout the city or on a case-by-case basis if deemed necessary. In brief, the Title 24 noise standards require the following for multi-family dwellings:

1. Party wall and floor-ceiling assembly designs must provide a minimum STC of 50, based on lab tests. Field tested assemblies must provide a minimum noise isolation class (NIC) of 45.

2. Floor-ceiling assembly designs must provide for a minimum impact insulation class (IIC) of 50, based on lab tests. Field tested assemblies must provide a minimum FIIC of 45.

3. Entry doors from interior corridors must provide an STC of 26 or more.

4. Penetrations or openings in sound rated assemblies must be treated to maintain required ratings.

5. Interior noise levels due to exterior sources must not exceed a community noise equivalent level (CNEL) or a day-night level (LDN) of 45 dBA, in any habitable room.

Thus, the interior limit is 45 dBA CNEL between dwelling units and from exterior noise sources to interior living spaces.

3.3 City of Beaumont Noise Regulations

The project is required to comply with the noise standards and thresholds established within the City of Beaumont Municipal Code Chapter 9.02 Noise Control and Chapter 10 Noise in the Beaumont General Plan. The noise standards from the General Plan and Municipal code are provided in Appendix A.

3.3.1 City of Beaumont Municipal Code Noise Standards

The City of Beaumont Municipal Code, Chapter 9.02, Noise Control, establishes criteria and standards for the regulation of noise levels within the City and to implement the noise provisions contained in the City's General Plan.

The City of Beaumont has established Base Ambient Noise Level (BANL) to assessing noise level violations within the City.

Table 6 shows the Base Ambient Noise Levels for the project site and surrounding residential land uses.

Table 6
City of Beaumont Municipal Code
Base Ambient Noise Level[1]

Land Use	Time Period	BANL
Residential	7:00 AM – 10:00 PM	55 dB (A)
	10:00 PM – 7:00 AM	45 dB (A)
Industrial and Commercial	7:00 AM – 10:00 PM	75 dB (A)
	10:00 PM – 7:00 AM	50 dB (A)

[1] Actual decibel measurements exceeding the levels set forth hereinabove at the times and within the zones corresponding thereto shall be employed as the "base ambient noise level" referred to in this Chapter. Otherwise, no ambient noise shall be deemed to be less than the above specified levels.

Table 7 shows the maximum allowable exterior noise levels for the residential uses from the City of Beaumont Municipal Code Section 9.02.070.

Table 7
City of Beaumont Municipal Code
Maximum Residential Noise Levels[1]

Nosie Level Exceeded	Maximum
5 dB (A) above BANL	15 minutes any hour
10 dB (A) above BANL	5 minutes any hour
15 dB (A) above BANL	1 minutes any hour
20 dB (A) above BANL	Not Permitted

[1] BMC 9.02.070.

3.3.2 Construction Noise Regulations

City's Municipal Code Section 9.02.110 – Special Provisions F. Construction, Landscape, Maintenance or Repair states that the following regarding construction noise:

- It shall be unlawful for any person to engage in or permit the generation of noise related to landscape maintenance, construction including erection, excavation, demolition, alteration or repair of any structure or improvement, at such sound levels, as measured at the property line of the nearest adjacent occupied property, as to be in excess of the sound levels permitted under this Chapter, at other times than between the hours of 7:00 a.m. and 6:00 p.m. The person engaged in such activity is hereby permitted to exceed sound levels otherwise set forth in this Chapter for the duration of the activity during the above-described hours for purposes of construction. However, nothing contained herein shall permit any person to cause sound levels to at any time exceed 55 dB(A) for intervals of more than 15 minutes per hour as measured in the interior of the nearest occupied residence or school.

- Whenever a construction site is within one-quarter of a mile of an occupied residence or residences, no construction activities shall be undertaken between the hours of 6:00 p.m. and 6:00 a.m. during the months of June through September and between the hours of 6:00 p.m. and 7:00 a.m. during the months of October through May. Exceptions to these standards shall be allowed only with the written consent of the building official.

4.0 Study Method and Procedures

The following section describes the measurement procedures, measurement locations, and noise modeling procedures and assumptions used in the noise analysis.

4.1 Measurement Procedures and Criteria

Noise measurement is taken to determine the existing noise level. A noise receiver or receptor is any location in the noise analysis in which noise might produce an impact. The following criteria are used to select measurement locations and receptors:

- Locations expected to receive the highest noise impacts, such as the first row of houses
- Locations that are acoustically representative and equivalent of the area of concern
- Human land usage
- Sites clear of major obstruction and contamination

RK conducted the sound level measurement in accordance with Caltrans technical noise specifications. All measurement equipment meets American National Standards Institute (ANSI) specifications for sound level meters (S1.4-1983 identified in Chapter 19.68.020.AA).

A Piccolo-II Type 2 integrating-averaging level meter was used to conduct short-term (10-minutes) noise measurement at the project site and property boundary.

The Leq, Lmin, Lmax, L2, L8, L25, and L50 statistical data were recorded over the measurement time period intervals and the information was utilized to define the noise characteristics for the project. The following gives a brief description of the Caltrans Technical Noise Supplement procedures for sound level measurements:

- Microphone for sound level meter was placed five (5) feet above the ground for short-term noise measurement.
- Sound level meter was calibrated before and after each measurement
- Following the calibration of equipment, a windscreen was placed over the microphone
- Frequency weighting was set on "A" and slow response
- Temperature and sky conditions were observed and documented

Appendix B includes photos, field sheets, and measured noise data.

4.2 Stationary Noise Modeling

The stationary noise was projected using a computer program that replicates the FHWA Noise Prediction Model (FHWA-RD-77-108). The FHWA model arrives at the predicted noise level through a series of adjustments to the reference energy noise level. For stationary source, the following noise level was applied to the model. The model outputs the projected noise level based on the following key parameters:

- Referenced noise level – (e.g. how loud a source is at a specific distance)
- Vertical and horizontal distances (sensitive receptor distance from noise source)
- Noise barrier vertical and horizontal distances (noise barrier distance from sound source and receptor).
- Typical noise source spectra
- Topography
- Table 8 indicates the referenced noise level used in this analysis.

Table 8
Reference Noise Levels

Source	Distance from Source (feet)	Noise Levels (dBA)
		Leq
HVAC Condenser Unit	3.0	77.0
Dog Park	60	60.4
Parking Lot	5.0	63.8

To estimate the future noise levels during typical conditions, RK adjusted the reference noise levels at approximately 50 feet for HVAC noise, 27 feet for dog park noise, and 20 feet for parking lot noise. Adjusted noise levels are based on the distance of the receptor location relative to the noise source and local topography.

4.3 Construction Noise Modeling

The construction noise analysis utilizes the Federal Highway Administration (FHWA) Roadway Construction Noise Model, together with several key construction parameters.

Key inputs include distance to the sensitive receiver, equipment usage, and baseline parameters for the project site. This study evaluates the potential exterior noise impacts during each phase of construction. Noise levels were projected at an average distance of 180 feet for equipment operating over an 8-hour period from to the nearest sensitive receptor property line. While some construction noise activity may occur closer than 180 feet from the property line, noise levels are averaged over an 8-hour period for purposes of assessing impacts.

- Construction phasing and equipment usage assumptions are referenced from the Xenia Multifamily Residential Project AQ & GHG Study, by RK Engineering, December 2021.

4.4 Construction Vibration Modeling

The construction vibration assessment is based on the methodology set-forth within the Caltrans Transportation and Construction Vibration Guidance Manual, April 2020. The vibration impacts from vibratory rollers and compactors, heavy truck loading and bulldozer activity is analyzed. All vibratory activity is analyzed as a continuous and/or frequent event and is required to comply with the applicable guidance thresholds criteria. It is expected that vibration levels will be highest during paving phase. No impact pile driving is expected as part of this project.

Vibratory impacts were calculated from the site area property line to the closest sensitive receptors and structures using the reference vibration levels, soil conditions and the reference equation *PPV= PPV ref (25/D)^n (in/sec)* (from Caltrans Manual) where:

PPV = reference measurement at 25 feet from vibration source
D = distance from equipment to property line
n= vibration attenuation rate through ground (n=1.1 was utilized for this study)

5.0 Existing Noise Environment

The existing noise environment for the project site and surrounding area has been established based on noise measurement data collected by RK and the City of Beaumont Base Ambient Noise Levels.

5.1 Short-Term (10-Minute) Noise Measurement Result

To determine the existing noise level environment, RK conducted one (1) short-term noise measurement at the project study area.

Noise levels were measured on December 9, 2021 using a Piccolo-II Type 2 integrating-averaging sound level meter. The information was utilized to establish the noise characteristics of the existing ambient environment.

The noise monitoring location was selected based on the proximity and location to adjacent sensitive receptors. Exhibit C graphically illustrates the location of the short-term measurements.

Table 9
Short-Term Noise Measurement Results – Ambient Conditions[1]

Event	Start Time	Leq	Lmin	Lmax	L_2	L_8	L_{25}	L_{50}
ST-1	2:46 PM	59.6	55.1	68.8	63.6	61.9	60.1	58.9

[1] Noise measurement conducted for 10-minute interval.

- Short-term noise monitoring location one (ST-1) was taken along the northwest corner of the project site, approximately 110 feet from the western property line and 30 feet from the northern property line. Ambient noise includes traffic noise from the adjacent roadways.

It should be noted that the existing daytime noise levels at the project site and surrounding uses are approximately 59.6 dBA and currently exceeding the City of Beaumont Baseline Ambient Noise Levels of 55 dBA for residential uses. Therefore, the daytime BANL threshold used in this analysis has been increased to the measured 59.6 dBA noise level. Because no noise measurements were taken during nighttime hours, nighttime noise impacts are analyzed using the City of Beaumont Nighttime Baseline Ambient Noise Levels of 45 dBA.

6.0 Operational Noise Impacts

This assessment analyzes the anticipated noise levels generated by the project and impacts caused by changes to the ambient environment. The main sources of noise generated by the project would include HVAC equipment noise, dog park noise, and on-site vehicular circulation and parking lot noise. Noise level impacts are compared to the City of Beaumont noise standards.

The project must demonstrate that noise levels generated by the project site would not result in a permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

6.1 Stationary Source Noise Impacts

The project is not expected to consist of significant sources of stationary noise. The main sources of potential stationary noise impacts from the project would include on-site noise from vehicular circulation and parking lot noise, the dog park, and HVAC units.

The types of on-site noise from the project are typically considered compatible with other adjacent residential uses and would not typically be categorized as loud, unnecessary, or unusual noise that disturbs the peace or quiet of any neighborhood, or that causes discomfort or annoyance to any person of normal sensitiveness. In particular, social activities and vehicular related noise are generally substantially less during the noise sensitive nighttime hours.

Mechanical HVAC will be located on the rooftop of each building and will be shielded behind parapet walls. The nearest noise sensitive receptors are existing single family residential homes located approximately 50 feet away from the Building-2 façade. All other adjacent noise sensitive receptors are located farther than 50 feet from the nearest building façade. Therefore, this evaluation provides a worst-case assessment of HVAC noise impacts at 50 feet.

The dog park will be located at the northeast corner of the property. The nearest noise sensitive receptors are existing residential land uses located approximately 44 feet from the center of the proposed dog park. All other adjacent noise sensitive receptors are located farther than 44 feet from the center of the proposed dog park. Therefore, this evaluation provides a worst-case assessment of dog park noise at 44 feet.

On-site vehicular noise would occur from vehicle engine idling and exhaust, doors slamming, tires screeching, people talking, and the occasional horn honking. The vehicular noise would occur approximately 20 feet from the northern and eastern property line of the project site.

The project will also include an on-site community club/swimming pool that is a potential source of operational noise. The club and swimming pool will be located near the center of the western end of the site, approximately 130 feet from the nearest property line, and will be blocked from sensitive receptors by the surrounding on-site buildings and equipment will be enclosed within an equipment room. Due to the location of the proposed on-site community club/swimming pool the noise impacts to adjacent properties surrounding the site would be less than significant.

The project is proposing to build a six (6) foot noise barrier wall along the northern, southern, eastern, and western property lines and the noise study has taken the applicable noise barrier shielding into account during the analysis.

It should be noted that the existing daytime noise levels at the project site and surrounding uses are approximately 59.6 dBA and currently exceeding the City of Beaumont Baseline Ambient Noise Levels of 55 dBA for residential uses. Therefore, the daytime BANL threshold used in this analysis has been increased to the measured 59.6 dBA noise level. Because no noise measurements were taken during nighttime hours, nighttime noise impacts are analyzed using the City of Beaumont Nighttime Baseline Ambient Noise Levels of 45 dBA.

Table 10
Stationary Noise Impact Analysis

Noise Source	Exterior Noise Level (Leq) dBA[1]	
	Daytime 7:00 a.m. to 10:00 p.m.	**Nighttime 10:00 p.m. to 7:00 a.m.**
HVAC Unit	39.6	39.6
Dog Park	56.9	0.0[2]
Parking Lot	41.4	41.4
Base Ambient Noise Level (BANL)[3]	59.6	45.0
Combined Noise Level	**61.5**	**47.4**
Increase in BANL	1.9	2.4
Beaumont Noise Level Criteria	5 dBA above BANL	5 dBA above BANL
Noise Level Exceeds Standard (?)	**No**	**No**

[1] Stationary HVAC noise calculation worksheets are shown in Appendix C.
[2] The proposed dog park will not be permitted to run during nighttime hours. Therefore, there is assumed to be no nighttime noise impact.
[3] Daytime Baseline Ambient Noise Levels reflect ambient noise measurements performed by RK. Nighttime Baseline Ambient Noise Levels reflect the City of Beaumont standards.

As shown in Table 10, operational noise levels generated by the project are not expected to cause an increase in the Baseline Ambient Noise Level by more than 5 dBA. As a result, the project would not exceed the City's daytime or nighttime noise standards at the nearest adjacent noise sensitive land uses and the impact is considered less than significant.

The project operational noise calculation worksheets are shown in Appendix C.

6.3 Noise/Land Use Compatibility

The project's noise/land use compatibility setting is reviewed to determine future noise levels to habitable exterior and interior areas on the project site. This section of the analysis is intended to satisfy the City of Beaumont General Plan Noise Element Objectives and Policies which helps ensure resident's quality of life is not affected adversely by high noise levels. The project's noise/land use compatibility is not necessarily applicable to CEQA, as recent court rulings have indicated that CEQA is primarily concerned with the project's impact of the environment, not the environment's impact on a project.

Based on the Beaumont General Plan Chapter 10: Noise, Figure 10.2 Future Noise Contours from Transportation, the project would be located within a 65 dBA CNEL noise contour. According to the City of Beaumont General Plan, the standard for maximum outdoor noise levels in residential areas in California, and the City specifically, is a CNEL of 65 dBA. Therefore, the project is considered compatible with the surrounding land use and noise environment.

6.4 Recommended Operational Design Features

The following recommended project design features include standard rules and requirements, best practices and recognized design guidelines for reducing noise levels. Design features are assumed to be part of the conditions of the project and integrated into its design. Design features are not typically considered mitigation under CEQA.

DF-1 Prior to the issuance of building permits, the project shall demonstrate building construction will achieve the minimum interior noise standard of 45 dBA CNEL for all residential units, per the California Building Standards Code.

DF-2 The project shall comply with California Title 24 building insulation requirements for exterior walls, roofs and common separating assemblies (e.g. floor/ceiling assemblies and demising walls).

DF-3 For proper acoustical performance, all exterior windows, doors, and sliding glass doors should have a positive seal and leaks/cracks must be kept to a minimum.

DF-4 All HVAC equipment shall be shielded behind parapet walls or enclosed from the line of sight of all adjacent residential properties.

DF-5 Deliveries, loading and unloading activities, and trash pick-up hours should be limited to daytime hours only (7 a.m. – 10 p.m.).

DF-6 Hours of operation for the pool and spa recreation area and dog park should be limited to daytime hours only (7 a.m. – 10 p.m.).

DF-7 Construct the six (6) foot high noise barrier wall along the property lines in the beginning phases of construction to provide shielding to the adjacent noise sensitive receptors. The designed noise screening will only be accomplished if the barrier's weight is at least 3.5 pounds per square foot of face area without decorative cutouts or line-of-site openings between the

shielded areas and the project site. All gaps (except for weep holes) should be filled with grout or caulking to avoid flanking.

Noise control barrier may be constructed using one, or any combination of the following materials:

- Masonry block;
- Stucco veneer over wood framing (or foam core), or 1-inch-thick tongue and groove wood of sufficient weight per square foot;
- Transparent glass (3/8-inch-thick), acrylic, polycarbonate, or other transparent material with sufficient weight per square foot.

DF-8 All pool/spa equipment will be enclosed from line of sight behind a solid block wall.

7.0 Construction Noise and Vibration Impacts

Temporary construction noise and vibration impacts have been assessed from the project site to the surrounding adjacent land uses. The degree of construction noise will vary depending on the type of construction activity taking place and the location of the activity relative to the surrounding properties.

The City of Beaumont Municipal Code (BMC) Chapter 9.02 establishes City-wide standards regulating noise for residential zones, public places, and motor vehicles. BMC Chapter 9.02.110 states that no construction activities may occur within one-quarter mile from an occupied residential dwelling between the hours of 6:00 p.m. and 6:00 a.m. during the months of June through September, and between the hours of 6:00 p.m. and 7:00 a.m. between the months of October through May, unless such activities are permitted under written consent of the City's Building Official.

For the purposes of this study, expected construction noise levels will be analyzed using the General Assessment construction noise criteria provided by the FTA. Estimated construction noise levels have been analyzed from the center of the project site to the nearest sensitive receptor property line, approximately 180 feet. Although construction activities are exempt from the noise standards in the City's Municipal Code, CEQA requires that potential noise impacts still be disclosed for informational purposes.

Construction phasing and equipment usage assumptions are referenced from:

- *Xenia Multifamily Residential Project AQ & GHG Impact Study, by RK Engineering Group, December 2021.*

7.1 Typical Construction Noise Levels

Table 11 shows typical construction noise levels compiled by the Environmental Protection Agency (EPA) for common type construction equipment. Typical construction noise levels are used to estimate potential project construction noise levels at the adjacent sensitive receptors.

Table 11
Typical Construction Noise Levels[1]

Type	Noise Levels (dBA) at 50 Feet
Earth Moving	
Compactors (Rollers)	73 - 76
Front Loaders	73 - 84
Backhoes	73 - 92
Tractors	75 - 95
Scrapers, Graders	78 - 92
Pavers	85 - 87
Trucks	81 - 94
Materials Handling	
Concrete Mixers	72 - 87
Concrete Pumps	81 - 83
Cranes (Movable)	72 - 86
Cranes (Derrick)	85 - 87
Stationary	
Pumps	68 - 71
Generators	71 - 83
Compressors	75 - 86
Impact Equipment	
Pneumatic Wrenches	82 - 87
Jack Hammers, Rock Drills	80 - 99
Pile Drivers (Peak)	95-105
Other	
Vibrators	68 - 82
Saws	71 - 82

[1] Referenced Noise Levels from the Environmental Protection Agency (EPA)

7.2 Construction Noise Impact Analysis

This assessment analyzes potential noise impacts during all expected phases of construction, including site preparation, grading, building construction, paving, and architectural coating. Noise levels are calculated based on an average distance of equipment over an 8-hour period to the nearest adjacent property. The project's estimated construction noise levels have been calculated using the Federal Highway Administration Roadway Construction Noise Model Version 1.1. Tables 12 show the noise level impacts to the receptor at 180 feet.

Table 12
Project Construction Noise Levels – at 180 Feet

Phase	Equipment	Quantity	Equipment Noise Level at 180ft (dBA Leq)	Combined Noise Level (dBA Leq)
Site Preparation	Rubber Tired Dozers	3	70.6	80.5
	Tractors/Loaders/Backhoes	4	72.9	
Grading	Excavators	2	69.6	81.1
	Graders	1	73.9	
	Rubber Tired Dozers	1	70.6	
	Scrapers	2	72.5	
	Tractors/Loaders/Backhoes	2	72.9	
Building Construction	Cranes	1	69.5	79.3
	Forklifts	3	63.9	
	Generator Sets	1	69.5	
	Tractors/Loaders/Backhoes	3	72.9	
	Welders	1	62.9	
Paving	Cement and Mortar Mixer	2	67.7	74.5
	Pavers	2	66.1	
	Paving Equipment	2	66.1	
Architectural Coating	Air Compressors	1	66.6	66.6
Worst Case Construction Phase Noise Level - Leq (dBA) – **without wall**				81.1
Worst Case Construction Phase Noise Level - Leq (dBA) – **with wall**				70.8

As shown in Table 12, the project is expected to generate noise levels of approximately 70.8 dBA at 180 feet with the proposed noise barrier wall. Construction noise calculation worksheets are provided in Appendix D.

Per the City of Beaumont Municipal Code Section 9.02.110(F), construction-related noise shall not exceed 55 dBA for more than 15 minutes per hour as measured in the interior of the nearest occupied residence or school.

Based on the above construction noise levels, the proposed project may expose adjacent sensitive receptors to noise levels that exceed the City's maximum allowable standards for interior noise exposure. Therefore, to ensure that interior noise levels fall within allowable levels, the following preliminary interior noise analysis has been performed.

The preliminary interior noise analysis has been prepared for the nearest off-site sensitive receptor locations using a typical "windows closed" condition. A "windows open" condition assumes standard California construction windows (STC ≥ 25) with 20 dBA of noise attenuation from the exterior noise level.

Table 13 indicates the interior noise levels for the residential uses adjacent to the project site.

Table 13
Interior Noise Analysis – Construction Noise

Receptor Location	Exterior Noise Level at Building Facade (dBA Leq)	Interior Noise Standard[1] (dBA Leq)	Interior Noise Level with "Windows Closed" Conditions (dBA Leq)
Existing residential land uses located north of the project site	70.8	55.0	50.8

[1]Source: City of Beaumont Municipal Code Section 9.02.110(F).
[2]A minimum of 20 dBA noise reduction is assumed with the "windows closed" condition and standard California construction windows (STC ≥ 25).

Based on the above interior noise analysis, adjacent sensitive receptor locations will not experience interior noise levels greater than 55 dBA during project construction. Therefore, the construction noise-related impacts are considered less than significant.

7.3 Construction Vibration

To determine the vibratory impacts during construction, reference construction equipment vibration levels were utilized and then extrapolated to the façade of the nearest adjacent structures. The nearest sensitive receptors are the residential structures located approximately 10 feet from the western property line. All structures surrounding the project site are "new residential structures". No historical or fragile buildings are known to be located within the vicinity of the site.

The construction of the proposed project is not expected to require the use of substantial vibration inducing equipment or activities, such as pile drivers or blasting. The main sources of vibration impacts during construction of the project would be the operation of equipment such as bulldozer activity during demolition, loading trucks during grading and excavation, and vibratory rollers during paving.

The construction vibration assessment utilizes the referenced vibration levels and methodology set-forth within the from Caltrans Transportation and Construction Vibration Guidance Manual, April 2020. Table 14 shows the referenced vibration levels.

Table 14
Typical Construction Vibration Levels[1]

Equipment	Peak Particle Velocity (PPV) (inches/second) at 25 feet	Approximate Vibration Level (LV) at 25 feet
Piledriver (impact)	1.518 (upper range)	112
	0.644 (typical)	104
Piledriver (sonic)	0.734 upper range	105
	0.170 typical	93
Clam shovel drop (slurry wall)	0.202	94
Hydromill	0.008 in soil	66
(slurry wall)	0.017 in rock	75
Vibratory Roller	0.210	94
Hoe Ram	0.089	87
Large bulldozer	0.089	87
Caisson drill	0.089	87
Loaded trucks	0.076	86
Jackhammer	0.035	79
Small bulldozer	0.003	58

[1] Caltrans Transportation and Construction Vibration Guidance Manual, April 2020

Table 15 shows the project's construction-related vibration analysis at the nearest structures to the project construction area. Construction impacts are assessed from the closest area on the project site to the nearest adjacent off-site structure.

Table 15
Construction Vibration Impact Analysis

Construction Activity	Distance to Nearest Off-Site Structure (ft)	Duration	Calculated Vibration Level - PPV (in/sec)	Damage Potential Level	Annoyance Criteria Level
Large Bulldozer	25	Continuous/Frequent	0.089	Extremely fragile historic buildings, ruins ancient monuments	Barely Perceptible
Vibratory Roller	25	Continuous/Frequent	0.210	Fragile Buildings	Distinctly Perceptible
Loaded Trucks	25	Continuous/Frequent	0.076	Extremely fragile historic buildings, ruins ancient monuments	Barely Perceptible

As shown in Table 15, project related construction activity is not expected to cause any potential damage to the nearest structures. The annoyance potential of vibration from construction activities would range from "Distinctly perceptible" to "Barely perceptible".

Construction vibration calculation worksheets are shown in Appendix D.

7.4 Construction Design Features

The following recommended design features are provided to help ensure the project's noise levels do not adversely impact the adjacent noise sensitive land uses:

DF-9 Prepare a construction management plan and obtain a construction work permit from the City of Beaumont prior to starting construction. The construction management plan shall ensure all contractors implement construction best management practices to reduce construction noise levels, such as:

- Construction activities shall not take place between the hours of 6:00 p.m. and 7:00 a.m. on weekdays, including Saturday, or at any time on Sunday or a Federal holiday.

- All construction equipment shall be equipped with muffles and other suitable noise attenuation devices (e.g., engine shields).

- Grading and construction contractors shall use quieter equipment as opposed to noisier equipment (such as rubber-tired equipment rather than track equipment), to the maximum extent feasible.

- If feasible, electric hook-ups shall be provided to avoid the use of generators. If electric service is determined to be infeasible for the site, only whisper-quiet generators shall be used (i.e., inverter generators capable of providing variable load.

- Use electric air compressors and similar power tools rather than diesel equipment, where feasible.

- Locate staging area, generators and stationary construction equipment as far from the adjacent residential homes as feasible.

- Construction-related equipment, including heavy-duty equipment, motor vehicles, and portable equipment, shall be turned off when not in use for more than 5 minutes.

- Provide notifications and signage in readily visible locations along the perimeter of construction sites that indicate the dates and duration of construction activities, as well as provide a telephone number where neighbors can enquire about the construction process and register complaints to a designated construction noise disturbance coordinator.

DF-10 No impact pile driving or blasting activities will be performed on the project site during construction.

Exhibits

Exhibit A

Location Map

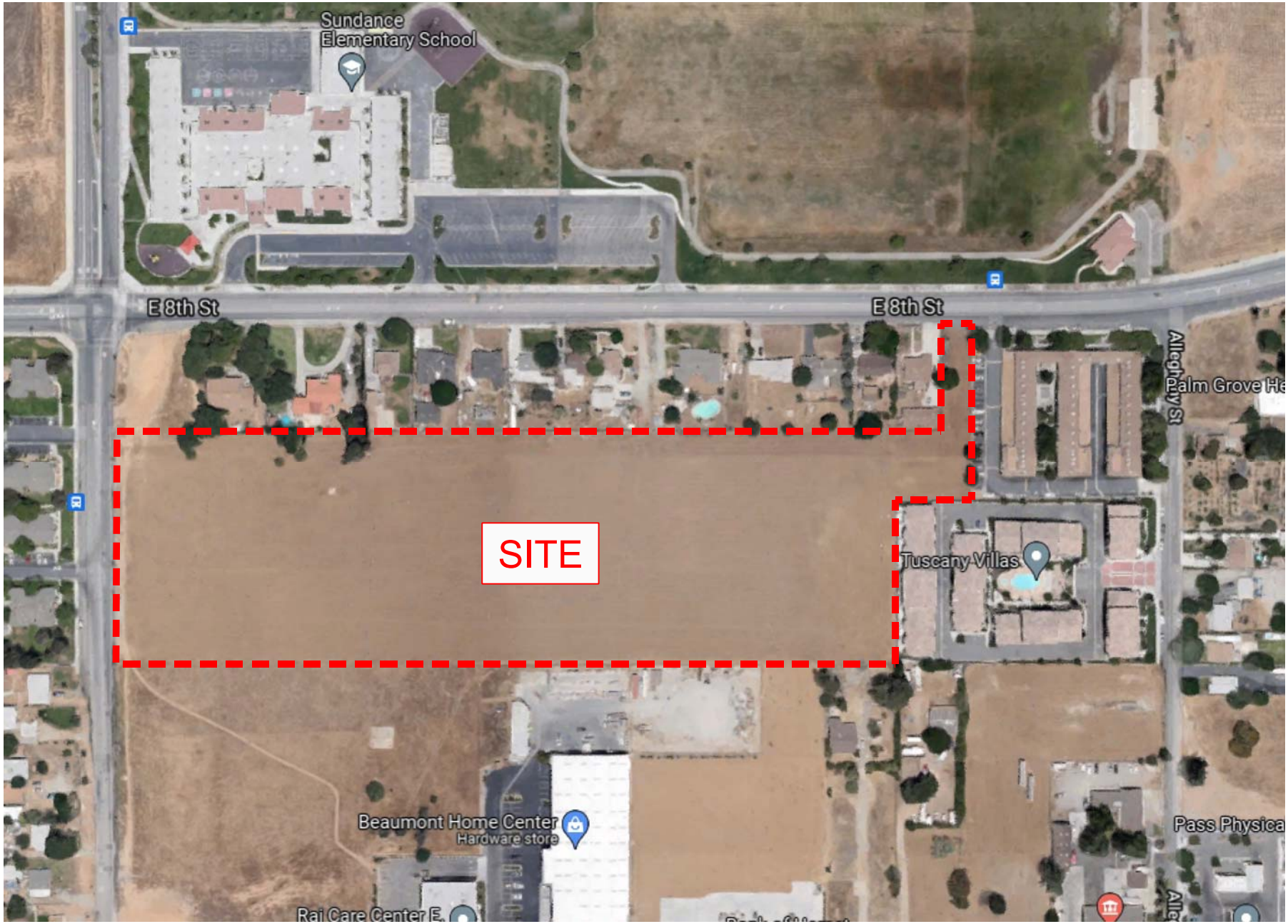
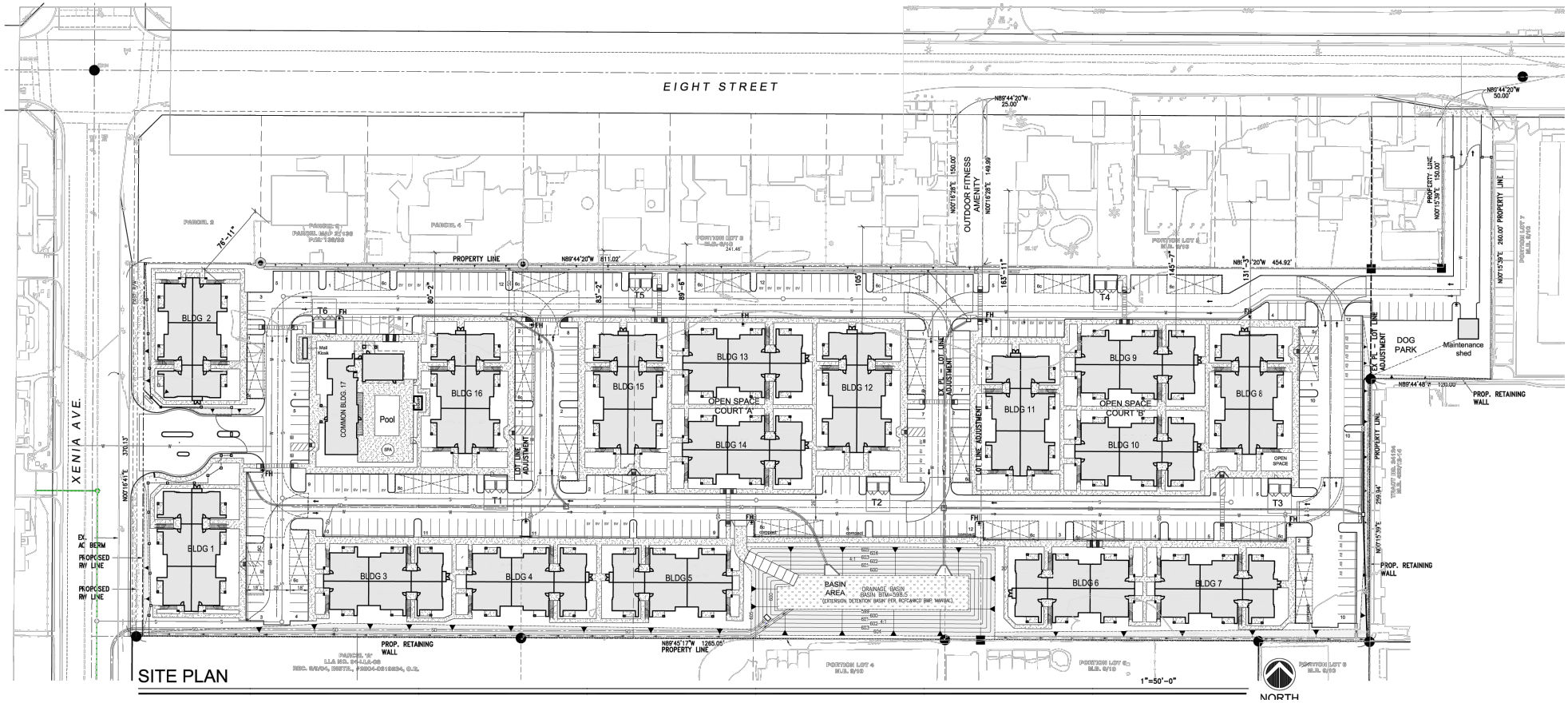


Exhibit B

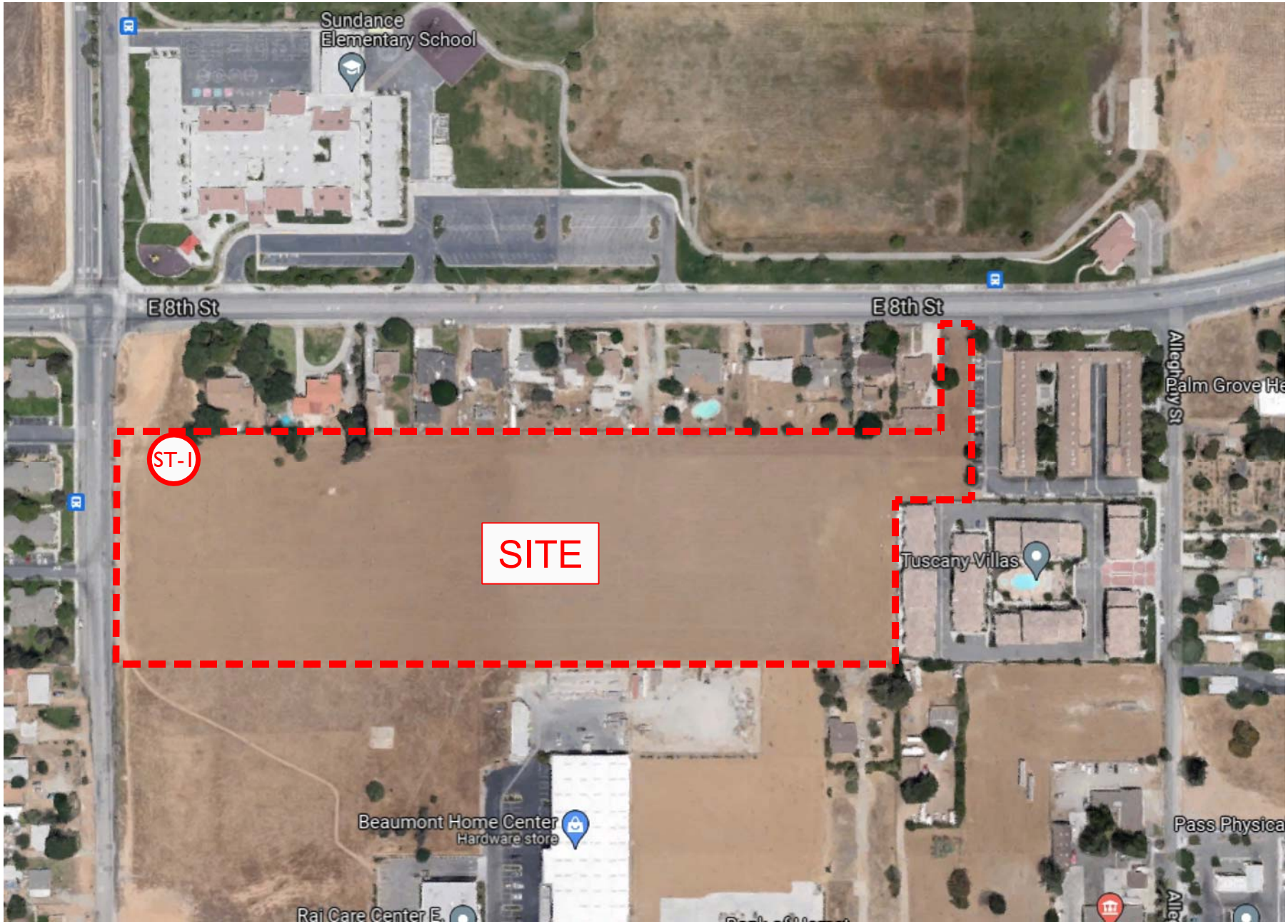
Site Plan



N

Exhibit C

Noise Monitoring Location



Appendices

Appendix A

City of Beaumont
Noise Standards



Chapter 10:
NOISE

The City of Beaumont understands the value of low noise levels to a high quality of life for people living and working in the community. Vehicle traffic is the main source of noise in Beaumont, exposing residents to potentially unwelcome and unhealthy noise levels. However, noise also results from other sources, including railroads, construction, residences, and businesses. This chapter identifies noise issues in the community and sensitive noise environments recommended for protection. Additionally, it identifies land use policies that minimize the community's exposure to excessive noise and identifies proactive solutions to addressing existing and foreseeable noise problems. Topics covered in this chapter include: transportation noise, stationary noise, noise standards and land use compatibility. This chapter also includes related goals and policies.

STATUTORY REQUIREMENTS

This Noise Element has been prepared to comply with State General Plan law. California law mandates the development of a Noise Element as part of the General Plan (CGC Section 65302(f)). The Noise Element should also be consistent with guidelines contained within the California Health and Safety Code Section 56050.1. In accordance with these regulations, this Element addresses noise sources and identifies ways to reduce impacts and exposure of sensitive receptors to high levels of noise.

CITY OF BEAUMONT NOISE REGULATIONS

The City's Municipal Code (Title 9, Chapter 9.02) includes detailed noise regulations intended to protect the welfare of its residents from excessive, unnecessary, or unusually loud noises by any and all sources in the community. The noise regulations in this chapter establish criteria and standards for the regulation of noise levels within the City.

SETTING THE SCENE

Noise is best defined as unwanted sound. Tolerance of noise depends on its character and its interference with daily activities. At excessive levels, people typically perceive noise as being intrusive, annoying, and undesirable. Excessive levels of noise can interfere with sleep, work, quality of life, and in the worst cases, even cause physiological or psychological damage.

Beaumont generally enjoys a quiet noise environment. Vehicle traffic is the primary source of noise. The highest noise levels in the City occur along high-volume roadways and rail corridors. Stationary sources of noise are limited, as the majority of Beaumont consists of residential housing, interspersed with commercial, public/institutional uses, and open space. Commercial land uses located along arterial roadways and new construction also contribute to stationary noise sources in the city. Other noise generators in Beaumont include industrial operations, construction activities, special event noise, commercial activities that include live music, and lawnmowers and leaf blowers, which can create substantial noise problems.

Sensitive receptors to noise include residential dwellings, hotels, hospitals, nursing homes, educational facilities, libraries, and biological open space. These are areas in which occupants tend to be more impacted by noise than others. The level and intensity of noise can interfere with human activities, including talking, studying, and sleeping. Additionally, people that live and/or work in sensitive receptors are more susceptible to the negative impacts of pollution, including toxic chemicals, diesel fuel exhaust, and particulate matter. Animal species and their habitats may also be affected by noise, especially during their breeding season.

Noise reduction at the source is the most effective noise mitigation measure. Many potential noise impacts can be addressed through the design of our buildings, public spaces, and roads. Strategies to reduce noise can be incorporated inside and outside of buildings, including the use of mufflers on stationary equipment, alternative facility siting, noise barriers, and reduction of traffic speeds.

TRANSPORTATION NOISE

Noise sources in the Planning Area fall into five basic categories: freeways, aircraft over flights, traffic from local streets, noise from railroad operations, and stationary sources. The predominant sources of noise in Beaumont are motor vehicles on roadways, mainly I-10 and SR-60, and trains on the Union Pacific railroad.

TRAFFIC NOISE

The principal noise source in Beaumont, as in most communities, is motor vehicles. The roadway system in the City includes a range of facilities: regional freeways, major highways, and other arterial, collector, and local streets. Regional freeways and highways in the City include I-10, SR-60, and State Route 79 (SR-79). Major roadways within Beaumont include 6th Street, Oak Valley Parkway/14th Street, Beaumont Avenue, Highland Springs Avenue, Brookside Avenue, and Potrero Boulevard.

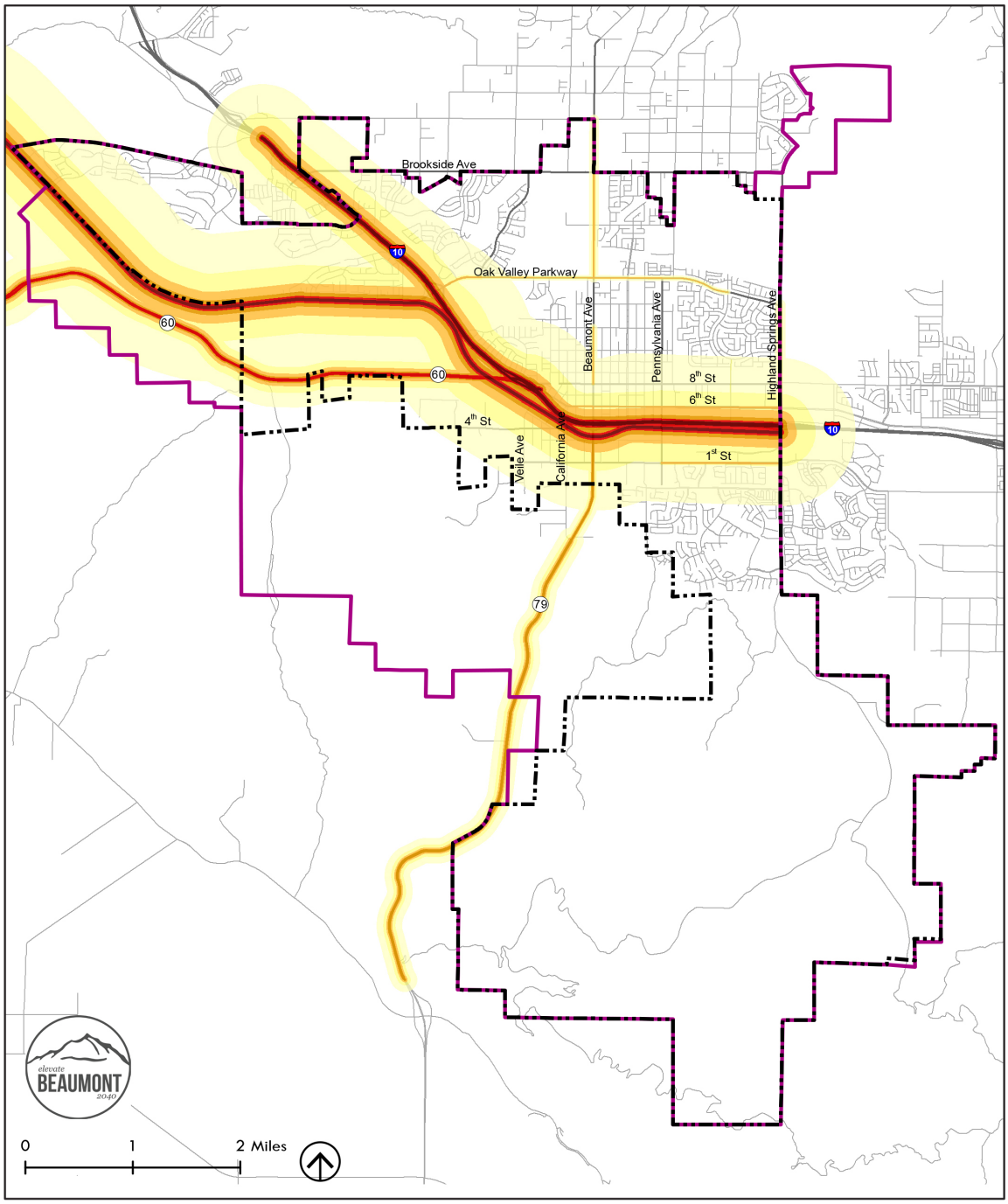
Noise generated by current traffic levels in Beaumont are shown in Figure 10-1. As shown, the I-10 which carries the most traffic through the City, and the Union Pacific railroad corridor are the greatest contributors to noise within the City. Other roadways in and around Beaumont that carry sufficient traffic to produce audible noise at a substantial distance include SR-60, SR-79, Beaumont Avenue, and Oak Valley Parkway.

Additionally, freight rail service along the Union Pacific Railroad lines located south of and parallel to Oak Valley Parkway and I-10 are also responsible for generating substantial noise levels. According to the Federal Railroad Administration, the Union Pacific Railroad carries up to 17 daytime trains (6 a.m. to 6 p.m.) and 17 nighttime trains (6 p.m. to 6 a.m.) on a daily basis (Federal Railroad Administration 2018b). The railroad is also a potential source of ground-borne vibration and noise.

In addition to roadway noise, air traffic periodically contributes to the noise environment. There are no airports in the City of Beaumont. However, the Banning Municipal Airport is located approximately five miles east of the City's eastern boundary. Therefore, aircraft noise may intermittently affect noise-sensitive receptors in the City, but noise levels will be outside of all identified 55 dBA, 60 dBA, and 65 dBA airport noise contours (City of Banning 2007).

Future development of noise-sensitive land uses, such as homes, schools, hospitals, and recreational areas, may be exposed to unacceptable noise levels if located near major noise generators. As Beaumont and the region grow, traffic on local roadways is expected to increase, raising noise levels and the ambient noise near roadways. Future traffic noise levels are shown in Figure 10.2. Predictions are based on estimated increases in traffic due to General Plan buildout projections.

Figure 10.1 Existing Noise Contours from Transportation



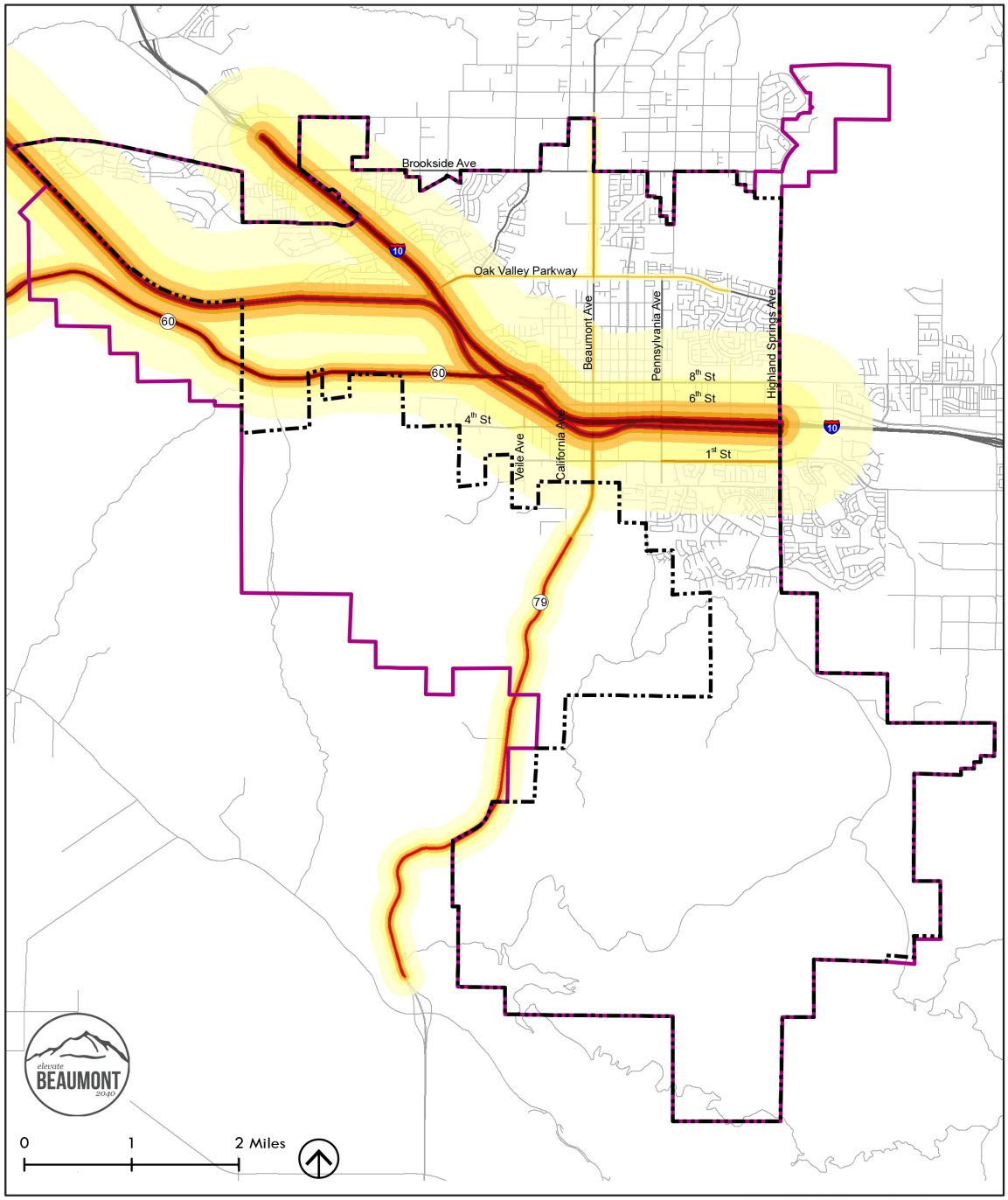
City of Beaumont General Plan Update, 2018 & Riverside County, 2017.

EXISTING NOISE CONTOURS

City Boundary
Sphere of Influence

60 dbA
65 dbA
70 dbA
75 dbA
80 dbA
85 dbA

Figure 10.2 Future Noise Contours from Transportation



City of Beaumont General Plan Update, 2018 & Riverside County, 2017.

STATIONARY NOISE

Stationary noise generators in Beaumont include industrial operations, construction activities, special event noise, and commercial activities that include live music, and lawnmowers and leaf blowers, which can create substantial noise problems. Loading and materials transfer areas, outdoor materials warehousing operations, and other acoustically unscreened operations may also create issues of noise impact and use compatibility. Certain types of construction activities, such as pile driving, can be temporary but also significant sources of ground-borne vibration.

The operation of mechanical equipment is another important source of potentially significant noise. This category includes refrigerator units, chillers, and heating/air conditioner equipment associated with commercial centers. Noise from roof-mounted equipment is especially effective at penetrating into bordering neighborhoods and impacting sensitive receptors. The continual drone associated with fans and compressors can degrade the enjoyment of the outdoors and negatively affect the quality of life for nearby residents.

NOISE STANDARDS + LAND USE COMPATIBILITY

Noise is problematic when it disrupts or interrupts activities associated with a given land use. Uses that are most affected by noise include residences, schools, hospitals, religious meeting spaces, and recreation areas. Conflicts between noise sources and noise-sensitive land uses occur when noise-sensitive land uses are permitted in areas with high ambient noise levels. These conflicts can be avoided through consideration of noise sources and the future noise environment when making land use planning and development decisions. Table 10.1 presents ambient noise level standards by land use and time of day. Table 10.2 presents the maximum duration period for noise level exceeded permitted in residential zones.

Table 10.1 Noise Standards by Land Use

Land Use	Decibels	Time
Residential	45 db(A)	10:00 pm – 7:00 am
Residential	55 db(A)	7:00 am – 10:00 pm
Industrial and Commercial	50 db(A)	10:00 pm – 7:00 am
Industrial and Commercial	75 db(A)	7:00 am – 10:00 pm

Table 10.2 Maximum Residential Noise

Noise Level Exceeded	Decibels
5 db(A) above BANL	15 minutes any hour
10 db(A) above BANL	5 minutes any hour
15 db(A) above BANL	1 minute any hour
20 db(A) above BANL	Not permitted

CITY OF BEAUMONT MUNICIPAL CODE

The City of Beaumont Municipal Code (BMC) Chapter 9.02 establishes City-wide standards regulating noise for residential zones, public places, and motor vehicles. BMC Chapter 9.02.110 states that no construction activities may occur within one-quarter mile from an occupied residential dwelling between the hours of 6:00 p.m. and 6:00 a.m. during the months of June through September, and between the hours of 6:00 p.m. and 7:00 a.m. between the months of October through May, unless such activities are permitted under written consent of the City's Building Official.

The applicable base ambient noise level (BANL) for outdoor noise levels in residential areas is 55 dBA from 7:00 a.m. to 10:00 p.m., and 45 dBA from 10:00 p.m. to 7:00 a.m. The standard used for maximum outdoor noise levels in residential areas in California, and the City specifically, is a CNEL of 65 dBA.

The regulations and policies discussed above are intended to protect the community from excessive noise and vibration to ensure quality of life for residents and workers in the City. The City is responsible for the continued enforcement of federal, state, and local regulations pertaining to noise generation and impacts, and for implementing Noise Element policies and applicable regulations of the BMC to ensure continued protection of the community from excessive noise and vibration in future growth and development.



Switchfoot performing live in Beaumont during the Summer Concert Series.

GOALS + POLICIES

The following section includes goals and policies for the Noise Element. Goals and policies are followed by implementation actions.

Goal 10.1: A City where noise exposure is minimized for those living and working in the community.

Policies:

10.1.1 Protect public health and welfare by eliminating existing noise problems and by preventing significant degradation of the future acoustic environment.

10.1.2 Adopt, maintain, and enforce planning guidelines that establish the acceptable noise standards identified in Table 10.1 and 10.2.

10.1.3 Protect noise-sensitive uses, such as residences, schools, health care facilities, hotels, libraries, parks and places of worship, from excessive noise levels through land use adjacency, building design, and noise ordinance enforcement.

10.1.4 Incorporate noise considerations into land use planning decisions. Require the inclusion of noise mitigation measures, as may be necessary to meet standards, in the design of new development projects in the City.

10.1.5 Require projects involving new development or modifications to existing development to implement measures, where necessary, to reduce noise levels to at least the normally compatible range. Design measures should focus on architectural features and building design and construction, rather than site design features, such as excessive setbacks, berms, and sound walls, to maintain compatibility with adjacent and surrounding uses.

10.1.6 Encourage reduction of stationary noise impacts from commercial and industrial land uses, activities, events, and businesses on noise-sensitive land uses.

10.1.7 Limit delivery or service hours for stores and businesses with loading areas, docks, or trash bins that front, side, border, or gain access on driveways next to residential and other noise sensitive areas, such as residences, schools, hospitals, religious meeting spaces, and recreation areas.

10.1.8 Promote the effective enforcement of Federal, State, and City noise standards by all appropriate City departments.

Goal 10.2: A City with minimal mobile source-generated noise levels.

Policies:

10.2.1 Work with Caltrans and the Federal Highway Administration to reduce noise impacts to sensitive receptors along I-10, SR-60 and SR-70.

10.2.2 Regulate traffic flow to enforce speed limits to reduce traffic noise. Periodically evaluate and enforce established truck and bus routes to avoid noise impacts on sensitive receptors.

10.2.3 Prohibit truck routes through neighborhoods with sensitive receptors, where feasible.

10.2.4 Reduce the impacts of roadway noise on noise-sensitive receptors where roadway noise exceeds the normally compatible range.

10.2.5 Require the use of traffic calming measures such as reduced speed limits or roadway design features to reduce noise levels where roadway noise exceeds the normally compatible range.

10.2.6 Encourage the use of noise-reducing paving materials, such as open-grade or rubberized asphalt, for public and private road surfacing projects in proximity to existing and proposed residential land uses.

10.2.7 Consider the noise effects of City purchases and or leases of vehicles and other noise generating equipment. Take reasonable and feasible actions to reduce the noise generated from City-owned or leased vehicles and equipment, where possible.

10.2.8 Ensure that noise and vibration from existing rail lines is considered during the land use planning and site development processes.

10.2.9 If Metrolink or other passenger rail service is initiated, work with the rail service providers to address noise and vibration considerations adjacent to the rail corridor.

IMPLEMENTATION

Table 10.3 Noise Programs

	DESCRIPTION	PRIORITY	TIME FRAME	RESPONSIBILITY
NOISE REGULATIONS				
N1	**Update the City's Noise Ordinance.** Provide development standards and project design guidelines that include a variety of mitigation measures that can be applied to meet City standards for projects exceeding the City's noise standards.	High	Short	Planning, Building and Safety
N2	**Requirement for Acoustical Studies.** Amend development application requirements so that projects that could result in noise environments above normally acceptable noise ranges or all new development complete acoustical studies prepared by qualified professionals to ensure that the noise levels are at acceptable levels, per the Municipal Code.	High	Short	Planning
N3	**Project Design Guidelines.** Integrate project design guidelines that integrate features into new developments that minimize impacts associated with the operation of air conditioning and heating equipment, on-site traffic, and use of parking, loading, and trash storage facilities.	High	Short	Planning
MOBILE NOISE SOURCES				
N4	**Freeway Noise Reduction.** Work collaboratively with Caltrans and the Federal Highway Administration to install measures that mitigate noise impacts along freeways.	Medium	Long	Public Works
N5	**Traffic Noise Assessment.** Periodically review and assess the sources of noise and vibration, strategies for mitigating impacts, and specific actions that can be applied.	High	Ongoing	Public Works
STATIONARY NOISE SOURCES				
N6	**Construction Noise Limits.** Review the hours of allowed construction activity to ensure they effectively lead to compliance within the limits (maximum noise levels, hours and days of allowed activity) established in the City's noise regulations.	High	Short	Planning, Building and Safety

	DESCRIPTION	PRIORITY	TIME FRAME	RESPONSIBILITY
N7	**Stationary Equipment.** Enforce requirements that all stationary construction equipment shall be operated with closed engine doors, equipped with properly operating and maintained mufflers, and placed so that emitted noise is directed away from the nearest sensitive receptors.	High	Short	Planning, Building and Safety, Code Enforcement
N8	**Equipment Staging Areas.** Require that equipment staging shall be in areas that will create the greatest distance feasible between construction-related noise sources and noise-sensitive receptors.	High	Short	Planning, Building and Safety
N9	**Additional Noise Attenuation Techniques.** Require that temporary sound barriers are installed and maintained between the construction site and the sensitive receptors during the clearing, earth moving, grading, and foundation/ conditioning phases of construction. Temporary sound barriers shall consist of sound blankets affixed to construction fencing along all sides of the construction site boundary facing potentially sensitive receptors.	High	Short	Planning
N10	**Vehicle and Equipment Idling.** Establish requirements that construction vehicles and equipment are not left idling for longer than five minutes when not in use.	High	Short	Planning, Building and Safety, Code Enforcement

Appendix B

Field Data and Photos

Field Sheet

Project: Xenia Multifamily Residential Project **Engineer:** D. Shivaiah **Date:** 12/9/2021

JN: 2640-2020-03

Measurement Address: Southeast corner of Xenia Avenue and 8th Street **City:** Beaumont **Site No.:** 1

Sound Level Meter:
Piccolo-II
Serial # P0218042101

Calibrator:
LD-250 250
Serial # 1322

Calibration Record:

	Input, dB/	Cali Date	Time
1	94.0	12/9/2021	2:44 PM
2			
3			
4			
5			

Notes:

Temp: 59
Windspeed: 10 mph
Direction: --
Skies: Cloudy
Camera:
Photo Nos.

Meter Settings:

☒ A-WTD ☐ LINEAR ☒ SLOW ☐ 1/1 OCT ☒ INTERVALS ___10____- MINUTE
☐ C-WTD ☐ IMPULSE ☐ FAST ☐ 1/3 OCT ☒ L_N PERCENTILE VALUES

Notes:

Measurement Type:
Long-term
Short-term X

		Start Time	Stop Time	Leq	Lmin	Lmax	L2	L8	L25	L50
Locations	1	2:46 PM	2:56 PM	59.6	55.1	68.8	63.6	61.9	60.1	58.9
		Measurementwas taken along the northwest corner of the project site, approximately 110 feet from the western property line and 30 feet from the northern property line. Ambient noise includes traffic noise from the adjacent roadways.								
	2									
	3									
	4									



RK engineering group, inc.

Field Sheet - ST1 Location Photos

Project: Xenia Multifamily Residential Project	**Engineer:** D. Shivaiah	**Date:**	12/9/2021
		JN:	2640-2020-03
Measurement Address: Southeast corner of Xenia Avenue and 8th Street	**City:** 0	**Site No.:**	1



RK engineering group, inc.

Field Sheet

Project:	Xenia Multifamily Residential Project Referenced Noise Levels	**Engineer:**	Becca Morrison	**Date:** **JN:**	12/6/2022 2640-2022-03
Measurement Address:		**City:**		**Site No.:**	1
25652 Baffin Bay Drive		Lake Forest, CA			

Sound Level Meter:
Piccolo II
Serial # P0218042101
P0221010802

Calibrator:
BSWA
Serial # 500732

Calibration Record:

	Input, dB/	Time
1	94.0	3:55 p.m.
2	94.0	3:58 p.m.
3		
4		
5		

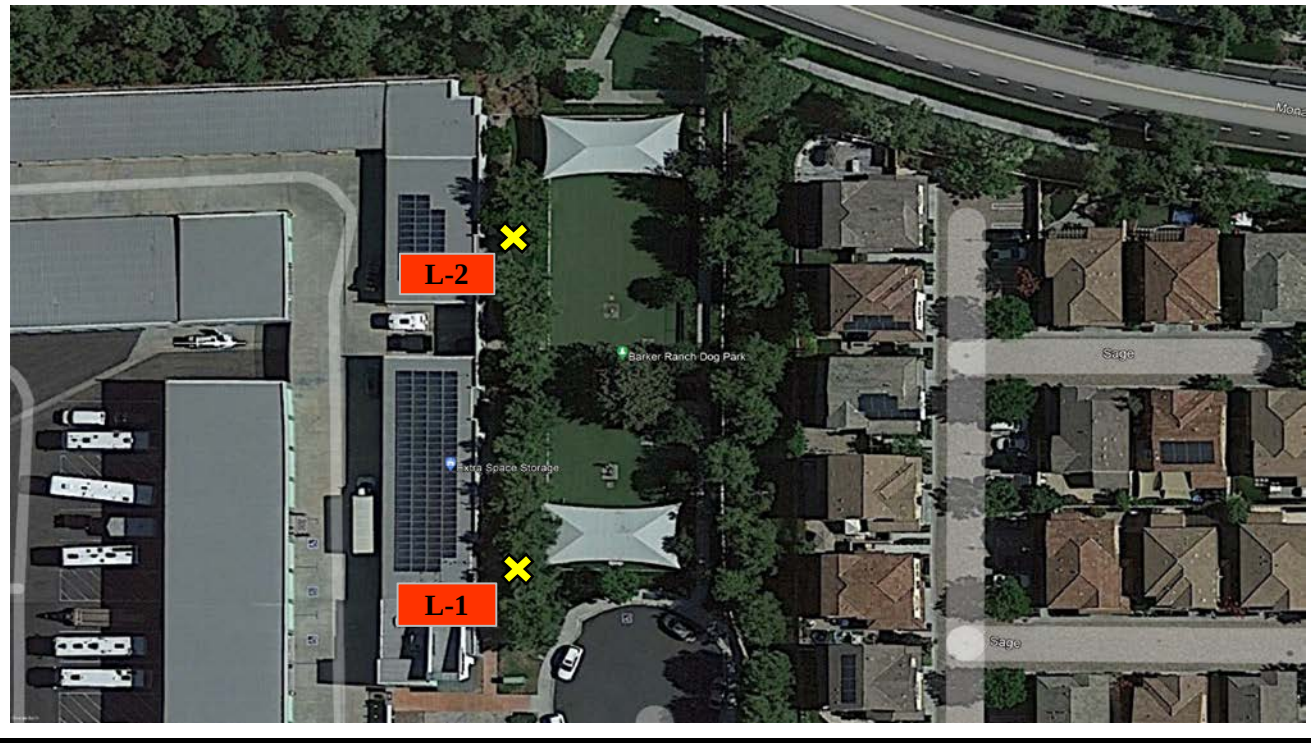
Conditions:

Temp:	59 Deg. F
Windspeed:	4 mph
Direction:	E
Skies:	Cloudy

Meter Settings:

- ☑ A-WTD ☐ C-WTD
- ☐ LINEAR ☐ IMPULSE
- ☑ SLOW ☐ FAST
- ☐ 1/1 OCT ☐ 1/3 OCT
- ☐ ____ MINUTE INTERVALS
- ☑ L(N) PERCENTILE VALUES

		Start Time	Stop Time	Leq	Lmax	Lmin	L2	L8	L25	L50
Interval	1	4:02 p.m.	4:32 p.m.	57.9	75.0	39.1	67.6	62.2	55.1	52.0
		Measurement was taken on the "small dog" end of the dog park, approximately 10' from the park's eastern fence. During the measurement period, the small dog area had a minimum of 2 dogs and a maximum of 6 dogs present at one time. The combined small and big dog areas had a minimum of 5 and a maximum of 11 dogs present at one time. Ambient noise was composed primarily of cars arriving/departing, adjacent roadways, people talking, dogs barking and playing, bird/nature sounds, and the occasional overhead plane.								
	2	4:03 p.m.	4:33 p.m.	60.4	80.4	39.2	71.6	63.9	53.0	49.8
		Measurement was taken on the "big dog" end of the dog park, approximately 13' from the park's eastern fence. During the measurement period, the big dog area had a minimum of 3 dogs and a maximum of 5 dogs present at one time. The combined small and big dog areas had a minimum of 5 and a maximum of 11 dogs present at one time. Ambient noise was composed primarily of cars arriving/departing, adjacent roadways, people talking, dogs barking and playing, bird/nature sounds, and the occasional overhead plane.								
	3									
	4									



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Field Sheet - Photos

Project: Xenia Multifamily Residential Project Referenced Noise Levels	**Engineer:** B. Morrison	**Date:**	12/17/2022
		JN:	2640-2022-03
Measurement Address: 25652 Baffin Bay Drive	**City:** Lake Forest, CA	**Location:**	L-1



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Field Sheet - Photos

Project: Xenia Multifamily Residential Project Referenced Noise Levels	**Engineer:** B. Morrison	**Date:**	12/17/2022
		JN:	2640-2022-03
Measurement Address: 25652 Baffin Bay Drive	**City:** Lake Forest, CA	**Location:**	L-2



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Appendix C

Stationary Noise Analysis Results

NOISE BARRIER CALCULATIONS - BASED UPON FHWA - RD-77-108

PROJECT:	Xenia Multifamily Residential Project	JOB #:	2640-2020-3
SOURCE:	HVAC Unit	DATE:	21-Dec-22
LOCATION:	Nearest Residential Property Line at 50 Feet	BY:	D. Shivaiah

NOISE INPUT DATA

OBS DIST=	60.0			
DT WALL=	10.0			
DT W/OB=	50.0			
HTH WALL=	27.0	********		
BARRIER =	0.0	(0=WALL,1=BERM)		
OBS HTH=	5.0			
NOISE HTH=	25.0		BARRIER+	
OBS EL =	0.0		TOPO SHIELDING =	-11.40
NOISE EL =	0.0		NOISE HTH EL=	25.0
DROP-OFF=	20.0	(20 = 6 dBA PER DOUBLING OF DISTANCE)		
COFF				

NOISE OUTPUT DATA (dBA)

	DIST (FT)	Leq	Lmax	L2	L8	L25	L50
REF LEVEL	3	77.0					
PROJ LEVEL	60	51.0	-26.0	-26.0	-26.0	-26.0	-26.0
SHIELDING	60	-11.4	-11.4	-11.4	-11.4	-11.4	-11.4
ADJ LEVEL	60	***39.6***	***-37.4***	***-37.4***	***-37.4***	***-37.4***	***-37.4***

NOISE LEVEL REDUCTION DUE TO DISTANCE = -26.0205999

PROJECT:	Xenia Multifamily Residential Project	JOB #:	2640-2020-3
SOURCE:	Parking Lot	DATE:	21-Dec-22
LOCATION:	Nearest Residential Property Line at 50 Feet	BY:	D. Shivaiah

NOISE INPUT DATA

OBS DIST=	30.0			
DT WALL=	20.0			
DT W/OB=	10.0			
HTH WALL=	6.0	********		
BARRIER =	0.0	(0=WALL,1=BERM)		
OBS HTH=	5.0			
NOISE HTH=	3.0		BARRIER+	
OBS EL =	0.0		TOPO SHIELDING =	-6.80
NOISE EL =	0.0		NOISE HTH EL=	3.0
DROP-OFF=	20.0	(20 = 6 dBA PER DOUBLING OF DISTANCE)		
COFF				

NOISE OUTPUT DATA (dBA)

	DIST (FT)	Leq	Lmax	L2	L8	L25	L50
REF LEVEL	5	63.8					
PROJ LEVEL	30	48.2	-15.6	-15.6	-15.6	-15.6	-15.6
SHIELDING	30	-6.8	-6.8	-6.8	-6.8	-6.8	-6.8
ADJ LEVEL	30	***41.4***	***-22.4***	***-22.4***	***-22.4***	***-22.4***	***-22.4***

NOISE LEVEL REDUCTION DUE TO DISTANCE = -15.563025

PROJECT:	Xenia Multifamily Residential Project	JOB #:	2640-2020-3
SOURCE:	Dog Park	DATE:	21-Dec-22
LOCATION:	Nearest Residential Property Line at 27 Feet	BY:	B. Morrison

NOISE INPUT DATA

OBS DIST=	27.0			
DT WALL=	17.0			
DT W/OB=	10.0			
HTH WALL=	6.0	********		
BARRIER =	0.0	(0=WALL,1=BERM)		
OBS HTH=	5.0			
NOISE HTH=	3.0		BARRIER+	
OBS EL =	0.0		TOPO SHIELDING =	-7.00
NOISE EL =	0.0		NOISE HTH EL=	3.0
DROP-OFF=	20.0	(20 = 6 dBA PER DOUBLING OF DISTANCE)		
COFF				

NOISE OUTPUT DATA (dBA)

	DIST (FT)	Leq	Lmax	L2	L8	L25	L50
REF LEVEL	60	60.4					
PROJ LEVEL	27	67.3	6.9	6.9	6.9	6.9	6.9
SHIELDING	27	-7.0	-7.0	-7.0	-7.0	-7.0	-7.0
ADJ LEVEL	27	***60.3***	***-0.1***	***-0.1***	***-0.1***	***-0.1***	***-0.1***

NOISE LEVEL REDUCTION DUE TO DISTANCE = 6.93574972

Appendix D

Construction Noise and Vibration
Analysis Results

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 12/15/2022
Case Description: Xenia Multifamily Residential Project

---- Receptor #1 ----

Baselines (dBA)

Description	Land Use	Daytime	Evening	Night
Site Preparation	Residential	80	80	55

Equipment

Description	Impact Device	Usage(%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Dozer	No	100		81.7	180	0
Dozer	No	100		81.7	180	0
Dozer	No	100		81.7	180	0
Tractor	No	100	84		180	0
Tractor	No	100	84		180	0
Tractor	No	100	84		180	0
Tractor	No	100	84		180	0

Results

Calculated (dBA)

Equipment		*Lmax	Leq
Dozer		70.6	70.6
Dozer		70.6	70.6
Dozer		70.6	70.6
Tractor		72.9	72.9
Tractor		72.9	72.9
Tractor		72.9	72.9
Tractor		72.9	72.9
	Total	72.9	80.5

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 12/15/2022
Case Description: Xenia Multifamily Residential Project

---- Receptor #1 ----

Baselines (dBA)

Description	Land Use	Daytime	Evening	Night
Grading	Residential	80	80	55

Equipment

Description	Impact Device	Usage(%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	100		80.7	180	0
Excavator	No	100		80.7	180	0
Grader	No	100	85		180	0
Dozer	No	100		81.7	180	0
Scraper	No	100		83.6	180	0
Scraper	No	100		83.6	180	0
Tractor	No	100	84		180	0
Tractor	No	100	84		180	0

Results

Calculated (dBA)

Equipment		*Lmax	Leq
Excavator		69.6	69.6
Excavator		69.6	69.6
Grader		73.9	73.9
Dozer		70.6	70.6
Scraper		72.5	72.5
Scraper		72.5	72.5
Tractor		72.9	72.9
Tractor		72.9	72.9
	Total	73.9	81.1

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 12/15/2022
Case Description: Xenia Multifamily Residential Project

---- Receptor #1 ----

Baselines (dBA)

Description	Land Use	Daytime	Evening	Night
Building Construction	Residential	80	80	55

Equipment

Description	Impact Device	Usage(%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	100		80.6	180	0
Pickup Truck	No	100		75	180	0
Pickup Truck	No	100		75	180	0
Pickup Truck	No	100		75	180	0
Generator	No	100		80.6	180	0
Tractor	No	100	84		180	0
Tractor	No	100	84		180	0
Tractor	No	100	84		180	0
Welder / Torch	No	100		74	180	0

Results

Calculated (dBA)

Equipment		*Lmax	Leq
Crane		69.5	69.5
Pickup Truck		63.9	63.9
Pickup Truck		63.9	63.9
Pickup Truck		63.9	63.9
Generator		69.5	69.5
Tractor		72.9	72.9
Tractor		72.9	72.9
Tractor		72.9	72.9
Welder / Torch		62.9	62.9
	Total	72.9	79.3

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 12/15/2022
Case Description: Xenia Multifamily Residential Project

---- Receptor #1 ----

Baselines (dBA)

Description	Land Use	Daytime	Evening	Night
Paving	Residential	80	80	55

Equipment

Description	Impact Device	Usage(%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Mixer Truck	No	100		78.8	180	0
Concrete Mixer Truck	No	100		78.8	180	0
Paver	No	100		77.2	180	0
Paver	No	100		77.2	180	0
Paver	No	100		77.2	180	0
Paver	No	100		77.2	180	0

Results

Calculated (dBA)

Equipment		*Lmax	Leq
Concrete Mixer Truck		67.7	67.7
Concrete Mixer Truck		67.7	67.7
Paver		66.1	66.1
Paver		66.1	66.1
Paver		66.1	66.1
Paver		66.1	66.1
	Total	67.7	74.5

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 12/15/2022
Case Description: Xenia Multifamily Residential Project

---- Receptor #1 ----

Baselines (dBA)

Description	Land Use	Daytime	Evening	Night
Architectural Coating	Residential	80	80	55

Equipment

Description	Impact Device	Usage(%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor	No	100		77.7	180	0

Results

Calculated (dBA)

Equipment		*Lmax	Leq
Compressor		66.6	66.6
	Total	66.6	66.6

*Calculated Lmax is the Loudest value.

VIBRATION IMPACTS FROM CONSTRUCTION AND OPERATIONS

PROJECT:	Vibration Study	JOB #:	2640-2020-03
ACTIVITY:	Xenia Multifamily Residential	DATE:	20-Dec-21
LOCATION:	Receptors at 25 feet	ENGINEER:	Darshan Shivaiah

VIBRATION INPUT/OUTPUT DATA

OTHER CONSTRUCTION EQUIPMENT

$$PPV = PPV_{ref}(25/D)^{n} \text{ (in/sec)}$$

PPV =	**0.089 in/sec**

Equipment Type =	2	Large Bulldozer
PPV_{ref} =	0.089	Reference PPV at 25 ft.
D =	25.00	Distance from Equipment to receiver in ft.
n =	1.10	Vibration attenuation rate through the ground

EQUIPMENT PPV REFERENCE LEVELS

Type	Equipment	Reference PPV
1	Vibratory Roller	0.210
2	Large Bulldozer	0.089
3	Caisson Drilling	0.089
4	Loaded Trucks	0.076
5	Jackhammer	0.035
6	Small Bulldozer	0.003
7	Crack and Seat	2.400

VIBRATION IMPACTS FROM CONSTRUCTION AND OPERATIONS

PROJECT:	Vibration Study	JOB #:	2640-2020-03
ACTIVITY:	Xenia Multifamily Residential	DATE:	20-Dec-21
LOCATION:	Receptors at 25 feet	ENGINEER:	Darshan Shivaiah

VIBRATION INPUT/OUTPUT DATA

OTHER CONSTRUCTION EQUIPMENT

$$PPV = PPV_{ref}(25/D)^{n} \text{ (in/sec)}$$

PPV =	**0.210 in/sec**

Equipment Type =	1	Vibratory Roller
PPV_{ref} =	0.210	Reference PPV at 25 ft.
D =	25.00	Distance from Equipment to receiver in ft.
n =	1.10	Vibration attenuation rate through the ground

EQUIPMENT PPV REFERENCE LEVELS

Type	Equipment	Reference PPV
1	Vibratory Roller	0.210
2	Large Bulldozer	0.089
3	Caisson Drilling	0.089
4	Loaded Trucks	0.076
5	Jackhammer	0.035
6	Small Bulldozer	0.003
7	Crack and Seat	2.400

VIBRATION IMPACTS FROM CONSTRUCTION AND OPERATIONS

PROJECT:	Vibration Study	JOB #:	2640-2020-03
ACTIVITY:	Xenia Multifamily Residential	DATE:	20-Dec-21
LOCATION:	Receptors at 25 feet	ENGINEER:	Darshan Shivaiah

VIBRATION INPUT/OUTPUT DATA

OTHER CONSTRUCTION EQUIPMENT

$$PPV = PPV_{ref}(25/D)^{n} \text{ (in/sec)}$$

PPV =	**0.076 in/sec**

Equipment Type =	4	Loaded Trucks
PPV_{ref} =	0.076	Reference PPV at 25 ft.
D =	25.00	Distance from Equipment to receiver in ft.
n =	1.10	Vibration attenuation rate through the ground

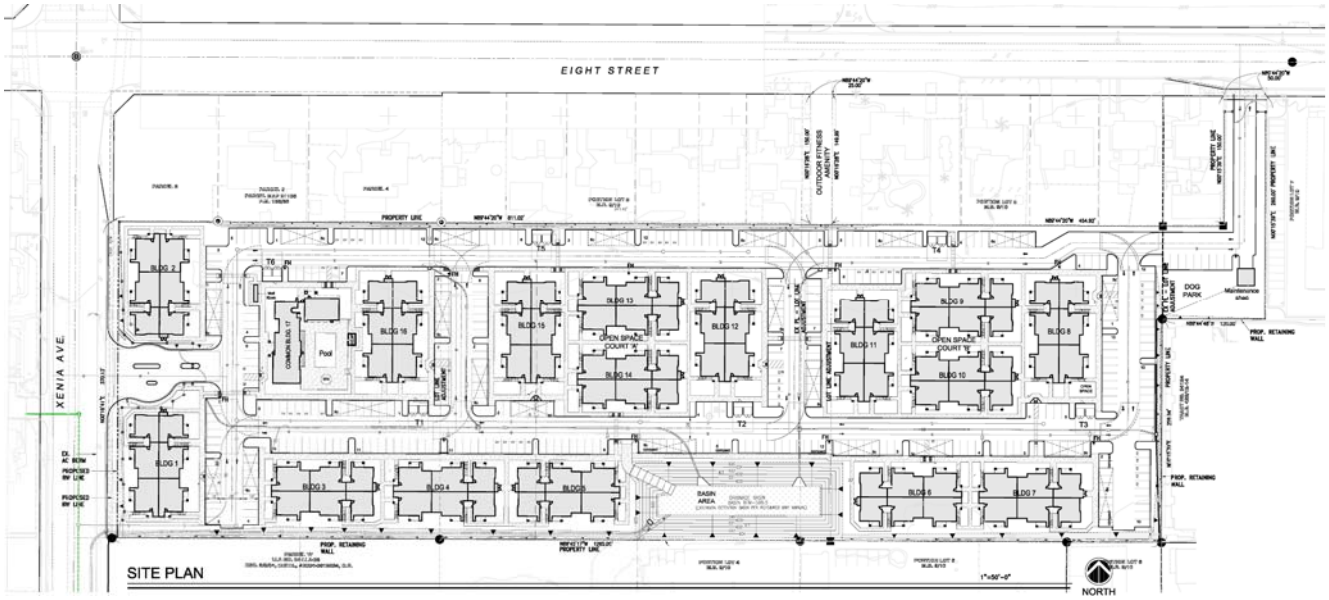
EQUIPMENT PPV REFERENCE LEVELS

Type	Equipment	Reference PPV
1	Vibratory Roller	0.210
2	Large Bulldozer	0.089
3	Caisson Drilling	0.089
4	Loaded Trucks	0.076
5	Jackhammer	0.035
6	Small Bulldozer	0.003
7	Crack and Seat	2.400

Appendix J

Xenia Multifamily Residential Project Traffic Impact Analysis
RK Engineering Group, Inc.
September 22, 2022

XENIA MULTI-FAMILY RESIDENTIAL PROJECT
TRAFFIC IMPACT ANALYSIS
City of Beaumont, California



XENIA MULTI-FAMILY RESIDENTIAL PROJECT TRAFFIC IMPACT STUDY City of Beaumont, California

Prepared for:

BEAUMONT LAND PARTNERS, LLC.
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Pasadena, CA 91105

Prepared by:

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Newport Beach, CA 92660

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September 22, 2022

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1.0 Introduction

1.1 Purpose of Report & Study Objectives

The purpose of this traffic impact analysis and report is to evaluate and assess the proposed Xenia Multi-Family Residential Project (hereinafter referred to as "project") from a traffic and circulation standpoint. Furthermore, this analysis will determine whether the proposed project will have a significant traffic impact on the environment.

This study has been conducted pursuant to the *Western Riverside Council of Governments Recommended Traffic Impact Analysis Guidelines for Vehicles Miles Traveled and Level of Service Assessment,* updated January 2020, and the California Environmental Quality Act (CEQA). This study evaluates the potential traffic and environmental impacts associated with the proposed project in accordance with the thresholds of significance.

This study has been prepared in accordance with the scope of work approved by the City of Beaumont staff, which is contained in Appendix A.

1.2 Site Location & Project Description

The project site is located near the southeast corner of Xenia Avenue and 8th Street in the City of Beaumont. The project site is currently vacant. The proposed project consists of constructing 192 multi-family residential dwelling units on approximately 10.93 acres. The proposed project will also provide ancillary amenities such as a community club and swimming pool. The proposed project will not provide any low income/affordable housing.

Vehicular access for the project is planned via the following two (2) proposed project access ways:

- One (1) full-access unsignalized access driveway along Xenia Avenue (Gated Access)
- One (1) full-access unsignalized access driveway along 8th Street (Gated Access)

The project is planned to open in 2024 and is evaluated in a single phase.

Exhibit 1-1 shows the location of the proposed project. Exhibit 1-2 shows the proposed project's site plan.

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1.3 Traffic Study Area & Analysis Scenarios

Exhibit 1-1 illustrates the project's site location map and traffic analysis study area.

The study area consists of the following six (6) intersections. The jurisdiction where each of these study intersections is located is also identified.

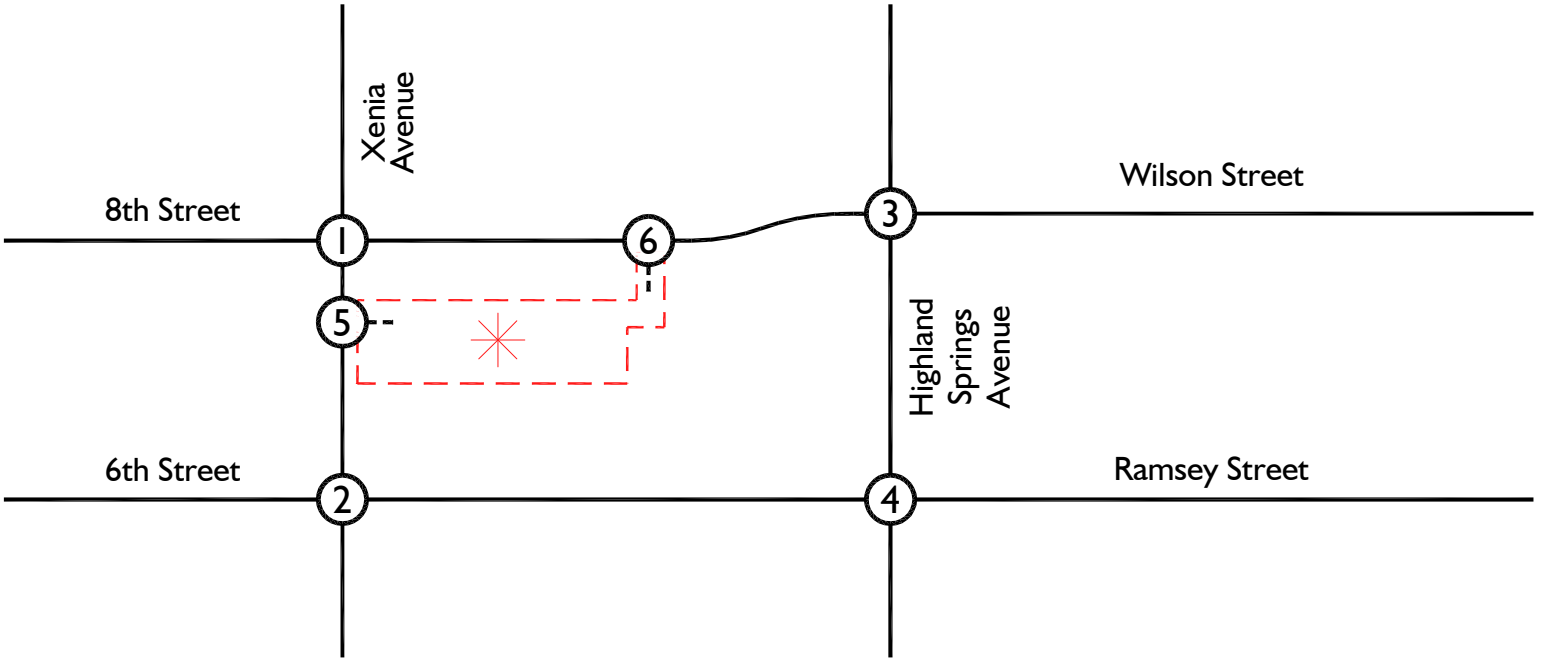
1. Xenia Avenue (NS) at 8th Street (EW) (Beaumont)
2. Xenia Avenue (NS) at 6th Street (EW) (Beaumont)
3. Highland Springs Avenue (NS) at 8th Street/Wilson Street (EW) (Beaumont/Banning);
4. Highland Springs Avenue (NS) at 6th Street/Ramsey Street (EW) (Beaumont/Banning);
5. Xenia Avenue (NS) at Project Access 1 (EW) (Beaumont); and
6. Project Access 2 (NS) at 8th Street (EW) (Beaumont).

The analysis evaluates traffic conditions for the study intersections under the following scenarios:

- Existing Conditions;
- Project Opening Year (2024) Without Project Conditions; and
- Project Opening Year (2024) With Project Conditions.

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Exhibit 1-1
Location Map



Legend:

(1) = Study Area Intersection

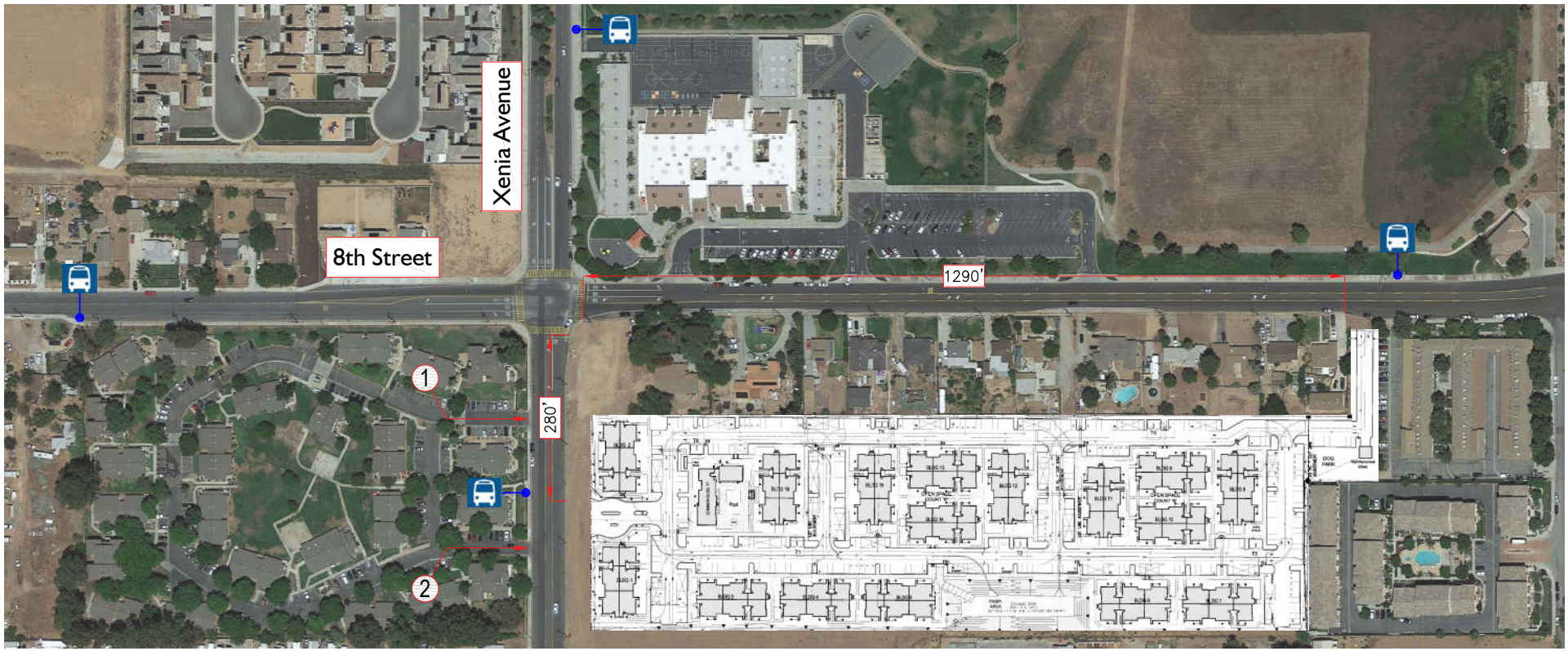
-- = Project Site Boundary

✳ = Project Site

▪▪▪ = Project Access Driveway

N

Exhibit 1-2
Site Plan



Legend:

= Bus Stop Location

(1) = 216-Unit Noble Creek Apartments Driveway #1

(2) = 216-Unit Noble Creek Apartments Driveway #2

N

2.0 Analysis Methodologies, Performance Criteria, & Thresholds of Significance

This section of the report presents the methodologies used to perform the traffic analyses summarized in this report in accordance with the City of Beaumont.

This section also discusses the agency-established applicable performance criteria and thresholds of significance for the study facilities.

2.1 Study Intersection Peak Hour Level of Service Analysis Methodology

In accordance with the *Western Riverside Council of Governments Recommended Traffic Impact Analysis Guidelines for Vehicles Miles Traveled and Level of Service Assessment*, updated January 2020, the Highway Capacity Manual Sixth Edition (HCM 6) is utilized as the technical guide in the evaluation of traffic operations.

The HCM defines level of service as a qualitative measure which describes operational conditions within a traffic stream, generally in terms of factors such as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience, and safety. The criteria used to evaluate LOS (Level of Service) conditions vary based on the type of roadway and whether the traffic flow is considered interrupted or uninterrupted.

The definitions of level of service for interrupted flow (flow regulated by the existence of traffic control devices) are:

- **LOS A** describes traffic operations in which progression is exceptionally favorable or the cycle length is extremely short. Generally, LOS A operations for signalized intersections tend to result in most vehicles arriving during the green phase and traveling through the intersection without stopping. LOS A operations for unsignalized intersection experience little or no delay.

- **LOS B** describes traffic operations in which progression slightly diminishes but is considered highly favorable and the cycle length is short. Vehicles stop more often causing a marginal increase in average delay.

- **LOS C** describes traffic operations in which progression is favorable and the cycle length is moderate. Individual cycle failures (i.e., one or more queued vehicles are not able to depart as a result of insufficient capacity during the

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cycle) may begin to appear. Many vehicles still past through the intersection but a significant number of vehicles are stopping. Average delay is fair.

- **LOS D** describes traffic operations in which progression is ineffective and/or cycle length is long. Considerable amount of vehicles stop and individual cycle failures are noticeable. Average delay is adequate.

- **LOS E** describes traffic operations in which progression is unfavorable and the cycle length is exceedingly long. Individual cycle failures are frequent. Average delay is high.

- **LOS F** describes traffic operations in which progression is extremely poor and the cycle length is extremely long. Most cycles fail to clear the queue. Average delay is vast.

2.1.1 HCM Methodology

Level of service is typically dependent on the quality of traffic flow at the intersection along a roadway. The HCM methodology expresses the level of service at an intersection in terms of delay time for various intersection approaches. The HCM uses different procedures depending on the type of intersection control. The levels of service determined in this study are calculated using the HCM methodology.

For signalized intersections, average control delay per vehicle is used to determine the level of service. Levels of service at signalized study intersections have been evaluated using the HCM intersection analysis program.

For all-way stop-controlled intersections, average control delay per vehicle is used to determine the level of service.

For intersections with stop control on the minor approach only, the calculation of level of service is dependent on the occurrence of gaps occurring in the free-flow traffic movement of the major street, and the level of service is determined based on the worst individual movement on the stop-controlled minor approach or movements sharing a single lane on the stop-controlled minor approach.

Table 2-1 shows the level of service criteria based on the HCM methodology.

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Table 2-1
HCM Intersection LOS & Delay Ranges

LOS	Average Control Delay Per Vehicle (Seconds)	
	Signalized	Unsignalized
A	0.00 - 10.00	0.00 - 10.00
B	10.01 - 20.00	10.01 - 15.00
C	20.01 - 35.00	15.01 - 25.00
D	35.01 - 55.00	25.01 - 35.00
E	55.01 - 80.00	35.01 - 50.00
F	>80.00	>50.00

2.2 LOS Performance Criteria & Thresholds for Requiring LOS Improvements

The six (6) key study intersections span over the following jurisdictions:

- City of Beaumont; and
- City of Banning.

Hence, this study evaluates the potential traffic impacts associated with the proposed project for each study intersection based on the performance criteria and thresholds of significance set forth by each respective jurisdiction.

2.2.1 City of Beaumont

The City of Beaumont adheres to the *Western Riverside Council of Governments Recommended Traffic Impact Analysis Guidelines for Vehicles Miles Traveled and Level of Service Assessment,* updated January 2020, for guidance and methodologies in the evaluation of intersection operations. Therefore, based on the WRCOG guidelines, the acceptable level of service for intersection operations is LOS D (or better). Hence, LOS E (or worse) would be considered deficient.

Per the WRCOG guidelines, the City adheres to the following performance criteria and thresholds of significance for signalized and unsignalized intersections.

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Signalized Intersections

Any signalized study intersection operating at an acceptable LOS (D or better) without project traffic in which the addition of project traffic causes the intersection to degrade to a deficient LOS (E or worse) shall identify improvements to improve operations to an acceptable LOS (D or better).

Any signalized study intersection that is operating at LOS E or F without project traffic where the project increases delay by 5.0 or more seconds shall identify improvements to offset the increase in delay.

Unsignalized Intersections

An operational improvement would be required if the study determines that either section a) or both section b) and c) occur:

a) The addition of project related traffic causes the intersection to degrade from an acceptable LOS D or better to LOS E or F

OR

b) The project adds 5.0 seconds or more of delay to an intersection that is already projected to operate without project traffic at a LOS E or F;

AND

c) The intersection meets the peak hour traffic signal warrant after the addition of project traffic.

If the conditions above are satisfied, improvements should be identified that achieve the following:

- LOS D or better for case a) above.
- Above or to pre-project LOS and delay for case b) above.

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2.2.2 City of Banning

In accordance with the City of Banning's General Plan Circulation Element, the acceptable LOS to be maintained for all study intersections is LOS D or better.

2.3 Vehicles Miles Traveled Performance Criteria and Thresholds of Significance

In response to Senate Bill (SB) 743, the California Resource Agency certified and adopted new CEQA guidelines in December 2018 which now identifies Vehicles Miles Traveled (VMT) as the most appropriate metric to evaluate a project's transportation impact under CEQA (§15064.3) Hence, the proposed project is subject to a VMT analysis to identify potential VMT related impacts to the environment.

The City of Beaumont adheres to the *Western Riverside Council of Governments Recommended Traffic Impact Analysis Guidelines for Vehicles Miles Traveled and Level of Service Assessment,* updated January 2020, which establish uniform analysis methodology and thresholds of significance for determining VMT impacts under CEQA.

In addition, the WRCOG guidelines describe project screening procedures to effectively screen out applicable development projects from project-level VMT assessment. Therefore, the proposed project shall first be evaluated per the screening procedures prior to further project-level VMT assessment.

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3.0 Existing Conditions and Setting

3.1 Existing Traffic Controls & Intersection Geometrics

RK conducted a field review of the study area on March 10th, 2022. Exhibit 3-1 identifies the existing roadway conditions within the study. The number of through traffic lanes for existing roadways and existing intersections controls are identified. The type of traffic control and number of lanes at an intersection are key inputs for the calculation of level of service.

3.2 Existing Conditions Traffic Volumes

Existing conditions intersection level of service calculations are based upon manual AM and PM peak hour turning movement counts taken in March 2022 during typical weekday conditions. The AM peak hour traffic volumes were determined by counting the two-hour peak period between 7:00 AM and 9:00 AM and using the highest hour within that two-hour peak period. Similarly, the PM peak hour traffic volumes were identified by counting the two-hour peak period between 4:00 PM and 6:00 PM and using the highest hour within that two-hour peak period. The traffic count worksheets are included in Appendix B.

Existing traffic volumes for the study area intersections are shown on Exhibit 3-2.

3.3 Existing Conditions Study Intersection Level of Service

The intersection level of service analysis for Existing Conditions is shown in Table 3-1.

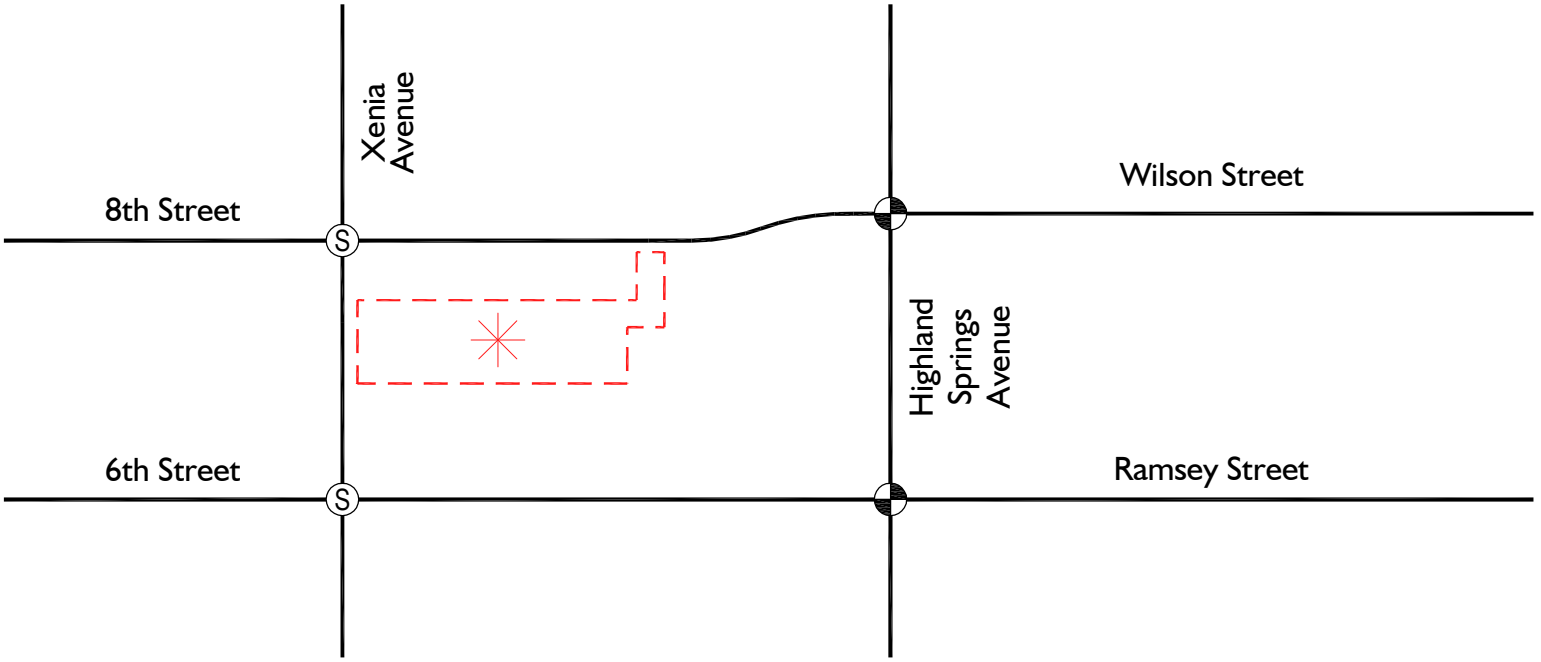
Detailed LOS analysis sheets for Existing Conditions are contained in Appendix C.

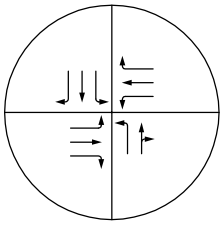
As shown in Table 3-1, all four (4) existing study intersections are currently operating at an acceptable level of service (LOS D or better) during the AM and PM peak hours.

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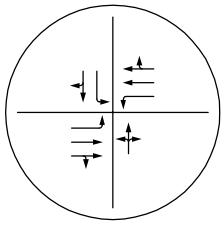
Exhibit 3-1

Existing Traffic Controls & Study Intersection Geometry

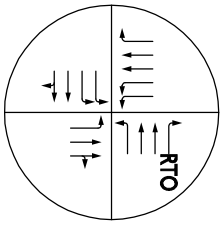




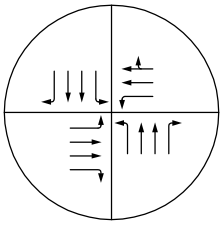
1. Xenia Avenue (NS) at 8th Street (EW)



2. Xenia Avenue (NS) at 6th Street (EW)



3. Highland Springs Avenue (NS) at Wilson Street / 8th Street (EW)



4. Highland Springs Avenue (NS) at Ramsey Street / 6th Street (EW)

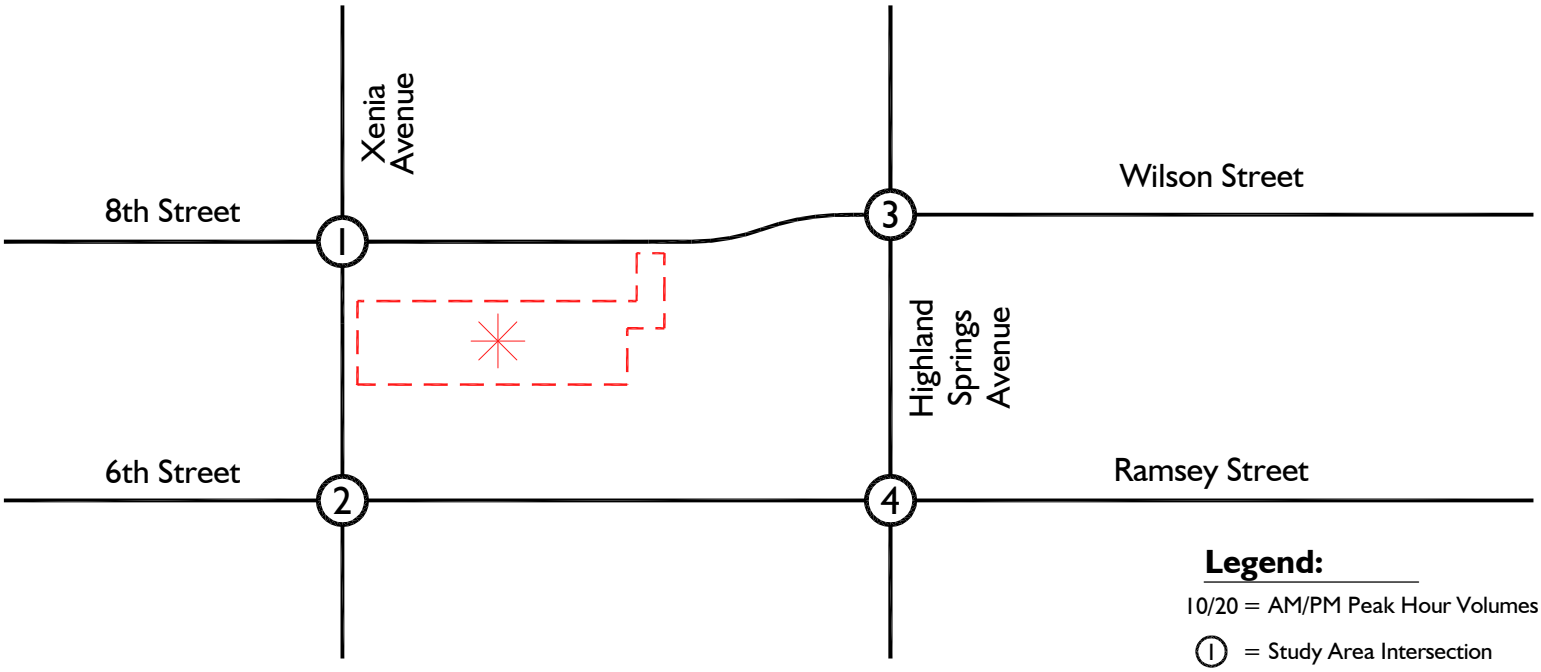
Legend:

- = Traffic Signal
- (S) = All Way Stop
- RTO = Right Turn Overlap
- = Project Site Boundary
- = Project Site

N

Exhibit 3-2

Existing Conditions Traffic Volumes



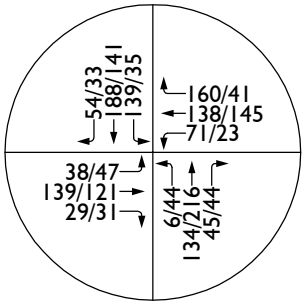
Legend:

10/20 = AM/PM Peak Hour Volumes

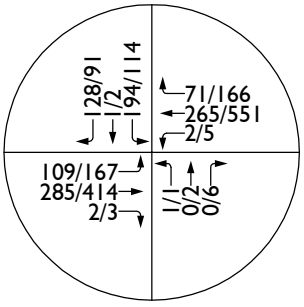
(1) = Study Area Intersection

= Project Site Boundary

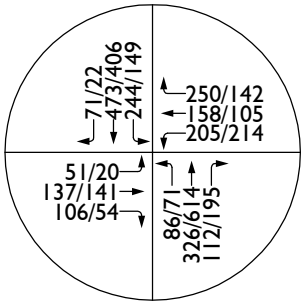
= Project Site



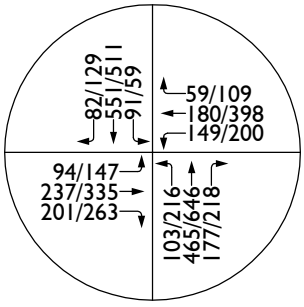
1. Xenia Avenue (NS) at 8th Street (EW)



2. Xenia Avenue (NS) at 6th Street (EW)



3. Highland Springs Avenue (NS) at Wilson Street / 8th Street (EW)



4. Highland Springs Avenue (NS) at Ramsey Street / 6th Street (EW)

N

Table 3-1
Study Intersection LOS Analysis Summary
Existing Conditions

	Intersection	Jurisdiction	Traffic Control[3]	Methodology	Delay (Sec / Veh)[1,2]		Level of Service	
					AM	PM	AM	PM
1.	Xenia Avenue (NS) at 8th Street (EW)	City of Beaumont	AWS	HCM 6	13.6	11.8	B	B
2.	Xenia Avenue (NS) at 6th Street (EW)	City of Beaumont	AWS	HCM 6	12.3	18.7	B	C
3.	Highland Springs Avenue (NS) at 8th Street/Wilson Street (EW)	City of Beaumont / City of Banning	TS	HCM 6	31.8	26.2	C	C
4.	Highland Springs Avenue (NS) at 6th Street/Ramsey Street (EW)	City of Beaumont / City of Banning	TS	HCM 6	34.0	47.7	C	D
5.	Xenia Avenue (NS) at Project Access 1 (EW)	City of Beaumont	CSS	HCM 6	Does Not Currently Exist			
6.	Project Access 2 (NS) at 8th Street (EW)	City of Beaumont	CSS	HCM 6	Does Not Currently Exist			

[1] Deficient operation shown in **Bold**.

[2] HCM Analysis Software: Vistro, Version 2022. Per the Highway Capacity Manual 6th Edition, overall average intersection delay and level of service are shown for intersections with traffic signal or all-way stop control. For intersections with cross-street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[3] TS = Traffic Signal
AWS = All-Way Stop
CSS = Cross Street Stop

4.0 Project Traffic

4.1 Project Trip Generation

Trip generation represents the amount of traffic that is attracted and produced by a development. The trip generation for the project is based upon the specific land uses that have been planned for this development.

Trip generation is typically estimated based on the trip generation rates from the latest Institute of Transportation Engineers (ITE) Trip Generation Manual (11th Edition, 2021). This publication provides a comprehensive evaluation of trip generation rates for a variety of land uses.

Table 4-1 shows the ITE trip generation rates for the trip generation analysis of the project land uses.

Utilizing the trip generation rates from Table 4-1, Table 4-2 summarizes the daily and peak hour trip generation for weekday conditions for the proposed project.

As shown in Table 4-2, based on the ITE trip generation rates:

- The proposed project is forecast to generate approximately 1,294 daily trips which include approximately 77 AM peak hour trips and approximately 98 PM peak hour trips.

4.2 Project Trip Distribution

Trip distribution represents the directional orientation of traffic to and from the project site. Trip distribution is heavily influenced by the geographical location of the site and the proximity to the regional freeway system. The directional orientation of traffic was determined by evaluating existing and proposed land uses and highways within the study area.

The project trip distribution is shown in Exhibit 4-1.

4.2.1 Modal Split

Modal split denotes the proportion of traffic generated by a project that would use any of the transportation modes, namely buses, cars, bicycles, motorcycles, trains, carpools, etc. The traffic reducing potential of public transit and other modes can be notable. However,

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the traffic projections in this study are conservative because no modal split reduction is applied to the projections.

4.3 Project Traffic Assignment and Volumes

The assignment of project traffic to the adjoining roadway system is based upon the project's trip generation, trip distribution, arterial highway, and local street systems that would be in place by the time of initial occupancy of the site.

Project traffic volumes are shown on Exhibit 4-2.

4.4 Cumulative Projects Traffic

Information on future projects in the vicinity of the study area has been provided by the City of Beaumont and the City of Banning staff for inclusion in this analysis and is shown in Table 4-3.

The list of cumulative projects provided are for projects that have been officially submitted for land use review, are waiting public hearing approval, or have been approved by the public hearing body.

Table 4-3 shows the land uses and corresponding trip generation for the nearby cumulative projects provided by public agencies.

A location map of the cumulative projects is shown in Exhibit 4-3.

Cumulative projects traffic volumes are shown in Exhibit 4-4.

In reality, some of the cumulative projects may be downsized or may not be developed by project opening year (2024). In addition, many of the cumulative projects have been or will be subject to a variety of mitigation measures that will reduce the potential environmental impacts associate with those projects. However, those mitigation measures have not been taken into account in projecting the environmental impact of the cumulative projects.

Therefore, the cumulative analyses set forth below are conservative and could result in greater impacts than actually anticipated. Additionally, the analysis utilizes a growth rate of two percent (2.0%) per year for project opening year (2024) conditions, which would already capture and account for most projects in the area. Applied to the Year 2022 existing traffic volumes, this factor results in a 4.0% total growth in existing volumes to near-term horizon year 2024. The growth rate methodology is considered conservative since it is applied to all movements in all the study intersections.

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4.5 Project Opening Year (2024) Without Project Conditions Traffic Volumes

Project Opening Year (2024) Without Project Conditions traffic volumes consist of two (2) years of linear annual growth on top of existing (2022) traffic volumes at two percent (2%) per year (i.e. 4% total growth), plus traffic generated by the cumulative projects.

Project Opening Year (2024) Without Project Conditions traffic volumes are shown on Exhibit 4-5.

4.6 Project Opening Year (2024) With Project Conditions Traffic Volumes

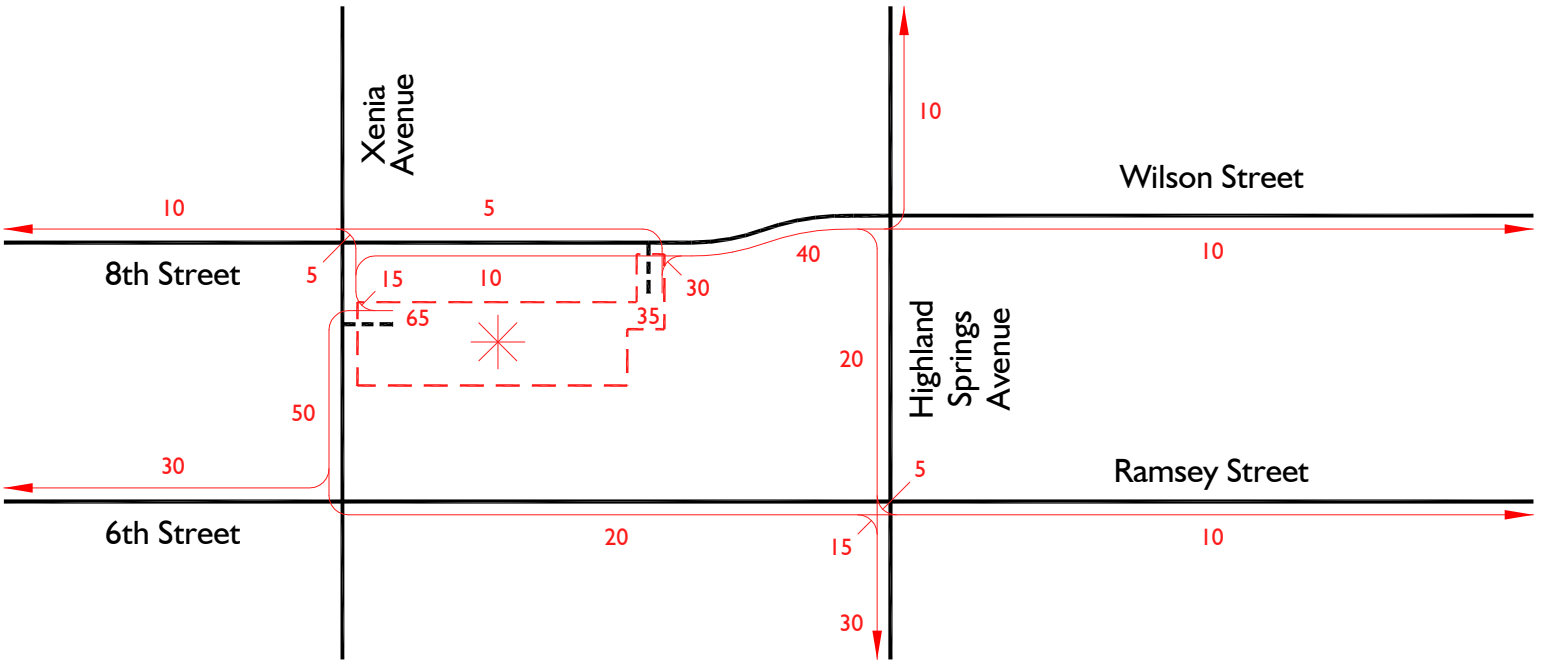
Project Opening Year (2024) With Project Conditions traffic volumes consist of two (2) year of linear annual growth on top of existing (2022) traffic volumes at two percent (2%) per year (i.e. 4% total growth), plus traffic generated by the cumulative projects and traffic generated by the proposed project.

Project Opening Year (2024) With Project Conditions traffic volumes are shown on Exhibit 4-6.

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Exhibit 4-1

Project Trip Distribution



Legend:

10 = Percent to/from Project

-- = Project Site Boundary

✳ = Project Site

▪▪▪ = Project Access Driveway

N

Table 4-1
ITE Trip Generation Rates[1]

Land Use	Units[2]	ITE Code	AM			PM			Daily
			In	Out	Total	In	Out	Total	
Multi-Family Housing - Low Rise	DU	220	0.10	0.30	0.40	0.32	0.19	0.51	6.74

[1] Source: *ITE Trip Generation Manual* (11th Edition, 2021)

[2] DU = Dwelling Units

Table 4-2
Project Trip Generation[1]

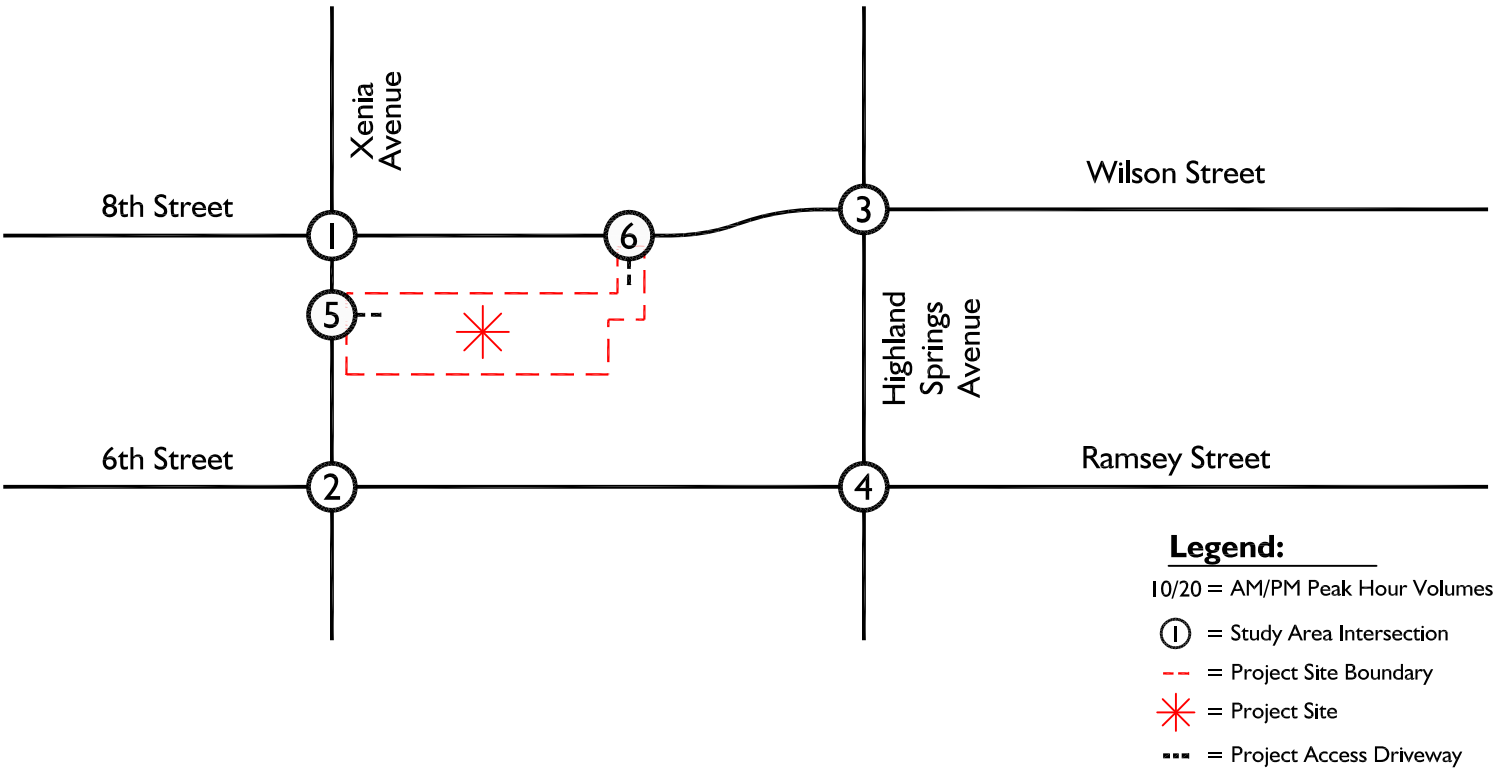
Proposed Land Uses									
Land Use (ITE Code)	**Quantity**	**Units[2]**	**AM**			**PM**			**Daily**
			In	**Out**	**Total**	**In**	**Out**	**Total**	
Xenia Multi-Family Residential Project (ITE 210)	192	DU	18	59	77	62	36	98	1,294
		Total	**18**	**59**	**77**	**62**	**36**	**98**	**1,294**

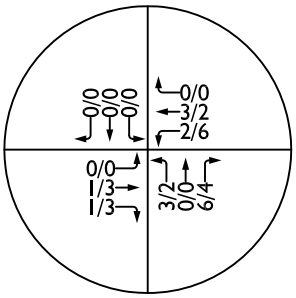
[1] Source: *ITE Trip Generation Manual* (11th Edition, 2021)

[2] DU = Dwelling Units

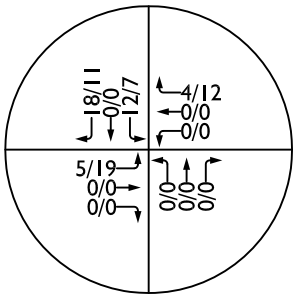
Exhibit 4-2

Project Traffic Volumes

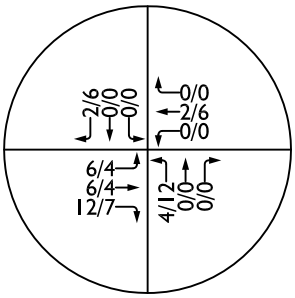




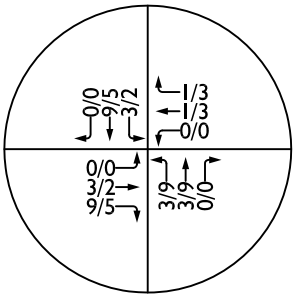
1. Xenia Avenue (NS) at 8th Street (EW)



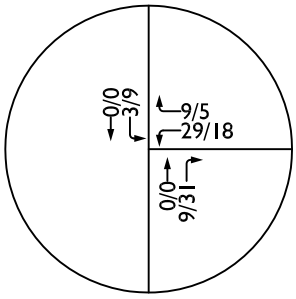
2. Xenia Avenue (NS) at 6th Street (EW)



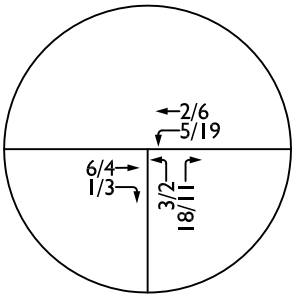
3. Highland Springs Avenue (NS) at Wilson Street / 8th Street (EW)



4. Highland Springs Avenue (NS) at Ramsey Street / 6th Street (EW)



5. Xenia Avenue (NS) at Project Access I (EW)

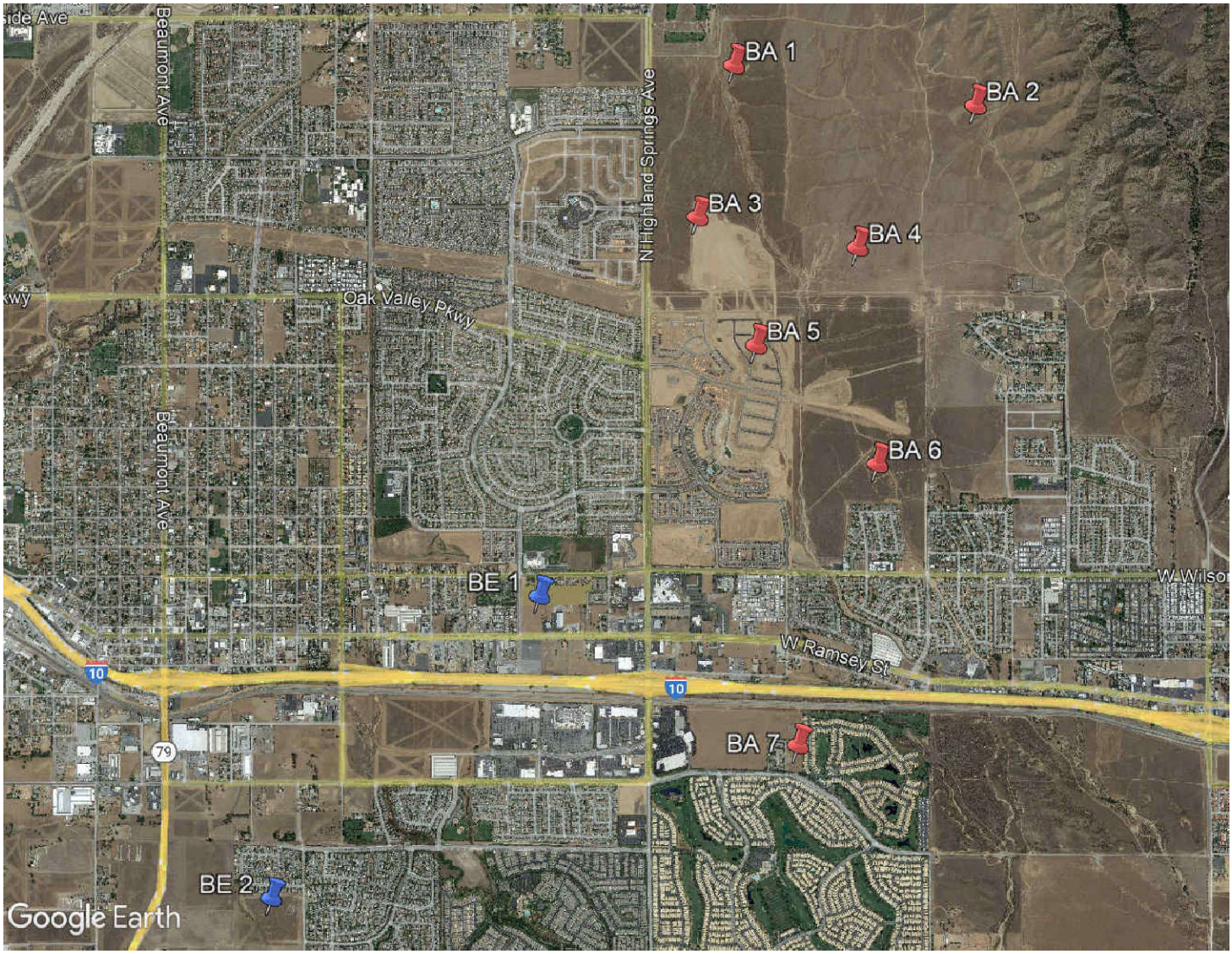


6. Project Access II (NS) at 8th Street (EW)

N

Exhibit 4-3

Cumulative Projects Location Map



NOTE: See report for full list of cumulative projects and traffic analysis zones (TAZ).

Legend:

= City of Beaumont Cumulative Project

= City of Banning Cumulative Project

N

Table 4-3
Cumulative Projects Trip Generation[1]

ID No.	Jurisdiction	Project Name / Case Number	Land Use	Quantity	Units[2]	Peak Hour						Daily
						AM			PM			
						In	Out	Total	In	Out	Total	
TAZ 1												
BE 1	**Beaumont**	Beaumont Commons[3]	Single Family Homes	120	DU	13	42	55	42	25	67	878
					TAZ 1 Total	**13**	**42**	**55**	**42**	**25**	**67**	**878**
TAZ 2												
BE 2	**Beaumont**	Pacific Scene (Tract No. 32850)[3]	Single Family Homes	95	DU	18	53	71	59	35	94	897
					TAZ 2 Total	**18**	**53**	**71**	**59**	**35**	**94**	**897**
TAZ 3												
BA 1	**Banning**	TTM 37445 - Pardee Homes	Single Family Homes	690	DU	126	357	483	409	240	649	6,507
BA 2	**Banning**	TTM 37446 - Pardee Homes	Single Family Homes	437	DU	80	226	306	259	152	411	4,121
BA 3	**Banning**	TTM 37443 - Pardee Homes	Single Family Homes	576	DU	105	298	403	341	200	541	5,432
BA 4	**Banning**	TTM 37444 - Pardee Homes	Single Family Homes	477	DU	87	247	334	282	166	448	4,498
BA 5	**Banning**	TTM 37388 - Pardee Homes	Single Family Homes	287	DU	52	149	201	170	100	270	2,706
BA 6	**Banning**	TTM 37389 - Pardee Homes	Single Family Homes	403	DU	73	209	282	239	140	379	3,800
					TAZ 3 Total	**523**	**1,486**	**2,009**	**1,700**	**998**	**2,698**	**27,064**
TAZ 4												
BA 7	**Banning**	Banning Medical	Medical Office	35.250	TSF	86	23	109	42	97	139	1,269
			Pharmacy	1.257	TSF	2	2	4	6	6	12	136
					TAZ 4 Total	**88**	**25**	**113**	**48**	**103**	**151**	**1,405**
					Total Cumulative Projects Trip Generation	***642***	***1,606***	***2,248***	***1,849***	***1,161***	***3,010***	***30,244***

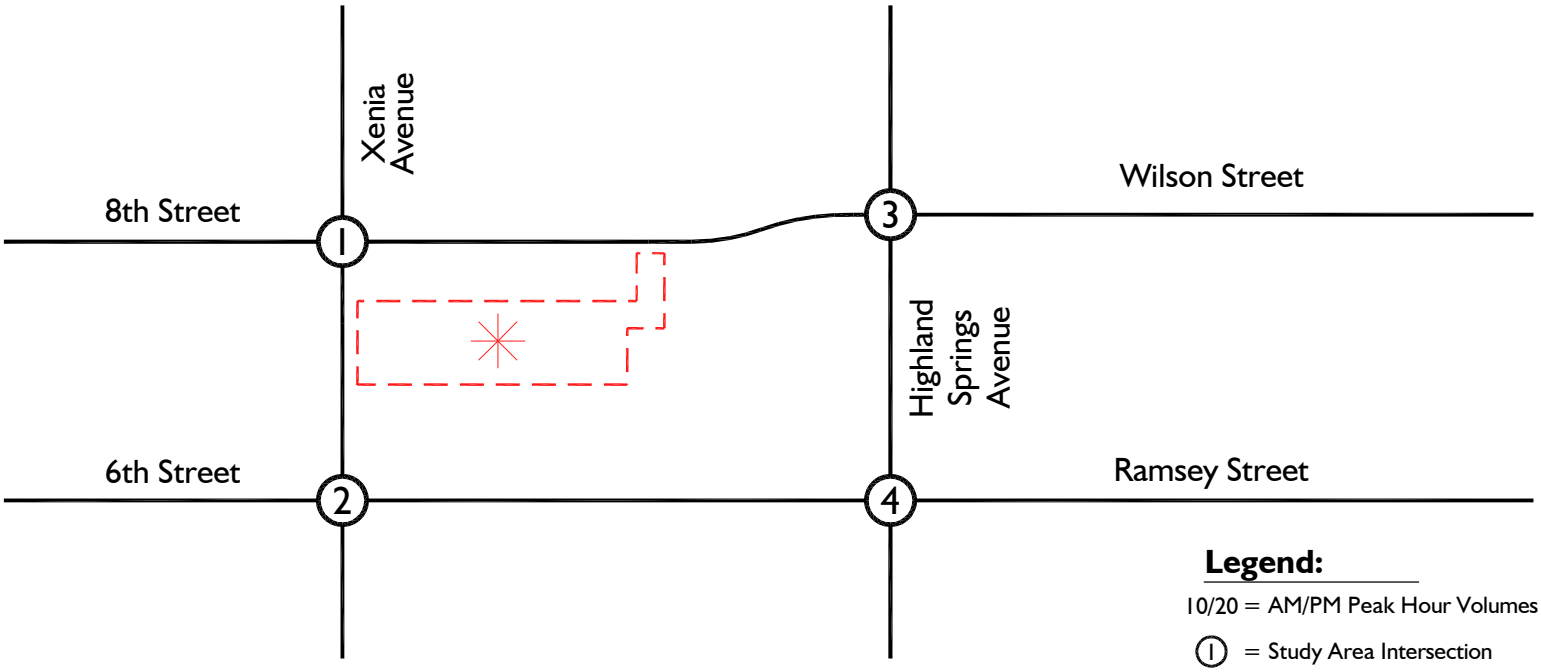
[1] Cumulative Projects information provided by City of Beaumont and City of Banning staff.

[2] DU = Dwelling Units.
TSF = Thousand Square Feet.

[3] Source: *Beaumont Summit Station Traffic Study,* dated February 2022, prepared by Kimley-Horn and Associates, Inc.

Exhibit 4-4

Cumulative Projects Traffic Volumes



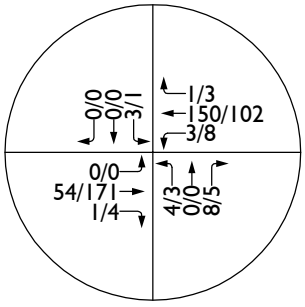
Legend:

10/20 = AM/PM Peak Hour Volumes

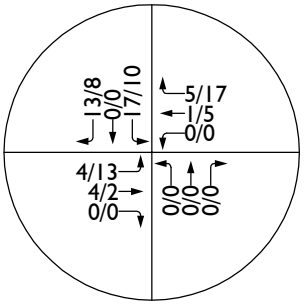
(1) = Study Area Intersection

= Project Site Boundary

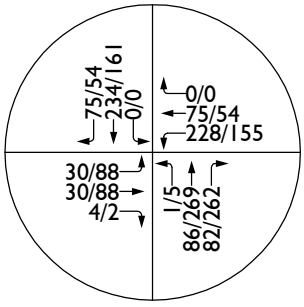
= Project Site



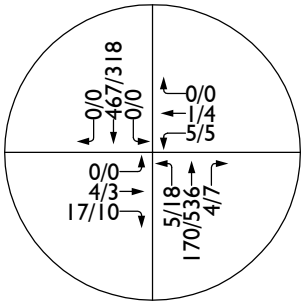
1. Xenia Avenue (NS) at 8th Street (EW)



2. Xenia Avenue (NS) at 6th Street (EW)



3. Highland Springs Avenue (NS) at Wilson Street / 8th Street (EW)

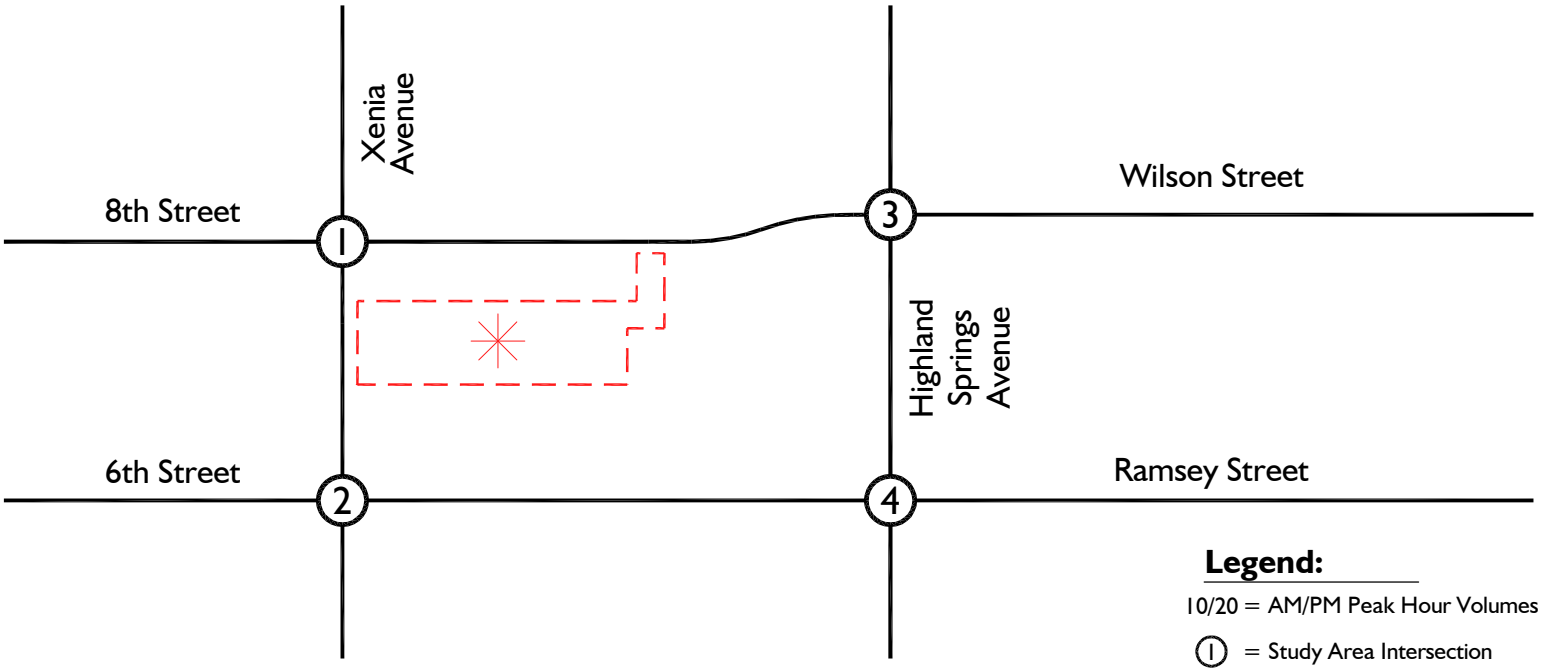


4. Highland Springs Avenue (NS) at Ramsey Street / 6th Street (EW)

N

Exhibit 4-5

Project Opening Year Without Project Conditions Traffic Volumes



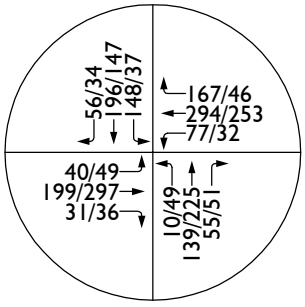
Legend:

10/20 = AM/PM Peak Hour Volumes

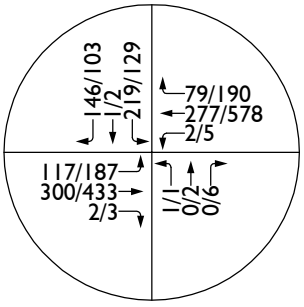
(1) = Study Area Intersection

= Project Site Boundary

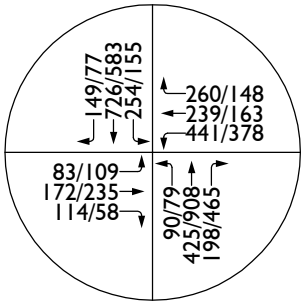
= Project Site



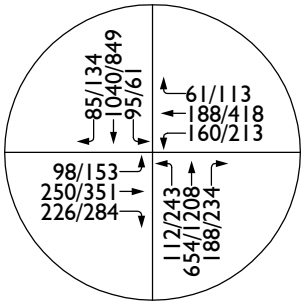
1. Xenia Avenue (NS) at 8th Street (EW)



2. Xenia Avenue (NS) at 6th Street (EW)



3. Highland Springs Avenue (NS) at Wilson Street / 8th Street (EW)

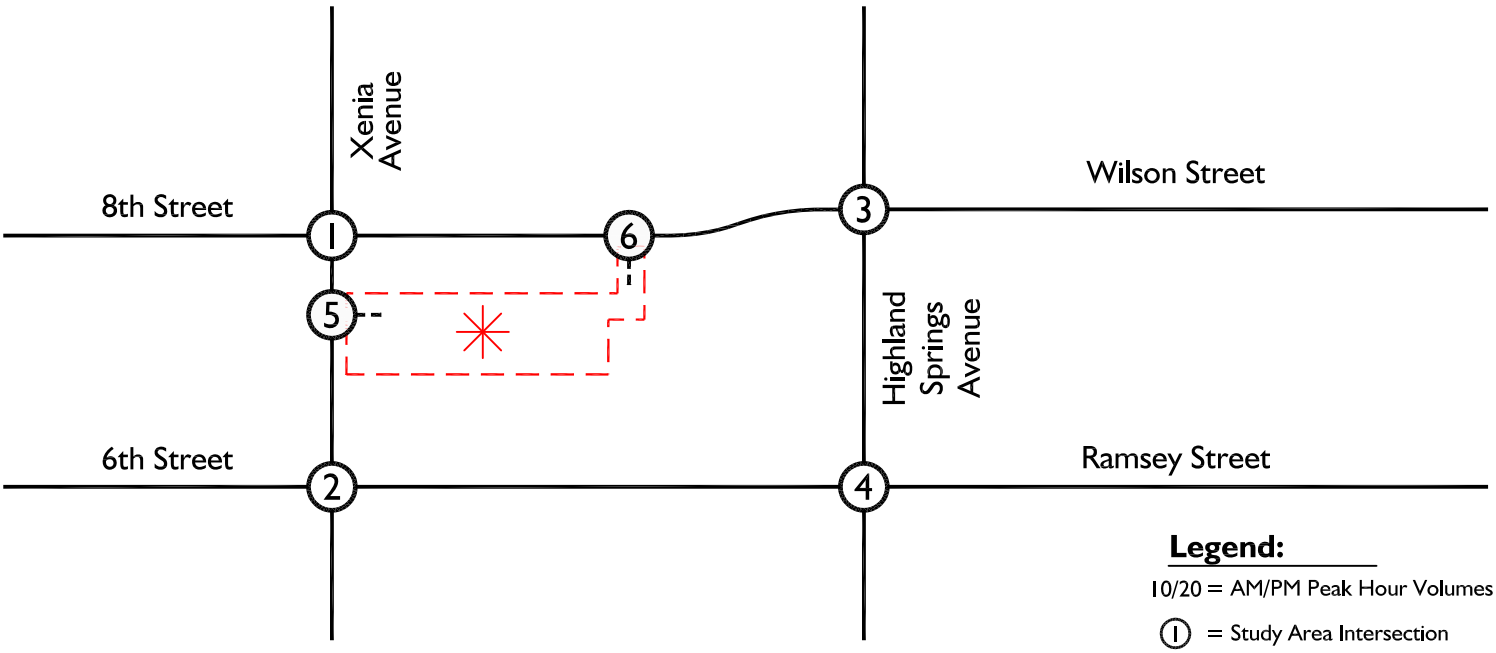


4. Highland Springs Avenue (NS) at Ramsey Street / 6th Street (EW)

N

Exhibit 4-6

Project Opening Year (2024) With Project Conditions Traffic Volumes



Legend:

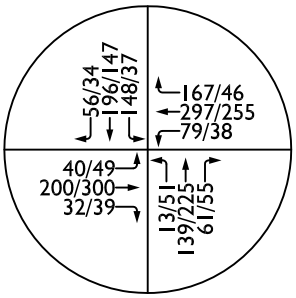
10/20 = AM/PM Peak Hour Volumes

(1) = Study Area Intersection

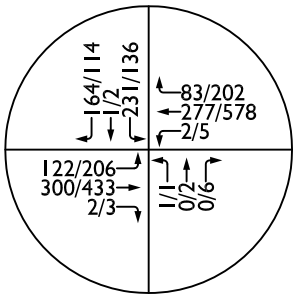
= Project Site Boundary

= Project Site

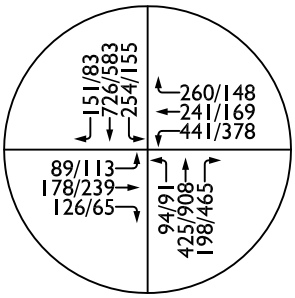
= Project Access Driveway



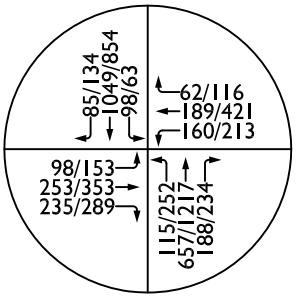
1. Xenia Avenue (NS) at 8th Street (EW)



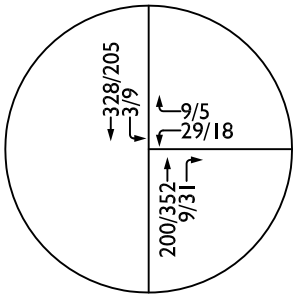
2. Xenia Avenue (NS) at 6th Street (EW)



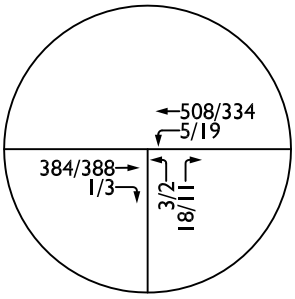
3. Highland Springs Avenue (NS) at Wilson Street / 8th Street (EW)



4. Highland Springs Avenue (NS) at Ramsey Street / 6th Street (EW)



5. Xenia Avenue (NS) at Project Access I (EW)



6. Project Access II (NS) at 8th Street (EW)

N

5.0 Project Opening Year (2024) Conditions

This section of the report provides a discussion on the study intersection peak hour level of service (LOS) analysis and findings.

5.1 Project Opening Year (2024) Without Project Conditions Level of Service

Project Opening Year (2024) Without Project Conditions LOS calculations for the four (4) existing study intersections are shown in Table 5-1 and are based upon the Project Opening Year (2024) Without Project Conditions traffic volumes shown on Exhibit 4-5 and the existing geometry shown on Exhibit 3-1.

As shown in Table 5-1, the four (4) existing study intersections are forecast to operate at an acceptable LOS (D or better) during the AM and PM peak hours for Project Opening Year (2024) Without Project Conditions.

Detailed LOS analysis worksheets for Project Opening Year (2024) Without Project Conditions are contained in Appendix D.

5.2 Project Opening Year (2024) With Project Conditions Level of Service

Project Opening Year (2024) With Project Conditions LOS calculations for the six (6) study intersections are also shown in Table 5-1 and are based upon the Project Opening Year (2024) With Project Conditions traffic volumes shown on Exhibit 4-6 and the existing geometry shown on Exhibit 3-1.

As shown in Table 5-1, the six (6) study intersections are forecast to operate at an acceptable LOS (D or better) during the AM and PM peak hours for Project Opening Year (2024) With Project Conditions. As such, no improvements are required or recommended at any of the six (6) study intersections.

Detailed LOS analysis worksheets for Project Opening Year (2024) With Project Conditions are contained in Appendix E.

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Table 5-1
Study Intersection LOS Analysis Summary
Project Opening Year (2024) Conditions

Intersection		Jurisdiction	Traffic Control[3]	Methodology	Without Project				With Project							
					Delay (Sec / Veh)[1,2]		Level of Service		Delay (Sec / Veh)[1,2]		Increase in Delay		Level of Service		Requires Improvement?	
					AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
1.	Xenia Avenue (NS) at 8th Street (EW)	City of Beaumont	AWS	HCM 6	20.6	17.6	C	C	20.9	17.8	0.3	0.2	C	C	No	No
2.	Xenia Avenue (NS) at 6th Street (EW)	City of Beaumont	AWS	HCM 6	13.2	22.4	B	C	13.6	24.2	0.4	1.8	B	C	No	No
3.	Highland Springs Avenue (NS) at 8th Street/Wilson Street (EW)	City of Beaumont / City of Banning	TS	HCM 6	38.0	28.1	D	C	38.5	28.5	0.5	0.4	D	C	No	No
4.	Highland Springs Avenue (NS) at 6th Street/Ramsey Street (EW)	City of Beaumont / City of Banning	TS	HCM 6	34.3	50.7	C	D	34.7	52.5	0.4	1.8	C	D	No	No
5.	Xenia Avenue (NS) at Project Access 1 (EW)	City of Beaumont	CSS	HCM 6	Does Not Currently Exist				12.3	12.9	- -	- -	B	B	No	No
6.	Project Access 2 (NS) at 8th Street (EW)	City of Beaumont	CSS	HCM 6	Does Not Currently Exist				11.8	11.4	- -	- -	B	B	No	No

[1] Deficient operation shown in **Bold**.

[2] HCM Analysis Software: Vistro, Version 2022. Per the Highway Capacity Manual 6th Edition, overall average intersection delay and level of service are shown for intersections with traffic signal or all-way stop control. For intersections with cross-street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[3] TS = Traffic Signal
AWS = All-Way Stop
CSS = Cross Street Stop

6.0 Vehicles Miles Traveled (VMT) Analysis

The following VMT analysis has been conducted in accordance with the *Western Riverside Council of Governments Recommended Traffic Impact Analysis Guidelines for Vehicles Miles Traveled and Level of Service Assessment*, updated January 2020.

6.1 Low VMT Area Screening

The WRCOG guidelines have implemented project screening procedures to identify projects that may be presumed to have a less than significant impact on VMT.

The WRCOG guidelines indicate that projects located within a low VMT-generating area may be presumed to have a less than significant impact absent substantial evidence to the contrary and would be exempted from further project-level VMT assessment.

The results of the VMT screening analysis are summarized in Table 6-1.

Table 6-1
VMT Screening Analysis[1]

Project APN	Baseline Year (Opening Year)	OD VMT Per Service Population
419170027	2024	30.2
	City of Beaumont Threshold of Significance	31.5
	Potentially Significant Impact? (Yes/No)	No

1. Western Riverside Council of Government (WRCOG) VMT Screening Tool. Website: https://fehrandpeers.maps.arcgis.com/apps/webappviewer/index.html?id=4e34ad3196464c8086c881189237b25c. Accessed: March 2022.

To identify if the project is in a low VMT-generating area, the WRCOG screening tool is used to compare the baseline (i.e. Opening Year 2024) project-generated VMT per service population to the lead agency's (Beaumont) VMT per service population.

Based on the results of the WRCOG VMT screening tool as shown in Appendix F, the proposed project's baseline VMT (i.e. Opening Year 2024) is calculated to be 30.2 VMT per service population. Since the project's baseline VMT is less than the City of Beaumont's threshold of significance of 31.5 VMT per service population, the proposed project satisfies the Low VMT Area Screening procedure

The project may be presumed to have a less than significant impact to VMT.

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7.0 Gated Access Points Queuing Analysis

A queue evaluation has been performed at the two gated access driveways for Project Opening Year (2024) With Project Conditions. The purpose of this analysis is to determine whether adequate storage capacity is provided to allow vehicles to enter the project area without causing vehicles to spill back onto the public roadway.

The vehicular queues at the gates under Project Opening Year (2024) Conditions were forecast utilizing the Crommelin methodology. This analysis is based on the intensity of the inbound traffic which is a function of the arrival rate of vehicles at the entry location and the service rate at which vehicles are served by the gate system while entering the project site.

7.1 Arrival Rate

In order to determine the arrival rate of vehicles at the gated entry locations, the project's trip generation and trip distribution was reviewed to estimate the volume of inbound vehicles at both project access points.

Table 7-1 calculates the number of project trips entering the project access driveways based on the project's trip generation and trip distribution.

As shown in Table 7-1, the following inbound trips are anticipated at the entrances on an average day during the peak hour:

- Project Access 1: 40 inbound vehicles per hour.
- Project Access 2: 22 inbound vehicles per hour.

7.2 Service Rate

As detailed in the *Residential Electronic Gate Service Rate Study, July 22, 2016,* prepared by RK Engineering Group Inc., 190 vehicles per hour has been calculated as the recommended gate service rate for one entering lane shared by both residents and visitors. As such, this service rate of 190 vehicles per hour has been utilized as the service rate for both access points serving the proposed project. The gate service rate study is included in Appendix G.

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7.3 Intensity Rate

The intensity rate is calculated as the ratio of the arrival rate to the service rate. Hence, the following intensity rates have been calculated for the two (2) project access driveways:

- Project Access 1: 0.21
- Project Access 2: 0.12

7.4 Queue Findings

Exhibit 7-1 and Exhibit 7-2 shows the results of the Crommelin methodology by plotting the intensity rates previously calculated on the Crommelin nomograph and identifying the corresponding number of vehicles in the reservoir space behind the service position.

Table 7-2 summarizes the results of the Crommelin methodology.

As shown in Table 7-2, under Project Opening Year (2024) With Project Conditions:

- The 95th percentile vehicular queue for the Project Access 1 driveway is forecast to be approximately two (2) vehicles during the peak hour.
- The 95th percentile vehicular queue for the Project Access 2 driveway is forecast to be approximately two (2) vehicles during the peak hour.

Based on the project site plan, it is expected that the projected two (2) vehicle queue at both project access driveways can be accommodated and is not expected to spill back onto the public roadway.

7.5 Recommendations

Since the Project Access 2 driveway is not expected to serve visitors and no turnaround area is proposed, a "Residents Only" sign should be installed at the entrance to redirect visitors to utilize the main gate at the Project Access 1 driveway along Xenia Avenue.

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Table 7-1
Trips Per Entry Lane

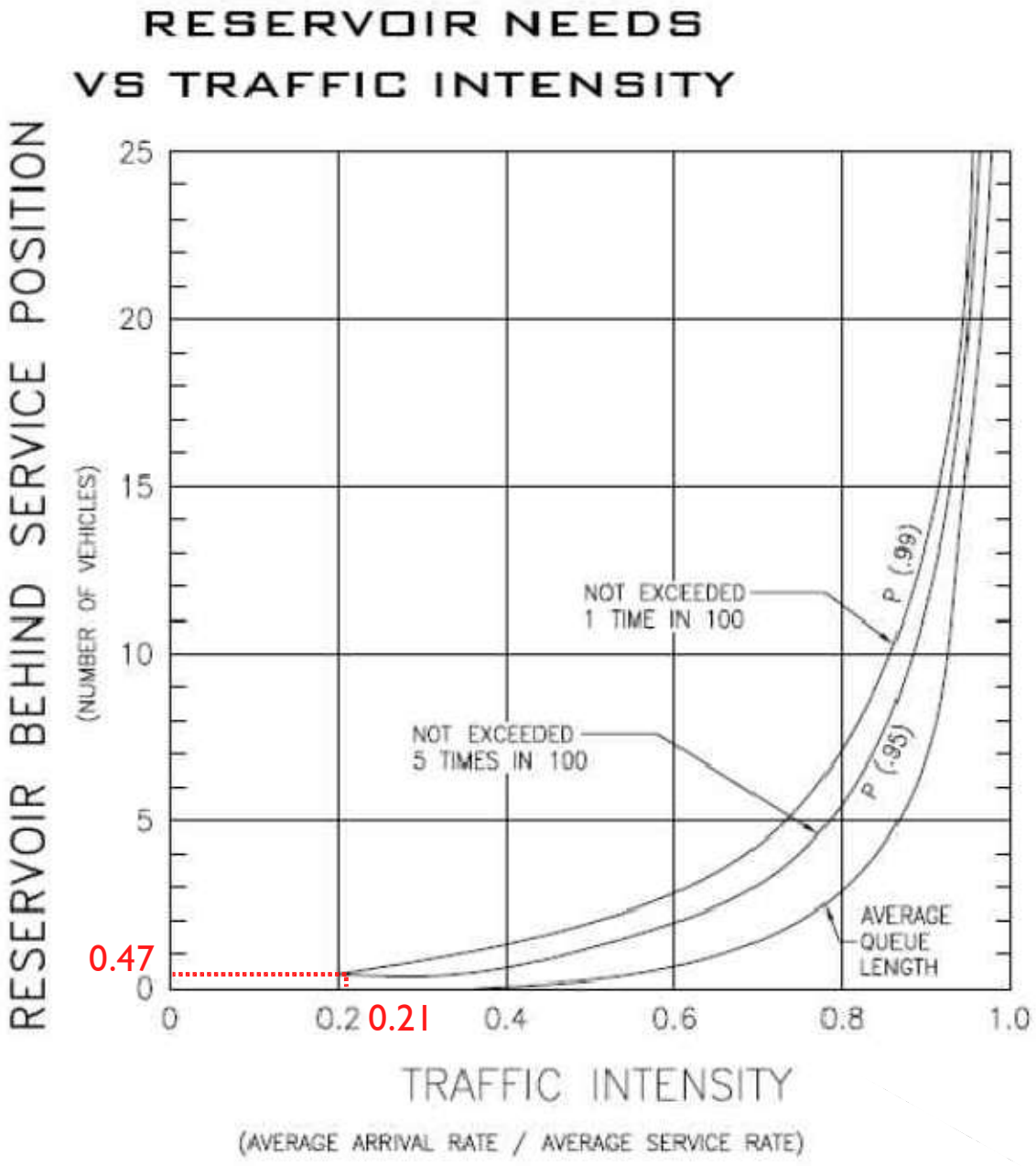
Land Use	Quantity	Units[2]	Highest Peak Hour Inbound Trips[1]	Percentage of Trips at Entrance[2]		Number of Trips at Entrance	
				Project Access 1	Project Access 2	Project Access 1	Project Access 2
Xenia Multi-Family Residential Project	192	DU	62	65%	35%	40	22

[1] Maximum number of project inbound trips between the project's AM and PM Peak hour trip generation shown in Table 4-2.

[2] Determined by the project's trip distribution as shown in Exhibit 4-1.

Exhibit 7-1

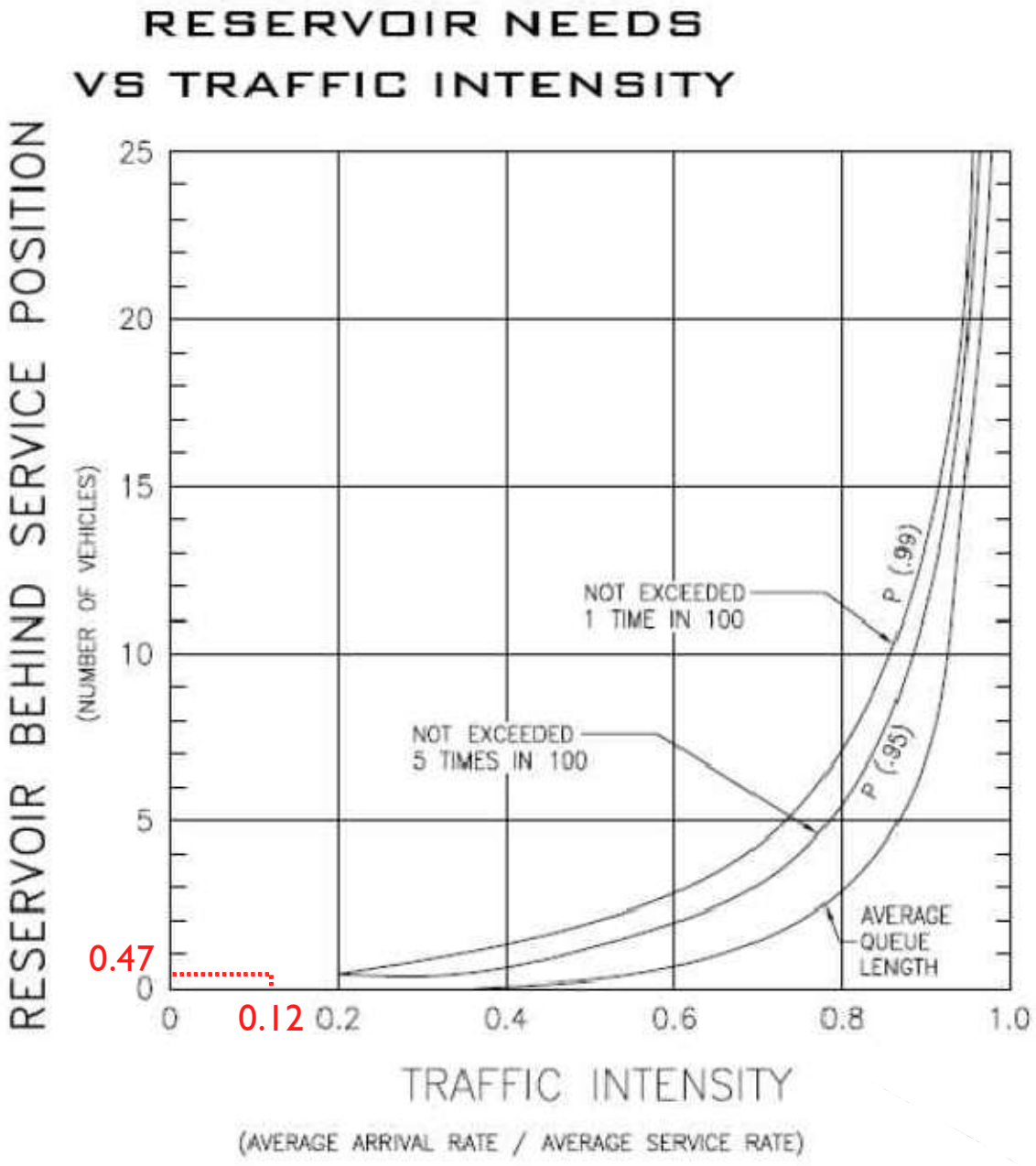
Crommelin Gate Queuing Analysis
Project Access 1 Gate
Project Opening Year (2024) Conditions



N

Exhibit 7-2

Crommelin Gate Queuing Analysis
Project Access 2 Gate
Project Opening Year (2024) Conditions



N

Table 7-2

Gate Service Rate Calculations

Gate Location	Project Opening Year (2024) Crommelin Traffic Arrival Rate (Number of Vehicles per Hour)[1]	Crommelin Traffic Service Rate (Number of Vehicles per Hour)[2]	Crommelin Traffic Intensity Rate	Anticipated Maximum Queue Behind Service Position (Vehicles)[3]	Anticipated Maximum Queue Including Service Position (Vehicles)[4]
Project Access 1	40	190	0.21	1	2
Project Access 2	22	190	0.12	1	2

[1] Crommelin traffic arrivial rate based on the project's trip generation and inbound trip distribution.

[2] Recommended gate service rate for combined user (Resident & Visitor) for a single entry lane. Source: *Residential Electronic Gate Service Rate Study* , dated July 22, 2016, prepared by RK Engineering Group Inc.

[3] Maximum queue behind service station position has been estimated using the Crommelin graph (rounded up to the nearest vehicle).

[4] An additional one vehicle is assumed to be in the service position.

8.0 Findings & Recommendations

8.1 Project Summary

The project site is located near the southeast corner of Xenia Avenue and 8th Street in the City of Beaumont. The project site is currently vacant. The proposed project consists of constructing 192 multi-family residential dwelling units on approximately 10.93 acres. The proposed project will also provide ancillary amenities such as a community club and swimming pool. The proposed project will not provide any low income/affordable housing.

The project is planned to open in 2024 and is evaluated in a single phase.

The proposed project is forecast to generate approximately 1,294 daily trips which include approximately 77 AM peak hour trips and approximately 98 PM peak hour trips.

8.2 Intersection Analysis Summary

The intersection level of service analysis has been performed at six (6) intersections within the vicinity of the site where the project may contribute a significant amount of traffic. Project deficiencies have been evaluated within the study area based on peak hour level of service criteria.

Existing Conditions

All four (4) existing study intersections are currently operating at an acceptable level of service (LOS D or better) during the AM and PM peak hours.

Project Opening Year (2024) Without Project Conditions

All four (4) existing study intersections are forecast to operate at an acceptable LOS (D or better) during the AM and PM peak hours for Project Opening Year (2024) Without Project Conditions.

Project Opening Year (2024) With Project Conditions

All six (6) study intersections are forecast to operate at an acceptable LOS (D or better) during the AM and PM peak hours for Project Opening Year (2024) With Project Conditions. As such, no improvements are required or recommended at any of the six (6) study intersections.

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8.3 Vehicles Miles Traveled (VMT) Analysis Summary

The proposed project was subject to a VMT analysis conducted in accordance with the *Western Riverside Council of Governments Recommended Traffic Impact Analysis Guidelines for Vehicles Miles Traveled and Level of Service Assessment,* updated January 2020.

The WRCOG guidelines indicate that projects located within a low VMT-generating area may be presumed to have a less than significant impact absent substantial evidence to the contrary and would be exempted from further project-level VMT assessment.

To identify if the project is in a low VMT-generating area, the WRCOG screening tool is used to compare the baseline (i.e. Opening Year 2024) project-generated VMT per service population to the lead agency's (Beaumont) VMT per service population.

Based on the results of the WRCOG VMT screening tool, the proposed project's baseline VMT (i.e. Opening Year 2024) is calculated to be 30.2 VMT per service population. The project's baseline VMT is less than the City of Beaumont's threshold of significance of 31.5 VMT per service population. Therefore, the proposed project satisfies the Low VMT Area Screening procedure.

The project may be presumed to have a less than significant impact to VMT.

8.4 Gated Access Points Queuing Analysis Summary

Based on the project site plan, it is expected that the projected two (2) vehicle queue at both project access driveways can be accommodated and is not expected to spill back onto the public roadway. Since the Project Access 2 driveway is not expected to serve visitors and no turnaround area is proposed, a "Residents Only" sign should be installed at the entrance to redirect visitors to utilize the main gate at the Project Access 1 driveway along Xenia Avenue.

4000 westerly place, ste. 280
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(949) 474-0809
rkengineer.com

Appendix A

Approved Scope of Work

Xenia Multi-Family Residential Project
Revised Traffic Impact Study
Scoping Agreement

March 15, 2022

The following provides information on the proposed project, summarizes the analysis scope, parameters, and assumptions for review and approval, and also includes request for information on items related to the study.

A. Project Description: The proposed Xenia Multi-Family Residential development project (hereinafter referred to as project) is located near the southeast corner of Xenia Avenue and 8th Street in the City of Beaumont.

The proposed project site is currently vacant. The project consists of constructing and operating 192 multi-family dwelling units on approximately 10.93 acres. The project will also provide ancillary amenities such as a community club and swimming pool. The proposed project will not provide any low income/affordable housing.

Main access for the project is planned via the following:

- One (1) full-access unsignalized access driveway along 8th Street (Gated Access)
- One (1) full-access unsignalized access driveway along Xenia Avenue (Gated Access)

The project is planned to open in 2024 and will be evaluated in one single phase.

Exhibit A shows the location map of the proposed project. Exhibit B shows the proposed site plan.

B. Project Trip Generation: Trip generation represents the amount of traffic that is attracted and produced by a development.

Trip generation is typically estimated based on the trip generation rates from the latest *Institute of Transportation Engineers (ITE) Trip Generation Manual.* The 11th Edition, 2021 ITE Manual has been utilized for this scoping agreement. This publication provides a comprehensive evaluation of trip generation rates for a variety of land uses.

Table 1 shows the ITE trip generation rates utilized for the trip generation analysis of the proposed project land use.

Table 1
ITE Trip Generation Rates[1]

Land Use	Units	ITE Code	AM			PM			Daily
			In	Out	Total	In	Out	Total	
Multi-family Housing - Low Rise	DU	220	24%	76%	0.40	63%	37%	0.51	6.74

[1] Source: *2021 ITE Trip Generation Manual (11th Edition)*

[2] DU = Dwelling Units

Table 2 shows the trip generation for the proposed project utilizing the trip generation rates shown in Table 1.

Table 2
Proposed Project Trip Generation[1]

Land Use (ITE Code)	Quantity	Units	AM			PM			Daily
			In	Out	Total	In	Out	Total	
Xenia Multi-Family Residential Project	192	DU	18	59	77	62	36	98	1,294

[1] Source: *2021 ITE Trip Generation Manual (11th Edition)*

[2] DU = Dwelling Units

As shown in Table 2, based on the ITE trip generation rates, the proposed project is forecast to generate approximately 1,294 daily trips which include approximately 77 AM peak hour trips and approximately 98 PM peak hour trips.

C. Project Trip Distribution: Exhibit C shows the project trip distribution for the proposed project.

D. Study Intersections: The analysis will evaluate the following six (6) study intersections:

1. Xenia Avenue (NS) at 8th Street (EW)
2. Xenia Avenue (NS) at 6th Street (EW)
3. Highland Springs Avenue (NS) at 8th Street (EW)
4. Highland Springs Avenue (NS) at 6th Street (EW)

5. Xenia Avenue (NS) at Project Access 1 (EW)

6. Project Access 2 (NS) at 8th Street (EW)

E. Analysis Scenarios: The analysis will evaluate traffic conditions for the following scenarios during the weekday AM (7:00 AM to 9:00 AM) and weekday PM (4:00 PM to 6:00 PM):

- Existing Conditions;
- Project Opening Year Without Project Conditions; and
- Project Opening Year With Project Conditions;

F. Traffic Analysis Parameters: The analysis will utilize the following parameters:

- Synchro and/or Vistro analysis software and the Highway Capacity Manual 6th Editions (HCM 6) methodology.
- Optimized signal timing;

G. Existing Traffic Counts: The analysis will utilize new traffic counts. The counts will not be collected by vehicle classification.

- AM peak period counts will be collected during one typical weekday from 7:00 AM to 9:00 AM.
- PM peak period counts will be collected during one typical weekday from 4:00 PM to 6:00 PM.

H. Forecast Opening Year (2024) Conditions Traffic Volumes: Opening year (2024) background traffic volumes will be derived by applying an annual growth rate of two percent (2%) per year to existing traffic volumes and addition of traffic associated with specific cumulative projects in the area provided by the City.

I. Performance Criteria: Acceptable LOS of D or better.

J. Queuing Analysis at Gated Access Points: Since the two project access points are proposed to be gated, the traffic impact study will evaluate the projected inbound queues for each project access point utilizing City of Beaumont criteria and/or the Crommelin Methodology.

K. VMT Analysis:

Effective July 1st, 2020, the longstanding metric of roadway level of service (LOS), which is typically measured in terms of vehicle delay, roadway capacity and congestion, will no longer be considered a significant impact under the California Environmental Quality Act (CEQA). Pursuant to CEQA Guidelines, Section 15064.3, VMT is now the most appropriate measure of transportation impacts.

Based on preliminary review of the VMT data for the site utilizing the WRCOG website, the project appears to be in a low VMT area. Therefore, the project is expected to meet the VMT screening criteria consistent with WRCOG and the County of Riverside and a full VMT analysis will not be provided. Exhibit D presents a screenshot from the online WRCOG VMT Tool, prepared by Fehr & Peers, stating that the project site is located within low VMT generating TAZ's. The TIA will present all supporting maps and data to justify the project meeting the VMT screening criteria.

L. Mitigation Measures: If an intersection is operating deficiently and a significant impact is anticipated, improvements shall be identified to improve intersection operations back to overall level of service prior to the addition of project-related traffic, If an impact drops from an acceptable LOS to an unacceptable LOS level, then improvements may be necessary to return intersection operations back to an acceptable level.

M. Request for Information: Please provide information on the following for use in the traffic study:

- Information on cumulative projects that need to be included in the traffic analysis (location, land use type(s), and land use quantities); and

- Information on future roadway and circulation system modifications/improvements that are planned within the study area and would potentially affect the analysis.

If you have any questions, or would like further review, please call us at (949) 474-0809.

Sincerely,

RK ENGINEERING GROUP, INC.



Justin Tucker, P.E.
Principal Engineer

Attachments

Approved by:

_____

City of Beaumont

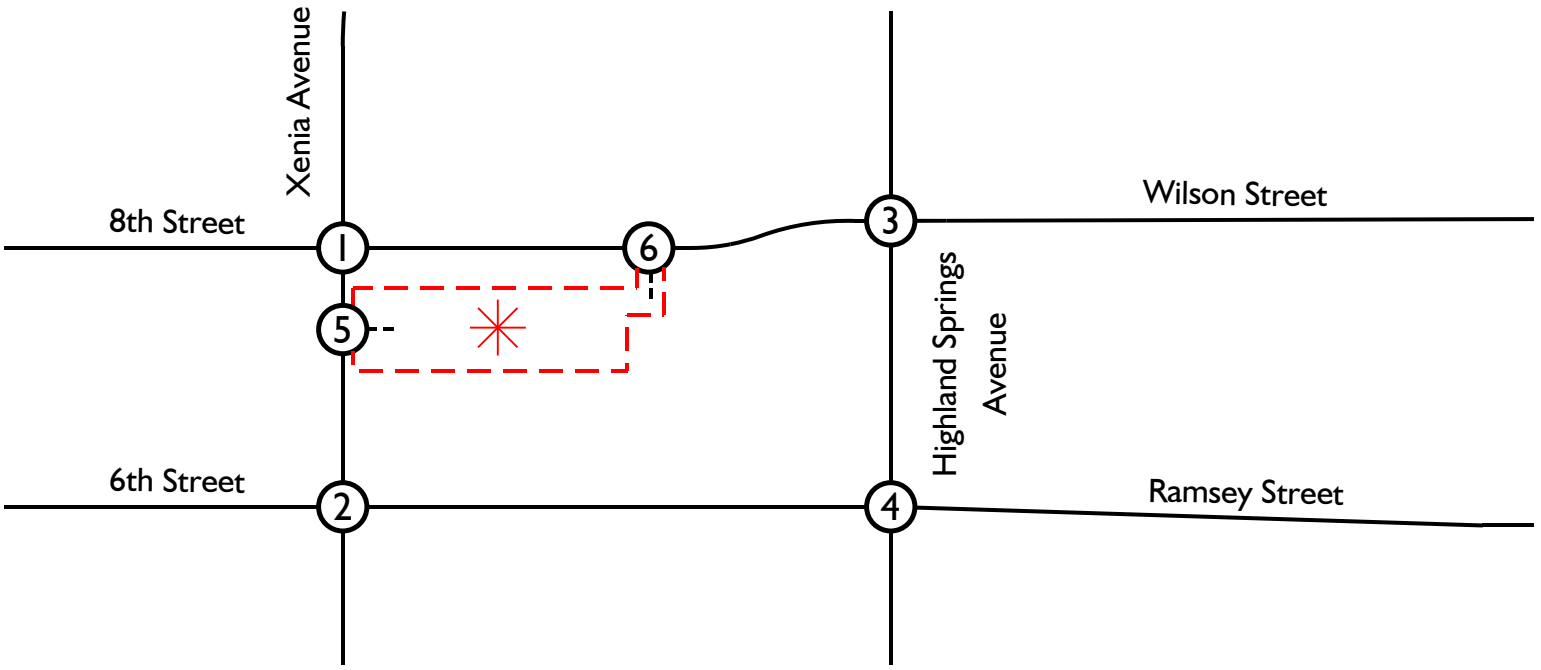
_____

Date

Attachments

Exhibit A

Location Map



Legend:

1 = Study Area Intersection

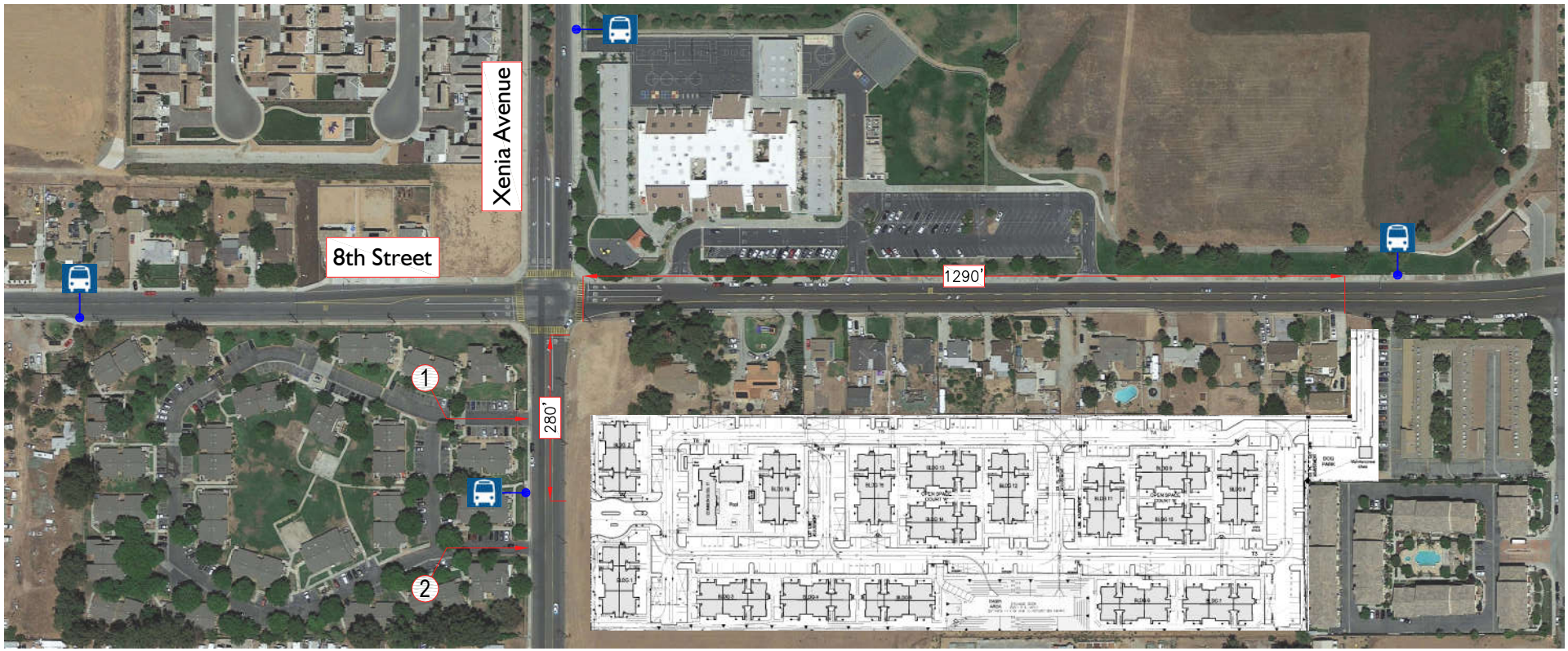
= Project Site Boundary

= Project Site

= Project Access Driveway

N

Exhibit 1-2
Site Plan



Legend:

= Bus Stop Location

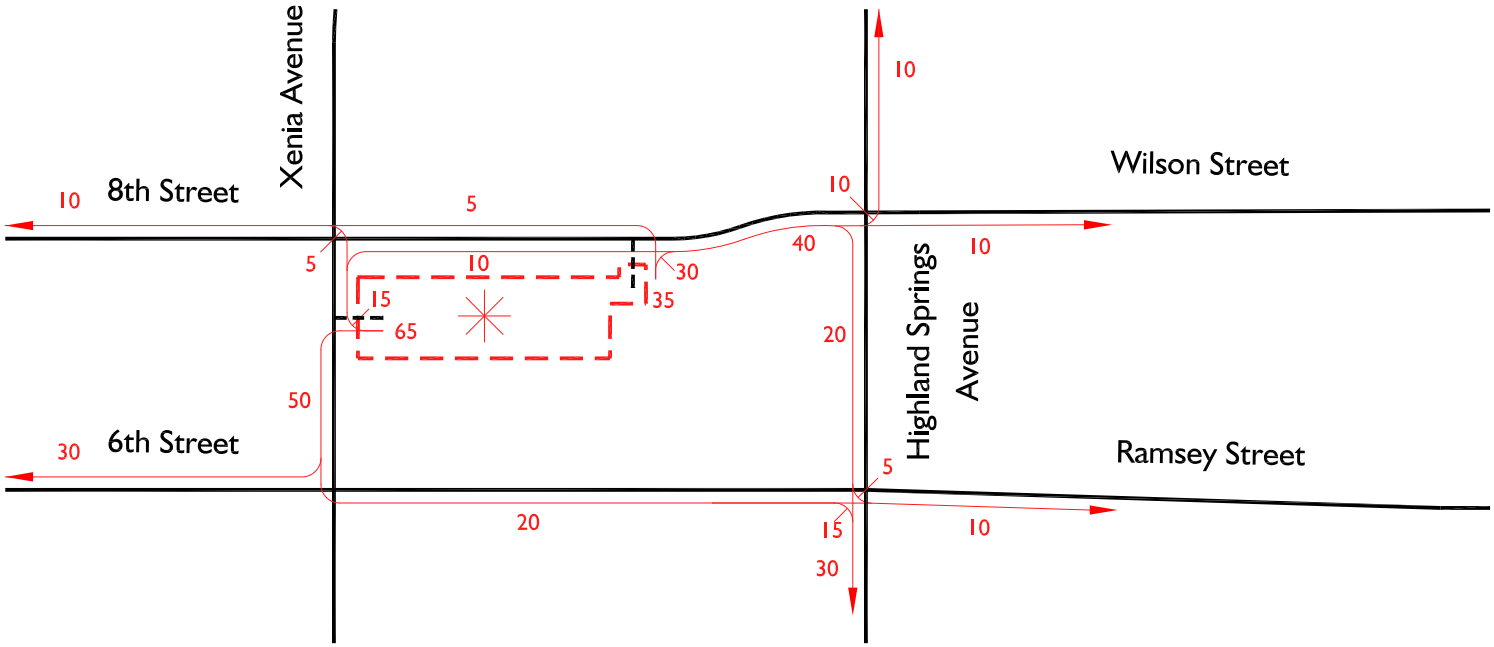
(1) = 216-Unit Noble Creek Apartments Driveway #1

(2) = 216-Unit Noble Creek Apartments Driveway #2

N

Exhibit C

Project Trip Distribution

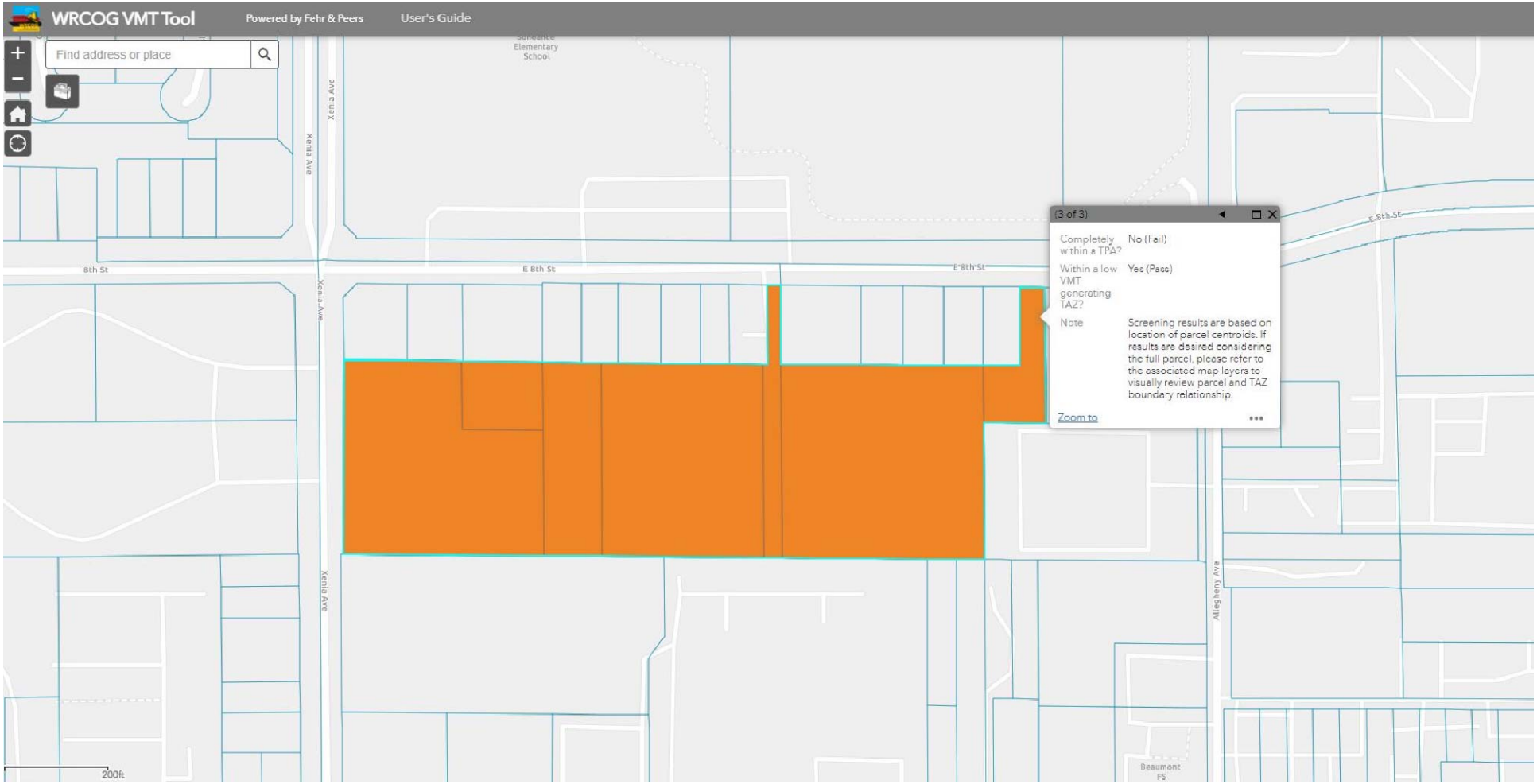


Legend:

10 = Percent to/from Project

N

WRCOG VMT Tool Output



N

Appendix B

Existing Traffic Count Worksheets

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951)268-6268

City of Beaumont
N/S: Xenia Avenue
E/W: 8th Street
Weather: Clear

File Name : 01_BMT_Xenia_8th AM
Site Code : 10522218
Start Date : 3/10/2022
Page No : 1

Groups Printed- Total Volume

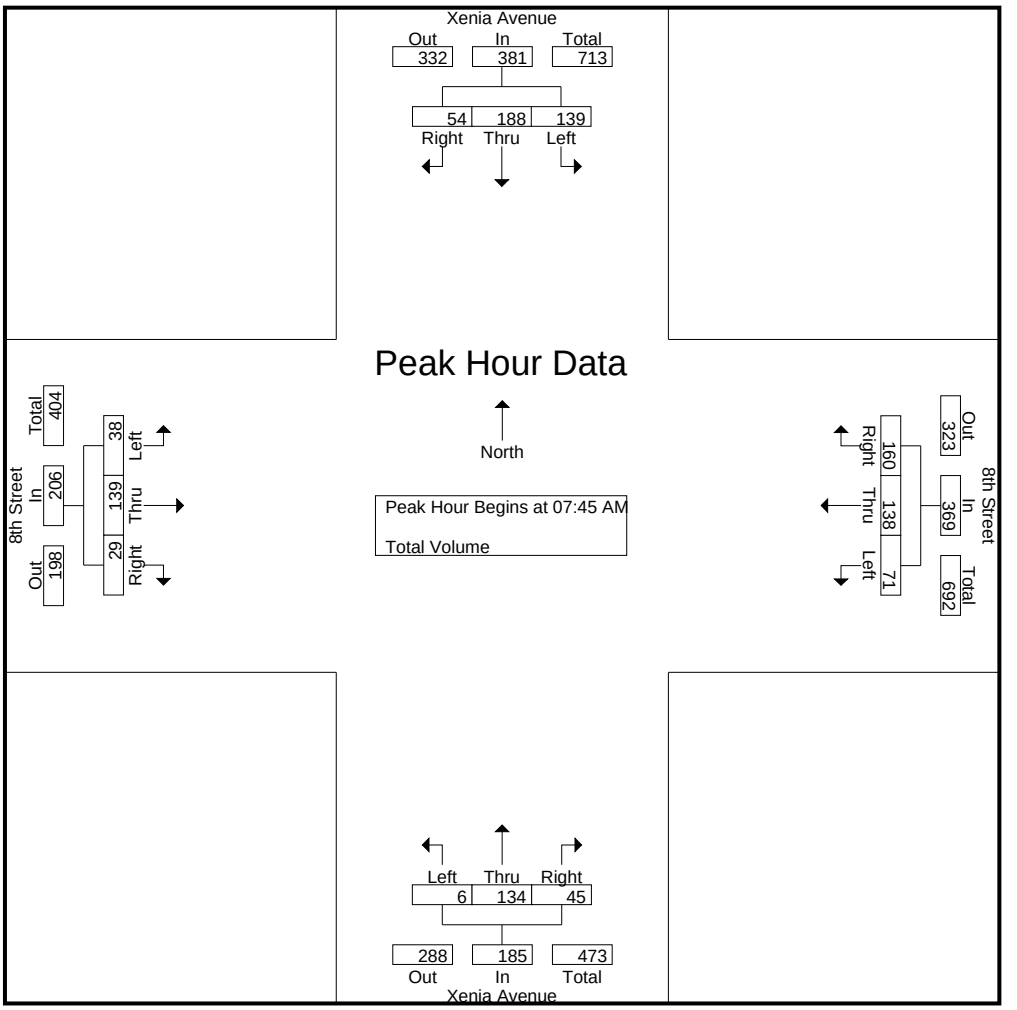
	Xenia Avenue Southbound				8th Street Westbound				Xenia Avenue Northbound				8th Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	7	33	12	52	2	8	5	15	2	8	5	15	3	19	3	25	107
07:15 AM	17	30	8	55	6	9	6	21	1	21	4	26	1	25	4	30	132
07:30 AM	37	35	12	84	6	27	18	51	1	21	16	38	5	36	11	52	225
07:45 AM	61	36	18	115	25	41	55	121	1	30	22	53	10	44	6	60	349
Total	122	134	50	306	39	85	84	208	5	80	47	132	19	124	24	167	813
08:00 AM	43	31	14	88	24	37	64	125	1	27	7	35	7	37	6	50	298
08:15 AM	14	44	7	65	11	33	26	70	3	42	9	54	10	35	11	56	245
08:30 AM	21	77	15	113	11	27	15	53	1	35	7	43	11	23	6	40	249
08:45 AM	19	65	24	108	7	13	16	36	4	26	9	39	15	21	10	46	229
Total	97	217	60	374	53	110	121	284	9	130	32	171	43	116	33	192	1021
Grand Total	219	351	110	680	92	195	205	492	14	210	79	303	62	240	57	359	1834
Apprch %	32.2	51.6	16.2		18.7	39.6	41.7		4.6	69.3	26.1		17.3	66.9	15.9		
Total %	11.9	19.1	6	37.1	5	10.6	11.2	26.8	0.8	11.5	4.3	16.5	3.4	13.1	3.1	19.6	

	Xenia Avenue Southbound				8th Street Westbound				Xenia Avenue Northbound				8th Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	**61**	36	**18**	**115**	**25**	**41**	55	121	1	30	**22**	53	10	**44**	6	**60**	**349**
08:00 AM	43	31	14	88	24	37	**64**	**125**	1	27	7	35	7	37	6	50	298
08:15 AM	14	44	7	65	11	33	26	70	**3**	**42**	9	**54**	10	35	**11**	56	245
08:30 AM	21	**77**	15	113	11	27	15	53	1	35	7	43	**11**	23	6	40	249
Total Volume	139	188	54	381	71	138	160	369	6	134	45	185	38	139	29	206	1141
% App. Total	36.5	49.3	14.2		19.2	37.4	43.4		3.2	72.4	24.3		18.4	67.5	14.1		
PHF	.570	.610	.750	.828	.710	.841	.625	.738	.500	.798	.511	.856	.864	.790	.659	.858	.817

Counts Unlimited, Inc.
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City of Beaumont
N/S: Xenia Avenue
E/W: 8th Street
Weather: Clear

File Name : 01_BMT_Xenia_8th AM
Site Code : 10522218
Start Date : 3/10/2022
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:45 AM				07:45 AM				07:45 AM				07:30 AM			
+0 mins.	**61**	36	**18**	**115**	**25**	**41**	55	121	1	30	**22**	53	5	36	**11**	52
+15 mins.	43	31	14	88	24	37	**64**	**125**	1	27	7	35	**10**	**44**	6	**60**
+30 mins.	14	44	7	65	11	33	26	70	**3**	**42**	9	**54**	7	37	6	50
+45 mins.	21	**77**	15	113	11	27	15	53	1	35	7	43	10	35	11	56
Total Volume	139	188	54	381	71	138	160	369	6	134	45	185	32	152	34	218
% App. Total	36.5	49.3	14.2		19.2	37.4	43.4		3.2	72.4	24.3		14.7	69.7	15.6	
PHF	.570	.610	.750	.828	.710	.841	.625	.738	.500	.798	.511	.856	.800	.864	.773	.908

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City of Beaumont
N/S: Xenia Avenue
E/W: 8th Street
Weather: Clear

File Name : 01_BMT_Xenia_8th PM
Site Code : 10522218
Start Date : 3/10/2022
Page No : 1

Groups Printed- Total Volume

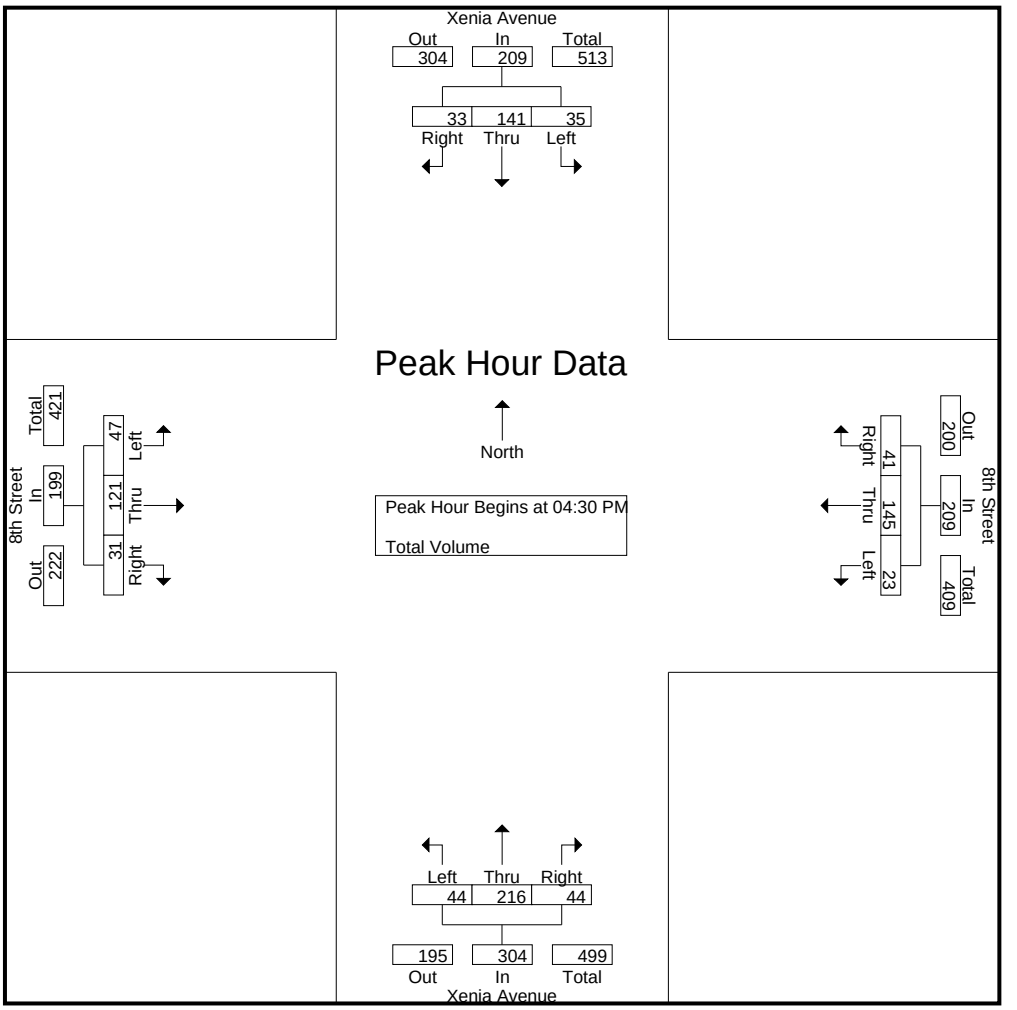
	Xenia Avenue Southbound				8th Street Westbound				Xenia Avenue Northbound				8th Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	10	39	14	63	9	36	16	61	6	37	7	50	8	37	11	56	230
04:15 PM	8	39	9	56	1	31	9	41	11	41	10	62	9	28	13	50	209
04:30 PM	10	31	9	50	3	42	11	56	9	54	8	71	9	33	10	52	229
04:45 PM	8	42	10	60	6	34	9	49	13	56	11	80	15	30	9	54	243
Total	36	151	42	229	19	143	45	207	39	188	36	263	41	128	43	212	911
05:00 PM	6	43	6	55	5	26	15	46	12	51	9	72	11	28	3	42	215
05:15 PM	11	25	8	44	9	43	6	58	10	55	16	81	12	30	9	51	234
05:30 PM	11	25	9	45	5	29	14	48	9	66	5	80	5	28	1	34	207
05:45 PM	19	42	10	71	7	25	21	53	7	48	12	67	8	29	6	43	234
Total	47	135	33	215	26	123	56	205	38	220	42	300	36	115	19	170	890
Grand Total	83	286	75	444	45	266	101	412	77	408	78	563	77	243	62	382	1801
Apprch %	18.7	64.4	16.9		10.9	64.6	24.5		13.7	72.5	13.9		20.2	63.6	16.2		
Total %	4.6	15.9	4.2	24.7	2.5	14.8	5.6	22.9	4.3	22.7	4.3	31.3	4.3	13.5	3.4	21.2	

	Xenia Avenue Southbound				8th Street Westbound				Xenia Avenue Northbound				8th Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	10	31	9	50	3	42	11	56	9	54	8	71	9	**33**	**10**	52	229
04:45 PM	8	42	**10**	**60**	6	34	9	49	**13**	**56**	11	80	**15**	30	9	**54**	**243**
05:00 PM	6	**43**	6	55	5	26	**15**	46	12	51	9	72	11	28	3	42	215
05:15 PM	**11**	25	8	44	**9**	**43**	6	**58**	10	55	**16**	**81**	12	30	9	51	234
Total Volume	35	141	33	209	23	145	41	209	44	216	44	304	47	121	31	199	921
% App. Total	16.7	67.5	15.8		11	69.4	19.6		14.5	71.1	14.5		23.6	60.8	15.6		
PHF	.795	.820	.825	.871	.639	.843	.683	.901	.846	.964	.688	.938	.783	.917	.775	.921	.948

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City of Beaumont
N/S: Xenia Avenue
E/W: 8th Street
Weather: Clear

File Name : 01_BMT_Xenia_8th PM
Site Code : 10522218
Start Date : 3/10/2022
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM				04:30 PM				04:45 PM				04:00 PM			
+0 mins.	**10**	39	**14**	**63**	3	42	11	56	**13**	56	11	80	8	**37**	11	**56**
+15 mins.	8	39	9	56	6	34	9	49	12	51	9	72	9	28	**13**	50
+30 mins.	10	31	9	50	5	26	**15**	46	10	55	**16**	**81**	9	33	10	52
+45 mins.	8	**42**	10	60	**9**	**43**	6	**58**	9	**66**	5	80	**15**	30	9	54
Total Volume	36	151	42	229	23	145	41	209	44	228	41	313	41	128	43	212
% App. Total	15.7	65.9	18.3		11	69.4	19.6		14.1	72.8	13.1		19.3	60.4	20.3	
PHF	.900	.899	.750	.909	.639	.843	.683	.901	.846	.864	.641	.966	.683	.865	.827	.946

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City of Beaumont
N/S: Xenia Avenue
E/W: 6th Street
Weather: Clear

File Name : 02_BMT_Xenia_6th AM
Site Code : 10522218
Start Date : 3/10/2022
Page No : 1

Groups Printed- Total Volume

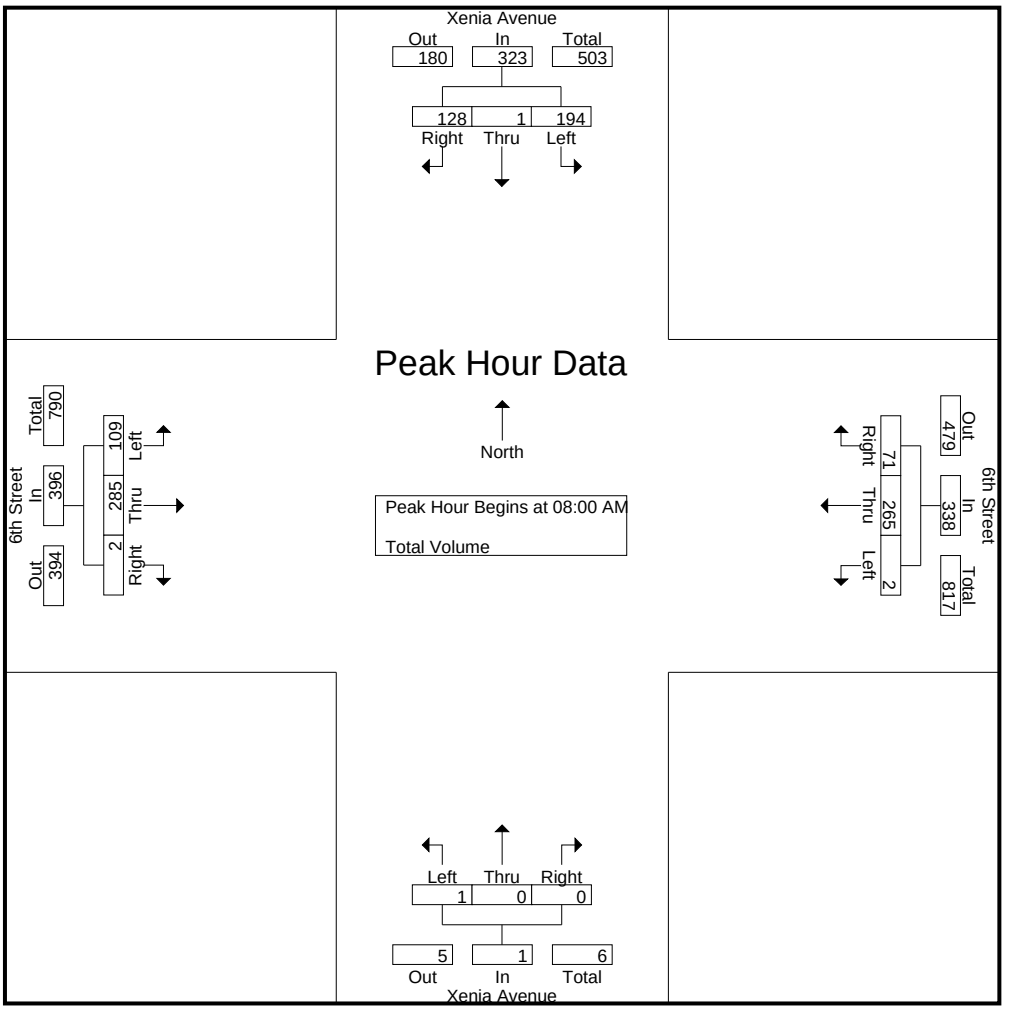
	Xenia Avenue Southbound				6th Street Westbound				Xenia Avenue Northbound				6th Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	20	1	17	38	0	43	9	52	2	0	0	2	7	36	0	43	135
07:15 AM	24	0	21	45	0	32	9	41	0	0	0	0	16	53	0	69	155
07:30 AM	32	0	18	50	2	63	17	82	0	0	0	0	22	85	0	107	239
07:45 AM	28	0	27	55	1	58	12	71	0	0	1	1	32	84	0	116	243
Total	104	1	83	188	3	196	47	246	2	0	1	3	77	258	0	335	772
08:00 AM	38	1	31	70	0	70	13	83	1	0	0	1	27	73	0	100	254
08:15 AM	41	0	35	76	0	68	33	101	0	0	0	0	31	65	0	96	273
08:30 AM	58	0	35	93	2	65	12	79	0	0	0	0	29	60	0	89	261
08:45 AM	57	0	27	84	0	62	13	75	0	0	0	0	22	87	2	111	270
Total	194	1	128	323	2	265	71	338	1	0	0	1	109	285	2	396	1058
Grand Total	298	2	211	511	5	461	118	584	3	0	1	4	186	543	2	731	1830
Apprch %	58.3	0.4	41.3		0.9	78.9	20.2		75	0	25		25.4	74.3	0.3		
Total %	16.3	0.1	11.5	27.9	0.3	25.2	6.4	31.9	0.2	0	0.1	0.2	10.2	29.7	0.1	39.9	

	Xenia Avenue Southbound				6th Street Westbound				Xenia Avenue Northbound				6th Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	38	**1**	31	70	0	**70**	13	83	**1**	0	0	**1**	27	73	0	100	254
08:15 AM	41	0	**35**	76	0	68	**33**	**101**	0	0	0	0	**31**	65	0	96	**273**
08:30 AM	**58**	0	35	**93**	**2**	65	12	79	0	0	0	0	29	60	0	89	261
08:45 AM	57	0	27	84	0	62	13	75	0	0	0	0	22	**87**	**2**	**111**	270
Total Volume	194	1	128	323	2	265	71	338	1	0	0	1	109	285	2	396	1058
% App. Total	60.1	0.3	39.6		0.6	78.4	21		100	0	0		27.5	72	0.5		
PHF	.836	.250	.914	.868	.250	.946	.538	.837	.250	.000	.000	.250	.879	.819	.250	.892	.969

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City of Beaumont
N/S: Xenia Avenue
E/W: 6th Street
Weather: Clear

File Name : 02_BMT_Xenia_6th AM
Site Code : 10522218
Start Date : 3/10/2022
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	08:00 AM				08:00 AM				07:00 AM				07:30 AM			
+0 mins.	38	**1**	31	70	0	**70**	13	83	**2**	0	0	**2**	22	**85**	0	107
+15 mins.	41	0	**35**	76	0	68	**33**	**101**	0	0	0	0	**32**	84	0	**116**
+30 mins.	**58**	0	35	**93**	**2**	65	12	79	0	0	0	0	27	73	0	100
+45 mins.	57	0	27	84	0	62	13	75	0	0	**1**	1	31	65	0	96
Total Volume	194	1	128	323	2	265	71	338	2	0	1	3	112	307	0	419
% App. Total	60.1	0.3	39.6		0.6	78.4	21		66.7	0	33.3		26.7	73.3	0	
PHF	.836	.250	.914	.868	.250	.946	.538	.837	.250	.000	.250	.375	.875	.903	.000	.903

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City of Beaumont
N/S: Xenia Avenue
E/W: 6th Street
Weather: Clear

File Name : 02_BMT_Xenia_6th PM
Site Code : 10522218
Start Date : 3/10/2022
Page No : 1

Groups Printed- Total Volume

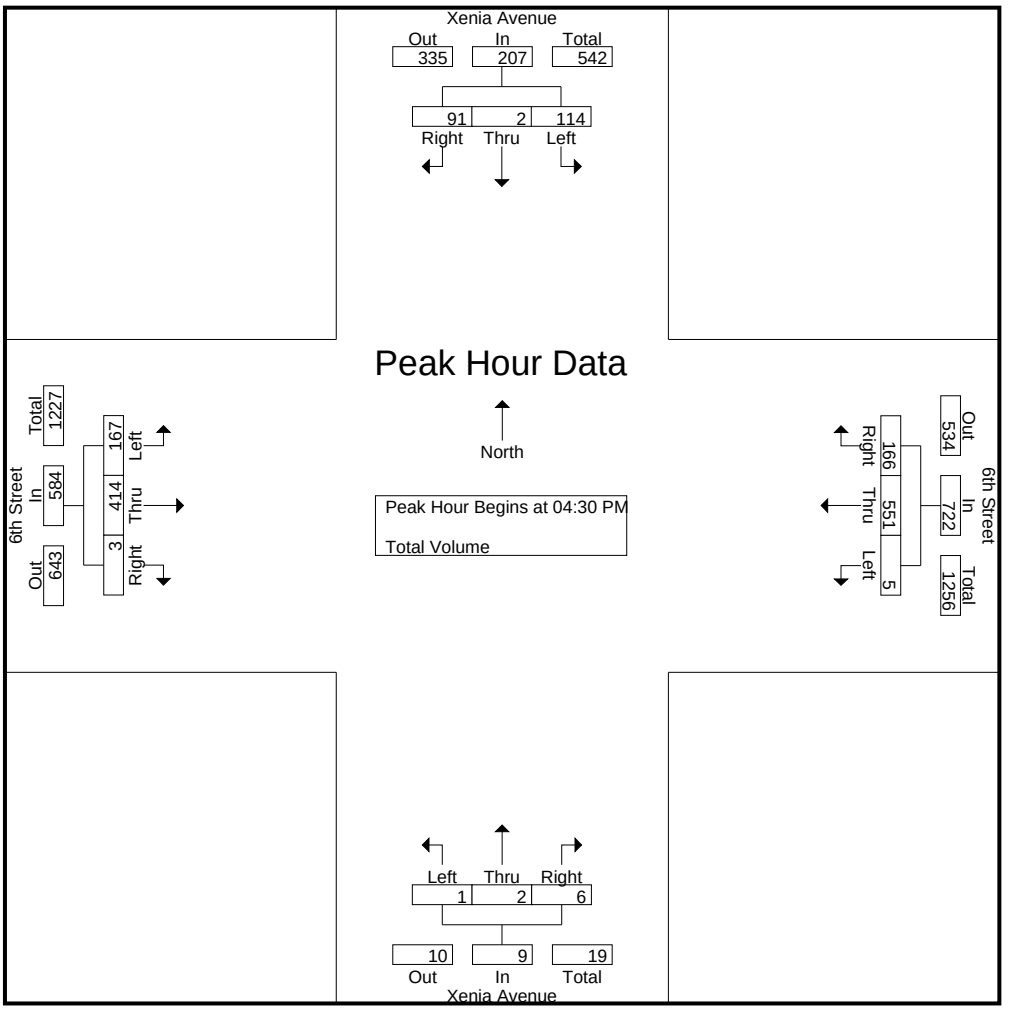
	Xenia Avenue Southbound				6th Street Westbound				Xenia Avenue Northbound				6th Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	40	0	25	65	0	103	27	130	0	0	0	0	33	110	2	145	340
04:15 PM	38	0	14	52	2	95	33	130	0	0	2	2	33	103	0	136	320
04:30 PM	32	0	20	52	2	149	38	189	0	0	0	0	38	112	0	150	391
04:45 PM	29	1	26	56	3	126	46	175	0	0	3	3	38	104	0	142	376
Total	139	1	85	225	7	473	144	624	0	0	5	5	142	429	2	573	1427
05:00 PM	33	0	21	54	0	135	34	169	0	1	2	3	47	111	3	161	387
05:15 PM	20	1	24	45	0	141	48	189	1	1	1	3	44	87	0	131	368
05:30 PM	17	0	20	37	0	134	35	169	0	0	1	1	46	111	2	159	366
05:45 PM	35	0	26	61	0	99	31	130	1	0	1	2	45	95	0	140	333
Total	105	1	91	197	0	509	148	657	2	2	5	9	182	404	5	591	1454
Grand Total	244	2	176	422	7	982	292	1281	2	2	10	14	324	833	7	1164	2881
Apprch %	57.8	0.5	41.7		0.5	76.7	22.8		14.3	14.3	71.4		27.8	71.6	0.6		
Total %	8.5	0.1	6.1	14.6	0.2	34.1	10.1	44.5	0.1	0.1	0.3	0.5	11.2	28.9	0.2	40.4	

	Xenia Avenue Southbound				6th Street Westbound				Xenia Avenue Northbound				6th Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	32	0	20	52	2	**149**	38	**189**	0	0	0	0	38	**112**	0	150	**391**
04:45 PM	29	**1**	**26**	**56**	**3**	126	46	175	0	0	**3**	**3**	38	104	0	142	376
05:00 PM	**33**	0	21	54	0	135	34	169	0	**1**	2	3	**47**	111	**3**	**161**	387
05:15 PM	20	1	24	45	0	141	**48**	189	**1**	1	1	3	44	87	0	131	368
Total Volume	114	2	91	207	5	551	166	722	1	2	6	9	167	414	3	584	1522
% App. Total	55.1	1	44		0.7	76.3	23		11.1	22.2	66.7		28.6	70.9	0.5		
PHF	.864	.500	.875	.924	.417	.924	.865	.955	.250	.500	.500	.750	.888	.924	.250	.907	.973

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City of Beaumont
N/S: Xenia Avenue
E/W: 6th Street
Weather: Clear

File Name : 02_BMT_Xenia_6th PM
Site Code : 10522218
Start Date : 3/10/2022
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM				04:30 PM				04:45 PM				04:45 PM			
+0 mins.	**40**	0	25	**65**	2	**149**	38	**189**	0	0	**3**	**3**	38	104	0	142
+15 mins.	38	0	14	52	**3**	126	46	175	0	**1**	2	3	**47**	**111**	**3**	**161**
+30 mins.	32	0	20	52	0	135	34	169	**1**	1	1	3	44	87	0	131
+45 mins.	29	**1**	**26**	56	0	141	**48**	189	0	0	1	1	46	111	2	159
Total Volume	139	1	85	225	5	551	166	722	1	2	7	10	175	413	5	593
% App. Total	61.8	0.4	37.8		0.7	76.3	23		10	20	70		29.5	69.6	0.8	
PHF	.869	.250	.817	.865	.417	.924	.865	.955	.250	.500	.583	.833	.931	.930	.417	.921

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City of Beaumont
N/S: Highland Springs Avenue
E/W: 8th Street/Wilson Street
Weather: Clear

File Name : 03_BMT_Highland_8th AM
Site Code : 10522218
Start Date : 3/10/2022
Page No : 1

Groups Printed- Total Volume

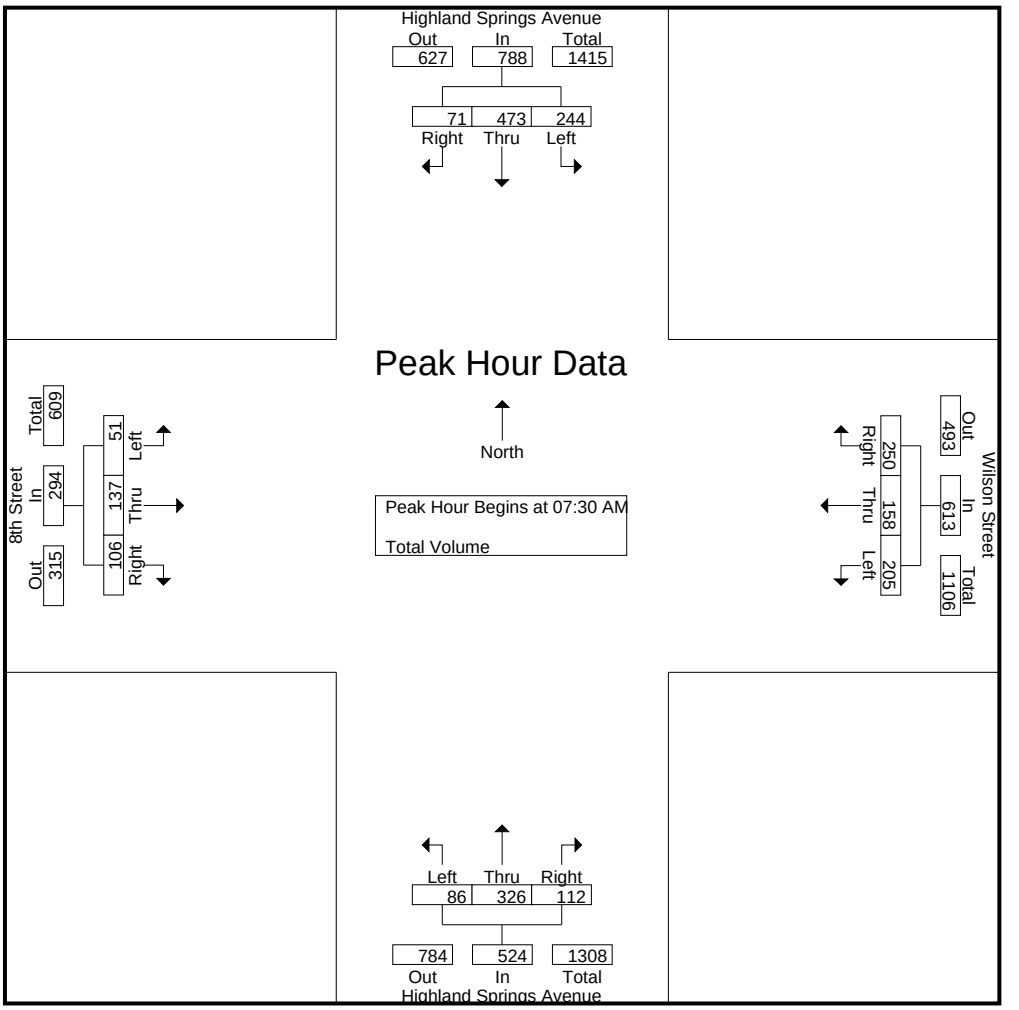
	Highland Springs Avenue Southbound				Wilson Street Westbound				Highland Springs Avenue Northbound				8th Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	41	128	1	170	63	11	46	120	9	78	23	110	4	18	17	39	439
07:15 AM	40	125	6	171	31	12	49	92	14	75	25	114	3	15	14	32	409
07:30 AM	39	126	14	179	53	34	62	149	11	83	19	113	2	25	20	47	488
07:45 AM	60	130	29	219	56	46	85	187	33	92	41	166	23	36	28	87	659
Total	180	509	50	739	203	103	242	548	67	328	108	503	32	94	79	205	1995
08:00 AM	68	111	22	201	41	50	60	151	33	73	21	127	18	38	28	84	563
08:15 AM	77	106	6	189	55	28	43	126	9	78	31	118	8	38	30	76	509
08:30 AM	62	123	3	188	60	42	44	146	6	62	17	85	1	36	15	52	471
08:45 AM	45	118	1	164	53	27	24	104	13	82	25	120	1	34	21	56	444
Total	252	458	32	742	209	147	171	527	61	295	94	450	28	146	94	268	1987
Grand Total	432	967	82	1481	412	250	413	1075	128	623	202	953	60	240	173	473	3982
Apprch %	29.2	65.3	5.5		38.3	23.3	38.4		13.4	65.4	21.2		12.7	50.7	36.6		
Total %	10.8	24.3	2.1	37.2	10.3	6.3	10.4	27	3.2	15.6	5.1	23.9	1.5	6	4.3	11.9	

	Highland Springs Avenue Southbound				Wilson Street Westbound				Highland Springs Avenue Northbound				8th Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	39	126	14	179	53	34	62	149	11	83	19	113	2	25	20	47	488
07:45 AM	60	**130**	**29**	**219**	**56**	46	**85**	**187**	**33**	**92**	**41**	**166**	**23**	36	28	**87**	**659**
08:00 AM	68	111	22	201	41	**50**	60	151	33	73	21	127	18	**38**	28	84	563
08:15 AM	**77**	106	6	189	55	28	43	126	9	78	31	118	8	38	**30**	76	509
Total Volume	244	473	71	788	205	158	250	613	86	326	112	524	51	137	106	294	2219
% App. Total	31	60	9		33.4	25.8	40.8		16.4	62.2	21.4		17.3	46.6	36.1		
PHF	.792	.910	.612	.900	.915	.790	.735	.820	.652	.886	.683	.789	.554	.901	.883	.845	.842

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City of Beaumont
N/S: Highland Springs Avenue
E/W: 8th Street/Wilson Street
Weather: Clear

File Name : 03_BMT_Highland_8th AM
Site Code : 10522218
Start Date : 3/10/2022
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:45 AM				07:30 AM				07:30 AM				07:45 AM			
+0 mins.	60	**130**	**29**	**219**	53	34	62	149	11	83	19	113	**23**	36	28	**87**
+15 mins.	68	111	22	201	**56**	46	**85**	**187**	**33**	**92**	**41**	**166**	18	**38**	28	84
+30 mins.	**77**	106	6	189	41	**50**	60	151	33	73	21	127	8	38	**30**	76
+45 mins.	62	123	3	188	55	28	43	126	9	78	31	118	1	36	15	52
Total Volume	267	470	60	797	205	158	250	613	86	326	112	524	50	148	101	299
% App. Total	33.5	59	7.5		33.4	25.8	40.8		16.4	62.2	21.4		16.7	49.5	33.8	
PHF	.867	.904	.517	.910	.915	.790	.735	.820	.652	.886	.683	.789	.543	.974	.842	.859

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City of Beaumont
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File Name : 03_BMT_Highland_8th PM
Site Code : 10522218
Start Date : 3/10/2022
Page No : 1

Groups Printed- Total Volume

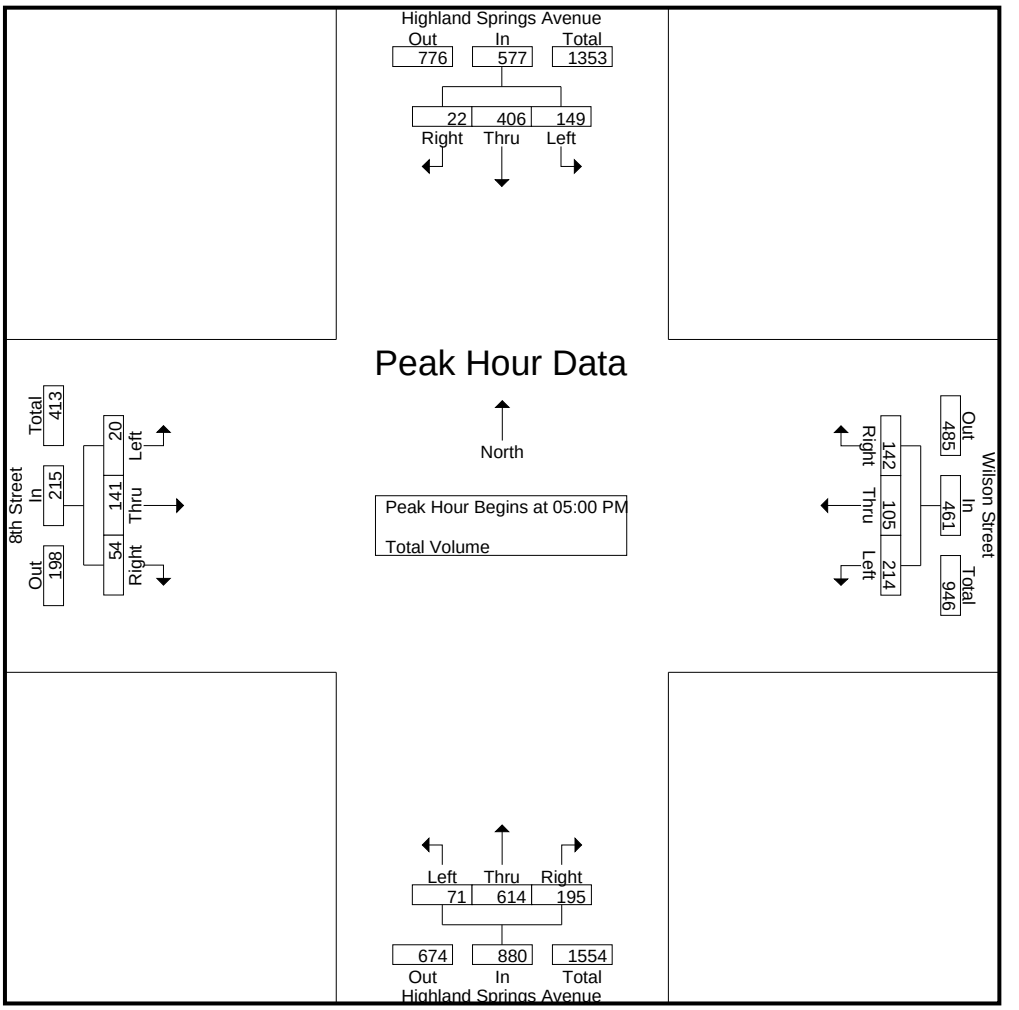
	Highland Springs Avenue Southbound				Wilson Street Westbound				Highland Springs Avenue Northbound				8th Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	80	125	4	209	56	24	33	113	16	133	49	198	4	42	25	71	591
04:15 PM	56	95	3	154	42	29	32	103	10	146	39	195	2	25	14	41	493
04:30 PM	49	105	2	156	52	31	34	117	14	140	45	199	3	39	14	56	528
04:45 PM	31	103	2	136	34	28	37	99	21	157	60	238	3	28	10	41	514
Total	216	428	11	655	184	112	136	432	61	576	193	830	12	134	63	209	2126
05:00 PM	34	108	5	147	53	15	33	101	20	166	48	234	8	32	12	52	534
05:15 PM	30	86	4	120	50	41	37	128	15	147	43	205	4	40	11	55	508
05:30 PM	41	97	5	143	43	26	31	100	23	147	55	225	4	22	17	43	511
05:45 PM	44	115	8	167	68	23	41	132	13	154	49	216	4	47	14	65	580
Total	149	406	22	577	214	105	142	461	71	614	195	880	20	141	54	215	2133
Grand Total	365	834	33	1232	398	217	278	893	132	1190	388	1710	32	275	117	424	4259
Apprch %	29.6	67.7	2.7		44.6	24.3	31.1		7.7	69.6	22.7		7.5	64.9	27.6		
Total %	8.6	19.6	0.8	28.9	9.3	5.1	6.5	21	3.1	27.9	9.1	40.2	0.8	6.5	2.7	10	

	Highland Springs Avenue Southbound				Wilson Street Westbound				Highland Springs Avenue Northbound				8th Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	34	108	5	147	53	15	33	101	20	**166**	48	**234**	**8**	32	12	52	534
05:15 PM	30	86	4	120	50	**41**	37	128	15	147	43	205	4	40	11	55	508
05:30 PM	41	97	5	143	43	26	31	100	**23**	147	**55**	225	4	22	**17**	43	511
05:45 PM	**44**	**115**	**8**	**167**	**68**	23	**41**	**132**	13	154	49	216	4	**47**	14	**65**	**580**
Total Volume	149	406	22	577	214	105	142	461	71	614	195	880	20	141	54	215	2133
% App. Total	25.8	70.4	3.8		46.4	22.8	30.8		8.1	69.8	22.2		9.3	65.6	25.1		
PHF	.847	.883	.688	.864	.787	.640	.866	.873	.772	.925	.886	.940	.625	.750	.794	.827	.919

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City of Beaumont
N/S: Highland Springs Avenue
E/W: 8th Street/Wilson Street
Weather: Clear

File Name : 03_BMT_Highland_8th PM
Site Code : 10522218
Start Date : 3/10/2022
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM				05:00 PM				04:45 PM				05:00 PM			
+0 mins.	**80**	**125**	**4**	**209**	53	15	33	101	21	157	**60**	**238**	**8**	32	12	52
+15 mins.	56	95	3	154	50	**41**	37	128	20	**166**	48	234	4	40	11	55
+30 mins.	49	105	2	156	43	26	31	100	15	147	43	205	4	22	**17**	43
+45 mins.	31	103	2	136	**68**	23	**41**	**132**	**23**	147	55	225	4	**47**	14	**65**
Total Volume	216	428	11	655	214	105	142	461	79	617	206	902	20	141	54	215
% App. Total	33	65.3	1.7		46.4	22.8	30.8		8.8	68.4	22.8		9.3	65.6	25.1	
PHF	.675	.856	.688	.783	.787	.640	.866	.873	.859	.929	.858	.947	.625	.750	.794	.827

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City of Beaumont
N/S: Highland Springs Avenue
E/W: 6th Street/Ramsey Street
Weather: Clear

File Name : 04_BMT_Highland_6th AM
Site Code : 10522218
Start Date : 3/10/2022
Page No : 1

Groups Printed- Total Volume

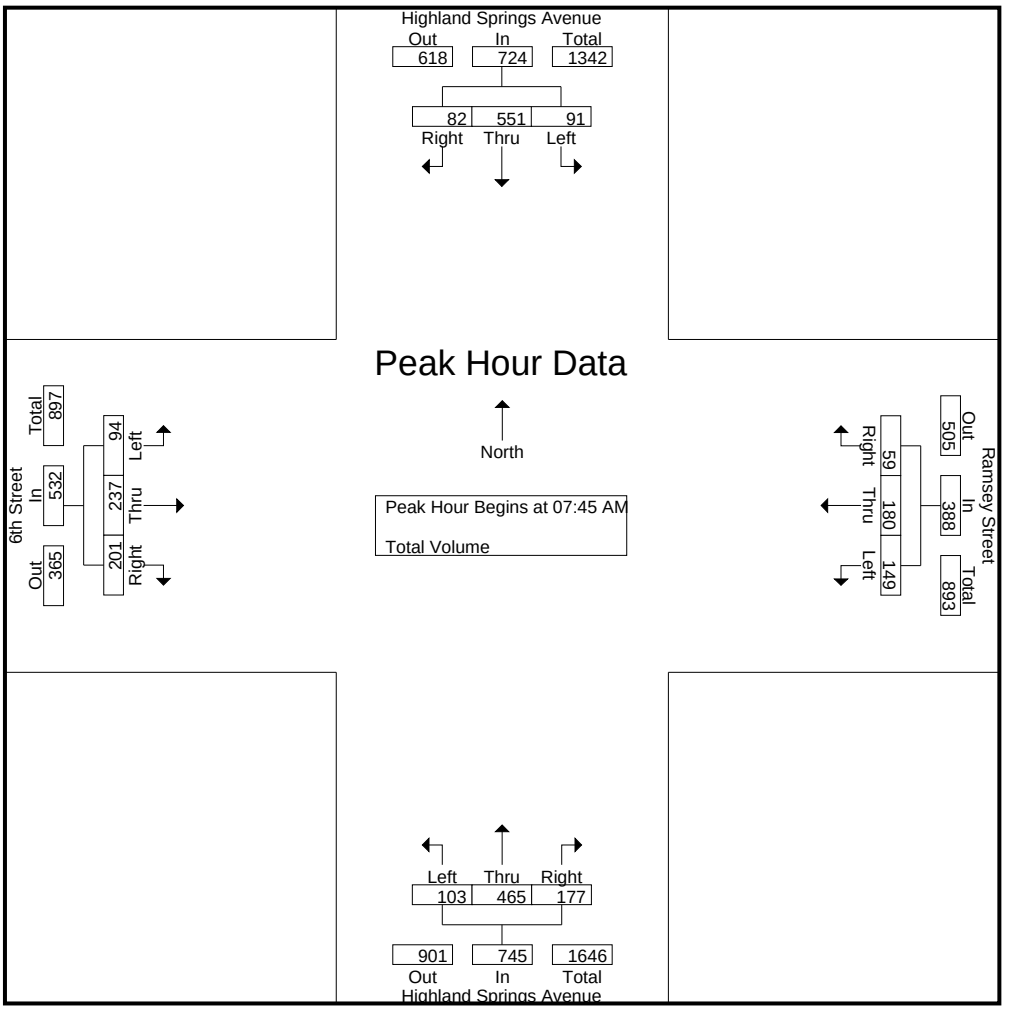
	Highland Springs Avenue Southbound				Ramsey Street Westbound				Highland Springs Avenue Northbound				6th Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	15	167	15	197	34	28	8	70	21	99	27	147	18	23	36	77	491
07:15 AM	12	134	11	157	35	20	9	64	24	87	35	146	23	42	31	96	463
07:30 AM	18	147	14	179	34	42	15	91	19	105	48	172	32	54	40	126	568
07:45 AM	24	136	23	183	34	45	13	92	26	146	55	227	28	73	33	134	636
Total	69	584	63	716	137	135	45	317	90	437	165	692	101	192	140	433	2158
08:00 AM	24	129	15	168	38	44	11	93	25	129	35	189	21	52	54	127	577
08:15 AM	24	133	19	176	39	50	22	111	29	110	39	178	23	62	49	134	599
08:30 AM	19	153	25	197	38	41	13	92	23	80	48	151	22	50	65	137	577
08:45 AM	22	108	34	164	46	52	16	114	27	81	57	165	25	70	73	168	611
Total	89	523	93	705	161	187	62	410	104	400	179	683	91	234	241	566	2364
Grand Total	158	1107	156	1421	298	322	107	727	194	837	344	1375	192	426	381	999	4522
Apprch %	11.1	77.9	11		41	44.3	14.7		14.1	60.9	25		19.2	42.6	38.1		
Total %	3.5	24.5	3.4	31.4	6.6	7.1	2.4	16.1	4.3	18.5	7.6	30.4	4.2	9.4	8.4	22.1	

	Highland Springs Avenue Southbound				Ramsey Street Westbound				Highland Springs Avenue Northbound				6th Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	**24**	136	23	183	34	45	13	92	26	**146**	**55**	**227**	**28**	**73**	33	134	**636**
08:00 AM	24	129	15	168	38	44	11	93	25	129	35	189	21	52	54	127	577
08:15 AM	24	133	19	176	**39**	**50**	**22**	**111**	**29**	110	39	178	23	62	49	134	599
08:30 AM	19	**153**	**25**	**197**	38	41	13	92	23	80	48	151	22	50	**65**	**137**	577
Total Volume	91	551	82	724	149	180	59	388	103	465	177	745	94	237	201	532	2389
% App. Total	12.6	76.1	11.3		38.4	46.4	15.2		13.8	62.4	23.8		17.7	44.5	37.8		
PHF	.948	.900	.820	.919	.955	.900	.670	.874	.888	.796	.805	.820	.839	.812	.773	.971	.939

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City of Beaumont
N/S: Highland Springs Avenue
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File Name : 04_BMT_Highland_6th AM
Site Code : 10522218
Start Date : 3/10/2022
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:45 AM				08:00 AM				07:30 AM				08:00 AM			
+0 mins.	**24**	136	23	183	38	44	11	93	19	105	48	172	21	52	54	127
+15 mins.	24	129	15	168	39	50	**22**	111	26	**146**	**55**	**227**	23	62	49	134
+30 mins.	24	133	19	176	38	41	13	92	25	129	35	189	22	50	65	137
+45 mins.	19	**153**	**25**	**197**	**46**	**52**	16	**114**	**29**	110	39	178	**25**	**70**	**73**	**168**
Total Volume	91	551	82	724	161	187	62	410	99	490	177	766	91	234	241	566
% App. Total	12.6	76.1	11.3		39.3	45.6	15.1		12.9	64	23.1		16.1	41.3	42.6	
PHF	.948	.900	.820	.919	.875	.899	.705	.899	.853	.839	.805	.844	.910	.836	.825	.842

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City of Beaumont
N/S: Highland Springs Avenue
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File Name : 04_BMT_Highland_6th PM
Site Code : 10522218
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Groups Printed- Total Volume

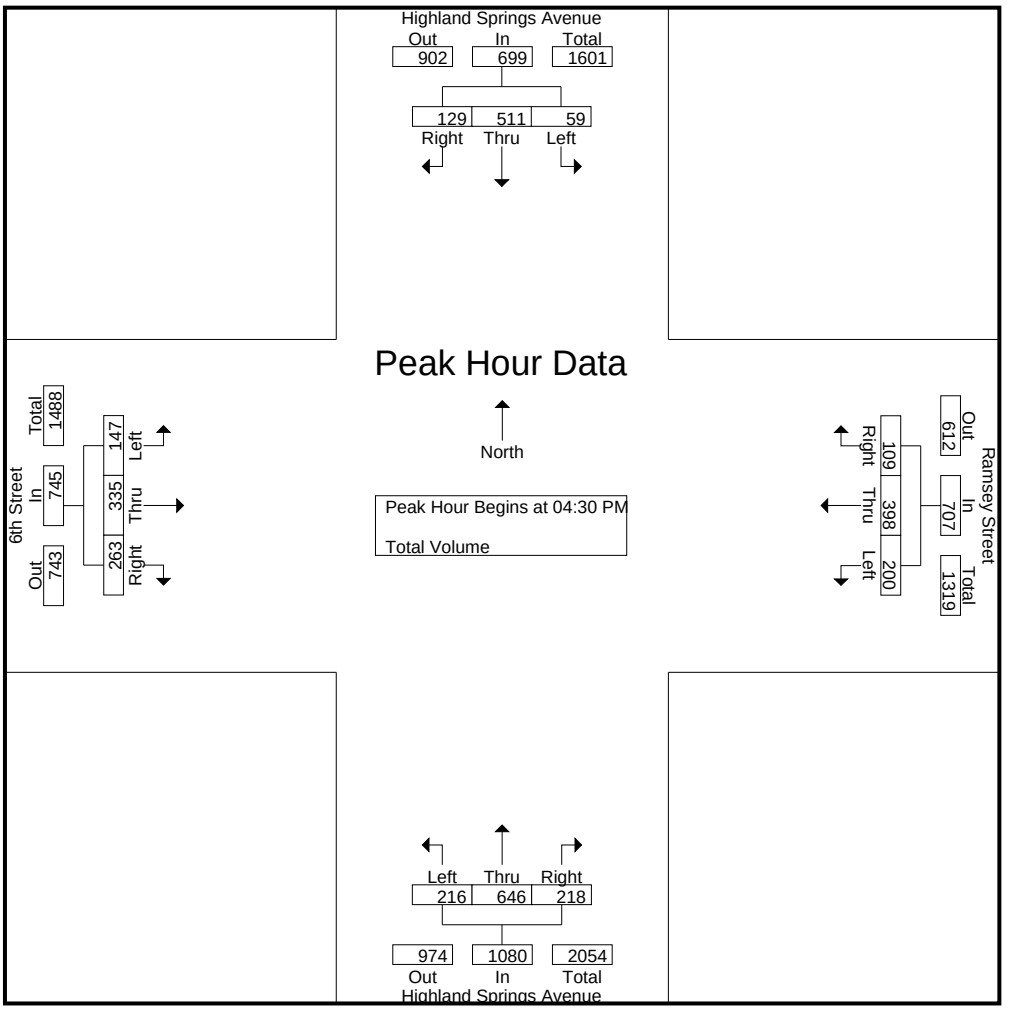
	Highland Springs Avenue Southbound				Ramsey Street Westbound				Highland Springs Avenue Northbound				6th Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	22	145	18	185	50	80	19	149	51	148	58	257	44	90	52	186	777
04:15 PM	15	116	14	145	45	86	24	155	58	147	55	260	32	76	74	182	742
04:30 PM	13	135	37	185	54	99	23	176	54	153	57	264	40	96	84	220	845
04:45 PM	14	118	32	164	47	99	26	172	55	170	56	281	38	77	58	173	790
Total	64	514	101	679	196	364	92	652	218	618	226	1062	154	339	268	761	3154
05:00 PM	22	142	35	199	44	108	28	180	55	163	48	266	36	86	70	192	837
05:15 PM	10	116	25	151	55	92	32	179	52	160	57	269	33	76	51	160	759
05:30 PM	14	118	23	155	49	117	24	190	46	152	46	244	36	82	53	171	760
05:45 PM	14	145	29	188	41	77	24	142	43	177	61	281	37	75	57	169	780
Total	60	521	112	693	189	394	108	691	196	652	212	1060	142	319	231	692	3136
Grand Total	124	1035	213	1372	385	758	200	1343	414	1270	438	2122	296	658	499	1453	6290
Apprch %	9	75.4	15.5		28.7	56.4	14.9		19.5	59.8	20.6		20.4	45.3	34.3		
Total %	2	16.5	3.4	21.8	6.1	12.1	3.2	21.4	6.6	20.2	7	33.7	4.7	10.5	7.9	23.1	

	Highland Springs Avenue Southbound				Ramsey Street Westbound				Highland Springs Avenue Northbound				6th Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	13	135	**37**	185	54	99	23	176	54	153	**57**	264	**40**	**96**	**84**	**220**	**845**
04:45 PM	14	118	32	164	47	99	26	172	**55**	**170**	56	**281**	38	77	58	173	790
05:00 PM	**22**	**142**	35	**199**	44	**108**	28	**180**	55	163	48	266	36	86	70	192	837
05:15 PM	10	116	25	151	**55**	92	**32**	179	52	160	57	269	33	76	51	160	759
Total Volume	59	511	129	699	200	398	109	707	216	646	218	1080	147	335	263	745	3231
% App. Total	8.4	73.1	18.5		28.3	56.3	15.4		20	59.8	20.2		19.7	45	35.3		
PHF	.670	.900	.872	.878	.909	.921	.852	.982	.982	.950	.956	.961	.919	.872	.783	.847	.956

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City of Beaumont
N/S: Highland Springs Avenue
E/W: 6th Street/Ramsey Street
Weather: Clear

File Name : 04_BMT_Highland_6th PM
Site Code : 10522218
Start Date : 3/10/2022
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:30 PM				04:45 PM				04:30 PM				04:15 PM			
+0 mins.	13	135	**37**	185	47	99	26	172	54	153	**57**	264	32	76	74	182
+15 mins.	14	118	32	164	44	108	28	180	**55**	**170**	56	**281**	**40**	**96**	**84**	**220**
+30 mins.	**22**	**142**	35	**199**	**55**	92	**32**	179	55	163	48	266	38	77	58	173
+45 mins.	10	116	25	151	49	**117**	24	**190**	52	160	57	269	36	86	70	192
Total Volume	59	511	129	699	195	416	110	721	216	646	218	1080	146	335	286	767
% App. Total	8.4	73.1	18.5		27	57.7	15.3		20	59.8	20.2		19	43.7	37.3	
PHF	.670	.900	.872	.878	.886	.889	.859	.949	.982	.950	.956	.961	.913	.872	.851	.872

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City of Beaumont
N/S: Xenia Avenue
E/W: Noble Creek Apartments South DW
Weather: Clear

File Name : 05_BMT_Xenia_Noble AM
Site Code : 10522218
Start Date : 3/10/2022
Page No : 1

Groups Printed- Total Volume

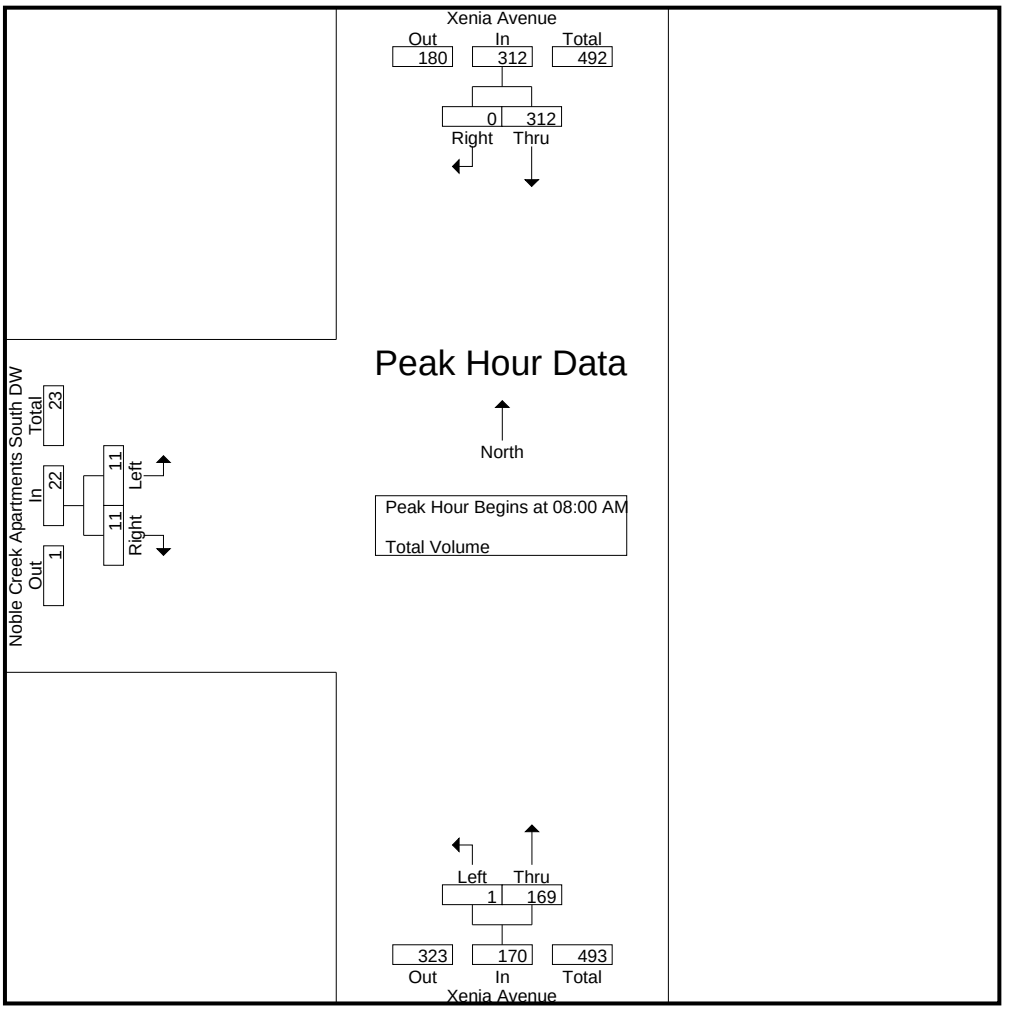
	Xenia Avenue Southbound			Xenia Avenue Northbound			Noble Creek Apartments South DW Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
07:00 AM	36	0	36	0	16	16	0	3	3	55
07:15 AM	41	0	41	0	25	25	2	2	4	70
07:30 AM	48	0	48	0	32	32	3	2	5	85
07:45 AM	57	0	57	0	46	46	6	0	6	109
Total	182	0	182	0	119	119	11	7	18	319
08:00 AM	66	0	66	0	36	36	4	3	7	109
08:15 AM	70	0	70	1	57	58	2	3	5	133
08:30 AM	91	0	91	0	39	39	3	1	4	134
08:45 AM	85	0	85	0	37	37	2	4	6	128
Total	312	0	312	1	169	170	11	11	22	504
Grand Total	494	0	494	1	288	289	22	18	40	823
Apprch %	100	0		0.3	99.7		55	45		
Total %	60	0	60	0.1	35	35.1	2.7	2.2	4.9	

	Xenia Avenue Southbound			Xenia Avenue Northbound			Noble Creek Apartments South DW Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 08:00 AM										
08:00 AM	66	0	66	0	36	36	**4**	3	**7**	109
08:15 AM	70	0	70	**1**	**57**	**58**	2	3	5	133
08:30 AM	**91**	0	**91**	0	39	39	3	1	4	**134**
08:45 AM	85	0	85	0	37	37	2	**4**	6	128
Total Volume	312	0	312	1	169	170	11	11	22	504
% App. Total	100	0		0.6	99.4		50	50		
PHF	.857	.000	.857	.250	.741	.733	.688	.688	.786	.940

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City of Beaumont
N/S: Xenia Avenue
E/W: Noble Creek Apartments South DW
Weather: Clear

File Name : 05_BMT_Xenia_Noble AM
Site Code : 10522218
Start Date : 3/10/2022
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	08:00 AM			07:45 AM			07:30 AM		
+0 mins.	66	0	66	0	46	46	3	2	5
+15 mins.	70	0	70	0	36	36	**6**	0	6
+30 mins.	**91**	0	**91**	**1**	**57**	**58**	4	**3**	**7**
+45 mins.	85	0	85	0	39	39	2	3	5
Total Volume	312	0	312	1	178	179	15	8	23
% App. Total	100	0		0.6	99.4		65.2	34.8	
PHF	.857	.000	.857	.250	.781	.772	.625	.667	.821

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City of Beaumont
N/S: Xenia Avenue
E/W: Noble Creek Apartments South DW
Weather: Clear

File Name : 05_BMT_Xenia_Noble PM
Site Code : 10522218
Start Date : 3/10/2022
Page No : 1

Groups Printed- Total Volume

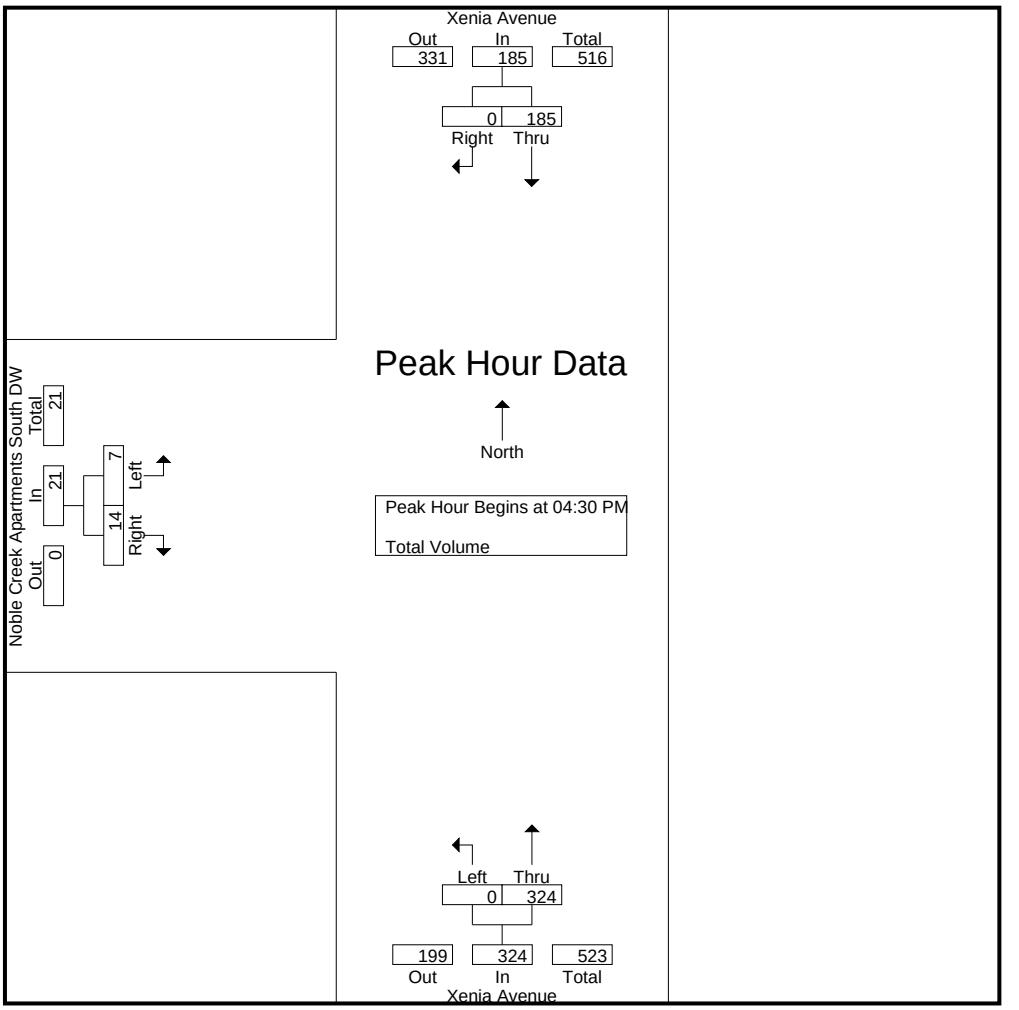
	Xenia Avenue Southbound			Xenia Avenue Northbound			Noble Creek Apartments South DW Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
04:00 PM	56	0	56	0	54	54	1	7	8	118
04:15 PM	53	0	53	1	67	68	5	8	13	134
04:30 PM	42	0	42	0	74	74	1	5	6	122
04:45 PM	53	0	53	0	82	82	1	2	3	138
Total	204	0	204	1	277	278	8	22	30	512
05:00 PM	49	0	49	0	77	77	1	3	4	130
05:15 PM	41	0	41	0	91	91	4	4	8	140
05:30 PM	31	0	31	0	78	78	1	4	5	114
05:45 PM	53	0	53	0	73	73	0	7	7	133
Total	174	0	174	0	319	319	6	18	24	517
Grand Total	378	0	378	1	596	597	14	40	54	1029
Apprch %	100	0		0.2	99.8		25.9	74.1		
Total %	36.7	0	36.7	0.1	57.9	58	1.4	3.9	5.2	

	Xenia Avenue Southbound			Xenia Avenue Northbound			Noble Creek Apartments South DW Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:30 PM										
04:30 PM	42	0	42	0	74	74	1	**5**	6	122
04:45 PM	**53**	0	**53**	0	82	82	1	2	3	138
05:00 PM	49	0	49	0	77	77	1	3	4	130
05:15 PM	41	0	41	0	**91**	**91**	**4**	4	**8**	**140**
Total Volume	185	0	185	0	324	324	7	14	21	530
% App. Total	100	0		0	100		33.3	66.7		
PHF	.873	.000	.873	.000	.890	.890	.438	.700	.656	.946

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City of Beaumont
N/S: Xenia Avenue
E/W: Noble Creek Apartments South DW
Weather: Clear

File Name : 05_BMT_Xenia_Noble PM
Site Code : 10522218
Start Date : 3/10/2022
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM			04:45 PM			04:00 PM		
+0 mins.	**56**	0	**56**	0	82	82	1	7	8
+15 mins.	53	0	53	0	77	77	**5**	**8**	**13**
+30 mins.	42	0	42	0	**91**	**91**	1	5	6
+45 mins.	53	0	53	0	78	78	1	2	3
Total Volume	204	0	204	0	328	328	8	22	30
% App. Total	100	0		0	100		26.7	73.3	
PHF	.911	.000	.911	.000	.901	.901	.400	.688	.577

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City of Beaumont
N/S: Sycamore Square Gated Driveway
E/W: 8th Street
Weather: Clear

File Name : 06_BMT_Sycamore_8th AM
Site Code : 10522218
Start Date : 3/10/2022
Page No : 1

Groups Printed- Total Volume

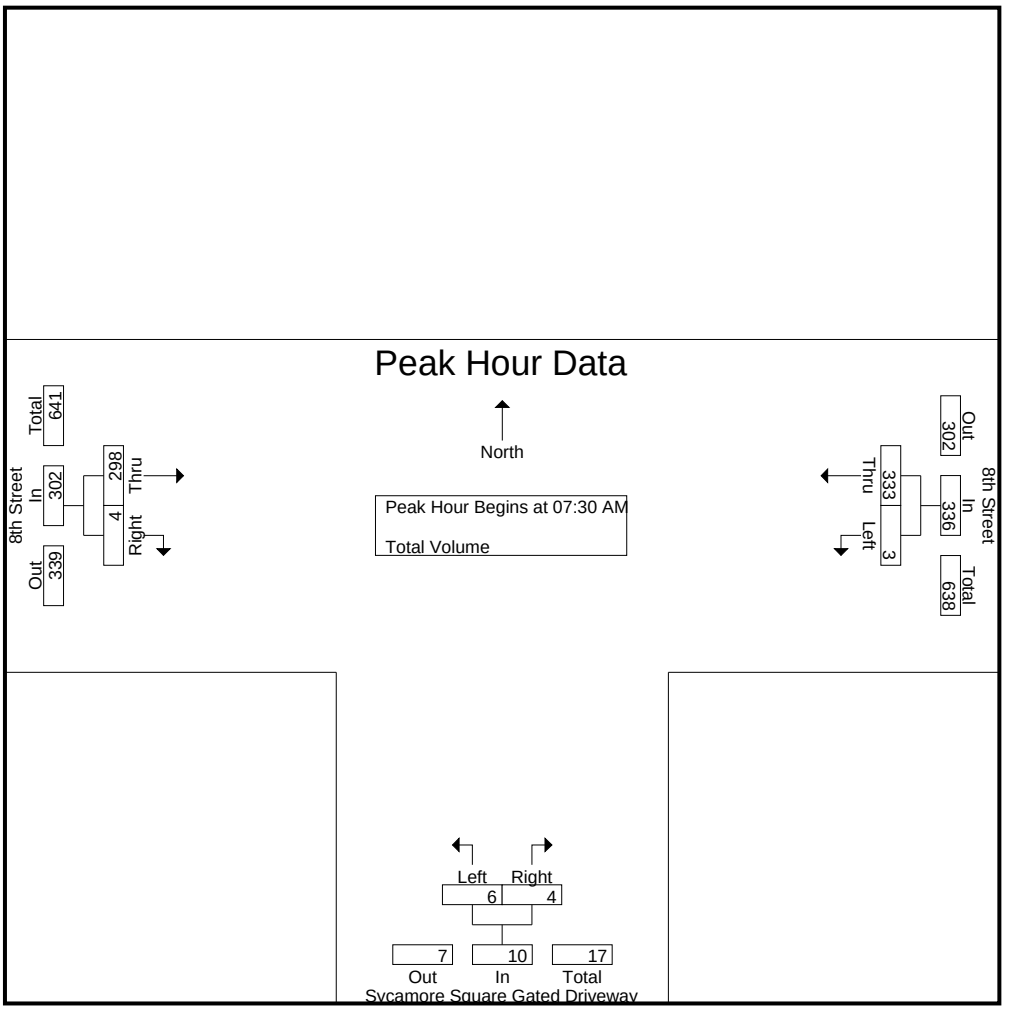
	8th Street Westbound			Sycamore Square Gated Driveway Northbound			8th Street Eastbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
07:00 AM	0	19	19	1	3	4	31	0	31	54
07:15 AM	1	26	27	1	0	1	32	2	34	62
07:30 AM	0	57	57	2	0	2	48	0	48	107
07:45 AM	1	108	109	2	1	3	89	1	90	202
Total	2	210	212	6	4	10	200	3	203	425
08:00 AM	0	129	129	1	3	4	86	0	86	219
08:15 AM	2	39	41	1	0	1	75	3	78	120
08:30 AM	1	47	48	0	1	1	51	0	51	100
08:45 AM	0	30	30	1	0	1	50	1	51	82
Total	3	245	248	3	4	7	262	4	266	521
Grand Total	5	455	460	9	8	17	462	7	469	946
Apprch %	1.1	98.9		52.9	47.1		98.5	1.5		
Total %	0.5	48.1	48.6	1	0.8	1.8	48.8	0.7	49.6	

	8th Street Westbound			Sycamore Square Gated Driveway Northbound			8th Street Eastbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:30 AM										
07:30 AM	0	57	57	**2**	0	2	48	0	48	107
07:45 AM	1	108	109	2	1	3	**89**	1	**90**	202
08:00 AM	0	**129**	**129**	1	**3**	**4**	86	0	86	**219**
08:15 AM	**2**	39	41	1	0	1	75	**3**	78	120
Total Volume	3	333	336	6	4	10	298	4	302	648
% App. Total	0.9	99.1		60	40		98.7	1.3		
PHF	.375	.645	.651	.750	.333	.625	.837	.333	.839	.740

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City of Beaumont
N/S: Sycamore Square Gated Driveway
E/W: 8th Street
Weather: Clear

File Name : 06_BMT_Sycamore_8th AM
Site Code : 10522218
Start Date : 3/10/2022
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:30 AM			07:00 AM			07:45 AM		
+0 mins.	0	57	57	1	**3**	**4**	**89**	1	**90**
+15 mins.	1	108	109	1	0	1	86	0	86
+30 mins.	0	**129**	**129**	**2**	0	2	75	**3**	78
+45 mins.	**2**	39	41	2	1	3	51	0	51
Total Volume	3	333	336	6	4	10	301	4	305
% App. Total	0.9	99.1		60	40		98.7	1.3	
PHF	.375	.645	.651	.750	.333	.625	.846	.333	.847

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City of Beaumont
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File Name : 06_BMT_Sycamore_8th PM
Site Code : 10522218
Start Date : 3/10/2022
Page No : 1

Groups Printed- Total Volume

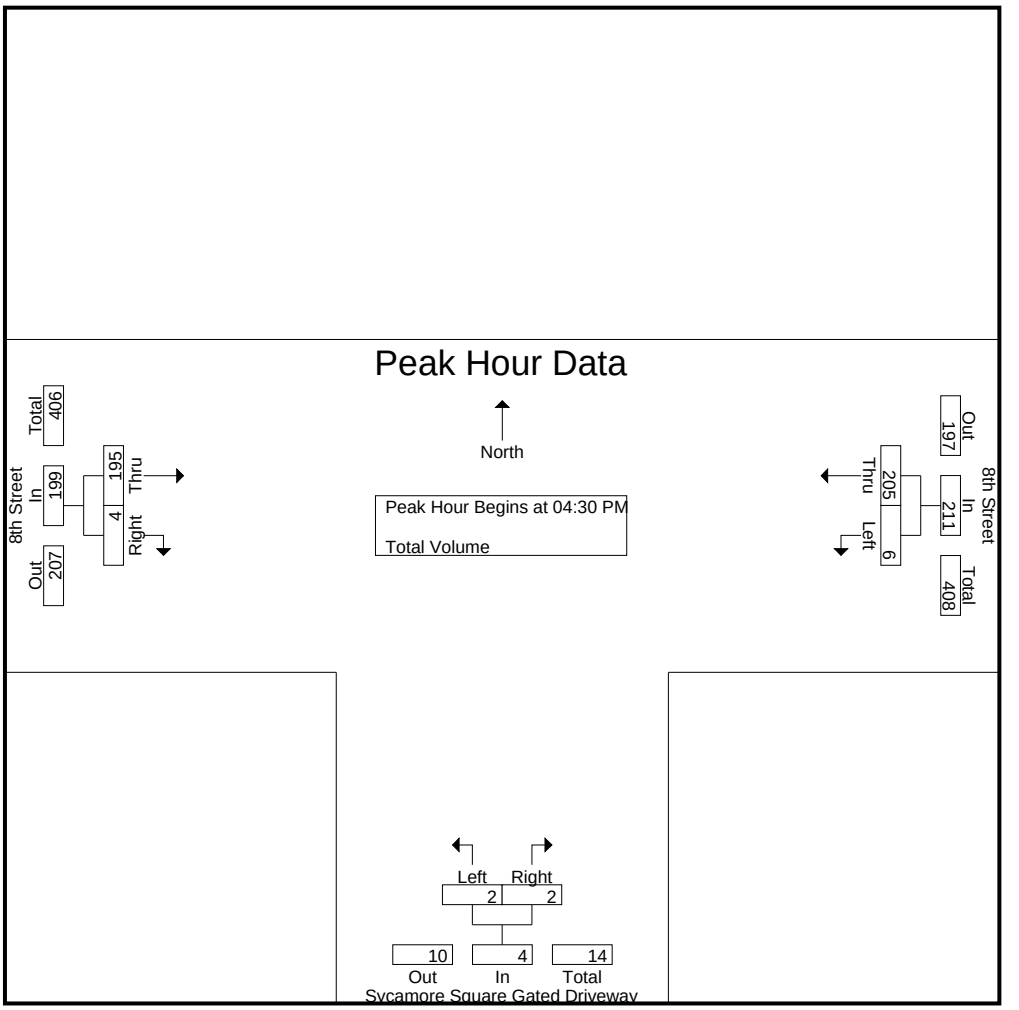
	8th Street Westbound			Sycamore Square Gated Driveway Northbound			8th Street Eastbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
04:00 PM	0	48	48	1	1	2	65	1	66	116
04:15 PM	3	40	43	1	1	2	42	0	42	87
04:30 PM	0	54	54	0	1	1	54	1	55	110
04:45 PM	0	49	49	2	0	2	46	2	48	99
Total	3	191	194	4	3	7	207	4	211	412
05:00 PM	4	45	49	0	1	1	43	0	43	93
05:15 PM	2	57	59	0	0	0	52	1	53	112
05:30 PM	2	56	58	1	1	2	41	0	41	101
05:45 PM	0	42	42	0	1	1	61	0	61	104
Total	8	200	208	1	3	4	197	1	198	410
Grand Total	11	391	402	5	6	11	404	5	409	822
Apprch %	2.7	97.3		45.5	54.5		98.8	1.2		
Total %	1.3	47.6	48.9	0.6	0.7	1.3	49.1	0.6	49.8	

	8th Street Westbound			Sycamore Square Gated Driveway Northbound			8th Street Eastbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:30 PM										
04:30 PM	0	54	54	0	**1**	1	**54**	1	**55**	110
04:45 PM	0	49	49	**2**	0	**2**	46	**2**	48	99
05:00 PM	**4**	45	49	0	1	1	43	0	43	93
05:15 PM	2	**57**	**59**	0	0	0	52	1	53	**112**
Total Volume	6	205	211	2	2	4	195	4	199	414
% App. Total	2.8	97.2		50	50		98	2		
PHF	.375	.899	.894	.250	.500	.500	.903	.500	.905	.924

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City of Beaumont
N/S: Sycamore Square Gated Driveway
E/W: 8th Street
Weather: Clear

File Name : 06_BMT_Sycamore_8th PM
Site Code : 10522218
Start Date : 3/10/2022
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:45 PM			04:00 PM			04:00 PM		
+0 mins.	0	49	49	1	**1**	**2**	**65**	1	**66**
+15 mins.	**4**	45	49	1	1	2	42	0	42
+30 mins.	2	**57**	**59**	0	1	1	54	1	55
+45 mins.	2	56	58	**2**	0	2	46	**2**	48
Total Volume	8	207	215	4	3	7	207	4	211
% App. Total	3.7	96.3		57.1	42.9		98.1	1.9	
PHF	.500	.908	.911	.500	.750	.875	.796	.500	.799

Appendix C

Existing Conditions Intersection Analysis Worksheets

Intersection Level Of Service Report
Intersection 1: Xenia Avenue (NS) / 8th Street (EW)

Control Type:	All-way stop	Delay (sec / veh):	13.6
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.452

Intersection Setup

Name	Xenia Avenue			Xenia Avenue			8th Street			8th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	1	1	0	1
Entry Pocket Length [ft]	90.00	100.00	100.00	150.00	100.00	150.00	150.00	100.00	150.00	125.00	100.00	125.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Xenia Avenue			Xenia Avenue			8th Street			8th Street		
Base Volume Input [veh/h]	6	134	45	139	188	54	38	139	29	71	138	160
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	6	134	45	139	188	54	38	139	29	71	138	160
Peak Hour Factor	0.8170	0.8170	0.8170	0.8170	0.8170	0.8170	0.8170	0.8170	0.8170	0.8170	0.8170	0.8170
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	41	14	43	58	17	12	43	9	22	42	49
Total Analysis Volume [veh/h]	7	164	55	170	230	66	47	170	35	87	169	196
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	495	540	477	509	563	450	479	527	463	494	546
Degree of Utilization, x	0.01	0.41	0.36	0.45	0.12	0.10	0.35	0.07	0.19	0.34	0.36

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.04	1.95	1.60	2.32	0.40	0.35	1.58	0.21	0.68	1.50	1.62
95th-Percentile Queue Length [ft]	1.07	48.81	39.89	57.92	9.90	8.68	39.58	5.32	17.11	37.60	40.53
Approach Delay [s/veh]	13.73		14.28			13.19			13.11		
Approach LOS	B		B			B			B		
Intersection Delay [s/veh]	13.61										
Intersection LOS	B										

Intersection Level Of Service Report
Intersection 2: Xenia Avenue (NS) / 6th Street (EW)

Control Type:	All-way stop	Delay (sec / veh):	12.3
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.398

Intersection Setup

Name	Xenia Avenue			Xenia Avenue			6th Street			6th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	185.00	100.00	100.00	180.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Xenia Avenue			Xenia Avenue			6th Street			6th Street		
Base Volume Input [veh/h]	1	0	0	194	1	128	109	285	2	2	265	71
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1	0	0	194	1	128	109	285	2	2	265	71
Peak Hour Factor	0.9690	0.9690	0.9690	0.9690	0.9690	0.9690	0.9690	0.9690	0.9690	0.9690	0.9690	0.9690
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	50	0	33	28	74	1	1	68	18
Total Analysis Volume [veh/h]	1	0	0	200	1	132	112	294	2	2	273	73
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	486	502	601	504	543	544	499	536	561
Degree of Utilization, x	0.00	0.40	0.22	0.22	0.27	0.27	0.00	0.32	0.31

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.01	1.89	0.84	0.84	1.10	1.10	0.01	1.39	1.30
95th-Percentile Queue Length [ft]	0.15	47.29	21.03	21.06	27.50	27.45	0.30	34.68	32.57
Approach Delay [s/veh]	10.43	12.88		11.81			12.25		
Approach LOS	B	B		B			B		
Intersection Delay [s/veh]	12.28								
Intersection LOS	B								

Intersection Level Of Service Report

Intersection 3: Highland Springs Avenue (NS) / Wilson Street - 8th Street (EW)

Control Type:	Signalized	Delay (sec / veh):	31.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.542

Intersection Setup

Name	Hi Sp			Hi Sp			8th Street			Wilson Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	0	1	0	1
Entry Pocket Length [ft]	210.00	100.00	200.00	155.00	100.00	100.00	150.00	100.00	100.00	300.00	100.00	325.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	35.00			45.00			35.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Hi Sp			Hi Sp			8th Street			Wilson Street		
Base Volume Input [veh/h]	86	326	112	244	473	71	51	137	106	205	158	250
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	86	326	112	244	473	71	51	137	106	205	158	250
Peak Hour Factor	0.8420	0.8420	0.8420	0.8420	0.8420	0.8420	0.8420	0.8420	0.8420	0.8420	0.8420	0.8420
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	26	97	33	72	140	21	15	41	31	61	47	74
Total Analysis Volume [veh/h]	102	387	133	290	562	84	61	163	126	243	188	297
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing major stree	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street [	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor stree	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street [	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protect	Permis	Overla	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	1	6	6	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups			6,7									
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	7	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	30	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	18	37	37	14	33	0	11	36	0	13	38	0
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	7	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	26	26	0	22	0	0	25	0	0	27	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No	No	No	No		No	No		No	No	
Maximum Recall	No	No	No	No	No		No	No		No	No	
Pedestrian Recall	No	No	No	No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	7	47	60	10	50	50	6	18	18	9	21	21
g / C, Green / Cycle	0.07	0.47	0.60	0.10	0.50	0.50	0.06	0.18	0.18	0.09	0.21	0.21
(v / s)_i Volume / Saturation Flow Rate	0.06	0.11	0.08	0.08	0.18	0.18	0.03	0.08	0.09	0.07	0.05	0.19
s, saturation flow rate [veh/h]	1781	3560	1589	3459	1870	1786	1781	1870	1610	3459	3560	1589
c, Capacity [veh/h]	131	1669	952	348	927	886	104	338	291	311	757	338
d1, Uniform Delay [s]	45.57	15.85	8.80	44.21	15.46	15.46	45.99	36.55	36.74	44.62	32.78	38.19
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	9.44	0.33	0.31	5.22	1.07	1.12	5.22	0.92	1.19	4.32	0.17	7.62
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.78	0.23	0.14	0.83	0.36	0.36	0.59	0.45	0.47	0.78	0.25	0.88
d, Delay for Lane Group [s/veh]	55.02	16.17	9.11	49.42	16.53	16.58	51.20	37.47	37.93	48.93	32.95	45.81
Lane Group LOS	E	B	A	D	B	B	D	D	D	D	C	D
Critical Lane Group	Yes	No	No	No	No	Yes	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.80	2.60	1.25	3.65	4.46	4.27	1.61	3.32	3.06	3.03	1.84	7.41
50th-Percentile Queue Length [ft/ln]	69.88	64.97	31.16	91.15	111.38	106.70	40.20	82.98	76.60	75.71	45.94	185.31
95th-Percentile Queue Length [veh/ln]	5.03	4.68	2.24	6.56	7.92	7.66	2.89	5.97	5.52	5.45	3.31	11.88
95th-Percentile Queue Length [ft/ln]	125.78	116.94	56.09	164.08	197.92	191.40	72.37	149.37	137.89	136.27	82.69	296.93

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	55.02	16.17	9.11	49.42	16.55	16.58	51.20	37.50	37.93	48.93	32.95	45.81
Movement LOS	E	B	A	D	B	B	D	D	D	D	C	D
d_A, Approach Delay [s/veh]	21.03			26.74			40.05			43.53		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	31.80											
Intersection LOS	C											
Intersection V/C	0.542											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.64	39.64	39.64	39.64
l_p,int, Pedestrian LOS Score for Intersection	2.752	2.867	2.469	2.873
Crosswalk LOS	C	C	B	C
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	660	580	640	680
d_b, Bicycle Delay [s]	22.48	25.24	23.15	21.81
l_b,int, Bicycle LOS Score for Intersection	2.073	2.332	1.848	2.160
Bicycle LOS	B	B	A	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report

Intersection 4: Highland Springs Avenue (NS) / 6th Street - Ramsey Street (EW)

Control Type:	Signalized	Delay (sec / veh):	34.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.520

Intersection Setup

Name	Hi Sp			Hi Sp			6th Street			Ramsey Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	1	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	195.00	150.00	100.00	85.00	205.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	35.00			30.00			35.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Hi Sp			Hi Sp			6th Street			Ramsey Street		
Base Volume Input [veh/h]	103	465	177	91	551	82	94	237	201	149	180	59
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	103	465	177	91	551	82	94	237	201	149	180	59
Peak Hour Factor	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	27	124	47	24	147	22	25	63	54	40	48	16
Total Analysis Volume [veh/h]	110	495	188	97	587	87	100	252	214	159	192	63
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing major stree	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street [	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor stree	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street [	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	14	46	0	12	44	0	25	44	0	18	37	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	35	0	0	33	0	0	32	0	0	26	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	R	L	C	C
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	9	65	65	8	64	64	8	19	19	13	23	23
g / C, Green / Cycle	0.08	0.54	0.54	0.07	0.53	0.53	0.07	0.16	0.16	0.10	0.19	0.19
(v / s)_i Volume / Saturation Flow Rate	0.06	0.14	0.12	0.05	0.16	0.05	0.06	0.07	0.13	0.09	0.07	0.07
s, saturation flow rate [veh/h]	1781	3560	1589	1781	3560	1589	1781	3560	1589	1781	1870	1716
c, Capacity [veh/h]	136	1914	854	120	1882	840	127	559	250	187	357	327
d1, Uniform Delay [s]	54.60	14.91	14.56	55.23	15.97	14.11	54.88	45.90	49.29	52.82	42.27	42.36
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	10.84	0.33	0.59	12.03	0.43	0.25	10.41	0.57	8.29	10.36	0.63	0.72
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.81	0.26	0.22	0.81	0.31	0.10	0.79	0.45	0.86	0.85	0.37	0.38
d, Delay for Lane Group [s/veh]	65.44	15.24	15.16	67.25	16.41	14.36	65.30	46.47	57.58	63.18	42.91	43.08
Lane Group LOS	E	B	B	E	B	B	E	D	E	E	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	3.66	3.62	2.76	3.30	4.62	1.24	3.32	3.43	6.76	5.13	3.37	3.19
50th-Percentile Queue Length [ft/ln]	91.41	90.47	69.01	82.40	115.38	30.92	82.98	85.85	168.93	128.18	84.19	79.74
95th-Percentile Queue Length [veh/ln]	6.58	6.51	4.97	5.93	8.14	2.23	5.97	6.18	11.02	8.84	6.06	5.74
95th-Percentile Queue Length [ft/ln]	164.54	162.85	124.22	148.33	203.46	55.65	149.36	154.54	275.50	221.01	151.55	143.53

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	65.44	15.24	15.16	67.25	16.41	14.36	65.30	46.47	57.58	63.18	42.96	43.08
Movement LOS	E	B	B	E	B	B	E	D	E	E	D	D
d_A, Approach Delay [s/veh]	22.18			22.57			54.00			50.75		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	34.03											
Intersection LOS	C											
Intersection V/C	0.520											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.52	49.52	49.52	49.52
l_p,int, Pedestrian LOS Score for Intersection	2.799	2.699	2.648	2.592
Crosswalk LOS	C	B	B	B
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	700	666	666	550
d_b, Bicycle Delay [s]	25.36	26.68	26.68	31.55
l_b,int, Bicycle LOS Score for Intersection	2.214	2.196	2.027	1.901
Bicycle LOS	B	B	B	A

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 1: Xenia Avenue (NS) / 8th Street (EW)

Control Type:	All-way stop	Delay (sec / veh):	11.8
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.466

Intersection Setup

Name	Xenia Avenue			Xenia Avenue			8th Street			8th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	1	1	0	1
Entry Pocket Length [ft]	90.00	100.00	100.00	150.00	100.00	150.00	150.00	100.00	150.00	125.00	100.00	125.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Xenia Avenue			Xenia Avenue			8th Street			8th Street		
Base Volume Input [veh/h]	44	216	44	35	141	33	47	121	31	23	145	41
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	44	216	44	35	141	33	47	121	31	23	145	41
Peak Hour Factor	0.9480	0.9480	0.9480	0.9480	0.9480	0.9480	0.9480	0.9480	0.9480	0.9480	0.9480	0.9480
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	57	12	9	37	9	12	32	8	6	38	11
Total Analysis Volume [veh/h]	46	228	46	37	149	35	50	128	33	24	153	43
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	535	588	514	553	618	502	539	602	505	542	605
Degree of Utilization, x	0.09	0.47	0.07	0.27	0.06	0.10	0.24	0.05	0.05	0.28	0.07

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.28	2.47	0.23	1.08	0.18	0.33	0.92	0.17	0.15	1.15	0.23
95th-Percentile Queue Length [ft]	7.02	61.65	5.79	27.07	4.49	8.25	22.94	4.34	3.74	28.82	5.72
Approach Delay [s/veh]	13.49		10.93			10.88			11.19		
Approach LOS	B		B			B			B		
Intersection Delay [s/veh]	11.82										
Intersection LOS	B										

Intersection Level Of Service Report
Intersection 2: Xenia Avenue (NS) / 6th Street (EW)

Control Type:	All-way stop	Delay (sec / veh):	18.7
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.709

Intersection Setup

Name	Xenia Avenue			Xenia Avenue			6th Street			6th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	185.00	100.00	100.00	180.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Xenia Avenue			Xenia Avenue			6th Street			6th Street		
Base Volume Input [veh/h]	1	2	6	114	2	91	167	414	3	5	551	166
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1	2	6	114	2	91	167	414	3	5	551	166
Peak Hour Factor	0.9730	0.9730	0.9730	0.9730	0.9730	0.9730	0.9730	0.9730	0.9730	0.9730	0.9730	0.9730
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	1	2	29	1	23	43	106	1	1	142	43
Total Analysis Volume [veh/h]	1	2	6	117	2	94	172	425	3	5	566	171
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	456	418	484	467	500	500	485	520	546
Degree of Utilization, x	0.02	0.28	0.20	0.37	0.43	0.43	0.01	0.71	0.68

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.06	1.13	0.73	1.67	2.12	2.12	0.03	5.63	5.08
95th-Percentile Queue Length [ft]	1.51	28.28	18.29	41.87	53.08	52.96	0.78	140.69	126.96
Approach Delay [s/veh]	11.07	13.42		15.09			23.25		
Approach LOS	B	B		C			C		
Intersection Delay [s/veh]	18.71								
Intersection LOS	C								

Intersection Level Of Service Report

Intersection 3: Highland Springs Avenue (NS) / Wilson Street - 8th Street (EW)

Control Type:	Signalized	Delay (sec / veh):	26.2
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.428

Intersection Setup

Name	Hi Sp			Hi Sp			8th Street			Wilson Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	0	1	0	1
Entry Pocket Length [ft]	210.00	100.00	200.00	155.00	100.00	100.00	150.00	100.00	100.00	300.00	100.00	325.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	35.00			45.00			35.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Hi Sp			Hi Sp			8th Street			Wilson Street		
Base Volume Input [veh/h]	71	614	195	149	406	22	20	141	54	214	105	142
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	71	614	195	149	406	22	20	141	54	214	105	142
Peak Hour Factor	0.9190	0.9190	0.9190	0.9190	0.9190	0.9190	0.9190	0.9190	0.9190	0.9190	0.9190	0.9190
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	19	167	53	41	110	6	5	38	15	58	29	39
Total Analysis Volume [veh/h]	77	668	212	162	442	24	22	153	59	233	114	155
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing major stree	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street [	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor stree	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street [	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	105
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protect	Permis	Overla	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	1	6	6	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups			6,7									
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	7	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	30	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	14	37	37	11	34	0	11	37	0	20	46	0
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	7	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	26	26	0	22	0	0	25	0	0	27	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No	No	No	No		No	No		No	No	
Maximum Recall	No	No	No	No	No		No	No		No	No	
Pedestrian Recall	No	No	No	No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	105	105	105	105	105	105	105	105	105	105	105	105
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	6	64	77	7	64	64	3	9	9	10	15	15
g / C, Green / Cycle	0.06	0.61	0.74	0.07	0.61	0.61	0.03	0.08	0.08	0.09	0.14	0.14
(v / s)_i Volume / Saturation Flow Rate	0.04	0.19	0.13	0.05	0.13	0.13	0.01	0.06	0.06	0.07	0.03	0.10
s, saturation flow rate [veh/h]	1781	3560	1589	3459	1870	1836	1781	1870	1700	3459	3560	1589
c, Capacity [veh/h]	108	2152	1169	231	1142	1121	58	157	142	321	512	229
d1, Uniform Delay [s]	48.48	10.13	4.25	48.01	9.11	9.11	49.79	46.84	47.00	46.38	39.80	42.69
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	8.45	0.38	0.34	3.82	0.41	0.42	4.00	5.35	6.97	3.12	0.22	3.49
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.71	0.31	0.18	0.70	0.21	0.21	0.38	0.69	0.73	0.73	0.22	0.68
d, Delay for Lane Group [s/veh]	56.94	10.50	4.59	51.84	9.52	9.53	53.79	52.19	53.97	49.50	40.02	46.18
Lane Group LOS	E	B	A	D	A	A	D	D	D	D	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.21	3.57	1.23	2.13	2.21	2.18	0.62	2.95	2.89	3.00	1.28	3.90
50th-Percentile Queue Length [ft/ln]	55.26	89.19	30.87	53.37	55.36	54.56	15.61	73.70	72.23	75.06	31.93	97.55
95th-Percentile Queue Length [veh/ln]	3.98	6.42	2.22	3.84	3.99	3.93	1.12	5.31	5.20	5.40	2.30	7.02
95th-Percentile Queue Length [ft/ln]	99.47	160.54	55.56	96.07	99.64	98.21	28.10	132.66	130.01	135.10	57.47	175.59

Movement, Approach, & Intersection Results

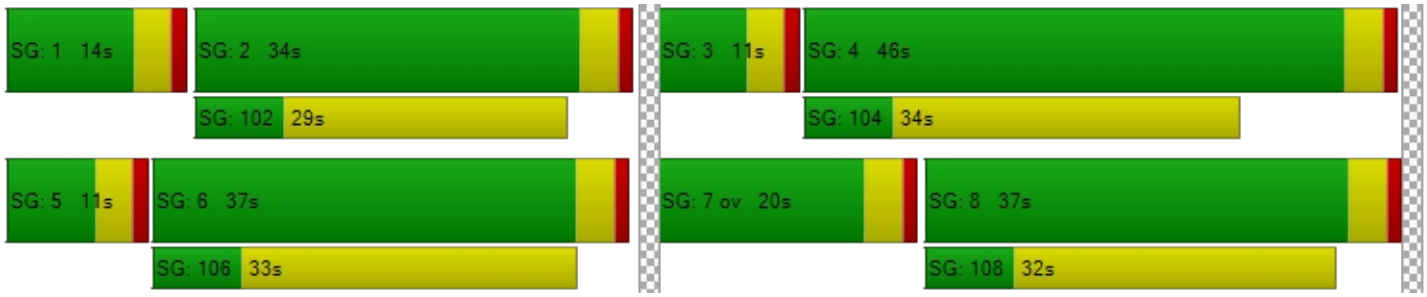
d_M, Delay for Movement [s/veh]	56.94	10.50	4.59	51.84	9.52	9.53	53.79	52.71	53.97	49.50	40.02	46.18
Movement LOS	E	B	A	D	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	12.93			20.44			53.13			46.32		
Approach LOS	B			C			D			D		
d_I, Intersection Delay [s/veh]	26.24											
Intersection LOS	C											
Intersection V/C	0.428											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	42.11	42.11	42.11	42.11
I_p,int, Pedestrian LOS Score for Intersection	2.781	2.819	2.409	2.816
Crosswalk LOS	C	C	B	C
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	628	571	628	800
d_b, Bicycle Delay [s]	24.71	26.81	24.71	18.93
I_b,int, Bicycle LOS Score for Intersection	2.349	2.078	1.753	1.974
Bicycle LOS	B	B	A	A

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report

Intersection 4: Highland Springs Avenue (NS) / 6th Street - Ramsey Street (EW)

Control Type:	Signalized	Delay (sec / veh):	47.7
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.655

Intersection Setup

Name	Hi Sp			Hi Sp			6th Street			Ramsey Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	1	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	195.00	150.00	100.00	85.00	205.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	35.00			30.00			35.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Hi Sp			Hi Sp			6th Street			Ramsey Street		
Base Volume Input [veh/h]	216	646	218	59	511	129	147	335	263	200	398	109
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	216	646	218	59	511	129	147	335	263	200	398	109
Peak Hour Factor	0.9560	0.9560	0.9560	0.9560	0.9560	0.9560	0.9560	0.9560	0.9560	0.9560	0.9560	0.9560
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	56	169	57	15	134	34	38	88	69	52	104	29
Total Analysis Volume [veh/h]	226	676	228	62	535	135	154	350	275	209	416	114
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing major stree	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street [	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor stree	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street [	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	17	49	0	12	44	0	22	43	0	16	37	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	35	0	0	33	0	0	32	0	0	26	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	R	L	C	C
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	13	62	62	6	55	55	12	24	24	12	23	23
g / C, Green / Cycle	0.11	0.52	0.52	0.05	0.46	0.46	0.10	0.20	0.20	0.10	0.19	0.19
(v / s)_i Volume / Saturation Flow Rate	0.13	0.19	0.14	0.03	0.15	0.08	0.09	0.10	0.17	0.12	0.15	0.15
s, saturation flow rate [veh/h]	1781	3560	1589	1781	3560	1589	1781	3560	1589	1781	1870	1733
c, Capacity [veh/h]	194	1843	823	92	1640	732	183	701	313	179	364	337
d1, Uniform Delay [s]	53.50	17.24	16.31	55.93	20.56	19.09	52.90	42.95	46.83	54.00	45.64	45.67
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	86.84	0.56	0.84	8.21	0.53	0.56	9.91	0.55	8.32	88.22	3.19	3.49
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	1.17	0.37	0.28	0.67	0.33	0.18	0.84	0.50	0.88	1.17	0.75	0.76
d, Delay for Lane Group [s/veh]	140.34	17.80	17.14	64.14	21.09	19.64	62.82	43.50	55.15	142.22	48.83	49.17
Lane Group LOS	F	B	B	E	C	B	E	D	E	F	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	10.46	5.55	3.64	2.06	4.87	2.34	5.02	4.65	8.60	9.65	7.82	7.31
50th-Percentile Queue Length [ft/ln]	261.57	138.65	90.93	51.42	121.71	58.44	125.60	116.21	214.89	241.24	195.40	182.71
95th-Percentile Queue Length [veh/ln]	16.73	9.41	6.55	3.70	8.49	4.21	8.70	8.18	13.40	15.61	12.40	11.74
95th-Percentile Queue Length [ft/ln]	418.19	235.20	163.68	92.56	212.17	105.20	217.50	204.61	335.09	390.30	310.03	293.55

Movement, Approach, & Intersection Results

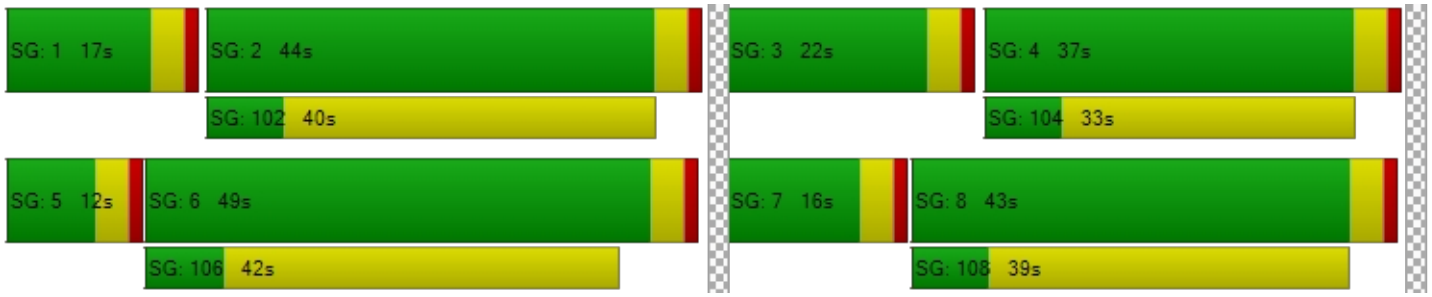
d_M, Delay for Movement [s/veh]	140.34	17.80	17.14	64.14	21.09	19.64	62.82	43.50	55.15	142.22	48.94	49.17
Movement LOS	F	B	B	E	C	B	E	D	E	F	D	D
d_A, Approach Delay [s/veh]	42.18			24.47			51.43			75.36		
Approach LOS	D			C			D			E		
d_I, Intersection Delay [s/veh]	47.73											
Intersection LOS	D											
Intersection V/C	0.655											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.52	49.52	49.52	49.52
I_p,int, Pedestrian LOS Score for Intersection	2.874	2.739	2.762	2.717
Crosswalk LOS	C	B	C	B
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	750	666	650	550
d_b, Bicycle Delay [s]	23.45	26.68	27.35	31.55
I_b,int, Bicycle LOS Score for Intersection	2.492	2.164	2.202	2.169
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Appendix D

Project Opening Year (2024) Without Project Conditions
Intersection Analysis Worksheets

Intersection Level Of Service Report
Intersection 1: Xenia Avenue (NS) / 8th Street (EW)

Control Type:	All-way stop	Delay (sec / veh):	20.6
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.787

Intersection Setup

Name	Xenia Avenue			Xenia Avenue			8th Street			8th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	1	1	0	1
Entry Pocket Length [ft]	90.00	100.00	100.00	150.00	100.00	150.00	150.00	100.00	150.00	125.00	100.00	125.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Xenia Avenue			Xenia Avenue			8th Street			8th Street		
Base Volume Input [veh/h]	10	139	55	148	196	56	40	199	31	77	294	167
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	10	139	55	148	196	56	40	199	31	77	294	167
Peak Hour Factor	0.8170	0.8170	0.8170	0.8170	0.8170	0.8170	0.8170	0.8170	0.8170	0.8170	0.8170	0.8170
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	43	17	45	60	17	12	61	9	24	90	51
Total Analysis Volume [veh/h]	12	170	67	181	240	69	49	244	38	94	360	204
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	447	484	420	445	486	409	433	471	431	458	501
Degree of Utilization, x	0.03	0.49	0.43	0.54	0.14	0.12	0.56	0.08	0.22	0.79	0.41

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.08	2.66	2.12	3.13	0.49	0.40	3.39	0.26	0.82	7.03	1.96
95th-Percentile Queue Length [ft]	2.07	66.39	52.96	78.16	12.31	10.11	84.75	6.55	20.54	175.74	48.94
Approach Delay [s/veh]	16.80		17.81			18.80			25.06		
Approach LOS	C		C			C			D		
Intersection Delay [s/veh]	20.61										
Intersection LOS	C										

Intersection Level Of Service Report
Intersection 2: Xenia Avenue (NS) / 6th Street (EW)

Control Type:	All-way stop	Delay (sec / veh):	13.2
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.462

Intersection Setup

Name	Xenia Avenue			Xenia Avenue			6th Street			6th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	185.00	100.00	100.00	180.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Xenia Avenue			Xenia Avenue			6th Street			6th Street		
Base Volume Input [veh/h]	1	0	0	219	1	146	117	300	2	2	277	79
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1	0	0	219	1	146	117	300	2	2	277	79
Peak Hour Factor	0.9690	0.9690	0.9690	0.9690	0.9690	0.9690	0.9690	0.9690	0.9690	0.9690	0.9690	0.9690
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	57	0	38	30	77	1	1	71	20
Total Analysis Volume [veh/h]	1	0	0	226	1	151	121	310	2	2	286	82
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	471	490	583	486	522	523	481	515	540
Degree of Utilization, x	0.00	0.46	0.26	0.25	0.30	0.30	0.00	0.36	0.34

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.01	2.40	1.04	0.97	1.24	1.24	0.01	1.60	1.50
95th-Percentile Queue Length [ft]	0.16	59.94	25.96	24.34	31.11	31.06	0.31	40.03	37.46
Approach Delay [s/veh]	10.66	14.13		12.51			13.11		
Approach LOS	B	B		B			B		
Intersection Delay [s/veh]	13.21								
Intersection LOS	B								

Intersection Level Of Service Report

Intersection 3: Highland Springs Avenue (NS) / Wilson Street - 8th Street (EW)

Control Type:	Signalized	Delay (sec / veh):	38.0
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.690

Intersection Setup

Name	Hi Sp			Hi Sp			8th Street			Wilson Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	0	1	0	1
Entry Pocket Length [ft]	210.00	100.00	200.00	155.00	100.00	100.00	150.00	100.00	100.00	300.00	100.00	325.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	35.00			45.00			35.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Hi Sp			Hi Sp			8th Street			Wilson Street		
Base Volume Input [veh/h]	90	425	198	254	726	149	83	172	114	441	239	260
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	90	425	198	254	726	149	83	172	114	441	239	260
Peak Hour Factor	0.8420	0.8420	0.8420	0.8420	0.8420	0.8420	0.8420	0.8420	0.8420	0.8420	0.8420	0.8420
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	27	126	59	75	216	44	25	51	34	131	71	77
Total Analysis Volume [veh/h]	107	505	235	302	862	177	99	204	135	524	284	309
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing major stree	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street [	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor stree	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street [	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protect	Permis	Overla	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	1	6	6	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups			6,7									
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	7	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	30	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	13	37	37	20	44	0	12	36	0	27	51	0
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	7	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	26	26	0	22	0	0	25	0	0	27	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No	No	No	No		No	No		No	No	
Maximum Recall	No	No	No	No	No		No	No		No	No	
Pedestrian Recall	No	No	No	No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	9	56	81	13	60	60	8	14	14	21	27	27
g / C, Green / Cycle	0.07	0.47	0.68	0.11	0.50	0.50	0.07	0.12	0.12	0.17	0.22	0.22
(v / s)_i Volume / Saturation Flow Rate	0.06	0.14	0.15	0.09	0.28	0.29	0.06	0.10	0.10	0.15	0.08	0.19
s, saturation flow rate [veh/h]	1781	3560	1589	3459	1870	1761	1781	1870	1629	3459	3560	1589
c, Capacity [veh/h]	132	1670	1072	364	935	881	120	224	196	595	801	357
d1, Uniform Delay [s]	54.73	19.71	7.46	52.64	20.97	21.04	55.29	51.37	51.59	48.49	39.20	44.78
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	10.98	0.47	0.47	4.85	2.52	2.72	13.13	6.20	8.43	4.43	0.27	6.30
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.81	0.30	0.22	0.83	0.57	0.57	0.83	0.79	0.82	0.88	0.35	0.86
d, Delay for Lane Group [s/veh]	65.70	20.18	7.93	57.49	23.49	23.76	68.42	57.57	60.02	52.91	39.47	51.08
Lane Group LOS	E	C	A	E	C	C	E	E	E	D	D	D
Critical Lane Group	Yes	No	No	No	No	Yes	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	3.56	4.39	2.27	4.59	10.40	9.95	3.37	5.54	5.15	7.79	3.47	9.17
50th-Percentile Queue Length [ft/ln]	89.11	109.87	56.75	114.80	259.99	248.83	84.31	138.54	128.79	194.75	86.70	229.30
95th-Percentile Queue Length [veh/ln]	6.42	7.83	4.09	8.11	15.69	15.13	6.07	9.40	8.87	12.37	6.24	14.14
95th-Percentile Queue Length [ft/ln]	160.39	195.82	102.15	202.66	392.20	378.17	151.76	235.06	221.84	309.19	156.06	353.47

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	65.70	20.18	7.93	57.49	23.59	23.76	68.42	57.88	60.02	52.91	39.47	51.08
Movement LOS	E	C	A	E	C	C	E	E	E	D	D	D
d_A, Approach Delay [s/veh]	22.53			31.25			60.93			48.99		
Approach LOS	C			C			E			D		
d_I, Intersection Delay [s/veh]	38.04											
Intersection LOS	D											
Intersection V/C	0.690											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.52	49.52	49.52	49.52
l_p,int, Pedestrian LOS Score for Intersection	2.916	3.016	2.543	2.996
Crosswalk LOS	C	C	B	C
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	550	666	533	783
d_b, Bicycle Delay [s]	31.55	26.68	32.28	22.22
l_b,int, Bicycle LOS Score for Intersection	2.258	2.666	1.921	2.481
Bicycle LOS	B	B	A	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report

Intersection 4: Highland Springs Avenue (NS) / 6th Street - Ramsey Street (EW)

Control Type:	Signalized	Delay (sec / veh):	34.3
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.721

Intersection Setup

Name	Hi Sp			Hi Sp			6th Street			Ramsey Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	1	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	195.00	150.00	100.00	85.00	205.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	35.00			30.00			35.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Hi Sp			Hi Sp			6th Street			Ramsey Street		
Base Volume Input [veh/h]	112	654	188	95	1040	85	98	250	226	160	188	61
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	112	654	188	95	1040	85	98	250	226	160	188	61
Peak Hour Factor	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	30	174	50	25	277	23	26	67	60	43	50	16
Total Analysis Volume [veh/h]	119	696	200	101	1108	91	104	266	241	170	200	65
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing major stree	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street [	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor stree	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street [	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	13	46	0	12	45	0	14	46	0	15	48	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	35	0	0	33	0	0	32	0	0	26	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	R	L	C	C
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	9	64	64	8	63	63	9	21	21	11	23	23
g / C, Green / Cycle	0.08	0.53	0.53	0.07	0.53	0.53	0.07	0.17	0.17	0.09	0.19	0.19
(v / s)_i Volume / Saturation Flow Rate	0.07	0.20	0.13	0.06	0.31	0.06	0.06	0.07	0.15	0.10	0.07	0.07
s, saturation flow rate [veh/h]	1781	3560	1589	1781	3560	1589	1781	3560	1589	1781	1870	1717
c, Capacity [veh/h]	135	1897	847	120	1868	834	129	621	277	164	363	333
d1, Uniform Delay [s]	54.97	16.29	14.99	55.36	19.70	14.40	54.83	44.23	48.24	54.49	42.08	42.17
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	16.61	0.55	0.66	14.38	1.40	0.26	10.94	0.47	8.22	41.97	0.65	0.73
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.88	0.37	0.24	0.84	0.59	0.11	0.80	0.43	0.87	1.03	0.38	0.39
d, Delay for Lane Group [s/veh]	71.57	16.83	15.64	69.74	21.10	14.66	65.77	44.70	56.46	96.47	42.73	42.90
Lane Group LOS	E	B	B	E	C	B	E	D	E	F	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	4.16	5.53	3.00	3.50	10.77	1.31	3.47	3.55	7.57	6.75	3.50	3.31
50th-Percentile Queue Length [ft/ln]	103.91	138.15	75.02	87.53	269.33	32.77	86.65	88.78	189.27	168.72	87.45	82.67
95th-Percentile Queue Length [veh/ln]	7.48	9.38	5.40	6.30	16.16	2.36	6.24	6.39	12.08	11.15	6.30	5.95
95th-Percentile Queue Length [ft/ln]	187.03	234.53	135.03	157.55	403.91	58.98	155.97	159.80	302.09	278.73	157.40	148.81

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	71.57	16.83	15.64	69.74	21.10	14.66	65.77	44.70	56.46	96.47	42.78	42.90
Movement LOS	E	B	B	E	C	B	E	D	E	F	D	D
d_A, Approach Delay [s/veh]	23.02			24.43			52.93			63.78		
Approach LOS	C			C			D			E		
d_I, Intersection Delay [s/veh]	34.27											
Intersection LOS	C											
Intersection V/C	0.721											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.52	49.52	49.52	49.52
l_p,int, Pedestrian LOS Score for Intersection	2.947	2.818	2.660	2.607
Crosswalk LOS	C	C	B	B
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	700	683	700	733
d_b, Bicycle Delay [s]	25.36	26.02	25.36	24.08
l_b,int, Bicycle LOS Score for Intersection	2.397	2.632	2.064	1.918
Bicycle LOS	B	B	B	A

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report

Intersection 1: Xenia Avenue (NS) / 8th Street (EW)

Control Type:	All-way stop	Delay (sec / veh):	17.6
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.641

Intersection Setup

Name	Xenia Avenue			Xenia Avenue			8th Street			8th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	1	1	0	1
Entry Pocket Length [ft]	90.00	100.00	100.00	150.00	100.00	150.00	150.00	100.00	150.00	125.00	100.00	125.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Xenia Avenue			Xenia Avenue			8th Street			8th Street		
Base Volume Input [veh/h]	49	225	51	37	147	34	49	297	36	32	253	46
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	49	225	51	37	147	34	49	297	36	32	253	46
Peak Hour Factor	0.9480	0.9480	0.9480	0.9480	0.9480	0.9480	0.9480	0.9480	0.9480	0.9480	0.9480	0.9480
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	59	13	10	39	9	13	78	9	8	67	12
Total Analysis Volume [veh/h]	52	237	54	39	155	36	52	313	38	34	267	49
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	461	499	439	466	510	458	489	539	450	479	528
Degree of Utilization, x	0.11	0.58	0.09	0.33	0.07	0.11	0.64	0.07	0.08	0.56	0.09

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.38	3.68	0.29	1.44	0.23	0.38	4.45	0.23	0.24	3.35	0.31
95th-Percentile Queue Length [ft]	9.48	91.94	7.28	36.05	5.67	9.53	111.17	5.67	6.10	83.66	7.63
Approach Delay [s/veh]	18.30		13.19			19.73			17.20		
Approach LOS	C		B			C			C		
Intersection Delay [s/veh]	17.56										
Intersection LOS	C										

Intersection Level Of Service Report
Intersection 2: Xenia Avenue (NS) / 6th Street (EW)

Control Type:	All-way stop	Delay (sec / veh):	22.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.790

Intersection Setup

Name	Xenia Avenue			Xenia Avenue			6th Street			6th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	185.00	100.00	100.00	180.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Xenia Avenue			Xenia Avenue			6th Street			6th Street		
Base Volume Input [veh/h]	1	2	6	129	2	103	187	433	3	5	578	190
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1	2	6	129	2	103	187	433	3	5	578	190
Peak Hour Factor	0.9730	0.9730	0.9730	0.9730	0.9730	0.9730	0.9730	0.9730	0.9730	0.9730	0.9730	0.9730
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	1	2	33	1	26	48	111	1	1	149	49
Total Analysis Volume [veh/h]	1	2	6	133	2	106	192	445	3	5	594	195
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	436	402	463	449	479	480	467	500	525
Degree of Utilization, x	0.02	0.33	0.23	0.43	0.47	0.47	0.01	0.79	0.75

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.06	1.42	0.90	2.11	2.45	2.44	0.03	7.26	6.49
95th-Percentile Queue Length [ft]	1.58	35.58	22.39	52.67	61.22	61.09	0.81	181.45	162.35
Approach Delay [s/veh]	11.43	14.60		16.63			29.55		
Approach LOS	B	B		C			D		
Intersection Delay [s/veh]	22.40								
Intersection LOS	C								

Intersection Level Of Service Report

Intersection 3: Highland Springs Avenue (NS) / Wilson Street - 8th Street (EW)

Control Type:	Signalized	Delay (sec / veh):	28.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.630

Intersection Setup

Name	Hi Sp			Hi Sp			8th Street			Wilson Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	0	1	0	1
Entry Pocket Length [ft]	210.00	100.00	200.00	155.00	100.00	100.00	150.00	100.00	100.00	300.00	100.00	325.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	35.00			45.00			35.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Hi Sp			Hi Sp			8th Street			Wilson Street		
Base Volume Input [veh/h]	79	908	465	155	583	77	109	235	58	378	163	148
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	79	908	465	155	583	77	109	235	58	378	163	148
Peak Hour Factor	0.9190	0.9190	0.9190	0.9190	0.9190	0.9190	0.9190	0.9190	0.9190	0.9190	0.9190	0.9190
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	21	247	126	42	159	21	30	64	16	103	44	40
Total Analysis Volume [veh/h]	86	988	506	169	634	84	119	256	63	411	177	161
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing major stree	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street [	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor stree	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street [	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	105
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protect	Permis	Overla	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	1	6	6	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups			6,7									
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	7	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	30	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	15	37	37	11	33	0	19	37	0	20	38	0
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	7	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	26	26	0	22	0	0	25	0	0	27	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No	No	No	No		No	No		No	No	
Maximum Recall	No	No	No	No	No		No	No		No	No	
Pedestrian Recall	No	No	No	No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	105	105	105	105	105	105	105	105	105	105	105	105
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	7	54	74	7	55	55	9	12	12	16	19	19
g / C, Green / Cycle	0.06	0.52	0.71	0.07	0.52	0.52	0.08	0.11	0.11	0.15	0.18	0.18
(v / s)_i Volume / Saturation Flow Rate	0.05	0.28	0.32	0.05	0.20	0.20	0.07	0.09	0.09	0.12	0.05	0.10
s, saturation flow rate [veh/h]	1781	3560	1589	3459	1870	1794	1781	1870	1745	3459	3560	1589
c, Capacity [veh/h]	111	1832	1121	233	971	932	149	212	197	528	648	289
d1, Uniform Delay [s]	48.53	17.14	6.69	48.07	15.10	15.10	47.27	45.30	45.39	42.82	37.02	39.14
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	10.67	1.14	1.31	4.26	1.12	1.17	9.24	5.90	6.84	2.52	0.23	1.68
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.77	0.54	0.45	0.73	0.38	0.38	0.80	0.77	0.79	0.78	0.27	0.56
d, Delay for Lane Group [s/veh]	59.20	18.28	8.01	52.33	16.22	16.27	56.51	51.20	52.23	45.34	37.24	40.82
Lane Group LOS	E	B	A	D	B	B	E	D	D	D	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.52	7.83	4.47	2.24	5.06	4.87	3.40	4.43	4.27	5.12	1.91	3.77
50th-Percentile Queue Length [ft/ln]	63.07	195.82	111.69	56.01	126.40	121.64	84.94	110.63	106.69	128.03	47.80	94.33
95th-Percentile Queue Length [veh/ln]	4.54	12.42	7.93	4.03	8.74	8.48	6.12	7.87	7.66	8.83	3.44	6.79
95th-Percentile Queue Length [ft/ln]	113.52	310.57	198.34	100.81	218.59	212.08	152.90	196.87	191.39	220.81	86.04	169.80

Movement, Approach, & Intersection Results

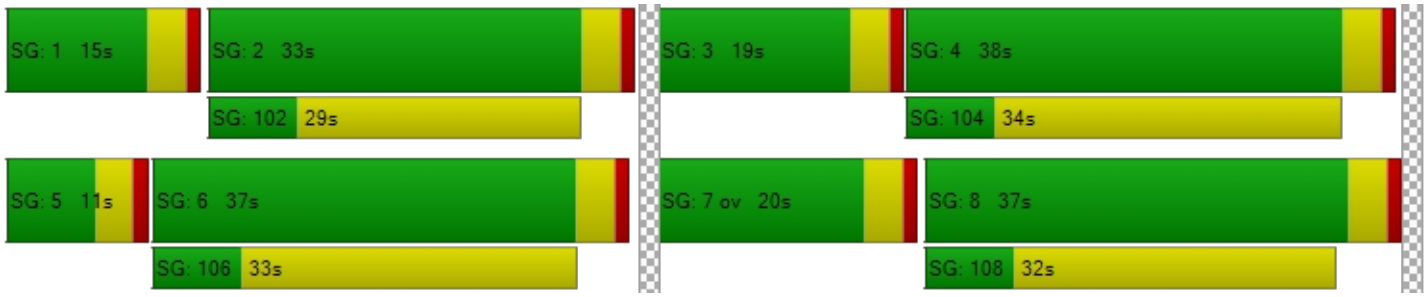
d_M, Delay for Movement [s/veh]	59.20	18.28	8.01	52.33	16.24	16.27	56.51	51.57	52.23	45.34	37.24	40.82
Movement LOS	E	B	A	D	B	B	E	D	D	D	D	D
d_A, Approach Delay [s/veh]	17.22			23.12			53.01			42.45		
Approach LOS	B			C			D			D		
d_I, Intersection Delay [s/veh]	28.11											
Intersection LOS	C											
Intersection V/C	0.630											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	42.11	42.11	42.11	42.11
l_p,int, Pedestrian LOS Score for Intersection	2.970	2.985	2.486	2.952
Crosswalk LOS	C	C	B	C
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	628	552	628	647
d_b, Bicycle Delay [s]	24.71	27.53	24.71	24.03
l_b,int, Bicycle LOS Score for Intersection	2.863	2.291	1.921	2.178
Bicycle LOS	C	B	A	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report

Intersection 4: Highland Springs Avenue (NS) / 6th Street - Ramsey Street (EW)

Control Type:	Signalized	Delay (sec / veh):	50.7
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.812

Intersection Setup

Name	Hi Sp			Hi Sp			6th Street			Ramsey Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	1	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	195.00	150.00	100.00	85.00	205.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	35.00			30.00			35.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Hi Sp			Hi Sp			6th Street			Ramsey Street		
Base Volume Input [veh/h]	243	1208	234	61	849	134	153	351	284	213	418	113
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	243	1208	234	61	849	134	153	351	284	213	418	113
Peak Hour Factor	0.9560	0.9560	0.9560	0.9560	0.9560	0.9560	0.9560	0.9560	0.9560	0.9560	0.9560	0.9560
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	64	316	61	16	222	35	40	92	74	56	109	30
Total Analysis Volume [veh/h]	254	1264	245	64	888	140	160	367	297	223	437	118
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing major stree	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street [	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor stree	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street [	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	17	50	0	11	44	0	22	43	0	16	37	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	35	0	0	33	0	0	32	0	0	26	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	R	L	C	C
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	13	60	60	6	54	54	13	25	25	12	25	25
g / C, Green / Cycle	0.11	0.50	0.50	0.05	0.45	0.45	0.11	0.21	0.21	0.10	0.20	0.20
(v / s)_i Volume / Saturation Flow Rate	0.14	0.36	0.15	0.04	0.25	0.09	0.09	0.10	0.19	0.13	0.15	0.15
s, saturation flow rate [veh/h]	1781	3560	1589	1781	3560	1589	1781	3560	1589	1781	1870	1735
c, Capacity [veh/h]	194	1792	800	93	1590	710	189	750	335	179	384	356
d1, Uniform Delay [s]	53.50	22.97	17.51	55.93	24.49	20.16	52.70	41.69	45.99	54.00	44.82	44.84
k, delay calibration	0.14	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.15	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	149.65	2.36	0.99	8.69	1.42	0.62	9.92	0.50	10.25	120.57	2.96	3.21
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	1.31	0.71	0.31	0.69	0.56	0.20	0.85	0.49	0.89	1.25	0.75	0.75
d, Delay for Lane Group [s/veh]	203.15	25.33	18.50	64.62	25.91	20.78	62.62	42.19	56.24	174.57	47.77	48.06
Lane Group LOS	F	C	B	E	C	C	E	D	E	F	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	13.84	13.75	4.11	2.13	9.51	2.51	5.21	4.80	9.43	11.26	8.11	7.57
50th-Percentile Queue Length [ft/ln]	346.11	343.63	102.73	53.29	237.75	62.73	130.37	120.00	235.78	281.46	202.72	189.34
95th-Percentile Queue Length [veh/ln]	22.03	19.83	7.40	3.84	14.57	4.52	8.96	8.39	14.47	18.14	12.78	12.09
95th-Percentile Queue Length [ft/ln]	550.65	495.64	184.92	95.93	364.19	112.92	223.99	209.82	361.69	453.57	319.47	302.18

Movement, Approach, & Intersection Results

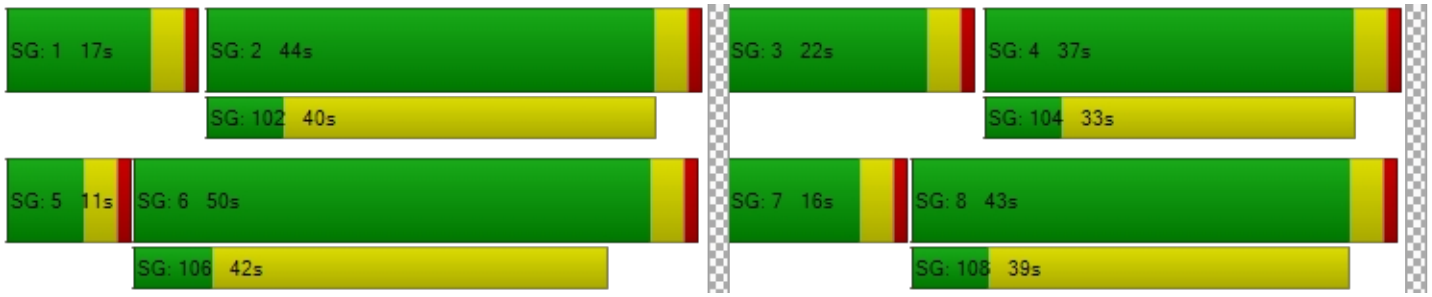
d_M, Delay for Movement [s/veh]	203.15	25.33	18.50	64.62	25.91	20.78	62.62	42.19	56.24	174.57	47.87	48.06
Movement LOS	F	C	B	E	C	C	E	D	E	F	D	D
d_A, Approach Delay [s/veh]	50.00			27.52			51.22			84.22		
Approach LOS	D			C			D			F		
d_I, Intersection Delay [s/veh]	50.69											
Intersection LOS	D											
Intersection V/C	0.812											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.52	49.52	49.52	49.52
l_p,int, Pedestrian LOS Score for Intersection	3.068	2.895	2.780	2.739
Crosswalk LOS	C	C	C	B
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	766	666	650	550
d_b, Bicycle Delay [s]	22.83	26.68	27.35	31.55
l_b,int, Bicycle LOS Score for Intersection	3.014	2.461	2.239	2.201
Bicycle LOS	C	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Appendix E

Project Opening Year (2024) With Project Conditions
Intersection Analysis Worksheets

Intersection Level Of Service Report
Intersection 1: Xenia Avenue (NS) / 8th Street (EW)

Control Type:	All-way stop	Delay (sec / veh):	20.9
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.797

Intersection Setup

Name	Xenia Avenue			Xenia Avenue			8th Street			8th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	1	1	0	1
Entry Pocket Length [ft]	90.00	100.00	100.00	150.00	100.00	150.00	150.00	100.00	150.00	125.00	100.00	125.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Xenia Avenue			Xenia Avenue			8th Street			8th Street		
Base Volume Input [veh/h]	13	139	61	148	196	56	40	200	32	79	297	167
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	13	139	61	148	196	56	40	200	32	79	297	167
Peak Hour Factor	0.8170	0.8170	0.8170	0.8170	0.8170	0.8170	0.8170	0.8170	0.8170	0.8170	0.8170	0.8170
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	43	19	45	60	17	12	61	10	24	91	51
Total Analysis Volume [veh/h]	16	170	75	181	240	69	49	245	39	97	364	204
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	447	484	419	444	485	410	433	471	430	457	500
Degree of Utilization, x	0.04	0.51	0.43	0.54	0.14	0.12	0.57	0.08	0.23	0.80	0.41

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.11	2.81	2.12	3.14	0.49	0.40	3.41	0.27	0.86	7.25	1.96
95th-Percentile Queue Length [ft]	2.78	70.34	53.11	78.46	12.35	10.09	85.18	6.73	21.41	181.25	49.10
Approach Delay [s/veh]	17.14		17.87			18.80			25.67		
Approach LOS	C		C			C			D		
Intersection Delay [s/veh]	20.90										
Intersection LOS	C										

Intersection Level Of Service Report
Intersection 2: Xenia Avenue (NS) / 6th Street (EW)

Control Type:	All-way stop	Delay (sec / veh):	13.6
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.490

Intersection Setup

Name	Xenia Avenue			Xenia Avenue			6th Street			6th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	185.00	100.00	100.00	180.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Xenia Avenue			Xenia Avenue			6th Street			6th Street		
Base Volume Input [veh/h]	1	0	0	231	1	164	122	300	2	2	277	83
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1	0	0	231	1	164	122	300	2	2	277	83
Peak Hour Factor	0.9690	0.9690	0.9690	0.9690	0.9690	0.9690	0.9690	0.9690	0.9690	0.9690	0.9690	0.9690
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	60	0	42	31	77	1	1	71	21
Total Analysis Volume [veh/h]	1	0	0	238	1	169	126	310	2	2	286	86
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	465	486	578	478	513	513	473	507	531
Degree of Utilization, x	0.00	0.49	0.29	0.26	0.30	0.30	0.00	0.37	0.35

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.01	2.65	1.22	1.05	1.28	1.27	0.01	1.67	1.56
95th-Percentile Queue Length [ft]	0.16	66.33	30.54	26.23	31.89	31.84	0.32	41.76	38.99
Approach Delay [s/veh]	10.76	14.72		12.80			13.46		
Approach LOS	B	B		B			B		
Intersection Delay [s/veh]	13.64								
Intersection LOS	B								

Intersection Level Of Service Report

Intersection 3: Highland Springs Avenue (NS) / Wilson Street - 8th Street (EW)

Control Type:	Signalized	Delay (sec / veh):	38.5
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.701

Intersection Setup

Name	Hi Sp			Hi Sp			8th Street			Wilson Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	0	1	0	1
Entry Pocket Length [ft]	210.00	100.00	200.00	155.00	100.00	100.00	150.00	100.00	100.00	300.00	100.00	325.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	35.00			45.00			35.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Hi Sp			Hi Sp			8th Street			Wilson Street		
Base Volume Input [veh/h]	94	425	198	254	726	151	89	178	126	441	241	260
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	94	425	198	254	726	151	89	178	126	441	241	260
Peak Hour Factor	0.8420	0.8420	0.8420	0.8420	0.8420	0.8420	0.8420	0.8420	0.8420	0.8420	0.8420	0.8420
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	28	126	59	75	216	45	26	53	37	131	72	77
Total Analysis Volume [veh/h]	112	505	235	302	862	179	106	211	150	524	286	309
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing major stree	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street [	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor stree	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street [	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protect	Permis	Overla	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	1	6	6	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups			6,7									
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	7	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	30	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	13	37	37	20	44	0	12	36	0	27	51	0
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	7	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	26	26	0	22	0	0	25	0	0	27	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No	No	No	No		No	No		No	No	
Maximum Recall	No	No	No	No	No		No	No		No	No	
Pedestrian Recall	No	No	No	No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	9	56	80	13	59	59	8	15	15	21	28	28
g / C, Green / Cycle	0.08	0.46	0.67	0.11	0.49	0.49	0.07	0.13	0.13	0.17	0.23	0.23
(v / s)_i Volume / Saturation Flow Rate	0.06	0.14	0.15	0.09	0.29	0.29	0.06	0.10	0.11	0.15	0.08	0.19
s, saturation flow rate [veh/h]	1781	3560	1589	3459	1870	1760	1781	1870	1619	3459	3560	1589
c, Capacity [veh/h]	135	1646	1062	364	920	866	120	237	205	595	825	368
d1, Uniform Delay [s]	54.73	20.22	7.77	52.64	21.68	21.75	55.52	50.95	51.17	48.49	38.54	43.99
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	12.25	0.48	0.48	4.85	2.67	2.89	18.27	6.20	8.44	4.43	0.25	5.15
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.83	0.31	0.22	0.83	0.58	0.59	0.88	0.80	0.83	0.88	0.35	0.84
d, Delay for Lane Group [s/veh]	66.99	20.70	8.25	57.49	24.34	24.64	73.79	57.15	59.60	52.91	38.79	49.14
Lane Group LOS	E	C	A	E	C	C	E	E	E	D	D	D
Critical Lane Group	Yes	No	No	No	No	Yes	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	3.77	4.46	2.33	4.59	10.66	10.20	3.76	5.91	5.45	7.79	3.46	8.99
50th-Percentile Queue Length [ft/ln]	94.29	111.60	58.36	114.80	266.46	254.98	94.11	147.86	136.22	194.75	86.45	224.64
95th-Percentile Queue Length [veh/ln]	6.79	7.93	4.20	8.11	16.01	15.44	6.78	9.90	9.28	12.37	6.22	13.90
95th-Percentile Queue Length [ft/ln]	169.72	198.23	105.05	202.66	400.32	385.92	169.39	247.56	231.93	309.19	155.60	347.55

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	66.99	20.70	8.25	57.49	24.45	24.64	73.79	57.39	59.60	52.91	38.79	49.14
Movement LOS	E	C	A	E	C	C	E	E	E	D	D	D
d_A, Approach Delay [s/veh]	23.35			31.91			61.83			48.26		
Approach LOS	C			C			E			D		
d_I, Intersection Delay [s/veh]	38.52											
Intersection LOS	D											
Intersection V/C	0.701											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.52	49.52	49.52	49.52
I_p,int, Pedestrian LOS Score for Intersection	2.919	3.018	2.551	2.998
Crosswalk LOS	C	C	B	C
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	550	666	533	783
d_b, Bicycle Delay [s]	31.55	26.68	32.28	22.22
I_b,int, Bicycle LOS Score for Intersection	2.263	2.668	1.945	2.483
Bicycle LOS	B	B	A	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report

Intersection 4: Highland Springs Avenue (NS) / 6th Street - Ramsey Street (EW)

Control Type:	Signalized	Delay (sec / veh):	34.7
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.733

Intersection Setup

Name	Hi Sp			Hi Sp			6th Street			Ramsey Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	1	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	195.00	150.00	100.00	85.00	205.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	35.00			30.00			35.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Hi Sp			Hi Sp			6th Street			Ramsey Street		
Base Volume Input [veh/h]	115	657	188	98	1049	85	98	253	235	160	189	62
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	115	657	188	98	1049	85	98	253	235	160	189	62
Peak Hour Factor	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	31	175	50	26	279	23	26	67	63	43	50	17
Total Analysis Volume [veh/h]	122	700	200	104	1117	91	104	269	250	170	201	66
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing major stree	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street [	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor stree	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street [	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	13	46	0	12	45	0	14	46	0	15	48	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	35	0	0	33	0	0	32	0	0	26	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	R	L	C	C
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	9	63	63	8	62	62	9	22	22	11	24	24
g / C, Green / Cycle	0.08	0.53	0.53	0.07	0.52	0.52	0.07	0.18	0.18	0.09	0.20	0.20
(v / s)_i Volume / Saturation Flow Rate	0.07	0.20	0.13	0.06	0.31	0.06	0.06	0.08	0.16	0.10	0.07	0.08
s, saturation flow rate [veh/h]	1781	3560	1589	1781	3560	1589	1781	3560	1589	1781	1870	1716
c, Capacity [veh/h]	135	1877	838	120	1847	825	129	641	286	164	373	342
d1, Uniform Delay [s]	55.06	16.71	15.36	55.46	20.25	14.74	54.83	43.66	47.89	54.49	41.51	41.60
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	19.10	0.57	0.67	16.57	1.48	0.27	10.94	0.44	8.21	41.97	0.61	0.69
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.91	0.37	0.24	0.87	0.60	0.11	0.80	0.42	0.87	1.03	0.37	0.38
d, Delay for Lane Group [s/veh]	74.17	17.28	16.03	72.02	21.73	15.01	65.77	44.10	56.10	96.47	42.12	42.28
Lane Group LOS	E	B	B	E	C	B	E	D	E	F	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	4.35	5.65	3.05	3.67	11.07	1.33	3.47	3.56	7.84	6.75	3.50	3.30
50th-Percentile Queue Length [ft/ln]	108.64	141.29	76.16	91.73	276.73	33.25	86.65	89.12	196.04	168.72	87.41	82.58
95th-Percentile Queue Length [veh/ln]	7.76	9.55	5.48	6.60	16.53	2.39	6.24	6.42	12.43	11.15	6.29	5.95
95th-Percentile Queue Length [ft/ln]	194.10	238.75	137.09	165.11	413.13	59.84	155.97	160.41	310.85	278.73	157.34	148.65

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	74.17	17.28	16.03	72.02	21.73	15.01	65.77	44.10	56.10	96.47	42.17	42.28
Movement LOS	E	B	B	E	C	B	E	D	E	F	D	D
d_A, Approach Delay [s/veh]	23.83			25.25			52.53			63.31		
Approach LOS	C			C			D			E		
d_I, Intersection Delay [s/veh]	34.73											
Intersection LOS	C											
Intersection V/C	0.733											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.52	49.52	49.52	49.52
l_p,int, Pedestrian LOS Score for Intersection	2.952	2.821	2.663	2.609
Crosswalk LOS	C	C	B	B
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	700	683	700	733
d_b, Bicycle Delay [s]	25.36	26.02	25.36	24.08
l_b,int, Bicycle LOS Score for Intersection	2.403	2.642	2.074	1.920
Bicycle LOS	B	B	B	A

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report

Intersection 5: Xenia Avenue (NS) / Project Access 1 (EW)

Control Type:	Two-way stop	Delay (sec / veh):	13.0
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.066

Intersection Setup

Name	Xenia Avenue		Xenia Avenue		Project Access 1	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	50.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Xenia Avenue		Xenia Avenue		Project Access 1	
Base Volume Input [veh/h]	200	9	3	328	30	9
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	200	9	3	328	30	9
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	53	2	1	86	8	2
Total Analysis Volume [veh/h]	211	9	3	345	32	9
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.07	0.01
d_M, Delay for Movement [s/veh]	0.00	0.00	7.67	0.00	13.00	9.93
Movement LOS	A	A	A	A	B	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.01	0.00	0.25	0.25
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.17	0.00	6.23	6.23
d_A, Approach Delay [s/veh]	0.00		0.07		12.33	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.87					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 6: Project Access 2 (NS) / 8th Street (EW)

Control Type:	Two-way stop	Delay (sec / veh):	17.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.010

Intersection Setup

Name	Project Access 2		8th Street		8th Street	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	1	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	50.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Project Access 2		8th Street		8th Street	
Base Volume Input [veh/h]	3	18	384	1	5	508
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	18	384	1	5	508
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	5	101	0	1	134
Total Analysis Volume [veh/h]	3	19	404	1	5	535
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.03	0.00	0.00	0.00	0.01
d_M, Delay for Movement [s/veh]	17.79	10.84	0.00	0.00	8.13	0.00
Movement LOS	C	B	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.12	0.12	0.00	0.00	0.01	0.00
95th-Percentile Queue Length [ft/ln]	3.11	3.11	0.00	0.00	0.33	0.00
d_A, Approach Delay [s/veh]	11.79		0.00		0.08	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	0.31					
Intersection LOS	C					

Intersection Level Of Service Report
Intersection 1: Xenia Avenue (NS) / 8th Street (EW)

Control Type:	All-way stop	Delay (sec / veh):	17.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.649

Intersection Setup

Name	Xenia Avenue			Xenia Avenue			8th Street			8th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	1	1	0	1
Entry Pocket Length [ft]	90.00	100.00	100.00	150.00	100.00	150.00	150.00	100.00	150.00	125.00	100.00	125.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Xenia Avenue			Xenia Avenue			8th Street			8th Street		
Base Volume Input [veh/h]	51	225	55	37	147	34	49	300	39	38	255	46
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	51	225	55	37	147	34	49	300	39	38	255	46
Peak Hour Factor	0.9480	0.9480	0.9480	0.9480	0.9480	0.9480	0.9480	0.9480	0.9480	0.9480	0.9480	0.9480
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	59	15	10	39	9	13	79	10	10	67	12
Total Analysis Volume [veh/h]	54	237	58	39	155	36	52	316	41	40	269	49
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	460	499	438	465	509	457	487	537	449	478	526
Degree of Utilization, x	0.12	0.59	0.09	0.33	0.07	0.11	0.65	0.08	0.09	0.56	0.09

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.40	3.78	0.29	1.45	0.23	0.38	4.57	0.25	0.29	3.42	0.31
95th-Percentile Queue Length [ft]	9.90	94.50	7.30	36.18	5.69	9.56	114.16	6.18	7.30	85.41	7.67
Approach Delay [s/veh]	18.55		13.22			20.04			17.34		
Approach LOS	C		B			C			C		
Intersection Delay [s/veh]	17.77										
Intersection LOS	C										

Intersection Level Of Service Report
Intersection 2: Xenia Avenue (NS) / 6th Street (EW)

Control Type:	All-way stop	Delay (sec / veh):	24.2
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.820

Intersection Setup

Name	Xenia Avenue			Xenia Avenue			6th Street			6th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	185.00	100.00	100.00	180.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Xenia Avenue			Xenia Avenue			6th Street			6th Street		
Base Volume Input [veh/h]	1	2	6	136	2	114	206	433	3	5	578	202
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1	2	6	136	2	114	206	433	3	5	578	202
Peak Hour Factor	0.9730	0.9730	0.9730	0.9730	0.9730	0.9730	0.9730	0.9730	0.9730	0.9730	0.9730	0.9730
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	1	2	35	1	29	53	111	1	1	149	52
Total Analysis Volume [veh/h]	1	2	6	140	2	117	212	445	3	5	594	208
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	428	396	454	440	470	471	458	489	514
Degree of Utilization, x	0.02	0.35	0.26	0.48	0.48	0.48	0.01	0.82	0.78

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.06	1.57	1.04	2.55	2.53	2.52	0.03	7.94	7.08
95th-Percentile Queue Length [ft]	1.61	39.23	26.02	63.87	63.16	63.03	0.83	198.60	176.93
Approach Delay [s/veh]	11.60	15.21		17.48			32.77		
Approach LOS	B	C		C			D		
Intersection Delay [s/veh]	24.22								
Intersection LOS	C								

Intersection Level Of Service Report

Intersection 3: Highland Springs Avenue (NS) / Wilson Street - 8th Street (EW)

Control Type:	Signalized	Delay (sec / veh):	28.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.635

Intersection Setup

Name	Hi Sp			Hi Sp			8th Street			Wilson Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	0	1	0	1
Entry Pocket Length [ft]	210.00	100.00	200.00	155.00	100.00	100.00	150.00	100.00	100.00	300.00	100.00	325.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	35.00			45.00			35.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Hi Sp			Hi Sp			8th Street			Wilson Street		
Base Volume Input [veh/h]	91	908	465	155	583	83	113	239	65	378	169	148
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	91	908	465	155	583	83	113	239	65	378	169	148
Peak Hour Factor	0.9190	0.9190	0.9190	0.9190	0.9190	0.9190	0.9190	0.9190	0.9190	0.9190	0.9190	0.9190
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	25	247	126	42	159	23	31	65	18	103	46	40
Total Analysis Volume [veh/h]	99	988	506	169	634	90	123	260	71	411	184	161
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing major stree	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street [	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor stree	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street [	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	105
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protect	Permis	Overla	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	1	6	6	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups			6,7									
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	7	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	30	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	15	37	37	11	33	0	19	37	0	20	38	0
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	7	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	26	26	0	22	0	0	25	0	0	27	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No	No	No	No		No	No		No	No	
Maximum Recall	No	No	No	No	No		No	No		No	No	
Pedestrian Recall	No	No	No	No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	105	105	105	105	105	105	105	105	105	105	105	105
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	7	54	74	7	53	53	9	12	12	16	19	19
g / C, Green / Cycle	0.07	0.51	0.70	0.07	0.51	0.51	0.09	0.12	0.12	0.15	0.18	0.18
(v / s)_i Volume / Saturation Flow Rate	0.06	0.28	0.32	0.05	0.20	0.20	0.07	0.09	0.09	0.12	0.05	0.10
s, saturation flow rate [veh/h]	1781	3560	1589	3459	1870	1790	1781	1870	1735	3459	3560	1589
c, Capacity [veh/h]	126	1819	1115	233	948	908	154	219	203	528	653	291
d1, Uniform Delay [s]	48.03	17.41	6.87	48.07	15.92	15.92	47.13	45.09	45.18	42.82	36.97	39.01
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	10.04	1.17	1.33	4.26	1.21	1.26	9.17	5.87	6.87	2.52	0.23	1.64
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.78	0.54	0.45	0.73	0.39	0.39	0.80	0.78	0.79	0.78	0.28	0.55
d, Delay for Lane Group [s/veh]	58.07	18.58	8.20	52.33	17.12	17.18	56.30	50.96	52.05	45.34	37.20	40.64
Lane Group LOS	E	B	A	D	B	B	E	D	D	D	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.87	7.91	4.55	2.24	5.29	5.08	3.51	4.60	4.41	5.12	1.99	3.76
50th-Percentile Queue Length [ft/ln]	71.75	197.83	113.85	56.01	132.37	127.07	87.64	114.89	110.28	128.03	49.70	94.10
95th-Percentile Queue Length [veh/ln]	5.17	12.53	8.05	4.03	9.07	8.78	6.31	8.11	7.86	8.83	3.58	6.78
95th-Percentile Queue Length [ft/ln]	129.16	313.17	201.34	100.81	226.71	219.51	157.75	202.78	196.39	220.81	89.45	169.38

Movement, Approach, & Intersection Results

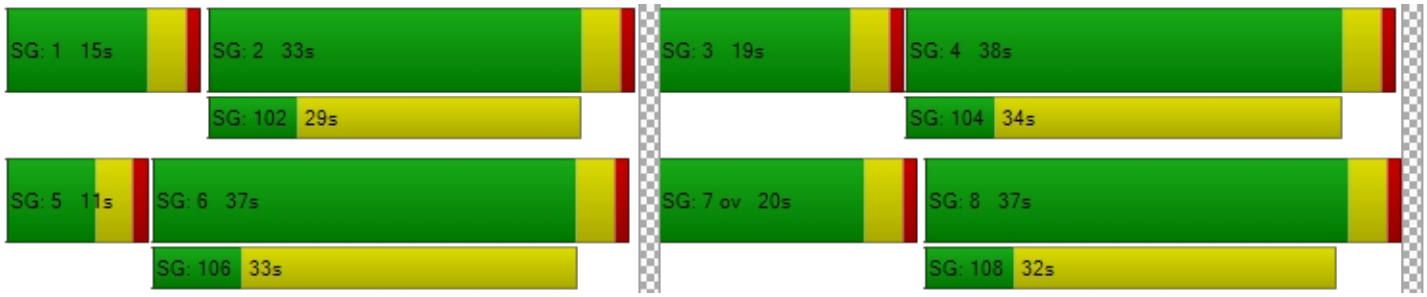
d_M, Delay for Movement [s/veh]	58.07	18.58	8.20	52.33	17.15	17.18	56.30	51.34	52.05	45.34	37.20	40.64
Movement LOS	E	B	A	D	B	B	E	D	D	D	D	D
d_A, Approach Delay [s/veh]	17.74			23.81			52.80			42.36		
Approach LOS	B			C			D			D		
d_I, Intersection Delay [s/veh]	28.55											
Intersection LOS	C											
Intersection V/C	0.635											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	42.11	42.11	42.11	42.11
I_p,int, Pedestrian LOS Score for Intersection	2.974	2.988	2.495	2.954
Crosswalk LOS	C	C	B	C
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	628	552	628	647
d_b, Bicycle Delay [s]	24.71	27.53	24.71	24.03
I_b,int, Bicycle LOS Score for Intersection	2.874	2.296	1.934	2.183
Bicycle LOS	C	B	A	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report

Intersection 4: Highland Springs Avenue (NS) / 6th Street - Ramsey Street (EW)

Control Type:	Signalized	Delay (sec / veh):	52.5
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.824

Intersection Setup

Name	Hi Sp			Hi Sp			6th Street			Ramsey Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	1	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	195.00	150.00	100.00	85.00	205.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	35.00			30.00			35.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Hi Sp			Hi Sp			6th Street			Ramsey Street		
Base Volume Input [veh/h]	252	1217	234	63	854	134	153	353	289	213	421	116
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	252	1217	234	63	854	134	153	353	289	213	421	116
Peak Hour Factor	0.9560	0.9560	0.9560	0.9560	0.9560	0.9560	0.9560	0.9560	0.9560	0.9560	0.9560	0.9560
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	66	318	61	16	223	35	40	92	76	56	110	30
Total Analysis Volume [veh/h]	264	1273	245	66	893	140	160	369	302	223	440	121
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing major stree	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street [	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor stree	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street [	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	17	50	0	11	44	0	22	43	0	16	37	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	35	0	0	33	0	0	32	0	0	26	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	R	L	C	C
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	13	60	60	6	53	53	13	26	26	12	25	25
g / C, Green / Cycle	0.11	0.50	0.50	0.05	0.44	0.44	0.11	0.21	0.21	0.10	0.21	0.21
(v / s)_i Volume / Saturation Flow Rate	0.15	0.36	0.15	0.04	0.25	0.09	0.09	0.10	0.19	0.13	0.16	0.16
s, saturation flow rate [veh/h]	1781	3560	1589	1781	3560	1589	1781	3560	1589	1781	1870	1733
c, Capacity [veh/h]	194	1779	794	94	1579	705	189	761	340	179	389	361
d1, Uniform Delay [s]	53.50	23.39	17.77	55.95	24.81	20.39	52.70	41.39	45.80	54.00	44.56	44.58
k, delay calibration	0.15	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.15	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	172.95	2.50	1.01	9.21	1.47	0.63	9.92	0.48	10.69	120.57	2.87	3.12
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	1.36	0.72	0.31	0.70	0.57	0.20	0.85	0.48	0.89	1.25	0.75	0.75
d, Delay for Lane Group [s/veh]	226.45	25.89	18.77	65.16	26.29	21.02	62.62	41.87	56.49	174.57	47.43	47.71
Lane Group LOS	F	C	B	E	C	C	E	D	E	F	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	15.10	14.04	4.15	2.21	9.65	2.53	5.21	4.81	9.62	11.26	8.17	7.62
50th-Percentile Queue Length [ft/ln]	377.48	350.94	103.65	55.20	241.26	63.16	130.37	120.16	240.58	281.46	204.35	190.61
95th-Percentile Queue Length [veh/ln]	24.00	20.18	7.46	3.97	14.74	4.55	8.96	8.40	14.71	18.14	12.86	12.15
95th-Percentile Queue Length [ft/ln]	599.96	504.55	186.57	99.36	368.62	113.69	223.99	210.04	367.77	453.57	321.57	303.83

Movement, Approach, & Intersection Results

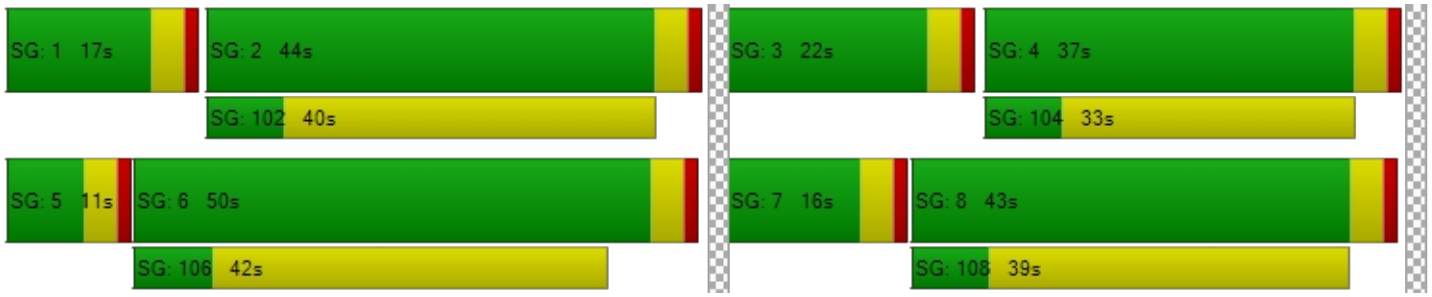
d_M, Delay for Movement [s/veh]	226.45	25.89	18.77	65.16	26.29	21.02	62.62	41.87	56.49	174.57	47.52	47.71
Movement LOS	F	C	B	E	C	C	E	D	E	F	D	D
d_A, Approach Delay [s/veh]	54.62			27.95			51.18			83.69		
Approach LOS	D			C			D			F		
d_I, Intersection Delay [s/veh]	52.53											
Intersection LOS	D											
Intersection V/C	0.824											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.52	49.52	49.52	49.52
l_p,int, Pedestrian LOS Score for Intersection	3.073	2.898	2.784	2.742
Crosswalk LOS	C	C	C	B
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	766	666	650	550
d_b, Bicycle Delay [s]	22.83	26.68	27.35	31.55
l_b,int, Bicycle LOS Score for Intersection	3.030	2.466	2.245	2.206
Bicycle LOS	C	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report

Intersection 5: Xenia Avenue (NS) / Project Access 1 (EW)

Control Type:	Two-way stop	Delay (sec / veh):	13.4
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.042

Intersection Setup

Name	Xenia Avenue		Xenia Avenue		Project Access 1	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	50.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Xenia Avenue		Xenia Avenue		Project Access 1	
Base Volume Input [veh/h]	352	31	9	205	18	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	352	31	9	205	18	5
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	93	8	2	54	5	1
Total Analysis Volume [veh/h]	371	33	9	216	19	5
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.01	0.00	0.04	0.01
d_M, Delay for Movement [s/veh]	0.00	0.00	8.14	0.00	13.45	10.85
Movement LOS	A	A	A	A	B	B
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.02	0.00	0.16	0.16
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.59	0.00	3.94	3.94
d_A, Approach Delay [s/veh]	0.00		0.33		12.90	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.59					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 6: Project Access 2 (NS) / 8th Street (EW)

Control Type:	Two-way stop	Delay (sec / veh):	15.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.006

Intersection Setup

Name	Project Access 2		8th Street		8th Street	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	1	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	50.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Project Access 2		8th Street		8th Street	
Base Volume Input [veh/h]	2	11	388	3	19	334
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	2	11	388	3	19	334
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	3	102	1	5	88
Total Analysis Volume [veh/h]	2	12	408	3	20	352
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

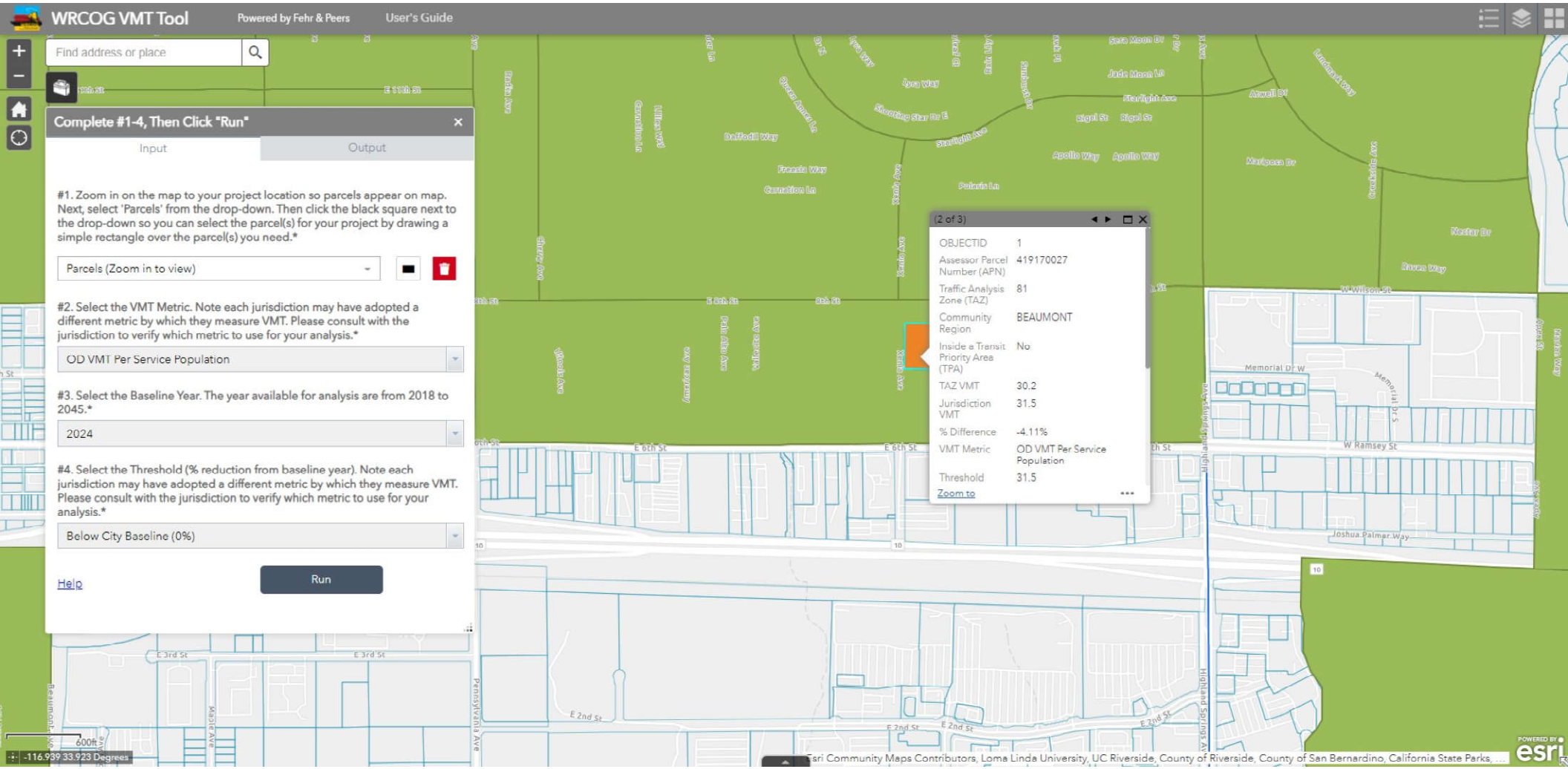
Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.02	0.00	0.00	0.02	0.00
d_M, Delay for Movement [s/veh]	15.52	10.77	0.00	0.00	8.19	0.00
Movement LOS	C	B	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.08	0.08	0.00	0.00	0.05	0.00
95th-Percentile Queue Length [ft/ln]	1.88	1.88	0.00	0.00	1.33	0.00
d_A, Approach Delay [s/veh]	11.44		0.00		0.44	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	0.41					
Intersection LOS	C					

Appendix F

WRCOG Screening Tool Output


WRCOG VMT Tool
Powered by Fehr & Peers
User's Guide
Find address or place
Complete #1-4, Then Click "Run"
Input
Output
#1. Zoom in on the map to your project location so parcels appear on map. Next, select 'Parcels' from the drop-down. Then click the black square next to the drop-down so you can select the parcel(s) for your project by drawing a simple rectangle over the parcel(s) you need.*
Parcels (Zoom in to view)
#2. Select the VMT Metric. Note each jurisdiction may have adopted a different metric by which they measure VMT. Please consult with the jurisdiction to verify which metric to use for your analysis.*
OD VMT Per Service Population
#3. Select the Baseline Year. The year available for analysis are from 2018 to 2045.*
2024
#4. Select the Threshold (% reduction from baseline year). Note each jurisdiction may have adopted a different metric by which they measure VMT. Please consult with the jurisdiction to verify which metric to use for your analysis.*
Below City Baseline (0%)
Help
Run
(2 of 3)
OBJECTID 1
Assessor Parcel Number (APN) 419170027
Traffic Analysis Zone (TAZ) 81
Community Region BEAUMONT
Inside a Transit Priority Area (TPA) No
TAZ VMT 30.2
Jurisdiction VMT 31.5
% Difference -4.11%
VMT Metric OD VMT Per Service Population
Threshold 31.5
Zoom to
E 6th St
E 3rd St
E 2nd St
W Ramsey St
Memorial Dr W
Joshua Palmer Way
W Wilson St
-116.939 33.923 Degrees
Esri Community Maps Contributors, Loma Linda University, UC Riverside, County of Riverside, County of San Bernardino, California State Parks, ...
esri

Appendix G

Residential Electronic Gate Service Rate Study

RESIDENTIAL ELECTRONIC GATE SERVICE RATE STUDY
Orange County, California



RK engineering group, inc.

RESIDENTIAL ELECTRONIC GATE SERVICE RATE STUDY
Orange County, California

Prepared by:

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Alexandra Brown
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July 22, 2016

RK:dt/RK11774.doc
JN:2595-2016-01

List of Attachments

Exhibits

Location Map: Spy Glass Hill Road ……..……..……..…..…...A-1

Location Map: Newport Ridge Dr. West……..…A-2

Location Map: Newport Ridge Dr. East……..A-3

Location Map: Ridge Park Road……....A-4

Location Map: Kensington and Silver Oaks…….……..A-5

Location Map: Crimson Canyon and Endless Vista……..…A-6

Location Map: Alastair ……..……..…A-7

Typical Gate Layout ……..…….... B

Tables

Percentage of Visitors vs. Residents Entering Residential. Gates ……..……..…1

Residential Electronic Gate Times and Service Rates (All types of gates) ……..……..…… 2

Residential Electronic Swinging Gate Times and Service Rates ..……..…… 3

Residential Electronic Rolling Gate Times and Service Rates ……..… 4

PM Peak Hour Trips per Dwelling Unit (D.U.)..…… 5

Appendices

Site#1-13 Raw Data……....A

Site #1-13 PM Peak Hour Traffic Counts……....B

RK:dt/RK11774.doc
JN:2595-2016-01

Introduction

Many private residential communities in Southern California have utilized electronic or manned (guard) gates to control access to their communities. Typically these residential communities have private streets and have limited access through one or more gate controls. The vast majority of communities with gates use electronic gates for controlling access into their community. Manned gates typically occur in very high-end residential communities and were not studied in this analysis. The service rates for visitors at manned gates are somewhat lower capacity than for electronic automated gates, since they require communication with the guard.

For the most part, electronic gates are either swinging gates or rolling gates depending on the traffic control selected by the developer or homeowner association. While the operations of these two types of electronic gates are somewhat different, functionally they are similar. However, access times do vary somewhat between the two types of gates. For nearly all communities, an electronic gate is accompanied by a traffic directory for visitors to activate the gates, and a resident bypass control system activated by a resident's garage door remote controller. The traffic directories are operated by either entering a code for automatic entrance or requesting access by dialing an individual home owner's telephone system to be let in. Residence activation occurs through the use of an electronic remote control device integrated into their garage door remote control which then immediately opens the gate. Typically there is very little delay with the resident activation in comparison to the time required for visitors to request to open the gate through the traffic directory. Also, many times when a resident or visitor activates the gate, other residents or visitors can follow-up quickly once the gate is opened by the first resident or visitor, which increases the overall service capacity of the gate. This can also result in unauthorized visitors to access the gate.

The gate capacity or service rate (vehicles per hour) of the gates is used to determine the potential queuing which would occur at either the traffic directory or the gate. Typically, residents will queue near the gate, whereas visitors will queue at the traffic directory. Once the peak entering demand is established, then the potential queuing can be determined. The peak inbound demand is distributed between the visitors and residents entering the community. Typically this is approximately 20% visitors versus 80% residents within residential communities.

Once the peak entering demand for visitors/residents and service rate of the gate are determined, the traffic utilization factor (the ratio of the demand to the service rate for both the visitors and residents) can be determined and used to calculate the potential queuing. If there is sufficient entering width for two lanes, queuing for both visitors and residents can be determined separately.

At the present time, there are two methodologies available to determine gate queuing, *Transportation and Land Development* prepared by the Institute of Transportation Engineers (1988), and *Entrance/Exit Design and Control for Major Parking Facilities* prepared by Robert W. Crommelin, P.E. (October 1972). Both of these documents provide methodologies for calculating the potential queuing depending on the peak demand rate and average service rate.

According to the Crommelin report, "research has shown that random arrivals or events in a traffic stream tend to follow the Poisson mathematical distribution. This distribution provides a means that, if the average rate is known, the probability of exceeding a given volume in a unit of time may be calculated. Thus, if you know the average volume, you may calculate the surges in volume to allow design of reservoir space". This methodology allows for a gate utilization factor to be calculated to then determine the potential queuing. The Crommelin report provides a graph based upon a Poisson distribution to determine the queue length behind the vehicle being served. Similarly, the ITE report includes Poisson distribution equations that can determine the number of queued vehicles, based upon various probability levels.

Purpose and Objectives

The purpose of this study is to determine the hourly service rate capacity (vehicles per hour) of electronic gates at residential communities containing single family detached homes. The results of this study could also be applied to multi-family residential developments, since the service rates is expected to be similar. This study is based on field observations conducted at a total of thirteen (13) existing gated residential communities in Orange County, California in the Cities of Newport Beach and Aliso Viejo. A total of fourteen (14) electronic gate operations were observed in this study.

This study includes analysis of both swinging and rolling style gates. Swinging gates consist of two separate gates where both sides "swing" open, whereas rolling gates consist of a single gate that rolls on a metal track. The observations also account for the type of users entering the sites by identifying residents versus visitors (those using the traffic

directory). Hence, the study determines the visitor service rate as well as the resident service rate for a typical residential gated community. The study focused on the PM peak hour (4-6 pm) which has been determined to be the peak entering time for most residential communities. For both types of gates, "sneakers" can follow residents or visitors that activate the gate which actually increases the gate capacity.

Furthermore, as part of this study, the number of vehicles entering and exiting the observed properties during the PM peak hour were counted. This information was utilized to determine the inbound and outbound PM peak hour trip generation rate of single family detached residential use based on the conducted observations and provide a comparison to data published in the *Institute of Transportation Engineers (ITE) Trip Generation Manual*. It should be noted that the trip generation data was collected simultaneously with the service rate data, but it is not intended to be conclusive. It is strictly included as supplemental information to the primary purpose of the study.

Findings

The following findings are obtained from this study:

1. Observed Average Gate Service Rate per User Type:
    - Resident = 320.7 vehicles per hour (Range = 191.5 to 437.8 vehicles per hour)
    - Visitor = 150.6 vehicles per hour (Range = 111.7 to 184.4 vehicles per hour)
2. Observed 95th Percentile Gate Service Rate per User Type:
    - Resident = 209.6 vehicles per hour
    - Visitor = 117.5 vehicles per hour
3. Observed Average Percent Split of Total Entering PM Peak Hour Traffic by User Type:
    - Resident = 79.52%
    - Visitor = 20.48%

4. Recommended Percent Split of Total Entering PM Peak Hour Traffic by User Type:

    - Resident = 80.00%
    - Visitor = 20.00%

5. Recommended Gate Service Rate per User Type:

    - Resident [1] = 210 vehicles per hour
    - Visitor [1] = 115 vehicles per hour
    - Combined [2] = 190 vehicles per hour

6. Comparison of Observed Swinging Gate versus Rolling Gate Service Rates:

    - Swinging gates and rolling gates have similar service rates for visitors

      (Swinging gates have a 95th percentile service rate of 113.9 vehicles per hour, whereas rolling gates have a 95th percentile service rate of 133.5 vehicles per hour)

    - Swinging gates have more capacity than rolling gates for residents

      (Swinging gates have a 95th percentile service rate of 286.3 vehicles per hour, whereas rolling gates have 95th percentile service rate of 200.8 vehicles per hour)

7. Observed Average PM Peak Hour Trip Generation Rate:

    a. Inbound = 0.42 vehicles/hour/dwelling unit

    b. Outbound = 0.34 vehicles/hour/dwelling unit

    c. Total (Inbound & Outbound) = 0.76 vehicles/hour/dwelling unit

---

[1] To be used when there is sufficient entering width for 2 lanes: one for residents and one for visitors.

[2] To be used when only one entering lane is available and is shared between residents and visitors.

Site Location and Study Area

This study is based on field observations conducted at a total of fourteen (14) existing gates within a total of thirteen (13) existing gated residential communities in Orange County, California in the Cities of Newport Beach and Aliso Viejo. Eight (8) of the gates were rolling gates and six (6) were swinging style gates. All of the gates were found to be typical for these types of private gate access controlled communities.

The following is a summary list of the observed sites. The location maps of the observed sites are shown in Exhibits A-1 through A-7.

City of Newport Beach:

1. Hillsborough at Spy Glass Hill Road, Newport Beach (40 Dwelling Units with a Rolling Gate)

2. Palisades Dr at Newport Ridge Dr W, Newport Beach (56 Dwelling Units with a Swinging Gate)

3. Whitesands Dr at Newport Ridge Dr W, Newport Beach (21 Dwelling Units with a Swinging Gate)

4. Terrace Ridge at Newport Ridge Dr W, Newport Beach (38 Dwelling Units with a Swinging Gate)

5. Montserrat at Newport Ridge Dr E, Newport Beach (80 Dwelling Units with a Rolling Gate)

6. Mont St Michel/Menton at Newport Ridge Dr E, Newport Beach (169 Dwelling Units with two (2) Rolling Gates)

7. Tesoro at Ridge Park Road, Newport Beach (180 Dwelling Units with a Rolling Gate)

8. Campobello at Ridge Park Roa d, Newport Beach (90 Dwelling Units with a Rolling Gate)

City of Aliso Viejo:

9. Kensington at Oak View Dr, Aliso Viejo (154 Dwelling Units with a Swinging Gate)

10. Silver Oaks at Oak View Dr, Aliso Viejo (81 Dwelling Units with a Rolling Gate)

11. Crimson Canyon at Oak View Dr, Aliso Viejo (76 Dwelling Units with a Swinging Gate)

12. Endless Vista at Oak View Dr, Aliso Viejo (115 Dwelling Units with a Swinging Gate)

13. Alastair at Oak View Dr, Aliso Viejo (116 Dwelling Units with a Rolling Gate)

Data Collection

Service rate times were calculated at each location by measuring the time from when the vehicle entered the traffic directory to when it passed through the gate. The location of a typical traffic directory and gate are shown in Exhibit B (the service time was measured once the vehicle reached the traffic directory and then passed the gate). These times were converted to a service rate by the following formula:

$$\text{Service Rate (vehicles per hour)} = \frac{3{,}600 \text{ (sec/hr.)}}{\text{Service time (sec/vehicle)}}$$

Data collection at each of the fourteen (14) studied gates was conducted on a typical weekday (Tuesday, Wednesday or Thursday) during the typical weekday PM peak period from 4:00 PM to 6:00 PM. This is also considered to be the typical peak time of entering (inbound) traffic for residential communities.

At each study gate, the type of the gate was noted as either rolling or swinging. Service times for both visitors and residents were noted on the data collection forms. Service rates for both types of gates were calculated and also combined as a single rate for both residents and visitors

For every inbound vehicle between 4:00 PM and 6:00 PM, the observer noted the time at which the vehicle entered the community, timed how long it took for the vehicle to get from the directory through the gate, and noted whether the vehicle was a visitor or resident. If a vehicle stopped at the directory to type in a key code or call someone, it was categorized as a visitor and the time spent at the directory was included in the service time. If a vehicle did not stop at the directory and instead used a remote control device or followed up a vehicle to gain access, it was categorized as a resident, since that time was much shorter than those vehicles utilizing the traffic directory. Some of these vehicles could be considered "sneakers" that followed either a resident or visitor who activated the gate.

Similarly, for every outbound vehicle between 4:00 PM and 6:00 PM, the observer noted the time at which the vehicle exited the community. The raw data collected at each study gate can be found in Appendix A.

Data Analysis

1. Percent Split of Visitors versus Residents

The percentage of entering visitors versus residents for each site was calculated by dividing the total number of visitors or residents that entered between 4:00 PM and 6:00 PM by the total number of inbound vehicles during that time period. Then, the overall average was determined by averaging the entering visitor and resident percentages for each site (see Table 1). Based upon this study, approximately 80% of peak inbound traffic were residents and 20% were visitors.

2. Hourly Gate Service Rate Capacity

For each study site, the observed duration of time in seconds that each resident took to get from the directory through the gate was averaged to determine the average service time for residents at that specific site. The hourly service rate for residents at each site was then determined by dividing the number of seconds in a single hour (3,600 sec./hour) by the average service time for the residents obtained from the previous step.

The same calculation was performed for visitors at each of the sites. Then the data from all the sites were averaged to determine the overall hourly service rate for visitors and residents. The data was also separated by the gate type (rolling versus swinging) to compare the service rates for each gate type.

A summary of the calculated service rates for all types of gates is shown in Table 2. Service rates for swinging gates were calculated separately and are shown in Table 3 and service rates for rolling gates are shown in Table 4.

A statistical analysis was performed on the resulting data to determine the standard deviation, coefficient of variation and the 95th, 90th and 85th percentiles for all gate types. The statistical analysis was also performed on the data for both swinging gates and rolling gates. Since for most planning studies the gate types may not be known, it is recommended that the average for all gate types be utilized for determining service rates and calculating potential queuing.

When data from a number of observations and locations is available, there are a few different methods for determining what the appropriate design capacity is. For instance, the Crommelin method is a common methodology for determining gate processing capacity and forecasting vehicular queues at various gate types. The Crommelin report states that gates should be designed to operate at 80% of the average capacity. Other methods state that gates should be designed to accommodate 95% of the average gate capacity.

For this study, both of these two methods were used to derive the recommended design capacity based on the observed data. Based on the observed data at the fourteen (14) study gates, 80% of the average hourly service rate design capacity is 120.4 vehicles per hour for visitors and 256.6 vehicles per hour for residents. Based on the observed data at the fourteen (14) study gates, utilizing the 95th percentile, the service rate design capacity is 117.5 vehicles per hour for visitors and 209.6 vehicles per hour for residents.

By reviewing both methodologies with the data collected at the fourteen (14) electronic gates, recommended gate service rates have been determined by user type. In the case where there are sufficient entering widths to accommodate both a visitor and resident lane, it is recommended that the resident service rate be approximately 210 vehicles per hour and the visitor service rate is recommended to be approximately 115 vehicles per hour. When there is insufficient width available for both residents and visitors, the combined rate of 190 vehicles per hour would appear to be appropriate. It should be noted that in most cases at the sites that were observed, there was sufficient width for residents to bypass visitors at the traffic directory. These recommendations are typical for most gate installations similar to that which were observed during this study.

3. Peak Hour & Trip Generation

The observed data over the two-hour peak period was grouped and organized into fifteen-minute intervals. The peak hour is considered to be the four (4) consecutive 15-minute periods from 4:00 PM to 6:00 PM that had the highest number of total observed trips (inbound plus outbound).

Then, for each study site, the trip generation rate was determined by dividing the total peak hour trips for that site by the number of dwelling units at the site. The trip generation calculation data for each study gate can be found in Appendix B.

The PM peak hour trip generation ranges from 0.57 to 0.98 vehicles per hour per dwelling unit. The overall average trip generation rate was then determined by averaging the peak hour data results of the thirteen (13) study sites. The results of this analysis are shown in Table 5. The average inbound rate was 0.42 vehicles per dwelling unit, the average outbound rate was 0.34 vehicles per dwelling unit and the total trip generation rate was 0.76 vehicles per dwelling unit.

The total peak hour trip rate is somewhat less than the ITE (Institute of Transportation Engineers) PM peak hour rates which are 0.63 entering vehicles per hour per dwelling unit (inbound), 0.37 exiting vehicles per hour per dwelling unit (outbound) and a total of 1.00 vehicles per hour per dwelling unit. This data was collected for informational purposes only and not to question the ITE data which included substantially more sites.

Recommendations & Conclusions

Combining the two methods for determining the hourly gate service rate design capacity yields a rate of 115 vehicles per hour for visitors and 210 vehicles per hour for residents. The recommended service rates provide for sufficient variation in actual individual site conditions when there is enough room to accommodate both a visitor lane and resident lane. The entering width will typically allow for an entering resident to bypass the visitor at the gate directory and queue directly at the gate. Therefore, gate queuing for residents should be measured from the gate itself, whereas gate queuing for visitors would be measured from the traffic directory.

To obtain a recommended design capacity for residential gates when there is not sufficient width for two entering lanes, the design capacities for visitors and residents should be based upon a weighted average rate, calculated using the average percentage of residents versus visitors and the recommended design rate for residents and visitors. Based upon this study, it would be 190 vehicles per hour for a single entry lane.

Both the Crommelin and ITE methods for gate queuing use traffic intensity in order to predict the queue length at any given time. Based on the observed data, the average PM peak hour traffic intensity would be equal to the average PM peak hour entering trips per hour divided by the gate design capacity for both residents and visitors. When there is sufficient width for two entering lanes, then the queue length for each lane can be determined.

As the traffic intensity increases towards 1.0, the predicted queue length substantially increases. If the number of dwelling units in the community would lead to a high traffic intensity, hence a long queue length, installing multiple electronic gates is recommended to mitigate traffic intensity at a single electronic gate. Therefore, this study provides numerical data on gate service rates that can be used to predict queuing by both visitors and residents in a community that is controlled by electronic gates. The recommended service rates from this study are as follows:

Gate Condition	Service Rate (vehicles per hour)		
	Visitors	Residents	Both
Two Entry Lanes	115	220	-
Single Entry Lane	-	-	190

Resources

(1) Stover, Vergil G. and Koepke, Frank J., Transportation and Land Development, Institute of Transportation Engineers, 1988

(2) Crommelin, Robert W., Entrance/Exit Design and Control for Major Parking Facilities, October 1972

RK Engineering Group, Inc. is pleased to provide this study of Residential Electronic Gate Service Rates. A significant effort was placed on this study to evaluate several electronic gates throughout south Orange County. The study will serve to provide service rates for queuing studies at future residential developments. Once the inbound demand is known then the queuing can be determined based upon the appropriate service rate.

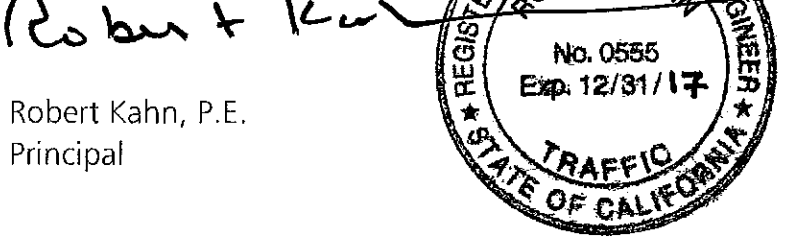
RK Engineering Group was assisted in this project by UCI Senior Civil Engineering Team II, which consists of Jeremy Mempin, Natalie Chen, Sara Lay, Selena Lau, Madeleine Ortiz and Alex Vu. The UCI group helped by collecting field data for the overall study. Furthermore, Alexandra Brown assisted in the data analysis and participated in preparing the report for the study. Finally, Ms. Allison Kahn Goedecke provided editorial review of the report to finalize it for publication.

RK Engineering Group hopes that this report will be useful to other transportation engineers and planners for the analysis of queuing requirements for residential electronic gate projects. Very little information on this subject has been published in the past and hopefully this information will be useful to others in the future.

If you have any questions regarding this study, please call me at (949) 474-0809.

Sincerely,

RK ENGINEERING GROUP, INC



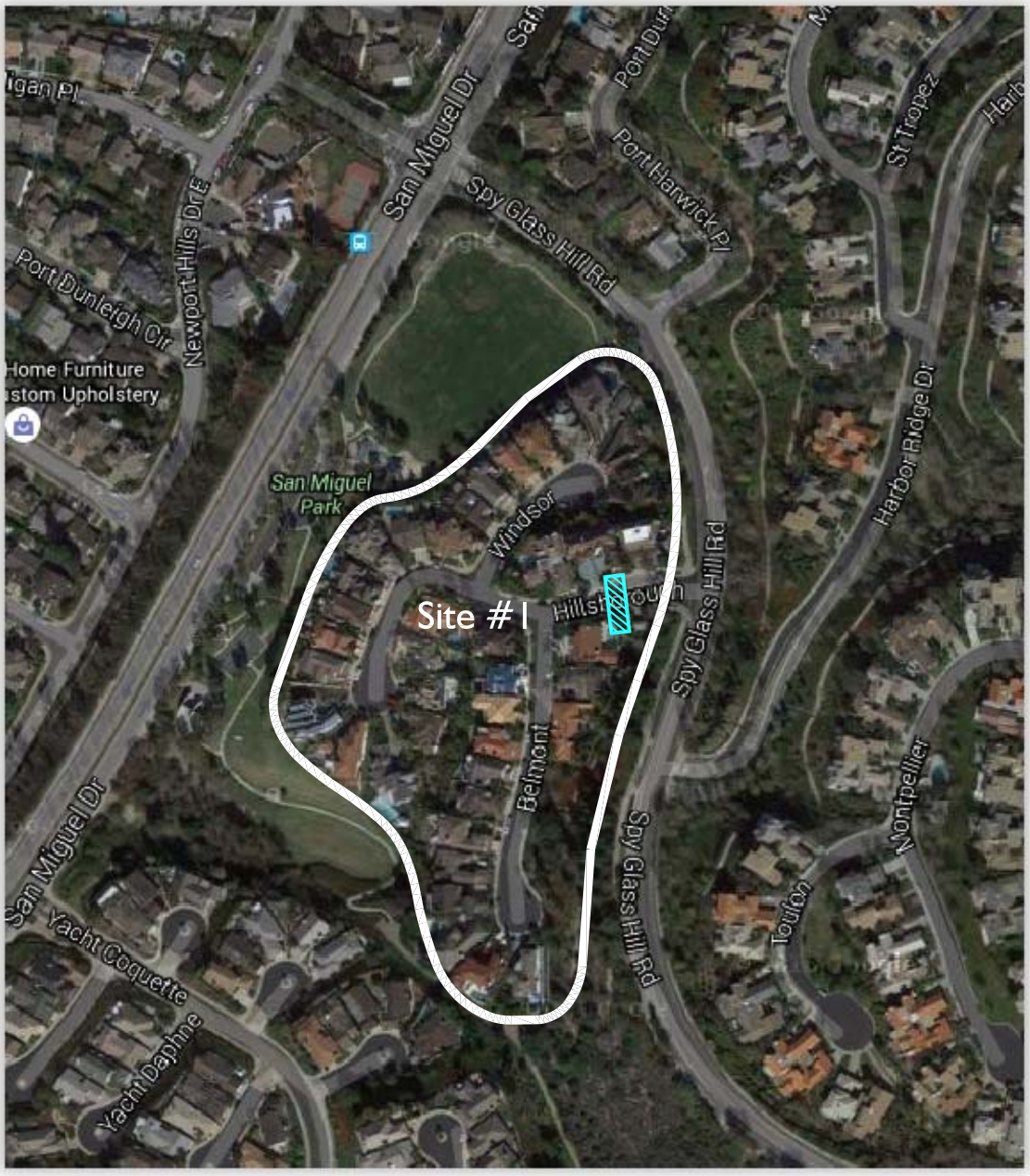
Robert Kahn, P.E.
Principal

RK:dt/RK11774.doc
JN:2595-2016-01

Exhibits

Exhibit A-1

Location Map: Spy Glass Hill Road



N

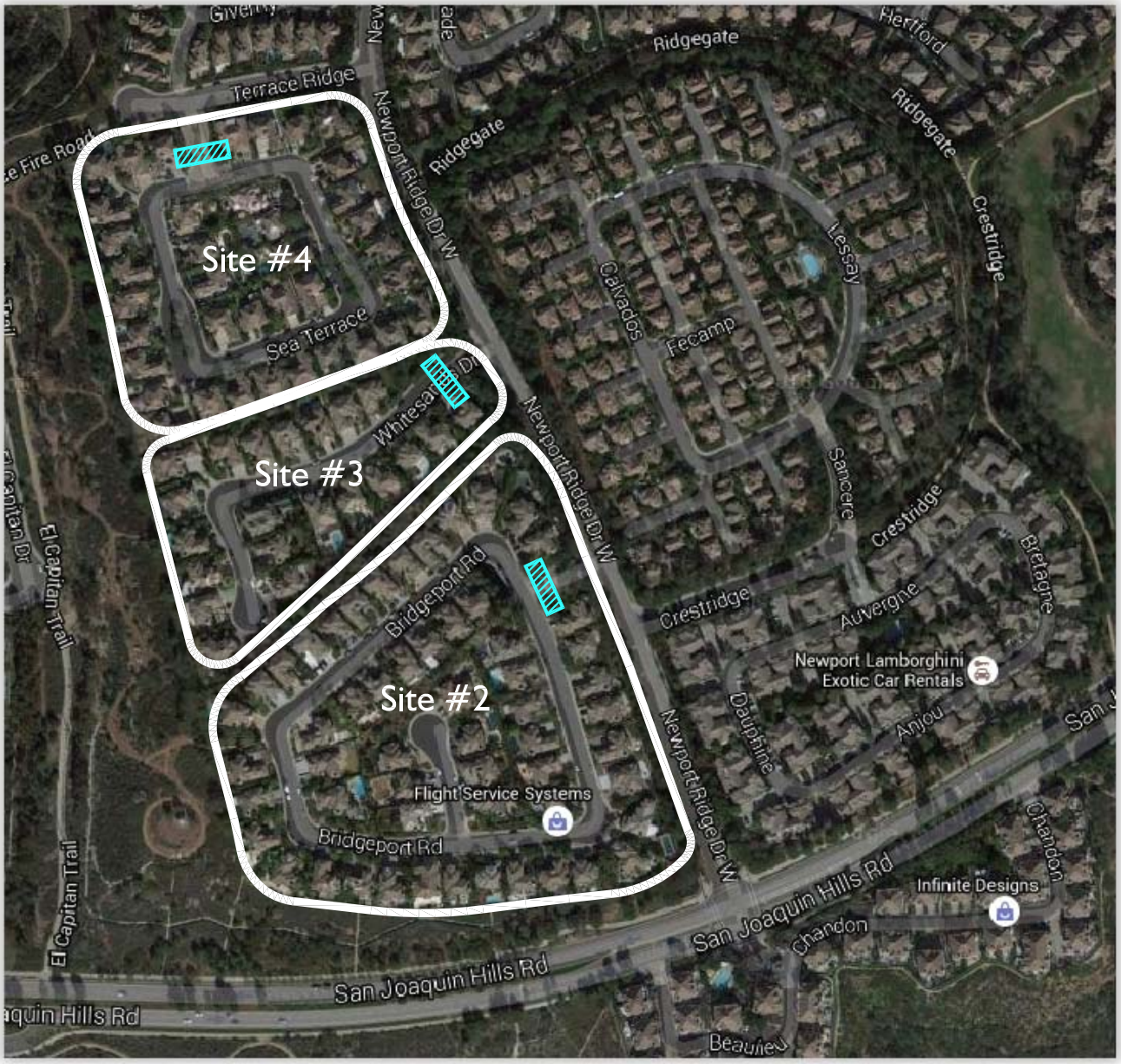
Legend:

= Residential Electronic Gate

RK engineering group, inc.

Exhibit A-2

Location Map: Newport Ridge Dr W



N

Legend:

= Residential Electronic Gate

Exhibit A-3

Location Map: Newport Ridge Dr E



N

Legend:

= Residential Electronic Gate

Exhibit A-4

Location Map: Ridge Park Road



N

Legend:

▨ = Residential Electronic Gate

Exhibit A-5

Location Map: Kensington and Silver Oaks



N

Legend:

▨ = Residential Electronic Gate

Exhibit A-6

Location Map: Crimson Canyon and Endless Vista



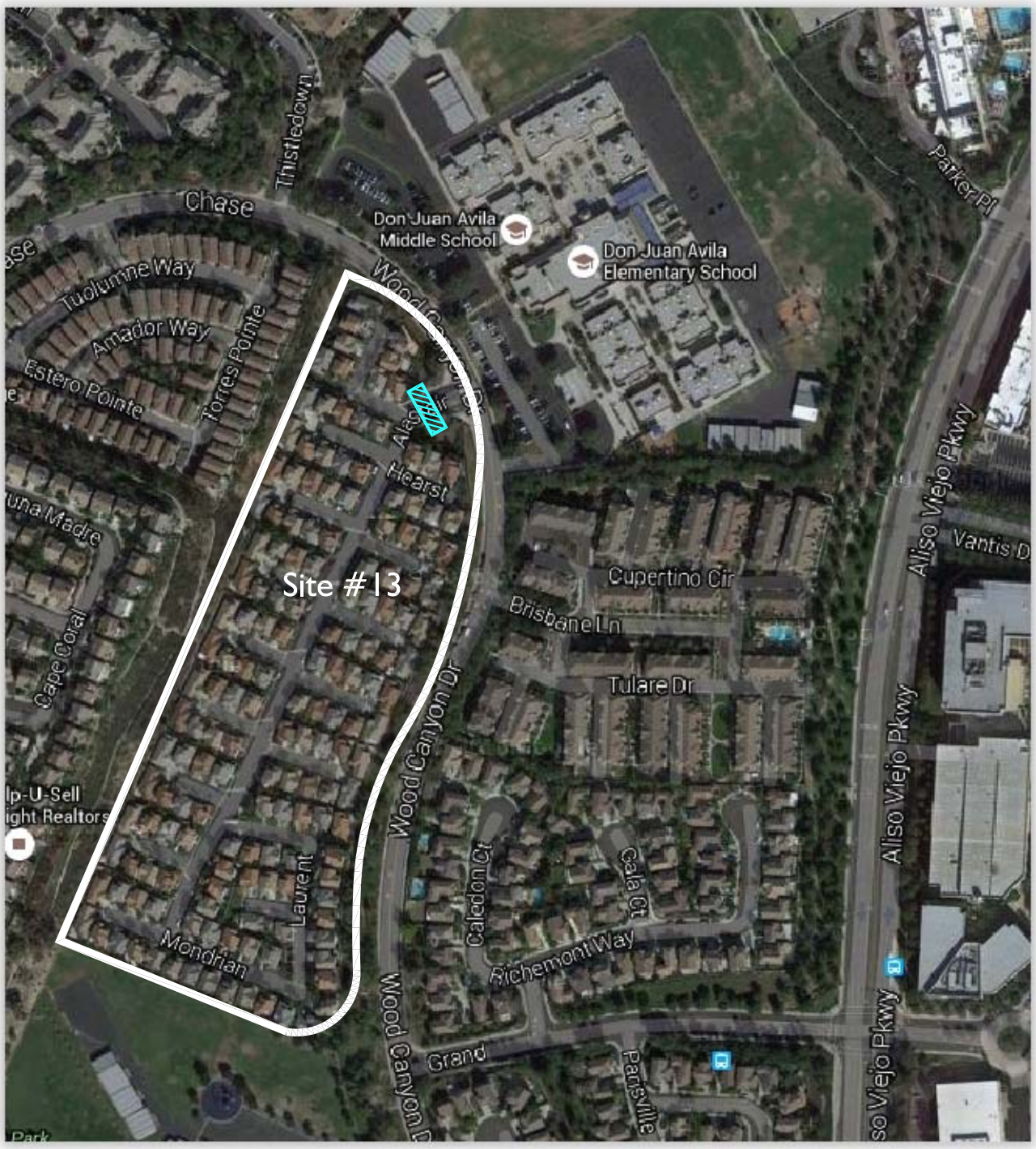
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Legend:

= Residential Electronic Gate

Exhibit A-7

Location Map: Alastair



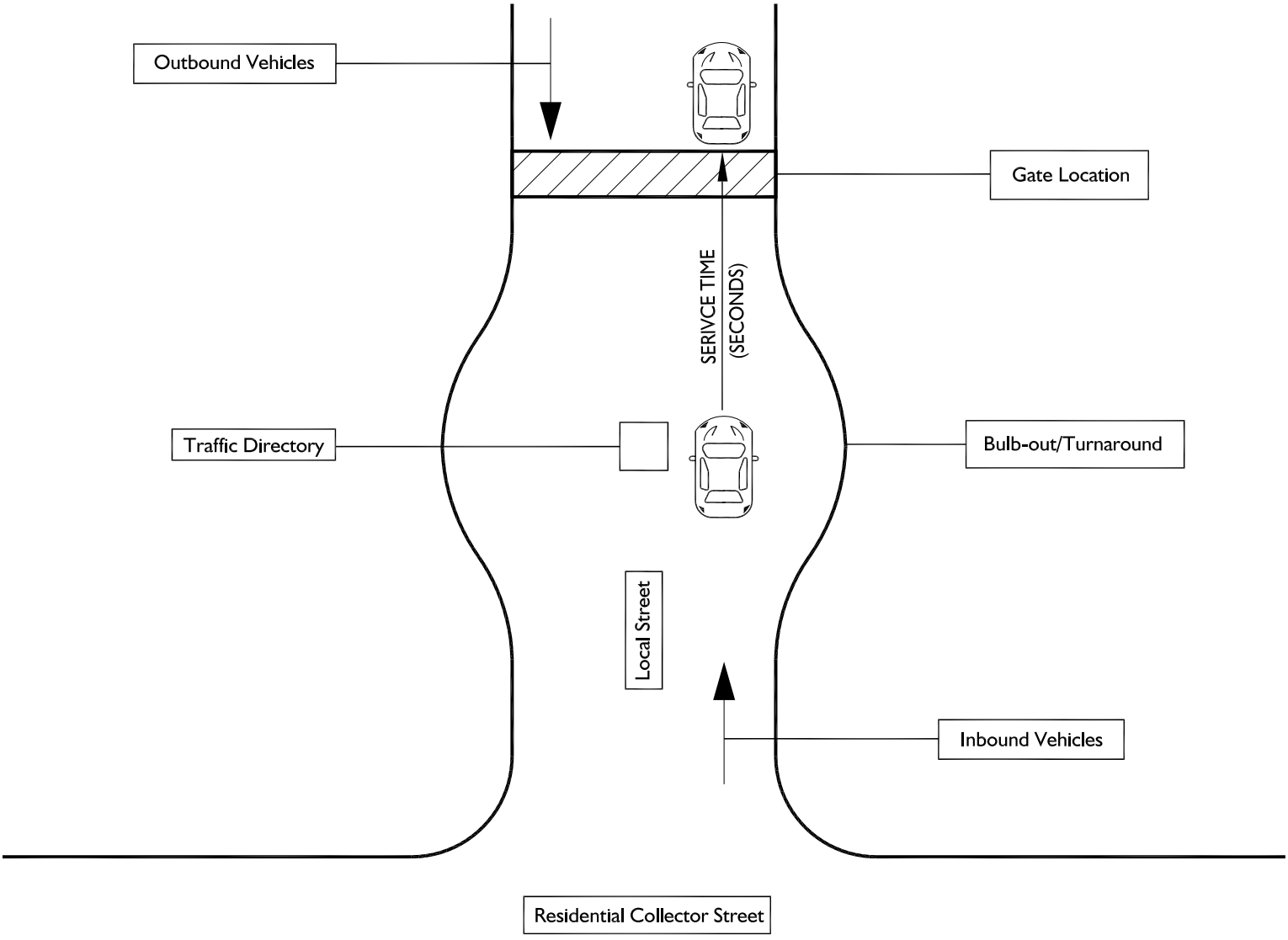
N

Legend:

= Residential Electronic Gate

Exhibit B

Typical Gate Layout



Tables

Table 1
Percentage of Visitors vs. Residents Entering Residential Gates

SITE NO.	VISITORS (%)	RESIDENTS (%)
1	32.43	67.57
2	18.18	81.82
3	17.65	82.35
4	44.00	56.00
5	4.55	95.45
6a	21.43	78.57
6b	20.24	79.76
7	16.42	83.58
8	16.67	83.33
9	13.66	86.34
10	24.42	75.58
11	30.00	70.00
12	16.84	83.16
13	10.19	89.81
AVERAGE (%)	20.48	79.52
WEIGHTED AVG.	18.36	81.64

Table 2
Residential Electronic Gate Times and Service Rates (All types of gates)

SITE NO.	VISITOR TIME (SECONDS)	VISITOR RATE (VPH)[1]	RESIDENT TIME (SECONDS)	RESIDENT RATE (VPH)[1]	GATE TYPE
1	25.5	141.1	13.6	265.3	Rolling
2	29.8	120.8	8.2	437.6	Swinging
3	32.2	111.7	8.8	409.1	Swinging
4	20.1	179.2	13.1	273.9	Swinging
5	27.6	130.7	18.8	191.5	Rolling
6a	23.7	152.1	16.3	220.6	Rolling
6b	23.0	156.4	11.9	302.7	Rolling
7	25.4	141.8	10.1	356.0	Rolling
8	25.1	143.6	12.0	301.3	Rolling
9	23.6	152.3	11.0	327.7	Swinging
10	25.8	139.6	15.1	238.6	Rolling
11	19.7	183.2	8.2	437.8	Swinging
12	19.5	184.4	9.8	366.2	Swinging
13	21.1	170.8	10.0	361.6	Rolling
AVERAGE	24.4	150.6	11.9	320.7	Both
STANDARD DEV.	3.8	22.5	3.2	78.3	Both
COEFF. OF VARIATION	15.4	15.0	26.6	24.4	Both
95th %	30.6	117.5	17.2	209.6	Both
90th %	29.1	123.5	15.9	225.8	Both
85th %	27.7	129.9	15.2	237.5	Both
WEIGHTED AVG.	23.5	153.4	11.5	313.5	Both
80% AVERAGE		120.4		256.6	Both
80% WEIGHTED AVG.		122.7		250.8	Both

	RECOMMENDED DESIGN CAPACITY
VISITORS	115.0
RESIDENTS	210.0
COMBINED	190.0

[1] VPH = vehicle per hour

Table 3
Residential Electronic Swinging Gate Times and Service Rates

SITE NO.	VISITOR TIME (SECONDS)	VISITOR RATE (VPH)[1]	RESIDENT TIME (SECONDS)	RESIDENT RATE (VPH)[1]	GATE TYPE
2	29.8	120.8	8.2	437.6	Swinging
3	32.2	111.7	8.8	409.1	Swinging
4	20.1	179.2	13.1	273.9	Swinging
9	23.6	152.3	11.0	327.7	Swinging
11	19.7	183.2	8.2	437.8	Swinging
12	19.5	184.4	9.8	366.2	Swinging
AVERAGE	24.1	155.3	9.8	375.4	Swinging
STANDARD DEV.	5.6	32.5	1.9	65.7	Swinging
COEFF. OF VARIATION	23.1	21.0	19.5	17.5	Swinging
95th %	31.6	113.9	12.6	286.3	Swinging
90th %	31.0	116.1	12.0	298.9	Swinging
85th %	30.4	118.4	11.5	312.6	Swinging

[1] VPH = vehicles per hour

Table 4
Residential Electronic Rolling Gate Times and Service Rates

SITE NO.	VISITOR TIME (SECONDS)	VISITOR RATE (VPH)[1]	RESIDENT TIME (SECONDS)	RESIDENT RATE (VPH)[1]	GATE TYPE
1	25.5	141.1	13.6	265.3	Rolling
5	27.6	130.7	18.8	191.5	Rolling
6a	23.7	152.1	16.3	220.6	Rolling
6b	23.0	156.4	11.9	302.7	Rolling
7	25.4	141.8	10.1	356.0	Rolling
8	25.1	143.6	12.0	301.3	Rolling
10	25.8	139.6	15.1	238.6	Rolling
13	21.1	170.8	10.0	361.6	Rolling
AVERAGE	24.7	147.0	13.5	279.7	Rolling
STANDARD DEV.	2.0	12.4	3.1	61.8	Rolling
COEFF. OF VARIATION	8.1	8.4	23.0	22.1	Rolling
95th %	27.0	133.5	17.9	200.8	Rolling
90th %	26.3	136.7	17.1	211.1	Rolling
85th %	25.8	139.6	16.2	221.7	Rolling

[1] VPH = vehicles per hour

Table 5
PM Peak Hour Trips per Dwelling Unit (D.U.)

SITE NO.	PEAK HOUR TRIPS IN PER D.U.	PEAK HOUR TRIPS OUT PER D.U.	PEAK HOUR TOTAL TRIPS PER D.U.
1	0.48	0.45	0.93
2	0.30	0.27	0.57
3	0.52	0.19	0.71
4	0.37	0.42	0.79
5	0.35	0.28	0.63
6a/6b	0.36	0.24	0.59
7	0.37	0.37	0.73
8	0.36	0.28	0.63
9	0.56	0.40	0.95
10	0.51	0.47	0.98
11	0.5	0.46	0.96
12	0.43	0.37	0.79
13	0.37	0.25	0.62
AVERAGE	0.42	0.34	0.76
WEIGHTED AVG.	0.41	0.30	0.71

Appendices

Appendix A

Site #1-13
Raw Data

Site #1 : Hillsborough at Spyglass Hill Road, Newport Beach
40 Dwelling Units with a Rolling Gate

TIME (PM)	GUEST SERIVE TIME (SECONDS)	RESIDENT SERVICE TIME (SECONDS)	OUTBOUND NO. VEHICLES
4:00			1
4:01			1
4:02			1
4:04			1
4:07	27.7		
4:10	20.6	14.5	
4:14		6.3	
4:15			1
4:19			1
4:20		26.5	1
4:25	24.0	9.4	
4:28			1
4:31	35.9		1
4:34		13.1	
4:37			1
4:40		19.8	
4:41			1
4:43	35.9		
4:45		8.0	2
4:45		7.2	
4:47	33.2		2
4:50			1
4:52			
4:53		8.8	
4:53		9.3	
4:54	18.6		
4:54		10.2	1
4:56			
4:59		12.0	
5:00			1
5:07			1
5:09		17.0	
5:12		17.9	
5:16	23.9		
5:18			1
5:21	20.3		
5:26	17.3	9.8	1
5:30		25.5	
5:34		14.1	
5:34		13.7	

TIME (PM)	GUEST SERIVE TIME (SECONDS)	RESIDENT SERVICE TIME (SECONDS)	OUTBOUND NO. VEHICLES
5:36			1
5:39		14	
5:40			2
5:43		8.4	1
5:45		12.6	
5:46	22.4		
5:46		16.7	
5:50		10.6	1
5:52		19.1	
5:55	26.3		
5:59			1
6:00		14.8	
AVG. TIME	25.5	13.6	
AVG. RATE	141.1	265.3	
COUNT	12	25	37

Site #2 : Palisades Dr at Newport Ridge Dr W, Newport Beach
56 Dwelling Units with a Swinging Gate

TIME (PM)	GUEST SERIVE TIME (SECONDS)	RESIDENT SERVICE TIME (SECONDS)	OUTBOUND NO. VEHICLES
4:03			1
4:10		10.3	
4:14			2
4:16	31.3		
4:21		7.6	1
4:22		12.5	1
4:25	29.1		
4:27		10.1	
4:27		3.4	
4:33		9.4	1
4:37		7.2	
4:40	30.2		
4:40		3.6	
4:40		2.2	
4:43			1
4:44		13.6	
4:49		11.2	1
4:54		10.2	
4:59			1
5:01			1
5:07			1
5:09			2

TIME (PM)	GUEST SERIVE TIME (SECONDS)	RESIDENT SERVICE TIME (SECONDS)	OUTBOUND NO. VEHICLES
5:16		7.2	1
5:16		7.0	
5:16		14.1	
5:23		10.6	
5:24			1
5:27		15.7	1
5:28	36.5		
5:28		2.3	
5:28		2.2	
5:31			1
5:33		9.1	1
5:35	23.1		
5:36		5.2	
5:38	28.6		1
5:38		3.1	
5:39		2.3	1
5:41		10.6	1
5:43			1
5:49		17.7	
5:49		4.5	
5:56		9.2	
AVG. TIME	29.8	8.2	
AVG. RATE	120.8	437.6	
COUNT	6	27	33

Site #3 : Whitesands Dr at Newport Ridge Dr W, Newport Beach
21 Dwelling Units with a Swinging Gate

TIME (PM)	GUEST SERVICE TIME (SECONDS)	RESIDENT SERVICE TIME (SECONDS)	OUTBOUND NO. VEHICLES
4:46		7.4	
4:57	70		
4:58		8.1	
5:06	9.5		
5:12			1
5:15		6.5	
5:16		8.3	
5:18			1
5:28		9.6	
5:28		9	
5:31		8.3	
5:32	17.2		
5:33		10.6	

TIME (PM)	GUEST SERIVE TIME (SECONDS)	RESIDENT SERVICE TIME (SECONDS)	OUTBOUND NO. VEHICLES
5:37			1
5:41			1
5:58		8.5	
6:17		9.7	
6:20		9	
6:27		10.1	
6:31		8.4	
6:39		9.7	
AVG. TIME	32.2	8.8	
AVG. RATE	111.7	409.1	
COUNT	3	14	17

Site #4 : Terrace Ridge at Newport Ridge Dr W, Newport Beach
38 Dwelling Units with a Swinging Gate

TIME (PM)	GUEST SERVICE TIME (SECONDS)	RESIDENT SERVICE TIME (SECONDS)	OUTBOUND NO. VEHICLES
3:55	17.0		
3:59			1
4:02	34.0		
4:06			1
4:09			1
4:13		10.0	
4:15	17.0		
4:18			1
4:20			1
4:20		12.0	
4:23			1
4:25			2
4:26		14.0	
4:28	16.0		1
4:33			1
4:34	18.0		
4:35		12.0	
4:36		14.0	
4:38			1
4:40	18.0		1
4:41			2
4:43			1
4:46		20.0	
4:49	27.0		
4:50		14.0	
4:50			1

TIME (PM)	GUEST SERIVE TIME (SECONDS)	RESIDENT SERVICE TIME (SECONDS)	OUTBOUND NO. VEHICLES
4:51	16.0		
5:02		11.0	
5:05			1
5:12			1
5:13	16.0		
5:15			1
5:16	18.0		
5:16		13.0	
5:20		13.0	
5:25	24.0		
5:26			1
5:29			1
5:31			1
5:32		10.0	
5:36		12.0	
5:36			1
5:37		13.0	
5:41			1
5:46		16.0	
5:51			1
AVG. TIME	20.1	13.1	
AVG. RATE	179.2	273.9	
COUNT	11	14	25

Site #5 : Montserrat at Newport Ridge Dr E, Newport Beach
80 Dwelling Units with a Rolling Gate

TIME (PM)	GUEST SERVICE TIME (SECONDS)	RESIDENT SERVICE TIME (SECONDS)	OUTBOUND NO. VEHICLES
4:00			1
4:01		18.4	
4:02		17.4	2
4:03		14.9	2
4:04		20.1	
4:05		16.9	
4:07			1
4:08		12.9	1
4:11		23.6	
4:12		17.6	
4:13		24.1	
4:14		21.0	
4:15			2
4:19		25.4	

TIME (PM)	GUEST SERIVE TIME (SECONDS)	RESIDENT SERVICE TIME (SECONDS)	OUTBOUND NO. VEHICLES
4:21		23.7	
4:22		16.9	
4:23		14.9	2
4:25	27.1		
4:26		20.6	
4:27		14.0	1
4:31		19.1	1
4:33		26.1	
4:34		22.3	
4:36		14.5	
4:37			2
4:38		25.4	
4:41		22.5	
4:42	28.0		
4:43		17.9	
4:45		25.8	
4:46			3
4:48			
4:50			2
4:51		22.9	
4:54			
4:55		16.6	
4:58			2
5:01		14.0	
5:02		15.2	
5:03		15.6	
5:07		19.2	2
5:08		16.6	1
5:09		14.1	
5:15			1
5:16		15.3	
5:20		18.3	
5:22		18.1	
5:27			1
5:29		15.6	
5:30		17.3	
5:40		20.1	
5:41		19.2	
5:47			1
5:49		20.4	
5:50			1
5:51		18.1	

TIME (PM)	GUEST SERIVE TIME (SECONDS)	RESIDENT SERVICE TIME (SECONDS)	OUTBOUND NO. VEHICLES
5:57		16.8	
AVG. TIME	27.6	18.8	
AVG. RATE	130.7	191.5	
COUNT	2	42	44

Site # 6a : Mont St Michel at Newport Ridge Dr E, Newport Beach
169 Dwelling Units with two Rolling Gates

TIME (PM)	GUEST SERVICE TIME (SECONDS)	RESIDENT SERVICE TIME (SECONDS)	OUTBOUND NO. VEHICLES
4:03			1
4:05		15.3	
4:09		13.2	
4:13			1
4:17			3
4:19		15.0	
4:21		17.3	
4:22	22.7		
4:25			1
4:28			1
4:29		17.6	
4:30		20.6	
4:31		18.4	1
4:32		24.7	
4:34		14.1	1
4:39		12.2	
4:39	21.4		
4:44		13.9	
4:45		18.7	
4:47			1
4:49	24.2		1
4:52		17.4	
4:53		23.1	1
4:55			1
4:56			1
4:58		17.5	
4:59		21.5	
5:00	33.6		1
5:04		14.9	
5:08		14.8	
5:09		7.1	
5:11			1
5:13			1

TIME (PM)	GUEST SERIVE TIME (SECONDS)	RESIDENT SERVICE TIME (SECONDS)	OUTBOUND NO. VEHICLES
5:15	22.0		1
5:16	18.1		1
5:27			1
5:31		14.0	
5:38			1
5:40		13.2	
5:49		14.5	
AVG. TIME	23.7	16.3	
AVG. RATE	152.1	220.6	
COUNT	6	22	28

Site #6b : Menton at Newport Ridge Dr E, Newport Beach
169 Dwelling Units with two Rolling Gates

TIME (PM)	GUEST SERVICE TIME (SECONDS)	RESIDENT SERVICE TIME (SECONDS)	OUTBOUND NO. VEHICLES
4:00			1
4:02		15.2	1
4:03			1
4:05	15.1	13.9	1
4:06		3.5	1
4:07		11.5	
4:10		19.9	1
4:11		8.9	
4:13	20.4		2
4:13		7.9	1
4:13		3.8	
4:14		13.9	
4:15	19.1		
4:16		11.7	
4:17			1
4:18			1
4:20			1
4:22			1
4:23			1
4:24		13.5	
4:25		12.3	
4:26		10.3	
4:27		15.1	
4:28		8.1	
4:28		7.3	
4:30	33.0		
4:30	26.7		

TIME (PM)	GUEST SERIVE TIME (SECONDS)	RESIDENT SERVICE TIME (SECONDS)	OUTBOUND NO. VEHICLES
4:31		12.9	
4:31		13.5	
4:34		30.8	1
4:35	14.6		
4:38			1
4:42		15.5	1
4:43			1
4:44		12.2	
4:44		17.2	
4:45		6.3	
4:46	22.4		1
4:47		14.5	
4:48		7.8	
4:51	29.8		
4:52	16.5		
4:53		5.6	
4:53		14.9	1
4:56		18.3	
4:57		10.5	
4:59		12.7	1
5:00	17.4		4
5:01		15.3	
5:02		8.9	
5:02		9.9	1
5:04			1
5:05		14.1	
5:06			1
5:07			1
5:08	17.5		
5:10		10.8	
5:12		11.3	
5:13		4.1	
5:14		15.0	
5:14		13.6	
5:15		12.1	
5:15		8.2	
5:16			1
5:17		11.3	1
5:18			1
5:21	16.8		1
5:22		16.5	
5:22		9.8	

TIME (PM)	GUEST SERIVE TIME (SECONDS)	RESIDENT SERVICE TIME (SECONDS)	OUTBOUND NO. VEHICLES
5:22		6.4	1
5:26			2
5:27	15.9		
5:28	59.8		
5:30		12.8	
5:31			1
5:34	16.0	8.5	
5:35		13.9	1
5:35		14.6	
5:36	30.0		
5:38		12.1	
5:38		13.8	
5:40			1
5:42			1
5:44			1
5:46		14.4	
5:46		12.3	
5:46		16	
5:48		10.9	
5:49			1
5:50		11.6	
5:50		4.3	
5:52		14.4	
5:52		9.4	
5:53		17.0	
5:53		3.8	
5:53		4.5	
5:54		11.6	1
5:56		19	
5:57	20.2		
5:59		13.6	
6:00		13.3	
6:00		8.3	
AVG. TIME	23.0	11.9	
AVG. RATE	156.4	302.7	
COUNT	17	67	84

Site #7 : Tesoro at Ridge Park, Newport Beach
180 Dwelling Units with a Rolling Gate

TIME	GUEST SERVICE TIME (SECONDS)	RESIDENT SERVICE TIME (SECONDS)	OUTBOUND NO. VEHICLES
4:01		13.2	

TIME (PM)	GUEST SERIVE TIME (SECONDS)	RESIDENT SERVICE TIME (SECONDS)	OUTBOUND NO. VEHICLES
4:02		13.8	
4:03		12.4	
4:04		5.5	1
4:05			2
4:06			1
4:07	14.9		3
4:09		12.2	1
4:09		3.4	
4:09		15.3	
4:10		3.4	1
4:11	17.5	6.1	
4:13		9.1	
4:13		3.9	
4:14	16.5		2
4:15		11.9	1
4:15		10.8	
4:15		11.1	
4:15		4.0	
4:18		13.2	1
4:19		15.1	1
4:20			1
4:22			1
4:23			1
4:24		15.8	
4:26	14.8	7.7	2
4:27	31.7	11.2	
4:28		9.6	
4:29		8.7	
4:29		9.4	
4:29		10.1	
4:30		13.9	
4:31		10.3	
4:31		13.8	
4:32		11.3	2
4:33	18.5	10.2	2
4:34		7.4	2
4:35			1
4:36			1
4:37			4
4:38		12.8	
4:39	24.3		
4:40		11.3	2

TIME (PM)	GUEST SERIVE TIME (SECONDS)	RESIDENT SERVICE TIME (SECONDS)	OUTBOUND NO. VEHICLES
4:41		5.1	2
4:42			1
4:44		9.3	
4:44		13.9	
4:45		12.0	1
4:45		11.9	
4:47		18.8	1
4:49		12.2	2
4:50	23.9		2
4:51	15.8	10.3	
4:51		3.8	
4:51		8.2	1
4:52		11.9	
4:53		10.0	
4:53		10.2	
4:53		6.7	
4:54			1
4:55	21.7	13.8	
4:55	15.5	11.2	
4:56	23.6	9.6	2
4:56		10.3	
4:57			1
4:58	16.5	13.6	3
4:59			2
5:00			1
5:01	77.3	13.7	2
5:02		9.0	1
5:03		12.3	
5:03		4.2	
5:04		12.6	
5:04		9.2	
5:04		2.5	
5:04		3.2	1
5:06	11.3	3.5	1
5:07		16.9	
5:08		3.1	2
5:08		7.3	
5:10		10.8	2
5:13		17.1	1
5:14		3.4	
5:14		2.8	
5:15			1

TIME (PM)	GUEST SERIVE TIME (SECONDS)	RESIDENT SERVICE TIME (SECONDS)	OUTBOUND NO. VEHICLES
5:16		15.3	
5:16		13.2	
5:16		9.3	1
5:16		4.3	
5:16		6.1	1
5:17			2
5:18			3
5:19			1
5:21			1
5:22		11.7	1
5:22		5.3	
5:22		3.1	
5:23			1
5:25		15.2	1
5:25		3.3	
5:25		2.9	2
5:27			1
5:28		10.8	2
5:29		13.7	2
5:30		16.8	2
5:31	15.4	9.1	
5:31		5.3	1
5:32		11.0	1
5:33			2
5:34	91.2		
5:35		8.2	2
5:36		18.4	1
5:37		9.7	
5:37		13.2	
5:38		14.1	
5:38		9.2	1
5:39		11.1	2
5:40		19.3	
5:40		15.6	
5:41		6.2	1
5:42		8.8	
5:43		11.2	
5:44		15.4	
5:45			2
5:46	24.6	11.1	3
5:47		15.4	
5:47		3.7	2

TIME (PM)	GUEST SERIVE TIME (SECONDS)	RESIDENT SERVICE TIME (SECONDS)	OUTBOUND NO. VEHICLES
5:48		13.5	
5:48		18.5	
5:49		2.7	1
5:49		14.6	
5:49		5.1	
5:50			2
5:51	11.1		
5:51	32.1	7.4	
5:53			1
5:54			2
5:55	23.1	3.2	
5:56		13.2	
5:56		5.3	1
5:58	17.2	14.0	
5:59		10.8	1
6:00		15.0	
AVG. TIME	25.39	10.11	
AVG. RATE	141.8	356.0	
COUNT	22	112	134

Site #8 : Campobello at Ridge Park, Newport Beach
90 Dwelling Units with a Rolling Gate

TIME	GUEST SERVICE TIME (SECONDS)	RESIDENT SERVICE TIME (SECONDS)	OUTBOUND NO. VEHICLES
4:00			**1**
4:01		9.2	
4:02			**1**
4:03	21.3		
4:04		14.3	
4:04		11.1	
4:06		8.8	
4:07	18.4	12.9	1
4:08			1
4:09		15.2	1
4:11			1
4:13	15.5		
4:14			2
4:15		16.6	
4:16	16.0	10.3	1
4:18			1
4:20		9.4	2
4:22		17.6	1

TIME (PM)	GUEST SERIVE TIME (SECONDS)	RESIDENT SERVICE TIME (SECONDS)	OUTBOUND NO. VEHICLES
4:22		15.4	
4:22		4.7	
4:23		2.8	1
4:25	13.4		1
4:26		13.4	
4:29			1
4:30		19.3	
4:32		10.7	
4:33		20.7	1
4:33		16.3	
4:36			1
4:39		12.3	
4:40	104.68		
4:46		26.2	1
4:48		17.4	1
4:50			1
4:51	18.5	11.3	
4:53			1
4:55			1
4:57		11.8	
4:59		8.2	1
5:00		10.7	1
5:01			1
5:03		8.3	
5:05		12.1	
5:05		10.2	
5:06		22.8	
5:07		13.4	2
5:08		14.8	
5:09		3.6	1
5:09		1.8	
5:09		3.4	
5:12			2
5:13		11.3	2
5:17	10.1	9.4	1
5:20			3
5:22			2
5:28	16.9	14.2	
5:29		13.6	
5:30		15.6	
5:30		14.0	
5:31			1

TIME (PM)	GUEST SERIVE TIME (SECONDS)	RESIDENT SERVICE TIME (SECONDS)	OUTBOUND NO. VEHICLES
5:34		12.3	
5:35		7.4	
5:36	15.9		
5:39			1
5:40		9.6	
5:40		5.2	
5:40		5.3	
5:42		10.0	
5:45			1
5:46			1
5:47			1
5:48		12.1	
5:51		15.3	1
5:52			1
5:53		13.7	
5:55		11.5	
5:57			2
5:58			1
AVG. TIME	25.07	11.95	
AVG. RATE	143.6	301.3	
COUNT	10	50	60

Site #9 : Kensington at Oak View Dr, Aliso Viejo
154 Dwelling Units with a Swinging Gate

TIME	GUEST SERVICE TIME (SECONDS)	RESIDENT SERVICE TIME (SECONDS)	OUTBOUND NO. VEHICLES
4:01			1
4:01	18.5		
4:02			4
4:03		17.4	5
4:04		16.5	1
4:04		16	
4:06		12.5	1
4:08	18.3		
4:08		10.3	
4:09		12.1	
4:09		6.1	
4:10		10.7	1
4:10			1
4:11	31.1	12.5	1
4:11		17.6	
4:11		16.2	

TIME (PM)	GUEST SERIVE TIME (SECONDS)	RESIDENT SERVICE TIME (SECONDS)	OUTBOUND NO. VEHICLES
4:12		12.9	
4:12		1.9	1
4:13			2
4:13		14.5	
4:14			3
4:15	18.8		
4:16		13.7	
4:16		13.3	
4:16		12.6	
4:16		3.2	4
4:17		17.5	
4:17		8.6	
4:17		4.9	
4:18		13.1	2
4:19		14.8	2
4:21			2
4:22			1
4:23		11.8	
4:23		3.3	
4:23		14.5	
4:23		11.2	
4:24		14.1	
4:25			3
4:26		12.0	
4:26		8.8	1
4:27		8.7	3
4:27		13.7	
4:29		17.4	1
4:29		16.5	
4:29		10.9	
4:29		8.1	
4:29		2.3	
4:31		21.6	
4:31		6.0	
4:33		10.5	1
4:34		14.8	1
4:35		12.1	2
4:36		15.5	
4:37			1
4:38		13.9	
4:38		8.1	1
4:39		23.6	

TIME (PM)	GUEST SERIVE TIME (SECONDS)	RESIDENT SERVICE TIME (SECONDS)	OUTBOUND NO. VEHICLES
4:40		20.4	1
4:41		11.9	1
4:41		15.2	1
4:43			2
4:45		13.7	
4:46		11.9	
4:46		15.0	
4:47		18.7	2
4:47		11.4	
4:48		14.7	1
4:49		10.6	1
4:50	17.1		1
4:50		13.1	1
4:51			3
4:52		24.9	
4:53			1
4:54		22.3	2
4:54		5.9	1
4:55	69.6	14.0	1
4:56		19.4	1
4:56			
4:58	22.0	17.8	
4:58		16.2	
4:58		2.5	
4:58		3.2	
4:58		1.7	
4:59			2
5:00		14.5	
5:01		10.4	
5:02		18.0	1
5:02		3.0	
5:03			1
5:04	18.2	16.2	
5:04		15.2	
5:05		13.1	1
5:05		13.0	
5:07			3
5:08			1
5:09		15.1	
5:09		2.0	1
5:11		16.0	2
5:11		13.3	

TIME (PM)	GUEST SERIVE TIME (SECONDS)	RESIDENT SERVICE TIME (SECONDS)	OUTBOUND NO. VEHICLES
5:12			3
5:12			
5:13		12.2	
5:13		3.9	2
5:14	23.0		
5:15		12.0	1
5:16	23.3		2
5:16		5.6	
5:16		2.1	
5:18			3
5:19		17.0	
5:19		15.8	3
5:20		14.2	1
5:20		13.8	1
5:20		7.4	
5:20		2.2	
5:21			1
5:22		17.3	3
5:23	24.2	2.0	1
5:23	23.0	2.7	
5:25			1
5:26	20.0	4.8	2
5:28		19.0	
5:29	15.9	5.1	1
5:30			2
5:31	21.0	6.7	
5:32		19.5	1
5:32		3.8	
5:33		8.3	1
5:33		4.4	
5:35		12.9	3
5:36		1.6	
5:36		13.5	
5:37		12.7	
5:39		13.5	1
5:39		3.7	1
5:39		6.8	
5:41	19.0	12.4	
5:42	17.4	14.7	
5:42		15.9	
5:43		3.2	3
5:44		15.2	2

TIME (PM)	GUEST SERIVE TIME (SECONDS)	RESIDENT SERVICE TIME (SECONDS)	OUTBOUND NO. VEHICLES
5:47	18.1		1
5:48	18.8		
5:49		15.4	1
5:49		7.8	
5:49		3.0	
5:51		13.7	
5:51		3.9	
5:51		2.4	
5:52		13.6	
5:52		12.5	1
5:53		15.0	1
5:53		11.1	1
5:54	22.9	15.7	
5:54		13.8	
5:54		7.9	
5:54		3.0	
5:54		2.9	
5:55		15.6	2
5:55		8.9	
5:55		2.7	
5:56	37.9	10.9	1
5:56		2.8	
5:57			1
5:58	21.9		
5:59		10.6	3
6:00		5.2	
6:00		2.8	
6:00		2.2	
6:00		3.2	
6:00		2.0	
AVG. TIME	23.64	10.99	
AVG. RATE	152.31	327.68	
COUNT	22	139	161

Site #10 : Silver Oaks at Oak View Dr, Aliso Viejo
81 Dwelling Units with a Rolling Gate

TIME (PM)	GUEST SERVICE TIME (SECONDS)	RESIDENT SERVICE TIME (SECONDS)	OUTBOUND NO. VEHICLES
4:00		12.7	1
4:02	20.6		
4:03		13.4	
4:04	38.2		

TIME (PM)	GUEST SERIVE TIME (SECONDS)	RESIDENT SERVICE TIME (SECONDS)	OUTBOUND NO. VEHICLES
4:05		30.4	1
4:06		12.7	
4:08		19.1	2
4:08		16.2	
4:08		5.3	
4:09		16.2	2
4:10			2
4:11			1
4:12		12.0	
4:13			1
4:15	24.2		2
4:16		11.6	1
4:17		12.1	
4:18			2
4:19		23.2	1
4:21		20.0	
4:21		18.2	
4:22		22.9	1
4:23			1
4:24			1
4:25	19.2		1
4:26		20.5	
4:27			2
4:28	19.0		1
4:29			2
4:31			1
4:32			1
4:33			2
4:34		15.5	1
4:36	18.1		
4:37		11.1	1
4:38		12.1	1
4:40	21.1		
4:43			1
4:44	42.7		
4:47			2
4:48		21.7	
4:49			1
4:50		21.6	
4:51		20.5	
4:53		24.4	1
4:53		6.6	

TIME (PM)	GUEST SERIVE TIME (SECONDS)	RESIDENT SERVICE TIME (SECONDS)	OUTBOUND NO. VEHICLES
4:54		19.0	
4:55	26.3		1
4:55		22.7	
4:56		15.3	
4:58		17.0	
4:58		19.4	
4:58		13.8	
5:00	31.4	19.7	
5:01	26.7		
5:03		9.4	
5:06	38.4		
5:07		8.3	
5:07		12.5	
5:07		6.3	
5:08			2
5:09		18.7	2
5:12		18.9	
5:12		15.3	
5:12		12.4	
5:12		12.0	
5:13		2.1	
5:14		11.7	
5:15	24.7	22.9	1
5:16		7.0	
5:17		12.4	
5:19		37.7	2
5:20	22.1		1
5:22		13.2	
5:23		20.0	
5:23		19.6	
5:24			1
5:25		13.5	2
5:27		13.8	
5:28			1
5:32			1
5:35			1
5:38			1
5:39			1
5:40		15.5	
5:40		3.2	
5:41		11.2	1
5:41		6.3	

TIME (PM)	GUEST SERIVE TIME (SECONDS)	RESIDENT SERVICE TIME (SECONDS)	OUTBOUND NO. VEHICLES
5:41		3.7	
5:42	21.9		
5:44	24.1		1
5:45		18.1	1
5:48		18.3	
5:48		15.2	
5:49	18.4		1
5:50		19.4	2
5:51			2
5:53			1
5:54	15.4		
5:54	22.2		
5:55	50.0		
5:56	16.7	18.6	1
5:58		11.7	
6:00		10.9	1
6:00		8.7	
6:00		5.4	
AVG. TIME	25.78	15.09	
AVG. RATE	139.64	238.58	
COUNT	21	65	86

Site #11 : Crimson Canyon at Oak View Dr, Aliso Viejo
76 Dwelling Units with a Swinging Gate

TIME (PM)	GUEST SERVICE TIME (SECONDS)	RESIDENT SERVICE TIME (SECONDS)	OUTBOUND NO. VEHICLES
4:00			3
4:01		10.2	
4:04			1
4:05	14.4		2
4:06		8.8	2
4:06		2.0	
4:07			1
4:08		10.4	2
4:09			1
4:14		10.4	
4:15		11.4	
4:19	32.8		
4:20		5.8	
4:22	8.8	3.9	
4:23		10.3	
4:25			1

TIME (PM)	GUEST SERIVE TIME (SECONDS)	RESIDENT SERVICE TIME (SECONDS)	OUTBOUND NO. VEHICLES
4:27		11.5	
4:28	15.6		
4:29	63.8		
4:30			2
4:32	17.2		
4:34			1
4:35			2
4:37			1
4:38	12.3		1
4:39		6.8	
4:40			1
4:41		16.6	
4:42		5.0	
4:45		11.7	1
4:46	18.8	7.2	
4:48	23.0		1
4:49			1
4:50	18.1		
4:51		2.2	2
4:52	9.3	1.8	
4:52		2.3	
4:53	17.1		2
4:55			1
4:56			1
4:57			1
4:58			2
5:00			1
5:02	14.7		1
5:03		10.9	1
5:04			1
5:05	13.7		
5:06		15.1	1
5:06		2.7	
5:07			2
5:08	18.8		1
5:10		14.8	1
5:11	14.3		1
5:13		2.6	1
5:14			1
5:16		7.6	
5:16		13.5	
5:17			1

TIME (PM)	GUEST SERIVE TIME (SECONDS)	RESIDENT SERVICE TIME (SECONDS)	OUTBOUND NO. VEHICLES
5:18		6.4	1
5:18		4.9	
5:19		11.2	1
5:21		12.4	
5:22			1
5:25		7.3	
5:25		6.6	
5:27		6.0	
5:30		10.1	
5:30		10.3	
5:31		8.8	
5:32		1.8	
5:32		2.3	
5:32		2.4	
5:34			3
5:35	20.0		1
5:36			1
5:37	35.0		
5:39			1
5:41		6.4	
5:42			1
5:43		16.0	
5:44		13.7	
5:45			1
5:46		11	
5:47		2.9	
5:49		6.8	
5:50		7.1	
5:51		10.9	1
5:56		14.7	2
5:57	11.0	7.2	
5:59	16.7		1
6:00	17.3	10.2	
AVG. TIME	19.7	8.2	
AVG. RATE	183.2	437.8	
COUNT	21	49	70

Site #12 : Endless Vista at Oak View Dr, Aliso Viejo
115 Dwelling Units with a Swinging Gate

TIME (PM)	GUEST SERVICE TIME (SECONDS)	RESIDENT SERVICE TIME (SECONDS)	OUTBOUND NO. VEHICLES
4:01		16.5	1

TIME (PM)	GUEST SERIVE TIME (SECONDS)	RESIDENT SERVICE TIME (SECONDS)	OUTBOUND NO. VEHICLES
4:02		11.2	1
4:03		4.8	1
4:04			1
4:05	15.2	7.2	
4:06		11.4	
4:06		3.8	1
4:07			1
4:08		10.3	1
4:09		4.1	
4:09		6.5	
4:10	22.4		
4:11		17.5	
4:13	15.4		
4:15		14.6	
4:16	16.3	6.0	
4:18			2
4:19		9.4	1
4:22		3.0	1
4:23		12.2	
4:24		12.6	
4:24		11.6	2
4:26	17.0		1
4:28		13.5	2
4:29			1
4:31		14.4	
4:32		19.7	1
4:33		4.2	1
4:33			2
4:37		16.6	
4:38		13.1	1
4:39			1
4:39			2
4:40		15.4	1
4:41	17.2	3.7	
4:42		14.1	
4:43		13.7	1
4:43		4	
4:43		2.9	
4:44		4.3	
4:44		14.9	1
4:45			2
4:46			2

TIME (PM)	GUEST SERIVE TIME (SECONDS)	RESIDENT SERVICE TIME (SECONDS)	OUTBOUND NO. VEHICLES
4:48			1
4:49	17.7		
4:51		13.2	1
4:53			1
4:54		12.6	
4:54		7.2	
4:54		9.3	
4:55		3.4	1
4:57		10.8	
4:58		10.9	
5:00		7.3	1
5:01			1
5:04			1
5:05	17.1		1
5:06		10.5	1
5:07			2
5:08	18.4	3.8	
5:09			1
5:10	14.2		
5:11		10.3	1
5:12			1
5:13	23.9	14.8	
5:15		4.5	1
5:16	15.9		1
5:17	15.8	11.7	
5:19		16.9	
5:19		4.3	
5:20			1
5:22	32.5	4.8	
5:24		13.9	
5:25		13.9	1
5:26		7.9	
5:26		3.9	
5:27	39.4		
5:28		11.2	2
5:30		17.2	
5:31		3.8	
5:31		4.2	1
5:31		4.9	
5:32		15.6	1
5:33			1
5:34		10.5	2

TIME (PM)	GUEST SERIVE TIME (SECONDS)	RESIDENT SERVICE TIME (SECONDS)	OUTBOUND NO. VEHICLES
5:36		12.9	2
5:36		7.8	
5:36		4.4	
5:36		3.9	1
5:39			1
5:40		17.0	1
5:40		4.2	
5:42		14.0	
5:43		15.4	
5:43		3.9	
5:45		8.1	
5:46		22.2	2
5:47		17.8	2
5:49		16.2	
5:49		3.9	
5:50		6.4	1
5:51		11.0	1
5:51		3.5	1
5:52			2
5:53			3
5:55			1
5:56			1
5:57		8.5	1
5:58		11.8	
5:58		3.3	
5:59	14.0		1
6:00			1
AVG. TIME	19.5	9.8	
AVG. RATE	184.4	366.2	
COUNT	16	79	95

Site #13 : Alastair at Oak View Dr, Aliso Viejo
116 Dwelling Units with a Rolling Gate

TIME (PM)	GUEST SERVICE TIME (SECONDS)	RESIDENT SERVICE TIME (SECONDS)	OUTBOUND NO. VEHICLES
4:00			1
4:03		4.9	
4:06		16.9	
4:11		7.6	
4:12	17.0		
4:13	14.7		
4:14			1

TIME (PM)	GUEST SERIVE TIME (SECONDS)	RESIDENT SERVICE TIME (SECONDS)	OUTBOUND NO. VEHICLES
4:16		17.6	1
4:18		16.2	
4:18		4.9	
4:21		13.6	
4:22			1
4:23		11.9	
4:23		9.7	
4:24		13.4	
4:25		16.7	1
4:26		16.4	1
4:26		16.8	
4:27			3
4:28			1
4:30		11.5	
4:31	31.3		
4:32		2.5	
4:32		3.6	1
4:33		7.2	1
4:34			1
4:35		15.9	2
4:36		4	
4:36		2.7	
4:38		17.8	
4:39		3.6	
4:39		3.9	
4:39		5.6	
4:40			2
4:42			3
4:43		13.2	
4:44			2
4:45		9.7	
4:47		12.9	
4:47		10.3	
4:47		4.8	1
4:49		9.6	
4:51		16.6	
4:52		19.2	
4:52		18.8	
4:52		5.2	
4:53			1
4:54		7.7	1
4:54		3.7	

TIME (PM)	GUEST SERIVE TIME (SECONDS)	RESIDENT SERVICE TIME (SECONDS)	OUTBOUND NO. VEHICLES
4:54		3.4	
4:56	20.5	14.7	
4:57			1
4:58		15.5	
4:58		5.1	
4:59		4.8	
5:00		4.9	
5:00		5.7	
5:00		3.6	
5:00		2.3	
5:01		11.2	
5:05		6.3	2
5:07		10.8	2
5:07		9.9	
5:08		14.5	
5:09		14.6	2
5:10	19.6		
5:12			1
5:13		15.9	1
5:15		11.0	1
5:15		3.6	
5:17		8.9	1
5:18			1
5:19		14.1	3
5:19		3.0	
5:20	19.0		1
5:21			1
5:22		11.6	
5:22		12.0	1
5:23		11.6	
5:24		16.2	1
5:24		15.7	
5:25		13.2	
5:26		12.8	
5:26		11.8	1
5:27	19.8	3.9	
5:27		3.9	
5:28		4.1	
5:28		5.1	
5:28		3.4	
5:29	11.7	14.0	1
5:31		5.9	

TIME (PM)	GUEST SERIVE TIME (SECONDS)	RESIDENT SERVICE TIME (SECONDS)	OUTBOUND NO. VEHICLES
5:33		12.8	
5:33		11.9	2
5:34		7	1
5:34		5.1	1
5:37		11	1
5:37		3	
5:38	13.4		
5:39		3	1
5:40			1
5:43		11.3	
5:43		8.4	
5:44		11.4	1
5:45		11.3	3
5:46			1
5:47		12.7	
5:47		7.6	
5:51	46.2	16.4	1
5:52		15.9	1
5:53		15.5	1
5:54		14.7	
5:56	18.6		2
5:57		18.1	
5:58		14.1	1
5:58		14.3	1
5:59		7.1	
5:59		6.8	
5:59		4.1	1
6:00		8.7	
6:00		7.9	
AVG. TIME	21.1	10.0	
AVG. RATE	170.8	361.6	
COUNT	11	97	108

Appendix B

Site #1-13

PM Peak Hour Traffic Counts

Site #1 PM Peak Hour Traffic Counts
40 Dwelling Units with Rolling Gate

TIME	NO. TRIPS IN	NO. TRIPS OUT	HOURLY TRIPS IN	HOURLY TRIPS OUT	HOURLY TOTAL TRIPS
4:15 PM	4	5			
4:30 PM	3	3			
4:45 PM	6	5			
5:00 PM	6	5	19	18	37
5:15 PM	2	1	17	14	31
5:30 PM	5	2	19	13	32
5:45 PM	5	4	18	12	30
6:00 PM	6	2	18	9	27
PEAK HOUR TRIP COUNT			19	18	37
PEAK HOUR TRIPS PER D.U.			0.48	0.45	0.93

Site #2 PM Peak Hour Traffic Counts
56 Dwelling Units with a Swinging Gate

TIME	NO. TRIPS IN	NO. TRIPS OUT	HOURLY TRIPS IN	HOURLY TRIPS OUT	HOURLY TOTAL TRIPS
4:15 PM	1	3			
4:30 PM	6	2			
4:45 PM	6	2			
5:00 PM	2	2	15	9	24
5:15 PM	0	4	14	10	24
5:30 PM	8	3	16	11	27
5:45 PM	7	6	17	15	32
6:00 PM	3	0	18	13	31
PEAK HOUR TRIP COUNT			17	15	32
PEAK HOUR TRIPS PER D.U.			0.30	0.27	0.57

Site #3 PM Peak Hour Traffic Counts
21 Dwelling Units with a Swinging Gate

TIME	NO. TRIPS IN	NO. TRIPS OUT	HOURLY TRIPS IN	HOURLY TRIPS OUT	HOURLY TOTAL TRIPS
5:00 PM	3	0			
5:15 PM	2	1			
5:30 PM	3	1			
5:45 PM	3	2	11	4	15
6:00 PM	1	0	9	4	13
6:15 PM	0	0	7	3	10
6:30 PM	3	0	7	2	9
6:45 PM	2	0	6	0	6
PEAK HOUR TRIP COUNT			11	4	15
PEAK HPUR TRIPS PER D.U.			0.52	0.19	0.71

Site #4 PM Peak Hour Traffic Counts
38 Dwelling Units with a Swinging Gate

TIME	NO. TRIPS IN	NO. TRIPS OUT	HOURLY TRIPS IN	HOURLY TRIPS OUT	HOURLY TOTAL TRIPS
4:15 PM	3	3			
4:30 PM	3	6			
4:45 PM	4	6			
5:00 PM	4	1	14	16	30
5:15 PM	2	3	13	16	29
5:30 PM	4	2	14	12	26
5:45 PM	3	3	13	9	22
6:00 PM	2	1	11	9	20
PEAK HOUR TRIP COUNT			14	16	30
PEAK HOUR TRIPS PER D.U.			0.37	0.42	0.79

Site #5 PM Peak Hour Traffic Counts
80 Dwelling Units with a Rolling Gate

TIME	NO. TRIPS IN	NO. TRIPS OUT	HOURLY TRIPS IN	HOURLY TRIPS OUT	HOURLY TOTAL TRIPS
4:15 PM	10	9			
4:30 PM	7	3			
4:45 PM	9	3			
5:00 PM	2	7	28	22	50
5:15 PM	6	4	24	17	41
5:30 PM	5	1	22	15	37
5:45 PM	2	0	15	12	27
6:00 PM	3	2	16	7	23
PEAK HOUR TRIP COUNT			28	22	50
PEAK HOUR TRIPS PER D.U.			0.35	0.28	0.63

Site #6 PM Peak Hour Traffic Counts
169 Dwelling Units with two Rolling Gates

TIME	NO. TRIPS IN	NO. TRIPS OUT	HOURLY TRIPS IN	HOURLY TRIPS OUT	HOURLY TOTAL TRIPS
4:15 PM	14	11			
4:30 PM	14	10			
4:45 PM	15	6			
5:00 PM	17	13	60	40	100
5:15 PM	16	7	62	36	98
5:30 PM	9	9	57	35	92
5:45 PM	9	6	51	35	86
6:00 PM	17	2	51	24	75
PEAK HOUR TRIP COUNT			60	40	100
PEAK HOUR TRIPS PER D.U.			0.36	0.24	0.59

Site #7 PM Peak Hour Traffic Counts
180 Dwelling Units with Rolling Gate

TIME	NO. TRIPS IN	NO. TRIPS OUT	HOURLY TRIPS IN	HOURLY TRIPS OUT	HOURLY TOTAL TRIPS
4:15 PM	18	12			
4:30 PM	12	7			
4:45 PM	14	18			
5:00 PM	20	16	64	53	117
5:15 PM	18	11	64	52	116
5:30 PM	14	21	66	66	132
5:45 PM	18	13	70	61	131
6:00 PM	20	13	70	58	128
PEAK HOUR TRIP COUNT			66	66	132
PEAK HOUR TRIPS PER D.U.			0.37	0.37	0.73

Site #8 PM Peak Hour Traffic Counts
90 Dwelling Units with Rolling Gate

TIME	NO. TRIPS IN	NO. TRIPS OUT	HOURLY TRIPS IN	HOURLY TRIPS OUT	HOURLY TOTAL TRIPS
4:15 PM	10	8			
4:30 PM	10	8			
4:45 PM	5	2			
5:00 PM	7	7	32	25	57
5:15 PM	10	8	32	25	57
5:30 PM	7	6	29	23	52
5:45 PM	7	3	31	24	55
6:00 PM	4	7	28	24	52
PEAK HOUR TRIP COUNT			32	25	57
PEAK HOUR TRIPS PER D.U.			0.36	0.28	0.63

Site #9 PM Peak Hour Traffic Counts
154 Dwelling Units with a Swinging Gate

TIME	NO. TRIPS IN	NO. TRIPS OUT	HOURLY TRIPS IN	HOURLY TRIPS OUT	HOURLY TOTAL TRIPS
4:15 PM	18	21			
4:30 PM	23	19			
4:45 PM	13	12			
5:00 PM	21	17	75	69	144
5:15 PM	16	16	73	64	137
5:30 PM	19	21	69	66	135
5:45 PM	20	12	76	66	142
6:00 PM	31	12	86	61	147
PEAK HOUR TRIP COUNT			86	61	147
PEAK HOUR TRIPS PER D.U.			0.56	0.40	0.95

Site #10 PM Peak Hour Traffic Counts
81 Dwelling Units with a Rolling Gate

TIME	NO. TRIPS IN	NO. TRIPS OUT	HOURLY TRIPS IN	HOURLY TRIPS OUT	HOURLY TOTAL TRIPS
4:15 PM	12	12			
4:30 PM	9	13			
4:45 PM	6	8			
5:00 PM	14	5	41	38	79
5:15 PM	15	5	44	31	75
5:30 PM	9	7	44	25	69
5:45 PM	8	7	46	24	70
6:00 PM	13	8	45	27	72
PEAK HOUR TRIP COUNT			41	38	79
PEAK HOUR TRIPS PER D.U.			0.51	0.47	0.98

Site #11 PM Peak Hour Traffic Counts
76 Dwelling Units with a Swinging Gate

TIME	NO. TRIPS IN	NO. TRIPS OUT	HOURLY TRIPS IN	HOURLY TRIPS OUT	HOURLY TOTAL TRIPS
4:15 PM	7	12			
4:30 PM	8	3			
4:45 PM	6	7			
5:00 PM	9	12	30	34	64
5:15 PM	9	11	32	33	65
5:30 PM	11	4	35	34	69
5:45 PM	9	8	38	35	73
6:00 PM	11	4	40	27	67
PEAK HOUR TRIP COUNT			38	35	73
PEAK HOUR TRIPS PER D.U.			0.50	0.46	0.96

Site #12 PM Peak Hour Traffic Counts
115 Dwelling Units with a Swinging Gate

TIME	NO. TRIPS IN	NO. TRIPS OUT	HOURLY TRIPS IN	HOURLY TRIPS OUT	HOURLY TOTAL TRIPS
4:15 PM	14	7			
4:30 PM	9	10			
4:45 PM	14	13			
5:00 PM	9	7	46	37	83
5:15 PM	9	10	41	40	81
5:30 PM	14	5	46	35	81
5:45 PM	15	10	47	32	79
6:00 PM	11	17	49	42	91
PEAK HOUR TRIP COUNT			49	42	91
PEAK HOUR TRIPS PER D.U.			0.43	0.37	0.79

Site #13 PM Peak Hour Traffic Counts
116 Dwelling Units with a Rolling Gate

TIME	NO. TRIPS IN	NO. TRIPS OUT	HOURLY TRIPS IN	HOURLY TRIPS OUT	HOURLY TOTAL TRIPS
4:15 PM	5	2			
4:30 PM	11	8			
4:45 PM	13	12			
5:00 PM	20	4	49	26	75
5:15 PM	10	9	54	33	87
5:30 PM	20	11	63	36	99
5:45 PM	13	11	63	35	98
6:00 PM	16	9	59	40	99
PEAK HOUR TRIP COUNT			59	40	99
PEAK HOUR TRIPS PER D.U.			0.37	0.25	0.62

Appendix K

Preliminary Hydrology and Hydraulics Report
Stevenson, Porto & Pierce, Inc.
December 13, 2022

PRELIMINARY
HYDROLOGY AND HYDRAULICS REPORT
TENTATIVE PARCEL MAP 38233

FOR

BEAUMONT LAND PARTNERS, LLC
16133 VENTURA BLVD. #633
ENCINO, CA. 91436

PREPARED BY

STEVENSON PORTO & PIERCE, INC.
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December 13, 2022

"SERVING THE DEVELOPMENT COMMUNITY SINCE 1985"

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A. PROJECT BACKGROUND AND DESCRIPTION

PURPOSE:

The purpose of this study is to analysis the hydrological characteristics of the Tentative Parcel Map 38233 and demonstrate that the flows leaving the site will not adversely affect the downstream storm drain facilities.

PROJECT DESTRIPTION:

The Xenia project proposes the development of 10.93-acres into apartments within the City of Beaumont and County of Riverside. The project is primarily accessed via Xenia Avenue, south of 8th Street. The project is surrounded by vacant, undeveloped land, and single-family residential lands. Per FEMA FIRM Panel 0812G, effective date 8/28/2008, the project is located within zone "X".

EXISTING DRAINAGE:

At present, the site is vacant and barren that is mostly comprised of bare soil with sparse vegetation. The site's topography generally slopes from north to south with no definitive historical concentrated drainage paths. Currently, the runoff that leaves the site flows through the neighboring properties along the south property line and eventually reaches the inlets along E 6th Street. These inlets connect to the City storm drain system within E 6th Street and proceeds eastward. The existing site consists of three tributaries (Area X1, X2, and X3) with a total area of 15.3 acres which includes the existing residential lots along the north property line. The runoff from the northern properties sheet flows onto the project with no discernable concentrated flow path towards the south to City storm drain system. Please refer to Appendix VIII for the Pre-Developed Hydrology Key Map.

PROPOSED DRAINAGE DESIGN CONCEPT:

This study consists of three drainage areas (Areas D1, D2, and D3) totaling 15.3 acres for the proposed condition which includes onsite storm drain inlets, storm drain pipeline, and a stormwater treatment basin. Areas D1 and D3 consist of areas that drain away from the project due to the grading improvements. The developed drainage area includes the offsite runoff from the properties along the north property line. The proposed developed will continue to accept and intercept the offsite run on via an interception channel and onsite inlets. The runon will comingle with the onsite runoff and diverted to the onsite detention basin. The stormwater treatment basin (Basin "A") is designed to mitigate the net total (Areas D1, D2, and D3) post-developed peak runoff to within 110% of the pre-developed peak 100-year runoff via a combination of detention and a restricted outlet structure. The treated runoff from the basin is conveyed to the proposed extension of a 30" storm drain to the existing City storm drain line at the intersection of Xenia and E 6th Street. Please refer to Appendix VIII for the Developed Hydrology Key Map.

Treatment of first flush waters from the development will be accomplished by routing them through the proposed water quality basins for each drainage area. These treatment proposals will be consistent with *Riverside County Stormwater Quality Best Management Practice Design Handbook*. Basin BMP worksheets are included for each basin in Appendix VI.

DESIGN ASSUMPTIONS:

- Soil type was based on R.C.F.C. & W.C.D. Hydrologic Soils Group Map for Beaumont (Plate C-1.19)
- Antecedent moisture condition AMC 2 (moderately moist) was used for all storm events
- Rainfall data for the project was obtained from R.C.F.C. & W.C.D. Precipitation Maps (Plates D-4.3 & D-4.4)

B. HYDROLOGICAL & HYDRAULIC METHODOLOGY

Hydrology for this study is based upon *Riverside County Flood Control and Water Conservation District Hydrology Manual*, dated April 1978. Software designed by *CivilDESIGN* of San Bernardino was used to solve the drainage models of the site. The output is printed in the Standard Riverside County format.

1. Rainfall
   The computer stores a rainfall database corresponding to Plate D-4.1 that provides all the required time vs. intensity data for Riverside County.

2. Infiltration
   Soil type was based on RCFC. & W.C.D. Hydraulic Soils Group Map. The computer then uses Plates D-5.1 through D-5.8 as applicable.

3. Runoff and Routing
   After the "C" value is determined, the computer determines the runoff and routes the flood downstream based on the input model and Plates D-7 through D-9 as necessary.

Table 1: 100-Year Rational Method Summary

	Pre-Developed				Post Developed			
Model	**X1**	**X2**	**X3**	**Total**	**D1**	**D2**	**D3**	**Total**
Acreage	3.81	10.08	1.41	15.30	0.27	14.83	0.14	15.30
T_C	10.20 min.	13.41 min.	9.77 min.	13.41 min.	7.525 min.	15.89 min.	19.44 min.	19.44 min.
Q_{100}	10.1 cfs	24.2 cfs	3.9 cfs	*36.2 cfs	0.9 cfs	35.6 cfs	0.2 cfs	*36.7 cfs
RI	71.8	72.2	64.9	**71.43	56.0	56.2	61.0	**56.02
A_p	0.858	0.869	0.702	**0.851	0.200	0.290	1.000	**0.294

* Total pre-developed runoff flow rate was determined by combining the total runoff from each area and adjusted by the ratio of the rainfall intensities of each model.

** The total runoff index and average pervious area were determined by weighted averages of the individual tributary areas proportionally to the sum of the tributary areas.

SYNTHETIC UNIT HYDROGRAPH METHOD:

The Synthetic Unit Hydrograph, a computational procedure for developing peak runoff and discharge for storms of a specified recurrence interval, was used to evaluate our detention needs onsite. This procedure calculates effective rainfall, which is the portion of the total rainfall that appears as surface runoff, at a specific concentration point. Precipitation data for the project location was taken from R.C.F.C. & W.C.D. Precipitation Maps and are provided in Appendix I of this report.

The 100-year storm frequencies for each of the 1-, 3-, 6-, and 24-hour durations were analyzed for increased volume mitigation. The hydrographs and basin routing for the 2-and 100-year storm events are included to show that the basins passed the 100-year storm with sufficient capacity and 2-year, 24-hour hydromodification peak flow mitigation.

The following assumptions/guidelines were applied in the use to the Synthetic Unit Hydrograph Method:

- The 2-, 10-, and 100-Year point rainfall depths at 1-, 3-, 6-, and 24-hour durations were estimated from the R.C.F.C. & W.C.D. Precipitation Maps.
- Lag times used for the development of the synthetic unit hydrograph were generated based on the size and shape of the sub basin. The watershed sub area lag times were calculated according to the lag time equation as indicated in the RCFC&WCD Hydrology Manual.
- The basin factor (n-value) was estimated based on filed investigations and existing and planned development.
- The Valley S-curve graph was used for this project site. The 1-, 3-, 6-, and 24-hour 5-minute interval data was used.
- An area averaged infiltration rate was calculated based on hydrologic soil type, vegetative cover land use and impervious percentage. The "low loss rate" function was then incorporated. The RCFC&WCD Hydrology Manual's synthetic unit hydrograph method includes a "low loss rate" function when calculating effective rainfall (i.e. total rain minus infiltration).

Table 2: Unit Hydrograph Summary

	Pre-Developed		**Post Developed**	
	Peak Runoff (cfs)	**Volume (cu-ft)**	**Peak Runoff (cfs)**	**Volume (cu-ft)**
Tributary Area	15.3 ac.		15.3 ac.	
2-Year; 24-Hour	1.2	30,821	3.5	92,723
100-Year; 1-Hour	42.7	62,041	43.5	64,107
100-Year; 3-Hour	26.1	92,980	26.4	99,749
100-Year; 6-Hour	23.9	116,598	24.5	132,820
100-Year; 24-Hour	11.6	215,246	12.1	276,728

The synthetic Unit Hydrograph Method outlined in the RCFC&WCD Hydrology Manual was used to develop runoff hydrographs using "CIVILDESIGN" Engineering Software. This software was also used to route the unit hydrographs through the proposed detention basin onsite.

The following assumptions/guidelines were made in the use of Reservoir Routing:

- The Modified Puls (Storage Indication) Method is used for the detention basin routing studies. The basin routing relationships are based upon the following formula:

  $I - O = \Delta S/\Delta t$

  I = Basin inflow rate (cfs)

  O = Basin outflow rate (cfs)

  ΔS = Change in basin storage during the time step (cubic feet)

  Δt = time step (sec)

- The basin inflow rates are based on the unit hydrograph files (See Appendix D)
- Depth-Storage-Discharge curve is based on Basin Volume worksheet and Stage Discharge Rating Table (See Appendix D)
- The procedure is repeated for each time step until the basin inflow hydrograph has been completely analyzed and the basin outflow becomes negligible.

Table 3: Extended Detention Basin "A" Routing Summary

Storm Event	2-Year	100-Year			
	24-hr	1-hr	3-hr	6-hr	24-hr
Existing Peak Flow (cfs)	1.2	42.7	26.1	23.9	11.6
Developed Peak Flow (cfs)	3.5	43.5	26.4	24.5	12.1
Peak Basin Discharge (cfs)	1.3	7.3	25.2	23.2	12.0
Percent Difference	6%	-83%	-3%	-3%	4%
Maximum Basin Depth (ft.)	5.3	5.6	6.0	5.9	5.7
Maximum Water Surface Elev.	2603.8	2604.1	2604.5	2604.4	2604.2
Freeboard (ft.)	1.2	0.9	0.5	0.6	0.8
Drawdown Time (hr)	29.0	11.1	12.9	15.8	30.1

CONCLUSION:

The proposed site development greatly increases the impervious fraction for the drainage areas which results in an increased peak runoff rate to the existing drainage system and creek. By implementing the proposed drainage improvements and BMP basins, the increased runoff is mitigated and reduced to below the existing peak runoff rate. These drainage improvements will also satisfy the drainage protection and treatment requirements for Riverside County.

Riverside County Flood Control & Water Conservation District Plates.....I

- Hydrological Soils Group Map (Plate C-1.43)
- R.C.F.C. & W.C.D. Precipitation Maps
- Slope of Intensity Duration Curve (Plate D-4.6)

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations tables in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations tables should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) zone 11. The **horizontal datum** was NAD 83, GRS80 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from U.S. Geological Survey Digital Orthophoto Quadrangles produced at a scale of 1:12,000 from photography dated 1994 or later.

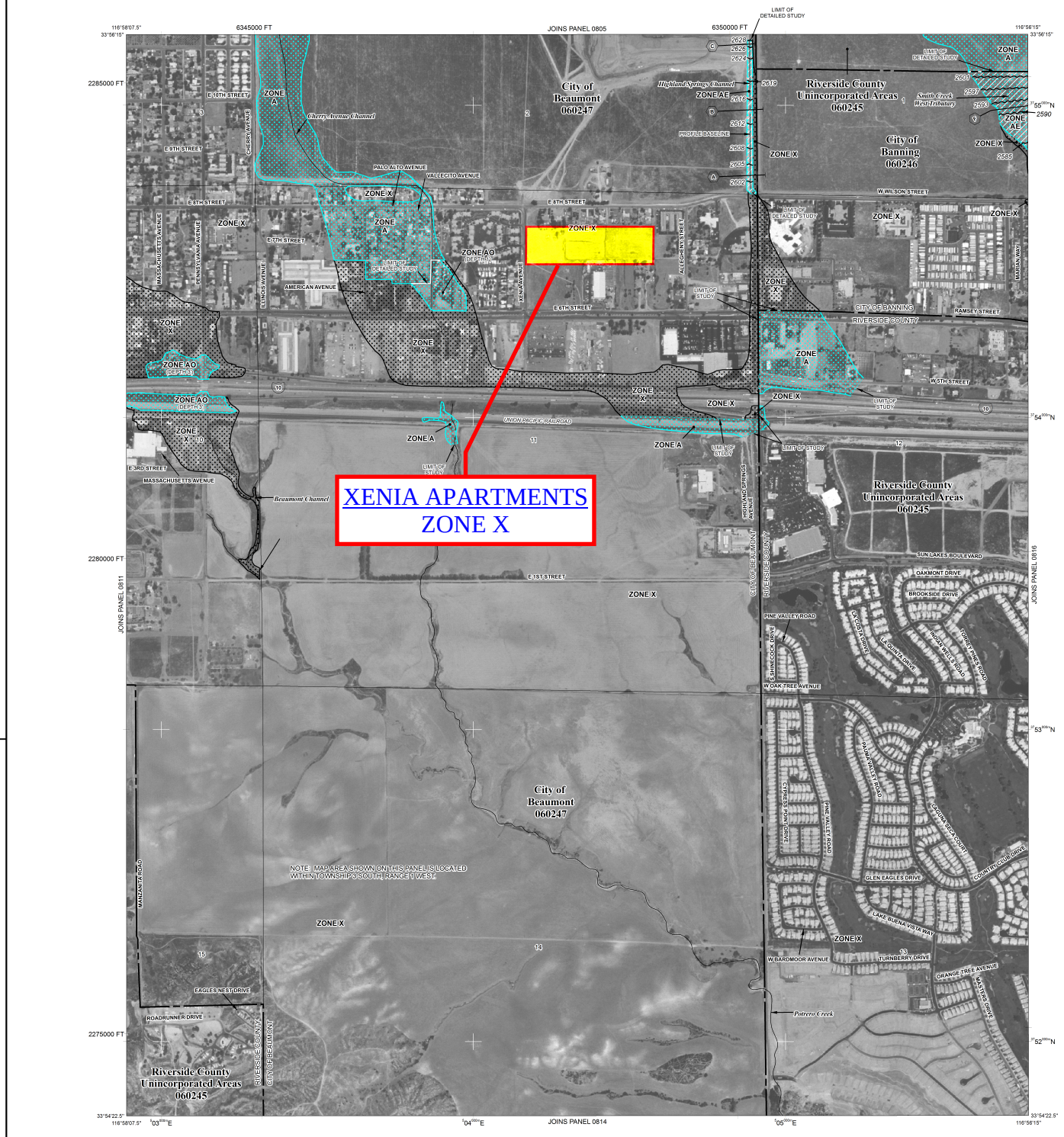
This map may reflect more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study report, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and its website at http://msc.fema.gov.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov.



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% annual chance floodplain boundary

0.2% annual chance floodplain boundary

Floodway boundary

Zone D boundary

CBRS and OPA boundary

Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.

513 — Base Flood Elevation line and value; elevation in feet*

(EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988

A — A — Cross section line

23 — 23 — Transect line

87°07'45", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere

2476000mN — 1000-meter Universal Transverse Mercator grid values, zone 11N

600000 FT — 5000-foot grid ticks: California State Plane coordinate system, zone VI (FIPSZONE 0406), Lambert Conformal Conic projection

DX5510 × — Bench mark (see explanation in Notes to Users section of this FIRM panel)

● M1.5 — River Mile

MAP REPOSITORY
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
August 28, 2008

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET

150 0 150 300 METERS

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0812G

FIRM

FLOOD INSURANCE RATE MAP

RIVERSIDE COUNTY, CALIFORNIA AND INCORPORATED AREAS

PANEL 812 OF 3805

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

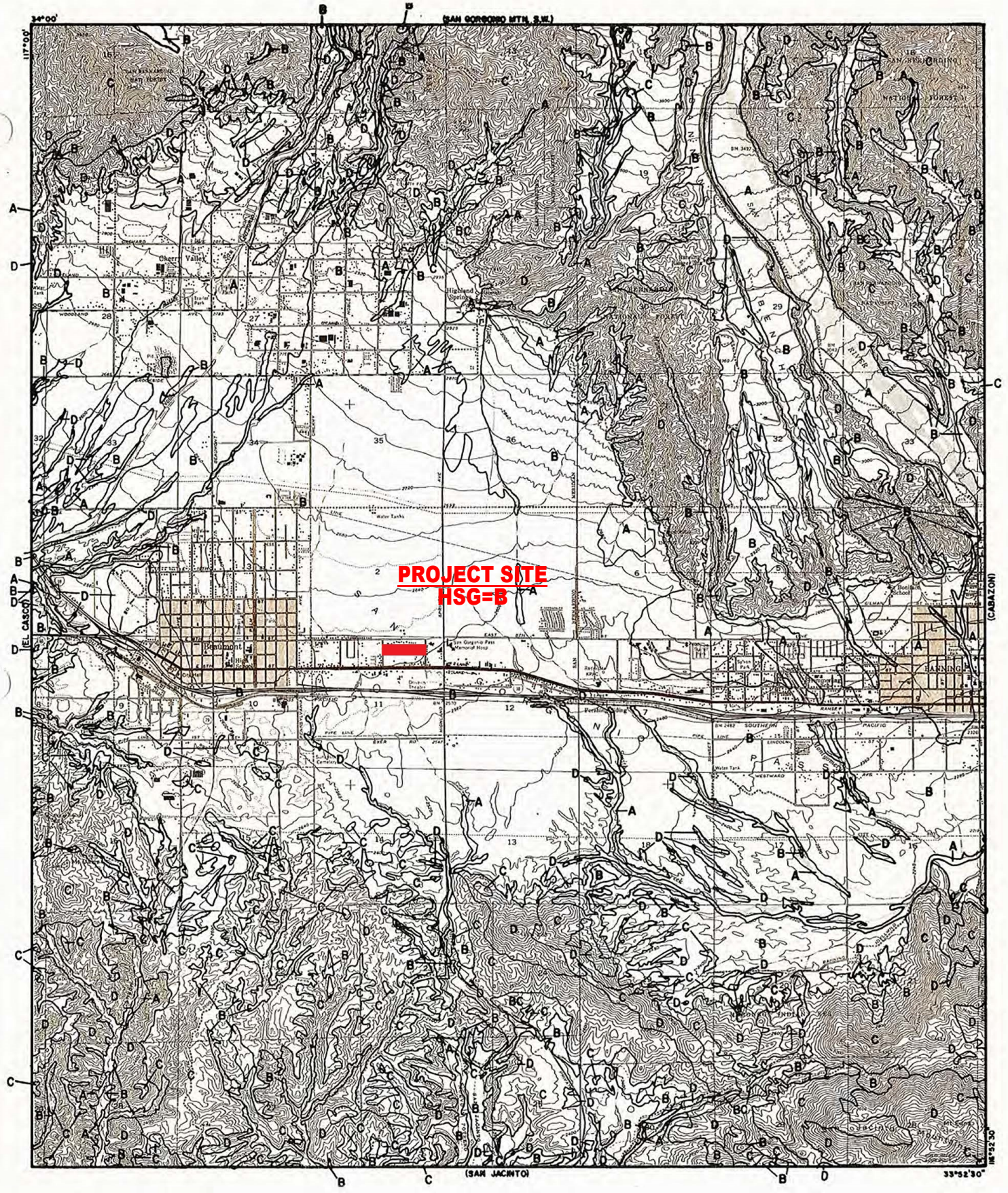
COMMUNITY	NUMBER	PANEL	SUFFIX
BANNING, CITY OF	060246	0812	G
BEAUMONT, CITY OF	060247	0812	G
RIVERSIDE COUNTY	060245	0812	G

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
06065C0812G

EFFECTIVE DATE
AUGUST 28, 2008

Federal Emergency Management Agency



LEGEND

—— SOILS GROUP BOUNDARY

A SOILS GROUP DESIGNATION

RCFC&WCD

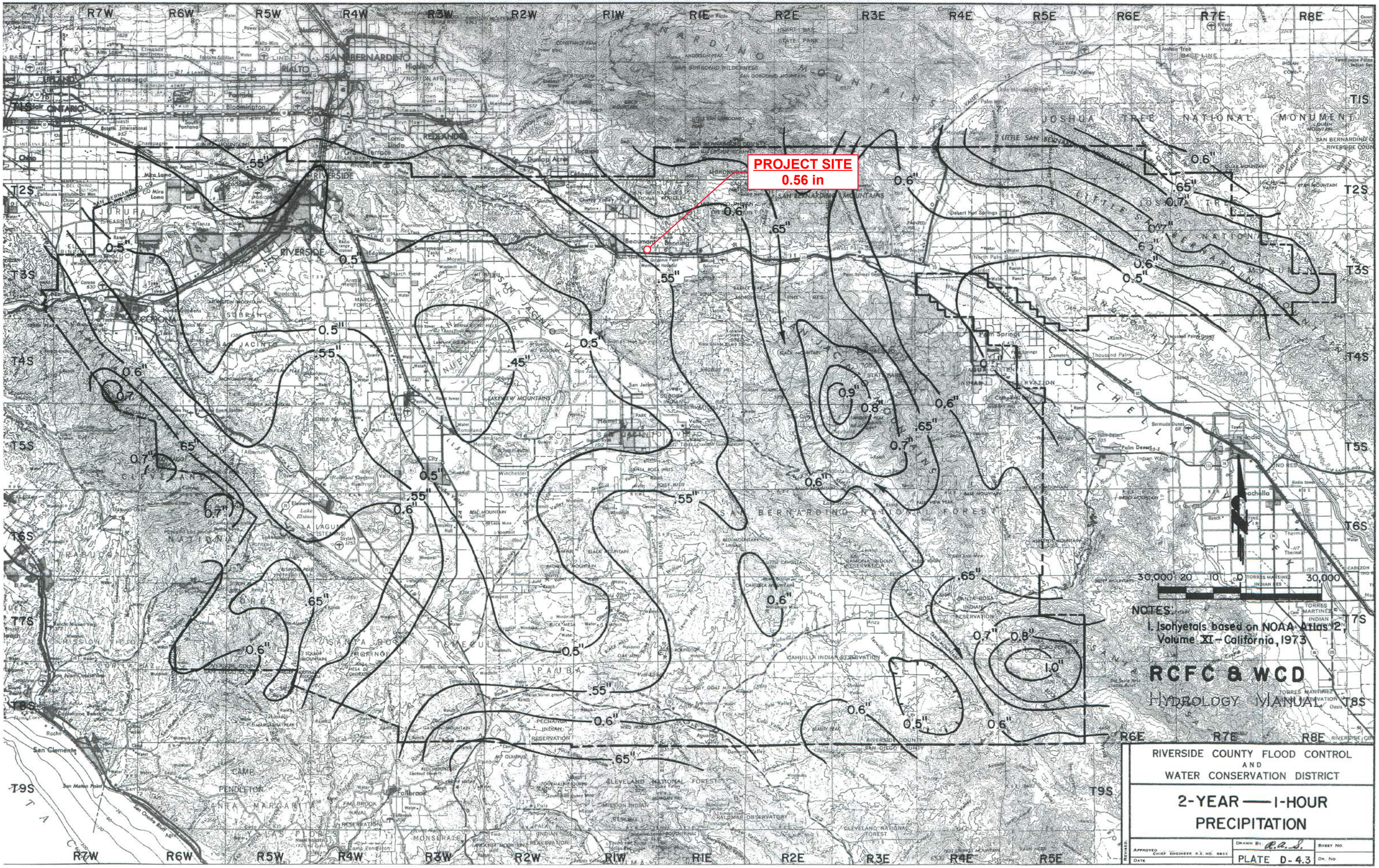
HYDROLOGY MANUAL

N

0 FEET 5000

HYDROLOGIC SOILS GROUP MAP FOR BEAUMONT

PLATE C-1.19



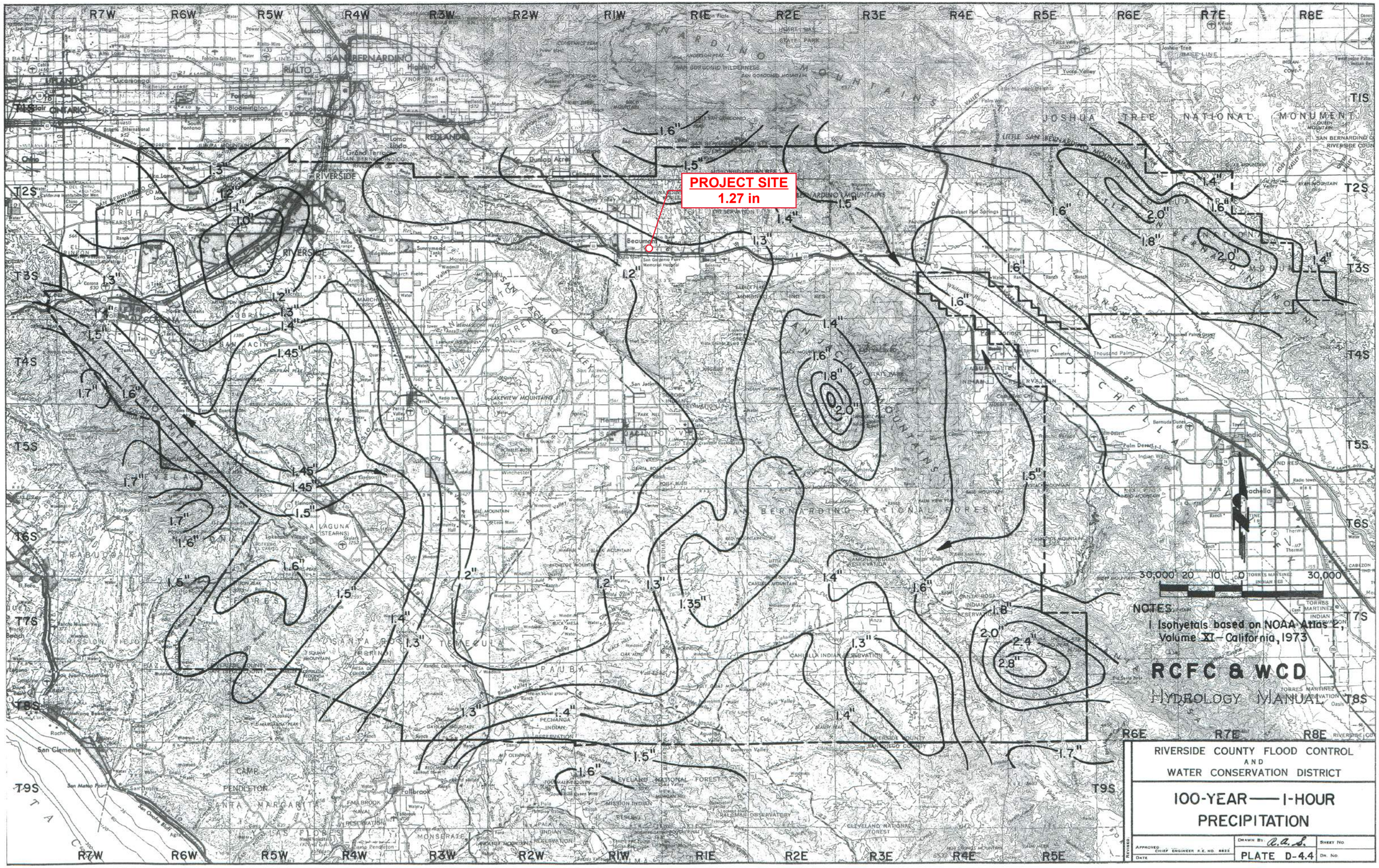
NOTES:
1. Isohyetals based on NOAA Atlas 2, Volume XI – California, 1973

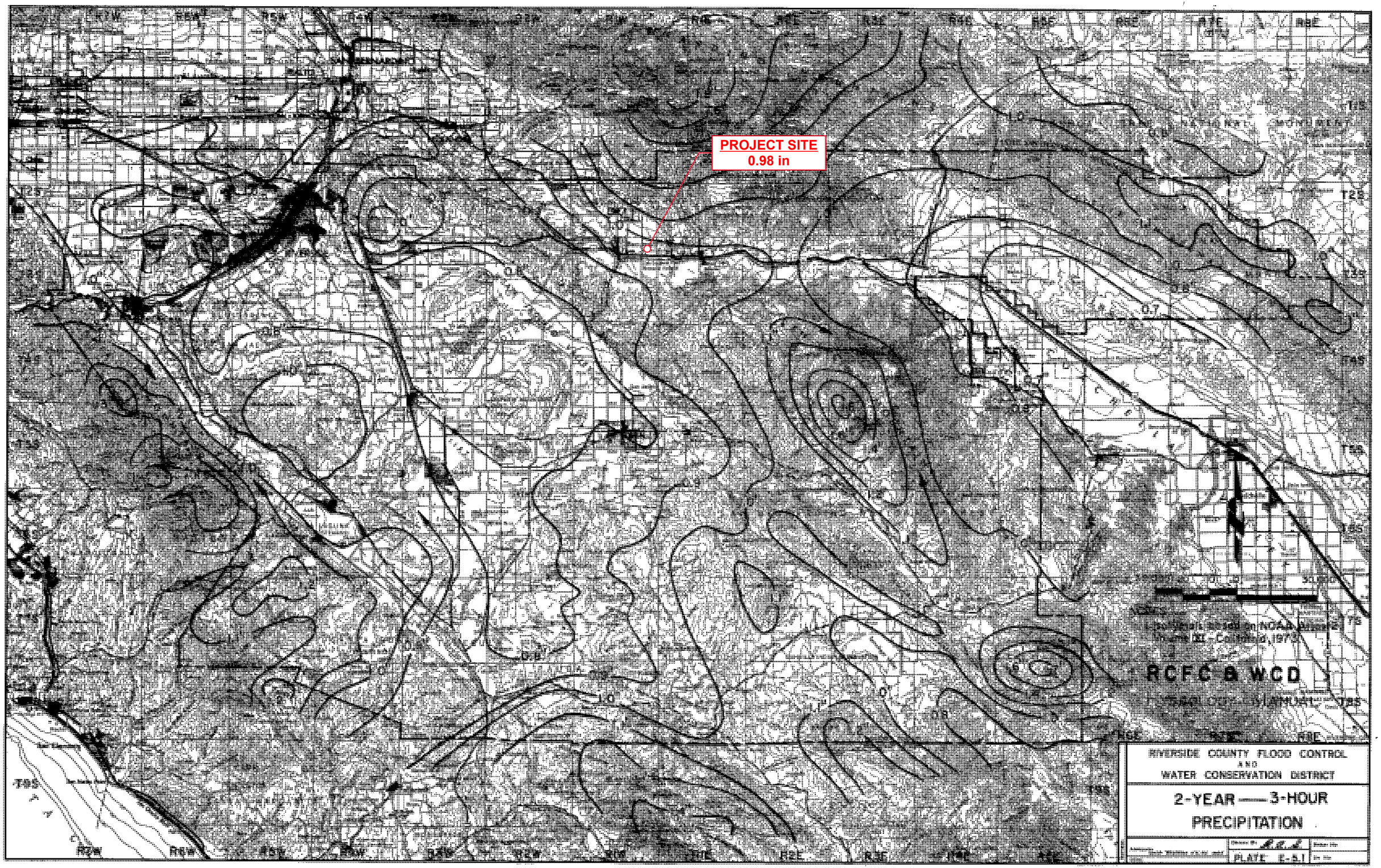
RCFC & WCD
HYDROLOGY MANUAL

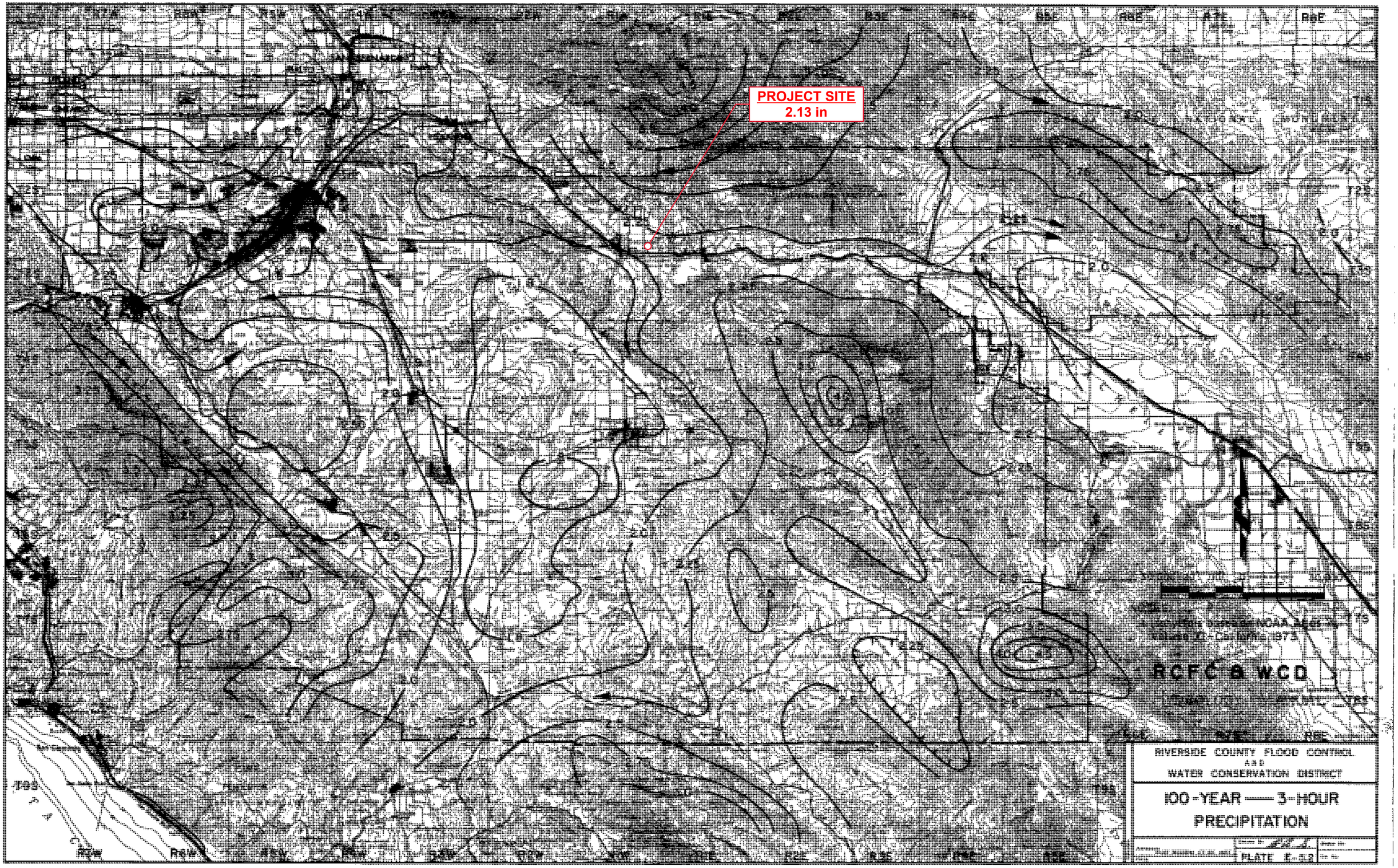
RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

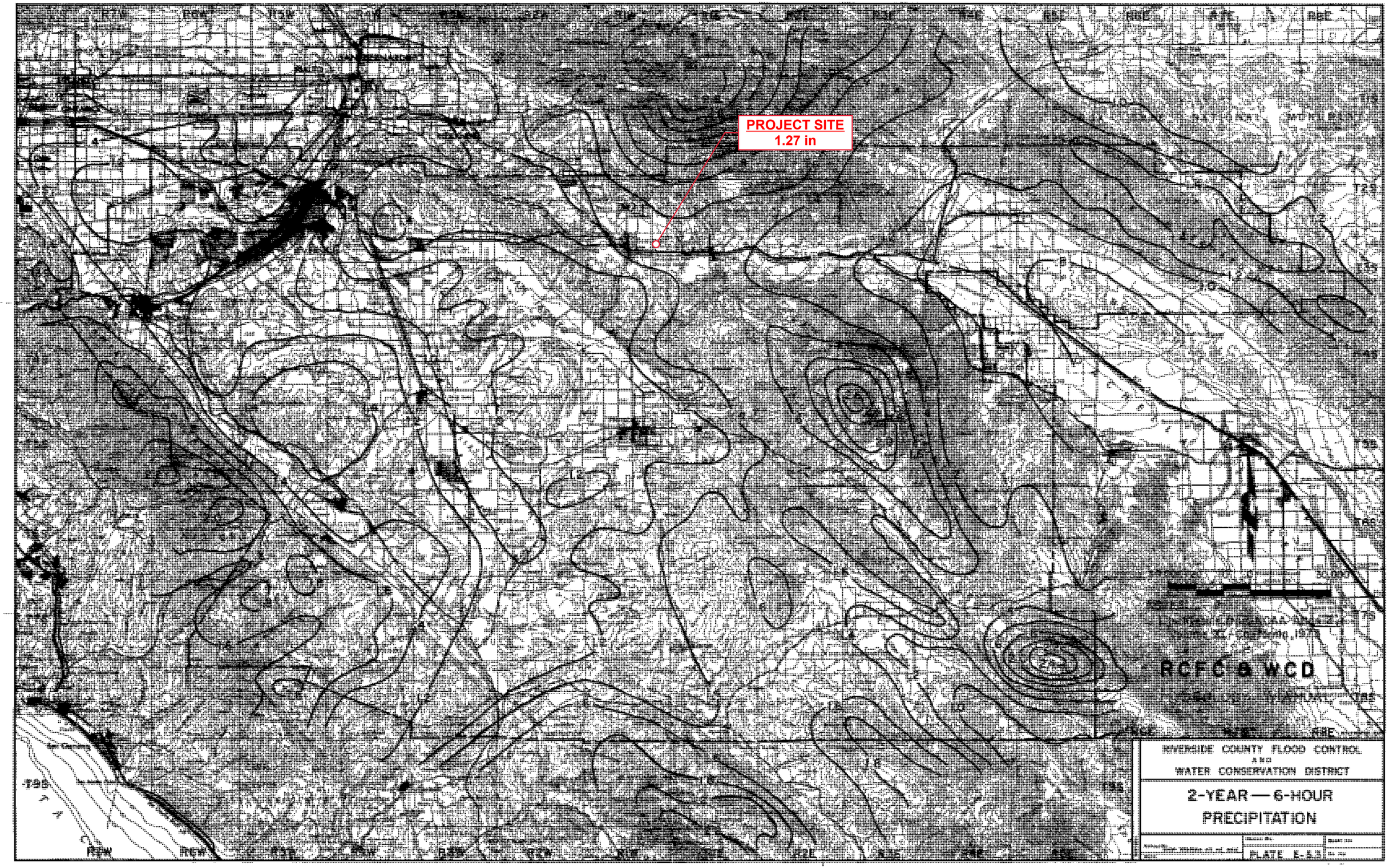
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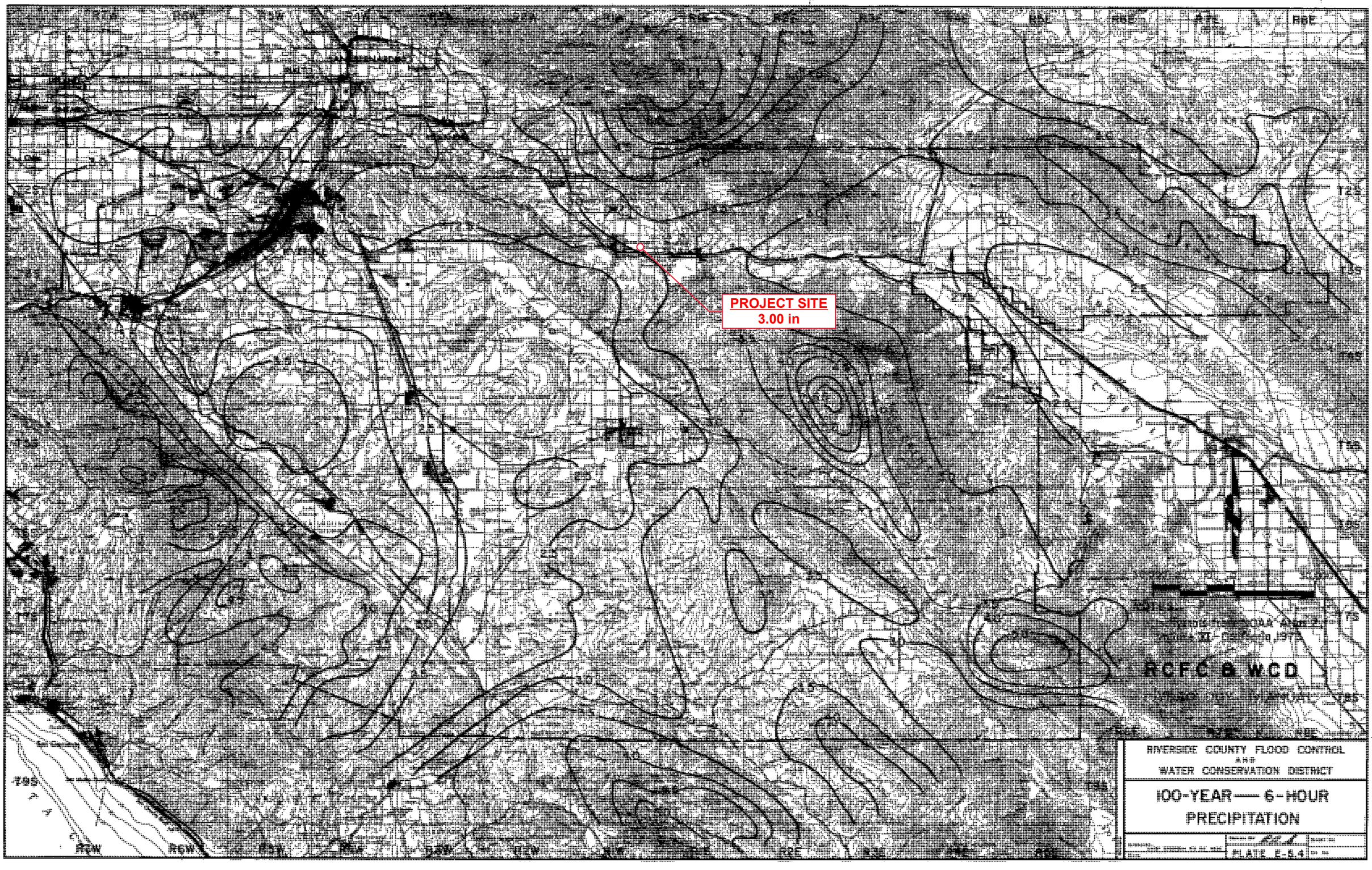
APPROVED CHIEF ENGINEER R.E. NO. 6822	DRAWN BY: R.A.S.	SHEET NO.
DATE	PLATE D-4.3	DR. NO.
REVISED		

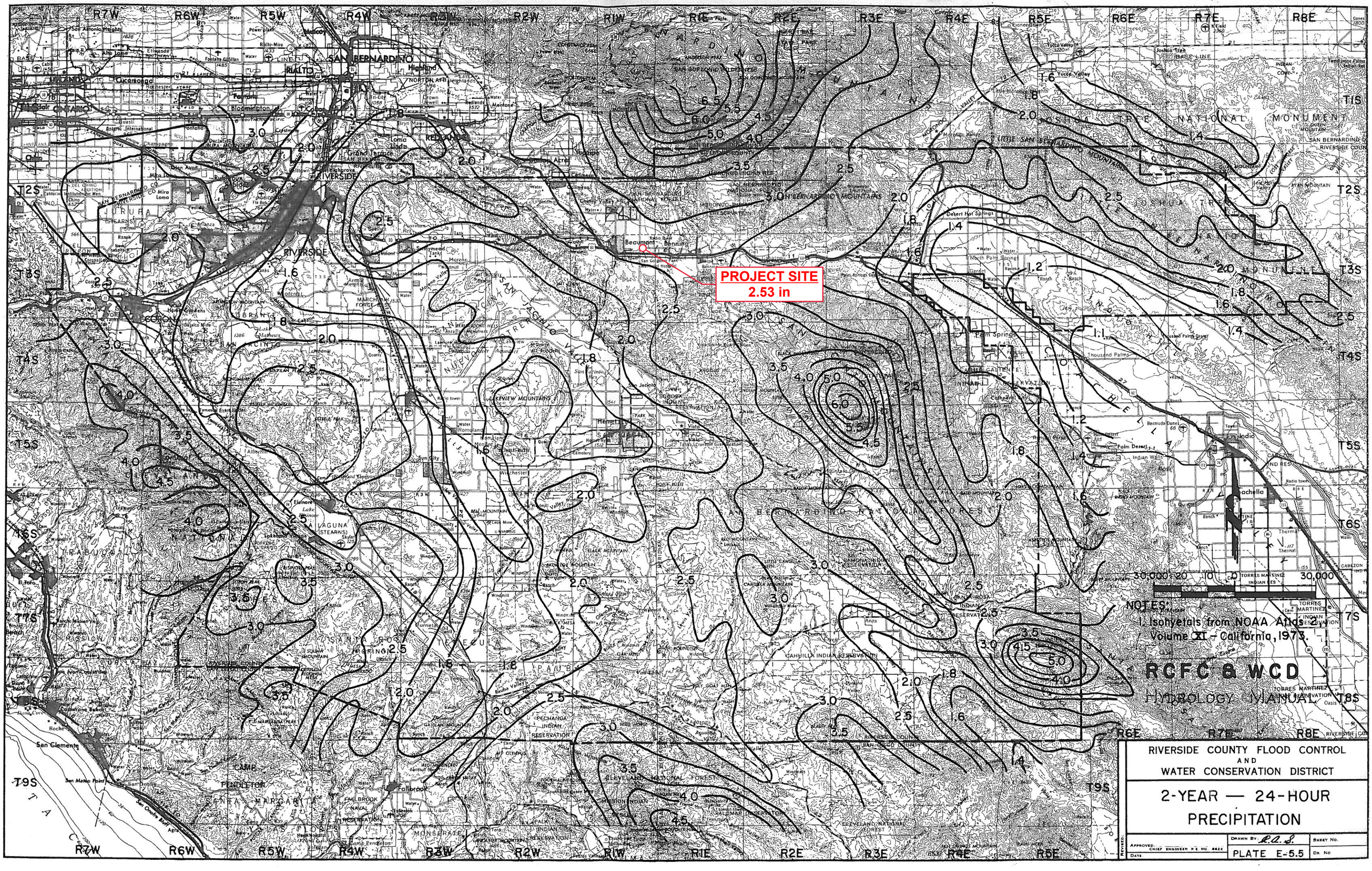

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R7W
R6W
R5W
R4W
R3W
R2W
R1W
R1E
R2E
R3E
R4E
R5E
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R7E
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T1S
T2S
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T4S
T5S
T6S
T7S
T8S
T9S
SAN BERNARDINO MOUNTAINS
JOSHUA TREE NATIONAL MONUMENT
SAN BERNARDINO NATIONAL FOREST
CLEVELAND NATIONAL FOREST
SANTA ROSA MOUNTAINS
SAN JACINTO MOUNTAINS
SAN JACINTO VALLEY
SANTA MARGARITA
SAN LUIS REY
SAN JACINTO
TEMECULA
PAUBA
SAN GORGONIO WILDERNESS
SAN GORGONIO MOUNTAIN
SAN JACINTO PEAK
SAN JACINTO WILDERNESS
SAN JACINTO STATE PARK
SAN BERNARDINO
RIALTO
REDLANDS
RIVERSIDE
BEAUMONT
HEMET
PERRIS
CORONA
ONTARIO
UPLAND
CHINO
POMONA
NORTON AFB
MARCH FIELD
PALM SPRINGS
DESERT HOT SPRINGS
INDIO
COACHELLA
CABAZON
BANNING
MORENO
SUN CITY
MURRIETA
TEMECULA
FALLBROOK
VISTA
SAN CLEMENTE
CAMP PENDLETON
1.6"
1.5"
1.4"
1.3"
1.2"
1.1"
1.0"
1.45"
1.7"
2.0"
1.8"
2.4"
2.8"
1.35"
2"
NOTES
1. Isohyetals based on NOAA Atlas 2, Volume XI – California, 1973
30,000 20 10 0 30,000
RCFC & WCD
HYDROLOGY MANUAL
RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
100-YEAR — 1-HOUR PRECIPITATION
DRAWN BY R.A.S.
SHEET NO
PLATE D-4.4
APPROVED CHIEF ENGINEER R.E. NO. 6822
DATE
DR. NO.
REVISED

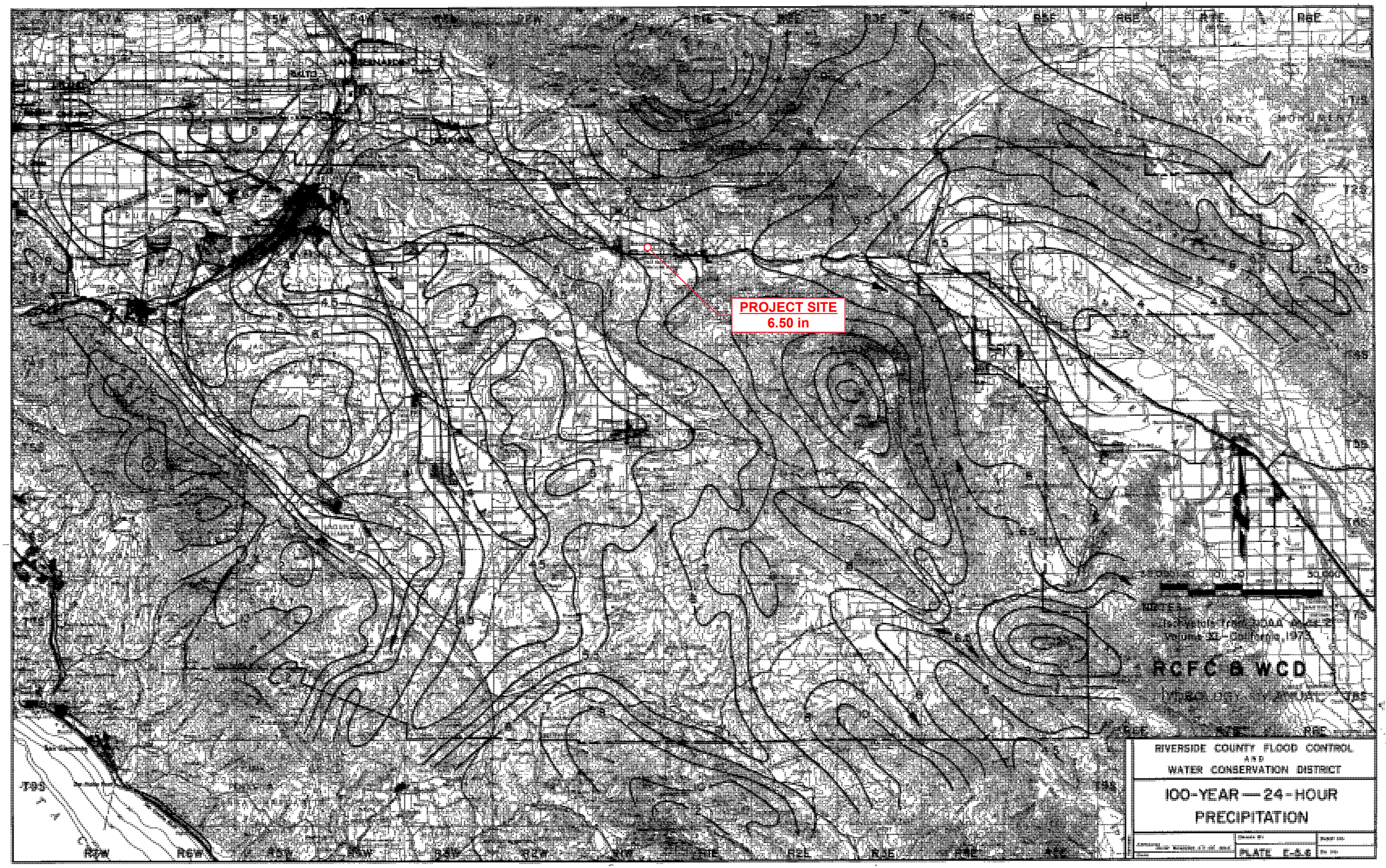

PROJECT SITE
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RCFC & WCD
RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT
2-YEAR — 3-HOUR
PRECIPITATION
PLATE E-5.1

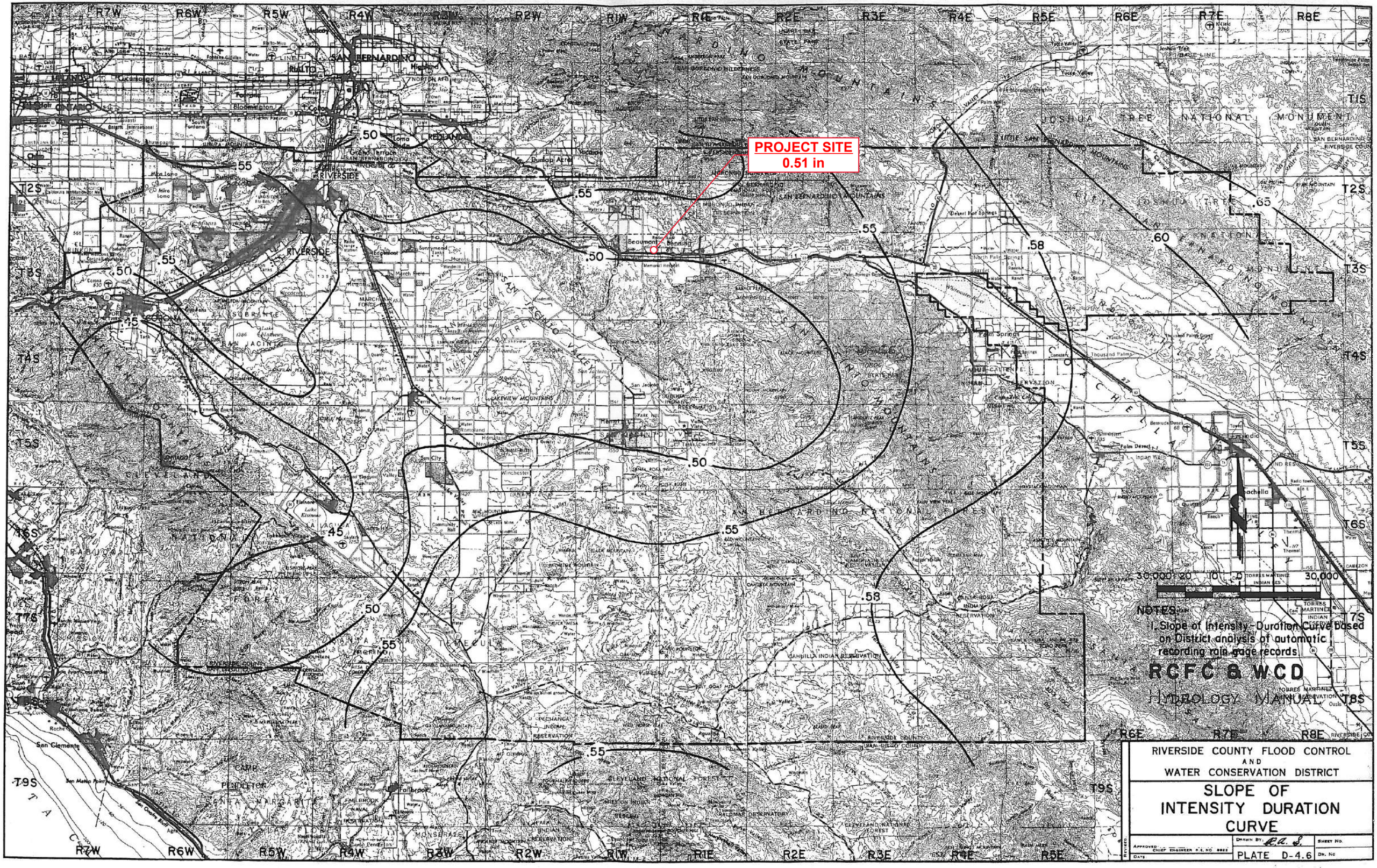

PROJECT SITE
2.13 in
RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT
100-YEAR — 3-HOUR
PRECIPITATION
PLATE E-5.2
RCFC & WCD


PROJECT SITE
1.27 in
RCFC & WCD
RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT
2-YEAR — 6-HOUR
PRECIPITATION
PLATE E-5.3


PROJECT SITE
3.00 in
NOTES:
RCFC & WCD
RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT
100-YEAR — 6-HOUR
PRECIPITATION
PLATE E-5.4


PROJECT SITE
2.53 in
NOTES:
1. Isohyetals from NOAA Atlas 2, Volume XI - California, 1973.
RCFC & WCD
HYDROLOGY MANUAL
RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
2-YEAR — 24-HOUR PRECIPITATION
PLATE E-5.5
SAN BERNARDINO NATIONAL FOREST
SAN JACINTO MOUNTAINS
SANTA ROSA MOUNTAINS
JOSHUA TREE NATIONAL MONUMENT
CLEVELAND NATIONAL FOREST
SANTA MARGARITA
SAN LUIS REY
TEMECULA
PAUBA
MURRIETA
PECHANGA INDIAN RESERVATION
AGUANGA
CAHUILLA INDIAN RESERVATION
SOBOBA INDIAN RESERVATION
SAN JACINTO WILDLIFE AREA
SAN JACINTO RIVER
SANTA ANA RIVER
SANTA MARGARITA RIVER
TEMECULA CREEK
PALOMAR MOUNTAIN
SAN ONOFRE MOUNTAIN
SAN MATEO POINT
SAN CLEMENTE
CAMP PENDLETON
FALLBROOK NAVAL WEAPONS STATION
MARCH AIR FORCE BASE
NORTON AFB
RIVERSIDE
SAN BERNARDINO
RIALTO
COLTON
REDLANDS
HIGHLAND
LOMA LINDA
GRAND TERRACE
MENTONE
BLOOMINGTON
CRESTMORE
JURUPA
RUBIDOUX
MIRA LOMA
ARLANZA
EL CERRITO
WOODCREST
MORENO VALLEY
SUNNYMEAD
HEMET
SAN JACINTO
SUN CITY
WINCHESTER
ELSINORE
LAKE ELSINORE
LAGUNA (STEARNS)
WILDOMAR
MURRIETA
TEMECULA
FALLBROOK
VISTA
ESCONDIDO
RANCHO CALIFORNIA
CORONA
NORCO
EL TORO
MISSION VIEJO
LAKE FOREST
ALISO CREEK
CANYON LAKE
LAKE MATHEWS
LAKE PERRIS
LAKE SKINNER
LAKE HENSHAW
LAKE WOHLFORD
LAKE CAHUILLA
LAKE TAMARISK
LAKE CATHEDRAL CITY
LAKE DESERT SPRINGS
LAKE PALM SPRINGS
LAKE INDIO
LAKE THERMAL
LAKE MECCA
LAKE OASIS
LAKE TORRES MARTINEZ
LAKE INDIAN WELLS
LAKE PALM DESERT
LAKE BERMUDA DUNES
LAKE THOUSAND PALMS
LAKE RANCHO MIRAGE
LAKE PALM SPRINGS
LAKE DESERT HOT SPRINGS
LAKE YUCCA VALLEY
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LAKE TWENTYNINE PALMS
LAKE JOSHUA TREE NATIONAL MONUMENT
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LAKE SAN JACINTO
LAKE SUN CITY
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LAKE LAKE LAKE WINCHESTER
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PROJECT SITE
6.50 in
RCFC & WCD
RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT
100-YEAR — 24-HOUR
PRECIPITATION
PLATE E-6.6


PROJECT SITE
0.51 in
.45
.50
.55
.58
.60
.63
NOTES:
1. Slope of Intensity-Duration Curve based on District analysis of automatic recording rain gage records
RCFC & WCD
HYDROLOGY MANUAL
RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
SLOPE OF INTENSITY DURATION CURVE
PLATE D-4.6

Pre-Developed Hydrology Models II

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2018 Version 9.0
Rational Hydrology Study Date: 09/16/22 File:X1.out

XENIA
PRELIMINARY HYDROLOGY ANALYSIS
AREA X1 PRESENT CONDITION
100-YEAR

********* Hydrology Study Control Information **********

English (in-lb) Units used in input data file

Program License Serial Number 6545

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 100.00 Antecedent Moisture Condition = 2

2 year, 1 hour precipitation = 0.570(In.)
100 year, 1 hour precipitation = 1.270(In.)

Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity = 1.270(In/Hr)
Slope of intensity duration curve = 0.5100

++

Process from Point/Station 10.000 to Point/Station 10.010
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 174.000(Ft.)
Top (of initial area) elevation = 2608.100(Ft.)
Bottom (of initial area) elevation = 2606.400(Ft.)
Difference in elevation = 1.700(Ft.)
Slope = 0.00977 s(percent)= 0.98
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 7.750 min.
Rainfall intensity = 3.607(In/Hr) for a 100.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.799
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 56.00
Pervious area fraction = 0.500; Impervious fraction = 0.500
Initial subarea runoff = 3.111(CFS)
Total initial stream area = 1.080(Ac.)
Pervious area fraction = 0.500

++

Process from Point/Station 10.010 to Point/Station 10.020

**** NATURAL CHANNEL TIME + SUBAREA FLOW ADDITION ****

Top of natural channel elevation = 2606.400(Ft.)
End of natural channel elevation = 2601.100(Ft.)
Length of natural channel = 392.000(Ft.)
Estimated mean flow rate at midpoint of channel = 7.043(CFS)

Natural valley channel type used
L.A. County flood control district formula for channel velocity:
Velocity(ft/s) = (7 + 8(q(English Units)^.352)(slope^0.5)
Velocity using mean channel flow = 2.66(Ft/s)

Correction to map slope used on extremely rugged channels with
drops and waterfalls (Plate D-6.2)
Normal channel slope = 0.0135
Corrected/adjusted channel slope = 0.0135
Travel time = 2.45 min. TC = 10.20 min.

Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.804
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 78.00
Pervious area fraction = 1.000; Impervious fraction = 0.000
Rainfall intensity = 3.135(In/Hr) for a 100.0 year storm
Subarea runoff = 6.877(CFS) for 2.730(Ac.)
Total runoff = 9.988(CFS) Total area = 3.810(Ac.)
End of computations, total study area = 3.81 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.858
Area averaged RI index number = 71.8

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2018 Version 9.0
Rational Hydrology Study Date: 09/16/22 File:X2.out

XENIA
PRELIMINARY HYDROLOGY ANALYSIS
AREA X2 PRESENT CONDITION
100-YEAR

********* Hydrology Study Control Information **********

English (in-lb) Units used in input data file

Program License Serial Number 6545

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 100.00 Antecedent Moisture Condition = 2

2 year, 1 hour precipitation = 0.570(In.)
100 year, 1 hour precipitation = 1.270(In.)

Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity = 1.270(In/Hr)
Slope of intensity duration curve = 0.5100

++

Process from Point/Station 20.000 to Point/Station 20.010
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 155.000(Ft.)
Top (of initial area) elevation = 2608.400(Ft.)
Bottom (of initial area) elevation = 2606.200(Ft.)
Difference in elevation = 2.200(Ft.)
Slope = 0.01419 s(percent)= 1.42
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 6.867 min.
Rainfall intensity = 3.836(In/Hr) for a 100.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.803
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 56.00
Pervious area fraction = 0.500; Impervious fraction = 0.500
Initial subarea runoff = 8.137(CFS)
Total initial stream area = 2.640(Ac.)
Pervious area fraction = 0.500

++

Process from Point/Station 20.010 to Point/Station 20.020

**** NATURAL CHANNEL TIME + SUBAREA FLOW ADDITION ****

Top of natural channel elevation = 2606.200(Ft.)
End of natural channel elevation = 2599.700(Ft.)
Length of natural channel = 962.000(Ft.)
Estimated mean flow rate at midpoint of channel = 19.603(CFS)

Natural valley channel type used
L.A. County flood control district formula for channel velocity:
Velocity(ft/s) = (7 + 8(q(English Units)^.352)(slope^0.5)
Velocity using mean channel flow = 2.45(Ft/s)

Correction to map slope used on extremely rugged channels with
drops and waterfalls (Plate D-6.2)
Normal channel slope = 0.0068
Corrected/adjusted channel slope = 0.0068
Travel time = 6.54 min. TC = 13.41 min.

Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.791
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 78.00
Pervious area fraction = 1.000; Impervious fraction = 0.000
Rainfall intensity = 2.727(In/Hr) for a 100.0 year storm
Subarea runoff = 16.045(CFS) for 7.440(Ac.)
Total runoff = 24.182(CFS) Total area = 10.080(Ac.)
End of computations, total study area = 10.08 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.869
Area averaged RI index number = 72.2

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2018 Version 9.0
Rational Hydrology Study Date: 09/16/22 File:X3.out

XENIA
PRELIMINARY HYDROLOGY ANALYSIS
AREA X3 PRESENT CONDITION
100-YEAR

********* Hydrology Study Control Information **********

English (in-lb) Units used in input data file

Program License Serial Number 6545

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 100.00 Antecedent Moisture Condition = 2

2 year, 1 hour precipitation = 0.570(In.)
100 year, 1 hour precipitation = 1.270(In.)

Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity = 1.270(In/Hr)
Slope of intensity duration curve = 0.5100

++

Process from Point/Station 30.000 to Point/Station 30.010
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 224.000(Ft.)
Top (of initial area) elevation = 2606.000(Ft.)
Bottom (of initial area) elevation = 2602.400(Ft.)
Difference in elevation = 3.600(Ft.)
Slope = 0.01607 s(percent)= 1.61
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 7.762 min.
Rainfall intensity = 3.604(In/Hr) for a 100.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.799
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 56.00
Pervious area fraction = 0.500; Impervious fraction = 0.500
Initial subarea runoff = 2.418(CFS)
Total initial stream area = 0.840(Ac.)
Pervious area fraction = 0.500

++

Process from Point/Station 30.010 to Point/Station 30.020

**** NATURAL CHANNEL TIME + SUBAREA FLOW ADDITION ****

Top of natural channel elevation = 2602.400(Ft.)
End of natural channel elevation = 2600.300(Ft.)
Length of natural channel = 223.000(Ft.)
Estimated mean flow rate at midpoint of channel = 3.238(CFS)

Natural valley channel type used
L.A. County flood control district formula for channel velocity:
Velocity(ft/s) = (7 + 8(q(English Units)^.352)(slope^0.5)
Velocity using mean channel flow = 1.85(Ft/s)

Correction to map slope used on extremely rugged channels with
drops and waterfalls (Plate D-6.2)
Normal channel slope = 0.0094
Corrected/adjusted channel slope = 0.0094
Travel time = 2.01 min. TC = 9.77 min.

Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.805
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 78.00
Pervious area fraction = 1.000; Impervious fraction = 0.000
Rainfall intensity = 3.205(In/Hr) for a 100.0 year storm
Subarea runoff = 1.472(CFS) for 0.570(Ac.)
Total runoff = 3.890(CFS) Total area = 1.410(Ac.)
End of computations, total study area = 1.41 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.702
Area averaged RI index number = 64.9

Developed Hydrology Models..... III

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2018 Version 9.0
Rational Hydrology Study Date: 09/16/22 File:D1.out

XENIA APARTMENTS
PRELIMINARY DRAINAGE STUDY
DMA D1 DEVELOPED CONDITION
100-YEAR

********* Hydrology Study Control Information **********

English (in-lb) Units used in input data file

Program License Serial Number 6545

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 100.00 Antecedent Moisture Condition = 2

2 year, 1 hour precipitation = 0.570(In.)
100 year, 1 hour precipitation = 1.270(In.)

Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity = 1.270(In/Hr)
Slope of intensity duration curve = 0.5100

++

Process from Point/Station 3.000 to Point/Station 3.100
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 309.000(Ft.)
Top (of initial area) elevation = 2605.100(Ft.)
Bottom (of initial area) elevation = 2600.800(Ft.)
Difference in elevation = 4.300(Ft.)
Slope = 0.01392 s(percent)= 1.39
TC = k(0.323)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 7.525 min.
Rainfall intensity = 3.661(In/Hr) for a 100.0 year storm
APARTMENT subarea type
Runoff Coefficient = 0.860
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 56.00
Pervious area fraction = 0.200; Impervious fraction = 0.800
Initial subarea runoff = 0.850(CFS)
Total initial stream area = 0.270(Ac.)
Pervious area fraction = 0.200
End of computations, total study area = 0.27 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

```
Area averaged pervious area fraction(Ap) = 0.200
Area averaged RI index number =  56.0
```

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2018 Version 9.0
Rational Hydrology Study Date: 09/16/22 File:D2.out

XENIA APARTMENTS
PRELIMINARY DRAINAGE STUDY
DMA D2 POST-DEVELOPED
100-YEAR

********* Hydrology Study Control Information **********

English (in-lb) Units used in input data file

Program License Serial Number 6545

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 100.00 Antecedent Moisture Condition = 2

2 year, 1 hour precipitation = 0.570(In.)
100 year, 1 hour precipitation = 1.270(In.)

Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity = 1.270(In/Hr)
Slope of intensity duration curve = 0.5100

++

Process from Point/Station 1.000 to Point/Station 1.010
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 545.000(Ft.)
Top (of initial area) elevation = 2608.000(Ft.)
Bottom (of initial area) elevation = 2600.600(Ft.)
Difference in elevation = 7.400(Ft.)
Slope = 0.01358 s(percent)= 1.36
TC = k(0.323)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 9.488 min.
Rainfall intensity = 3.253(In/Hr) for a 100.0 year storm
APARTMENT subarea type
Runoff Coefficient = 0.856
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 56.00
Pervious area fraction = 0.200; Impervious fraction = 0.800
Initial subarea runoff = 7.325(CFS)
Total initial stream area = 2.630(Ac.)
Pervious area fraction = 0.200

++

Process from Point/Station 1.010 to Point/Station 1.020

**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 2600.600(Ft.)
Downstream point/station elevation = 2600.200(Ft.)
Pipe length = 489.00(Ft.) Manning's N = 0.013
No. of pipes = 1 Required pipe flow = 7.325(CFS)
Nearest computed pipe diameter = 27.00(In.)
Calculated individual pipe flow = 7.325(CFS)
Normal flow depth in pipe = 18.73(In.)
Flow top width inside pipe = 24.89(In.)
Critical Depth = 11.12(In.)
Pipe flow velocity = 2.49(Ft/s)
Travel time through pipe = 3.27 min.
Time of concentration (TC) = 12.76 min.

++
Process from Point/Station 1.010 to Point/Station 1.020
**** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area = 2.630(Ac.)
Runoff from this stream = 7.325(CFS)
Time of concentration = 12.76 min.
Rainfall intensity = 2.797(In/Hr)
Program is now starting with Main Stream No. 2

++
Process from Point/Station 1.030 to Point/Station 1.040
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 373.000(Ft.)
Top (of initial area) elevation = 2604.600(Ft.)
Bottom (of initial area) elevation = 2602.400(Ft.)
Difference in elevation = 2.200(Ft.)
Slope = 0.00590 s(percent)= 0.59
TC = k(0.323)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 9.633 min.
Rainfall intensity = 3.228(In/Hr) for a 100.0 year storm
APARTMENT subarea type
Runoff Coefficient = 0.856
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 56.00
Pervious area fraction = 0.200; Impervious fraction = 0.800
Initial subarea runoff = 0.857(CFS)
Total initial stream area = 0.310(Ac.)
Pervious area fraction = 0.200

++
Process from Point/Station 1.040 to Point/Station 1.020
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 2600.800(Ft.)
Downstream point/station elevation = 2600.200(Ft.)
Pipe length = 122.00(Ft.) Manning's N = 0.013
No. of pipes = 1 Required pipe flow = 0.857(CFS)
Nearest computed pipe diameter = 9.00(In.)
Calculated individual pipe flow = 0.857(CFS)
Normal flow depth in pipe = 5.75(In.)
Flow top width inside pipe = 8.64(In.)

```
Critical Depth =    5.08(In.)
Pipe flow velocity =      2.87(Ft/s)
Travel time through pipe =    0.71 min.
Time of concentration (TC) =    10.34 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.040 to Point/Station        1.020
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      0.310(Ac.)
Runoff from this stream =      0.857(CFS)
Time of concentration =   10.34 min.
Rainfall intensity =     3.114(In/Hr)
Program is now starting with Main Stream No. 3


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.050 to Point/Station        1.020
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =   154.000(Ft.)
Top (of initial area) elevation =  2605.800(Ft.)
Bottom (of initial area) elevation =  2604.000(Ft.)
Difference in elevation =     1.800(Ft.)
Slope =    0.01169  s(percent)=       1.17
TC = k(0.323)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    5.897 min.
Rainfall intensity =      4.146(In/Hr) for a   100.0 year storm
APARTMENT subarea type
Runoff Coefficient = 0.864
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.200; Impervious fraction =  0.800
Initial subarea runoff =      0.716(CFS)
Total initial stream area =        0.200(Ac.)
Pervious area fraction = 0.200


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.050 to Point/Station        1.020
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 3
Stream flow area =      0.200(Ac.)
Runoff from this stream =      0.716(CFS)
Time of concentration =    5.90 min.
Rainfall intensity =     4.146(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1        7.325     12.76           2.797
2        0.857     10.34           3.114
3        0.716      5.90           4.146
Largest stream flow has longer time of concentration
Qp =      7.325 + sum of
         Qb         Ia/Ib
```

```
          0.857 *    0.898 =      0.769
         Qb         Ia/Ib
          0.716 *    0.675 =      0.483
Qp =      8.577

Total of 3 main streams to confluence:
Flow rates before confluence point:
       7.325       0.857       0.716
Area of streams before confluence:
        2.630        0.310        0.200


Results of confluence:
Total flow rate =      8.577(CFS)
Time of concentration =    12.762 min.
Effective stream area after confluence  =      3.140(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.020 to Point/Station        1.060
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  2600.200(Ft.)
Downstream point/station elevation =  2600.000(Ft.)
Pipe length  =    76.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     8.577(CFS)
Nearest computed pipe diameter  =     24.00(In.)
Calculated individual pipe flow  =     8.577(CFS)
Normal flow depth in pipe =   15.35(In.)
Flow top width inside pipe =   23.04(In.)
Critical Depth =   12.53(In.)
Pipe flow velocity =      4.04(Ft/s)
Travel time through pipe =    0.31 min.
Time of concentration (TC) =    13.08 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.060 to Point/Station        1.060
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
APARTMENT subarea type
Runoff Coefficient = 0.851
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.200; Impervious fraction =  0.800
Time of concentration =    13.08 min.
Rainfall intensity =      2.762(In/Hr) for a   100.0 year storm
Subarea runoff =      0.517(CFS) for      0.220(Ac.)
Total runoff =      9.094(CFS)   Total area =       3.360(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.060 to Point/Station        1.070
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  2600.000(Ft.)
Downstream point/station elevation =  2599.500(Ft.)
Pipe length  =   125.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     9.094(CFS)
Nearest computed pipe diameter  =     21.00(In.)
Calculated individual pipe flow  =     9.094(CFS)
Normal flow depth in pipe =   15.68(In.)
Flow top width inside pipe =   18.27(In.)
```

```
Critical Depth =   13.45(In.)
Pipe flow velocity =      4.72(Ft/s)
Travel time through pipe =    0.44 min.
Time of concentration (TC) =    13.52 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.070 to Point/Station        1.070
**** SUBAREA FLOW ADDITION ****
----------------------------------------------------------------------------
APARTMENT subarea type
Runoff Coefficient = 0.850
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.200; Impervious fraction =  0.800
Time of concentration =    13.52 min.
Rainfall intensity =      2.716(In/Hr) for a   100.0 year storm
Subarea runoff =      1.870(CFS) for      0.810(Ac.)
Total runoff =     10.964(CFS)   Total area =       4.170(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.070 to Point/Station        1.080
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
----------------------------------------------------------------------------
Upstream point/station elevation =  2599.500(Ft.)
Downstream point/station elevation =  2598.800(Ft.)
Pipe length  =   213.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    10.964(CFS)
Nearest computed pipe diameter  =     24.00(In.)
Calculated individual pipe flow  =    10.964(CFS)
Normal flow depth in pipe =   16.92(In.)
Flow top width inside pipe =   21.89(In.)
Critical Depth =   14.23(In.)
Pipe flow velocity =      4.63(Ft/s)
Travel time through pipe =    0.77 min.
Time of concentration (TC) =    14.28 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.070 to Point/Station        1.080
**** CONFLUENCE OF MAIN STREAMS ****
----------------------------------------------------------------------------
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =      4.170(Ac.)
Runoff from this stream =     10.964(CFS)
Time of concentration =   14.28 min.
Rainfall intensity =     2.641(In/Hr)
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.000 to Point/Station        1.090
**** INITIAL AREA EVALUATION ****
----------------------------------------------------------------------------
Initial area flow distance =   265.000(Ft.)
Top (of initial area) elevation =  2608.000(Ft.)
Bottom (of initial area) elevation =  2605.200(Ft.)
Difference in elevation =     2.800(Ft.)
Slope =    0.01057  s(percent)=       1.06
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.028 min.
```

```
Rainfall intensity =      3.337(In/Hr) for a   100.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.792
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      2.248(CFS)
Total initial stream area =        0.850(Ac.)
Pervious area fraction = 0.500


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.090 to Point/Station        1.100
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  2602.000(Ft.)
Downstream point/station elevation =  2600.900(Ft.)
Pipe length  =    60.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     2.248(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     2.248(CFS)
Normal flow depth in pipe =    5.76(In.)
Flow top width inside pipe =   11.99(In.)
Critical Depth =    7.70(In.)
Pipe flow velocity =      6.03(Ft/s)
Travel time through pipe =    0.17 min.
Time of concentration (TC) =     9.19 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.100 to Point/Station        1.100
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________________
APARTMENT subarea type
Runoff Coefficient = 0.857
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.200; Impervious fraction =  0.800
Time of concentration =     9.19 min.
Rainfall intensity =      3.306(In/Hr) for a   100.0 year storm
Subarea runoff =      4.220(CFS) for      1.490(Ac.)
Total runoff =      6.467(CFS)   Total area =       2.340(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.100 to Point/Station        1.080
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  2600.900(Ft.)
Downstream point/station elevation =  2598.800(Ft.)
Pipe length  =   195.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     6.467(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     6.467(CFS)
Normal flow depth in pipe =   11.84(In.)
Flow top width inside pipe =   12.24(In.)
Critical Depth =   12.29(In.)
Pipe flow velocity =      6.22(Ft/s)
Travel time through pipe =    0.52 min.
Time of concentration (TC) =     9.72 min.
```

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++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.100 to Point/Station        1.080
**** CONFLUENCE OF MAIN STREAMS ****
----------------------------------------------------------------------------
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      2.340(Ac.)
Runoff from this stream =      6.467(CFS)
Time of concentration =    9.72 min.
Rainfall intensity =     3.214(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                 (In/Hr)


1       10.964     14.28            2.641
2        6.467      9.72            3.214
Largest stream flow has longer time of concentration
Qp =     10.964 + sum of
         Qb          Ia/Ib
          6.467 *    0.822 =      5.313
Qp =     16.277

Total of 2 main streams to confluence:
Flow rates before confluence point:
      10.964       6.467
Area of streams before confluence:
        4.170        2.340


Results of confluence:
Total flow rate =     16.277(CFS)
Time of concentration =    14.284 min.
Effective stream area after confluence  =      6.510(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.080 to Point/Station        1.110
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
----------------------------------------------------------------------------
Upstream point/station elevation =  2598.800(Ft.)
Downstream point/station elevation =  2598.700(Ft.)
Pipe length  =    28.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    16.277(CFS)
Nearest computed pipe diameter  =     27.00(In.)
Calculated individual pipe flow  =    16.277(CFS)
Normal flow depth in pipe =   19.64(In.)
Flow top width inside pipe =   24.05(In.)
Critical Depth =   16.90(In.)
Pipe flow velocity =      5.25(Ft/s)
Travel time through pipe =    0.09 min.
Time of concentration (TC) =    14.37 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.110 to Point/Station        1.110
**** SUBAREA FLOW ADDITION ****
----------------------------------------------------------------------------
APARTMENT subarea type
Runoff Coefficient = 0.849
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
```

```
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.200; Impervious fraction =  0.800
Time of concentration =    14.37 min.
Rainfall intensity =      2.632(In/Hr) for a   100.0 year storm
Subarea runoff =      1.095(CFS) for      0.490(Ac.)
Total runoff =     17.372(CFS)   Total area =       7.000(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.110 to Point/Station        1.120
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  2598.700(Ft.)
Downstream point/station elevation =  2598.500(Ft.)
Pipe length  =    28.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    17.372(CFS)
Nearest computed pipe diameter  =     24.00(In.)
Calculated individual pipe flow  =    17.372(CFS)
Normal flow depth in pipe =   17.95(In.)
Flow top width inside pipe =   20.84(In.)
Critical Depth =   18.02(In.)
Pipe flow velocity =      6.90(Ft/s)
Travel time through pipe =    0.07 min.
Time of concentration (TC) =    14.44 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.120 to Point/Station        1.120
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________________
UNDEVELOPED (good cover) subarea
Runoff Coefficient = 0.679
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  61.00
Pervious area fraction =  1.000; Impervious fraction =  0.000
Time of concentration =    14.44 min.
Rainfall intensity =      2.626(In/Hr) for a   100.0 year storm
Subarea runoff =      0.963(CFS) for      0.540(Ac.)
Total runoff =     18.335(CFS)   Total area =       7.540(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.110 to Point/Station        1.120
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =      7.540(Ac.)
Runoff from this stream =     18.335(CFS)
Time of concentration =   14.44 min.
Rainfall intensity =     2.626(In/Hr)
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.130 to Point/Station        1.140
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =   303.000(Ft.)
Top (of initial area) elevation =  2608.400(Ft.)
Bottom (of initial area) elevation =  2604.000(Ft.)
Difference in elevation =     4.400(Ft.)
```

```
Slope =    0.01452  s(percent)=       1.45
TC = k(0.323)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    7.402 min.
Rainfall intensity =      3.692(In/Hr) for a   100.0 year storm
APARTMENT subarea type
Runoff Coefficient = 0.860
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.200; Impervious fraction =  0.800
Initial subarea runoff =      2.827(CFS)
Total initial stream area =        0.890(Ac.)
Pervious area fraction = 0.200


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.140 to Point/Station        1.150
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  2600.700(Ft.)
Downstream point/station elevation =  2600.600(Ft.)
Pipe length  =    46.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     2.827(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     2.827(CFS)
Normal flow depth in pipe =   11.53(In.)
Flow top width inside pipe =   12.65(In.)
Critical Depth =    8.10(In.)
Pipe flow velocity =      2.79(Ft/s)
Travel time through pipe =    0.27 min.
Time of concentration (TC) =     7.68 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.140 to Point/Station        1.150
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 2 in normal stream number 1
Stream flow area =      0.890(Ac.)
Runoff from this stream =      2.827(CFS)
Time of concentration =    7.68 min.
Rainfall intensity =     3.624(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.160 to Point/Station        1.170
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =   136.000(Ft.)
Top (of initial area) elevation =  2604.700(Ft.)
Bottom (of initial area) elevation =  2603.500(Ft.)
Difference in elevation =     1.200(Ft.)
Slope =    0.00882  s(percent)=       0.88
TC = k(0.323)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    5.936 min.
Rainfall intensity =      4.132(In/Hr) for a   100.0 year storm
APARTMENT subarea type
Runoff Coefficient = 0.864
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.200; Impervious fraction =  0.800
```

```
Initial subarea runoff =      1.142(CFS)
Total initial stream area =        0.320(Ac.)
Pervious area fraction = 0.200


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.170 to Point/Station        1.150
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  2600.800(Ft.)
Downstream point/station elevation =  2600.600(Ft.)
Pipe length  =   125.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     1.142(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     1.142(CFS)
Normal flow depth in pipe =    8.13(In.)
Flow top width inside pipe =   11.22(In.)
Critical Depth =    5.40(In.)
Pipe flow velocity =      2.02(Ft/s)
Travel time through pipe =    1.03 min.
Time of concentration (TC) =     6.97 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.170 to Point/Station        1.150
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 2 in normal stream number 2
Stream flow area =      0.320(Ac.)
Runoff from this stream =      1.142(CFS)
Time of concentration =    6.97 min.
Rainfall intensity =     3.808(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                 (In/Hr)


1        2.827      7.68                3.624
2        1.142      6.97                3.808
Largest stream flow has longer time of concentration
Qp =      2.827 + sum of
         Qb         Ia/Ib
          1.142 *    0.952 =      1.087
Qp =      3.914

Total of 2 streams to confluence:
Flow rates before confluence point:
       2.827       1.142
Area of streams before confluence:
        0.890        0.320
Results of confluence:
Total flow rate =      3.914(CFS)
Time of concentration =     7.677 min.
Effective stream area after confluence =      1.210(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.150 to Point/Station        1.180
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  2600.600(Ft.)
Downstream point/station elevation =  2600.500(Ft.)
Pipe length  =    55.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     3.914(CFS)
Nearest computed pipe diameter  =     18.00(In.)
```

```
Calculated individual pipe flow  =     3.914(CFS)
Normal flow depth in pipe =   13.03(In.)
Flow top width inside pipe =   16.09(In.)
Critical Depth =    9.07(In.)
Pipe flow velocity =      2.86(Ft/s)
Travel time through pipe =    0.32 min.
Time of concentration (TC) =     8.00 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.180 to Point/Station        1.180
**** SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------------
APARTMENT subarea type
Runoff Coefficient = 0.859
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.200; Impervious fraction =  0.800
Time of concentration =     8.00 min.
Rainfall intensity =      3.549(In/Hr) for a   100.0 year storm
Subarea runoff =      1.555(CFS) for      0.510(Ac.)
Total runoff =      5.468(CFS)   Total area =       1.720(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.180 to Point/Station        1.190
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------------
Upstream point/station elevation =  2600.500(Ft.)
Downstream point/station elevation =  2600.200(Ft.)
Pipe length  =   196.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     5.468(CFS)
Nearest computed pipe diameter  =     21.00(In.)
Calculated individual pipe flow  =     5.468(CFS)
Normal flow depth in pipe =   15.33(In.)
Flow top width inside pipe =   18.65(In.)
Critical Depth =   10.32(In.)
Pipe flow velocity =      2.91(Ft/s)
Travel time through pipe =    1.12 min.
Time of concentration (TC) =     9.12 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.190 to Point/Station        1.190
**** SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------------
APARTMENT subarea type
Runoff Coefficient = 0.857
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.200; Impervious fraction =  0.800
Time of concentration =     9.12 min.
Rainfall intensity =      3.319(In/Hr) for a   100.0 year storm
Subarea runoff =      2.275(CFS) for      0.800(Ac.)
Total runoff =      7.744(CFS)   Total area =       2.520(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.190 to Point/Station        1.200
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
```

```
Upstream point/station elevation =  2600.200(Ft.)
Downstream point/station elevation =  2600.100(Ft.)
Pipe length  =    37.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     7.744(CFS)
Nearest computed pipe diameter  =     21.00(In.)
Calculated individual pipe flow  =     7.744(CFS)
Normal flow depth in pipe =   16.17(In.)
Flow top width inside pipe =   17.67(In.)
Critical Depth =   12.39(In.)
Pipe flow velocity =      3.89(Ft/s)
Travel time through pipe =    0.16 min.
Time of concentration (TC) =     9.28 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.190 to Point/Station        1.200
**** CONFLUENCE OF MINOR STREAMS ****
------------------------------------------------------------------------------
Along Main Stream number: 2 in normal stream number 1
Stream flow area =      2.520(Ac.)
Runoff from this stream =      7.744(CFS)
Time of concentration =    9.28 min.
Rainfall intensity =     3.290(In/Hr)


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Process from Point/Station        1.210 to Point/Station        1.220
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------------
Initial area flow distance =   443.000(Ft.)
Top (of initial area) elevation =  2608.300(Ft.)
Bottom (of initial area) elevation =  2604.700(Ft.)
Difference in elevation =     3.600(Ft.)
Slope =    0.00813  s(percent)=       0.81
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   11.685 min.
Rainfall intensity =      2.925(In/Hr) for a   100.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.781
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      5.165(CFS)
Total initial stream area =        2.260(Ac.)
Pervious area fraction = 0.500


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.220 to Point/Station        1.230
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------------
Upstream point/station elevation =  2601.000(Ft.)
Downstream point/station elevation =  2600.700(Ft.)
Pipe length  =    46.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     5.165(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     5.165(CFS)
Normal flow depth in pipe =   12.16(In.)
Flow top width inside pipe =   11.75(In.)
Critical Depth =   11.05(In.)
Pipe flow velocity =      4.85(Ft/s)
Travel time through pipe =    0.16 min.
```

```
Time of concentration (TC) =    11.84 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.230 to Point/Station        1.230
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________________
APARTMENT subarea type
Runoff Coefficient = 0.852
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.200; Impervious fraction =  0.800
Time of concentration =    11.84 min.
Rainfall intensity =      2.905(In/Hr) for a   100.0 year storm
Subarea runoff =      3.912(CFS) for      1.580(Ac.)
Total runoff =      9.078(CFS)   Total area =       3.840(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.230 to Point/Station        1.200
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  2600.700(Ft.)
Downstream point/station elevation =  2600.100(Ft.)
Pipe length  =   213.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     9.078(CFS)
Nearest computed pipe diameter  =     24.00(In.)
Calculated individual pipe flow  =     9.078(CFS)
Normal flow depth in pipe =   15.59(In.)
Flow top width inside pipe =   22.90(In.)
Critical Depth =   12.92(In.)
Pipe flow velocity =      4.20(Ft/s)
Travel time through pipe =    0.85 min.
Time of concentration (TC) =    12.69 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.230 to Point/Station        1.200
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 2 in normal stream number 2
Stream flow area =      3.840(Ac.)
Runoff from this stream =      9.078(CFS)
Time of concentration =   12.69 min.
Rainfall intensity =     2.805(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                 (In/Hr)


1        7.744      9.28                3.290
2        9.078     12.69                2.805
Largest stream flow has longer time of concentration
Qp =      9.078 + sum of
         Qb         Ia/Ib
          7.744 *    0.852 =      6.601
Qp =     15.679

Total of 2 streams to confluence:
Flow rates before confluence point:
       7.744       9.078
Area of streams before confluence:
```

```
        2.520        3.840
Results of confluence:
Total flow rate =     15.679(CFS)
Time of concentration =    12.689 min.
Effective stream area after confluence =      6.360(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.200 to Point/Station        1.240
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  2600.100(Ft.)
Downstream point/station elevation =  2599.300(Ft.)
Pipe length  =   148.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    15.679(CFS)
Nearest computed pipe diameter  =     24.00(In.)
Calculated individual pipe flow  =    15.679(CFS)
Normal flow depth in pipe =   18.54(In.)
Flow top width inside pipe =   20.12(In.)
Critical Depth =   17.12(In.)
Pipe flow velocity =      6.02(Ft/s)
Travel time through pipe =    0.41 min.
Time of concentration (TC) =    13.10 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.240 to Point/Station        1.240
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________________
APARTMENT subarea type
Runoff Coefficient = 0.850
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.200; Impervious fraction =  0.800
Time of concentration =    13.10 min.
Rainfall intensity =      2.760(In/Hr) for a   100.0 year storm
Subarea runoff =      1.267(CFS) for      0.540(Ac.)
Total runoff =     16.947(CFS)   Total area =       6.900(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.240 to Point/Station        1.250
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  2599.300(Ft.)
Downstream point/station elevation =  2599.100(Ft.)
Pipe length  =    37.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    16.947(CFS)
Nearest computed pipe diameter  =     24.00(In.)
Calculated individual pipe flow  =    16.947(CFS)
Normal flow depth in pipe =   20.11(In.)
Flow top width inside pipe =   17.69(In.)
Critical Depth =   17.79(In.)
Pipe flow velocity =      6.03(Ft/s)
Travel time through pipe =    0.10 min.
Time of concentration (TC) =    13.20 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.250 to Point/Station        1.250
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________________
APARTMENT subarea type
```

```
Runoff Coefficient = 0.850
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.200; Impervious fraction =  0.800
Time of concentration =    13.20 min.
Rainfall intensity =      2.749(In/Hr) for a   100.0 year storm
Subarea runoff =      0.912(CFS) for      0.390(Ac.)
Total runoff =     17.858(CFS)   Total area =       7.290(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.250 to Point/Station        1.120
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  2599.100(Ft.)
Downstream point/station elevation =  2598.500(Ft.)
Pipe length  =   103.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    17.858(CFS)
Nearest computed pipe diameter  =     24.00(In.)
Calculated individual pipe flow  =    17.858(CFS)
Normal flow depth in pipe =   20.53(In.)
Flow top width inside pipe =   16.88(In.)
Critical Depth =   18.28(In.)
Pipe flow velocity =      6.25(Ft/s)
Travel time through pipe =    0.27 min.
Time of concentration (TC) =    13.48 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.250 to Point/Station        1.120
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      7.290(Ac.)
Runoff from this stream =     17.858(CFS)
Time of concentration =   13.48 min.
Rainfall intensity =     2.720(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1       18.335     14.44            2.626
2       17.858     13.48            2.720
Largest stream flow has longer time of concentration
Qp =     18.335 + sum of
         Qb         Ia/Ib
         17.858 *    0.965 =     17.239
Qp =     35.575

Total of 2 main streams to confluence:
Flow rates before confluence point:
      18.335      17.858
Area of streams before confluence:
        7.540        7.290


Results of confluence:
Total flow rate =     35.575(CFS)
Time of concentration =    14.440 min.
Effective stream area after confluence  =     14.830(Ac.)
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.120 to Point/Station        1.260
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  2595.000(Ft.)
Downstream point/station elevation =  2591.800(Ft.)
Pipe length  =   629.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    35.575(CFS)
Nearest computed pipe diameter  =     33.00(In.)
Calculated individual pipe flow  =    35.575(CFS)
Normal flow depth in pipe =   25.50(In.)
Flow top width inside pipe =   27.66(In.)
Critical Depth =   23.85(In.)
Pipe flow velocity =      7.22(Ft/s)
Travel time through pipe =    1.45 min.
Time of concentration (TC) =    15.89 min.
End of computations, total study area =           14.83 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.292
Area averaged RI index number =  56.2
```

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2018 Version 9.0
Rational Hydrology Study Date: 09/16/22 File:D3.out

XENIA APARTMENTS
PRELIMINARY DRAINAGE STUDY
DMA D3 DEVELOPED CONDITION
100-YEAR

********* Hydrology Study Control Information **********

English (in-lb) Units used in input data file

Program License Serial Number 6545

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 100.00 Antecedent Moisture Condition = 2

2 year, 1 hour precipitation = 0.570(In.)
100 year, 1 hour precipitation = 1.270(In.)

Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity = 1.270(In/Hr)
Slope of intensity duration curve = 0.5100

++

Process from Point/Station 2.000 to Point/Station 2.010
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 261.000(Ft.)
Top (of initial area) elevation = 2605.000(Ft.)
Bottom (of initial area) elevation = 2600.300(Ft.)
Difference in elevation = 4.700(Ft.)
Slope = 0.01801 s(percent)= 1.80
TC = k(0.940)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 19.440 min.
Rainfall intensity = 2.256(In/Hr) for a 100.0 year storm
UNDEVELOPED (good cover) subarea
Runoff Coefficient = 0.653
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 61.00
Pervious area fraction = 1.000; Impervious fraction = 0.000
Initial subarea runoff = 0.206(CFS)
Total initial stream area = 0.140(Ac.)
Pervious area fraction = 1.000
End of computations, total study area = 0.14 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

```
Area averaged pervious area fraction(Ap) = 1.000
Area averaged RI index number =  61.0
```

Pre-Developed Unit Hydrograph Models.....IV

- **2-Year; 24-Hour**
- **100-Year; 1-Hour**
- **100-Year; 3-Hour**
- **100-Year; 6-Hour**
- **100-Year; 24-Hour**

U n i t H y d r o g r a p h A n a l y s i s

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Study date 09/16/22 File: 1X242.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6545

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

XENIA
PRELIMINARY UNIT HYDROGRAPH ANALYSIS
AREA X1 PRESENT CONDITION
2-YEAR

Drainage Area = 3.81(Ac.) = 0.006 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 3.81(Ac.) = 0.006 Sq. Mi.
Length along longest watercourse = 586.00(Ft.)
Length along longest watercourse measured to centroid = 304.00(Ft.)
Length along longest watercourse = 0.111 Mi.
Length along longest watercourse measured to centroid = 0.058 Mi.
Difference in elevation = 7.00(Ft.)
Slope along watercourse = 63.0717 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.048 Hr.
Lag time = 2.88 Min.
25% of lag time = 0.72 Min.
40% of lag time = 1.15 Min.
Unit time = 5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
3.81	2.53	9.64

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
3.81	6.50	24.77

STORM EVENT (YEAR) = 2.00
Area Averaged 2-Year Rainfall = 2.530(In)
Area Averaged 100-Year Rainfall = 6.500(In)

Point rain (area averaged) = 2.530(In)
Areal adjustment factor = 100.00 %

Adjusted average point rain = 2.530(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
3.810	71.80	0.142

Total Area Entered = 3.81(Ac.)

RI AMC2	RI AMC-1	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
71.8	53.2	0.540	0.142	0.471	1.000	0.471
					Sum (F) =	0.471

Area averaged mean soil loss (F) (In/Hr) = 0.471
Minimum soil loss rate ((In/Hr)) = 0.235
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.786

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	173.526	38.422	1.475
2	0.167	347.051	45.256	1.738
3	0.250	520.577	9.968	0.383
4	0.333	694.102	4.151	0.159
5	0.417	867.628	2.202	0.085
			Sum = 100.000 Sum=	3.840

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.07	0.020	(0.835)	0.016	0.004
2	0.17	0.07	0.020	(0.831)	0.016	0.004
3	0.25	0.07	0.020	(0.828)	0.016	0.004
4	0.33	0.10	0.030	(0.825)	0.024	0.006
5	0.42	0.10	0.030	(0.822)	0.024	0.006
6	0.50	0.10	0.030	(0.818)	0.024	0.006
7	0.58	0.10	0.030	(0.815)	0.024	0.006
8	0.67	0.10	0.030	(0.812)	0.024	0.006
9	0.75	0.10	0.030	(0.809)	0.024	0.006
10	0.83	0.13	0.040	(0.806)	0.032	0.009
11	0.92	0.13	0.040	(0.803)	0.032	0.009
12	1.00	0.13	0.040	(0.799)	0.032	0.009
13	1.08	0.10	0.030	(0.796)	0.024	0.006
14	1.17	0.10	0.030	(0.793)	0.024	0.006
15	1.25	0.10	0.030	(0.790)	0.024	0.006
16	1.33	0.10	0.030	(0.787)	0.024	0.006
17	1.42	0.10	0.030	(0.784)	0.024	0.006
18	1.50	0.10	0.030	(0.781)	0.024	0.006
19	1.58	0.10	0.030	(0.777)	0.024	0.006
20	1.67	0.10	0.030	(0.774)	0.024	0.006
21	1.75	0.10	0.030	(0.771)	0.024	0.006
22	1.83	0.13	0.040	(0.768)	0.032	0.009
23	1.92	0.13	0.040	(0.765)	0.032	0.009
24	2.00	0.13	0.040	(0.762)	0.032	0.009
25	2.08	0.13	0.040	(0.759)	0.032	0.009
26	2.17	0.13	0.040	(0.756)	0.032	0.009

27	2.25	0.13	0.040	(0.753)	0.032	0.009
28	2.33	0.13	0.040	(0.750)	0.032	0.009
29	2.42	0.13	0.040	(0.747)	0.032	0.009
30	2.50	0.13	0.040	(0.744)	0.032	0.009
31	2.58	0.17	0.051	(0.740)	0.040	0.011
32	2.67	0.17	0.051	(0.737)	0.040	0.011
33	2.75	0.17	0.051	(0.734)	0.040	0.011
34	2.83	0.17	0.051	(0.731)	0.040	0.011
35	2.92	0.17	0.051	(0.728)	0.040	0.011
36	3.00	0.17	0.051	(0.725)	0.040	0.011
37	3.08	0.17	0.051	(0.722)	0.040	0.011
38	3.17	0.17	0.051	(0.719)	0.040	0.011
39	3.25	0.17	0.051	(0.716)	0.040	0.011
40	3.33	0.17	0.051	(0.713)	0.040	0.011
41	3.42	0.17	0.051	(0.710)	0.040	0.011
42	3.50	0.17	0.051	(0.707)	0.040	0.011
43	3.58	0.17	0.051	(0.704)	0.040	0.011
44	3.67	0.17	0.051	(0.702)	0.040	0.011
45	3.75	0.17	0.051	(0.699)	0.040	0.011
46	3.83	0.20	0.061	(0.696)	0.048	0.013
47	3.92	0.20	0.061	(0.693)	0.048	0.013
48	4.00	0.20	0.061	(0.690)	0.048	0.013
49	4.08	0.20	0.061	(0.687)	0.048	0.013
50	4.17	0.20	0.061	(0.684)	0.048	0.013
51	4.25	0.20	0.061	(0.681)	0.048	0.013
52	4.33	0.23	0.071	(0.678)	0.056	0.015
53	4.42	0.23	0.071	(0.675)	0.056	0.015
54	4.50	0.23	0.071	(0.672)	0.056	0.015
55	4.58	0.23	0.071	(0.669)	0.056	0.015
56	4.67	0.23	0.071	(0.667)	0.056	0.015
57	4.75	0.23	0.071	(0.664)	0.056	0.015
58	4.83	0.27	0.081	(0.661)	0.064	0.017
59	4.92	0.27	0.081	(0.658)	0.064	0.017
60	5.00	0.27	0.081	(0.655)	0.064	0.017
61	5.08	0.20	0.061	(0.652)	0.048	0.013
62	5.17	0.20	0.061	(0.649)	0.048	0.013
63	5.25	0.20	0.061	(0.647)	0.048	0.013
64	5.33	0.23	0.071	(0.644)	0.056	0.015
65	5.42	0.23	0.071	(0.641)	0.056	0.015
66	5.50	0.23	0.071	(0.638)	0.056	0.015
67	5.58	0.27	0.081	(0.635)	0.064	0.017
68	5.67	0.27	0.081	(0.633)	0.064	0.017
69	5.75	0.27	0.081	(0.630)	0.064	0.017
70	5.83	0.27	0.081	(0.627)	0.064	0.017
71	5.92	0.27	0.081	(0.624)	0.064	0.017
72	6.00	0.27	0.081	(0.621)	0.064	0.017
73	6.08	0.30	0.091	(0.619)	0.072	0.019
74	6.17	0.30	0.091	(0.616)	0.072	0.019
75	6.25	0.30	0.091	(0.613)	0.072	0.019
76	6.33	0.30	0.091	(0.610)	0.072	0.019
77	6.42	0.30	0.091	(0.608)	0.072	0.019
78	6.50	0.30	0.091	(0.605)	0.072	0.019
79	6.58	0.33	0.101	(0.602)	0.080	0.022
80	6.67	0.33	0.101	(0.600)	0.080	0.022
81	6.75	0.33	0.101	(0.597)	0.080	0.022
82	6.83	0.33	0.101	(0.594)	0.080	0.022
83	6.92	0.33	0.101	(0.591)	0.080	0.022
84	7.00	0.33	0.101	(0.589)	0.080	0.022
85	7.08	0.33	0.101	(0.586)	0.080	0.022
86	7.17	0.33	0.101	(0.583)	0.080	0.022
87	7.25	0.33	0.101	(0.581)	0.080	0.022
88	7.33	0.37	0.111	(0.578)	0.088	0.024
89	7.42	0.37	0.111	(0.575)	0.088	0.024
90	7.50	0.37	0.111	(0.573)	0.088	0.024
91	7.58	0.40	0.121	(0.570)	0.095	0.026
92	7.67	0.40	0.121	(0.568)	0.095	0.026

93	7.75	0.40	0.121	(0.565)	0.095	0.026
94	7.83	0.43	0.132	(0.562)	0.103	0.028
95	7.92	0.43	0.132	(0.560)	0.103	0.028
96	8.00	0.43	0.132	(0.557)	0.103	0.028
97	8.08	0.50	0.152	(0.555)	0.119	0.032
98	8.17	0.50	0.152	(0.552)	0.119	0.032
99	8.25	0.50	0.152	(0.549)	0.119	0.032
100	8.33	0.50	0.152	(0.547)	0.119	0.032
101	8.42	0.50	0.152	(0.544)	0.119	0.032
102	8.50	0.50	0.152	(0.542)	0.119	0.032
103	8.58	0.53	0.162	(0.539)	0.127	0.035
104	8.67	0.53	0.162	(0.537)	0.127	0.035
105	8.75	0.53	0.162	(0.534)	0.127	0.035
106	8.83	0.57	0.172	(0.532)	0.135	0.037
107	8.92	0.57	0.172	(0.529)	0.135	0.037
108	9.00	0.57	0.172	(0.527)	0.135	0.037
109	9.08	0.63	0.192	(0.524)	0.151	0.041
110	9.17	0.63	0.192	(0.522)	0.151	0.041
111	9.25	0.63	0.192	(0.519)	0.151	0.041
112	9.33	0.67	0.202	(0.517)	0.159	0.043
113	9.42	0.67	0.202	(0.514)	0.159	0.043
114	9.50	0.67	0.202	(0.512)	0.159	0.043
115	9.58	0.70	0.213	(0.509)	0.167	0.045
116	9.67	0.70	0.213	(0.507)	0.167	0.045
117	9.75	0.70	0.213	(0.504)	0.167	0.045
118	9.83	0.73	0.223	(0.502)	0.175	0.048
119	9.92	0.73	0.223	(0.500)	0.175	0.048
120	10.00	0.73	0.223	(0.497)	0.175	0.048
121	10.08	0.50	0.152	(0.495)	0.119	0.032
122	10.17	0.50	0.152	(0.492)	0.119	0.032
123	10.25	0.50	0.152	(0.490)	0.119	0.032
124	10.33	0.50	0.152	(0.488)	0.119	0.032
125	10.42	0.50	0.152	(0.485)	0.119	0.032
126	10.50	0.50	0.152	(0.483)	0.119	0.032
127	10.58	0.67	0.202	(0.480)	0.159	0.043
128	10.67	0.67	0.202	(0.478)	0.159	0.043
129	10.75	0.67	0.202	(0.476)	0.159	0.043
130	10.83	0.67	0.202	(0.473)	0.159	0.043
131	10.92	0.67	0.202	(0.471)	0.159	0.043
132	11.00	0.67	0.202	(0.469)	0.159	0.043
133	11.08	0.63	0.192	(0.467)	0.151	0.041
134	11.17	0.63	0.192	(0.464)	0.151	0.041
135	11.25	0.63	0.192	(0.462)	0.151	0.041
136	11.33	0.63	0.192	(0.460)	0.151	0.041
137	11.42	0.63	0.192	(0.457)	0.151	0.041
138	11.50	0.63	0.192	(0.455)	0.151	0.041
139	11.58	0.57	0.172	(0.453)	0.135	0.037
140	11.67	0.57	0.172	(0.451)	0.135	0.037
141	11.75	0.57	0.172	(0.448)	0.135	0.037
142	11.83	0.60	0.182	(0.446)	0.143	0.039
143	11.92	0.60	0.182	(0.444)	0.143	0.039
144	12.00	0.60	0.182	(0.442)	0.143	0.039
145	12.08	0.83	0.253	(0.439)	0.199	0.054
146	12.17	0.83	0.253	(0.437)	0.199	0.054
147	12.25	0.83	0.253	(0.435)	0.199	0.054
148	12.33	0.87	0.263	(0.433)	0.207	0.056
149	12.42	0.87	0.263	(0.431)	0.207	0.056
150	12.50	0.87	0.263	(0.429)	0.207	0.056
151	12.58	0.93	0.283	(0.426)	0.223	0.061
152	12.67	0.93	0.283	(0.424)	0.223	0.061
153	12.75	0.93	0.283	(0.422)	0.223	0.061
154	12.83	0.97	0.293	(0.420)	0.231	0.063
155	12.92	0.97	0.293	(0.418)	0.231	0.063
156	13.00	0.97	0.293	(0.416)	0.231	0.063
157	13.08	1.13	0.344	(0.414)	0.271	0.073
158	13.17	1.13	0.344	(0.412)	0.271	0.073

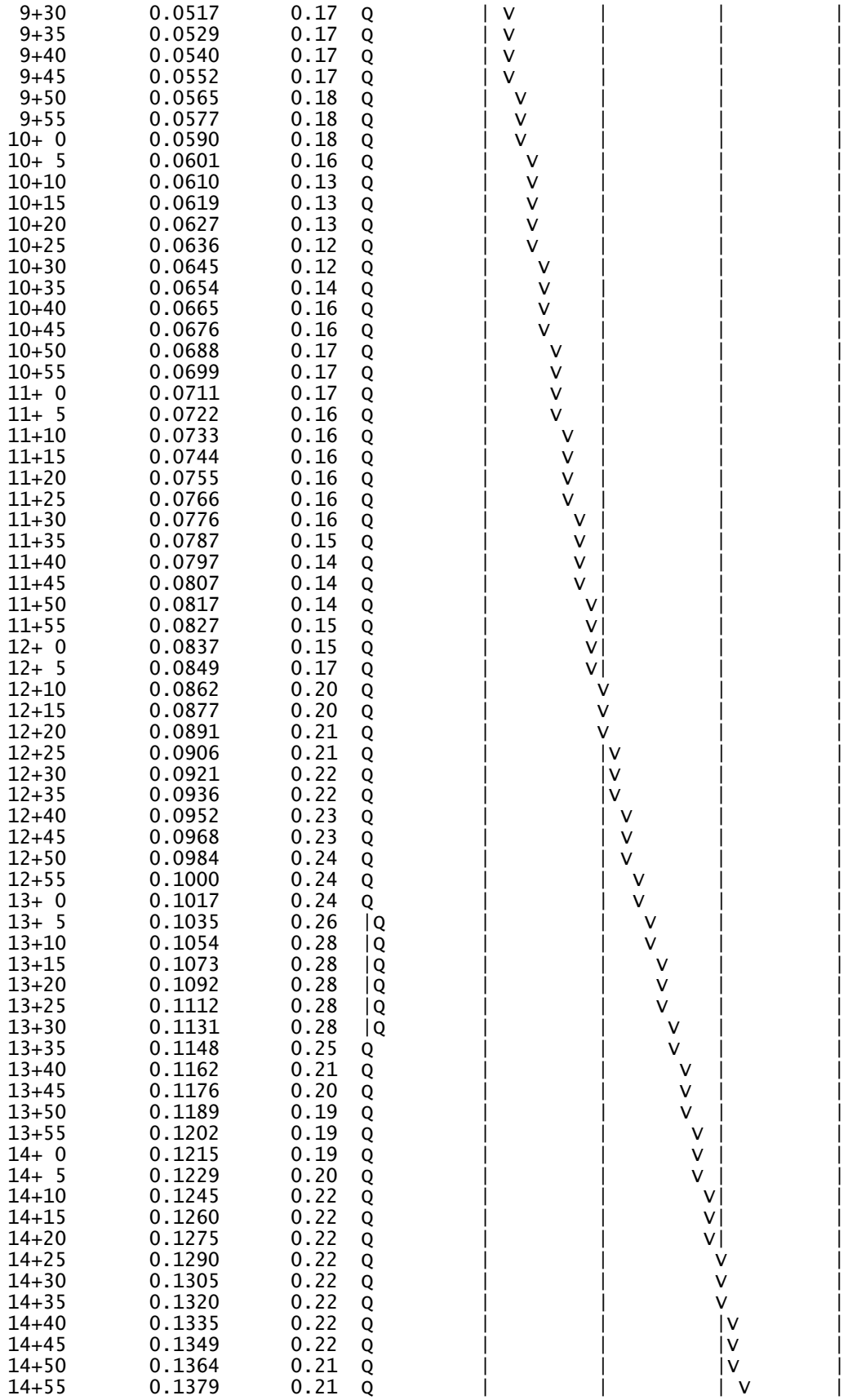
159	13.25	1.13	0.344	(0.409)	0.271	0.073
160	13.33	1.13	0.344	(0.407)	0.271	0.073
161	13.42	1.13	0.344	(0.405)	0.271	0.073
162	13.50	1.13	0.344	(0.403)	0.271	0.073
163	13.58	0.77	0.233	(0.401)	0.183	0.050
164	13.67	0.77	0.233	(0.399)	0.183	0.050
165	13.75	0.77	0.233	(0.397)	0.183	0.050
166	13.83	0.77	0.233	(0.395)	0.183	0.050
167	13.92	0.77	0.233	(0.393)	0.183	0.050
168	14.00	0.77	0.233	(0.391)	0.183	0.050
169	14.08	0.90	0.273	(0.389)	0.215	0.058
170	14.17	0.90	0.273	(0.387)	0.215	0.058
171	14.25	0.90	0.273	(0.385)	0.215	0.058
172	14.33	0.87	0.263	(0.383)	0.207	0.056
173	14.42	0.87	0.263	(0.381)	0.207	0.056
174	14.50	0.87	0.263	(0.379)	0.207	0.056
175	14.58	0.87	0.263	(0.377)	0.207	0.056
176	14.67	0.87	0.263	(0.375)	0.207	0.056
177	14.75	0.87	0.263	(0.373)	0.207	0.056
178	14.83	0.83	0.253	(0.371)	0.199	0.054
179	14.92	0.83	0.253	(0.370)	0.199	0.054
180	15.00	0.83	0.253	(0.368)	0.199	0.054
181	15.08	0.80	0.243	(0.366)	0.191	0.052
182	15.17	0.80	0.243	(0.364)	0.191	0.052
183	15.25	0.80	0.243	(0.362)	0.191	0.052
184	15.33	0.77	0.233	(0.360)	0.183	0.050
185	15.42	0.77	0.233	(0.358)	0.183	0.050
186	15.50	0.77	0.233	(0.357)	0.183	0.050
187	15.58	0.63	0.192	(0.355)	0.151	0.041
188	15.67	0.63	0.192	(0.353)	0.151	0.041
189	15.75	0.63	0.192	(0.351)	0.151	0.041
190	15.83	0.63	0.192	(0.349)	0.151	0.041
191	15.92	0.63	0.192	(0.347)	0.151	0.041
192	16.00	0.63	0.192	(0.346)	0.151	0.041
193	16.08	0.13	0.040	(0.344)	0.032	0.009
194	16.17	0.13	0.040	(0.342)	0.032	0.009
195	16.25	0.13	0.040	(0.340)	0.032	0.009
196	16.33	0.13	0.040	(0.339)	0.032	0.009
197	16.42	0.13	0.040	(0.337)	0.032	0.009
198	16.50	0.13	0.040	(0.335)	0.032	0.009
199	16.58	0.10	0.030	(0.334)	0.024	0.006
200	16.67	0.10	0.030	(0.332)	0.024	0.006
201	16.75	0.10	0.030	(0.330)	0.024	0.006
202	16.83	0.10	0.030	(0.329)	0.024	0.006
203	16.92	0.10	0.030	(0.327)	0.024	0.006
204	17.00	0.10	0.030	(0.325)	0.024	0.006
205	17.08	0.17	0.051	(0.324)	0.040	0.011
206	17.17	0.17	0.051	(0.322)	0.040	0.011
207	17.25	0.17	0.051	(0.320)	0.040	0.011
208	17.33	0.17	0.051	(0.319)	0.040	0.011
209	17.42	0.17	0.051	(0.317)	0.040	0.011
210	17.50	0.17	0.051	(0.316)	0.040	0.011
211	17.58	0.17	0.051	(0.314)	0.040	0.011
212	17.67	0.17	0.051	(0.312)	0.040	0.011
213	17.75	0.17	0.051	(0.311)	0.040	0.011
214	17.83	0.13	0.040	(0.309)	0.032	0.009
215	17.92	0.13	0.040	(0.308)	0.032	0.009
216	18.00	0.13	0.040	(0.306)	0.032	0.009
217	18.08	0.13	0.040	(0.305)	0.032	0.009
218	18.17	0.13	0.040	(0.303)	0.032	0.009
219	18.25	0.13	0.040	(0.302)	0.032	0.009
220	18.33	0.13	0.040	(0.300)	0.032	0.009
221	18.42	0.13	0.040	(0.299)	0.032	0.009
222	18.50	0.13	0.040	(0.297)	0.032	0.009
223	18.58	0.10	0.030	(0.296)	0.024	0.006
224	18.67	0.10	0.030	(0.294)	0.024	0.006

225	18.75	0.10	0.030	(0.293)	0.024	0.006
226	18.83	0.07	0.020	(0.292)	0.016	0.004
227	18.92	0.07	0.020	(0.290)	0.016	0.004
228	19.00	0.07	0.020	(0.289)	0.016	0.004
229	19.08	0.10	0.030	(0.288)	0.024	0.006
230	19.17	0.10	0.030	(0.286)	0.024	0.006
231	19.25	0.10	0.030	(0.285)	0.024	0.006
232	19.33	0.13	0.040	(0.284)	0.032	0.009
233	19.42	0.13	0.040	(0.282)	0.032	0.009
234	19.50	0.13	0.040	(0.281)	0.032	0.009
235	19.58	0.10	0.030	(0.280)	0.024	0.006
236	19.67	0.10	0.030	(0.278)	0.024	0.006
237	19.75	0.10	0.030	(0.277)	0.024	0.006
238	19.83	0.07	0.020	(0.276)	0.016	0.004
239	19.92	0.07	0.020	(0.275)	0.016	0.004
240	20.00	0.07	0.020	(0.273)	0.016	0.004
241	20.08	0.10	0.030	(0.272)	0.024	0.006
242	20.17	0.10	0.030	(0.271)	0.024	0.006
243	20.25	0.10	0.030	(0.270)	0.024	0.006
244	20.33	0.10	0.030	(0.269)	0.024	0.006
245	20.42	0.10	0.030	(0.267)	0.024	0.006
246	20.50	0.10	0.030	(0.266)	0.024	0.006
247	20.58	0.10	0.030	(0.265)	0.024	0.006
248	20.67	0.10	0.030	(0.264)	0.024	0.006
249	20.75	0.10	0.030	(0.263)	0.024	0.006
250	20.83	0.07	0.020	(0.262)	0.016	0.004
251	20.92	0.07	0.020	(0.261)	0.016	0.004
252	21.00	0.07	0.020	(0.260)	0.016	0.004
253	21.08	0.10	0.030	(0.259)	0.024	0.006
254	21.17	0.10	0.030	(0.258)	0.024	0.006
255	21.25	0.10	0.030	(0.257)	0.024	0.006
256	21.33	0.07	0.020	(0.256)	0.016	0.004
257	21.42	0.07	0.020	(0.255)	0.016	0.004
258	21.50	0.07	0.020	(0.254)	0.016	0.004
259	21.58	0.10	0.030	(0.253)	0.024	0.006
260	21.67	0.10	0.030	(0.252)	0.024	0.006
261	21.75	0.10	0.030	(0.251)	0.024	0.006
262	21.83	0.07	0.020	(0.250)	0.016	0.004
263	21.92	0.07	0.020	(0.249)	0.016	0.004
264	22.00	0.07	0.020	(0.249)	0.016	0.004
265	22.08	0.10	0.030	(0.248)	0.024	0.006
266	22.17	0.10	0.030	(0.247)	0.024	0.006
267	22.25	0.10	0.030	(0.246)	0.024	0.006
268	22.33	0.07	0.020	(0.245)	0.016	0.004
269	22.42	0.07	0.020	(0.245)	0.016	0.004
270	22.50	0.07	0.020	(0.244)	0.016	0.004
271	22.58	0.07	0.020	(0.243)	0.016	0.004
272	22.67	0.07	0.020	(0.243)	0.016	0.004
273	22.75	0.07	0.020	(0.242)	0.016	0.004
274	22.83	0.07	0.020	(0.241)	0.016	0.004
275	22.92	0.07	0.020	(0.241)	0.016	0.004
276	23.00	0.07	0.020	(0.240)	0.016	0.004
277	23.08	0.07	0.020	(0.239)	0.016	0.004
278	23.17	0.07	0.020	(0.239)	0.016	0.004
279	23.25	0.07	0.020	(0.238)	0.016	0.004
280	23.33	0.07	0.020	(0.238)	0.016	0.004
281	23.42	0.07	0.020	(0.237)	0.016	0.004
282	23.50	0.07	0.020	(0.237)	0.016	0.004
283	23.58	0.07	0.020	(0.237)	0.016	0.004
284	23.67	0.07	0.020	(0.236)	0.016	0.004
285	23.75	0.07	0.020	(0.236)	0.016	0.004
286	23.83	0.07	0.020	(0.236)	0.016	0.004
287	23.92	0.07	0.020	(0.236)	0.016	0.004
288	24.00	0.07	0.020	(0.235)	0.016	0.004
		(Loss Rate Not Used)				
	Sum =	100.0			Sum =	6.5

```
    Flood volume = Effective rainfall      0.54(In)
     times area       3.8(Ac.)/[(In)/(Ft.)] =       0.2(Ac.Ft)
    Total soil loss =      1.99(In)
    Total soil loss =     0.632(Ac.Ft)
    Total rainfall =      2.53(In)
    Flood volume =        7473.9 Cubic Feet
    Total soil loss =       27516.4 Cubic Feet
    ----------------------------------------------------------------------
     Peak flow rate of this hydrograph =      0.282(CFS)
    ----------------------------------------------------------------------
    ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                        24 - H O U R    S T O R M
                   R u n o f f      H y d r o g r a p h
    ----------------------------------------------------------------------
                Hydrograph in   5   Minute intervals ((CFS))

    ----------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0        2.5       5.0       7.5      10.0
----------------------------------------------------------------------------
  0+ 5       0.0000      0.01  Q          |         |         |         |
  0+10       0.0001      0.01  Q          |         |         |         |
  0+15       0.0002      0.02  Q          |         |         |         |
  0+20       0.0004      0.02  Q          |         |         |         |
  0+25       0.0005      0.02  Q          |         |         |         |
  0+30       0.0007      0.02  Q          |         |         |         |
  0+35       0.0009      0.02  Q          |         |         |         |
  0+40       0.0011      0.02  Q          |         |         |         |
  0+45       0.0012      0.02  Q          |         |         |         |
  0+50       0.0014      0.03  Q          |         |         |         |
  0+55       0.0016      0.03  Q          |         |         |         |
  1+ 0       0.0019      0.03  Q          |         |         |         |
  1+ 5       0.0021      0.03  Q          |         |         |         |
  1+10       0.0022      0.03  Q          |         |         |         |
  1+15       0.0024      0.03  Q          |         |         |         |
  1+20       0.0026      0.03  Q          |         |         |         |
  1+25       0.0028      0.02  Q          |         |         |         |
  1+30       0.0029      0.02  Q          |         |         |         |
  1+35       0.0031      0.02  Q          |         |         |         |
  1+40       0.0033      0.02  Q          |         |         |         |
  1+45       0.0035      0.02  Q          |         |         |         |
  1+50       0.0036      0.03  Q          |         |         |         |
  1+55       0.0039      0.03  Q          |         |         |         |
  2+ 0       0.0041      0.03  Q          |         |         |         |
  2+ 5       0.0043      0.03  QV         |         |         |         |
  2+10       0.0045      0.03  QV         |         |         |         |
  2+15       0.0048      0.03  QV         |         |         |         |
  2+20       0.0050      0.03  QV         |         |         |         |
  2+25       0.0052      0.03  QV         |         |         |         |
  2+30       0.0055      0.03  QV         |         |         |         |
  2+35       0.0057      0.04  QV         |         |         |         |
  2+40       0.0060      0.04  QV         |         |         |         |
  2+45       0.0063      0.04  QV         |         |         |         |
  2+50       0.0066      0.04  QV         |         |         |         |
  2+55       0.0068      0.04  QV         |         |         |         |
  3+ 0       0.0071      0.04  QV         |         |         |         |
  3+ 5       0.0074      0.04  QV         |         |         |         |
  3+10       0.0077      0.04  QV         |         |         |         |
  3+15       0.0080      0.04  QV         |         |         |         |
  3+20       0.0083      0.04  QV         |         |         |         |
  3+25       0.0086      0.04  QV         |         |         |         |
  3+30       0.0088      0.04  Q V        |         |         |         |
  3+35       0.0091      0.04  Q V        |         |         |         |
  3+40       0.0094      0.04  Q V        |         |         |         |
  3+45       0.0097      0.04  Q V        |         |         |         |
  3+50       0.0100      0.04  Q V        |         |         |         |
  3+55       0.0103      0.05  Q V        |         |         |         |
```

```
4+ 0       0.0107      0.05  Q v       |         |         |         |
4+ 5       0.0110      0.05  Q v       |         |         |         |
4+10       0.0114      0.05  Q v       |         |         |         |
4+15       0.0117      0.05  Q v       |         |         |         |
4+20       0.0121      0.05  Q v       |         |         |         |
4+25       0.0125      0.06  Q v       |         |         |         |
4+30       0.0129      0.06  Q v       |         |         |         |
4+35       0.0133      0.06  Q  v      |         |         |         |
4+40       0.0137      0.06  Q  v      |         |         |         |
4+45       0.0141      0.06  Q  v      |         |         |         |
4+50       0.0145      0.06  Q  v      |         |         |         |
4+55       0.0149      0.07  Q  v      |         |         |         |
5+ 0       0.0154      0.07  Q  v      |         |         |         |
5+ 5       0.0158      0.06  Q  v      |         |         |         |
5+10       0.0162      0.05  Q  v      |         |         |         |
5+15       0.0165      0.05  Q  v      |         |         |         |
5+20       0.0169      0.05  Q  v      |         |         |         |
5+25       0.0173      0.06  Q   v     |         |         |         |
5+30       0.0177      0.06  Q   v     |         |         |         |
5+35       0.0181      0.06  Q   v     |         |         |         |
5+40       0.0185      0.07  Q   v     |         |         |         |
5+45       0.0190      0.07  Q   v     |         |         |         |
5+50       0.0195      0.07  Q   v     |         |         |         |
5+55       0.0199      0.07  Q   v     |         |         |         |
6+ 0       0.0204      0.07  Q   v     |         |         |         |
6+ 5       0.0208      0.07  Q   v     |         |         |         |
6+10       0.0214      0.07  Q   v     |         |         |         |
6+15       0.0219      0.07  Q    v    |         |         |         |
6+20       0.0224      0.07  Q    v    |         |         |         |
6+25       0.0229      0.07  Q    v    |         |         |         |
6+30       0.0234      0.07  Q    v    |         |         |         |
6+35       0.0239      0.08  Q    v    |         |         |         |
6+40       0.0245      0.08  Q    v    |         |         |         |
6+45       0.0251      0.08  Q    v    |         |         |         |
6+50       0.0256      0.08  Q    v    |         |         |         |
6+55       0.0262      0.08  Q     v   |         |         |         |
7+ 0       0.0268      0.08  Q     v   |         |         |         |
7+ 5       0.0274      0.08  Q     v   |         |         |         |
7+10       0.0279      0.08  Q     v   |         |         |         |
7+15       0.0285      0.08  Q     v   |         |         |         |
7+20       0.0291      0.09  Q     v   |         |         |         |
7+25       0.0297      0.09  Q     v   |         |         |         |
7+30       0.0303      0.09  Q      v  |         |         |         |
7+35       0.0310      0.09  Q      v  |         |         |         |
7+40       0.0317      0.10  Q      v  |         |         |         |
7+45       0.0324      0.10  Q      v  |         |         |         |
7+50       0.0331      0.10  Q      v  |         |         |         |
7+55       0.0338      0.11  Q      v  |         |         |         |
8+ 0       0.0345      0.11  Q       v |         |         |         |
8+ 5       0.0353      0.11  Q       v |         |         |         |
8+10       0.0362      0.12  Q       v |         |         |         |
8+15       0.0370      0.12  Q       v |         |         |         |
8+20       0.0379      0.12  Q       v |         |         |         |
8+25       0.0387      0.12  Q        v|         |         |         |
8+30       0.0396      0.12  Q        v|         |         |         |
8+35       0.0405      0.13  Q        v|         |         |         |
8+40       0.0414      0.13  Q        v|         |         |         |
8+45       0.0423      0.13  Q        v|         |         |         |
8+50       0.0432      0.14  Q         v         |         |         |
8+55       0.0442      0.14  Q         v         |         |         |
9+ 0       0.0451      0.14  Q         v         |         |         |
9+ 5       0.0462      0.15  Q         v         |         |         |
9+10       0.0472      0.16  Q         |v        |         |         |
9+15       0.0483      0.16  Q         |v        |         |         |
9+20       0.0494      0.16  Q         |v        |         |         |
9+25       0.0505      0.16  Q         |v        |         |         |
```



15+ 0	0.1393	0.21	Q	|	|	V |	
15+ 5	0.1407	0.20	Q	|	|	V |	
15+10	0.1421	0.20	Q	|	|	V |	
15+15	0.1435	0.20	Q	|	|	V |	
15+20	0.1448	0.20	Q	|	|	V |	
15+25	0.1461	0.19	Q	|	|	V |	
15+30	0.1474	0.19	Q	|	|	V |	
15+35	0.1487	0.18	Q	|	|	V |	
15+40	0.1498	0.16	Q	|	|	V |	
15+45	0.1509	0.16	Q	|	|	V |	
15+50	0.1520	0.16	Q	|	|	V |	
15+55	0.1531	0.16	Q	|	|	V |	
16+ 0	0.1542	0.16	Q	|	|	V |	
16+ 5	0.1549	0.11	Q	|	|	V |	
16+10	0.1553	0.05	Q	|	|	V |	
16+15	0.1556	0.04	Q	|	|	V |	
16+20	0.1558	0.04	Q	|	|	V |	
16+25	0.1561	0.03	Q	|	|	V |	
16+30	0.1563	0.03	Q	|	|	V |	
16+35	0.1565	0.03	Q	|	|	V |	
16+40	0.1567	0.03	Q	|	|	V |	
16+45	0.1568	0.03	Q	|	|	V |	
16+50	0.1570	0.03	Q	|	|	V |	
16+55	0.1572	0.02	Q	|	|	V |	
17+ 0	0.1574	0.02	Q	|	|	V |	
17+ 5	0.1576	0.03	Q	|	|	V |	
17+10	0.1578	0.04	Q	|	|	V |	
17+15	0.1581	0.04	Q	|	|	V |	
17+20	0.1584	0.04	Q	|	|	V |	
17+25	0.1587	0.04	Q	|	|	V |	
17+30	0.1590	0.04	Q	|	|	V |	
17+35	0.1593	0.04	Q	|	|	V |	
17+40	0.1595	0.04	Q	|	|	V |	
17+45	0.1598	0.04	Q	|	|	V |	
17+50	0.1601	0.04	Q	|	|	V |	
17+55	0.1603	0.03	Q	|	|	V |	
18+ 0	0.1606	0.03	Q	|	|	V |	
18+ 5	0.1608	0.03	Q	|	|	V |	
18+10	0.1610	0.03	Q	|	|	V |	
18+15	0.1613	0.03	Q	|	|	V |	
18+20	0.1615	0.03	Q	|	|	V |	
18+25	0.1617	0.03	Q	|	|	V |	
18+30	0.1619	0.03	Q	|	|	V |	
18+35	0.1622	0.03	Q	|	|	V |	
18+40	0.1623	0.03	Q	|	|	V |	
18+45	0.1625	0.03	Q	|	|	V |	
18+50	0.1627	0.02	Q	|	|	V |	
18+55	0.1628	0.02	Q	|	|	V |	
19+ 0	0.1629	0.02	Q	|	|	V |	
19+ 5	0.1630	0.02	Q	|	|	V |	
19+10	0.1632	0.02	Q	|	|	V |	
19+15	0.1634	0.02	Q	|	|	V |	
19+20	0.1636	0.03	Q	|	|	V |	
19+25	0.1638	0.03	Q	|	|	V |	
19+30	0.1640	0.03	Q	|	|	V |	
19+35	0.1642	0.03	Q	|	|	V |	
19+40	0.1644	0.03	Q	|	|	V |	
19+45	0.1646	0.03	Q	|	|	V |	
19+50	0.1647	0.02	Q	|	|	V |	
19+55	0.1648	0.02	Q	|	|	V |	
20+ 0	0.1650	0.02	Q	|	|	V |	
20+ 5	0.1651	0.02	Q	|	|	V |	
20+10	0.1653	0.02	Q	|	|	V |	
20+15	0.1654	0.02	Q	|	|	V |	
20+20	0.1656	0.02	Q	|	|	V |	
20+25	0.1658	0.02	Q	|	|	V |	

```
  20+30       0.1659      0.02  Q          |          |          |        V |
  20+35       0.1661      0.02  Q          |          |          |        V |
  20+40       0.1663      0.02  Q          |          |          |        V |
  20+45       0.1665      0.02  Q          |          |          |        V |
  20+50       0.1666      0.02  Q          |          |          |        V |
  20+55       0.1667      0.02  Q          |          |          |        V |
  21+ 0       0.1668      0.02  Q          |          |          |        V |
  21+ 5       0.1670      0.02  Q          |          |          |        V |
  21+10       0.1671      0.02  Q          |          |          |        V |
  21+15       0.1673      0.02  Q          |          |          |         V|
  21+20       0.1675      0.02  Q          |          |          |         V|
  21+25       0.1676      0.02  Q          |          |          |         V|
  21+30       0.1677      0.02  Q          |          |          |         V|
  21+35       0.1678      0.02  Q          |          |          |         V|
  21+40       0.1680      0.02  Q          |          |          |         V|
  21+45       0.1682      0.02  Q          |          |          |         V|
  21+50       0.1683      0.02  Q          |          |          |         V|
  21+55       0.1684      0.02  Q          |          |          |         V|
  22+ 0       0.1686      0.02  Q          |          |          |         V|
  22+ 5       0.1687      0.02  Q          |          |          |         V|
  22+10       0.1689      0.02  Q          |          |          |         V|
  22+15       0.1690      0.02  Q          |          |          |         V|
  22+20       0.1692      0.02  Q          |          |          |         V|
  22+25       0.1693      0.02  Q          |          |          |         V|
  22+30       0.1694      0.02  Q          |          |          |         V|
  22+35       0.1695      0.02  Q          |          |          |         V|
  22+40       0.1696      0.02  Q          |          |          |         V|
  22+45       0.1698      0.02  Q          |          |          |         V|
  22+50       0.1699      0.02  Q          |          |          |         V|
  22+55       0.1700      0.02  Q          |          |          |         V|
  23+ 0       0.1701      0.02  Q          |          |          |         V|
  23+ 5       0.1702      0.02  Q          |          |          |         V|
  23+10       0.1703      0.02  Q          |          |          |         V|
  23+15       0.1704      0.02  Q          |          |          |         V|
  23+20       0.1706      0.02  Q          |          |          |         V|
  23+25       0.1707      0.02  Q          |          |          |         V|
  23+30       0.1708      0.02  Q          |          |          |         V|
  23+35       0.1709      0.02  Q          |          |          |         V|
  23+40       0.1710      0.02  Q          |          |          |         V|
  23+45       0.1711      0.02  Q          |          |          |         V|
  23+50       0.1713      0.02  Q          |          |          |         V|
  23+55       0.1714      0.02  Q          |          |          |         V|
  24+ 0       0.1715      0.02  Q          |          |          |         V|
  24+ 5       0.1715      0.01  Q          |          |          |         V|
  24+10       0.1716      0.00  Q          |          |          |         V|
  24+15       0.1716      0.00  Q          |          |          |         V|
  24+20       0.1716      0.00  Q          |          |          |          V
-------------------------------------------------------------------------
```

U n i t H y d r o g r a p h A n a l y s i s

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Study date 09/16/22 File: 2X242.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6545

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

XENIA
PRELIMINARY UNIT HYDROGRAPH ANALYSIS
AREA 2X PRESENT CONDITION
2-YEAR

Drainage Area = 10.08(Ac.) = 0.016 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 10.08(Ac.) = 0.016 Sq. Mi.
Length along longest watercourse = 1117.00(Ft.)
Length along longest watercourse measured to centroid = 544.00(Ft.)
Length along longest watercourse = 0.212 Mi.
Length along longest watercourse measured to centroid = 0.103 Mi.
Difference in elevation = 8.70(Ft.)
Slope along watercourse = 41.1244 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.083 Hr.
Lag time = 4.98 Min.
25% of lag time = 1.25 Min.
40% of lag time = 1.99 Min.
Unit time = 5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
10.08	2.53	25.50

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
10.08	6.50	65.52

STORM EVENT (YEAR) = 2.00
Area Averaged 2-Year Rainfall = 2.530(In)
Area Averaged 100-Year Rainfall = 6.500(In)

Point rain (area averaged) = 2.530(In)
Areal adjustment factor = 100.00 %

Adjusted average point rain = 2.530(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
10.080	72.20	0.131

Total Area Entered = 10.08(Ac.)

RI AMC2	RI AMC-1	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
72.2	53.6	0.535	0.131	0.472	1.000	0.472
					Sum (F) =	0.472

Area averaged mean soil loss (F) (In/Hr) = 0.472
Minimum soil loss rate ((In/Hr)) = 0.236
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.795

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	100.364	19.312	1.962
2	0.167	200.729	48.430	4.920
3	0.250	301.093	15.580	1.583
4	0.333	401.457	7.043	0.716
5	0.417	501.821	3.960	0.402
6	0.500	602.186	2.564	0.260
7	0.583	702.550	1.588	0.161
8	0.667	802.914	1.522	0.155
		Sum = 100.000	Sum=	10.159

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max		Low	Effective (In/Hr)
1	0.08	0.07	0.020	(0.836)		0.016	0.004
2	0.17	0.07	0.020	(0.833)		0.016	0.004
3	0.25	0.07	0.020	(0.830)		0.016	0.004
4	0.33	0.10	0.030	(0.827)		0.024	0.006
5	0.42	0.10	0.030	(0.823)		0.024	0.006
6	0.50	0.10	0.030	(0.820)		0.024	0.006
7	0.58	0.10	0.030	(0.817)		0.024	0.006
8	0.67	0.10	0.030	(0.814)		0.024	0.006
9	0.75	0.10	0.030	(0.811)		0.024	0.006
10	0.83	0.13	0.040	(0.808)		0.032	0.008
11	0.92	0.13	0.040	(0.804)		0.032	0.008
12	1.00	0.13	0.040	(0.801)		0.032	0.008
13	1.08	0.10	0.030	(0.798)		0.024	0.006
14	1.17	0.10	0.030	(0.795)		0.024	0.006
15	1.25	0.10	0.030	(0.792)		0.024	0.006
16	1.33	0.10	0.030	(0.789)		0.024	0.006
17	1.42	0.10	0.030	(0.785)		0.024	0.006
18	1.50	0.10	0.030	(0.782)		0.024	0.006
19	1.58	0.10	0.030	(0.779)		0.024	0.006
20	1.67	0.10	0.030	(0.776)		0.024	0.006
21	1.75	0.10	0.030	(0.773)		0.024	0.006
22	1.83	0.13	0.040	(0.770)		0.032	0.008
23	1.92	0.13	0.040	(0.767)		0.032	0.008

24	2.00	0.13	0.040	(0.764)	0.032	0.008
25	2.08	0.13	0.040	(0.760)	0.032	0.008
26	2.17	0.13	0.040	(0.757)	0.032	0.008
27	2.25	0.13	0.040	(0.754)	0.032	0.008
28	2.33	0.13	0.040	(0.751)	0.032	0.008
29	2.42	0.13	0.040	(0.748)	0.032	0.008
30	2.50	0.13	0.040	(0.745)	0.032	0.008
31	2.58	0.17	0.051	(0.742)	0.040	0.010
32	2.67	0.17	0.051	(0.739)	0.040	0.010
33	2.75	0.17	0.051	(0.736)	0.040	0.010
34	2.83	0.17	0.051	(0.733)	0.040	0.010
35	2.92	0.17	0.051	(0.730)	0.040	0.010
36	3.00	0.17	0.051	(0.727)	0.040	0.010
37	3.08	0.17	0.051	(0.724)	0.040	0.010
38	3.17	0.17	0.051	(0.721)	0.040	0.010
39	3.25	0.17	0.051	(0.718)	0.040	0.010
40	3.33	0.17	0.051	(0.715)	0.040	0.010
41	3.42	0.17	0.051	(0.712)	0.040	0.010
42	3.50	0.17	0.051	(0.709)	0.040	0.010
43	3.58	0.17	0.051	(0.706)	0.040	0.010
44	3.67	0.17	0.051	(0.703)	0.040	0.010
45	3.75	0.17	0.051	(0.700)	0.040	0.010
46	3.83	0.20	0.061	(0.697)	0.048	0.012
47	3.92	0.20	0.061	(0.694)	0.048	0.012
48	4.00	0.20	0.061	(0.691)	0.048	0.012
49	4.08	0.20	0.061	(0.688)	0.048	0.012
50	4.17	0.20	0.061	(0.685)	0.048	0.012
51	4.25	0.20	0.061	(0.682)	0.048	0.012
52	4.33	0.23	0.071	(0.680)	0.056	0.015
53	4.42	0.23	0.071	(0.677)	0.056	0.015
54	4.50	0.23	0.071	(0.674)	0.056	0.015
55	4.58	0.23	0.071	(0.671)	0.056	0.015
56	4.67	0.23	0.071	(0.668)	0.056	0.015
57	4.75	0.23	0.071	(0.665)	0.056	0.015
58	4.83	0.27	0.081	(0.662)	0.064	0.017
59	4.92	0.27	0.081	(0.659)	0.064	0.017
60	5.00	0.27	0.081	(0.657)	0.064	0.017
61	5.08	0.20	0.061	(0.654)	0.048	0.012
62	5.17	0.20	0.061	(0.651)	0.048	0.012
63	5.25	0.20	0.061	(0.648)	0.048	0.012
64	5.33	0.23	0.071	(0.645)	0.056	0.015
65	5.42	0.23	0.071	(0.642)	0.056	0.015
66	5.50	0.23	0.071	(0.640)	0.056	0.015
67	5.58	0.27	0.081	(0.637)	0.064	0.017
68	5.67	0.27	0.081	(0.634)	0.064	0.017
69	5.75	0.27	0.081	(0.631)	0.064	0.017
70	5.83	0.27	0.081	(0.628)	0.064	0.017
71	5.92	0.27	0.081	(0.626)	0.064	0.017
72	6.00	0.27	0.081	(0.623)	0.064	0.017
73	6.08	0.30	0.091	(0.620)	0.072	0.019
74	6.17	0.30	0.091	(0.617)	0.072	0.019
75	6.25	0.30	0.091	(0.615)	0.072	0.019
76	6.33	0.30	0.091	(0.612)	0.072	0.019
77	6.42	0.30	0.091	(0.609)	0.072	0.019
78	6.50	0.30	0.091	(0.606)	0.072	0.019
79	6.58	0.33	0.101	(0.604)	0.080	0.021
80	6.67	0.33	0.101	(0.601)	0.080	0.021
81	6.75	0.33	0.101	(0.598)	0.080	0.021
82	6.83	0.33	0.101	(0.595)	0.080	0.021
83	6.92	0.33	0.101	(0.593)	0.080	0.021
84	7.00	0.33	0.101	(0.590)	0.080	0.021
85	7.08	0.33	0.101	(0.587)	0.080	0.021
86	7.17	0.33	0.101	(0.585)	0.080	0.021
87	7.25	0.33	0.101	(0.582)	0.080	0.021
88	7.33	0.37	0.111	(0.579)	0.089	0.023
89	7.42	0.37	0.111	(0.577)	0.089	0.023

90	7.50	0.37	0.111	(0.574)	0.089	0.023
91	7.58	0.40	0.121	(0.571)	0.097	0.025
92	7.67	0.40	0.121	(0.569)	0.097	0.025
93	7.75	0.40	0.121	(0.566)	0.097	0.025
94	7.83	0.43	0.132	(0.564)	0.105	0.027
95	7.92	0.43	0.132	(0.561)	0.105	0.027
96	8.00	0.43	0.132	(0.558)	0.105	0.027
97	8.08	0.50	0.152	(0.556)	0.121	0.031
98	8.17	0.50	0.152	(0.553)	0.121	0.031
99	8.25	0.50	0.152	(0.551)	0.121	0.031
100	8.33	0.50	0.152	(0.548)	0.121	0.031
101	8.42	0.50	0.152	(0.545)	0.121	0.031
102	8.50	0.50	0.152	(0.543)	0.121	0.031
103	8.58	0.53	0.162	(0.540)	0.129	0.033
104	8.67	0.53	0.162	(0.538)	0.129	0.033
105	8.75	0.53	0.162	(0.535)	0.129	0.033
106	8.83	0.57	0.172	(0.533)	0.137	0.035
107	8.92	0.57	0.172	(0.530)	0.137	0.035
108	9.00	0.57	0.172	(0.528)	0.137	0.035
109	9.08	0.63	0.192	(0.525)	0.153	0.039
110	9.17	0.63	0.192	(0.523)	0.153	0.039
111	9.25	0.63	0.192	(0.520)	0.153	0.039
112	9.33	0.67	0.202	(0.518)	0.161	0.041
113	9.42	0.67	0.202	(0.515)	0.161	0.041
114	9.50	0.67	0.202	(0.513)	0.161	0.041
115	9.58	0.70	0.213	(0.510)	0.169	0.044
116	9.67	0.70	0.213	(0.508)	0.169	0.044
117	9.75	0.70	0.213	(0.506)	0.169	0.044
118	9.83	0.73	0.223	(0.503)	0.177	0.046
119	9.92	0.73	0.223	(0.501)	0.177	0.046
120	10.00	0.73	0.223	(0.498)	0.177	0.046
121	10.08	0.50	0.152	(0.496)	0.121	0.031
122	10.17	0.50	0.152	(0.493)	0.121	0.031
123	10.25	0.50	0.152	(0.491)	0.121	0.031
124	10.33	0.50	0.152	(0.489)	0.121	0.031
125	10.42	0.50	0.152	(0.486)	0.121	0.031
126	10.50	0.50	0.152	(0.484)	0.121	0.031
127	10.58	0.67	0.202	(0.482)	0.161	0.041
128	10.67	0.67	0.202	(0.479)	0.161	0.041
129	10.75	0.67	0.202	(0.477)	0.161	0.041
130	10.83	0.67	0.202	(0.474)	0.161	0.041
131	10.92	0.67	0.202	(0.472)	0.161	0.041
132	11.00	0.67	0.202	(0.470)	0.161	0.041
133	11.08	0.63	0.192	(0.468)	0.153	0.039
134	11.17	0.63	0.192	(0.465)	0.153	0.039
135	11.25	0.63	0.192	(0.463)	0.153	0.039
136	11.33	0.63	0.192	(0.461)	0.153	0.039
137	11.42	0.63	0.192	(0.458)	0.153	0.039
138	11.50	0.63	0.192	(0.456)	0.153	0.039
139	11.58	0.57	0.172	(0.454)	0.137	0.035
140	11.67	0.57	0.172	(0.452)	0.137	0.035
141	11.75	0.57	0.172	(0.449)	0.137	0.035
142	11.83	0.60	0.182	(0.447)	0.145	0.037
143	11.92	0.60	0.182	(0.445)	0.145	0.037
144	12.00	0.60	0.182	(0.443)	0.145	0.037
145	12.08	0.83	0.253	(0.440)	0.201	0.052
146	12.17	0.83	0.253	(0.438)	0.201	0.052
147	12.25	0.83	0.253	(0.436)	0.201	0.052
148	12.33	0.87	0.263	(0.434)	0.209	0.054
149	12.42	0.87	0.263	(0.432)	0.209	0.054
150	12.50	0.87	0.263	(0.429)	0.209	0.054
151	12.58	0.93	0.283	(0.427)	0.225	0.058
152	12.67	0.93	0.283	(0.425)	0.225	0.058
153	12.75	0.93	0.283	(0.423)	0.225	0.058
154	12.83	0.97	0.293	(0.421)	0.233	0.060
155	12.92	0.97	0.293	(0.419)	0.233	0.060

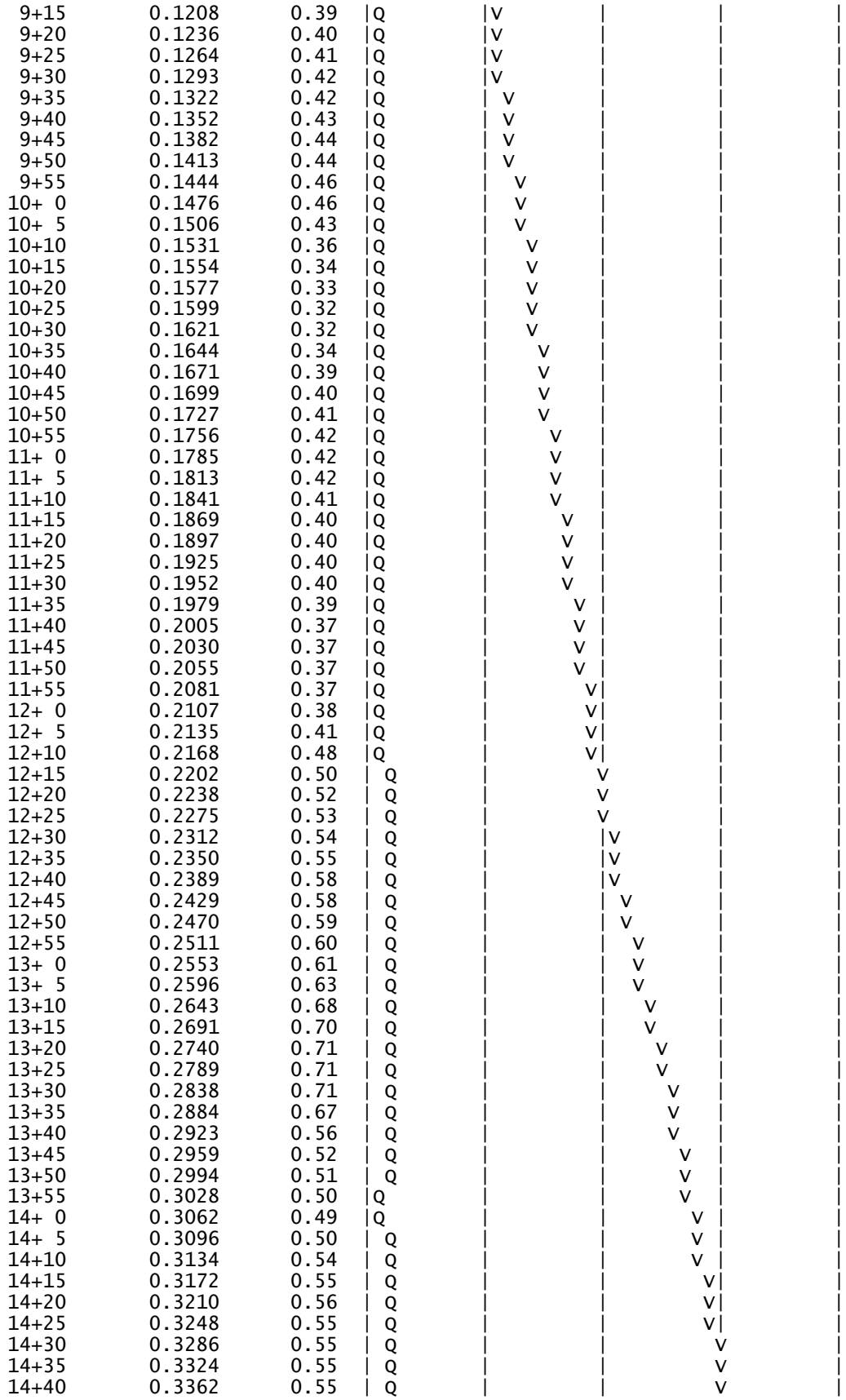
156	13.00	0.97	0.293	(0.417)	0.233	0.060
157	13.08	1.13	0.344	(0.415)	0.274	0.070
158	13.17	1.13	0.344	(0.412)	0.274	0.070
159	13.25	1.13	0.344	(0.410)	0.274	0.070
160	13.33	1.13	0.344	(0.408)	0.274	0.070
161	13.42	1.13	0.344	(0.406)	0.274	0.070
162	13.50	1.13	0.344	(0.404)	0.274	0.070
163	13.58	0.77	0.233	(0.402)	0.185	0.048
164	13.67	0.77	0.233	(0.400)	0.185	0.048
165	13.75	0.77	0.233	(0.398)	0.185	0.048
166	13.83	0.77	0.233	(0.396)	0.185	0.048
167	13.92	0.77	0.233	(0.394)	0.185	0.048
168	14.00	0.77	0.233	(0.392)	0.185	0.048
169	14.08	0.90	0.273	(0.390)	0.217	0.056
170	14.17	0.90	0.273	(0.388)	0.217	0.056
171	14.25	0.90	0.273	(0.386)	0.217	0.056
172	14.33	0.87	0.263	(0.384)	0.209	0.054
173	14.42	0.87	0.263	(0.382)	0.209	0.054
174	14.50	0.87	0.263	(0.380)	0.209	0.054
175	14.58	0.87	0.263	(0.378)	0.209	0.054
176	14.67	0.87	0.263	(0.376)	0.209	0.054
177	14.75	0.87	0.263	(0.374)	0.209	0.054
178	14.83	0.83	0.253	(0.372)	0.201	0.052
179	14.92	0.83	0.253	(0.370)	0.201	0.052
180	15.00	0.83	0.253	(0.369)	0.201	0.052
181	15.08	0.80	0.243	(0.367)	0.193	0.050
182	15.17	0.80	0.243	(0.365)	0.193	0.050
183	15.25	0.80	0.243	(0.363)	0.193	0.050
184	15.33	0.77	0.233	(0.361)	0.185	0.048
185	15.42	0.77	0.233	(0.359)	0.185	0.048
186	15.50	0.77	0.233	(0.357)	0.185	0.048
187	15.58	0.63	0.192	(0.355)	0.153	0.039
188	15.67	0.63	0.192	(0.354)	0.153	0.039
189	15.75	0.63	0.192	(0.352)	0.153	0.039
190	15.83	0.63	0.192	(0.350)	0.153	0.039
191	15.92	0.63	0.192	(0.348)	0.153	0.039
192	16.00	0.63	0.192	(0.346)	0.153	0.039
193	16.08	0.13	0.040	(0.345)	0.032	0.008
194	16.17	0.13	0.040	(0.343)	0.032	0.008
195	16.25	0.13	0.040	(0.341)	0.032	0.008
196	16.33	0.13	0.040	(0.339)	0.032	0.008
197	16.42	0.13	0.040	(0.338)	0.032	0.008
198	16.50	0.13	0.040	(0.336)	0.032	0.008
199	16.58	0.10	0.030	(0.334)	0.024	0.006
200	16.67	0.10	0.030	(0.333)	0.024	0.006
201	16.75	0.10	0.030	(0.331)	0.024	0.006
202	16.83	0.10	0.030	(0.329)	0.024	0.006
203	16.92	0.10	0.030	(0.328)	0.024	0.006
204	17.00	0.10	0.030	(0.326)	0.024	0.006
205	17.08	0.17	0.051	(0.324)	0.040	0.010
206	17.17	0.17	0.051	(0.323)	0.040	0.010
207	17.25	0.17	0.051	(0.321)	0.040	0.010
208	17.33	0.17	0.051	(0.319)	0.040	0.010
209	17.42	0.17	0.051	(0.318)	0.040	0.010
210	17.50	0.17	0.051	(0.316)	0.040	0.010
211	17.58	0.17	0.051	(0.315)	0.040	0.010
212	17.67	0.17	0.051	(0.313)	0.040	0.010
213	17.75	0.17	0.051	(0.311)	0.040	0.010
214	17.83	0.13	0.040	(0.310)	0.032	0.008
215	17.92	0.13	0.040	(0.308)	0.032	0.008
216	18.00	0.13	0.040	(0.307)	0.032	0.008
217	18.08	0.13	0.040	(0.305)	0.032	0.008
218	18.17	0.13	0.040	(0.304)	0.032	0.008
219	18.25	0.13	0.040	(0.302)	0.032	0.008
220	18.33	0.13	0.040	(0.301)	0.032	0.008
221	18.42	0.13	0.040	(0.299)	0.032	0.008

222	18.50	0.13	0.040	(0.298)	0.032	0.008
223	18.58	0.10	0.030	(0.297)	0.024	0.006
224	18.67	0.10	0.030	(0.295)	0.024	0.006
225	18.75	0.10	0.030	(0.294)	0.024	0.006
226	18.83	0.07	0.020	(0.292)	0.016	0.004
227	18.92	0.07	0.020	(0.291)	0.016	0.004
228	19.00	0.07	0.020	(0.290)	0.016	0.004
229	19.08	0.10	0.030	(0.288)	0.024	0.006
230	19.17	0.10	0.030	(0.287)	0.024	0.006
231	19.25	0.10	0.030	(0.285)	0.024	0.006
232	19.33	0.13	0.040	(0.284)	0.032	0.008
233	19.42	0.13	0.040	(0.283)	0.032	0.008
234	19.50	0.13	0.040	(0.282)	0.032	0.008
235	19.58	0.10	0.030	(0.280)	0.024	0.006
236	19.67	0.10	0.030	(0.279)	0.024	0.006
237	19.75	0.10	0.030	(0.278)	0.024	0.006
238	19.83	0.07	0.020	(0.276)	0.016	0.004
239	19.92	0.07	0.020	(0.275)	0.016	0.004
240	20.00	0.07	0.020	(0.274)	0.016	0.004
241	20.08	0.10	0.030	(0.273)	0.024	0.006
242	20.17	0.10	0.030	(0.272)	0.024	0.006
243	20.25	0.10	0.030	(0.270)	0.024	0.006
244	20.33	0.10	0.030	(0.269)	0.024	0.006
245	20.42	0.10	0.030	(0.268)	0.024	0.006
246	20.50	0.10	0.030	(0.267)	0.024	0.006
247	20.58	0.10	0.030	(0.266)	0.024	0.006
248	20.67	0.10	0.030	(0.265)	0.024	0.006
249	20.75	0.10	0.030	(0.264)	0.024	0.006
250	20.83	0.07	0.020	(0.263)	0.016	0.004
251	20.92	0.07	0.020	(0.261)	0.016	0.004
252	21.00	0.07	0.020	(0.260)	0.016	0.004
253	21.08	0.10	0.030	(0.259)	0.024	0.006
254	21.17	0.10	0.030	(0.258)	0.024	0.006
255	21.25	0.10	0.030	(0.257)	0.024	0.006
256	21.33	0.07	0.020	(0.256)	0.016	0.004
257	21.42	0.07	0.020	(0.255)	0.016	0.004
258	21.50	0.07	0.020	(0.254)	0.016	0.004
259	21.58	0.10	0.030	(0.254)	0.024	0.006
260	21.67	0.10	0.030	(0.253)	0.024	0.006
261	21.75	0.10	0.030	(0.252)	0.024	0.006
262	21.83	0.07	0.020	(0.251)	0.016	0.004
263	21.92	0.07	0.020	(0.250)	0.016	0.004
264	22.00	0.07	0.020	(0.249)	0.016	0.004
265	22.08	0.10	0.030	(0.248)	0.024	0.006
266	22.17	0.10	0.030	(0.247)	0.024	0.006
267	22.25	0.10	0.030	(0.247)	0.024	0.006
268	22.33	0.07	0.020	(0.246)	0.016	0.004
269	22.42	0.07	0.020	(0.245)	0.016	0.004
270	22.50	0.07	0.020	(0.244)	0.016	0.004
271	22.58	0.07	0.020	(0.244)	0.016	0.004
272	22.67	0.07	0.020	(0.243)	0.016	0.004
273	22.75	0.07	0.020	(0.242)	0.016	0.004
274	22.83	0.07	0.020	(0.242)	0.016	0.004
275	22.92	0.07	0.020	(0.241)	0.016	0.004
276	23.00	0.07	0.020	(0.241)	0.016	0.004
277	23.08	0.07	0.020	(0.240)	0.016	0.004
278	23.17	0.07	0.020	(0.239)	0.016	0.004
279	23.25	0.07	0.020	(0.239)	0.016	0.004
280	23.33	0.07	0.020	(0.238)	0.016	0.004
281	23.42	0.07	0.020	(0.238)	0.016	0.004
282	23.50	0.07	0.020	(0.238)	0.016	0.004
283	23.58	0.07	0.020	(0.237)	0.016	0.004
284	23.67	0.07	0.020	(0.237)	0.016	0.004
285	23.75	0.07	0.020	(0.237)	0.016	0.004
286	23.83	0.07	0.020	(0.236)	0.016	0.004
287	23.92	0.07	0.020	(0.236)	0.016	0.004

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288  24.00     0.07      0.020       (  0.236)       0.016        0.004
           (Loss Rate Not Used)
    Sum =     100.0                                          Sum =     6.2
      Flood volume = Effective rainfall      0.52(In)
       times area      10.1(Ac.)/[(In)/(Ft.)] =       0.4(Ac.Ft)
      Total soil loss =      2.01(In)
      Total soil loss =     1.690(Ac.Ft)
      Total rainfall =      2.53(In)
      Flood volume =       18958.7 Cubic Feet
      Total soil loss =       73613.2 Cubic Feet
      ---------------------------------------------------------------------
       Peak flow rate of this hydrograph =      0.713(CFS)
      ---------------------------------------------------------------------
      +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          24 - H O U R    S T O R M
                     R u n o f f      H y d r o g r a p h
      ---------------------------------------------------------------------
                  Hydrograph in   5   Minute intervals ((CFS))

      ---------------------------------------------------------------------
 Time(h+m) Volume Ac.Ft   Q(CFS)  0        2.5       5.0       7.5      10.0
 ------------------------------------------------------------------------
   0+ 5       0.0001      0.01  Q          |         |         |         |
   0+10       0.0003      0.03  Q          |         |         |         |
   0+15       0.0005      0.04  Q          |         |         |         |
   0+20       0.0008      0.04  Q          |         |         |         |
   0+25       0.0012      0.05  Q          |         |         |         |
   0+30       0.0016      0.06  Q          |         |         |         |
   0+35       0.0020      0.06  Q          |         |         |         |
   0+40       0.0024      0.06  Q          |         |         |         |
   0+45       0.0028      0.06  Q          |         |         |         |
   0+50       0.0033      0.07  Q          |         |         |         |
   0+55       0.0038      0.08  Q          |         |         |         |
   1+ 0       0.0044      0.08  Q          |         |         |         |
   1+ 5       0.0049      0.08  Q          |         |         |         |
   1+10       0.0054      0.07  Q          |         |         |         |
   1+15       0.0059      0.07  Q          |         |         |         |
   1+20       0.0063      0.06  Q          |         |         |         |
   1+25       0.0067      0.06  Q          |         |         |         |
   1+30       0.0072      0.06  Q          |         |         |         |
   1+35       0.0076      0.06  Q          |         |         |         |
   1+40       0.0081      0.06  Q          |         |         |         |
   1+45       0.0085      0.06  Q          |         |         |         |
   1+50       0.0090      0.07  Q          |         |         |         |
   1+55       0.0095      0.08  Q          |         |         |         |
   2+ 0       0.0100      0.08  Q          |         |         |         |
   2+ 5       0.0106      0.08  Q          |         |         |         |
   2+10       0.0112      0.08  QV         |         |         |         |
   2+15       0.0118      0.08  QV         |         |         |         |
   2+20       0.0123      0.08  QV         |         |         |         |
   2+25       0.0129      0.08  QV         |         |         |         |
   2+30       0.0135      0.08  QV         |         |         |         |
   2+35       0.0141      0.09  QV         |         |         |         |
   2+40       0.0148      0.10  QV         |         |         |         |
   2+45       0.0155      0.10  QV         |         |         |         |
   2+50       0.0162      0.10  QV         |         |         |         |
   2+55       0.0169      0.10  QV         |         |         |         |
   3+ 0       0.0176      0.10  QV         |         |         |         |
   3+ 5       0.0184      0.11  QV         |         |         |         |
   3+10       0.0191      0.11  QV         |         |         |         |
   3+15       0.0198      0.11  QV         |         |         |         |
   3+20       0.0205      0.11  QV         |         |         |         |
   3+25       0.0213      0.11  QV         |         |         |         |
   3+30       0.0220      0.11  Q V        |         |         |         |
   3+35       0.0227      0.11  Q V        |         |         |         |
   3+40       0.0234      0.11  Q V        |         |         |         |
```

3+45	0.0242	0.11	Q v	|	|	|	|
3+50	0.0249	0.11	Q v	|	|	|	|
3+55	0.0257	0.12	Q v	|	|	|	|
4+ 0	0.0266	0.12	Q v	|	|	|	|
4+ 5	0.0274	0.12	Q v	|	|	|	|
4+10	0.0283	0.13	Q v	|	|	|	|
4+15	0.0292	0.13	Q v	|	|	|	|
4+20	0.0301	0.13	Q v	|	|	|	|
4+25	0.0310	0.14	Q v	|	|	|	|
4+30	0.0320	0.14	Q v	|	|	|	|
4+35	0.0330	0.15	Q v	|	|	|	|
4+40	0.0340	0.15	Q v	|	|	|	|
4+45	0.0350	0.15	Q v	|	|	|	|
4+50	0.0361	0.15	Q v	|	|	|	|
4+55	0.0372	0.16	Q v	|	|	|	|
5+ 0	0.0383	0.17	Q v	|	|	|	|
5+ 5	0.0394	0.16	Q v	|	|	|	|
5+10	0.0404	0.14	Q v	|	|	|	|
5+15	0.0413	0.13	Q v	|	|	|	|
5+20	0.0422	0.13	Q v	|	|	|	|
5+25	0.0432	0.14	Q v	|	|	|	|
5+30	0.0442	0.15	Q v	|	|	|	|
5+35	0.0452	0.15	Q v	|	|	|	|
5+40	0.0463	0.16	Q v	|	|	|	|
5+45	0.0475	0.16	Q v	|	|	|	|
5+50	0.0486	0.17	Q v	|	|	|	|
5+55	0.0498	0.17	Q v	|	|	|	|
6+ 0	0.0509	0.17	Q v	|	|	|	|
6+ 5	0.0521	0.17	Q v	|	|	|	|
6+10	0.0534	0.18	Q v	|	|	|	|
6+15	0.0547	0.19	Q v	|	|	|	|
6+20	0.0559	0.19	Q v	|	|	|	|
6+25	0.0572	0.19	Q v	|	|	|	|
6+30	0.0585	0.19	Q v	|	|	|	|
6+35	0.0599	0.19	Q v	|	|	|	|
6+40	0.0613	0.20	Q v	|	|	|	|
6+45	0.0627	0.21	Q v	|	|	|	|
6+50	0.0641	0.21	Q v	|	|	|	|
6+55	0.0656	0.21	Q v	|	|	|	|
7+ 0	0.0670	0.21	Q v	|	|	|	|
7+ 5	0.0685	0.21	Q v	|	|	|	|
7+10	0.0699	0.21	Q v	|	|	|	|
7+15	0.0714	0.21	Q v	|	|	|	|
7+20	0.0729	0.21	Q v	|	|	|	|
7+25	0.0744	0.22	Q v	|	|	|	|
7+30	0.0760	0.23	Q v	|	|	|	|
7+35	0.0776	0.23	Q v	|	|	|	|
7+40	0.0793	0.24	Q v	|	|	|	|
7+45	0.0810	0.25	Q v	|	|	|	|
7+50	0.0827	0.25	|Q v	|	|	|	|
7+55	0.0846	0.27	|Q v	|	|	|	|
8+ 0	0.0864	0.27	|Q v	|	|	|	|
8+ 5	0.0884	0.28	|Q v	|	|	|	|
8+10	0.0904	0.30	|Q v	|	|	|	|
8+15	0.0926	0.31	|Q v	|	|	|	|
8+20	0.0947	0.31	|Q v	|	|	|	|
8+25	0.0969	0.31	|Q v	|	|	|	|
8+30	0.0990	0.31	|Q v	|	|	|	|
8+35	0.1012	0.32	|Q v	|	|	|	|
8+40	0.1035	0.33	|Q v	|	|	|	|
8+45	0.1058	0.33	|Q v	|	|	|	|
8+50	0.1081	0.34	|Q v	|	|	|	|
8+55	0.1105	0.35	|Q v	|	|	|	|
9+ 0	0.1130	0.35	|Q v	|	|	|	|
9+ 5	0.1155	0.36	|Q v	|	|	|	|
9+10	0.1181	0.39	|Q v	|	|	|	|



14+45	0.3399	0.55	| Q	|	|	|V	|
14+50	0.3437	0.54	| Q	|	|	|V	|
14+55	0.3474	0.53	| Q	|	|	|V	|
15+ 0	0.3510	0.53	| Q	|	|	| V	|
15+ 5	0.3546	0.52	| Q	|	|	| V	|
15+10	0.3582	0.51	| Q	|	|	| V	|
15+15	0.3617	0.51	| Q	|	|	| V	|
15+20	0.3651	0.50	| Q	|	|	| V	|
15+25	0.3685	0.49	|Q	|	|	| V	|
15+30	0.3719	0.49	|Q	|	|	| V	|
15+35	0.3751	0.47	|Q	|	|	| V	|
15+40	0.3781	0.43	|Q	|	|	| V	|
15+45	0.3809	0.41	|Q	|	|	| V	|
15+50	0.3838	0.41	|Q	|	|	| V	|
15+55	0.3865	0.41	|Q	|	|	| V	|
16+ 0	0.3893	0.40	|Q	|	|	| V	|
16+ 5	0.3917	0.34	|Q	|	|	| V	|
16+10	0.3929	0.19	Q	|	|	| V	|
16+15	0.3939	0.14	Q	|	|	| V	|
16+20	0.3947	0.11	Q	|	|	| V	|
16+25	0.3954	0.10	Q	|	|	| V	|
16+30	0.3960	0.09	Q	|	|	| V	|
16+35	0.3966	0.09	Q	|	|	| V	|
16+40	0.3971	0.07	Q	|	|	| V	|
16+45	0.3976	0.07	Q	|	|	| V	|
16+50	0.3980	0.07	Q	|	|	| V	|
16+55	0.3985	0.06	Q	|	|	| V	|
17+ 0	0.3989	0.06	Q	|	|	| V	|
17+ 5	0.3994	0.07	Q	|	|	| V	|
17+10	0.4000	0.09	Q	|	|	| V	|
17+15	0.4007	0.10	Q	|	|	| V	|
17+20	0.4014	0.10	Q	|	|	| V	|
17+25	0.4021	0.10	Q	|	|	| V	|
17+30	0.4028	0.10	Q	|	|	| V	|
17+35	0.4035	0.10	Q	|	|	| V	|
17+40	0.4043	0.11	Q	|	|	| V	|
17+45	0.4050	0.11	Q	|	|	| V	|
17+50	0.4057	0.10	Q	|	|	| V	|
17+55	0.4063	0.09	Q	|	|	| V	|
18+ 0	0.4069	0.09	Q	|	|	| V	|
18+ 5	0.4075	0.09	Q	|	|	| V	|
18+10	0.4081	0.09	Q	|	|	| V	|
18+15	0.4087	0.08	Q	|	|	| V	|
18+20	0.4093	0.08	Q	|	|	| V	|
18+25	0.4098	0.08	Q	|	|	| V	|
18+30	0.4104	0.08	Q	|	|	| V	|
18+35	0.4110	0.08	Q	|	|	| V	|
18+40	0.4115	0.07	Q	|	|	| V	|
18+45	0.4119	0.07	Q	|	|	| V	|
18+50	0.4123	0.06	Q	|	|	| V	|
18+55	0.4127	0.05	Q	|	|	| V	|
19+ 0	0.4130	0.05	Q	|	|	| V	|
19+ 5	0.4133	0.05	Q	|	|	| V	|
19+10	0.4137	0.06	Q	|	|	| V	|
19+15	0.4142	0.06	Q	|	|	| V	|
19+20	0.4146	0.07	Q	|	|	| V	|
19+25	0.4151	0.08	Q	|	|	| V	|
19+30	0.4157	0.08	Q	|	|	| V	|
19+35	0.4162	0.08	Q	|	|	| V	|
19+40	0.4167	0.07	Q	|	|	| V	|
19+45	0.4171	0.07	Q	|	|	| V	|
19+50	0.4176	0.06	Q	|	|	| V	|
19+55	0.4179	0.05	Q	|	|	| V	|
20+ 0	0.4182	0.05	Q	|	|	| V	|
20+ 5	0.4186	0.05	Q	|	|	| V	|
20+10	0.4190	0.06	Q	|	|	| V	|

20+15	0.4194	0.06	Q	|	|	|	V |
20+20	0.4198	0.06	Q	|	|	|	V |
20+25	0.4202	0.06	Q	|	|	|	V |
20+30	0.4207	0.06	Q	|	|	|	V |
20+35	0.4211	0.06	Q	|	|	|	V |
20+40	0.4215	0.06	Q	|	|	|	V |
20+45	0.4220	0.06	Q	|	|	|	V |
20+50	0.4224	0.06	Q	|	|	|	V |
20+55	0.4227	0.05	Q	|	|	|	V |
21+ 0	0.4230	0.05	Q	|	|	|	V |
21+ 5	0.4234	0.05	Q	|	|	|	V |
21+10	0.4237	0.06	Q	|	|	|	V |
21+15	0.4242	0.06	Q	|	|	|	V |
21+20	0.4246	0.06	Q	|	|	|	V|
21+25	0.4249	0.05	Q	|	|	|	V|
21+30	0.4252	0.04	Q	|	|	|	V|
21+35	0.4255	0.05	Q	|	|	|	V|
21+40	0.4259	0.06	Q	|	|	|	V|
21+45	0.4263	0.06	Q	|	|	|	V|
21+50	0.4267	0.06	Q	|	|	|	V|
21+55	0.4271	0.05	Q	|	|	|	V|
22+ 0	0.4274	0.04	Q	|	|	|	V|
22+ 5	0.4277	0.05	Q	|	|	|	V|
22+10	0.4281	0.06	Q	|	|	|	V|
22+15	0.4285	0.06	Q	|	|	|	V|
22+20	0.4289	0.06	Q	|	|	|	V|
22+25	0.4292	0.05	Q	|	|	|	V|
22+30	0.4295	0.04	Q	|	|	|	V|
22+35	0.4299	0.04	Q	|	|	|	V|
22+40	0.4301	0.04	Q	|	|	|	V|
22+45	0.4304	0.04	Q	|	|	|	V|
22+50	0.4307	0.04	Q	|	|	|	V|
22+55	0.4310	0.04	Q	|	|	|	V|
23+ 0	0.4313	0.04	Q	|	|	|	V|
23+ 5	0.4316	0.04	Q	|	|	|	V|
23+10	0.4319	0.04	Q	|	|	|	V|
23+15	0.4322	0.04	Q	|	|	|	V|
23+20	0.4325	0.04	Q	|	|	|	V|
23+25	0.4328	0.04	Q	|	|	|	V|
23+30	0.4331	0.04	Q	|	|	|	V|
23+35	0.4333	0.04	Q	|	|	|	V|
23+40	0.4336	0.04	Q	|	|	|	V|
23+45	0.4339	0.04	Q	|	|	|	V|
23+50	0.4342	0.04	Q	|	|	|	V|
23+55	0.4345	0.04	Q	|	|	|	V|
24+ 0	0.4348	0.04	Q	|	|	|	V|
24+ 5	0.4350	0.03	Q	|	|	|	V|
24+10	0.4351	0.01	Q	|	|	|	V|
24+15	0.4352	0.01	Q	|	|	|	V|
24+20	0.4352	0.00	Q	|	|	|	V|
24+25	0.4352	0.00	Q	|	|	|	V|
24+30	0.4352	0.00	Q	|	|	|	V|
24+35	0.4352	0.00	Q	|	|	|	V

U n i t H y d r o g r a p h A n a l y s i s

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Study date 09/16/22 File: 3X242.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6545

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

XENIA
PRELIMINARY UNIT HYDROGRAPH ANALYSIS
AREA X3 PRESENT CONDITION
2-YEAR

Drainage Area = 1.41(Ac.) = 0.002 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 1.41(Ac.) = 0.002 Sq. Mi.
Length along longest watercourse = 447.00(Ft.)
Length along longest watercourse measured to centroid = 212.00(Ft.)
Length along longest watercourse = 0.085 Mi.
Length along longest watercourse measured to centroid = 0.040 Mi.
Difference in elevation = 5.70(Ft.)
Slope along watercourse = 67.3289 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.037 Hr.
Lag time = 2.24 Min.
25% of lag time = 0.56 Min.
40% of lag time = 0.90 Min.
Unit time = 5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
1.41	2.53	3.57

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
1.41	6.50	9.16

STORM EVENT (YEAR) = 2.00
Area Averaged 2-Year Rainfall = 2.530(In)
Area Averaged 100-Year Rainfall = 6.500(In)

Point rain (area averaged) = 2.530(In)
Areal adjustment factor = 100.00 %

Adjusted average point rain = 2.530(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
1.410	64.90	0.298

Total Area Entered = 1.41(Ac.)

RI AMC2	RI AMC-1	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
64.9	44.9	0.622	0.298	0.455	1.000	0.455
					Sum (F) =	0.455

Area averaged mean soil loss (F) (In/Hr) = 0.455
Minimum soil loss rate ((In/Hr)) = 0.228
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.662

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	223.317	47.160	0.670
2	0.167	446.634	41.773	0.594
3	0.250	669.951	7.922	0.113
4	0.333	893.268	3.145	0.045
			Sum = 100.000 Sum=	1.421

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.07	0.020	(0.807)	0.013	0.007
2	0.17	0.07	0.020	(0.804)	0.013	0.007
3	0.25	0.07	0.020	(0.801)	0.013	0.007
4	0.33	0.10	0.030	(0.798)	0.020	0.010
5	0.42	0.10	0.030	(0.794)	0.020	0.010
6	0.50	0.10	0.030	(0.791)	0.020	0.010
7	0.58	0.10	0.030	(0.788)	0.020	0.010
8	0.67	0.10	0.030	(0.785)	0.020	0.010
9	0.75	0.10	0.030	(0.782)	0.020	0.010
10	0.83	0.13	0.040	(0.779)	0.027	0.014
11	0.92	0.13	0.040	(0.776)	0.027	0.014
12	1.00	0.13	0.040	(0.773)	0.027	0.014
13	1.08	0.10	0.030	(0.770)	0.020	0.010
14	1.17	0.10	0.030	(0.767)	0.020	0.010
15	1.25	0.10	0.030	(0.764)	0.020	0.010
16	1.33	0.10	0.030	(0.761)	0.020	0.010
17	1.42	0.10	0.030	(0.758)	0.020	0.010
18	1.50	0.10	0.030	(0.755)	0.020	0.010
19	1.58	0.10	0.030	(0.752)	0.020	0.010
20	1.67	0.10	0.030	(0.749)	0.020	0.010
21	1.75	0.10	0.030	(0.746)	0.020	0.010
22	1.83	0.13	0.040	(0.743)	0.027	0.014
23	1.92	0.13	0.040	(0.740)	0.027	0.014
24	2.00	0.13	0.040	(0.737)	0.027	0.014
25	2.08	0.13	0.040	(0.734)	0.027	0.014
26	2.17	0.13	0.040	(0.731)	0.027	0.014
27	2.25	0.13	0.040	(0.728)	0.027	0.014

28	2.33	0.13	0.040	(0.725)	0.027	0.014
29	2.42	0.13	0.040	(0.722)	0.027	0.014
30	2.50	0.13	0.040	(0.719)	0.027	0.014
31	2.58	0.17	0.051	(0.716)	0.033	0.017
32	2.67	0.17	0.051	(0.713)	0.033	0.017
33	2.75	0.17	0.051	(0.710)	0.033	0.017
34	2.83	0.17	0.051	(0.707)	0.033	0.017
35	2.92	0.17	0.051	(0.704)	0.033	0.017
36	3.00	0.17	0.051	(0.701)	0.033	0.017
37	3.08	0.17	0.051	(0.698)	0.033	0.017
38	3.17	0.17	0.051	(0.695)	0.033	0.017
39	3.25	0.17	0.051	(0.693)	0.033	0.017
40	3.33	0.17	0.051	(0.690)	0.033	0.017
41	3.42	0.17	0.051	(0.687)	0.033	0.017
42	3.50	0.17	0.051	(0.684)	0.033	0.017
43	3.58	0.17	0.051	(0.681)	0.033	0.017
44	3.67	0.17	0.051	(0.678)	0.033	0.017
45	3.75	0.17	0.051	(0.675)	0.033	0.017
46	3.83	0.20	0.061	(0.673)	0.040	0.021
47	3.92	0.20	0.061	(0.670)	0.040	0.021
48	4.00	0.20	0.061	(0.667)	0.040	0.021
49	4.08	0.20	0.061	(0.664)	0.040	0.021
50	4.17	0.20	0.061	(0.661)	0.040	0.021
51	4.25	0.20	0.061	(0.658)	0.040	0.021
52	4.33	0.23	0.071	(0.656)	0.047	0.024
53	4.42	0.23	0.071	(0.653)	0.047	0.024
54	4.50	0.23	0.071	(0.650)	0.047	0.024
55	4.58	0.23	0.071	(0.647)	0.047	0.024
56	4.67	0.23	0.071	(0.644)	0.047	0.024
57	4.75	0.23	0.071	(0.642)	0.047	0.024
58	4.83	0.27	0.081	(0.639)	0.054	0.027
59	4.92	0.27	0.081	(0.636)	0.054	0.027
60	5.00	0.27	0.081	(0.633)	0.054	0.027
61	5.08	0.20	0.061	(0.631)	0.040	0.021
62	5.17	0.20	0.061	(0.628)	0.040	0.021
63	5.25	0.20	0.061	(0.625)	0.040	0.021
64	5.33	0.23	0.071	(0.622)	0.047	0.024
65	5.42	0.23	0.071	(0.620)	0.047	0.024
66	5.50	0.23	0.071	(0.617)	0.047	0.024
67	5.58	0.27	0.081	(0.614)	0.054	0.027
68	5.67	0.27	0.081	(0.612)	0.054	0.027
69	5.75	0.27	0.081	(0.609)	0.054	0.027
70	5.83	0.27	0.081	(0.606)	0.054	0.027
71	5.92	0.27	0.081	(0.603)	0.054	0.027
72	6.00	0.27	0.081	(0.601)	0.054	0.027
73	6.08	0.30	0.091	(0.598)	0.060	0.031
74	6.17	0.30	0.091	(0.595)	0.060	0.031
75	6.25	0.30	0.091	(0.593)	0.060	0.031
76	6.33	0.30	0.091	(0.590)	0.060	0.031
77	6.42	0.30	0.091	(0.588)	0.060	0.031
78	6.50	0.30	0.091	(0.585)	0.060	0.031
79	6.58	0.33	0.101	(0.582)	0.067	0.034
80	6.67	0.33	0.101	(0.580)	0.067	0.034
81	6.75	0.33	0.101	(0.577)	0.067	0.034
82	6.83	0.33	0.101	(0.574)	0.067	0.034
83	6.92	0.33	0.101	(0.572)	0.067	0.034
84	7.00	0.33	0.101	(0.569)	0.067	0.034
85	7.08	0.33	0.101	(0.567)	0.067	0.034
86	7.17	0.33	0.101	(0.564)	0.067	0.034
87	7.25	0.33	0.101	(0.562)	0.067	0.034
88	7.33	0.37	0.111	(0.559)	0.074	0.038
89	7.42	0.37	0.111	(0.556)	0.074	0.038
90	7.50	0.37	0.111	(0.554)	0.074	0.038
91	7.58	0.40	0.121	(0.551)	0.080	0.041
92	7.67	0.40	0.121	(0.549)	0.080	0.041
93	7.75	0.40	0.121	(0.546)	0.080	0.041

94	7.83	0.43	0.132	(0.544)	0.087	0.045
95	7.92	0.43	0.132	(0.541)	0.087	0.045
96	8.00	0.43	0.132	(0.539)	0.087	0.045
97	8.08	0.50	0.152	(0.536)	0.100	0.051
98	8.17	0.50	0.152	(0.534)	0.100	0.051
99	8.25	0.50	0.152	(0.531)	0.100	0.051
100	8.33	0.50	0.152	(0.529)	0.100	0.051
101	8.42	0.50	0.152	(0.526)	0.100	0.051
102	8.50	0.50	0.152	(0.524)	0.100	0.051
103	8.58	0.53	0.162	(0.521)	0.107	0.055
104	8.67	0.53	0.162	(0.519)	0.107	0.055
105	8.75	0.53	0.162	(0.516)	0.107	0.055
106	8.83	0.57	0.172	(0.514)	0.114	0.058
107	8.92	0.57	0.172	(0.512)	0.114	0.058
108	9.00	0.57	0.172	(0.509)	0.114	0.058
109	9.08	0.63	0.192	(0.507)	0.127	0.065
110	9.17	0.63	0.192	(0.504)	0.127	0.065
111	9.25	0.63	0.192	(0.502)	0.127	0.065
112	9.33	0.67	0.202	(0.500)	0.134	0.068
113	9.42	0.67	0.202	(0.497)	0.134	0.068
114	9.50	0.67	0.202	(0.495)	0.134	0.068
115	9.58	0.70	0.213	(0.492)	0.141	0.072
116	9.67	0.70	0.213	(0.490)	0.141	0.072
117	9.75	0.70	0.213	(0.488)	0.141	0.072
118	9.83	0.73	0.223	(0.485)	0.147	0.075
119	9.92	0.73	0.223	(0.483)	0.147	0.075
120	10.00	0.73	0.223	(0.481)	0.147	0.075
121	10.08	0.50	0.152	(0.478)	0.100	0.051
122	10.17	0.50	0.152	(0.476)	0.100	0.051
123	10.25	0.50	0.152	(0.474)	0.100	0.051
124	10.33	0.50	0.152	(0.471)	0.100	0.051
125	10.42	0.50	0.152	(0.469)	0.100	0.051
126	10.50	0.50	0.152	(0.467)	0.100	0.051
127	10.58	0.67	0.202	(0.465)	0.134	0.068
128	10.67	0.67	0.202	(0.462)	0.134	0.068
129	10.75	0.67	0.202	(0.460)	0.134	0.068
130	10.83	0.67	0.202	(0.458)	0.134	0.068
131	10.92	0.67	0.202	(0.456)	0.134	0.068
132	11.00	0.67	0.202	(0.453)	0.134	0.068
133	11.08	0.63	0.192	(0.451)	0.127	0.065
134	11.17	0.63	0.192	(0.449)	0.127	0.065
135	11.25	0.63	0.192	(0.447)	0.127	0.065
136	11.33	0.63	0.192	(0.444)	0.127	0.065
137	11.42	0.63	0.192	(0.442)	0.127	0.065
138	11.50	0.63	0.192	(0.440)	0.127	0.065
139	11.58	0.57	0.172	(0.438)	0.114	0.058
140	11.67	0.57	0.172	(0.436)	0.114	0.058
141	11.75	0.57	0.172	(0.433)	0.114	0.058
142	11.83	0.60	0.182	(0.431)	0.121	0.062
143	11.92	0.60	0.182	(0.429)	0.121	0.062
144	12.00	0.60	0.182	(0.427)	0.121	0.062
145	12.08	0.83	0.253	(0.425)	0.167	0.086
146	12.17	0.83	0.253	(0.423)	0.167	0.086
147	12.25	0.83	0.253	(0.421)	0.167	0.086
148	12.33	0.87	0.263	(0.419)	0.174	0.089
149	12.42	0.87	0.263	(0.416)	0.174	0.089
150	12.50	0.87	0.263	(0.414)	0.174	0.089
151	12.58	0.93	0.283	(0.412)	0.187	0.096
152	12.67	0.93	0.283	(0.410)	0.187	0.096
153	12.75	0.93	0.283	(0.408)	0.187	0.096
154	12.83	0.97	0.293	(0.406)	0.194	0.099
155	12.92	0.97	0.293	(0.404)	0.194	0.099
156	13.00	0.97	0.293	(0.402)	0.194	0.099
157	13.08	1.13	0.344	(0.400)	0.228	0.116
158	13.17	1.13	0.344	(0.398)	0.228	0.116
159	13.25	1.13	0.344	(0.396)	0.228	0.116

160	13.33	1.13	0.344	(0.394)	0.228	0.116
161	13.42	1.13	0.344	(0.392)	0.228	0.116
162	13.50	1.13	0.344	(0.390)	0.228	0.116
163	13.58	0.77	0.233	(0.388)	0.154	0.079
164	13.67	0.77	0.233	(0.386)	0.154	0.079
165	13.75	0.77	0.233	(0.384)	0.154	0.079
166	13.83	0.77	0.233	(0.382)	0.154	0.079
167	13.92	0.77	0.233	(0.380)	0.154	0.079
168	14.00	0.77	0.233	(0.378)	0.154	0.079
169	14.08	0.90	0.273	(0.376)	0.181	0.092
170	14.17	0.90	0.273	(0.374)	0.181	0.092
171	14.25	0.90	0.273	(0.372)	0.181	0.092
172	14.33	0.87	0.263	(0.370)	0.174	0.089
173	14.42	0.87	0.263	(0.369)	0.174	0.089
174	14.50	0.87	0.263	(0.367)	0.174	0.089
175	14.58	0.87	0.263	(0.365)	0.174	0.089
176	14.67	0.87	0.263	(0.363)	0.174	0.089
177	14.75	0.87	0.263	(0.361)	0.174	0.089
178	14.83	0.83	0.253	(0.359)	0.167	0.086
179	14.92	0.83	0.253	(0.357)	0.167	0.086
180	15.00	0.83	0.253	(0.356)	0.167	0.086
181	15.08	0.80	0.243	(0.354)	0.161	0.082
182	15.17	0.80	0.243	(0.352)	0.161	0.082
183	15.25	0.80	0.243	(0.350)	0.161	0.082
184	15.33	0.77	0.233	(0.348)	0.154	0.079
185	15.42	0.77	0.233	(0.346)	0.154	0.079
186	15.50	0.77	0.233	(0.345)	0.154	0.079
187	15.58	0.63	0.192	(0.343)	0.127	0.065
188	15.67	0.63	0.192	(0.341)	0.127	0.065
189	15.75	0.63	0.192	(0.339)	0.127	0.065
190	15.83	0.63	0.192	(0.338)	0.127	0.065
191	15.92	0.63	0.192	(0.336)	0.127	0.065
192	16.00	0.63	0.192	(0.334)	0.127	0.065
193	16.08	0.13	0.040	(0.333)	0.027	0.014
194	16.17	0.13	0.040	(0.331)	0.027	0.014
195	16.25	0.13	0.040	(0.329)	0.027	0.014
196	16.33	0.13	0.040	(0.327)	0.027	0.014
197	16.42	0.13	0.040	(0.326)	0.027	0.014
198	16.50	0.13	0.040	(0.324)	0.027	0.014
199	16.58	0.10	0.030	(0.322)	0.020	0.010
200	16.67	0.10	0.030	(0.321)	0.020	0.010
201	16.75	0.10	0.030	(0.319)	0.020	0.010
202	16.83	0.10	0.030	(0.318)	0.020	0.010
203	16.92	0.10	0.030	(0.316)	0.020	0.010
204	17.00	0.10	0.030	(0.314)	0.020	0.010
205	17.08	0.17	0.051	(0.313)	0.033	0.017
206	17.17	0.17	0.051	(0.311)	0.033	0.017
207	17.25	0.17	0.051	(0.310)	0.033	0.017
208	17.33	0.17	0.051	(0.308)	0.033	0.017
209	17.42	0.17	0.051	(0.307)	0.033	0.017
210	17.50	0.17	0.051	(0.305)	0.033	0.017
211	17.58	0.17	0.051	(0.304)	0.033	0.017
212	17.67	0.17	0.051	(0.302)	0.033	0.017
213	17.75	0.17	0.051	(0.301)	0.033	0.017
214	17.83	0.13	0.040	(0.299)	0.027	0.014
215	17.92	0.13	0.040	(0.298)	0.027	0.014
216	18.00	0.13	0.040	(0.296)	0.027	0.014
217	18.08	0.13	0.040	(0.295)	0.027	0.014
218	18.17	0.13	0.040	(0.293)	0.027	0.014
219	18.25	0.13	0.040	(0.292)	0.027	0.014
220	18.33	0.13	0.040	(0.290)	0.027	0.014
221	18.42	0.13	0.040	(0.289)	0.027	0.014
222	18.50	0.13	0.040	(0.287)	0.027	0.014
223	18.58	0.10	0.030	(0.286)	0.020	0.010
224	18.67	0.10	0.030	(0.285)	0.020	0.010
225	18.75	0.10	0.030	(0.283)	0.020	0.010

226	18.83	0.07	0.020	(0.282)	0.013	0.007
227	18.92	0.07	0.020	(0.281)	0.013	0.007
228	19.00	0.07	0.020	(0.279)	0.013	0.007
229	19.08	0.10	0.030	(0.278)	0.020	0.010
230	19.17	0.10	0.030	(0.277)	0.020	0.010
231	19.25	0.10	0.030	(0.275)	0.020	0.010
232	19.33	0.13	0.040	(0.274)	0.027	0.014
233	19.42	0.13	0.040	(0.273)	0.027	0.014
234	19.50	0.13	0.040	(0.272)	0.027	0.014
235	19.58	0.10	0.030	(0.270)	0.020	0.010
236	19.67	0.10	0.030	(0.269)	0.020	0.010
237	19.75	0.10	0.030	(0.268)	0.020	0.010
238	19.83	0.07	0.020	(0.267)	0.013	0.007
239	19.92	0.07	0.020	(0.265)	0.013	0.007
240	20.00	0.07	0.020	(0.264)	0.013	0.007
241	20.08	0.10	0.030	(0.263)	0.020	0.010
242	20.17	0.10	0.030	(0.262)	0.020	0.010
243	20.25	0.10	0.030	(0.261)	0.020	0.010
244	20.33	0.10	0.030	(0.260)	0.020	0.010
245	20.42	0.10	0.030	(0.259)	0.020	0.010
246	20.50	0.10	0.030	(0.258)	0.020	0.010
247	20.58	0.10	0.030	(0.256)	0.020	0.010
248	20.67	0.10	0.030	(0.255)	0.020	0.010
249	20.75	0.10	0.030	(0.254)	0.020	0.010
250	20.83	0.07	0.020	(0.253)	0.013	0.007
251	20.92	0.07	0.020	(0.252)	0.013	0.007
252	21.00	0.07	0.020	(0.251)	0.013	0.007
253	21.08	0.10	0.030	(0.250)	0.020	0.010
254	21.17	0.10	0.030	(0.249)	0.020	0.010
255	21.25	0.10	0.030	(0.248)	0.020	0.010
256	21.33	0.07	0.020	(0.247)	0.013	0.007
257	21.42	0.07	0.020	(0.246)	0.013	0.007
258	21.50	0.07	0.020	(0.245)	0.013	0.007
259	21.58	0.10	0.030	(0.245)	0.020	0.010
260	21.67	0.10	0.030	(0.244)	0.020	0.010
261	21.75	0.10	0.030	(0.243)	0.020	0.010
262	21.83	0.07	0.020	(0.242)	0.013	0.007
263	21.92	0.07	0.020	(0.241)	0.013	0.007
264	22.00	0.07	0.020	(0.240)	0.013	0.007
265	22.08	0.10	0.030	(0.240)	0.020	0.010
266	22.17	0.10	0.030	(0.239)	0.020	0.010
267	22.25	0.10	0.030	(0.238)	0.020	0.010
268	22.33	0.07	0.020	(0.237)	0.013	0.007
269	22.42	0.07	0.020	(0.237)	0.013	0.007
270	22.50	0.07	0.020	(0.236)	0.013	0.007
271	22.58	0.07	0.020	(0.235)	0.013	0.007
272	22.67	0.07	0.020	(0.234)	0.013	0.007
273	22.75	0.07	0.020	(0.234)	0.013	0.007
274	22.83	0.07	0.020	(0.233)	0.013	0.007
275	22.92	0.07	0.020	(0.233)	0.013	0.007
276	23.00	0.07	0.020	(0.232)	0.013	0.007
277	23.08	0.07	0.020	(0.232)	0.013	0.007
278	23.17	0.07	0.020	(0.231)	0.013	0.007
279	23.25	0.07	0.020	(0.231)	0.013	0.007
280	23.33	0.07	0.020	(0.230)	0.013	0.007
281	23.42	0.07	0.020	(0.230)	0.013	0.007
282	23.50	0.07	0.020	(0.229)	0.013	0.007
283	23.58	0.07	0.020	(0.229)	0.013	0.007
284	23.67	0.07	0.020	(0.229)	0.013	0.007
285	23.75	0.07	0.020	(0.228)	0.013	0.007
286	23.83	0.07	0.020	(0.228)	0.013	0.007
287	23.92	0.07	0.020	(0.228)	0.013	0.007
288	24.00	0.07	0.020	(0.228)	0.013	0.007
		(Loss Rate Not Used)				
	Sum =	100.0			Sum =	10.3

Flood volume = Effective rainfall 0.86(In)

```
 times area       1.4(Ac.)/[(In)/(Ft.)] =       0.1(Ac.Ft)
Total soil loss =      1.67(In)
Total soil loss =     0.197(Ac.Ft)
Total rainfall =      2.53(In)
Flood volume =        4382.0 Cubic Feet
Total soil loss =        8567.2 Cubic Feet
---------------------------------------------------------------------
 Peak flow rate of this hydrograph =      0.166(CFS)
---------------------------------------------------------------------
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    24 - H O U R    S T O R M
                R u n o f f      H y d r o g r a p h
---------------------------------------------------------------------
            Hydrograph in   5   Minute intervals ((CFS))

---------------------------------------------------------------------
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Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0000	0.00	Q				
0+10	0.0001	0.01	Q				
0+15	0.0002	0.01	Q				
0+20	0.0002	0.01	Q				
0+25	0.0003	0.01	Q				
0+30	0.0004	0.01	Q				
0+35	0.0005	0.01	Q				
0+40	0.0006	0.01	Q				
0+45	0.0007	0.01	Q				
0+50	0.0009	0.02	Q				
0+55	0.0010	0.02	Q				
1+ 0	0.0011	0.02	Q				
1+ 5	0.0012	0.02	Q				
1+10	0.0013	0.02	Q				
1+15	0.0014	0.01	Q				
1+20	0.0015	0.01	Q				
1+25	0.0016	0.01	Q				
1+30	0.0017	0.01	Q				
1+35	0.0018	0.01	Q				
1+40	0.0019	0.01	Q				
1+45	0.0020	0.01	Q				
1+50	0.0022	0.02	Q				
1+55	0.0023	0.02	Q				
2+ 0	0.0024	0.02	Q				
2+ 5	0.0026	0.02	QV				
2+10	0.0027	0.02	QV				
2+15	0.0028	0.02	QV				
2+20	0.0030	0.02	QV				
2+25	0.0031	0.02	QV				
2+30	0.0032	0.02	QV				
2+35	0.0034	0.02	QV				
2+40	0.0035	0.02	QV				
2+45	0.0037	0.02	QV				
2+50	0.0039	0.02	QV				
2+55	0.0040	0.02	QV				
3+ 0	0.0042	0.02	QV				
3+ 5	0.0044	0.02	QV				
3+10	0.0045	0.02	QV				
3+15	0.0047	0.02	QV				
3+20	0.0049	0.02	QV				
3+25	0.0051	0.02	Q V				
3+30	0.0052	0.02	Q V				
3+35	0.0054	0.02	Q V				
3+40	0.0056	0.02	Q V				
3+45	0.0057	0.02	Q V				
3+50	0.0059	0.03	Q V				
3+55	0.0061	0.03	Q V				
4+ 0	0.0063	0.03	Q V				

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4+ 5       0.0065      0.03  Q v       |         |         |         |
4+10       0.0067      0.03  Q v       |         |         |         |
4+15       0.0069      0.03  Q v       |         |         |         |
4+20       0.0071      0.03  Q v       |         |         |         |
4+25       0.0074      0.03  Q v       |         |         |         |
4+30       0.0076      0.03  Q  v      |         |         |         |
4+35       0.0078      0.03  Q  v      |         |         |         |
4+40       0.0081      0.03  Q  v      |         |         |         |
4+45       0.0083      0.03  Q  v      |         |         |         |
4+50       0.0085      0.04  Q  v      |         |         |         |
4+55       0.0088      0.04  Q  v      |         |         |         |
5+ 0       0.0091      0.04  Q  v      |         |         |         |
5+ 5       0.0093      0.03  Q  v      |         |         |         |
5+10       0.0095      0.03  Q  v      |         |         |         |
5+15       0.0097      0.03  Q  v      |         |         |         |
5+20       0.0099      0.03  Q  v      |         |         |         |
5+25       0.0102      0.03  Q   v     |         |         |         |
5+30       0.0104      0.03  Q   v     |         |         |         |
5+35       0.0107      0.04  Q   v     |         |         |         |
5+40       0.0109      0.04  Q   v     |         |         |         |
5+45       0.0112      0.04  Q   v     |         |         |         |
5+50       0.0115      0.04  Q   v     |         |         |         |
5+55       0.0117      0.04  Q   v     |         |         |         |
6+ 0       0.0120      0.04  Q   v     |         |         |         |
6+ 5       0.0123      0.04  Q   v     |         |         |         |
6+10       0.0126      0.04  Q   v     |         |         |         |
6+15       0.0129      0.04  Q    v    |         |         |         |
6+20       0.0132      0.04  Q    v    |         |         |         |
6+25       0.0135      0.04  Q    v    |         |         |         |
6+30       0.0138      0.04  Q    v    |         |         |         |
6+35       0.0141      0.05  Q    v    |         |         |         |
6+40       0.0144      0.05  Q    v    |         |         |         |
6+45       0.0148      0.05  Q    v    |         |         |         |
6+50       0.0151      0.05  Q     v   |         |         |         |
6+55       0.0154      0.05  Q     v   |         |         |         |
7+ 0       0.0158      0.05  Q     v   |         |         |         |
7+ 5       0.0161      0.05  Q     v   |         |         |         |
7+10       0.0164      0.05  Q     v   |         |         |         |
7+15       0.0168      0.05  Q     v   |         |         |         |
7+20       0.0171      0.05  Q     v   |         |         |         |
7+25       0.0175      0.05  Q     v   |         |         |         |
7+30       0.0179      0.05  Q      v  |         |         |         |
7+35       0.0182      0.06  Q      v  |         |         |         |
7+40       0.0186      0.06  Q      v  |         |         |         |
7+45       0.0190      0.06  Q      v  |         |         |         |
7+50       0.0195      0.06  Q      v  |         |         |         |
7+55       0.0199      0.06  Q      v  |         |         |         |
8+ 0       0.0203      0.06  Q       v |         |         |         |
8+ 5       0.0208      0.07  Q       v |         |         |         |
8+10       0.0213      0.07  Q       v |         |         |         |
8+15       0.0218      0.07  Q       v |         |         |         |
8+20       0.0223      0.07  Q       v |         |         |         |
8+25       0.0228      0.07  Q        v|         |         |         |
8+30       0.0233      0.07  Q        v|         |         |         |
8+35       0.0238      0.08  Q        v|         |         |         |
8+40       0.0244      0.08  Q        v|         |         |         |
8+45       0.0249      0.08  Q        v|         |         |         |
8+50       0.0254      0.08  Q         v        |         |         |
8+55       0.0260      0.08  Q         v        |         |         |
9+ 0       0.0266      0.08  Q         v        |         |         |
9+ 5       0.0272      0.09  Q         v        |         |         |
9+10       0.0278      0.09  Q         |v       |         |         |
9+15       0.0284      0.09  Q         |v       |         |         |
9+20       0.0291      0.09  Q         |v       |         |         |
9+25       0.0298      0.10  Q         |v       |         |         |
9+30       0.0304      0.10  Q         | v      |         |         |
```

9+35	0.0311	0.10	Q	v				
9+40	0.0318	0.10	Q	v				
9+45	0.0325	0.10	Q	v				
9+50	0.0332	0.10	Q	v				
9+55	0.0340	0.11	Q	v				
10+ 0	0.0347	0.11	Q	v				
10+ 5	0.0353	0.09	Q	v				
10+10	0.0359	0.08	Q	v				
10+15	0.0364	0.07	Q	v				
10+20	0.0369	0.07	Q	v				
10+25	0.0374	0.07	Q	v				
10+30	0.0379	0.07	Q	v				
10+35	0.0385	0.08	Q	v				
10+40	0.0391	0.09	Q	v				
10+45	0.0398	0.10	Q	v				
10+50	0.0405	0.10	Q	v				
10+55	0.0411	0.10	Q	v				
11+ 0	0.0418	0.10	Q	v				
11+ 5	0.0425	0.10	Q	v				
11+10	0.0431	0.09	Q	v				
11+15	0.0437	0.09	Q	v				
11+20	0.0444	0.09	Q	v				
11+25	0.0450	0.09	Q	v				
11+30	0.0456	0.09	Q	v				
11+35	0.0463	0.09	Q	v				
11+40	0.0468	0.08	Q	v				
11+45	0.0474	0.08	Q	v				
11+50	0.0480	0.09	Q	v				
11+55	0.0486	0.09	Q	v				
12+ 0	0.0492	0.09	Q	v				
12+ 5	0.0499	0.10	Q	v				
12+10	0.0507	0.12	Q	v				
12+15	0.0515	0.12	Q	v				
12+20	0.0524	0.12	Q	v				
12+25	0.0533	0.13	Q	v				
12+30	0.0541	0.13	Q	v				
12+35	0.0550	0.13	Q	v				
12+40	0.0560	0.14	Q	v				
12+45	0.0569	0.14	Q	v				
12+50	0.0579	0.14	Q	v				
12+55	0.0588	0.14	Q	v				
13+ 0	0.0598	0.14	Q	v				
13+ 5	0.0609	0.15	Q	v				
13+10	0.0620	0.16	Q	v				
13+15	0.0631	0.16	Q	v				
13+20	0.0643	0.17	Q	v				
13+25	0.0654	0.17	Q	v				
13+30	0.0665	0.17	Q	v				
13+35	0.0675	0.14	Q	v				
13+40	0.0683	0.12	Q	v				
13+45	0.0691	0.11	Q	v				
13+50	0.0699	0.11	Q	v				
13+55	0.0706	0.11	Q	v				
14+ 0	0.0714	0.11	Q	v				
14+ 5	0.0722	0.12	Q	v				
14+10	0.0731	0.13	Q	v				
14+15	0.0740	0.13	Q	v				
14+20	0.0749	0.13	Q	v				
14+25	0.0758	0.13	Q	v				
14+30	0.0767	0.13	Q	v				
14+35	0.0775	0.13	Q	v				
14+40	0.0784	0.13	Q	v				
14+45	0.0793	0.13	Q	v				
14+50	0.0801	0.12	Q	v				
14+55	0.0810	0.12	Q	v				
15+ 0	0.0818	0.12	Q	v				

15+ 5	0.0826	0.12	Q	|	|	| V	|
15+10	0.0835	0.12	Q	|	|	| V	|
15+15	0.0843	0.12	Q	|	|	| V	|
15+20	0.0851	0.11	Q	|	|	| V	|
15+25	0.0858	0.11	Q	|	|	| V	|
15+30	0.0866	0.11	Q	|	|	| V	|
15+35	0.0873	0.10	Q	|	|	| V	|
15+40	0.0880	0.09	Q	|	|	| V	|
15+45	0.0886	0.09	Q	|	|	| V	|
15+50	0.0892	0.09	Q	|	|	| V	|
15+55	0.0899	0.09	Q	|	|	| V	|
16+ 0	0.0905	0.09	Q	|	|	| V	|
16+ 5	0.0909	0.06	Q	|	|	| V	|
16+10	0.0911	0.03	Q	|	|	| V	|
16+15	0.0913	0.02	Q	|	|	| V	|
16+20	0.0914	0.02	Q	|	|	| V	|
16+25	0.0915	0.02	Q	|	|	| V	|
16+30	0.0917	0.02	Q	|	|	| V	|
16+35	0.0918	0.02	Q	|	|	| V	|
16+40	0.0919	0.02	Q	|	|	| V	|
16+45	0.0920	0.01	Q	|	|	| V	|
16+50	0.0921	0.01	Q	|	|	| V	|
16+55	0.0922	0.01	Q	|	|	| V	|
17+ 0	0.0923	0.01	Q	|	|	| V	|
17+ 5	0.0924	0.02	Q	|	|	| V	|
17+10	0.0926	0.02	Q	|	|	| V	|
17+15	0.0927	0.02	Q	|	|	| V	|
17+20	0.0929	0.02	Q	|	|	| V	|
17+25	0.0931	0.02	Q	|	|	| V	|
17+30	0.0932	0.02	Q	|	|	| V	|
17+35	0.0934	0.02	Q	|	|	| V	|
17+40	0.0936	0.02	Q	|	|	| V	|
17+45	0.0937	0.02	Q	|	|	| V	|
17+50	0.0939	0.02	Q	|	|	| V	|
17+55	0.0940	0.02	Q	|	|	| V	|
18+ 0	0.0942	0.02	Q	|	|	| V	|
18+ 5	0.0943	0.02	Q	|	|	| V	|
18+10	0.0944	0.02	Q	|	|	| V	|
18+15	0.0946	0.02	Q	|	|	| V	|
18+20	0.0947	0.02	Q	|	|	| V	|
18+25	0.0948	0.02	Q	|	|	| V	|
18+30	0.0950	0.02	Q	|	|	| V	|
18+35	0.0951	0.02	Q	|	|	| V	|
18+40	0.0952	0.02	Q	|	|	| V	|
18+45	0.0953	0.01	Q	|	|	| V	|
18+50	0.0954	0.01	Q	|	|	| V	|
18+55	0.0955	0.01	Q	|	|	| V	|
19+ 0	0.0955	0.01	Q	|	|	| V	|
19+ 5	0.0956	0.01	Q	|	|	| V	|
19+10	0.0957	0.01	Q	|	|	| V	|
19+15	0.0958	0.01	Q	|	|	| V	|
19+20	0.0959	0.02	Q	|	|	| V	|
19+25	0.0960	0.02	Q	|	|	| V	|
19+30	0.0962	0.02	Q	|	|	| V	|
19+35	0.0963	0.02	Q	|	|	| V	|
19+40	0.0964	0.02	Q	|	|	| V	|
19+45	0.0965	0.01	Q	|	|	| V	|
19+50	0.0966	0.01	Q	|	|	| V	|
19+55	0.0967	0.01	Q	|	|	| V	|
20+ 0	0.0967	0.01	Q	|	|	| V	|
20+ 5	0.0968	0.01	Q	|	|	| V	|
20+10	0.0969	0.01	Q	|	|	| V	|
20+15	0.0970	0.01	Q	|	|	| V	|
20+20	0.0971	0.01	Q	|	|	| V	|
20+25	0.0972	0.01	Q	|	|	| V	|
20+30	0.0973	0.01	Q	|	|	| V	|

20+35	0.0974	0.01	Q	|	|	|	V |
20+40	0.0975	0.01	Q	|	|	|	V |
20+45	0.0976	0.01	Q	|	|	|	V |
20+50	0.0977	0.01	Q	|	|	|	V |
20+55	0.0978	0.01	Q	|	|	|	V |
21+ 0	0.0978	0.01	Q	|	|	|	V |
21+ 5	0.0979	0.01	Q	|	|	|	V |
21+10	0.0980	0.01	Q	|	|	|	V |
21+15	0.0981	0.01	Q	|	|	|	V|
21+20	0.0982	0.01	Q	|	|	|	V|
21+25	0.0983	0.01	Q	|	|	|	V|
21+30	0.0983	0.01	Q	|	|	|	V|
21+35	0.0984	0.01	Q	|	|	|	V|
21+40	0.0985	0.01	Q	|	|	|	V|
21+45	0.0986	0.01	Q	|	|	|	V|
21+50	0.0987	0.01	Q	|	|	|	V|
21+55	0.0988	0.01	Q	|	|	|	V|
22+ 0	0.0988	0.01	Q	|	|	|	V|
22+ 5	0.0989	0.01	Q	|	|	|	V|
22+10	0.0990	0.01	Q	|	|	|	V|
22+15	0.0991	0.01	Q	|	|	|	V|
22+20	0.0992	0.01	Q	|	|	|	V|
22+25	0.0993	0.01	Q	|	|	|	V|
22+30	0.0993	0.01	Q	|	|	|	V|
22+35	0.0994	0.01	Q	|	|	|	V|
22+40	0.0995	0.01	Q	|	|	|	V|
22+45	0.0995	0.01	Q	|	|	|	V|
22+50	0.0996	0.01	Q	|	|	|	V|
22+55	0.0997	0.01	Q	|	|	|	V|
23+ 0	0.0997	0.01	Q	|	|	|	V|
23+ 5	0.0998	0.01	Q	|	|	|	V|
23+10	0.0999	0.01	Q	|	|	|	V|
23+15	0.0999	0.01	Q	|	|	|	V|
23+20	0.1000	0.01	Q	|	|	|	V|
23+25	0.1001	0.01	Q	|	|	|	V|
23+30	0.1002	0.01	Q	|	|	|	V|
23+35	0.1002	0.01	Q	|	|	|	V|
23+40	0.1003	0.01	Q	|	|	|	V|
23+45	0.1004	0.01	Q	|	|	|	V|
23+50	0.1004	0.01	Q	|	|	|	V|
23+55	0.1005	0.01	Q	|	|	|	V|
24+ 0	0.1006	0.01	Q	|	|	|	V|
24+ 5	0.1006	0.01	Q	|	|	|	V|
24+10	0.1006	0.00	Q	|	|	|	V|
24+15	0.1006	0.00	Q	|	|	|	V|

U n i t H y d r o g r a p h A n a l y s i s

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Study date 09/17/22 File: 1X1100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6545

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

XENIA
PRELIMINARY UNIT HYDROGRAPH ANALYSIS
AREA X1 PRESENT CONDITION
100-YEAR

Drainage Area = 3.81(Ac.) = 0.006 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 3.81(Ac.) = 0.006 Sq. Mi.
Length along longest watercourse = 586.00(Ft.)
Length along longest watercourse measured to centroid = 304.00(Ft.)
Length along longest watercourse = 0.111 Mi.
Length along longest watercourse measured to centroid = 0.058 Mi.
Difference in elevation = 7.00(Ft.)
Slope along watercourse = 63.0717 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.048 Hr.
Lag time = 2.88 Min.
25% of lag time = 0.72 Min.
40% of lag time = 1.15 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
3.81	0.57	2.17

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
3.81	1.27	4.84

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.570(In)
Area Averaged 100-Year Rainfall = 1.270(In)

Point rain (area averaged) = 1.270(In)
Areal adjustment factor = 100.00 %

Adjusted average point rain = 1.270(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
3.810	71.80	0.142

Total Area Entered = 3.81(Ac.)

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
71.8	86.1	0.175	0.142	0.152	1.000	0.152
					Sum (F) =	0.152

Area averaged mean soil loss (F) (In/Hr) = 0.152
Minimum soil loss rate ((In/Hr)) = 0.076
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.786

Slope of intensity-duration curve for a 1 hour storm =0.5300

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	173.526	38.422	1.475
2	0.167	347.051	45.256	1.738
3	0.250	520.577	9.968	0.383
4	0.333	694.102	4.151	0.159
5	0.417	867.628	2.202	0.085
		Sum = 100.000	Sum=	3.840

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	3.40	0.518	0.152	(0.407)	0.366
2	0.17	4.70	0.716	0.152	(0.563)	0.564
3	0.25	4.70	0.716	0.152	(0.563)	0.564
4	0.33	5.10	0.777	0.152	(0.611)	0.625
5	0.42	5.80	0.884	0.152	(0.695)	0.732
6	0.50	5.90	0.899	0.152	(0.707)	0.747
7	0.58	7.10	1.082	0.152	(0.851)	0.930
8	0.67	8.70	1.326	0.152	(1.043)	1.173
9	0.75	13.20	2.012	0.152	(1.582)	1.859
10	0.83	29.70	4.526	0.152	(3.559)	4.374
11	0.92	7.70	1.173	0.152	(0.923)	1.021
12	1.00	4.00	0.610	0.152	(0.479)	0.457
		(Loss Rate Not Used)				
Sum =		100.0			Sum =	13.4

Flood volume = Effective rainfall 1.12(In)
times area 3.8(Ac.)/[(In)/(Ft.)] = 0.4(Ac.Ft)
Total soil loss = 0.15(In)
Total soil loss = 0.048(Ac.Ft)
Total rainfall = 1.27(In)
Flood volume = 15456.7 Cubic Feet
Total soil loss = 2107.2 Cubic Feet

Peak flow rate of this hydrograph = 10.349(CFS)

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1 - H O U R S T O R M

R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	5.0	10.0	15.0	20.0
0+ 5	0.0037	0.54	VQ				
0+10	0.0138	1.47	VQ				
0+15	0.0273	1.95	Q				
0+20	0.0423	2.18	Q				
0+25	0.0595	2.50	QV				
0+30	0.0785	2.75	Q V				
0+35	0.0998	3.10	Q	V			
0+40	0.1260	3.80	Q	V			
0+45	0.1626	5.32	Q	V			
0+50	0.2339	10.35			Q V		
0+55	0.3034	10.09			Q	V	
1+ 0	0.3345	4.52	Q			V	
1+ 5	0.3486	2.04	Q				V
1+10	0.3535	0.71	Q				V
1+15	0.3546	0.16	Q				V
1+20	0.3548	0.04	Q				V

U n i t H y d r o g r a p h A n a l y s i s

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6545

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

XENIA
PRELIMINARY UNIT HYDROGRAPH ANALYSIS
AREA X1 PRESENT CONDITION
100-YEAR

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Length along longest watercourse measured to centroid = 304.00(Ft.)
Length along longest watercourse = 0.111 Mi.
Length along longest watercourse measured to centroid = 0.058 Mi.
Difference in elevation = 7.00(Ft.)
Slope along watercourse = 63.0717 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.048 Hr.
Lag time = 2.88 Min.
25% of lag time = 0.72 Min.
40% of lag time = 1.15 Min.
Unit time = 5.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
3.81	0.98	3.73

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
3.81	2.13	8.12

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.980(In)
Area Averaged 100-Year Rainfall = 2.130(In)

Point rain (area averaged) = 2.130(In)
Areal adjustment factor = 100.00 %

Adjusted average point rain = 2.130(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
3.810	71.80	0.142

Total Area Entered = 3.81(Ac.)

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
71.8	86.1	0.175	0.142	0.152	1.000	0.152
					Sum (F) =	0.152

Area averaged mean soil loss (F) (In/Hr) = 0.152
Minimum soil loss rate ((In/Hr)) = 0.076
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.786

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	173.526	38.422	1.475
2	0.167	347.051	45.256	1.738
3	0.250	520.577	9.968	0.383
4	0.333	694.102	4.151	0.159
5	0.417	867.628	2.202	0.085
			Sum = 100.000 Sum=	3.840

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	1.30	0.332	0.152	(0.261)	0.180
2	0.17	1.30	0.332	0.152	(0.261)	0.180
3	0.25	1.10	0.281	0.152	(0.221)	0.129
4	0.33	1.50	0.383	0.152	(0.302)	0.231
5	0.42	1.50	0.383	0.152	(0.302)	0.231
6	0.50	1.80	0.460	0.152	(0.362)	0.308
7	0.58	1.50	0.383	0.152	(0.302)	0.231
8	0.67	1.80	0.460	0.152	(0.362)	0.308
9	0.75	1.80	0.460	0.152	(0.362)	0.308
10	0.83	1.50	0.383	0.152	(0.302)	0.231
11	0.92	1.60	0.409	0.152	(0.322)	0.257
12	1.00	1.80	0.460	0.152	(0.362)	0.308
13	1.08	2.20	0.562	0.152	(0.442)	0.410
14	1.17	2.20	0.562	0.152	(0.442)	0.410
15	1.25	2.20	0.562	0.152	(0.442)	0.410
16	1.33	2.00	0.511	0.152	(0.402)	0.359
17	1.42	2.60	0.665	0.152	(0.523)	0.512
18	1.50	2.70	0.690	0.152	(0.543)	0.538
19	1.58	2.40	0.613	0.152	(0.482)	0.461
20	1.67	2.70	0.690	0.152	(0.543)	0.538
21	1.75	3.30	0.843	0.152	(0.663)	0.691
22	1.83	3.10	0.792	0.152	(0.623)	0.640
23	1.92	2.90	0.741	0.152	(0.583)	0.589
24	2.00	3.00	0.767	0.152	(0.603)	0.614
25	2.08	3.10	0.792	0.152	(0.623)	0.640
26	2.17	4.20	1.074	0.152	(0.844)	0.921

```
27   2.25     5.00      1.278          0.152    (  1.005)        1.126
28   2.33     3.50      0.895          0.152    (  0.704)        0.742
29   2.42     6.80      1.738          0.152    (  1.367)        1.586
30   2.50     7.30      1.866          0.152    (  1.467)        1.713
31   2.58     8.20      2.096          0.152    (  1.648)        1.944
32   2.67     5.90      1.508          0.152    (  1.186)        1.356
33   2.75     2.00      0.511          0.152    (  0.402)        0.359
34   2.83     1.80      0.460          0.152    (  0.362)        0.308
35   2.92     1.80      0.460          0.152    (  0.362)        0.308
36   3.00     0.60      0.153       (  0.152)       0.121        0.033
           (Loss Rate Not Used)
   Sum =     100.0                                           Sum =    20.1
     Flood volume = Effective rainfall      1.68(In)
      times area       3.8(Ac.)/[(In)/(Ft.)] =       0.5(Ac.Ft)
     Total soil loss =      0.45(In)
     Total soil loss =     0.144(Ac.Ft)
     Total rainfall =      2.13(In)
     Flood volume =       23173.0 Cubic Feet
     Total soil loss =        6285.1 Cubic Feet
     ---------------------------------------------------------------------
      Peak flow rate of this hydrograph =      6.669(CFS)
     ---------------------------------------------------------------------
     +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                         3 - H O U R    S T O R M
                    R u n o f f     H y d r o g r a p h
     ---------------------------------------------------------------------
                Hydrograph in   5   Minute intervals ((CFS))

     ---------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0        2.5       5.0       7.5      10.0
-------------------------------------------------------------------------
  0+ 5       0.0018      0.27  VQ        |         |         |         |
  0+10       0.0058      0.58  V Q       |         |         |         |
  0+15       0.0098      0.57  V Q       |         |         |         |
  0+20       0.0143      0.66  |VQ       |         |         |         |
  0+25       0.0201      0.84  |V Q      |         |         |         |
  0+30       0.0268      0.98  | VQ      |         |         |         |
  0+35       0.0338      1.01  | V Q     |         |         |         |
  0+40       0.0409      1.03  |  VQ     |         |         |         |
  0+45       0.0488      1.15  |  VQ     |         |         |         |
  0+50       0.0561      1.06  |   Q     |         |         |         |
  0+55       0.0627      0.97  |  QV     |         |         |         |
  1+ 0       0.0700      1.06  |   QV    |         |         |         |
  1+ 5       0.0790      1.30  |    Q    |         |         |         |
  1+10       0.0893      1.50  |    QV   |         |         |         |
  1+15       0.1000      1.55  |     QV  |         |         |         |
  1+20       0.1102      1.49  |    Q  V |         |         |         |
  1+25       0.1215      1.64  |     Q  V|         |         |         |
  1+30       0.1347      1.92  |      Q  V         |         |         |
  1+35       0.1478      1.90  |      Q  |V        |         |         |
  1+40       0.1610      1.91  |      Q  | V       |         |         |
  1+45       0.1766      2.26  |        Q|  V      |         |         |
  1+50       0.1936      2.47  |        Q|   V     |         |         |
  1+55       0.2099      2.37  |        Q|    V    |         |         |
  2+ 0       0.2260      2.33  |        Q|     V   |         |         |
  2+ 5       0.2425      2.40  |        Q|       V |         |         |
  2+10       0.2622      2.86  |         |Q       V|         |         |
  2+15       0.2874      3.66  |         |   Q     |V        |         |
  2+20       0.3119      3.56  |         |   Q     |  V      |         |
  2+25       0.3412      4.26  |         |     Q   |    V    |         |
  2+30       0.3814      5.83  |         |         |  Q    V |         |
  2+35       0.4273      6.67  |         |         |     Q   | V       |
  2+40       0.4710      6.35  |         |         |    Q    |    V    |
  2+45       0.4989      4.04  |         |     Q   |         |      V  |
  2+50       0.5130      2.05  |       Q |         |         |       V |
  2+55       0.5234      1.51  |     Q   |         |         |        V|
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    3+ 0       0.5294      0.87  |  Q      |         |         |        v|
    3+ 5       0.5311      0.25  |Q        |         |         |        v|
    3+10       0.5317      0.09  Q         |         |         |        v|
    3+15       0.5320      0.03  Q         |         |         |        v|
    3+20       0.5320      0.00  Q         |         |         |         v
-------------------------------------------------------------------------
```

U n i t H y d r o g r a p h A n a l y s i s

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Study date 09/17/22 File: 1X6100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6545

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

XENIA
PRELIMINARY UNIT HYDROGRAPH ANALYSIS
AREA X1 PRESENT CONDITION
100-YEAR

Drainage Area = 3.81(Ac.) = 0.006 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 3.81(Ac.) = 0.006 Sq. Mi.
Length along longest watercourse = 586.00(Ft.)
Length along longest watercourse measured to centroid = 304.00(Ft.)
Length along longest watercourse = 0.111 Mi.
Length along longest watercourse measured to centroid = 0.058 Mi.
Difference in elevation = 7.00(Ft.)
Slope along watercourse = 63.0717 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.048 Hr.
Lag time = 2.88 Min.
25% of lag time = 0.72 Min.
40% of lag time = 1.15 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
3.81	1.27	4.84

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
3.81	3.00	11.43

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 1.270(In)
Area Averaged 100-Year Rainfall = 3.000(In)

Point rain (area averaged) = 3.000(In)
Areal adjustment factor = 100.00 %

Adjusted average point rain = 3.000(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
3.810	71.80	0.142

Total Area Entered = 3.81(Ac.)

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
71.8	86.1	0.175	0.142	0.152	1.000	0.152
					Sum (F) =	0.152

Area averaged mean soil loss (F) (In/Hr) = 0.152
Minimum soil loss rate ((In/Hr)) = 0.076
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.786

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

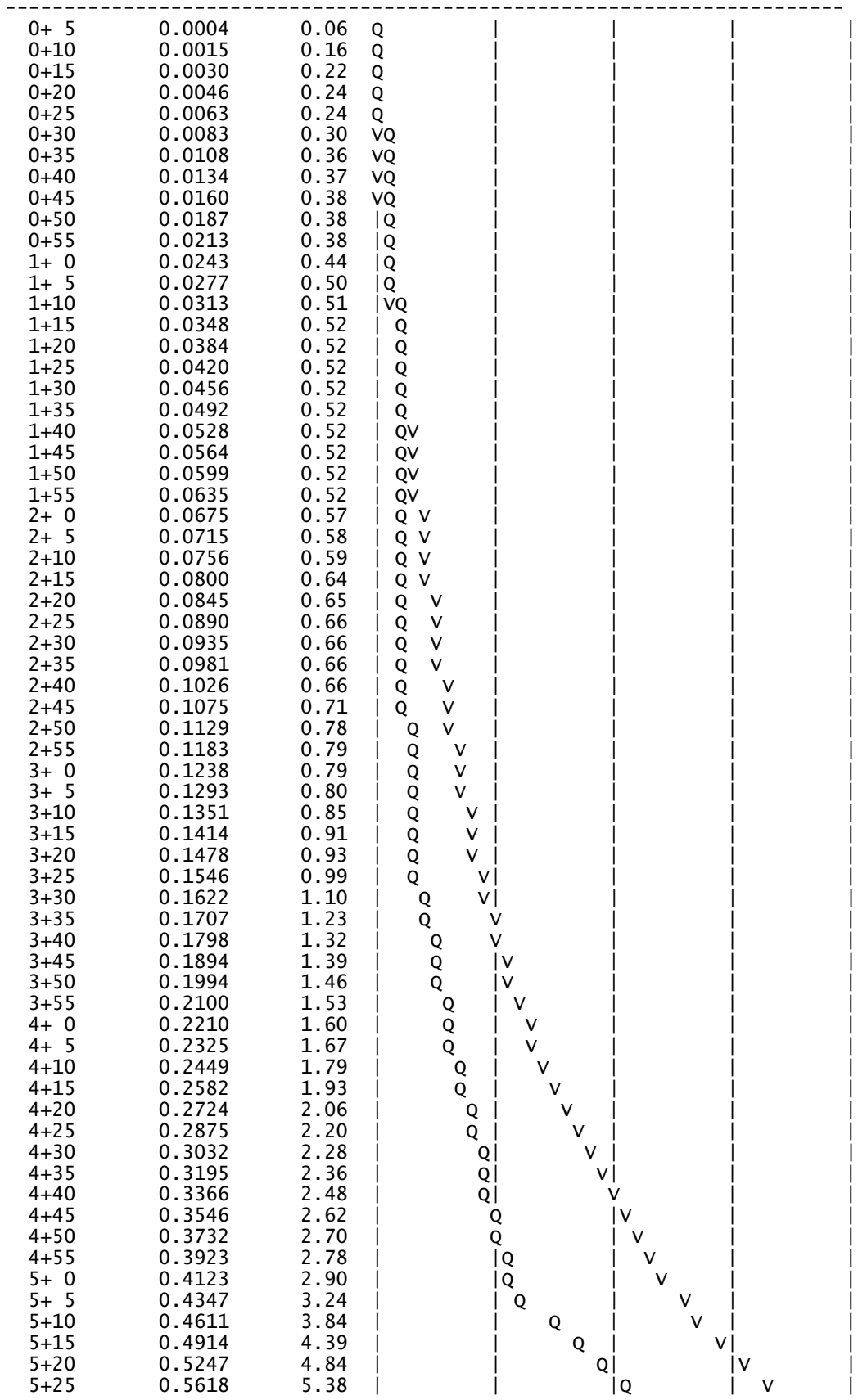
Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	173.526	38.422	1.475
2	0.167	347.051	45.256	1.738
3	0.250	520.577	9.968	0.383
4	0.333	694.102	4.151	0.159
5	0.417	867.628	2.202	0.085
			Sum = 100.000 Sum=	3.840

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.50	0.180	(0.152) 0.142	0.038
2	0.17	0.60	0.216	0.152 (0.170)	0.064
3	0.25	0.60	0.216	0.152 (0.170)	0.064
4	0.33	0.60	0.216	0.152 (0.170)	0.064
5	0.42	0.60	0.216	0.152 (0.170)	0.064
6	0.50	0.70	0.252	0.152 (0.198)	0.100
7	0.58	0.70	0.252	0.152 (0.198)	0.100
8	0.67	0.70	0.252	0.152 (0.198)	0.100
9	0.75	0.70	0.252	0.152 (0.198)	0.100
10	0.83	0.70	0.252	0.152 (0.198)	0.100
11	0.92	0.70	0.252	0.152 (0.198)	0.100
12	1.00	0.80	0.288	0.152 (0.226)	0.136
13	1.08	0.80	0.288	0.152 (0.226)	0.136
14	1.17	0.80	0.288	0.152 (0.226)	0.136
15	1.25	0.80	0.288	0.152 (0.226)	0.136
16	1.33	0.80	0.288	0.152 (0.226)	0.136
17	1.42	0.80	0.288	0.152 (0.226)	0.136
18	1.50	0.80	0.288	0.152 (0.226)	0.136
19	1.58	0.80	0.288	0.152 (0.226)	0.136
20	1.67	0.80	0.288	0.152 (0.226)	0.136
21	1.75	0.80	0.288	0.152 (0.226)	0.136
22	1.83	0.80	0.288	0.152 (0.226)	0.136
23	1.92	0.80	0.288	0.152 (0.226)	0.136
24	2.00	0.90	0.324	0.152 (0.255)	0.172
25	2.08	0.80	0.288	0.152 (0.226)	0.136
26	2.17	0.90	0.324	0.152 (0.255)	0.172

```
27   2.25     0.90      0.324          0.152    (  0.255)        0.172
28   2.33     0.90      0.324          0.152    (  0.255)        0.172
29   2.42     0.90      0.324          0.152    (  0.255)        0.172
30   2.50     0.90      0.324          0.152    (  0.255)        0.172
31   2.58     0.90      0.324          0.152    (  0.255)        0.172
32   2.67     0.90      0.324          0.152    (  0.255)        0.172
33   2.75     1.00      0.360          0.152    (  0.283)        0.208
34   2.83     1.00      0.360          0.152    (  0.283)        0.208
35   2.92     1.00      0.360          0.152    (  0.283)        0.208
36   3.00     1.00      0.360          0.152    (  0.283)        0.208
37   3.08     1.00      0.360          0.152    (  0.283)        0.208
38   3.17     1.10      0.396          0.152    (  0.311)        0.244
39   3.25     1.10      0.396          0.152    (  0.311)        0.244
40   3.33     1.10      0.396          0.152    (  0.311)        0.244
41   3.42     1.20      0.432          0.152    (  0.340)        0.280
42   3.50     1.30      0.468          0.152    (  0.368)        0.316
43   3.58     1.40      0.504          0.152    (  0.396)        0.352
44   3.67     1.40      0.504          0.152    (  0.396)        0.352
45   3.75     1.50      0.540          0.152    (  0.425)        0.388
46   3.83     1.50      0.540          0.152    (  0.425)        0.388
47   3.92     1.60      0.576          0.152    (  0.453)        0.424
48   4.00     1.60      0.576          0.152    (  0.453)        0.424
49   4.08     1.70      0.612          0.152    (  0.481)        0.460
50   4.17     1.80      0.648          0.152    (  0.510)        0.496
51   4.25     1.90      0.684          0.152    (  0.538)        0.532
52   4.33     2.00      0.720          0.152    (  0.566)        0.568
53   4.42     2.10      0.756          0.152    (  0.595)        0.604
54   4.50     2.10      0.756          0.152    (  0.595)        0.604
55   4.58     2.20      0.792          0.152    (  0.623)        0.640
56   4.67     2.30      0.828          0.152    (  0.651)        0.676
57   4.75     2.40      0.864          0.152    (  0.679)        0.712
58   4.83     2.40      0.864          0.152    (  0.679)        0.712
59   4.92     2.50      0.900          0.152    (  0.708)        0.748
60   5.00     2.60      0.936          0.152    (  0.736)        0.784
61   5.08     3.10      1.116          0.152    (  0.878)        0.964
62   5.17     3.60      1.296          0.152    (  1.019)        1.144
63   5.25     3.90      1.404          0.152    (  1.104)        1.252
64   5.33     4.20      1.512          0.152    (  1.189)        1.360
65   5.42     4.70      1.692          0.152    (  1.331)        1.540
66   5.50     5.60      2.016          0.152    (  1.585)        1.864
67   5.58     1.90      0.684          0.152    (  0.538)        0.532
68   5.67     0.90      0.324          0.152    (  0.255)        0.172
69   5.75     0.60      0.216          0.152    (  0.170)        0.064
70   5.83     0.50      0.180       (  0.152)       0.142        0.038
71   5.92     0.30      0.108       (  0.152)       0.085        0.023
72   6.00     0.20      0.072       (  0.152)       0.057        0.015
            (Loss Rate Not Used)
   Sum =     100.0                                    Sum =    25.2
     Flood volume = Effective rainfall      2.10(In)
      times area       3.8(Ac.)/[(In)/(Ft.)] =       0.7(Ac.Ft)
     Total soil loss =      0.90(In)
     Total soil loss =     0.285(Ac.Ft)
     Total rainfall =      3.00(In)
     Flood volume =       29060.0 Cubic Feet
     Total soil loss =       12430.4 Cubic Feet
     ---------------------------------------------------------------------
      Peak flow rate of this hydrograph =      6.245(CFS)
     ---------------------------------------------------------------------
     +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          6 - H O U R    S T O R M
                     R u n o f f      H y d r o g r a p h
     ---------------------------------------------------------------------
                  Hydrograph in   5   Minute intervals ((CFS))

     ---------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0        2.5       5.0       7.5      10.0
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    5+30       0.6048      6.24  |          |          |   Q      |     V    |
    5+35       0.6388      4.94  |          |         Q|          |       V  |
    5+40       0.6543      2.25  |         Q|          |          |         V|
    5+45       0.6613      1.02  |    Q     |          |          |         V|
    5+50       0.6646      0.48  |Q         |          |          |         V|
    5+55       0.6660      0.20  Q          |          |          |         V|
    6+ 0       0.6667      0.10  Q          |          |          |         V|
    6+ 5       0.6670      0.05  Q          |          |          |         V|
    6+10       0.6671      0.01  Q          |          |          |         V|
    6+15       0.6671      0.00  Q          |          |          |         V|
    6+20       0.6671      0.00  Q          |          |          |         V|
-------------------------------------------------------------------------------
```

U n i t H y d r o g r a p h A n a l y s i s

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Study date 09/17/22 File: 1X24100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6545

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

XENIA
PRELIMINARY UNIT HYDROGRAPH ANALYSIS
AREA X1 PRESENT CONDITION
100-YEAR

Drainage Area = 3.81(Ac.) = 0.006 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 3.81(Ac.) = 0.006 Sq. Mi.
Length along longest watercourse = 586.00(Ft.)
Length along longest watercourse measured to centroid = 304.00(Ft.)
Length along longest watercourse = 0.111 Mi.
Length along longest watercourse measured to centroid = 0.058 Mi.
Difference in elevation = 7.00(Ft.)
Slope along watercourse = 63.0717 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.048 Hr.
Lag time = 2.88 Min.
25% of lag time = 0.72 Min.
40% of lag time = 1.15 Min.
Unit time = 5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
3.81	2.53	9.64

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
3.81	6.50	24.77

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 2.530(In)
Area Averaged 100-Year Rainfall = 6.500(In)

Point rain (area averaged) = 6.500(In)
Areal adjustment factor = 100.00 %

Adjusted average point rain = 6.500(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
3.810	71.80	0.142

Total Area Entered = 3.81(Ac.)

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
71.8	86.1	0.175	0.142	0.152	1.000	0.152
					Sum (F) =	0.152

Area averaged mean soil loss (F) (In/Hr) = 0.152
Minimum soil loss rate ((In/Hr)) = 0.076
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.786

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	173.526	38.422	1.475
2	0.167	347.051	45.256	1.738
3	0.250	520.577	9.968	0.383
4	0.333	694.102	4.151	0.159
5	0.417	867.628	2.202	0.085
			Sum = 100.000 Sum=	3.840

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.07	0.052	(0.270)	0.041	0.011
2	0.17	0.07	0.052	(0.269)	0.041	0.011
3	0.25	0.07	0.052	(0.268)	0.041	0.011
4	0.33	0.10	0.078	(0.267)	0.061	0.017
5	0.42	0.10	0.078	(0.266)	0.061	0.017
6	0.50	0.10	0.078	(0.265)	0.061	0.017
7	0.58	0.10	0.078	(0.264)	0.061	0.017
8	0.67	0.10	0.078	(0.263)	0.061	0.017
9	0.75	0.10	0.078	(0.262)	0.061	0.017
10	0.83	0.13	0.104	(0.261)	0.082	0.022
11	0.92	0.13	0.104	(0.260)	0.082	0.022
12	1.00	0.13	0.104	(0.259)	0.082	0.022
13	1.08	0.10	0.078	(0.258)	0.061	0.017
14	1.17	0.10	0.078	(0.257)	0.061	0.017
15	1.25	0.10	0.078	(0.256)	0.061	0.017
16	1.33	0.10	0.078	(0.255)	0.061	0.017
17	1.42	0.10	0.078	(0.254)	0.061	0.017
18	1.50	0.10	0.078	(0.253)	0.061	0.017
19	1.58	0.10	0.078	(0.252)	0.061	0.017
20	1.67	0.10	0.078	(0.251)	0.061	0.017
21	1.75	0.10	0.078	(0.250)	0.061	0.017
22	1.83	0.13	0.104	(0.249)	0.082	0.022
23	1.92	0.13	0.104	(0.248)	0.082	0.022
24	2.00	0.13	0.104	(0.247)	0.082	0.022
25	2.08	0.13	0.104	(0.246)	0.082	0.022
26	2.17	0.13	0.104	(0.245)	0.082	0.022

27	2.25	0.13	0.104	(	0.244)	0.082		0.022
28	2.33	0.13	0.104	(	0.243)	0.082		0.022
29	2.42	0.13	0.104	(	0.242)	0.082		0.022
30	2.50	0.13	0.104	(	0.241)	0.082		0.022
31	2.58	0.17	0.130	(	0.240)	0.102		0.028
32	2.67	0.17	0.130	(	0.239)	0.102		0.028
33	2.75	0.17	0.130	(	0.238)	0.102		0.028
34	2.83	0.17	0.130	(	0.237)	0.102		0.028
35	2.92	0.17	0.130	(	0.236)	0.102		0.028
36	3.00	0.17	0.130	(	0.235)	0.102		0.028
37	3.08	0.17	0.130	(	0.234)	0.102		0.028
38	3.17	0.17	0.130	(	0.233)	0.102		0.028
39	3.25	0.17	0.130	(	0.232)	0.102		0.028
40	3.33	0.17	0.130	(	0.231)	0.102		0.028
41	3.42	0.17	0.130	(	0.230)	0.102		0.028
42	3.50	0.17	0.130	(	0.229)	0.102		0.028
43	3.58	0.17	0.130	(	0.228)	0.102		0.028
44	3.67	0.17	0.130	(	0.227)	0.102		0.028
45	3.75	0.17	0.130	(	0.226)	0.102		0.028
46	3.83	0.20	0.156	(	0.225)	0.123		0.033
47	3.92	0.20	0.156	(	0.224)	0.123		0.033
48	4.00	0.20	0.156	(	0.223)	0.123		0.033
49	4.08	0.20	0.156	(	0.222)	0.123		0.033
50	4.17	0.20	0.156	(	0.221)	0.123		0.033
51	4.25	0.20	0.156	(	0.220)	0.123		0.033
52	4.33	0.23	0.182	(	0.219)	0.143		0.039
53	4.42	0.23	0.182	(	0.219)	0.143		0.039
54	4.50	0.23	0.182	(	0.218)	0.143		0.039
55	4.58	0.23	0.182	(	0.217)	0.143		0.039
56	4.67	0.23	0.182	(	0.216)	0.143		0.039
57	4.75	0.23	0.182	(	0.215)	0.143		0.039
58	4.83	0.27	0.208	(	0.214)	0.164		0.044
59	4.92	0.27	0.208	(	0.213)	0.164		0.044
60	5.00	0.27	0.208	(	0.212)	0.164		0.044
61	5.08	0.20	0.156	(	0.211)	0.123		0.033
62	5.17	0.20	0.156	(	0.210)	0.123		0.033
63	5.25	0.20	0.156	(	0.209)	0.123		0.033
64	5.33	0.23	0.182	(	0.208)	0.143		0.039
65	5.42	0.23	0.182	(	0.207)	0.143		0.039
66	5.50	0.23	0.182	(	0.207)	0.143		0.039
67	5.58	0.27	0.208	(	0.206)	0.164		0.044
68	5.67	0.27	0.208	(	0.205)	0.164		0.044
69	5.75	0.27	0.208	(	0.204)	0.164		0.044
70	5.83	0.27	0.208	(	0.203)	0.164		0.044
71	5.92	0.27	0.208	(	0.202)	0.164		0.044
72	6.00	0.27	0.208	(	0.201)	0.164		0.044
73	6.08	0.30	0.234	(	0.200)	0.184		0.050
74	6.17	0.30	0.234	(	0.199)	0.184		0.050
75	6.25	0.30	0.234	(	0.198)	0.184		0.050
76	6.33	0.30	0.234	(	0.198)	0.184		0.050
77	6.42	0.30	0.234	(	0.197)	0.184		0.050
78	6.50	0.30	0.234	(	0.196)	0.184		0.050
79	6.58	0.33	0.260		0.195	(0.204)		0.065
80	6.67	0.33	0.260		0.194	(0.204)		0.066
81	6.75	0.33	0.260		0.193	(0.204)		0.067
82	6.83	0.33	0.260		0.192	(0.204)		0.068
83	6.92	0.33	0.260		0.191	(0.204)		0.069
84	7.00	0.33	0.260		0.191	(0.204)		0.069
85	7.08	0.33	0.260		0.190	(0.204)		0.070
86	7.17	0.33	0.260		0.189	(0.204)		0.071
87	7.25	0.33	0.260		0.188	(0.204)		0.072
88	7.33	0.37	0.286		0.187	(0.225)		0.099
89	7.42	0.37	0.286		0.186	(0.225)		0.100
90	7.50	0.37	0.286		0.185	(0.225)		0.101
91	7.58	0.40	0.312		0.185	(0.245)		0.127
92	7.67	0.40	0.312		0.184	(0.245)		0.128

93	7.75	0.40	0.312	0.183	(0.245)	0.129
94	7.83	0.43	0.338	0.182	(0.266)	0.156
95	7.92	0.43	0.338	0.181	(0.266)	0.157
96	8.00	0.43	0.338	0.180	(0.266)	0.158
97	8.08	0.50	0.390	0.179	(0.307)	0.211
98	8.17	0.50	0.390	0.179	(0.307)	0.211
99	8.25	0.50	0.390	0.178	(0.307)	0.212
100	8.33	0.50	0.390	0.177	(0.307)	0.213
101	8.42	0.50	0.390	0.176	(0.307)	0.214
102	8.50	0.50	0.390	0.175	(0.307)	0.215
103	8.58	0.53	0.416	0.175	(0.327)	0.241
104	8.67	0.53	0.416	0.174	(0.327)	0.242
105	8.75	0.53	0.416	0.173	(0.327)	0.243
106	8.83	0.57	0.442	0.172	(0.348)	0.270
107	8.92	0.57	0.442	0.171	(0.348)	0.271
108	9.00	0.57	0.442	0.170	(0.348)	0.272
109	9.08	0.63	0.494	0.170	(0.388)	0.324
110	9.17	0.63	0.494	0.169	(0.388)	0.325
111	9.25	0.63	0.494	0.168	(0.388)	0.326
112	9.33	0.67	0.520	0.167	(0.409)	0.353
113	9.42	0.67	0.520	0.166	(0.409)	0.354
114	9.50	0.67	0.520	0.166	(0.409)	0.354
115	9.58	0.70	0.546	0.165	(0.429)	0.381
116	9.67	0.70	0.546	0.164	(0.429)	0.382
117	9.75	0.70	0.546	0.163	(0.429)	0.383
118	9.83	0.73	0.572	0.162	(0.450)	0.410
119	9.92	0.73	0.572	0.162	(0.450)	0.410
120	10.00	0.73	0.572	0.161	(0.450)	0.411
121	10.08	0.50	0.390	0.160	(0.307)	0.230
122	10.17	0.50	0.390	0.159	(0.307)	0.231
123	10.25	0.50	0.390	0.159	(0.307)	0.231
124	10.33	0.50	0.390	0.158	(0.307)	0.232
125	10.42	0.50	0.390	0.157	(0.307)	0.233
126	10.50	0.50	0.390	0.156	(0.307)	0.234
127	10.58	0.67	0.520	0.156	(0.409)	0.364
128	10.67	0.67	0.520	0.155	(0.409)	0.365
129	10.75	0.67	0.520	0.154	(0.409)	0.366
130	10.83	0.67	0.520	0.153	(0.409)	0.367
131	10.92	0.67	0.520	0.152	(0.409)	0.368
132	11.00	0.67	0.520	0.152	(0.409)	0.368
133	11.08	0.63	0.494	0.151	(0.388)	0.343
134	11.17	0.63	0.494	0.150	(0.388)	0.344
135	11.25	0.63	0.494	0.149	(0.388)	0.344
136	11.33	0.63	0.494	0.149	(0.388)	0.345
137	11.42	0.63	0.494	0.148	(0.388)	0.346
138	11.50	0.63	0.494	0.147	(0.388)	0.347
139	11.58	0.57	0.442	0.147	(0.348)	0.295
140	11.67	0.57	0.442	0.146	(0.348)	0.296
141	11.75	0.57	0.442	0.145	(0.348)	0.297
142	11.83	0.60	0.468	0.144	(0.368)	0.324
143	11.92	0.60	0.468	0.144	(0.368)	0.324
144	12.00	0.60	0.468	0.143	(0.368)	0.325
145	12.08	0.83	0.650	0.142	(0.511)	0.508
146	12.17	0.83	0.650	0.142	(0.511)	0.508
147	12.25	0.83	0.650	0.141	(0.511)	0.509
148	12.33	0.87	0.676	0.140	(0.532)	0.536
149	12.42	0.87	0.676	0.139	(0.532)	0.537
150	12.50	0.87	0.676	0.139	(0.532)	0.537
151	12.58	0.93	0.728	0.138	(0.572)	0.590
152	12.67	0.93	0.728	0.137	(0.572)	0.591
153	12.75	0.93	0.728	0.137	(0.572)	0.591
154	12.83	0.97	0.754	0.136	(0.593)	0.618
155	12.92	0.97	0.754	0.135	(0.593)	0.619
156	13.00	0.97	0.754	0.135	(0.593)	0.619
157	13.08	1.13	0.884	0.134	(0.695)	0.750
158	13.17	1.13	0.884	0.133	(0.695)	0.751

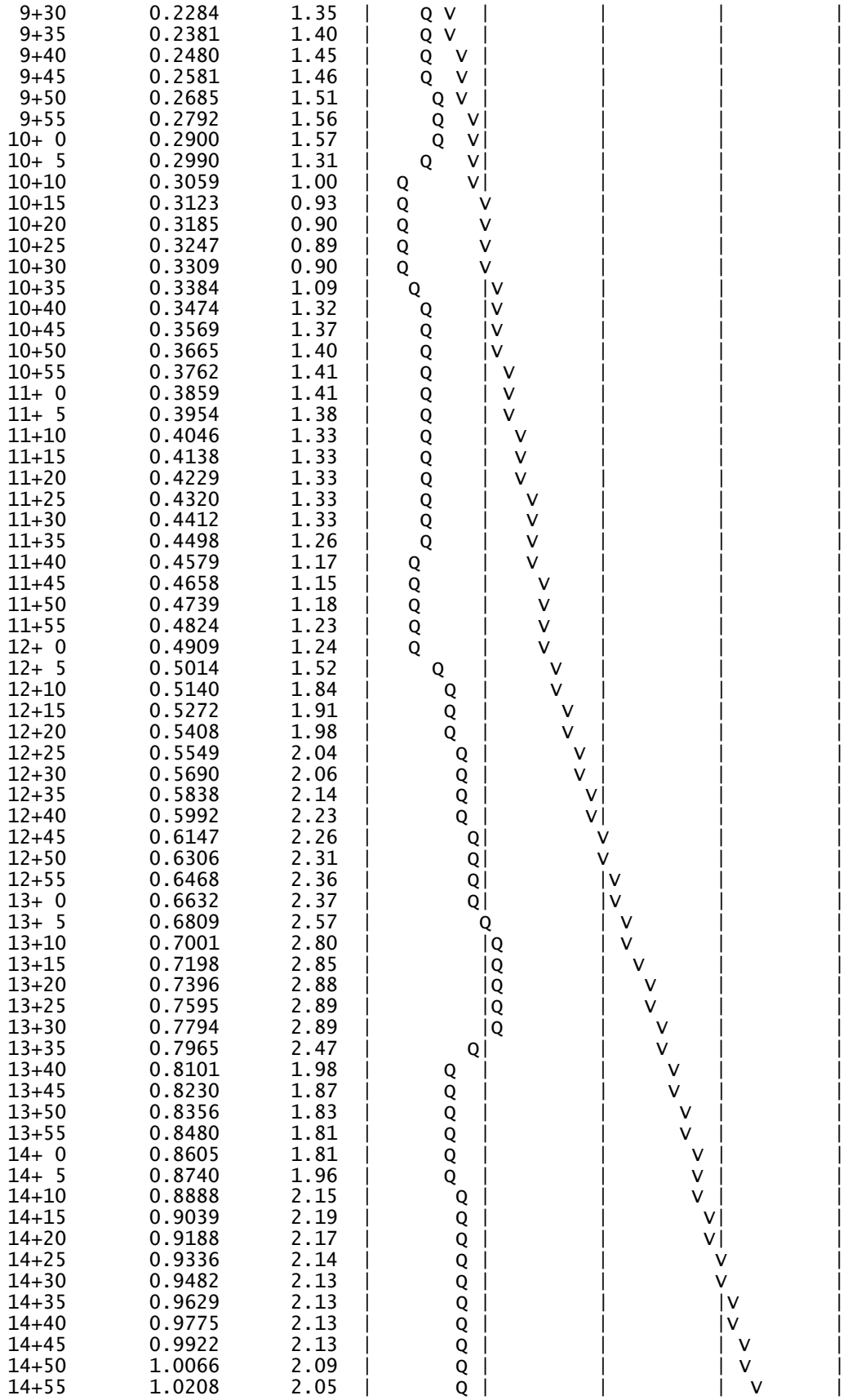
159	13.25	1.13	0.884	0.133	(0.695)	0.751
160	13.33	1.13	0.884	0.132	(0.695)	0.752
161	13.42	1.13	0.884	0.131	(0.695)	0.753
162	13.50	1.13	0.884	0.131	(0.695)	0.753
163	13.58	0.77	0.598	0.130	(0.470)	0.468
164	13.67	0.77	0.598	0.129	(0.470)	0.469
165	13.75	0.77	0.598	0.129	(0.470)	0.469
166	13.83	0.77	0.598	0.128	(0.470)	0.470
167	13.92	0.77	0.598	0.127	(0.470)	0.471
168	14.00	0.77	0.598	0.127	(0.470)	0.471
169	14.08	0.90	0.702	0.126	(0.552)	0.576
170	14.17	0.90	0.702	0.125	(0.552)	0.577
171	14.25	0.90	0.702	0.125	(0.552)	0.577
172	14.33	0.87	0.676	0.124	(0.532)	0.552
173	14.42	0.87	0.676	0.123	(0.532)	0.553
174	14.50	0.87	0.676	0.123	(0.532)	0.553
175	14.58	0.87	0.676	0.122	(0.532)	0.554
176	14.67	0.87	0.676	0.121	(0.532)	0.555
177	14.75	0.87	0.676	0.121	(0.532)	0.555
178	14.83	0.83	0.650	0.120	(0.511)	0.530
179	14.92	0.83	0.650	0.120	(0.511)	0.530
180	15.00	0.83	0.650	0.119	(0.511)	0.531
181	15.08	0.80	0.624	0.118	(0.491)	0.506
182	15.17	0.80	0.624	0.118	(0.491)	0.506
183	15.25	0.80	0.624	0.117	(0.491)	0.507
184	15.33	0.77	0.598	0.117	(0.470)	0.481
185	15.42	0.77	0.598	0.116	(0.470)	0.482
186	15.50	0.77	0.598	0.115	(0.470)	0.483
187	15.58	0.63	0.494	0.115	(0.388)	0.379
188	15.67	0.63	0.494	0.114	(0.388)	0.380
189	15.75	0.63	0.494	0.114	(0.388)	0.380
190	15.83	0.63	0.494	0.113	(0.388)	0.381
191	15.92	0.63	0.494	0.112	(0.388)	0.382
192	16.00	0.63	0.494	0.112	(0.388)	0.382
193	16.08	0.13	0.104	(0.111)	0.082	0.022
194	16.17	0.13	0.104	(0.111)	0.082	0.022
195	16.25	0.13	0.104	(0.110)	0.082	0.022
196	16.33	0.13	0.104	(0.110)	0.082	0.022
197	16.42	0.13	0.104	(0.109)	0.082	0.022
198	16.50	0.13	0.104	(0.109)	0.082	0.022
199	16.58	0.10	0.078	(0.108)	0.061	0.017
200	16.67	0.10	0.078	(0.107)	0.061	0.017
201	16.75	0.10	0.078	(0.107)	0.061	0.017
202	16.83	0.10	0.078	(0.106)	0.061	0.017
203	16.92	0.10	0.078	(0.106)	0.061	0.017
204	17.00	0.10	0.078	(0.105)	0.061	0.017
205	17.08	0.17	0.130	(0.105)	0.102	0.028
206	17.17	0.17	0.130	(0.104)	0.102	0.028
207	17.25	0.17	0.130	(0.104)	0.102	0.028
208	17.33	0.17	0.130	(0.103)	0.102	0.028
209	17.42	0.17	0.130	(0.103)	0.102	0.028
210	17.50	0.17	0.130	0.102	(0.102)	0.028
211	17.58	0.17	0.130	0.102	(0.102)	0.028
212	17.67	0.17	0.130	0.101	(0.102)	0.029
213	17.75	0.17	0.130	0.101	(0.102)	0.029
214	17.83	0.13	0.104	(0.100)	0.082	0.022
215	17.92	0.13	0.104	(0.100)	0.082	0.022
216	18.00	0.13	0.104	(0.099)	0.082	0.022
217	18.08	0.13	0.104	(0.099)	0.082	0.022
218	18.17	0.13	0.104	(0.098)	0.082	0.022
219	18.25	0.13	0.104	(0.098)	0.082	0.022
220	18.33	0.13	0.104	(0.097)	0.082	0.022
221	18.42	0.13	0.104	(0.097)	0.082	0.022
222	18.50	0.13	0.104	(0.096)	0.082	0.022
223	18.58	0.10	0.078	(0.096)	0.061	0.017
224	18.67	0.10	0.078	(0.095)	0.061	0.017

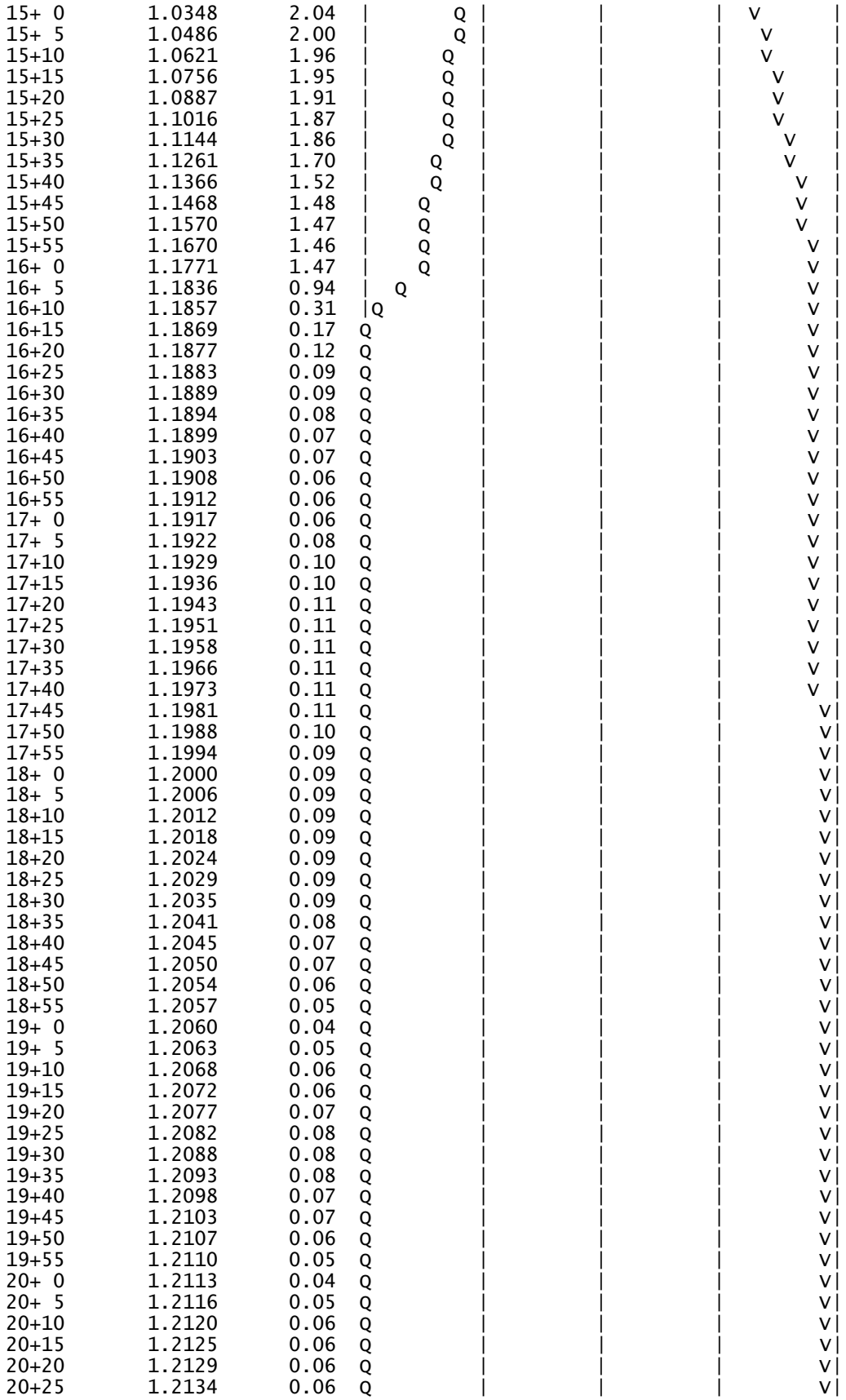
225	18.75	0.10	0.078	(0.095)	0.061	0.017
226	18.83	0.07	0.052	(0.094)	0.041	0.011
227	18.92	0.07	0.052	(0.094)	0.041	0.011
228	19.00	0.07	0.052	(0.093)	0.041	0.011
229	19.08	0.10	0.078	(0.093)	0.061	0.017
230	19.17	0.10	0.078	(0.093)	0.061	0.017
231	19.25	0.10	0.078	(0.092)	0.061	0.017
232	19.33	0.13	0.104	(0.092)	0.082	0.022
233	19.42	0.13	0.104	(0.091)	0.082	0.022
234	19.50	0.13	0.104	(0.091)	0.082	0.022
235	19.58	0.10	0.078	(0.090)	0.061	0.017
236	19.67	0.10	0.078	(0.090)	0.061	0.017
237	19.75	0.10	0.078	(0.090)	0.061	0.017
238	19.83	0.07	0.052	(0.089)	0.041	0.011
239	19.92	0.07	0.052	(0.089)	0.041	0.011
240	20.00	0.07	0.052	(0.088)	0.041	0.011
241	20.08	0.10	0.078	(0.088)	0.061	0.017
242	20.17	0.10	0.078	(0.088)	0.061	0.017
243	20.25	0.10	0.078	(0.087)	0.061	0.017
244	20.33	0.10	0.078	(0.087)	0.061	0.017
245	20.42	0.10	0.078	(0.087)	0.061	0.017
246	20.50	0.10	0.078	(0.086)	0.061	0.017
247	20.58	0.10	0.078	(0.086)	0.061	0.017
248	20.67	0.10	0.078	(0.085)	0.061	0.017
249	20.75	0.10	0.078	(0.085)	0.061	0.017
250	20.83	0.07	0.052	(0.085)	0.041	0.011
251	20.92	0.07	0.052	(0.084)	0.041	0.011
252	21.00	0.07	0.052	(0.084)	0.041	0.011
253	21.08	0.10	0.078	(0.084)	0.061	0.017
254	21.17	0.10	0.078	(0.083)	0.061	0.017
255	21.25	0.10	0.078	(0.083)	0.061	0.017
256	21.33	0.07	0.052	(0.083)	0.041	0.011
257	21.42	0.07	0.052	(0.082)	0.041	0.011
258	21.50	0.07	0.052	(0.082)	0.041	0.011
259	21.58	0.10	0.078	(0.082)	0.061	0.017
260	21.67	0.10	0.078	(0.082)	0.061	0.017
261	21.75	0.10	0.078	(0.081)	0.061	0.017
262	21.83	0.07	0.052	(0.081)	0.041	0.011
263	21.92	0.07	0.052	(0.081)	0.041	0.011
264	22.00	0.07	0.052	(0.080)	0.041	0.011
265	22.08	0.10	0.078	(0.080)	0.061	0.017
266	22.17	0.10	0.078	(0.080)	0.061	0.017
267	22.25	0.10	0.078	(0.080)	0.061	0.017
268	22.33	0.07	0.052	(0.079)	0.041	0.011
269	22.42	0.07	0.052	(0.079)	0.041	0.011
270	22.50	0.07	0.052	(0.079)	0.041	0.011
271	22.58	0.07	0.052	(0.079)	0.041	0.011
272	22.67	0.07	0.052	(0.078)	0.041	0.011
273	22.75	0.07	0.052	(0.078)	0.041	0.011
274	22.83	0.07	0.052	(0.078)	0.041	0.011
275	22.92	0.07	0.052	(0.078)	0.041	0.011
276	23.00	0.07	0.052	(0.078)	0.041	0.011
277	23.08	0.07	0.052	(0.078)	0.041	0.011
278	23.17	0.07	0.052	(0.077)	0.041	0.011
279	23.25	0.07	0.052	(0.077)	0.041	0.011
280	23.33	0.07	0.052	(0.077)	0.041	0.011
281	23.42	0.07	0.052	(0.077)	0.041	0.011
282	23.50	0.07	0.052	(0.077)	0.041	0.011
283	23.58	0.07	0.052	(0.077)	0.041	0.011
284	23.67	0.07	0.052	(0.076)	0.041	0.011
285	23.75	0.07	0.052	(0.076)	0.041	0.011
286	23.83	0.07	0.052	(0.076)	0.041	0.011
287	23.92	0.07	0.052	(0.076)	0.041	0.011
288	24.00	0.07	0.052	(0.076)	0.041	0.011
		(Loss Rate Not Used)				
	Sum =	100.0			Sum =	46.4

```
    Flood volume = Effective rainfall      3.87(In)
     times area       3.8(Ac.)/[(In)/(Ft.)] =       1.2(Ac.Ft)
    Total soil loss =      2.63(In)
    Total soil loss =     0.835(Ac.Ft)
    Total rainfall =      6.50(In)
    Flood volume =       53503.9 Cubic Feet
    Total soil loss =       36392.4 Cubic Feet
    ------------------------------------------------------------------------
     Peak flow rate of this hydrograph =      2.893(CFS)
    ------------------------------------------------------------------------
    ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                        24 - H O U R    S T O R M
                   R u n o f f      H y d r o g r a p h
    ------------------------------------------------------------------------
                Hydrograph in   5   Minute intervals ((CFS))

    ------------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0        2.5       5.0       7.5      10.0
----------------------------------------------------------------------------
  0+ 5       0.0001      0.02  Q          |         |         |         |
  0+10       0.0004      0.04  Q          |         |         |         |
  0+15       0.0006      0.04  Q          |         |         |         |
  0+20       0.0010      0.05  Q          |         |         |         |
  0+25       0.0014      0.06  Q          |         |         |         |
  0+30       0.0018      0.06  Q          |         |         |         |
  0+35       0.0023      0.06  Q          |         |         |         |
  0+40       0.0027      0.06  Q          |         |         |         |
  0+45       0.0031      0.06  Q          |         |         |         |
  0+50       0.0036      0.07  Q          |         |         |         |
  0+55       0.0042      0.08  Q          |         |         |         |
  1+ 0       0.0048      0.08  Q          |         |         |         |
  1+ 5       0.0053      0.08  Q          |         |         |         |
  1+10       0.0058      0.07  Q          |         |         |         |
  1+15       0.0062      0.07  Q          |         |         |         |
  1+20       0.0067      0.06  Q          |         |         |         |
  1+25       0.0071      0.06  Q          |         |         |         |
  1+30       0.0076      0.06  Q          |         |         |         |
  1+35       0.0080      0.06  Q          |         |         |         |
  1+40       0.0084      0.06  Q          |         |         |         |
  1+45       0.0089      0.06  Q          |         |         |         |
  1+50       0.0094      0.07  Q          |         |         |         |
  1+55       0.0099      0.08  Q          |         |         |         |
  2+ 0       0.0105      0.08  Q          |         |         |         |
  2+ 5       0.0111      0.08  Q          |         |         |         |
  2+10       0.0117      0.09  Q          |         |         |         |
  2+15       0.0123      0.09  Q          |         |         |         |
  2+20       0.0129      0.09  Q          |         |         |         |
  2+25       0.0135      0.09  Q          |         |         |         |
  2+30       0.0140      0.09  Q          |         |         |         |
  2+35       0.0147      0.09  Q          |         |         |         |
  2+40       0.0154      0.10  Q          |         |         |         |
  2+45       0.0161      0.11  Q          |         |         |         |
  2+50       0.0169      0.11  Q          |         |         |         |
  2+55       0.0176      0.11  Q          |         |         |         |
  3+ 0       0.0183      0.11  Q          |         |         |         |
  3+ 5       0.0191      0.11  Q          |         |         |         |
  3+10       0.0198      0.11  Q          |         |         |         |
  3+15       0.0205      0.11  Q          |         |         |         |
  3+20       0.0213      0.11  Q          |         |         |         |
  3+25       0.0220      0.11  Q          |         |         |         |
  3+30       0.0227      0.11  Q          |         |         |         |
  3+35       0.0235      0.11  Q          |         |         |         |
  3+40       0.0242      0.11  Q          |         |         |         |
  3+45       0.0249      0.11  Q          |         |         |         |
  3+50       0.0257      0.11  Q          |         |         |         |
  3+55       0.0266      0.12  Q          |         |         |         |
```

4+ 0	0.0275	0.13	Q				
4+ 5	0.0283	0.13	Q				
4+10	0.0292	0.13	Q				
4+15	0.0301	0.13	Q				
4+20	0.0310	0.14	QV				
4+25	0.0320	0.15	QV				
4+30	0.0331	0.15	QV				
4+35	0.0341	0.15	QV				
4+40	0.0351	0.15	QV				
4+45	0.0361	0.15	QV				
4+50	0.0372	0.16	QV				
4+55	0.0384	0.17	QV				
5+ 0	0.0395	0.17	QV				
5+ 5	0.0406	0.15	QV				
5+10	0.0415	0.13	QV				
5+15	0.0424	0.13	QV				
5+20	0.0434	0.14	QV				
5+25	0.0444	0.15	QV				
5+30	0.0454	0.15	QV				
5+35	0.0465	0.16	QV				
5+40	0.0476	0.17	QV				
5+45	0.0488	0.17	QV				
5+50	0.0500	0.17	QV				
5+55	0.0511	0.17	QV				
6+ 0	0.0523	0.17	QV				
6+ 5	0.0536	0.18	QV				
6+10	0.0549	0.19	QV				
6+15	0.0562	0.19	QV				
6+20	0.0575	0.19	QV				
6+25	0.0588	0.19	QV				
6+30	0.0601	0.19	QV				
6+35	0.0616	0.21	Q V				
6+40	0.0633	0.24	Q V				
6+45	0.0650	0.25	|QV				
6+50	0.0668	0.26	|QV				
6+55	0.0686	0.26	|QV				
7+ 0	0.0704	0.26	|QV				
7+ 5	0.0722	0.27	|QV				
7+10	0.0741	0.27	|QV				
7+15	0.0760	0.27	|QV				
7+20	0.0781	0.32	|QV				
7+25	0.0806	0.36	|QV				
7+30	0.0832	0.38	|QV				
7+35	0.0862	0.42	|QV				
7+40	0.0894	0.47	|QV				
7+45	0.0928	0.49	|Q V				
7+50	0.0964	0.53	| QV				
7+55	0.1005	0.58	| QV				
8+ 0	0.1046	0.60	| QV				
8+ 5	0.1093	0.68	| QV				
8+10	0.1146	0.78	| Q				
8+15	0.1201	0.80	| Q				
8+20	0.1257	0.81	| QV				
8+25	0.1313	0.82	| QV				
8+30	0.1370	0.82	| QV				
8+35	0.1429	0.86	| QV				
8+40	0.1492	0.91	| QV				
8+45	0.1556	0.92	| Q V				
8+50	0.1623	0.97	| Q V				
8+55	0.1693	1.02	| QV				
9+ 0	0.1764	1.03	| QV				
9+ 5	0.1841	1.12	| QV				
9+10	0.1925	1.21	| Q V				
9+15	0.2010	1.24	| Q V				
9+20	0.2099	1.29	| QV				
9+25	0.2191	1.34	| Q V				





20+30	1.2138	0.06	Q	|	|	|	V|
20+35	1.2142	0.06	Q	|	|	|	V|
20+40	1.2147	0.06	Q	|	|	|	V|
20+45	1.2151	0.06	Q	|	|	|	V|
20+50	1.2155	0.06	Q	|	|	|	V|
20+55	1.2158	0.05	Q	|	|	|	V|
21+ 0	1.2161	0.04	Q	|	|	|	V|
21+ 5	1.2165	0.05	Q	|	|	|	V|
21+10	1.2169	0.06	Q	|	|	|	V|
21+15	1.2173	0.06	Q	|	|	|	V|
21+20	1.2177	0.06	Q	|	|	|	V|
21+25	1.2180	0.05	Q	|	|	|	V|
21+30	1.2183	0.04	Q	|	|	|	V|
21+35	1.2187	0.05	Q	|	|	|	V|
21+40	1.2191	0.06	Q	|	|	|	V|
21+45	1.2195	0.06	Q	|	|	|	V|
21+50	1.2199	0.06	Q	|	|	|	V|
21+55	1.2202	0.05	Q	|	|	|	V|
22+ 0	1.2205	0.04	Q	|	|	|	V|
22+ 5	1.2209	0.05	Q	|	|	|	V|
22+10	1.2213	0.06	Q	|	|	|	V|
22+15	1.2217	0.06	Q	|	|	|	V|
22+20	1.2221	0.06	Q	|	|	|	V|
22+25	1.2224	0.05	Q	|	|	|	V|
22+30	1.2227	0.04	Q	|	|	|	V|
22+35	1.2230	0.04	Q	|	|	|	V|
22+40	1.2233	0.04	Q	|	|	|	V|
22+45	1.2236	0.04	Q	|	|	|	V|
22+50	1.2239	0.04	Q	|	|	|	V|
22+55	1.2242	0.04	Q	|	|	|	V|
23+ 0	1.2245	0.04	Q	|	|	|	V|
23+ 5	1.2248	0.04	Q	|	|	|	V|
23+10	1.2251	0.04	Q	|	|	|	V|
23+15	1.2254	0.04	Q	|	|	|	V|
23+20	1.2257	0.04	Q	|	|	|	V|
23+25	1.2260	0.04	Q	|	|	|	V|
23+30	1.2263	0.04	Q	|	|	|	V|
23+35	1.2266	0.04	Q	|	|	|	V|
23+40	1.2269	0.04	Q	|	|	|	V|
23+45	1.2271	0.04	Q	|	|	|	V|
23+50	1.2274	0.04	Q	|	|	|	V|
23+55	1.2277	0.04	Q	|	|	|	V|
24+ 0	1.2280	0.04	Q	|	|	|	V|
24+ 5	1.2282	0.03	Q	|	|	|	V|
24+10	1.2283	0.01	Q	|	|	|	V|
24+15	1.2283	0.00	Q	|	|	|	V|
24+20	1.2283	0.00	Q	|	|	|	V|

U n i t H y d r o g r a p h A n a l y s i s

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Study date 09/17/22 File: 2X1100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6545

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

XENIA
PRELIMINARY UNIT HYDROGRAPH ANALYSIS
AREA 2X PRESENT CONDITION
100-YEAR

Drainage Area = 10.08(Ac.) = 0.016 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 10.08(Ac.) = 0.016 Sq. Mi.
Length along longest watercourse = 1117.00(Ft.)
Length along longest watercourse measured to centroid = 544.00(Ft.)
Length along longest watercourse = 0.212 Mi.
Length along longest watercourse measured to centroid = 0.103 Mi.
Difference in elevation = 8.70(Ft.)
Slope along watercourse = 41.1244 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.083 Hr.
Lag time = 4.98 Min.
25% of lag time = 1.25 Min.
40% of lag time = 1.99 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
10.08	0.57	5.75

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
10.08	1.27	12.80

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.570(In)
Area Averaged 100-Year Rainfall = 1.270(In)

Point rain (area averaged) = 1.270(In)
Areal adjustment factor = 99.99 %

Adjusted average point rain = 1.270(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
10.080	72.20	0.131

Total Area Entered = 10.08(Ac.)

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
72.2	86.3	0.172	0.131	0.152	1.000	0.152
					Sum (F) =	0.152

Area averaged mean soil loss (F) (In/Hr) = 0.152
Minimum soil loss rate ((In/Hr)) = 0.076
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.795

Slope of intensity-duration curve for a 1 hour storm =0.5300

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	100.364	19.312	1.962
2	0.167	200.729	48.430	4.920
3	0.250	301.093	15.580	1.583
4	0.333	401.457	7.043	0.716
5	0.417	501.821	3.960	0.402
6	0.500	602.186	2.564	0.260
7	0.583	702.550	1.588	0.161
8	0.667	802.914	1.522	0.155
		Sum = 100.000	Sum=	10.159

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time	(Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max		Low	Effective (In/Hr)
1	0.08	3.40	0.518	0.152	(	0.412)	0.366
2	0.17	4.70	0.716	0.152	(	0.570)	0.565
3	0.25	4.70	0.716	0.152	(	0.570)	0.565
4	0.33	5.10	0.777	0.152	(	0.618)	0.625
5	0.42	5.80	0.884	0.152	(	0.703)	0.732
6	0.50	5.90	0.899	0.152	(	0.715)	0.747
7	0.58	7.10	1.082	0.152	(	0.860)	0.930
8	0.67	8.70	1.326	0.152	(	1.054)	1.174
9	0.75	13.20	2.011	0.152	(	1.600)	1.860
10	0.83	29.70	4.526	0.152	(	3.599)	4.374
11	0.92	7.70	1.173	0.152	(	0.933)	1.022
12	1.00	4.00	0.610	0.152	(	0.485)	0.458
		(Loss Rate Not Used)					
Sum =		100.0				Sum =	13.4

Flood volume = Effective rainfall 1.12(In)
times area 10.1(Ac.)/[(In)/(Ft.)] = 0.9(Ac.Ft)
Total soil loss = 0.15(In)
Total soil loss = 0.127(Ac.Ft)
Total rainfall = 1.27(In)
Flood volume = 40915.6 Cubic Feet
Total soil loss = 5550.0 Cubic Feet

Peak flow rate of this hydrograph = 28.107(CFS)

1 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	7.5	15.0	22.5	30.0
0+ 5	0.0050	0.72	Q				
0+10	0.0250	2.91	V Q				
0+15	0.0558	4.47	V Q				
0+20	0.0913	5.16	V Q				
0+25	0.1324	5.96	V Q				
0+30	0.1791	6.79	V Q				
0+35	0.2311	7.55	VQ				
0+40	0.2940	9.14	Q				
0+45	0.3772	12.07	Q				
0+50	0.5215	20.95	V Q				
0+55	0.7150	28.11	V Q				
1+ 0	0.8193	15.14	Q V				
1+ 5	0.8766	8.32	Q V				
1+10	0.9044	4.04	Q V				
1+15	0.9206	2.36	Q V				
1+20	0.9306	1.44	Q V				
1+25	0.9372	0.96	Q V				
1+30	0.9388	0.23	Q V				
1+35	0.9393	0.07	Q V				

U n i t H y d r o g r a p h A n a l y s i s

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Study date 09/17/22 File: 2X3100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6545

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

XENIA
PRELIMINARY UNIT HYDROGRAPH ANALYSIS
AREA 2X PRESENT CONDITION
100-YEAR

Drainage Area = 10.08(Ac.) = 0.016 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 10.08(Ac.) = 0.016 Sq. Mi.
Length along longest watercourse = 1117.00(Ft.)
Length along longest watercourse measured to centroid = 544.00(Ft.)
Length along longest watercourse = 0.212 Mi.
Length along longest watercourse measured to centroid = 0.103 Mi.
Difference in elevation = 8.70(Ft.)
Slope along watercourse = 41.1244 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.083 Hr.
Lag time = 4.98 Min.
25% of lag time = 1.25 Min.
40% of lag time = 1.99 Min.
Unit time = 5.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
10.08	0.98	9.88

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
10.08	2.13	21.47

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.980(In)
Area Averaged 100-Year Rainfall = 2.130(In)

Point rain (area averaged) = 2.130(In)
Areal adjustment factor = 100.00 %

Adjusted average point rain = 2.130(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
10.080	72.20	0.131

Total Area Entered = 10.08(Ac.)

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
72.2	86.3	0.172	0.131	0.152	1.000	0.152
					Sum (F) =	0.152

Area averaged mean soil loss (F) (In/Hr) = 0.152
Minimum soil loss rate ((In/Hr)) = 0.076
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.795

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

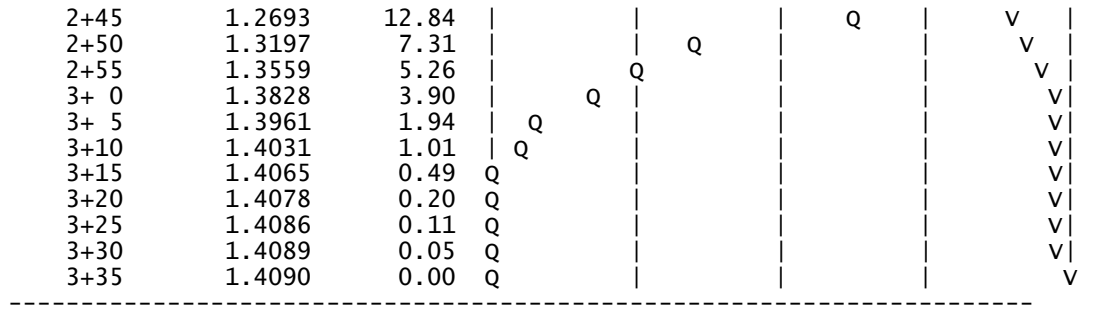
Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	100.364	19.312	1.962
2	0.167	200.729	48.430	4.920
3	0.250	301.093	15.580	1.583
4	0.333	401.457	7.043	0.716
5	0.417	501.821	3.960	0.402
6	0.500	602.186	2.564	0.260
7	0.583	702.550	1.588	0.161
8	0.667	802.914	1.522	0.155
		Sum = 100.000	Sum=	10.159

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	1.30	0.332	0.152	(0.264)	0.181
2	0.17	1.30	0.332	0.152	(0.264)	0.181
3	0.25	1.10	0.281	0.152	(0.224)	0.129
4	0.33	1.50	0.383	0.152	(0.305)	0.232
5	0.42	1.50	0.383	0.152	(0.305)	0.232
6	0.50	1.80	0.460	0.152	(0.366)	0.308
7	0.58	1.50	0.383	0.152	(0.305)	0.232
8	0.67	1.80	0.460	0.152	(0.366)	0.308
9	0.75	1.80	0.460	0.152	(0.366)	0.308
10	0.83	1.50	0.383	0.152	(0.305)	0.232
11	0.92	1.60	0.409	0.152	(0.325)	0.257
12	1.00	1.80	0.460	0.152	(0.366)	0.308
13	1.08	2.20	0.562	0.152	(0.447)	0.411
14	1.17	2.20	0.562	0.152	(0.447)	0.411
15	1.25	2.20	0.562	0.152	(0.447)	0.411
16	1.33	2.00	0.511	0.152	(0.406)	0.359
17	1.42	2.60	0.665	0.152	(0.528)	0.513
18	1.50	2.70	0.690	0.152	(0.549)	0.538
19	1.58	2.40	0.613	0.152	(0.488)	0.462
20	1.67	2.70	0.690	0.152	(0.549)	0.538
21	1.75	3.30	0.843	0.152	(0.671)	0.692
22	1.83	3.10	0.792	0.152	(0.630)	0.641
23	1.92	2.90	0.741	0.152	(0.589)	0.590

```
24   2.00     3.00      0.767          0.152    (  0.610)        0.615
25   2.08     3.10      0.792          0.152    (  0.630)        0.641
26   2.17     4.20      1.073          0.152    (  0.854)        0.922
27   2.25     5.00      1.278          0.152    (  1.016)        1.126
28   2.33     3.50      0.895          0.152    (  0.711)        0.743
29   2.42     6.80      1.738          0.152    (  1.382)        1.586
30   2.50     7.30      1.866          0.152    (  1.484)        1.714
31   2.58     8.20      2.096          0.152    (  1.667)        1.944
32   2.67     5.90      1.508          0.152    (  1.199)        1.356
33   2.75     2.00      0.511          0.152    (  0.406)        0.359
34   2.83     1.80      0.460          0.152    (  0.366)        0.308
35   2.92     1.80      0.460          0.152    (  0.366)        0.308
36   3.00     0.60      0.153       (  0.152)       0.122        0.031
            (Loss Rate Not Used)
   Sum =     100.0                                    Sum =    20.1
     Flood volume = Effective rainfall      1.68(In)
      times area      10.1(Ac.)/[(In)/(Ft.)] =       1.4(Ac.Ft)
     Total soil loss =      0.45(In)
     Total soil loss =     0.380(Ac.Ft)
     Total rainfall =      2.13(In)
     Flood volume =       61374.8 Cubic Feet
     Total soil loss =       16559.3 Cubic Feet
     ---------------------------------------------------------------------
      Peak flow rate of this hydrograph =     16.923(CFS)
     ---------------------------------------------------------------------
     +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                         3 - H O U R    S T O R M
                    R u n o f f      H y d r o g r a p h
     ---------------------------------------------------------------------
                Hydrograph in   5   Minute intervals ((CFS))

     ---------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0        5.0      10.0      15.0      20.0
-------------------------------------------------------------------------
  0+ 5       0.0024      0.35  Q         |         |         |         |
  0+10       0.0110      1.24  V Q       |         |         |         |
  0+15       0.0208      1.43  V Q       |         |         |         |
  0+20       0.0312      1.51  V  Q      |         |         |         |
  0+25       0.0450      2.00  |V  Q     |         |         |         |
  0+30       0.0610      2.33  |V  Q     |         |         |         |
  0+35       0.0792      2.63  | V  Q    |         |         |         |
  0+40       0.0970      2.58  | V  Q    |         |         |         |
  0+45       0.1170      2.91  |  V Q    |         |         |         |
  0+50       0.1368      2.87  |  V Q    |         |         |         |
  0+55       0.1547      2.60  |   VQ    |         |         |         |
  1+ 0       0.1735      2.73  |   VQ    |         |         |         |
  1+ 5       0.1955      3.19  |    VQ   |         |         |         |
  1+10       0.2213      3.76  |     VQ  |         |         |         |
  1+15       0.2486      3.96  |      Q  |         |         |         |
  1+20       0.2758      3.95  |      Q  |         |         |         |
  1+25       0.3036      4.04  |       Q |         |         |         |
  1+30       0.3367      4.81  |        Q|         |         |         |
  1+35       0.3713      5.01  |         Q         |         |         |
  1+40       0.4052      4.93  |        Q|V        |         |         |
  1+45       0.4435      5.55  |         |QV       |         |         |
  1+50       0.4870      6.32  |         | QV      |         |         |
  1+55       0.5301      6.26  |         | Q  V    |         |         |
  2+ 0       0.5722      6.12  |         | Q   V   |         |         |
  2+ 5       0.6153      6.25  |         | Q    V  |         |         |
  2+10       0.6632      6.96  |         |  Q    V |         |         |
  2+15       0.7238      8.80  |         |      Q  V         |         |
  2+20       0.7895      9.53  |         |        Q| V       |         |
  2+25       0.8572      9.83  |         |        Q|   V     |         |
  2+30       0.9528     13.88  |         |         |      Q  |         |
  2+35       1.0643     16.19  |         |         |         V Q       |
  2+40       1.1808     16.92  |         |         |         |  Q      |
```


2+45 1.2693 12.84
2+50 1.3197 7.31
2+55 1.3559 5.26
3+ 0 1.3828 3.90
3+ 5 1.3961 1.94
3+10 1.4031 1.01
3+15 1.4065 0.49
3+20 1.4078 0.20
3+25 1.4086 0.11
3+30 1.4089 0.05
3+35 1.4090 0.00

U n i t H y d r o g r a p h A n a l y s i s

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Study date 09/17/22 File: 2X6100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6545

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

XENIA
PRELIMINARY UNIT HYDROGRAPH ANALYSIS
AREA 2X PRESENT CONDITION
100-YEAR

Drainage Area = 10.08(Ac.) = 0.016 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 10.08(Ac.) = 0.016 Sq. Mi.
Length along longest watercourse = 1117.00(Ft.)
Length along longest watercourse measured to centroid = 544.00(Ft.)
Length along longest watercourse = 0.212 Mi.
Length along longest watercourse measured to centroid = 0.103 Mi.
Difference in elevation = 8.70(Ft.)
Slope along watercourse = 41.1244 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.083 Hr.
Lag time = 4.98 Min.
25% of lag time = 1.25 Min.
40% of lag time = 1.99 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
10.08	1.27	12.80

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
10.08	3.00	30.24

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 1.270(In)
Area Averaged 100-Year Rainfall = 3.000(In)

Point rain (area averaged) = 3.000(In)
Areal adjustment factor = 100.00 %

Adjusted average point rain = 3.000(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
10.080	72.20	0.131

Total Area Entered = 10.08(Ac.)

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
72.2	86.3	0.172	0.131	0.152	1.000	0.152
					Sum (F) =	0.152

Area averaged mean soil loss (F) (In/Hr) = 0.152
Minimum soil loss rate ((In/Hr)) = 0.076
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.795

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

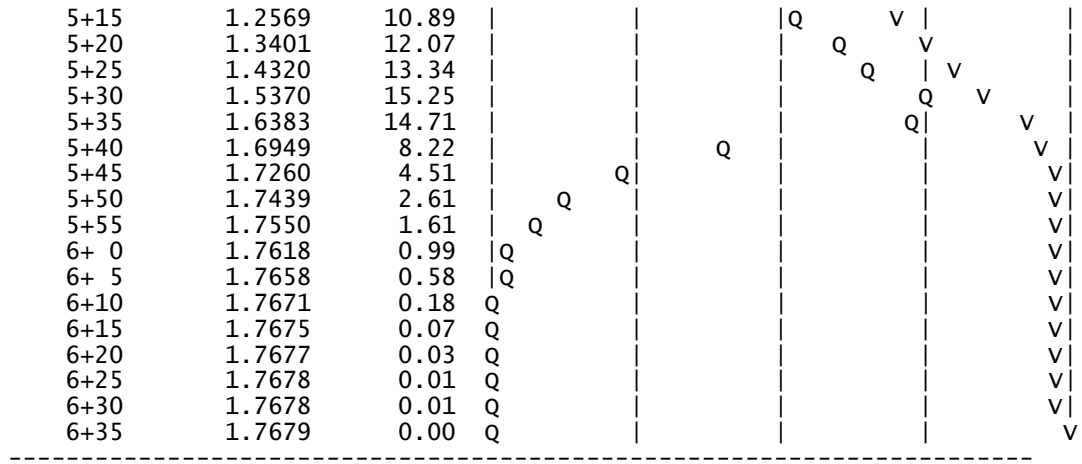
Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	100.364	19.312	1.962
2	0.167	200.729	48.430	4.920
3	0.250	301.093	15.580	1.583
4	0.333	401.457	7.043	0.716
5	0.417	501.821	3.960	0.402
6	0.500	602.186	2.564	0.260
7	0.583	702.550	1.588	0.161
8	0.667	802.914	1.522	0.155
		Sum = 100.000	Sum=	10.159

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max		Low	Effective (In/Hr)
1	0.08	0.50	0.180	(0.152)		0.143	0.037
2	0.17	0.60	0.216	0.152	(	0.172)	0.064
3	0.25	0.60	0.216	0.152	(	0.172)	0.064
4	0.33	0.60	0.216	0.152	(	0.172)	0.064
5	0.42	0.60	0.216	0.152	(	0.172)	0.064
6	0.50	0.70	0.252	0.152	(	0.200)	0.100
7	0.58	0.70	0.252	0.152	(	0.200)	0.100
8	0.67	0.70	0.252	0.152	(	0.200)	0.100
9	0.75	0.70	0.252	0.152	(	0.200)	0.100
10	0.83	0.70	0.252	0.152	(	0.200)	0.100
11	0.92	0.70	0.252	0.152	(	0.200)	0.100
12	1.00	0.80	0.288	0.152	(	0.229)	0.136
13	1.08	0.80	0.288	0.152	(	0.229)	0.136
14	1.17	0.80	0.288	0.152	(	0.229)	0.136
15	1.25	0.80	0.288	0.152	(	0.229)	0.136
16	1.33	0.80	0.288	0.152	(	0.229)	0.136
17	1.42	0.80	0.288	0.152	(	0.229)	0.136
18	1.50	0.80	0.288	0.152	(	0.229)	0.136
19	1.58	0.80	0.288	0.152	(	0.229)	0.136
20	1.67	0.80	0.288	0.152	(	0.229)	0.136
21	1.75	0.80	0.288	0.152	(	0.229)	0.136
22	1.83	0.80	0.288	0.152	(	0.229)	0.136
23	1.92	0.80	0.288	0.152	(	0.229)	0.136

```
24   2.00     0.90      0.324          0.152    (  0.258)        0.172
25   2.08     0.80      0.288          0.152    (  0.229)        0.136
26   2.17     0.90      0.324          0.152    (  0.258)        0.172
27   2.25     0.90      0.324          0.152    (  0.258)        0.172
28   2.33     0.90      0.324          0.152    (  0.258)        0.172
29   2.42     0.90      0.324          0.152    (  0.258)        0.172
30   2.50     0.90      0.324          0.152    (  0.258)        0.172
31   2.58     0.90      0.324          0.152    (  0.258)        0.172
32   2.67     0.90      0.324          0.152    (  0.258)        0.172
33   2.75     1.00      0.360          0.152    (  0.286)        0.208
34   2.83     1.00      0.360          0.152    (  0.286)        0.208
35   2.92     1.00      0.360          0.152    (  0.286)        0.208
36   3.00     1.00      0.360          0.152    (  0.286)        0.208
37   3.08     1.00      0.360          0.152    (  0.286)        0.208
38   3.17     1.10      0.396          0.152    (  0.315)        0.244
39   3.25     1.10      0.396          0.152    (  0.315)        0.244
40   3.33     1.10      0.396          0.152    (  0.315)        0.244
41   3.42     1.20      0.432          0.152    (  0.344)        0.280
42   3.50     1.30      0.468          0.152    (  0.372)        0.316
43   3.58     1.40      0.504          0.152    (  0.401)        0.352
44   3.67     1.40      0.504          0.152    (  0.401)        0.352
45   3.75     1.50      0.540          0.152    (  0.429)        0.388
46   3.83     1.50      0.540          0.152    (  0.429)        0.388
47   3.92     1.60      0.576          0.152    (  0.458)        0.424
48   4.00     1.60      0.576          0.152    (  0.458)        0.424
49   4.08     1.70      0.612          0.152    (  0.487)        0.460
50   4.17     1.80      0.648          0.152    (  0.515)        0.496
51   4.25     1.90      0.684          0.152    (  0.544)        0.532
52   4.33     2.00      0.720          0.152    (  0.573)        0.568
53   4.42     2.10      0.756          0.152    (  0.601)        0.604
54   4.50     2.10      0.756          0.152    (  0.601)        0.604
55   4.58     2.20      0.792          0.152    (  0.630)        0.640
56   4.67     2.30      0.828          0.152    (  0.658)        0.676
57   4.75     2.40      0.864          0.152    (  0.687)        0.712
58   4.83     2.40      0.864          0.152    (  0.687)        0.712
59   4.92     2.50      0.900          0.152    (  0.716)        0.748
60   5.00     2.60      0.936          0.152    (  0.744)        0.784
61   5.08     3.10      1.116          0.152    (  0.887)        0.964
62   5.17     3.60      1.296          0.152    (  1.031)        1.144
63   5.25     3.90      1.404          0.152    (  1.116)        1.252
64   5.33     4.20      1.512          0.152    (  1.202)        1.360
65   5.42     4.70      1.692          0.152    (  1.345)        1.540
66   5.50     5.60      2.016          0.152    (  1.603)        1.864
67   5.58     1.90      0.684          0.152    (  0.544)        0.532
68   5.67     0.90      0.324          0.152    (  0.258)        0.172
69   5.75     0.60      0.216          0.152    (  0.172)        0.064
70   5.83     0.50      0.180       (  0.152)       0.143        0.037
71   5.92     0.30      0.108       (  0.152)       0.086        0.022
72   6.00     0.20      0.072       (  0.152)       0.057        0.015
            (Loss Rate Not Used)
   Sum =     100.0                                    Sum =    25.3
     Flood volume = Effective rainfall      2.10(In)
      times area      10.1(Ac.)/[(In)/(Ft.)] =       1.8(Ac.Ft)
     Total soil loss =      0.90(In)
     Total soil loss =     0.752(Ac.Ft)
     Total rainfall =      3.00(In)
     Flood volume =       77008.1 Cubic Feet
     Total soil loss =       32759.2 Cubic Feet
     ---------------------------------------------------------------------
      Peak flow rate of this hydrograph =     15.246(CFS)
     ---------------------------------------------------------------------
     +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                         6 - H O U R    S T O R M
                    R u n o f f      H y d r o g r a p h
     ---------------------------------------------------------------------
                 Hydrograph in   5   Minute intervals ((CFS))
```

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	5.0	10.0	15.0	20.0
0+ 5	0.0005	0.07	Q				
0+10	0.0026	0.31	Q				
0+15	0.0061	0.50	VQ				
0+20	0.0100	0.57	VQ				
0+25	0.0142	0.61	VQ				
0+30	0.0190	0.70	VQ				
0+35	0.0251	0.89	VQ				
0+40	0.0317	0.95	VQ				
0+45	0.0384	0.98	VQ				
0+50	0.0453	1.00	|Q				
0+55	0.0523	1.01	|VQ				
1+ 0	0.0597	1.08	|VQ				
1+ 5	0.0685	1.27	|VQ				
1+10	0.0776	1.32	|VQ				
1+15	0.0869	1.35	|VQ				
1+20	0.0963	1.36	| Q				
1+25	0.1057	1.37	| Q				
1+30	0.1152	1.38	| Q				
1+35	0.1248	1.39	| Q				
1+40	0.1343	1.39	| QV				
1+45	0.1439	1.39	| QV				
1+50	0.1534	1.39	| QV				
1+55	0.1629	1.39	| QV				
2+ 0	0.1730	1.46	| QV				
2+ 5	0.1837	1.56	| QV				
2+10	0.1942	1.51	| QV				
2+15	0.2056	1.66	| QV				
2+20	0.2173	1.70	| QV				
2+25	0.2292	1.73	| Q V				
2+30	0.2412	1.74	| Q V				
2+35	0.2532	1.75	| Q V				
2+40	0.2652	1.75	| Q V				
2+45	0.2778	1.82	| Q V				
2+50	0.2915	2.00	| Q V				
2+55	0.3057	2.06	| Q V				
3+ 0	0.3200	2.08	| Q V				
3+ 5	0.3345	2.10	| Q V				
3+10	0.3495	2.18	| Q V				
3+15	0.3657	2.36	| Q V				
3+20	0.3824	2.42	| Q V				
3+25	0.3997	2.52	| Q V				
3+30	0.4189	2.78	| Q V				
3+35	0.4402	3.10	| Q V				
3+40	0.4634	3.36	| Q V				
3+45	0.4877	3.53	| Q |V				
3+50	0.5136	3.76	| Q |V				
3+55	0.5406	3.92	| Q | V				
4+ 0	0.5691	4.14	| Q | V				
4+ 5	0.5987	4.30	| Q | V				
4+10	0.6303	4.58	| Q| V				
4+15	0.6641	4.91	| Q| V				
4+20	0.7003	5.26	| Q V				
4+25	0.7389	5.61	| |Q V				
4+30	0.7795	5.90	| |Q V				
4+35	0.8214	6.08	| | Q V |			
4+40	0.8654	6.39	| | Q V|			
4+45	0.9117	6.73	| | Q V				
4+50	0.9600	7.01	| | Q |V				
4+55	1.0095	7.19	| | Q | V				
5+ 0	1.0610	7.49	| | Q | V				
5+ 5	1.1169	8.11	| | Q | V				
5+10	1.1820	9.45	| | Q | V				


5+15 1.2569 10.89
5+20 1.3401 12.07
5+25 1.4320 13.34
5+30 1.5370 15.25
5+35 1.6383 14.71
5+40 1.6949 8.22
5+45 1.7260 4.51
5+50 1.7439 2.61
5+55 1.7550 1.61
6+ 0 1.7618 0.99
6+ 5 1.7658 0.58
6+10 1.7671 0.18
6+15 1.7675 0.07
6+20 1.7677 0.03
6+25 1.7678 0.01
6+30 1.7678 0.01
6+35 1.7679 0.00

U n i t H y d r o g r a p h A n a l y s i s

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Study date 09/17/22 File: 2X24100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6545

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

XENIA
PRELIMINARY UNIT HYDROGRAPH ANALYSIS
AREA 2X PRESENT CONDITION
100-YEAR

Drainage Area = 10.08(Ac.) = 0.016 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 10.08(Ac.) = 0.016 Sq. Mi.
Length along longest watercourse = 1117.00(Ft.)
Length along longest watercourse measured to centroid = 544.00(Ft.)
Length along longest watercourse = 0.212 Mi.
Length along longest watercourse measured to centroid = 0.103 Mi.
Difference in elevation = 8.70(Ft.)
Slope along watercourse = 41.1244 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.083 Hr.
Lag time = 4.98 Min.
25% of lag time = 1.25 Min.
40% of lag time = 1.99 Min.
Unit time = 5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
10.08	2.53	25.50

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
10.08	6.50	65.52

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 2.530(In)
Area Averaged 100-Year Rainfall = 6.500(In)

Point rain (area averaged) = 6.500(In)
Areal adjustment factor = 100.00 %

Adjusted average point rain = 6.500(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
10.080	72.20	0.131

Total Area Entered = 10.08(Ac.)

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
72.2	86.3	0.172	0.131	0.152	1.000	0.152
					Sum (F) =	0.152

Area averaged mean soil loss (F) (In/Hr) = 0.152
Minimum soil loss rate ((In/Hr)) = 0.076
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.795

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	100.364	19.312	1.962
2	0.167	200.729	48.430	4.920
3	0.250	301.093	15.580	1.583
4	0.333	401.457	7.043	0.716
5	0.417	501.821	3.960	0.402
6	0.500	602.186	2.564	0.260
7	0.583	702.550	1.588	0.161
8	0.667	802.914	1.522	0.155
		Sum = 100.000	Sum=	10.159

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.07	0.052	(0.269)	0.041	0.011
2	0.17	0.07	0.052	(0.268)	0.041	0.011
3	0.25	0.07	0.052	(0.267)	0.041	0.011
4	0.33	0.10	0.078	(0.266)	0.062	0.016
5	0.42	0.10	0.078	(0.265)	0.062	0.016
6	0.50	0.10	0.078	(0.264)	0.062	0.016
7	0.58	0.10	0.078	(0.263)	0.062	0.016
8	0.67	0.10	0.078	(0.262)	0.062	0.016
9	0.75	0.10	0.078	(0.261)	0.062	0.016
10	0.83	0.13	0.104	(0.260)	0.083	0.021
11	0.92	0.13	0.104	(0.259)	0.083	0.021
12	1.00	0.13	0.104	(0.258)	0.083	0.021
13	1.08	0.10	0.078	(0.257)	0.062	0.016
14	1.17	0.10	0.078	(0.256)	0.062	0.016
15	1.25	0.10	0.078	(0.255)	0.062	0.016
16	1.33	0.10	0.078	(0.253)	0.062	0.016
17	1.42	0.10	0.078	(0.252)	0.062	0.016
18	1.50	0.10	0.078	(0.251)	0.062	0.016
19	1.58	0.10	0.078	(0.250)	0.062	0.016
20	1.67	0.10	0.078	(0.249)	0.062	0.016
21	1.75	0.10	0.078	(0.248)	0.062	0.016
22	1.83	0.13	0.104	(0.247)	0.083	0.021
23	1.92	0.13	0.104	(0.246)	0.083	0.021

24	2.00	0.13	0.104	(	0.245)	0.083		0.021
25	2.08	0.13	0.104	(	0.244)	0.083		0.021
26	2.17	0.13	0.104	(	0.243)	0.083		0.021
27	2.25	0.13	0.104	(	0.243)	0.083		0.021
28	2.33	0.13	0.104	(	0.242)	0.083		0.021
29	2.42	0.13	0.104	(	0.241)	0.083		0.021
30	2.50	0.13	0.104	(	0.240)	0.083		0.021
31	2.58	0.17	0.130	(	0.239)	0.103		0.027
32	2.67	0.17	0.130	(	0.238)	0.103		0.027
33	2.75	0.17	0.130	(	0.237)	0.103		0.027
34	2.83	0.17	0.130	(	0.236)	0.103		0.027
35	2.92	0.17	0.130	(	0.235)	0.103		0.027
36	3.00	0.17	0.130	(	0.234)	0.103		0.027
37	3.08	0.17	0.130	(	0.233)	0.103		0.027
38	3.17	0.17	0.130	(	0.232)	0.103		0.027
39	3.25	0.17	0.130	(	0.231)	0.103		0.027
40	3.33	0.17	0.130	(	0.230)	0.103		0.027
41	3.42	0.17	0.130	(	0.229)	0.103		0.027
42	3.50	0.17	0.130	(	0.228)	0.103		0.027
43	3.58	0.17	0.130	(	0.227)	0.103		0.027
44	3.67	0.17	0.130	(	0.226)	0.103		0.027
45	3.75	0.17	0.130	(	0.225)	0.103		0.027
46	3.83	0.20	0.156	(	0.224)	0.124		0.032
47	3.92	0.20	0.156	(	0.223)	0.124		0.032
48	4.00	0.20	0.156	(	0.222)	0.124		0.032
49	4.08	0.20	0.156	(	0.221)	0.124		0.032
50	4.17	0.20	0.156	(	0.220)	0.124		0.032
51	4.25	0.20	0.156	(	0.219)	0.124		0.032
52	4.33	0.23	0.182	(	0.218)	0.145		0.037
53	4.42	0.23	0.182	(	0.218)	0.145		0.037
54	4.50	0.23	0.182	(	0.217)	0.145		0.037
55	4.58	0.23	0.182	(	0.216)	0.145		0.037
56	4.67	0.23	0.182	(	0.215)	0.145		0.037
57	4.75	0.23	0.182	(	0.214)	0.145		0.037
58	4.83	0.27	0.208	(	0.213)	0.165		0.043
59	4.92	0.27	0.208	(	0.212)	0.165		0.043
60	5.00	0.27	0.208	(	0.211)	0.165		0.043
61	5.08	0.20	0.156	(	0.210)	0.124		0.032
62	5.17	0.20	0.156	(	0.209)	0.124		0.032
63	5.25	0.20	0.156	(	0.208)	0.124		0.032
64	5.33	0.23	0.182	(	0.207)	0.145		0.037
65	5.42	0.23	0.182	(	0.207)	0.145		0.037
66	5.50	0.23	0.182	(	0.206)	0.145		0.037
67	5.58	0.27	0.208	(	0.205)	0.165		0.043
68	5.67	0.27	0.208	(	0.204)	0.165		0.043
69	5.75	0.27	0.208	(	0.203)	0.165		0.043
70	5.83	0.27	0.208	(	0.202)	0.165		0.043
71	5.92	0.27	0.208	(	0.201)	0.165		0.043
72	6.00	0.27	0.208	(	0.200)	0.165		0.043
73	6.08	0.30	0.234	(	0.199)	0.186		0.048
74	6.17	0.30	0.234	(	0.198)	0.186		0.048
75	6.25	0.30	0.234	(	0.198)	0.186		0.048
76	6.33	0.30	0.234	(	0.197)	0.186		0.048
77	6.42	0.30	0.234	(	0.196)	0.186		0.048
78	6.50	0.30	0.234	(	0.195)	0.186		0.048
79	6.58	0.33	0.260		0.194	(0.207)		0.066
80	6.67	0.33	0.260		0.193	(0.207)		0.067
81	6.75	0.33	0.260		0.192	(0.207)		0.068
82	6.83	0.33	0.260		0.191	(0.207)		0.069
83	6.92	0.33	0.260		0.191	(0.207)		0.069
84	7.00	0.33	0.260		0.190	(0.207)		0.070
85	7.08	0.33	0.260		0.189	(0.207)		0.071
86	7.17	0.33	0.260		0.188	(0.207)		0.072
87	7.25	0.33	0.260		0.187	(0.207)		0.073
88	7.33	0.37	0.286		0.186	(0.227)		0.100
89	7.42	0.37	0.286		0.185	(0.227)		0.101

90	7.50	0.37	0.286	0.185	(0.227)	0.101
91	7.58	0.40	0.312	0.184	(0.248)	0.128
92	7.67	0.40	0.312	0.183	(0.248)	0.129
93	7.75	0.40	0.312	0.182	(0.248)	0.130
94	7.83	0.43	0.338	0.181	(0.269)	0.157
95	7.92	0.43	0.338	0.180	(0.269)	0.158
96	8.00	0.43	0.338	0.180	(0.269)	0.158
97	8.08	0.50	0.390	0.179	(0.310)	0.211
98	8.17	0.50	0.390	0.178	(0.310)	0.212
99	8.25	0.50	0.390	0.177	(0.310)	0.213
100	8.33	0.50	0.390	0.176	(0.310)	0.214
101	8.42	0.50	0.390	0.175	(0.310)	0.215
102	8.50	0.50	0.390	0.175	(0.310)	0.215
103	8.58	0.53	0.416	0.174	(0.331)	0.242
104	8.67	0.53	0.416	0.173	(0.331)	0.243
105	8.75	0.53	0.416	0.172	(0.331)	0.244
106	8.83	0.57	0.442	0.171	(0.351)	0.271
107	8.92	0.57	0.442	0.170	(0.351)	0.272
108	9.00	0.57	0.442	0.170	(0.351)	0.272
109	9.08	0.63	0.494	0.169	(0.393)	0.325
110	9.17	0.63	0.494	0.168	(0.393)	0.326
111	9.25	0.63	0.494	0.167	(0.393)	0.327
112	9.33	0.67	0.520	0.166	(0.413)	0.354
113	9.42	0.67	0.520	0.166	(0.413)	0.354
114	9.50	0.67	0.520	0.165	(0.413)	0.355
115	9.58	0.70	0.546	0.164	(0.434)	0.382
116	9.67	0.70	0.546	0.163	(0.434)	0.383
117	9.75	0.70	0.546	0.163	(0.434)	0.383
118	9.83	0.73	0.572	0.162	(0.455)	0.410
119	9.92	0.73	0.572	0.161	(0.455)	0.411
120	10.00	0.73	0.572	0.160	(0.455)	0.412
121	10.08	0.50	0.390	0.159	(0.310)	0.231
122	10.17	0.50	0.390	0.159	(0.310)	0.231
123	10.25	0.50	0.390	0.158	(0.310)	0.232
124	10.33	0.50	0.390	0.157	(0.310)	0.233
125	10.42	0.50	0.390	0.156	(0.310)	0.234
126	10.50	0.50	0.390	0.156	(0.310)	0.234
127	10.58	0.67	0.520	0.155	(0.413)	0.365
128	10.67	0.67	0.520	0.154	(0.413)	0.366
129	10.75	0.67	0.520	0.153	(0.413)	0.367
130	10.83	0.67	0.520	0.153	(0.413)	0.367
131	10.92	0.67	0.520	0.152	(0.413)	0.368
132	11.00	0.67	0.520	0.151	(0.413)	0.369
133	11.08	0.63	0.494	0.150	(0.393)	0.344
134	11.17	0.63	0.494	0.150	(0.393)	0.344
135	11.25	0.63	0.494	0.149	(0.393)	0.345
136	11.33	0.63	0.494	0.148	(0.393)	0.346
137	11.42	0.63	0.494	0.147	(0.393)	0.347
138	11.50	0.63	0.494	0.147	(0.393)	0.347
139	11.58	0.57	0.442	0.146	(0.351)	0.296
140	11.67	0.57	0.442	0.145	(0.351)	0.297
141	11.75	0.57	0.442	0.144	(0.351)	0.298
142	11.83	0.60	0.468	0.144	(0.372)	0.324
143	11.92	0.60	0.468	0.143	(0.372)	0.325
144	12.00	0.60	0.468	0.142	(0.372)	0.326
145	12.08	0.83	0.650	0.142	(0.517)	0.508
146	12.17	0.83	0.650	0.141	(0.517)	0.509
147	12.25	0.83	0.650	0.140	(0.517)	0.510
148	12.33	0.87	0.676	0.139	(0.538)	0.537
149	12.42	0.87	0.676	0.139	(0.538)	0.537
150	12.50	0.87	0.676	0.138	(0.538)	0.538
151	12.58	0.93	0.728	0.137	(0.579)	0.591
152	12.67	0.93	0.728	0.137	(0.579)	0.591
153	12.75	0.93	0.728	0.136	(0.579)	0.592
154	12.83	0.97	0.754	0.135	(0.600)	0.619
155	12.92	0.97	0.754	0.135	(0.600)	0.619

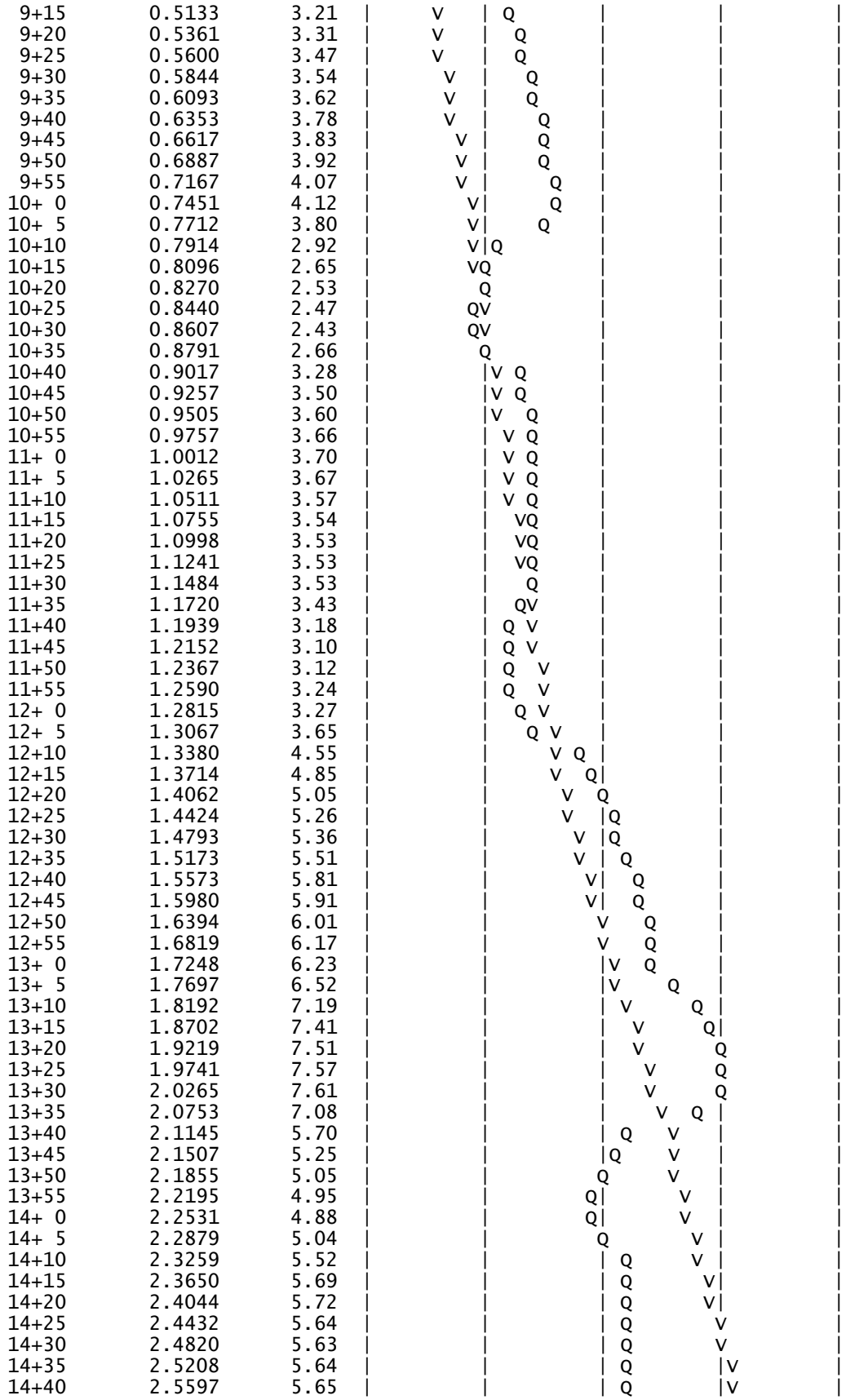
156	13.00	0.97	0.754	0.134	(0.600)	0.620
157	13.08	1.13	0.884	0.133	(0.703)	0.751
158	13.17	1.13	0.884	0.133	(0.703)	0.751
159	13.25	1.13	0.884	0.132	(0.703)	0.752
160	13.33	1.13	0.884	0.131	(0.703)	0.753
161	13.42	1.13	0.884	0.131	(0.703)	0.753
162	13.50	1.13	0.884	0.130	(0.703)	0.754
163	13.58	0.77	0.598	0.129	(0.476)	0.469
164	13.67	0.77	0.598	0.129	(0.476)	0.469
165	13.75	0.77	0.598	0.128	(0.476)	0.470
166	13.83	0.77	0.598	0.127	(0.476)	0.471
167	13.92	0.77	0.598	0.127	(0.476)	0.471
168	14.00	0.77	0.598	0.126	(0.476)	0.472
169	14.08	0.90	0.702	0.125	(0.558)	0.577
170	14.17	0.90	0.702	0.125	(0.558)	0.577
171	14.25	0.90	0.702	0.124	(0.558)	0.578
172	14.33	0.87	0.676	0.123	(0.538)	0.553
173	14.42	0.87	0.676	0.123	(0.538)	0.553
174	14.50	0.87	0.676	0.122	(0.538)	0.554
175	14.58	0.87	0.676	0.122	(0.538)	0.554
176	14.67	0.87	0.676	0.121	(0.538)	0.555
177	14.75	0.87	0.676	0.120	(0.538)	0.556
178	14.83	0.83	0.650	0.120	(0.517)	0.530
179	14.92	0.83	0.650	0.119	(0.517)	0.531
180	15.00	0.83	0.650	0.118	(0.517)	0.532
181	15.08	0.80	0.624	0.118	(0.496)	0.506
182	15.17	0.80	0.624	0.117	(0.496)	0.507
183	15.25	0.80	0.624	0.117	(0.496)	0.507
184	15.33	0.77	0.598	0.116	(0.476)	0.482
185	15.42	0.77	0.598	0.115	(0.476)	0.483
186	15.50	0.77	0.598	0.115	(0.476)	0.483
187	15.58	0.63	0.494	0.114	(0.393)	0.380
188	15.67	0.63	0.494	0.114	(0.393)	0.380
189	15.75	0.63	0.494	0.113	(0.393)	0.381
190	15.83	0.63	0.494	0.113	(0.393)	0.381
191	15.92	0.63	0.494	0.112	(0.393)	0.382
192	16.00	0.63	0.494	0.111	(0.393)	0.383
193	16.08	0.13	0.104	(0.111)	0.083	0.021
194	16.17	0.13	0.104	(0.110)	0.083	0.021
195	16.25	0.13	0.104	(0.110)	0.083	0.021
196	16.33	0.13	0.104	(0.109)	0.083	0.021
197	16.42	0.13	0.104	(0.109)	0.083	0.021
198	16.50	0.13	0.104	(0.108)	0.083	0.021
199	16.58	0.10	0.078	(0.107)	0.062	0.016
200	16.67	0.10	0.078	(0.107)	0.062	0.016
201	16.75	0.10	0.078	(0.106)	0.062	0.016
202	16.83	0.10	0.078	(0.106)	0.062	0.016
203	16.92	0.10	0.078	(0.105)	0.062	0.016
204	17.00	0.10	0.078	(0.105)	0.062	0.016
205	17.08	0.17	0.130	(0.104)	0.103	0.027
206	17.17	0.17	0.130	(0.104)	0.103	0.027
207	17.25	0.17	0.130	0.103	(0.103)	0.027
208	17.33	0.17	0.130	0.103	(0.103)	0.027
209	17.42	0.17	0.130	0.102	(0.103)	0.028
210	17.50	0.17	0.130	0.102	(0.103)	0.028
211	17.58	0.17	0.130	0.101	(0.103)	0.029
212	17.67	0.17	0.130	0.101	(0.103)	0.029
213	17.75	0.17	0.130	0.100	(0.103)	0.030
214	17.83	0.13	0.104	(0.100)	0.083	0.021
215	17.92	0.13	0.104	(0.099)	0.083	0.021
216	18.00	0.13	0.104	(0.099)	0.083	0.021
217	18.08	0.13	0.104	(0.098)	0.083	0.021
218	18.17	0.13	0.104	(0.098)	0.083	0.021
219	18.25	0.13	0.104	(0.097)	0.083	0.021
220	18.33	0.13	0.104	(0.097)	0.083	0.021
221	18.42	0.13	0.104	(0.096)	0.083	0.021

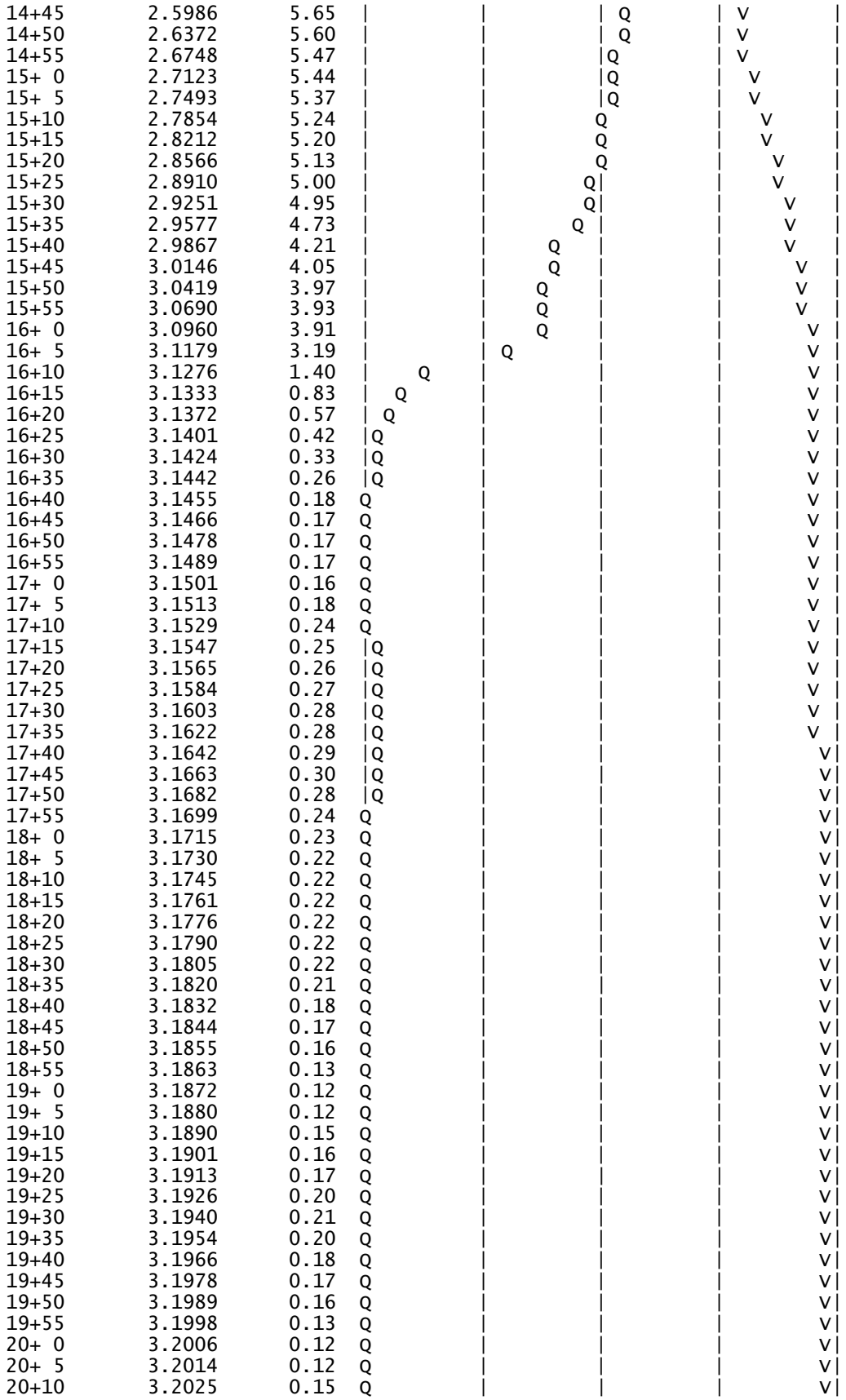
222	18.50	0.13	0.104	(0.096)	0.083	0.021
223	18.58	0.10	0.078	(0.095)	0.062	0.016
224	18.67	0.10	0.078	(0.095)	0.062	0.016
225	18.75	0.10	0.078	(0.094)	0.062	0.016
226	18.83	0.07	0.052	(0.094)	0.041	0.011
227	18.92	0.07	0.052	(0.094)	0.041	0.011
228	19.00	0.07	0.052	(0.093)	0.041	0.011
229	19.08	0.10	0.078	(0.093)	0.062	0.016
230	19.17	0.10	0.078	(0.092)	0.062	0.016
231	19.25	0.10	0.078	(0.092)	0.062	0.016
232	19.33	0.13	0.104	(0.091)	0.083	0.021
233	19.42	0.13	0.104	(0.091)	0.083	0.021
234	19.50	0.13	0.104	(0.091)	0.083	0.021
235	19.58	0.10	0.078	(0.090)	0.062	0.016
236	19.67	0.10	0.078	(0.090)	0.062	0.016
237	19.75	0.10	0.078	(0.089)	0.062	0.016
238	19.83	0.07	0.052	(0.089)	0.041	0.011
239	19.92	0.07	0.052	(0.088)	0.041	0.011
240	20.00	0.07	0.052	(0.088)	0.041	0.011
241	20.08	0.10	0.078	(0.088)	0.062	0.016
242	20.17	0.10	0.078	(0.087)	0.062	0.016
243	20.25	0.10	0.078	(0.087)	0.062	0.016
244	20.33	0.10	0.078	(0.087)	0.062	0.016
245	20.42	0.10	0.078	(0.086)	0.062	0.016
246	20.50	0.10	0.078	(0.086)	0.062	0.016
247	20.58	0.10	0.078	(0.085)	0.062	0.016
248	20.67	0.10	0.078	(0.085)	0.062	0.016
249	20.75	0.10	0.078	(0.085)	0.062	0.016
250	20.83	0.07	0.052	(0.084)	0.041	0.011
251	20.92	0.07	0.052	(0.084)	0.041	0.011
252	21.00	0.07	0.052	(0.084)	0.041	0.011
253	21.08	0.10	0.078	(0.083)	0.062	0.016
254	21.17	0.10	0.078	(0.083)	0.062	0.016
255	21.25	0.10	0.078	(0.083)	0.062	0.016
256	21.33	0.07	0.052	(0.082)	0.041	0.011
257	21.42	0.07	0.052	(0.082)	0.041	0.011
258	21.50	0.07	0.052	(0.082)	0.041	0.011
259	21.58	0.10	0.078	(0.082)	0.062	0.016
260	21.67	0.10	0.078	(0.081)	0.062	0.016
261	21.75	0.10	0.078	(0.081)	0.062	0.016
262	21.83	0.07	0.052	(0.081)	0.041	0.011
263	21.92	0.07	0.052	(0.080)	0.041	0.011
264	22.00	0.07	0.052	(0.080)	0.041	0.011
265	22.08	0.10	0.078	(0.080)	0.062	0.016
266	22.17	0.10	0.078	(0.080)	0.062	0.016
267	22.25	0.10	0.078	(0.079)	0.062	0.016
268	22.33	0.07	0.052	(0.079)	0.041	0.011
269	22.42	0.07	0.052	(0.079)	0.041	0.011
270	22.50	0.07	0.052	(0.079)	0.041	0.011
271	22.58	0.07	0.052	(0.078)	0.041	0.011
272	22.67	0.07	0.052	(0.078)	0.041	0.011
273	22.75	0.07	0.052	(0.078)	0.041	0.011
274	22.83	0.07	0.052	(0.078)	0.041	0.011
275	22.92	0.07	0.052	(0.078)	0.041	0.011
276	23.00	0.07	0.052	(0.077)	0.041	0.011
277	23.08	0.07	0.052	(0.077)	0.041	0.011
278	23.17	0.07	0.052	(0.077)	0.041	0.011
279	23.25	0.07	0.052	(0.077)	0.041	0.011
280	23.33	0.07	0.052	(0.077)	0.041	0.011
281	23.42	0.07	0.052	(0.077)	0.041	0.011
282	23.50	0.07	0.052	(0.076)	0.041	0.011
283	23.58	0.07	0.052	(0.076)	0.041	0.011
284	23.67	0.07	0.052	(0.076)	0.041	0.011
285	23.75	0.07	0.052	(0.076)	0.041	0.011
286	23.83	0.07	0.052	(0.076)	0.041	0.011
287	23.92	0.07	0.052	(0.076)	0.041	0.011

```
288  24.00     0.07      0.052       (  0.076)       0.041        0.011
           (Loss Rate Not Used)
    Sum =     100.0                                    Sum =    46.3
      Flood volume = Effective rainfall      3.86(In)
       times area      10.1(Ac.)/[(In)/(Ft.)] =       3.2(Ac.Ft)
      Total soil loss =      2.64(In)
      Total soil loss =     2.216(Ac.Ft)
      Total rainfall =      6.50(In)
      Flood volume =      141320.2 Cubic Feet
      Total soil loss =       96512.7 Cubic Feet
      ---------------------------------------------------------------------
       Peak flow rate of this hydrograph =      7.613(CFS)
      ---------------------------------------------------------------------
      +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          24 - H O U R    S T O R M
                     R u n o f f      H y d r o g r a p h
      ---------------------------------------------------------------------
                  Hydrograph in   5   Minute intervals ((CFS))

      ---------------------------------------------------------------------
 Time(h+m) Volume Ac.Ft   Q(CFS)  0        2.5       5.0       7.5      10.0
 ----------------------------------------------------------------------------
   0+ 5       0.0001      0.02  Q          |         |         |         |
   0+10       0.0006      0.07  Q          |         |         |         |
   0+15       0.0013      0.09  Q          |         |         |         |
   0+20       0.0020      0.11  Q          |         |         |         |
   0+25       0.0030      0.14  Q          |         |         |         |
   0+30       0.0040      0.15  Q          |         |         |         |
   0+35       0.0051      0.16  Q          |         |         |         |
   0+40       0.0062      0.16  Q          |         |         |         |
   0+45       0.0073      0.16  Q          |         |         |         |
   0+50       0.0085      0.17  Q          |         |         |         |
   0+55       0.0098      0.20  Q          |         |         |         |
   1+ 0       0.0113      0.21  Q          |         |         |         |
   1+ 5       0.0126      0.20  Q          |         |         |         |
   1+10       0.0139      0.18  Q          |         |         |         |
   1+15       0.0150      0.17  Q          |         |         |         |
   1+20       0.0162      0.17  Q          |         |         |         |
   1+25       0.0173      0.17  Q          |         |         |         |
   1+30       0.0184      0.16  Q          |         |         |         |
   1+35       0.0196      0.16  Q          |         |         |         |
   1+40       0.0207      0.16  Q          |         |         |         |
   1+45       0.0218      0.16  Q          |         |         |         |
   1+50       0.0230      0.17  Q          |         |         |         |
   1+55       0.0244      0.20  Q          |         |         |         |
   2+ 0       0.0258      0.21  Q          |         |         |         |
   2+ 5       0.0273      0.21  Q          |         |         |         |
   2+10       0.0287      0.21  Q          |         |         |         |
   2+15       0.0302      0.21  Q          |         |         |         |
   2+20       0.0317      0.22  Q          |         |         |         |
   2+25       0.0332      0.22  Q          |         |         |         |
   2+30       0.0347      0.22  Q          |         |         |         |
   2+35       0.0362      0.23  Q          |         |         |         |
   2+40       0.0380      0.25  VQ         |         |         |         |
   2+45       0.0398      0.26  VQ         |         |         |         |
   2+50       0.0416      0.27  VQ         |         |         |         |
   2+55       0.0434      0.27  VQ         |         |         |         |
   3+ 0       0.0453      0.27  VQ         |         |         |         |
   3+ 5       0.0472      0.27  VQ         |         |         |         |
   3+10       0.0490      0.27  VQ         |         |         |         |
   3+15       0.0509      0.27  VQ         |         |         |         |
   3+20       0.0527      0.27  VQ         |         |         |         |
   3+25       0.0546      0.27  VQ         |         |         |         |
   3+30       0.0565      0.27  VQ         |         |         |         |
   3+35       0.0583      0.27  VQ         |         |         |         |
   3+40       0.0602      0.27  VQ         |         |         |         |
```

```
3+45       0.0621      0.27  VQ        |         |         |         |
3+50       0.0640      0.28  VQ        |         |         |         |
3+55       0.0661      0.31  VQ        |         |         |         |
4+ 0       0.0683      0.32  VQ        |         |         |         |
4+ 5       0.0705      0.32  VQ        |         |         |         |
4+10       0.0727      0.32  VQ        |         |         |         |
4+15       0.0749      0.32  VQ        |         |         |         |
4+20       0.0772      0.33  VQ        |         |         |         |
4+25       0.0797      0.36  VQ        |         |         |         |
4+30       0.0823      0.37  |Q        |         |         |         |
4+35       0.0848      0.37  |Q        |         |         |         |
4+40       0.0874      0.38  |Q        |         |         |         |
4+45       0.0900      0.38  |Q        |         |         |         |
4+50       0.0927      0.39  |Q        |         |         |         |
4+55       0.0956      0.42  |Q        |         |         |         |
5+ 0       0.0985      0.42  |Q        |         |         |         |
5+ 5       0.1013      0.41  |Q        |         |         |         |
5+10       0.1037      0.36  |Q        |         |         |         |
5+15       0.1061      0.34  |Q        |         |         |         |
5+20       0.1085      0.34  |Q        |         |         |         |
5+25       0.1110      0.37  |Q        |         |         |         |
5+30       0.1136      0.37  |Q        |         |         |         |
5+35       0.1162      0.39  |Q        |         |         |         |
5+40       0.1191      0.41  |Q        |         |         |         |
5+45       0.1220      0.42  |Q        |         |         |         |
5+50       0.1249      0.43  |Q        |         |         |         |
5+55       0.1279      0.43  |Q        |         |         |         |
6+ 0       0.1308      0.43  |Q        |         |         |         |
6+ 5       0.1339      0.44  |Q        |         |         |         |
6+10       0.1371      0.47  |Q        |         |         |         |
6+15       0.1404      0.48  |Q        |         |         |         |
6+20       0.1437      0.48  |Q        |         |         |         |
6+25       0.1471      0.48  |Q        |         |         |         |
6+30       0.1504      0.49  |Q        |         |         |         |
6+35       0.1540      0.52  |VQ       |         |         |         |
6+40       0.1582      0.61  |VQ       |         |         |         |
6+45       0.1627      0.65  | Q       |         |         |         |
6+50       0.1673      0.67  | Q       |         |         |         |
6+55       0.1720      0.68  | Q       |         |         |         |
7+ 0       0.1768      0.70  | Q       |         |         |         |
7+ 5       0.1817      0.71  | Q       |         |         |         |
7+10       0.1866      0.72  | Q       |         |         |         |
7+15       0.1916      0.73  | Q       |         |         |         |
7+20       0.1970      0.79  | VQ      |         |         |         |
7+25       0.2034      0.92  | VQ      |         |         |         |
7+30       0.2101      0.97  | VQ      |         |         |         |
7+35       0.2174      1.05  | V Q     |         |         |         |
7+40       0.2256      1.20  | V Q     |         |         |         |
7+45       0.2343      1.26  | V  Q    |         |         |         |
7+50       0.2435      1.34  |  V Q    |         |         |         |
7+55       0.2538      1.49  |  V Q    |         |         |         |
8+ 0       0.2644      1.55  |  V  Q   |         |         |         |
8+ 5       0.2760      1.68  |  V  Q   |         |         |         |
8+10       0.2894      1.96  |  V   Q  |         |         |         |
8+15       0.3036      2.06  |  V    Q |         |         |         |
8+20       0.3181      2.11  |  V    Q |         |         |         |
8+25       0.3328      2.14  |   V   Q |         |         |         |
8+30       0.3477      2.16  |   V   Q |         |         |         |
8+35       0.3631      2.23  |   V   Q |         |         |         |
8+40       0.3794      2.37  |   V    Q|         |         |         |
8+45       0.3961      2.42  |   V    Q|         |         |         |
8+50       0.4133      2.50  |    V    Q         |         |         |
8+55       0.4315      2.65  |    V    Q         |         |         |
9+ 0       0.4502      2.70  |    V    Q         |         |         |
9+ 5       0.4697      2.84  |    V    |Q        |         |         |
9+10       0.4912      3.12  |     V   | Q       |         |         |
```





```
  20+15       3.2035      0.16  Q          |          |          |         v|
  20+20       3.2046      0.16  Q          |          |          |         v|
  20+25       3.2057      0.16  Q          |          |          |         v|
  20+30       3.2068      0.16  Q          |          |          |         v|
  20+35       3.2079      0.16  Q          |          |          |         v|
  20+40       3.2090      0.16  Q          |          |          |         v|
  20+45       3.2102      0.16  Q          |          |          |         v|
  20+50       3.2112      0.15  Q          |          |          |         v|
  20+55       3.2121      0.13  Q          |          |          |         v|
  21+ 0       3.2129      0.12  Q          |          |          |         v|
  21+ 5       3.2137      0.12  Q          |          |          |         v|
  21+10       3.2148      0.15  Q          |          |          |         v|
  21+15       3.2158      0.16  Q          |          |          |         v|
  21+20       3.2168      0.15  Q          |          |          |         v|
  21+25       3.2177      0.12  Q          |          |          |         v|
  21+30       3.2185      0.12  Q          |          |          |         v|
  21+35       3.2193      0.12  Q          |          |          |         v|
  21+40       3.2203      0.15  Q          |          |          |         v|
  21+45       3.2214      0.16  Q          |          |          |         v|
  21+50       3.2224      0.15  Q          |          |          |         v|
  21+55       3.2233      0.12  Q          |          |          |         v|
  22+ 0       3.2241      0.12  Q          |          |          |         v|
  22+ 5       3.2249      0.12  Q          |          |          |         v|
  22+10       3.2259      0.15  Q          |          |          |         v|
  22+15       3.2270      0.16  Q          |          |          |         v|
  22+20       3.2280      0.15  Q          |          |          |         v|
  22+25       3.2289      0.12  Q          |          |          |         v|
  22+30       3.2297      0.12  Q          |          |          |         v|
  22+35       3.2304      0.11  Q          |          |          |         v|
  22+40       3.2312      0.11  Q          |          |          |         v|
  22+45       3.2320      0.11  Q          |          |          |         v|
  22+50       3.2327      0.11  Q          |          |          |         v|
  22+55       3.2335      0.11  Q          |          |          |         v|
  23+ 0       3.2342      0.11  Q          |          |          |         v|
  23+ 5       3.2349      0.11  Q          |          |          |         v|
  23+10       3.2357      0.11  Q          |          |          |         v|
  23+15       3.2364      0.11  Q          |          |          |         v|
  23+20       3.2372      0.11  Q          |          |          |         v|
  23+25       3.2379      0.11  Q          |          |          |         v|
  23+30       3.2387      0.11  Q          |          |          |         v|
  23+35       3.2394      0.11  Q          |          |          |         v|
  23+40       3.2402      0.11  Q          |          |          |         v|
  23+45       3.2409      0.11  Q          |          |          |         v|
  23+50       3.2417      0.11  Q          |          |          |         v|
  23+55       3.2424      0.11  Q          |          |          |         v|
  24+ 0       3.2431      0.11  Q          |          |          |         v|
  24+ 5       3.2438      0.09  Q          |          |          |         v|
  24+10       3.2440      0.03  Q          |          |          |         v|
  24+15       3.2441      0.02  Q          |          |          |         v|
  24+20       3.2442      0.01  Q          |          |          |         v|
  24+25       3.2442      0.01  Q          |          |          |         v|
  24+30       3.2443      0.00  Q          |          |          |         v|
  24+35       3.2443      0.00  Q          |          |          |          v
-------------------------------------------------------------------------
```

U n i t H y d r o g r a p h A n a l y s i s

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Study date 09/17/22 File: 3X1100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6545

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

XENIA
PRELIMINARY UNIT HYDROGRAPH ANALYSIS
AREA X3 PRESENT CONDITION
100-YEAR

Drainage Area = 1.41(Ac.) = 0.002 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 1.41(Ac.) = 0.002 Sq. Mi.
Length along longest watercourse = 447.00(Ft.)
Length along longest watercourse measured to centroid = 212.00(Ft.)
Length along longest watercourse = 0.085 Mi.
Length along longest watercourse measured to centroid = 0.040 Mi.
Difference in elevation = 5.70(Ft.)
Slope along watercourse = 67.3289 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.037 Hr.
Lag time = 2.24 Min.
25% of lag time = 0.56 Min.
40% of lag time = 0.90 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
1.41	0.57	0.80

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
1.41	1.27	1.79

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.570(In)
Area Averaged 100-Year Rainfall = 1.270(In)

Point rain (area averaged) = 1.270(In)
Areal adjustment factor = 100.00 %

Adjusted average point rain = 1.270(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
1.410	64.90	0.298

Total Area Entered = 1.41(Ac.)

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
64.9	81.9	0.222	0.298	0.163	1.000	0.163
					Sum (F) =	0.163

Area averaged mean soil loss (F) (In/Hr) = 0.163
Minimum soil loss rate ((In/Hr)) = 0.081
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.662

Slope of intensity-duration curve for a 1 hour storm =0.5300

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	223.317	47.160	0.670
2	0.167	446.634	41.773	0.594
3	0.250	669.951	7.922	0.113
4	0.333	893.268	3.145	0.045
		Sum = 100.000	Sum=	1.421

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	3.40	0.518	0.163	(0.343)	0.356
2	0.17	4.70	0.716	0.163	(0.474)	0.554
3	0.25	4.70	0.716	0.163	(0.474)	0.554
4	0.33	5.10	0.777	0.163	(0.514)	0.615
5	0.42	5.80	0.884	0.163	(0.585)	0.721
6	0.50	5.90	0.899	0.163	(0.595)	0.737
7	0.58	7.10	1.082	0.163	(0.716)	0.919
8	0.67	8.70	1.326	0.163	(0.877)	1.163
9	0.75	13.20	2.012	0.163	(1.331)	1.849
10	0.83	29.70	4.526	0.163	(2.995)	4.364
11	0.92	7.70	1.173	0.163	(0.776)	1.011
12	1.00	4.00	0.610	0.163	(0.403)	0.447
	(Loss Rate Not Used)					
Sum =	100.0				Sum =	13.3

Flood volume = Effective rainfall 1.11(In)
times area 1.4(Ac.)/[(In)/(Ft.)] = 0.1(Ac.Ft)
Total soil loss = 0.16(In)
Total soil loss = 0.019(Ac.Ft)
Total rainfall = 1.27(In)
Flood volume = 5668.2 Cubic Feet
Total soil loss = 831.9 Cubic Feet

Peak flow rate of this hydrograph = 4.196(CFS)

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1 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0016	0.24	Q				
0+10	0.0057	0.58	VQ				
0+15	0.0108	0.74	QV				
0+20	0.0164	0.82	Q V				
0+25	0.0228	0.94	Q V				
0+30	0.0298	1.02	Q V				
0+35	0.0378	1.16	Q V				
0+40	0.0478	1.44	Q V				
0+45	0.0620	2.07	Q V				
0+50	0.0909	4.20	Q V				
0+55	0.1152	3.53	Q V				
1+ 0	0.1254	1.47	Q V				
1+ 5	0.1293	0.57	Q V				
1+10	0.1300	0.10	Q V				
1+15	0.1301	0.02	Q V				

U n i t H y d r o g r a p h A n a l y s i s

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Study date 09/17/22 File: 3X3100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6545

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

XENIA
PRELIMINARY UNIT HYDROGRAPH ANALYSIS
AREA X3 PRESENT CONDITION
100-YEAR

Drainage Area = 1.41(Ac.) = 0.002 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 1.41(Ac.) = 0.002 Sq. Mi.
Length along longest watercourse = 447.00(Ft.)
Length along longest watercourse measured to centroid = 212.00(Ft.)
Length along longest watercourse = 0.085 Mi.
Length along longest watercourse measured to centroid = 0.040 Mi.
Difference in elevation = 5.70(Ft.)
Slope along watercourse = 67.3289 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.037 Hr.
Lag time = 2.24 Min.
25% of lag time = 0.56 Min.
40% of lag time = 0.90 Min.
Unit time = 5.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
1.41	0.98	1.38

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
1.41	2.13	3.00

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.980(In)
Area Averaged 100-Year Rainfall = 2.130(In)

Point rain (area averaged) = 2.130(In)
Areal adjustment factor = 100.00 %

Adjusted average point rain = 2.130(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
1.410	64.90	0.298

Total Area Entered = 1.41(Ac.)

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
64.9	81.9	0.222	0.298	0.163	1.000	0.163
					Sum (F) =	0.163

Area averaged mean soil loss (F) (In/Hr) = 0.163
Minimum soil loss rate ((In/Hr)) = 0.081
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.662

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	223.317	47.160	0.670
2	0.167	446.634	41.773	0.594
3	0.250	669.951	7.922	0.113
4	0.333	893.268	3.145	0.045
			Sum = 100.000 Sum=	1.421

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	1.30	0.332	0.163	(0.220)	0.170
2	0.17	1.30	0.332	0.163	(0.220)	0.170
3	0.25	1.10	0.281	0.163	(0.186)	0.119
4	0.33	1.50	0.383	0.163	(0.254)	0.221
5	0.42	1.50	0.383	0.163	(0.254)	0.221
6	0.50	1.80	0.460	0.163	(0.304)	0.298
7	0.58	1.50	0.383	0.163	(0.254)	0.221
8	0.67	1.80	0.460	0.163	(0.304)	0.298
9	0.75	1.80	0.460	0.163	(0.304)	0.298
10	0.83	1.50	0.383	0.163	(0.254)	0.221
11	0.92	1.60	0.409	0.163	(0.271)	0.246
12	1.00	1.80	0.460	0.163	(0.304)	0.298
13	1.08	2.20	0.562	0.163	(0.372)	0.400
14	1.17	2.20	0.562	0.163	(0.372)	0.400
15	1.25	2.20	0.562	0.163	(0.372)	0.400
16	1.33	2.00	0.511	0.163	(0.338)	0.349
17	1.42	2.60	0.665	0.163	(0.440)	0.502
18	1.50	2.70	0.690	0.163	(0.457)	0.528
19	1.58	2.40	0.613	0.163	(0.406)	0.451
20	1.67	2.70	0.690	0.163	(0.457)	0.528
21	1.75	3.30	0.843	0.163	(0.558)	0.681
22	1.83	3.10	0.792	0.163	(0.524)	0.630
23	1.92	2.90	0.741	0.163	(0.490)	0.579
24	2.00	3.00	0.767	0.163	(0.507)	0.604
25	2.08	3.10	0.792	0.163	(0.524)	0.630
26	2.17	4.20	1.074	0.163	(0.710)	0.911
27	2.25	5.00	1.278	0.163	(0.846)	1.115

28	2.33	3.50	0.895	0.163	(0.592)	0.732
29	2.42	6.80	1.738	0.163	(1.150)	1.576
30	2.50	7.30	1.866	0.163	(1.234)	1.703
31	2.58	8.20	2.096	0.163	(1.387)	1.933
32	2.67	5.90	1.508	0.163	(0.998)	1.345
33	2.75	2.00	0.511	0.163	(0.338)	0.349
34	2.83	1.80	0.460	0.163	(0.304)	0.298
35	2.92	1.80	0.460	0.163	(0.304)	0.298
36	3.00	0.60	0.153	(0.163)	0.101	0.052

(Loss Rate Not Used)

Sum = 100.0 Sum = 19.8

Flood volume = Effective rainfall 1.65(In)
times area 1.4(Ac.)/[(In)/(Ft.)] = 0.2(Ac.Ft)
Total soil loss = 0.48(In)
Total soil loss = 0.057(Ac.Ft)
Total rainfall = 2.13(In)
Flood volume = 8432.2 Cubic Feet
Total soil loss = 2469.8 Cubic Feet

Peak flow rate of this hydrograph = 2.518(CFS)

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3 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0 2.5 5.0 7.5 10.0
0+ 5	0.0008	0.11	Q
0+10	0.0023	0.21	Q
0+15	0.0036	0.20	Q
0+20	0.0053	0.25	QV
0+25	0.0074	0.30	Q
0+30	0.0099	0.36	QV
0+35	0.0124	0.36	QV
0+40	0.0149	0.37	Q V
0+45	0.0178	0.41	Q V
0+50	0.0203	0.37	Q V
0+55	0.0227	0.34	Q V
1+ 0	0.0253	0.38	Q V
1+ 5	0.0286	0.48	Q V
1+10	0.0324	0.55	Q V
1+15	0.0363	0.56	Q V
1+20	0.0400	0.53	Q V
1+25	0.0442	0.61	Q V
1+30	0.0491	0.71	Q V
1+35	0.0538	0.69	Q V
1+40	0.0586	0.70	Q V
1+45	0.0645	0.84	Q V
1+50	0.0707	0.91	Q V
1+55	0.0766	0.86	Q V
2+ 0	0.0825	0.85	Q V
2+ 5	0.0885	0.87	Q V
2+10	0.0959	1.08	Q V
2+15	0.1055	1.39	Q V
2+20	0.1143	1.28	Q V
2+25	0.1258	1.66	Q V
2+30	0.1410	2.21	Q V
2+35	0.1583	2.52	Q V
2+40	0.1742	2.31	Q V
2+45	0.1834	1.33	Q V
2+50	0.1878	0.64	Q V
2+55	0.1911	0.48	Q V
3+ 0	0.1929	0.26	Q V

```
    3+ 5       0.1934      0.08  Q          |          |          |        V|
    3+10       0.1936      0.02  Q          |          |          |        V|
    3+15       0.1936      0.00  Q          |          |          |         V
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U n i t H y d r o g r a p h A n a l y s i s

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Study date 09/17/22 File: 3X6100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6545

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

XENIA
PRELIMINARY UNIT HYDROGRAPH ANALYSIS
AREA X3 PRESENT CONDITION
100-YEAR

Drainage Area = 1.41(Ac.) = 0.002 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 1.41(Ac.) = 0.002 Sq. Mi.
Length along longest watercourse = 447.00(Ft.)
Length along longest watercourse measured to centroid = 212.00(Ft.)
Length along longest watercourse = 0.085 Mi.
Length along longest watercourse measured to centroid = 0.040 Mi.
Difference in elevation = 5.70(Ft.)
Slope along watercourse = 67.3289 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.037 Hr.
Lag time = 2.24 Min.
25% of lag time = 0.56 Min.
40% of lag time = 0.90 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
1.41	1.27	1.79

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
1.41	3.00	4.23

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 1.270(In)
Area Averaged 100-Year Rainfall = 3.000(In)

Point rain (area averaged) = 3.000(In)
Areal adjustment factor = 100.00 %

Adjusted average point rain = 3.000(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
1.410	64.90	0.298

Total Area Entered = 1.41(Ac.)

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
64.9	81.9	0.222	0.298	0.163	1.000	0.163
					Sum (F) =	0.163

Area averaged mean soil loss (F) (In/Hr) = 0.163
Minimum soil loss rate ((In/Hr)) = 0.081
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.662

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

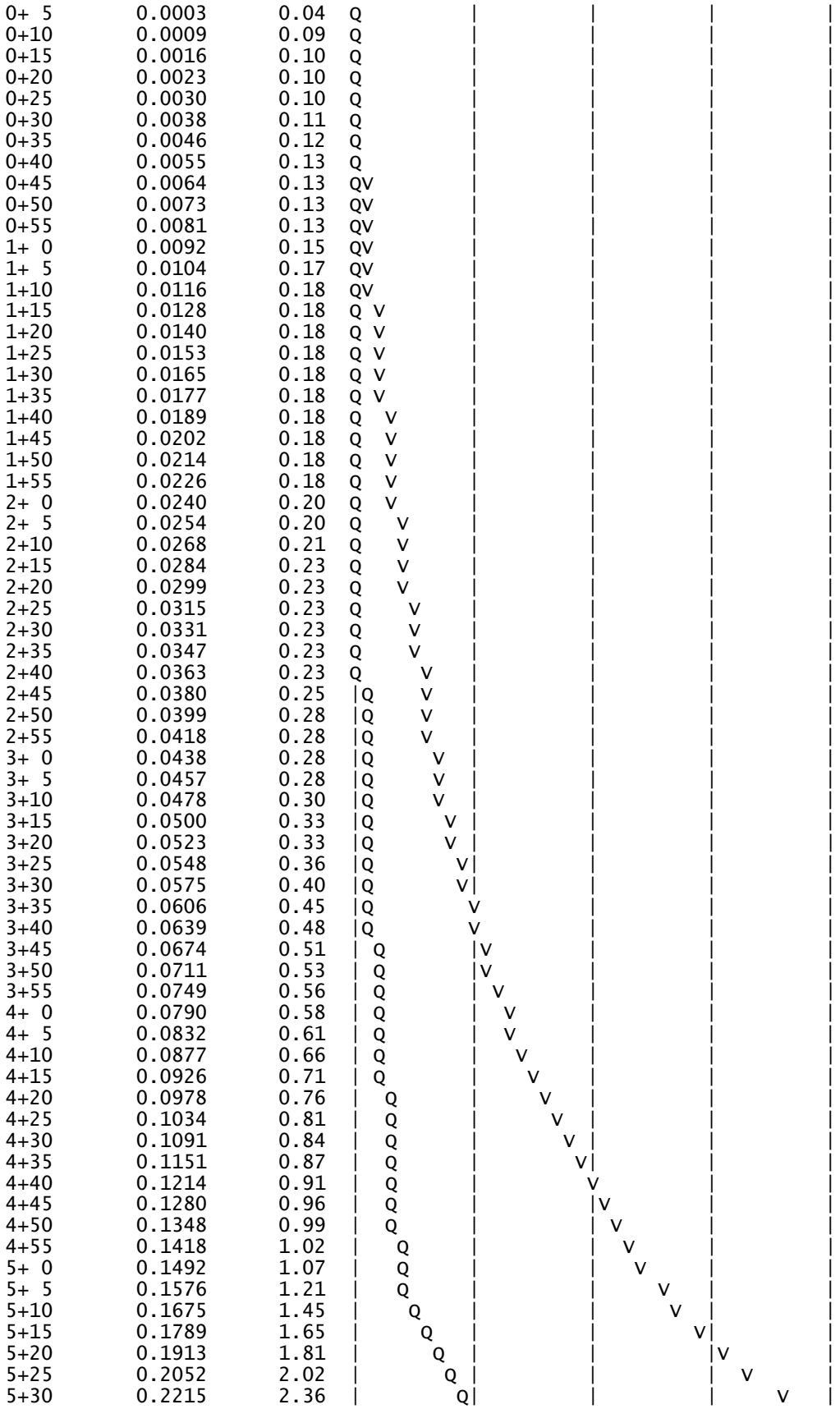
Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	223.317	47.160	0.670
2	0.167	446.634	41.773	0.594
3	0.250	669.951	7.922	0.113
4	0.333	893.268	3.145	0.045
			Sum = 100.000 Sum=	1.421

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max		Low	Effective (In/Hr)
1	0.08	0.50	0.180	(0.163)	0.119	0.061
2	0.17	0.60	0.216	(0.163)	0.143	0.073
3	0.25	0.60	0.216	(0.163)	0.143	0.073
4	0.33	0.60	0.216	(0.163)	0.143	0.073
5	0.42	0.60	0.216	(0.163)	0.143	0.073
6	0.50	0.70	0.252	0.163	(0.167)	0.089
7	0.58	0.70	0.252	0.163	(0.167)	0.089
8	0.67	0.70	0.252	0.163	(0.167)	0.089
9	0.75	0.70	0.252	0.163	(0.167)	0.089
10	0.83	0.70	0.252	0.163	(0.167)	0.089
11	0.92	0.70	0.252	0.163	(0.167)	0.089
12	1.00	0.80	0.288	0.163	(0.191)	0.125
13	1.08	0.80	0.288	0.163	(0.191)	0.125
14	1.17	0.80	0.288	0.163	(0.191)	0.125
15	1.25	0.80	0.288	0.163	(0.191)	0.125
16	1.33	0.80	0.288	0.163	(0.191)	0.125
17	1.42	0.80	0.288	0.163	(0.191)	0.125
18	1.50	0.80	0.288	0.163	(0.191)	0.125
19	1.58	0.80	0.288	0.163	(0.191)	0.125
20	1.67	0.80	0.288	0.163	(0.191)	0.125
21	1.75	0.80	0.288	0.163	(0.191)	0.125
22	1.83	0.80	0.288	0.163	(0.191)	0.125
23	1.92	0.80	0.288	0.163	(0.191)	0.125
24	2.00	0.90	0.324	0.163	(0.214)	0.161
25	2.08	0.80	0.288	0.163	(0.191)	0.125
26	2.17	0.90	0.324	0.163	(0.214)	0.161
27	2.25	0.90	0.324	0.163	(0.214)	0.161

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28   2.33     0.90      0.324          0.163    (  0.214)        0.161
29   2.42     0.90      0.324          0.163    (  0.214)        0.161
30   2.50     0.90      0.324          0.163    (  0.214)        0.161
31   2.58     0.90      0.324          0.163    (  0.214)        0.161
32   2.67     0.90      0.324          0.163    (  0.214)        0.161
33   2.75     1.00      0.360          0.163    (  0.238)        0.197
34   2.83     1.00      0.360          0.163    (  0.238)        0.197
35   2.92     1.00      0.360          0.163    (  0.238)        0.197
36   3.00     1.00      0.360          0.163    (  0.238)        0.197
37   3.08     1.00      0.360          0.163    (  0.238)        0.197
38   3.17     1.10      0.396          0.163    (  0.262)        0.233
39   3.25     1.10      0.396          0.163    (  0.262)        0.233
40   3.33     1.10      0.396          0.163    (  0.262)        0.233
41   3.42     1.20      0.432          0.163    (  0.286)        0.269
42   3.50     1.30      0.468          0.163    (  0.310)        0.305
43   3.58     1.40      0.504          0.163    (  0.333)        0.341
44   3.67     1.40      0.504          0.163    (  0.333)        0.341
45   3.75     1.50      0.540          0.163    (  0.357)        0.377
46   3.83     1.50      0.540          0.163    (  0.357)        0.377
47   3.92     1.60      0.576          0.163    (  0.381)        0.413
48   4.00     1.60      0.576          0.163    (  0.381)        0.413
49   4.08     1.70      0.612          0.163    (  0.405)        0.449
50   4.17     1.80      0.648          0.163    (  0.429)        0.485
51   4.25     1.90      0.684          0.163    (  0.453)        0.521
52   4.33     2.00      0.720          0.163    (  0.476)        0.557
53   4.42     2.10      0.756          0.163    (  0.500)        0.593
54   4.50     2.10      0.756          0.163    (  0.500)        0.593
55   4.58     2.20      0.792          0.163    (  0.524)        0.629
56   4.67     2.30      0.828          0.163    (  0.548)        0.665
57   4.75     2.40      0.864          0.163    (  0.572)        0.701
58   4.83     2.40      0.864          0.163    (  0.572)        0.701
59   4.92     2.50      0.900          0.163    (  0.595)        0.737
60   5.00     2.60      0.936          0.163    (  0.619)        0.773
61   5.08     3.10      1.116          0.163    (  0.738)        0.953
62   5.17     3.60      1.296          0.163    (  0.857)        1.133
63   5.25     3.90      1.404          0.163    (  0.929)        1.241
64   5.33     4.20      1.512          0.163    (  1.000)        1.349
65   5.42     4.70      1.692          0.163    (  1.119)        1.529
66   5.50     5.60      2.016          0.163    (  1.334)        1.853
67   5.58     1.90      0.684          0.163    (  0.453)        0.521
68   5.67     0.90      0.324          0.163    (  0.214)        0.161
69   5.75     0.60      0.216       (  0.163)       0.143        0.073
70   5.83     0.50      0.180       (  0.163)       0.119        0.061
71   5.92     0.30      0.108       (  0.163)       0.071        0.037
72   6.00     0.20      0.072       (  0.163)       0.048        0.024
            (Loss Rate Not Used)
   Sum =     100.0                                    Sum =    24.7
    Flood volume = Effective rainfall      2.06(In)
     times area       1.4(Ac.)/[(In)/(Ft.)] =       0.2(Ac.Ft)
    Total soil loss =      0.94(In)
    Total soil loss =     0.111(Ac.Ft)
    Total rainfall =      3.00(In)
    Flood volume =       10530.0 Cubic Feet
    Total soil loss =        4824.8 Cubic Feet
    ---------------------------------------------------------------------
     Peak flow rate of this hydrograph =      2.359(CFS)
    ---------------------------------------------------------------------
    +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                        6 - H O U R    S T O R M
                    R u n o f f      H y d r o g r a p h
    ---------------------------------------------------------------------
                Hydrograph in   5   Minute intervals ((CFS))

    ---------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0        2.5       5.0       7.5      10.0
---------------------------------------------------------------------
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    5+35       0.2331      1.68  |     Q   |         |         |       V |
    5+40       0.2379      0.70  | Q       |         |         |        V|
    5+45       0.2398      0.29  |Q        |         |         |        V|
    5+50       0.2407      0.13  Q         |         |         |        V|
    5+55       0.2412      0.08  Q         |         |         |        V|
    6+ 0       0.2416      0.05  Q         |         |         |        V|
    6+ 5       0.2417      0.02  Q         |         |         |        V|
    6+10       0.2417      0.00  Q         |         |         |        V|
    6+15       0.2417      0.00  Q         |         |         |        V|
---------------------------------------------------------------------------
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U n i t H y d r o g r a p h A n a l y s i s

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Study date 09/17/22 File: 3X24100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6545

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

XENIA
PRELIMINARY UNIT HYDROGRAPH ANALYSIS
AREA X3 PRESENT CONDITION
100-YEAR

Drainage Area = 1.41(Ac.) = 0.002 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 1.41(Ac.) = 0.002 Sq. Mi.
Length along longest watercourse = 447.00(Ft.)
Length along longest watercourse measured to centroid = 212.00(Ft.)
Length along longest watercourse = 0.085 Mi.
Length along longest watercourse measured to centroid = 0.040 Mi.
Difference in elevation = 5.70(Ft.)
Slope along watercourse = 67.3289 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.037 Hr.
Lag time = 2.24 Min.
25% of lag time = 0.56 Min.
40% of lag time = 0.90 Min.
Unit time = 5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
1.41	2.53	3.57

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
1.41	6.50	9.16

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 2.530(In)
Area Averaged 100-Year Rainfall = 6.500(In)

Point rain (area averaged) = 6.500(In)
Areal adjustment factor = 100.00 %

Adjusted average point rain = 6.500(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
1.410	64.90	0.298

Total Area Entered = 1.41(Ac.)

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
64.9	81.9	0.222	0.298	0.163	1.000	0.163
					Sum (F) =	0.163

Area averaged mean soil loss (F) (In/Hr) = 0.163
Minimum soil loss rate ((In/Hr)) = 0.081
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.662

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	223.317	47.160	0.670
2	0.167	446.634	41.773	0.594
3	0.250	669.951	7.922	0.113
4	0.333	893.268	3.145	0.045
			Sum = 100.000 Sum=	1.421

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.07	0.052	(0.288)	0.034	0.018
2	0.17	0.07	0.052	(0.287)	0.034	0.018
3	0.25	0.07	0.052	(0.286)	0.034	0.018
4	0.33	0.10	0.078	(0.285)	0.052	0.026
5	0.42	0.10	0.078	(0.284)	0.052	0.026
6	0.50	0.10	0.078	(0.283)	0.052	0.026
7	0.58	0.10	0.078	(0.281)	0.052	0.026
8	0.67	0.10	0.078	(0.280)	0.052	0.026
9	0.75	0.10	0.078	(0.279)	0.052	0.026
10	0.83	0.13	0.104	(0.278)	0.069	0.035
11	0.92	0.13	0.104	(0.277)	0.069	0.035
12	1.00	0.13	0.104	(0.276)	0.069	0.035
13	1.08	0.10	0.078	(0.275)	0.052	0.026
14	1.17	0.10	0.078	(0.274)	0.052	0.026
15	1.25	0.10	0.078	(0.273)	0.052	0.026
16	1.33	0.10	0.078	(0.272)	0.052	0.026
17	1.42	0.10	0.078	(0.271)	0.052	0.026
18	1.50	0.10	0.078	(0.269)	0.052	0.026
19	1.58	0.10	0.078	(0.268)	0.052	0.026
20	1.67	0.10	0.078	(0.267)	0.052	0.026
21	1.75	0.10	0.078	(0.266)	0.052	0.026
22	1.83	0.13	0.104	(0.265)	0.069	0.035
23	1.92	0.13	0.104	(0.264)	0.069	0.035
24	2.00	0.13	0.104	(0.263)	0.069	0.035
25	2.08	0.13	0.104	(0.262)	0.069	0.035
26	2.17	0.13	0.104	(0.261)	0.069	0.035
27	2.25	0.13	0.104	(0.260)	0.069	0.035

28	2.33	0.13	0.104	(0.259)	0.069	0.035
29	2.42	0.13	0.104	(0.258)	0.069	0.035
30	2.50	0.13	0.104	(0.257)	0.069	0.035
31	2.58	0.17	0.130	(0.256)	0.086	0.044
32	2.67	0.17	0.130	(0.255)	0.086	0.044
33	2.75	0.17	0.130	(0.254)	0.086	0.044
34	2.83	0.17	0.130	(0.253)	0.086	0.044
35	2.92	0.17	0.130	(0.251)	0.086	0.044
36	3.00	0.17	0.130	(0.250)	0.086	0.044
37	3.08	0.17	0.130	(0.249)	0.086	0.044
38	3.17	0.17	0.130	(0.248)	0.086	0.044
39	3.25	0.17	0.130	(0.247)	0.086	0.044
40	3.33	0.17	0.130	(0.246)	0.086	0.044
41	3.42	0.17	0.130	(0.245)	0.086	0.044
42	3.50	0.17	0.130	(0.244)	0.086	0.044
43	3.58	0.17	0.130	(0.243)	0.086	0.044
44	3.67	0.17	0.130	(0.242)	0.086	0.044
45	3.75	0.17	0.130	(0.241)	0.086	0.044
46	3.83	0.20	0.156	(0.240)	0.103	0.053
47	3.92	0.20	0.156	(0.239)	0.103	0.053
48	4.00	0.20	0.156	(0.238)	0.103	0.053
49	4.08	0.20	0.156	(0.237)	0.103	0.053
50	4.17	0.20	0.156	(0.236)	0.103	0.053
51	4.25	0.20	0.156	(0.235)	0.103	0.053
52	4.33	0.23	0.182	(0.234)	0.120	0.062
53	4.42	0.23	0.182	(0.233)	0.120	0.062
54	4.50	0.23	0.182	(0.232)	0.120	0.062
55	4.58	0.23	0.182	(0.231)	0.120	0.062
56	4.67	0.23	0.182	(0.230)	0.120	0.062
57	4.75	0.23	0.182	(0.229)	0.120	0.062
58	4.83	0.27	0.208	(0.228)	0.138	0.070
59	4.92	0.27	0.208	(0.227)	0.138	0.070
60	5.00	0.27	0.208	(0.226)	0.138	0.070
61	5.08	0.20	0.156	(0.225)	0.103	0.053
62	5.17	0.20	0.156	(0.224)	0.103	0.053
63	5.25	0.20	0.156	(0.223)	0.103	0.053
64	5.33	0.23	0.182	(0.222)	0.120	0.062
65	5.42	0.23	0.182	(0.221)	0.120	0.062
66	5.50	0.23	0.182	(0.220)	0.120	0.062
67	5.58	0.27	0.208	(0.219)	0.138	0.070
68	5.67	0.27	0.208	(0.218)	0.138	0.070
69	5.75	0.27	0.208	(0.217)	0.138	0.070
70	5.83	0.27	0.208	(0.216)	0.138	0.070
71	5.92	0.27	0.208	(0.216)	0.138	0.070
72	6.00	0.27	0.208	(0.215)	0.138	0.070
73	6.08	0.30	0.234	(0.214)	0.155	0.079
74	6.17	0.30	0.234	(0.213)	0.155	0.079
75	6.25	0.30	0.234	(0.212)	0.155	0.079
76	6.33	0.30	0.234	(0.211)	0.155	0.079
77	6.42	0.30	0.234	(0.210)	0.155	0.079
78	6.50	0.30	0.234	(0.209)	0.155	0.079
79	6.58	0.33	0.260	(0.208)	0.172	0.088
80	6.67	0.33	0.260	(0.207)	0.172	0.088
81	6.75	0.33	0.260	(0.206)	0.172	0.088
82	6.83	0.33	0.260	(0.205)	0.172	0.088
83	6.92	0.33	0.260	(0.204)	0.172	0.088
84	7.00	0.33	0.260	(0.203)	0.172	0.088
85	7.08	0.33	0.260	(0.202)	0.172	0.088
86	7.17	0.33	0.260	(0.201)	0.172	0.088
87	7.25	0.33	0.260	(0.201)	0.172	0.088
88	7.33	0.37	0.286	(0.200)	0.189	0.097
89	7.42	0.37	0.286	(0.199)	0.189	0.097
90	7.50	0.37	0.286	(0.198)	0.189	0.097
91	7.58	0.40	0.312	0.197	(0.206)	0.115
92	7.67	0.40	0.312	0.196	(0.206)	0.116
93	7.75	0.40	0.312	0.195	(0.206)	0.117

94	7.83	0.43	0.338	0.194	(0.224)	0.144
95	7.92	0.43	0.338	0.193	(0.224)	0.145
96	8.00	0.43	0.338	0.192	(0.224)	0.146
97	8.08	0.50	0.390	0.191	(0.258)	0.199
98	8.17	0.50	0.390	0.191	(0.258)	0.199
99	8.25	0.50	0.390	0.190	(0.258)	0.200
100	8.33	0.50	0.390	0.189	(0.258)	0.201
101	8.42	0.50	0.390	0.188	(0.258)	0.202
102	8.50	0.50	0.390	0.187	(0.258)	0.203
103	8.58	0.53	0.416	0.186	(0.275)	0.230
104	8.67	0.53	0.416	0.185	(0.275)	0.231
105	8.75	0.53	0.416	0.184	(0.275)	0.232
106	8.83	0.57	0.442	0.184	(0.292)	0.258
107	8.92	0.57	0.442	0.183	(0.292)	0.259
108	9.00	0.57	0.442	0.182	(0.292)	0.260
109	9.08	0.63	0.494	0.181	(0.327)	0.313
110	9.17	0.63	0.494	0.180	(0.327)	0.314
111	9.25	0.63	0.494	0.179	(0.327)	0.315
112	9.33	0.67	0.520	0.178	(0.344)	0.342
113	9.42	0.67	0.520	0.178	(0.344)	0.342
114	9.50	0.67	0.520	0.177	(0.344)	0.343
115	9.58	0.70	0.546	0.176	(0.361)	0.370
116	9.67	0.70	0.546	0.175	(0.361)	0.371
117	9.75	0.70	0.546	0.174	(0.361)	0.372
118	9.83	0.73	0.572	0.173	(0.378)	0.399
119	9.92	0.73	0.572	0.172	(0.378)	0.400
120	10.00	0.73	0.572	0.172	(0.378)	0.400
121	10.08	0.50	0.390	0.171	(0.258)	0.219
122	10.17	0.50	0.390	0.170	(0.258)	0.220
123	10.25	0.50	0.390	0.169	(0.258)	0.221
124	10.33	0.50	0.390	0.168	(0.258)	0.222
125	10.42	0.50	0.390	0.168	(0.258)	0.222
126	10.50	0.50	0.390	0.167	(0.258)	0.223
127	10.58	0.67	0.520	0.166	(0.344)	0.354
128	10.67	0.67	0.520	0.165	(0.344)	0.355
129	10.75	0.67	0.520	0.164	(0.344)	0.356
130	10.83	0.67	0.520	0.163	(0.344)	0.357
131	10.92	0.67	0.520	0.163	(0.344)	0.357
132	11.00	0.67	0.520	0.162	(0.344)	0.358
133	11.08	0.63	0.494	0.161	(0.327)	0.333
134	11.17	0.63	0.494	0.160	(0.327)	0.334
135	11.25	0.63	0.494	0.159	(0.327)	0.335
136	11.33	0.63	0.494	0.159	(0.327)	0.335
137	11.42	0.63	0.494	0.158	(0.327)	0.336
138	11.50	0.63	0.494	0.157	(0.327)	0.337
139	11.58	0.57	0.442	0.156	(0.292)	0.286
140	11.67	0.57	0.442	0.156	(0.292)	0.286
141	11.75	0.57	0.442	0.155	(0.292)	0.287
142	11.83	0.60	0.468	0.154	(0.310)	0.314
143	11.92	0.60	0.468	0.153	(0.310)	0.315
144	12.00	0.60	0.468	0.152	(0.310)	0.316
145	12.08	0.83	0.650	0.152	(0.430)	0.498
146	12.17	0.83	0.650	0.151	(0.430)	0.499
147	12.25	0.83	0.650	0.150	(0.430)	0.500
148	12.33	0.87	0.676	0.149	(0.447)	0.527
149	12.42	0.87	0.676	0.149	(0.447)	0.527
150	12.50	0.87	0.676	0.148	(0.447)	0.528
151	12.58	0.93	0.728	0.147	(0.482)	0.581
152	12.67	0.93	0.728	0.146	(0.482)	0.582
153	12.75	0.93	0.728	0.146	(0.482)	0.582
154	12.83	0.97	0.754	0.145	(0.499)	0.609
155	12.92	0.97	0.754	0.144	(0.499)	0.610
156	13.00	0.97	0.754	0.144	(0.499)	0.610
157	13.08	1.13	0.884	0.143	(0.585)	0.741
158	13.17	1.13	0.884	0.142	(0.585)	0.742
159	13.25	1.13	0.884	0.141	(0.585)	0.743

160	13.33	1.13	0.884	0.141	(0.585)	0.743
161	13.42	1.13	0.884	0.140	(0.585)	0.744
162	13.50	1.13	0.884	0.139	(0.585)	0.745
163	13.58	0.77	0.598	0.139	(0.396)	0.459
164	13.67	0.77	0.598	0.138	(0.396)	0.460
165	13.75	0.77	0.598	0.137	(0.396)	0.461
166	13.83	0.77	0.598	0.136	(0.396)	0.462
167	13.92	0.77	0.598	0.136	(0.396)	0.462
168	14.00	0.77	0.598	0.135	(0.396)	0.463
169	14.08	0.90	0.702	0.134	(0.464)	0.568
170	14.17	0.90	0.702	0.134	(0.464)	0.568
171	14.25	0.90	0.702	0.133	(0.464)	0.569
172	14.33	0.87	0.676	0.132	(0.447)	0.544
173	14.42	0.87	0.676	0.132	(0.447)	0.544
174	14.50	0.87	0.676	0.131	(0.447)	0.545
175	14.58	0.87	0.676	0.130	(0.447)	0.546
176	14.67	0.87	0.676	0.130	(0.447)	0.546
177	14.75	0.87	0.676	0.129	(0.447)	0.547
178	14.83	0.83	0.650	0.128	(0.430)	0.522
179	14.92	0.83	0.650	0.128	(0.430)	0.522
180	15.00	0.83	0.650	0.127	(0.430)	0.523
181	15.08	0.80	0.624	0.126	(0.413)	0.498
182	15.17	0.80	0.624	0.126	(0.413)	0.498
183	15.25	0.80	0.624	0.125	(0.413)	0.499
184	15.33	0.77	0.598	0.124	(0.396)	0.474
185	15.42	0.77	0.598	0.124	(0.396)	0.474
186	15.50	0.77	0.598	0.123	(0.396)	0.475
187	15.58	0.63	0.494	0.122	(0.327)	0.372
188	15.67	0.63	0.494	0.122	(0.327)	0.372
189	15.75	0.63	0.494	0.121	(0.327)	0.373
190	15.83	0.63	0.494	0.121	(0.327)	0.373
191	15.92	0.63	0.494	0.120	(0.327)	0.374
192	16.00	0.63	0.494	0.119	(0.327)	0.375
193	16.08	0.13	0.104	(0.119)	0.069	0.035
194	16.17	0.13	0.104	(0.118)	0.069	0.035
195	16.25	0.13	0.104	(0.118)	0.069	0.035
196	16.33	0.13	0.104	(0.117)	0.069	0.035
197	16.42	0.13	0.104	(0.116)	0.069	0.035
198	16.50	0.13	0.104	(0.116)	0.069	0.035
199	16.58	0.10	0.078	(0.115)	0.052	0.026
200	16.67	0.10	0.078	(0.115)	0.052	0.026
201	16.75	0.10	0.078	(0.114)	0.052	0.026
202	16.83	0.10	0.078	(0.113)	0.052	0.026
203	16.92	0.10	0.078	(0.113)	0.052	0.026
204	17.00	0.10	0.078	(0.112)	0.052	0.026
205	17.08	0.17	0.130	(0.112)	0.086	0.044
206	17.17	0.17	0.130	(0.111)	0.086	0.044
207	17.25	0.17	0.130	(0.111)	0.086	0.044
208	17.33	0.17	0.130	(0.110)	0.086	0.044
209	17.42	0.17	0.130	(0.109)	0.086	0.044
210	17.50	0.17	0.130	(0.109)	0.086	0.044
211	17.58	0.17	0.130	(0.108)	0.086	0.044
212	17.67	0.17	0.130	(0.108)	0.086	0.044
213	17.75	0.17	0.130	(0.107)	0.086	0.044
214	17.83	0.13	0.104	(0.107)	0.069	0.035
215	17.92	0.13	0.104	(0.106)	0.069	0.035
216	18.00	0.13	0.104	(0.106)	0.069	0.035
217	18.08	0.13	0.104	(0.105)	0.069	0.035
218	18.17	0.13	0.104	(0.105)	0.069	0.035
219	18.25	0.13	0.104	(0.104)	0.069	0.035
220	18.33	0.13	0.104	(0.104)	0.069	0.035
221	18.42	0.13	0.104	(0.103)	0.069	0.035
222	18.50	0.13	0.104	(0.103)	0.069	0.035
223	18.58	0.10	0.078	(0.102)	0.052	0.026
224	18.67	0.10	0.078	(0.102)	0.052	0.026
225	18.75	0.10	0.078	(0.101)	0.052	0.026

226	18.83	0.07	0.052	(0.101)	0.034	0.018
227	18.92	0.07	0.052	(0.100)	0.034	0.018
228	19.00	0.07	0.052	(0.100)	0.034	0.018
229	19.08	0.10	0.078	(0.099)	0.052	0.026
230	19.17	0.10	0.078	(0.099)	0.052	0.026
231	19.25	0.10	0.078	(0.098)	0.052	0.026
232	19.33	0.13	0.104	(0.098)	0.069	0.035
233	19.42	0.13	0.104	(0.097)	0.069	0.035
234	19.50	0.13	0.104	(0.097)	0.069	0.035
235	19.58	0.10	0.078	(0.097)	0.052	0.026
236	19.67	0.10	0.078	(0.096)	0.052	0.026
237	19.75	0.10	0.078	(0.096)	0.052	0.026
238	19.83	0.07	0.052	(0.095)	0.034	0.018
239	19.92	0.07	0.052	(0.095)	0.034	0.018
240	20.00	0.07	0.052	(0.094)	0.034	0.018
241	20.08	0.10	0.078	(0.094)	0.052	0.026
242	20.17	0.10	0.078	(0.094)	0.052	0.026
243	20.25	0.10	0.078	(0.093)	0.052	0.026
244	20.33	0.10	0.078	(0.093)	0.052	0.026
245	20.42	0.10	0.078	(0.092)	0.052	0.026
246	20.50	0.10	0.078	(0.092)	0.052	0.026
247	20.58	0.10	0.078	(0.092)	0.052	0.026
248	20.67	0.10	0.078	(0.091)	0.052	0.026
249	20.75	0.10	0.078	(0.091)	0.052	0.026
250	20.83	0.07	0.052	(0.090)	0.034	0.018
251	20.92	0.07	0.052	(0.090)	0.034	0.018
252	21.00	0.07	0.052	(0.090)	0.034	0.018
253	21.08	0.10	0.078	(0.089)	0.052	0.026
254	21.17	0.10	0.078	(0.089)	0.052	0.026
255	21.25	0.10	0.078	(0.089)	0.052	0.026
256	21.33	0.07	0.052	(0.088)	0.034	0.018
257	21.42	0.07	0.052	(0.088)	0.034	0.018
258	21.50	0.07	0.052	(0.088)	0.034	0.018
259	21.58	0.10	0.078	(0.087)	0.052	0.026
260	21.67	0.10	0.078	(0.087)	0.052	0.026
261	21.75	0.10	0.078	(0.087)	0.052	0.026
262	21.83	0.07	0.052	(0.086)	0.034	0.018
263	21.92	0.07	0.052	(0.086)	0.034	0.018
264	22.00	0.07	0.052	(0.086)	0.034	0.018
265	22.08	0.10	0.078	(0.086)	0.052	0.026
266	22.17	0.10	0.078	(0.085)	0.052	0.026
267	22.25	0.10	0.078	(0.085)	0.052	0.026
268	22.33	0.07	0.052	(0.085)	0.034	0.018
269	22.42	0.07	0.052	(0.084)	0.034	0.018
270	22.50	0.07	0.052	(0.084)	0.034	0.018
271	22.58	0.07	0.052	(0.084)	0.034	0.018
272	22.67	0.07	0.052	(0.084)	0.034	0.018
273	22.75	0.07	0.052	(0.084)	0.034	0.018
274	22.83	0.07	0.052	(0.083)	0.034	0.018
275	22.92	0.07	0.052	(0.083)	0.034	0.018
276	23.00	0.07	0.052	(0.083)	0.034	0.018
277	23.08	0.07	0.052	(0.083)	0.034	0.018
278	23.17	0.07	0.052	(0.082)	0.034	0.018
279	23.25	0.07	0.052	(0.082)	0.034	0.018
280	23.33	0.07	0.052	(0.082)	0.034	0.018
281	23.42	0.07	0.052	(0.082)	0.034	0.018
282	23.50	0.07	0.052	(0.082)	0.034	0.018
283	23.58	0.07	0.052	(0.082)	0.034	0.018
284	23.67	0.07	0.052	(0.082)	0.034	0.018
285	23.75	0.07	0.052	(0.081)	0.034	0.018
286	23.83	0.07	0.052	(0.081)	0.034	0.018
287	23.92	0.07	0.052	(0.081)	0.034	0.018
288	24.00	0.07	0.052	(0.081)	0.034	0.018
		(Loss Rate Not Used)				
Sum =		100.0			Sum =	47.9

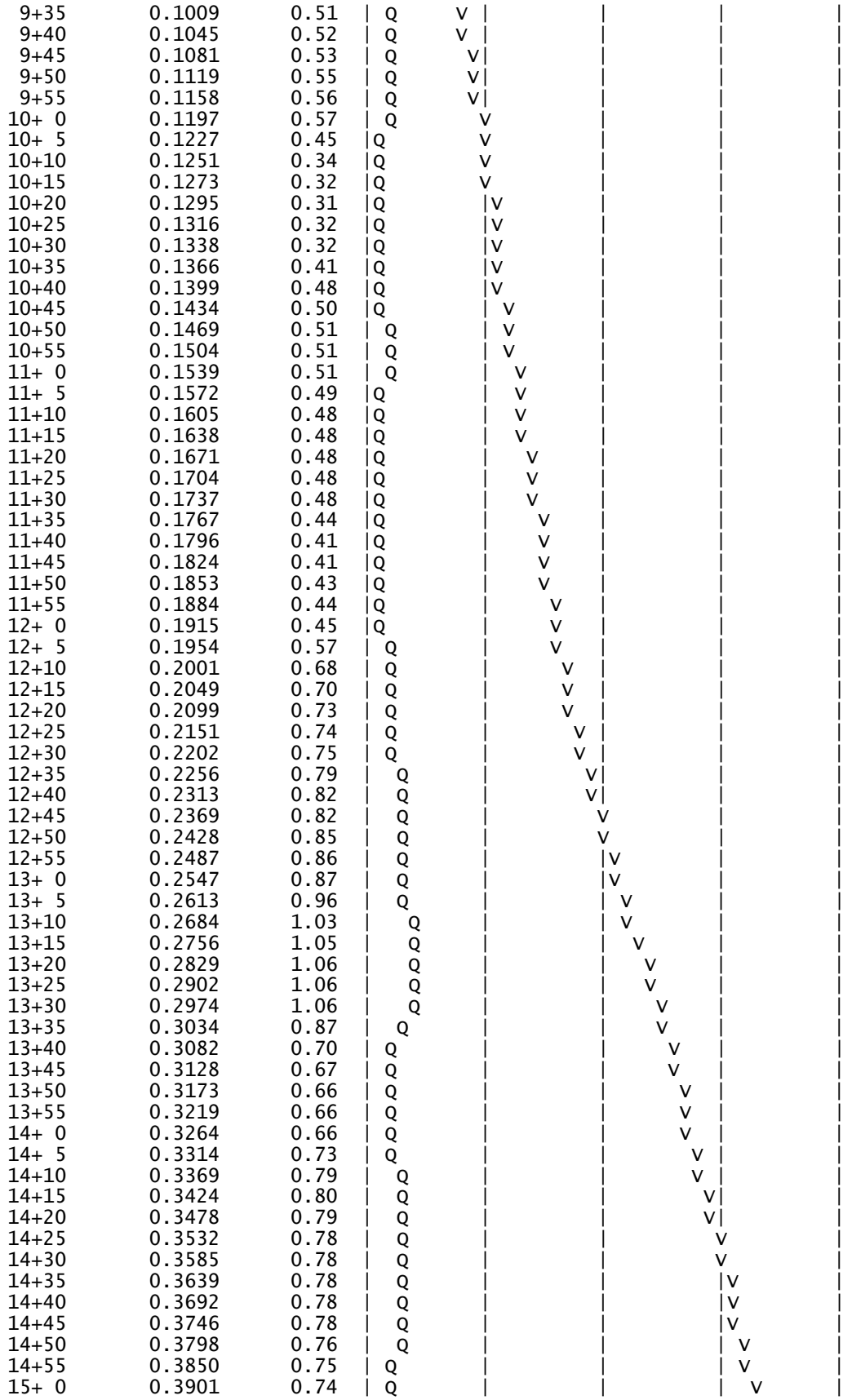
Flood volume = Effective rainfall 3.99(In)

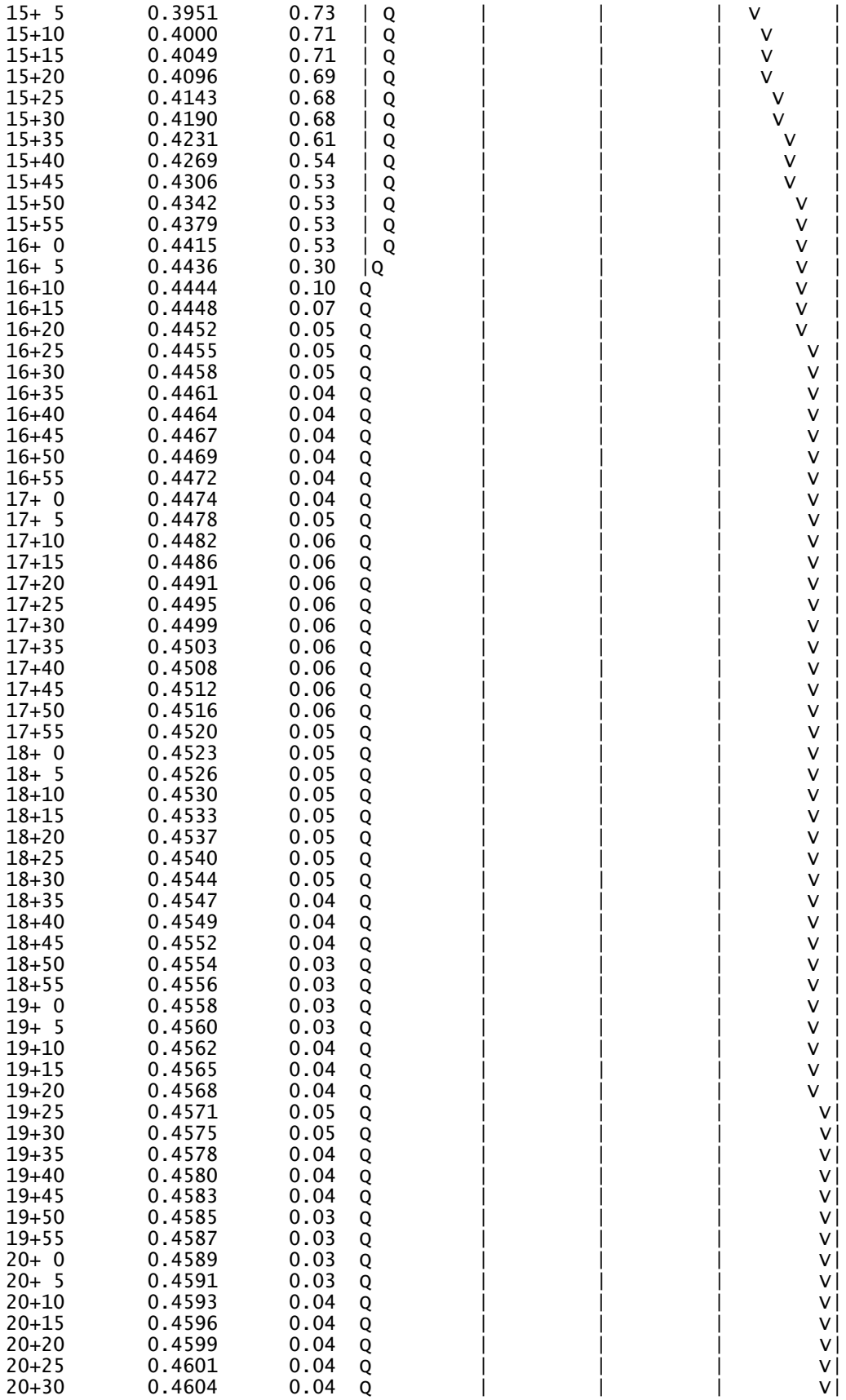
```
 times area       1.4(Ac.)/[(In)/(Ft.)] =       0.5(Ac.Ft)
Total soil loss =      2.51(In)
Total soil loss =     0.295(Ac.Ft)
Total rainfall =      6.50(In)
Flood volume =       20421.6 Cubic Feet
Total soil loss =       12847.3 Cubic Feet
--------------------------------------------------------------------
 Peak flow rate of this hydrograph =      1.058(CFS)
--------------------------------------------------------------------
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    24 - H O U R    S T O R M
               R u n o f f      H y d r o g r a p h
--------------------------------------------------------------------
            Hydrograph in   5   Minute intervals ((CFS))

--------------------------------------------------------------------
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Time(h+m)	Volume Ac.Ft	Q(CFS)		0	2.5	5.0	7.5	10.0
0+ 5	0.0001	0.01	Q					
0+10	0.0002	0.02	Q					
0+15	0.0004	0.02	Q					
0+20	0.0006	0.03	Q					
0+25	0.0009	0.04	Q					
0+30	0.0011	0.04	Q					
0+35	0.0014	0.04	Q					
0+40	0.0016	0.04	Q					
0+45	0.0019	0.04	Q					
0+50	0.0022	0.04	Q					
0+55	0.0025	0.05	Q					
1+ 0	0.0029	0.05	Q					
1+ 5	0.0032	0.04	Q					
1+10	0.0034	0.04	Q					
1+15	0.0037	0.04	Q					
1+20	0.0040	0.04	Q					
1+25	0.0042	0.04	Q					
1+30	0.0045	0.04	Q					
1+35	0.0047	0.04	Q					
1+40	0.0050	0.04	Q					
1+45	0.0053	0.04	Q					
1+50	0.0056	0.04	Q					
1+55	0.0059	0.05	Q					
2+ 0	0.0062	0.05	Q					
2+ 5	0.0066	0.05	Q					
2+10	0.0069	0.05	Q					
2+15	0.0073	0.05	Q					
2+20	0.0076	0.05	Q					
2+25	0.0080	0.05	Q					
2+30	0.0083	0.05	Q					
2+35	0.0087	0.06	Q					
2+40	0.0091	0.06	Q					
2+45	0.0095	0.06	Q					
2+50	0.0100	0.06	Q					
2+55	0.0104	0.06	Q					
3+ 0	0.0108	0.06	Q					
3+ 5	0.0113	0.06	Q					
3+10	0.0117	0.06	Q					
3+15	0.0121	0.06	QV					
3+20	0.0125	0.06	QV					
3+25	0.0130	0.06	QV					
3+30	0.0134	0.06	QV					
3+35	0.0138	0.06	QV					
3+40	0.0143	0.06	QV					
3+45	0.0147	0.06	QV					
3+50	0.0152	0.07	QV					
3+55	0.0157	0.07	QV					
4+ 0	0.0162	0.07	QV					

4+ 5	0.0167	0.08	QV	|	|	|	|
4+10	0.0172	0.08	QV	|	|	|	|
4+15	0.0177	0.08	QV	|	|	|	|
4+20	0.0183	0.08	QV	|	|	|	|
4+25	0.0189	0.09	QV	|	|	|	|
4+30	0.0195	0.09	QV	|	|	|	|
4+35	0.0201	0.09	QV	|	|	|	|
4+40	0.0207	0.09	QV	|	|	|	|
4+45	0.0213	0.09	QV	|	|	|	|
4+50	0.0219	0.09	QV	|	|	|	|
4+55	0.0226	0.10	QV	|	|	|	|
5+ 0	0.0233	0.10	QV	|	|	|	|
5+ 5	0.0239	0.09	Q V	|	|	|	|
5+10	0.0245	0.08	Q V	|	|	|	|
5+15	0.0250	0.08	Q V	|	|	|	|
5+20	0.0255	0.08	Q V	|	|	|	|
5+25	0.0261	0.09	Q V	|	|	|	|
5+30	0.0267	0.09	Q V	|	|	|	|
5+35	0.0274	0.09	Q V	|	|	|	|
5+40	0.0281	0.10	Q V	|	|	|	|
5+45	0.0287	0.10	Q V	|	|	|	|
5+50	0.0294	0.10	Q V	|	|	|	|
5+55	0.0301	0.10	Q V	|	|	|	|
6+ 0	0.0308	0.10	Q V	|	|	|	|
6+ 5	0.0315	0.11	Q V	|	|	|	|
6+10	0.0323	0.11	Q V	|	|	|	|
6+15	0.0331	0.11	Q V	|	|	|	|
6+20	0.0339	0.11	Q V	|	|	|	|
6+25	0.0346	0.11	Q V	|	|	|	|
6+30	0.0354	0.11	Q V	|	|	|	|
6+35	0.0362	0.12	Q V	|	|	|	|
6+40	0.0371	0.12	Q V	|	|	|	|
6+45	0.0379	0.12	Q V	|	|	|	|
6+50	0.0388	0.13	Q V	|	|	|	|
6+55	0.0397	0.13	Q V	|	|	|	|
7+ 0	0.0405	0.13	Q V	|	|	|	|
7+ 5	0.0414	0.13	Q V	|	|	|	|
7+10	0.0422	0.13	Q V	|	|	|	|
7+15	0.0431	0.13	Q V	|	|	|	|
7+20	0.0440	0.13	Q V	|	|	|	|
7+25	0.0449	0.14	Q V	|	|	|	|
7+30	0.0459	0.14	Q V	|	|	|	|
7+35	0.0469	0.15	Q V	|	|	|	|
7+40	0.0480	0.16	Q V	|	|	|	|
7+45	0.0492	0.16	Q V	|	|	|	|
7+50	0.0504	0.18	Q V	|	|	|	|
7+55	0.0518	0.20	Q V	|	|	|	|
8+ 0	0.0532	0.21	Q V	|	|	|	|
8+ 5	0.0549	0.24	Q V	|	|	|	|
8+10	0.0568	0.27	|Q V	|	|	|	|
8+15	0.0587	0.28	|Q V	|	|	|	|
8+20	0.0607	0.29	|Q V	|	|	|	|
8+25	0.0627	0.29	|Q V	|	|	|	|
8+30	0.0646	0.29	|Q V	|	|	|	|
8+35	0.0668	0.31	|Q V	|	|	|	|
8+40	0.0690	0.32	|Q V	|	|	|	|
8+45	0.0712	0.33	|Q V	|	|	|	|
8+50	0.0736	0.35	|Q V	|	|	|	|
8+55	0.0761	0.36	|Q V	|	|	|	|
9+ 0	0.0787	0.37	|Q V	|	|	|	|
9+ 5	0.0815	0.41	|Q V	|	|	|	|
9+10	0.0845	0.44	|Q V	|	|	|	|
9+15	0.0875	0.44	|Q V	|	|	|	|
9+20	0.0907	0.47	|Q V	|	|	|	|
9+25	0.0941	0.48	|Q V |	|	|	|
9+30	0.0974	0.49	|Q V |	|	|	|





20+35	0.4606	0.04	Q	|	|	|	v|
20+40	0.4609	0.04	Q	|	|	|	v|
20+45	0.4611	0.04	Q	|	|	|	v|
20+50	0.4614	0.03	Q	|	|	|	v|
20+55	0.4615	0.03	Q	|	|	|	v|
21+ 0	0.4617	0.03	Q	|	|	|	v|
21+ 5	0.4619	0.03	Q	|	|	|	v|
21+10	0.4622	0.04	Q	|	|	|	v|
21+15	0.4624	0.04	Q	|	|	|	v|
21+20	0.4627	0.03	Q	|	|	|	v|
21+25	0.4628	0.03	Q	|	|	|	v|
21+30	0.4630	0.03	Q	|	|	|	v|
21+35	0.4632	0.03	Q	|	|	|	v|
21+40	0.4635	0.04	Q	|	|	|	v|
21+45	0.4637	0.04	Q	|	|	|	v|
21+50	0.4639	0.03	Q	|	|	|	v|
21+55	0.4641	0.03	Q	|	|	|	v|
22+ 0	0.4643	0.03	Q	|	|	|	v|
22+ 5	0.4645	0.03	Q	|	|	|	v|
22+10	0.4648	0.04	Q	|	|	|	v|
22+15	0.4650	0.04	Q	|	|	|	v|
22+20	0.4652	0.03	Q	|	|	|	v|
22+25	0.4654	0.03	Q	|	|	|	v|
22+30	0.4656	0.03	Q	|	|	|	v|
22+35	0.4658	0.03	Q	|	|	|	v|
22+40	0.4659	0.03	Q	|	|	|	v|
22+45	0.4661	0.03	Q	|	|	|	v|
22+50	0.4663	0.03	Q	|	|	|	v|
22+55	0.4665	0.03	Q	|	|	|	v|
23+ 0	0.4666	0.03	Q	|	|	|	v|
23+ 5	0.4668	0.03	Q	|	|	|	v|
23+10	0.4670	0.03	Q	|	|	|	v|
23+15	0.4671	0.03	Q	|	|	|	v|
23+20	0.4673	0.03	Q	|	|	|	v|
23+25	0.4675	0.03	Q	|	|	|	v|
23+30	0.4677	0.03	Q	|	|	|	v|
23+35	0.4678	0.03	Q	|	|	|	v|
23+40	0.4680	0.03	Q	|	|	|	v|
23+45	0.4682	0.03	Q	|	|	|	v|
23+50	0.4684	0.03	Q	|	|	|	v|
23+55	0.4685	0.03	Q	|	|	|	v|
24+ 0	0.4687	0.03	Q	|	|	|	v|
24+ 5	0.4688	0.01	Q	|	|	|	v|
24+10	0.4688	0.00	Q	|	|	|	v|
24+15	0.4688	0.00	Q	|	|	|	v|

Developed Unit Hydrograph Models V

- 2-Year, 24-Hour
- 100-Year, 1-Hour
- 100-Year, 3-Hour
- 100-Year, 6-Hour
- 100-Year, 24-Hour

U n i t H y d r o g r a p h A n a l y s i s

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Study date 09/16/22 File: 1D242.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6545

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

XENIA
PRELIMINARY UNIT HYDROGRAPH ANALYSIS
AREA D1 DEVELOPED CONDITION
2-YEAR

Drainage Area = 0.27(Ac.) = 0.000 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 0.27(Ac.) = 0.000 Sq. Mi.
Length along longest watercourse = 309.00(Ft.)
Length along longest watercourse measured to centroid = 124.00(Ft.)
Length along longest watercourse = 0.059 Mi.
Length along longest watercourse measured to centroid = 0.023 Mi.
Difference in elevation = 4.30(Ft.)
Slope along watercourse = 73.4757 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.013 Hr.
Lag time = 0.78 Min.
25% of lag time = 0.20 Min.
40% of lag time = 0.31 Min.
Unit time = 5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
0.27	2.53	0.68

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
0.27	6.50	1.76

STORM EVENT (YEAR) = 2.00
Area Averaged 2-Year Rainfall = 2.530(In)
Area Averaged 100-Year Rainfall = 6.500(In)

Point rain (area averaged) = 2.530(In)
Areal adjustment factor = 100.00 %

Adjusted average point rain = 2.530(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
0.270	56.00	0.800

Total Area Entered = 0.27(Ac.)

RI AMC2	RI AMC-1	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
56.0	36.0	0.706	0.800	0.198	1.000	0.198
					Sum (F) =	0.198

Area averaged mean soil loss (F) (In/Hr) = 0.198
Minimum soil loss rate ((In/Hr)) = 0.099
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.260

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	640.621	76.692	0.209
2	0.167	1281.241	23.308	0.063
			Sum = 100.000 Sum=	0.272

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max		Low	Effective (In/Hr)
1	0.08	0.07	0.020	(0.350)		0.005	0.015
2	0.17	0.07	0.020	(0.349)		0.005	0.015
3	0.25	0.07	0.020	(0.348)		0.005	0.015
4	0.33	0.10	0.030	(0.346)		0.008	0.022
5	0.42	0.10	0.030	(0.345)		0.008	0.022
6	0.50	0.10	0.030	(0.344)		0.008	0.022
7	0.58	0.10	0.030	(0.342)		0.008	0.022
8	0.67	0.10	0.030	(0.341)		0.008	0.022
9	0.75	0.10	0.030	(0.340)		0.008	0.022
10	0.83	0.13	0.040	(0.338)		0.011	0.030
11	0.92	0.13	0.040	(0.337)		0.011	0.030
12	1.00	0.13	0.040	(0.336)		0.011	0.030
13	1.08	0.10	0.030	(0.334)		0.008	0.022
14	1.17	0.10	0.030	(0.333)		0.008	0.022
15	1.25	0.10	0.030	(0.332)		0.008	0.022
16	1.33	0.10	0.030	(0.330)		0.008	0.022
17	1.42	0.10	0.030	(0.329)		0.008	0.022
18	1.50	0.10	0.030	(0.328)		0.008	0.022
19	1.58	0.10	0.030	(0.326)		0.008	0.022
20	1.67	0.10	0.030	(0.325)		0.008	0.022
21	1.75	0.10	0.030	(0.324)		0.008	0.022
22	1.83	0.13	0.040	(0.323)		0.011	0.030
23	1.92	0.13	0.040	(0.321)		0.011	0.030
24	2.00	0.13	0.040	(0.320)		0.011	0.030
25	2.08	0.13	0.040	(0.319)		0.011	0.030
26	2.17	0.13	0.040	(0.317)		0.011	0.030
27	2.25	0.13	0.040	(0.316)		0.011	0.030
28	2.33	0.13	0.040	(0.315)		0.011	0.030
29	2.42	0.13	0.040	(0.313)		0.011	0.030

30	2.50	0.13	0.040	(0.312)	0.011	0.030
31	2.58	0.17	0.051	(0.311)	0.013	0.037
32	2.67	0.17	0.051	(0.310)	0.013	0.037
33	2.75	0.17	0.051	(0.308)	0.013	0.037
34	2.83	0.17	0.051	(0.307)	0.013	0.037
35	2.92	0.17	0.051	(0.306)	0.013	0.037
36	3.00	0.17	0.051	(0.305)	0.013	0.037
37	3.08	0.17	0.051	(0.303)	0.013	0.037
38	3.17	0.17	0.051	(0.302)	0.013	0.037
39	3.25	0.17	0.051	(0.301)	0.013	0.037
40	3.33	0.17	0.051	(0.300)	0.013	0.037
41	3.42	0.17	0.051	(0.298)	0.013	0.037
42	3.50	0.17	0.051	(0.297)	0.013	0.037
43	3.58	0.17	0.051	(0.296)	0.013	0.037
44	3.67	0.17	0.051	(0.295)	0.013	0.037
45	3.75	0.17	0.051	(0.293)	0.013	0.037
46	3.83	0.20	0.061	(0.292)	0.016	0.045
47	3.92	0.20	0.061	(0.291)	0.016	0.045
48	4.00	0.20	0.061	(0.290)	0.016	0.045
49	4.08	0.20	0.061	(0.288)	0.016	0.045
50	4.17	0.20	0.061	(0.287)	0.016	0.045
51	4.25	0.20	0.061	(0.286)	0.016	0.045
52	4.33	0.23	0.071	(0.285)	0.018	0.052
53	4.42	0.23	0.071	(0.284)	0.018	0.052
54	4.50	0.23	0.071	(0.282)	0.018	0.052
55	4.58	0.23	0.071	(0.281)	0.018	0.052
56	4.67	0.23	0.071	(0.280)	0.018	0.052
57	4.75	0.23	0.071	(0.279)	0.018	0.052
58	4.83	0.27	0.081	(0.277)	0.021	0.060
59	4.92	0.27	0.081	(0.276)	0.021	0.060
60	5.00	0.27	0.081	(0.275)	0.021	0.060
61	5.08	0.20	0.061	(0.274)	0.016	0.045
62	5.17	0.20	0.061	(0.273)	0.016	0.045
63	5.25	0.20	0.061	(0.271)	0.016	0.045
64	5.33	0.23	0.071	(0.270)	0.018	0.052
65	5.42	0.23	0.071	(0.269)	0.018	0.052
66	5.50	0.23	0.071	(0.268)	0.018	0.052
67	5.58	0.27	0.081	(0.267)	0.021	0.060
68	5.67	0.27	0.081	(0.266)	0.021	0.060
69	5.75	0.27	0.081	(0.264)	0.021	0.060
70	5.83	0.27	0.081	(0.263)	0.021	0.060
71	5.92	0.27	0.081	(0.262)	0.021	0.060
72	6.00	0.27	0.081	(0.261)	0.021	0.060
73	6.08	0.30	0.091	(0.260)	0.024	0.067
74	6.17	0.30	0.091	(0.259)	0.024	0.067
75	6.25	0.30	0.091	(0.257)	0.024	0.067
76	6.33	0.30	0.091	(0.256)	0.024	0.067
77	6.42	0.30	0.091	(0.255)	0.024	0.067
78	6.50	0.30	0.091	(0.254)	0.024	0.067
79	6.58	0.33	0.101	(0.253)	0.026	0.075
80	6.67	0.33	0.101	(0.252)	0.026	0.075
81	6.75	0.33	0.101	(0.251)	0.026	0.075
82	6.83	0.33	0.101	(0.249)	0.026	0.075
83	6.92	0.33	0.101	(0.248)	0.026	0.075
84	7.00	0.33	0.101	(0.247)	0.026	0.075
85	7.08	0.33	0.101	(0.246)	0.026	0.075
86	7.17	0.33	0.101	(0.245)	0.026	0.075
87	7.25	0.33	0.101	(0.244)	0.026	0.075
88	7.33	0.37	0.111	(0.243)	0.029	0.082
89	7.42	0.37	0.111	(0.242)	0.029	0.082
90	7.50	0.37	0.111	(0.241)	0.029	0.082
91	7.58	0.40	0.121	(0.239)	0.032	0.090
92	7.67	0.40	0.121	(0.238)	0.032	0.090
93	7.75	0.40	0.121	(0.237)	0.032	0.090
94	7.83	0.43	0.132	(0.236)	0.034	0.097
95	7.92	0.43	0.132	(0.235)	0.034	0.097

96	8.00	0.43	0.132	(0.234)	0.034	0.097
97	8.08	0.50	0.152	(0.233)	0.039	0.112
98	8.17	0.50	0.152	(0.232)	0.039	0.112
99	8.25	0.50	0.152	(0.231)	0.039	0.112
100	8.33	0.50	0.152	(0.230)	0.039	0.112
101	8.42	0.50	0.152	(0.229)	0.039	0.112
102	8.50	0.50	0.152	(0.227)	0.039	0.112
103	8.58	0.53	0.162	(0.226)	0.042	0.120
104	8.67	0.53	0.162	(0.225)	0.042	0.120
105	8.75	0.53	0.162	(0.224)	0.042	0.120
106	8.83	0.57	0.172	(0.223)	0.045	0.127
107	8.92	0.57	0.172	(0.222)	0.045	0.127
108	9.00	0.57	0.172	(0.221)	0.045	0.127
109	9.08	0.63	0.192	(0.220)	0.050	0.142
110	9.17	0.63	0.192	(0.219)	0.050	0.142
111	9.25	0.63	0.192	(0.218)	0.050	0.142
112	9.33	0.67	0.202	(0.217)	0.053	0.150
113	9.42	0.67	0.202	(0.216)	0.053	0.150
114	9.50	0.67	0.202	(0.215)	0.053	0.150
115	9.58	0.70	0.213	(0.214)	0.055	0.157
116	9.67	0.70	0.213	(0.213)	0.055	0.157
117	9.75	0.70	0.213	(0.212)	0.055	0.157
118	9.83	0.73	0.223	(0.211)	0.058	0.165
119	9.92	0.73	0.223	(0.210)	0.058	0.165
120	10.00	0.73	0.223	(0.209)	0.058	0.165
121	10.08	0.50	0.152	(0.208)	0.039	0.112
122	10.17	0.50	0.152	(0.207)	0.039	0.112
123	10.25	0.50	0.152	(0.206)	0.039	0.112
124	10.33	0.50	0.152	(0.205)	0.039	0.112
125	10.42	0.50	0.152	(0.204)	0.039	0.112
126	10.50	0.50	0.152	(0.203)	0.039	0.112
127	10.58	0.67	0.202	(0.202)	0.053	0.150
128	10.67	0.67	0.202	(0.201)	0.053	0.150
129	10.75	0.67	0.202	(0.200)	0.053	0.150
130	10.83	0.67	0.202	(0.199)	0.053	0.150
131	10.92	0.67	0.202	(0.198)	0.053	0.150
132	11.00	0.67	0.202	(0.197)	0.053	0.150
133	11.08	0.63	0.192	(0.196)	0.050	0.142
134	11.17	0.63	0.192	(0.195)	0.050	0.142
135	11.25	0.63	0.192	(0.194)	0.050	0.142
136	11.33	0.63	0.192	(0.193)	0.050	0.142
137	11.42	0.63	0.192	(0.192)	0.050	0.142
138	11.50	0.63	0.192	(0.191)	0.050	0.142
139	11.58	0.57	0.172	(0.190)	0.045	0.127
140	11.67	0.57	0.172	(0.189)	0.045	0.127
141	11.75	0.57	0.172	(0.188)	0.045	0.127
142	11.83	0.60	0.182	(0.187)	0.047	0.135
143	11.92	0.60	0.182	(0.186)	0.047	0.135
144	12.00	0.60	0.182	(0.185)	0.047	0.135
145	12.08	0.83	0.253	(0.185)	0.066	0.187
146	12.17	0.83	0.253	(0.184)	0.066	0.187
147	12.25	0.83	0.253	(0.183)	0.066	0.187
148	12.33	0.87	0.263	(0.182)	0.068	0.195
149	12.42	0.87	0.263	(0.181)	0.068	0.195
150	12.50	0.87	0.263	(0.180)	0.068	0.195
151	12.58	0.93	0.283	(0.179)	0.074	0.210
152	12.67	0.93	0.283	(0.178)	0.074	0.210
153	12.75	0.93	0.283	(0.177)	0.074	0.210
154	12.83	0.97	0.293	(0.176)	0.076	0.217
155	12.92	0.97	0.293	(0.175)	0.076	0.217
156	13.00	0.97	0.293	(0.175)	0.076	0.217
157	13.08	1.13	0.344	(0.174)	0.089	0.255
158	13.17	1.13	0.344	(0.173)	0.089	0.255
159	13.25	1.13	0.344	(0.172)	0.089	0.255
160	13.33	1.13	0.344	(0.171)	0.089	0.255
161	13.42	1.13	0.344	(0.170)	0.089	0.255

162	13.50	1.13	0.344	(0.169)	0.089	0.255
163	13.58	0.77	0.233	(0.168)	0.061	0.172
164	13.67	0.77	0.233	(0.168)	0.061	0.172
165	13.75	0.77	0.233	(0.167)	0.061	0.172
166	13.83	0.77	0.233	(0.166)	0.061	0.172
167	13.92	0.77	0.233	(0.165)	0.061	0.172
168	14.00	0.77	0.233	(0.164)	0.061	0.172
169	14.08	0.90	0.273	(0.163)	0.071	0.202
170	14.17	0.90	0.273	(0.163)	0.071	0.202
171	14.25	0.90	0.273	(0.162)	0.071	0.202
172	14.33	0.87	0.263	(0.161)	0.068	0.195
173	14.42	0.87	0.263	(0.160)	0.068	0.195
174	14.50	0.87	0.263	(0.159)	0.068	0.195
175	14.58	0.87	0.263	(0.158)	0.068	0.195
176	14.67	0.87	0.263	(0.158)	0.068	0.195
177	14.75	0.87	0.263	(0.157)	0.068	0.195
178	14.83	0.83	0.253	(0.156)	0.066	0.187
179	14.92	0.83	0.253	(0.155)	0.066	0.187
180	15.00	0.83	0.253	(0.154)	0.066	0.187
181	15.08	0.80	0.243	(0.154)	0.063	0.180
182	15.17	0.80	0.243	(0.153)	0.063	0.180
183	15.25	0.80	0.243	(0.152)	0.063	0.180
184	15.33	0.77	0.233	(0.151)	0.061	0.172
185	15.42	0.77	0.233	(0.150)	0.061	0.172
186	15.50	0.77	0.233	(0.150)	0.061	0.172
187	15.58	0.63	0.192	(0.149)	0.050	0.142
188	15.67	0.63	0.192	(0.148)	0.050	0.142
189	15.75	0.63	0.192	(0.147)	0.050	0.142
190	15.83	0.63	0.192	(0.147)	0.050	0.142
191	15.92	0.63	0.192	(0.146)	0.050	0.142
192	16.00	0.63	0.192	(0.145)	0.050	0.142
193	16.08	0.13	0.040	(0.144)	0.011	0.030
194	16.17	0.13	0.040	(0.144)	0.011	0.030
195	16.25	0.13	0.040	(0.143)	0.011	0.030
196	16.33	0.13	0.040	(0.142)	0.011	0.030
197	16.42	0.13	0.040	(0.141)	0.011	0.030
198	16.50	0.13	0.040	(0.141)	0.011	0.030
199	16.58	0.10	0.030	(0.140)	0.008	0.022
200	16.67	0.10	0.030	(0.139)	0.008	0.022
201	16.75	0.10	0.030	(0.139)	0.008	0.022
202	16.83	0.10	0.030	(0.138)	0.008	0.022
203	16.92	0.10	0.030	(0.137)	0.008	0.022
204	17.00	0.10	0.030	(0.137)	0.008	0.022
205	17.08	0.17	0.051	(0.136)	0.013	0.037
206	17.17	0.17	0.051	(0.135)	0.013	0.037
207	17.25	0.17	0.051	(0.134)	0.013	0.037
208	17.33	0.17	0.051	(0.134)	0.013	0.037
209	17.42	0.17	0.051	(0.133)	0.013	0.037
210	17.50	0.17	0.051	(0.132)	0.013	0.037
211	17.58	0.17	0.051	(0.132)	0.013	0.037
212	17.67	0.17	0.051	(0.131)	0.013	0.037
213	17.75	0.17	0.051	(0.131)	0.013	0.037
214	17.83	0.13	0.040	(0.130)	0.011	0.030
215	17.92	0.13	0.040	(0.129)	0.011	0.030
216	18.00	0.13	0.040	(0.129)	0.011	0.030
217	18.08	0.13	0.040	(0.128)	0.011	0.030
218	18.17	0.13	0.040	(0.127)	0.011	0.030
219	18.25	0.13	0.040	(0.127)	0.011	0.030
220	18.33	0.13	0.040	(0.126)	0.011	0.030
221	18.42	0.13	0.040	(0.125)	0.011	0.030
222	18.50	0.13	0.040	(0.125)	0.011	0.030
223	18.58	0.10	0.030	(0.124)	0.008	0.022
224	18.67	0.10	0.030	(0.124)	0.008	0.022
225	18.75	0.10	0.030	(0.123)	0.008	0.022
226	18.83	0.07	0.020	(0.122)	0.005	0.015
227	18.92	0.07	0.020	(0.122)	0.005	0.015

228	19.00	0.07	0.020	(0.121)	0.005	0.015
229	19.08	0.10	0.030	(0.121)	0.008	0.022
230	19.17	0.10	0.030	(0.120)	0.008	0.022
231	19.25	0.10	0.030	(0.120)	0.008	0.022
232	19.33	0.13	0.040	(0.119)	0.011	0.030
233	19.42	0.13	0.040	(0.118)	0.011	0.030
234	19.50	0.13	0.040	(0.118)	0.011	0.030
235	19.58	0.10	0.030	(0.117)	0.008	0.022
236	19.67	0.10	0.030	(0.117)	0.008	0.022
237	19.75	0.10	0.030	(0.116)	0.008	0.022
238	19.83	0.07	0.020	(0.116)	0.005	0.015
239	19.92	0.07	0.020	(0.115)	0.005	0.015
240	20.00	0.07	0.020	(0.115)	0.005	0.015
241	20.08	0.10	0.030	(0.114)	0.008	0.022
242	20.17	0.10	0.030	(0.114)	0.008	0.022
243	20.25	0.10	0.030	(0.113)	0.008	0.022
244	20.33	0.10	0.030	(0.113)	0.008	0.022
245	20.42	0.10	0.030	(0.112)	0.008	0.022
246	20.50	0.10	0.030	(0.112)	0.008	0.022
247	20.58	0.10	0.030	(0.111)	0.008	0.022
248	20.67	0.10	0.030	(0.111)	0.008	0.022
249	20.75	0.10	0.030	(0.110)	0.008	0.022
250	20.83	0.07	0.020	(0.110)	0.005	0.015
251	20.92	0.07	0.020	(0.110)	0.005	0.015
252	21.00	0.07	0.020	(0.109)	0.005	0.015
253	21.08	0.10	0.030	(0.109)	0.008	0.022
254	21.17	0.10	0.030	(0.108)	0.008	0.022
255	21.25	0.10	0.030	(0.108)	0.008	0.022
256	21.33	0.07	0.020	(0.107)	0.005	0.015
257	21.42	0.07	0.020	(0.107)	0.005	0.015
258	21.50	0.07	0.020	(0.107)	0.005	0.015
259	21.58	0.10	0.030	(0.106)	0.008	0.022
260	21.67	0.10	0.030	(0.106)	0.008	0.022
261	21.75	0.10	0.030	(0.105)	0.008	0.022
262	21.83	0.07	0.020	(0.105)	0.005	0.015
263	21.92	0.07	0.020	(0.105)	0.005	0.015
264	22.00	0.07	0.020	(0.104)	0.005	0.015
265	22.08	0.10	0.030	(0.104)	0.008	0.022
266	22.17	0.10	0.030	(0.104)	0.008	0.022
267	22.25	0.10	0.030	(0.103)	0.008	0.022
268	22.33	0.07	0.020	(0.103)	0.005	0.015
269	22.42	0.07	0.020	(0.103)	0.005	0.015
270	22.50	0.07	0.020	(0.102)	0.005	0.015
271	22.58	0.07	0.020	(0.102)	0.005	0.015
272	22.67	0.07	0.020	(0.102)	0.005	0.015
273	22.75	0.07	0.020	(0.102)	0.005	0.015
274	22.83	0.07	0.020	(0.101)	0.005	0.015
275	22.92	0.07	0.020	(0.101)	0.005	0.015
276	23.00	0.07	0.020	(0.101)	0.005	0.015
277	23.08	0.07	0.020	(0.101)	0.005	0.015
278	23.17	0.07	0.020	(0.100)	0.005	0.015
279	23.25	0.07	0.020	(0.100)	0.005	0.015
280	23.33	0.07	0.020	(0.100)	0.005	0.015
281	23.42	0.07	0.020	(0.100)	0.005	0.015
282	23.50	0.07	0.020	(0.100)	0.005	0.015
283	23.58	0.07	0.020	(0.099)	0.005	0.015
284	23.67	0.07	0.020	(0.099)	0.005	0.015
285	23.75	0.07	0.020	(0.099)	0.005	0.015
286	23.83	0.07	0.020	(0.099)	0.005	0.015
287	23.92	0.07	0.020	(0.099)	0.005	0.015
288	24.00	0.07	0.020	(0.099)	0.005	0.015

(Loss Rate Not Used)

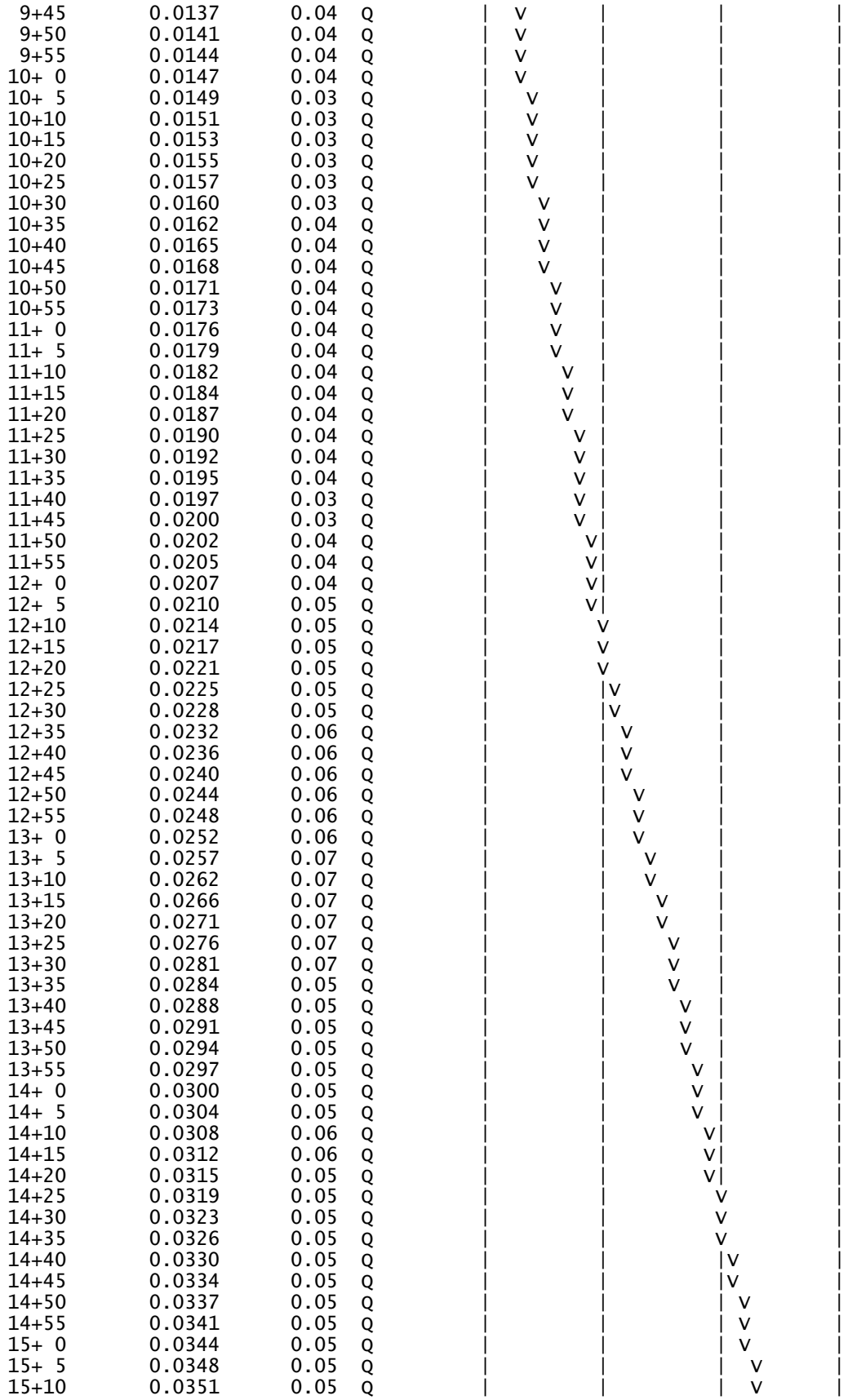
Sum = 100.0 Sum = 22.5

Flood volume = Effective rainfall 1.87(In)
times area 0.3(Ac.)/[(In)/(Ft.)] = 0.0(Ac.Ft)
Total soil loss = 0.66(In)

```
    Total soil loss =     0.015(Ac.Ft)
    Total rainfall =      2.53(In)
    Flood volume =        1834.9 Cubic Feet
    Total soil loss =         644.7 Cubic Feet
    ---------------------------------------------------------------------
     Peak flow rate of this hydrograph =      0.069(CFS)
    ---------------------------------------------------------------------
    +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                        24 - H O U R    S T O R M
                   R u n o f f      H y d r o g r a p h
    ---------------------------------------------------------------------
                Hydrograph in   5   Minute intervals ((CFS))

    ---------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0        2.5       5.0       7.5      10.0
-------------------------------------------------------------------------
  0+ 5       0.0000      0.00  Q          |         |         |         |
  0+10       0.0000      0.00  Q          |         |         |         |
  0+15       0.0001      0.00  Q          |         |         |         |
  0+20       0.0001      0.01  Q          |         |         |         |
  0+25       0.0002      0.01  Q          |         |         |         |
  0+30       0.0002      0.01  Q          |         |         |         |
  0+35       0.0002      0.01  Q          |         |         |         |
  0+40       0.0003      0.01  Q          |         |         |         |
  0+45       0.0003      0.01  Q          |         |         |         |
  0+50       0.0004      0.01  Q          |         |         |         |
  0+55       0.0004      0.01  Q          |         |         |         |
  1+ 0       0.0005      0.01  Q          |         |         |         |
  1+ 5       0.0005      0.01  Q          |         |         |         |
  1+10       0.0006      0.01  Q          |         |         |         |
  1+15       0.0006      0.01  Q          |         |         |         |
  1+20       0.0007      0.01  Q          |         |         |         |
  1+25       0.0007      0.01  Q          |         |         |         |
  1+30       0.0007      0.01  Q          |         |         |         |
  1+35       0.0008      0.01  Q          |         |         |         |
  1+40       0.0008      0.01  Q          |         |         |         |
  1+45       0.0009      0.01  Q          |         |         |         |
  1+50       0.0009      0.01  Q          |         |         |         |
  1+55       0.0010      0.01  Q          |         |         |         |
  2+ 0       0.0010      0.01  Q          |         |         |         |
  2+ 5       0.0011      0.01  QV         |         |         |         |
  2+10       0.0012      0.01  QV         |         |         |         |
  2+15       0.0012      0.01  QV         |         |         |         |
  2+20       0.0013      0.01  QV         |         |         |         |
  2+25       0.0013      0.01  QV         |         |         |         |
  2+30       0.0014      0.01  QV         |         |         |         |
  2+35       0.0014      0.01  QV         |         |         |         |
  2+40       0.0015      0.01  QV         |         |         |         |
  2+45       0.0016      0.01  QV         |         |         |         |
  2+50       0.0017      0.01  QV         |         |         |         |
  2+55       0.0017      0.01  QV         |         |         |         |
  3+ 0       0.0018      0.01  QV         |         |         |         |
  3+ 5       0.0019      0.01  QV         |         |         |         |
  3+10       0.0019      0.01  QV         |         |         |         |
  3+15       0.0020      0.01  QV         |         |         |         |
  3+20       0.0021      0.01  QV         |         |         |         |
  3+25       0.0021      0.01  Q V        |         |         |         |
  3+30       0.0022      0.01  Q V        |         |         |         |
  3+35       0.0023      0.01  Q V        |         |         |         |
  3+40       0.0024      0.01  Q V        |         |         |         |
  3+45       0.0024      0.01  Q V        |         |         |         |
  3+50       0.0025      0.01  Q V        |         |         |         |
  3+55       0.0026      0.01  Q V        |         |         |         |
  4+ 0       0.0027      0.01  Q V        |         |         |         |
  4+ 5       0.0028      0.01  Q V        |         |         |         |
  4+10       0.0028      0.01  Q V        |         |         |         |
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4+15       0.0029      0.01  Q v       |          |          |          |
4+20       0.0030      0.01  Q v       |          |          |          |
4+25       0.0031      0.01  Q v       |          |          |          |
4+30       0.0032      0.01  Q  v      |          |          |          |
4+35       0.0033      0.01  Q  v      |          |          |          |
4+40       0.0034      0.01  Q  v      |          |          |          |
4+45       0.0035      0.01  Q  v      |          |          |          |
4+50       0.0036      0.02  Q  v      |          |          |          |
4+55       0.0037      0.02  Q  v      |          |          |          |
5+ 0       0.0038      0.02  Q  v      |          |          |          |
5+ 5       0.0039      0.01  Q  v      |          |          |          |
5+10       0.0040      0.01  Q  v      |          |          |          |
5+15       0.0041      0.01  Q  v      |          |          |          |
5+20       0.0042      0.01  Q  v      |          |          |          |
5+25       0.0043      0.01  Q   v     |          |          |          |
5+30       0.0044      0.01  Q   v     |          |          |          |
5+35       0.0045      0.02  Q   v     |          |          |          |
5+40       0.0046      0.02  Q   v     |          |          |          |
5+45       0.0047      0.02  Q   v     |          |          |          |
5+50       0.0048      0.02  Q   v     |          |          |          |
5+55       0.0050      0.02  Q   v     |          |          |          |
6+ 0       0.0051      0.02  Q   v     |          |          |          |
6+ 5       0.0052      0.02  Q   v     |          |          |          |
6+10       0.0053      0.02  Q    v    |          |          |          |
6+15       0.0054      0.02  Q    v    |          |          |          |
6+20       0.0056      0.02  Q    v    |          |          |          |
6+25       0.0057      0.02  Q    v    |          |          |          |
6+30       0.0058      0.02  Q    v    |          |          |          |
6+35       0.0060      0.02  Q    v    |          |          |          |
6+40       0.0061      0.02  Q    v    |          |          |          |
6+45       0.0062      0.02  Q    v    |          |          |          |
6+50       0.0064      0.02  Q     v   |          |          |          |
6+55       0.0065      0.02  Q     v   |          |          |          |
7+ 0       0.0067      0.02  Q     v   |          |          |          |
7+ 5       0.0068      0.02  Q     v   |          |          |          |
7+10       0.0069      0.02  Q     v   |          |          |          |
7+15       0.0071      0.02  Q     v   |          |          |          |
7+20       0.0072      0.02  Q     v   |          |          |          |
7+25       0.0074      0.02  Q      v  |          |          |          |
7+30       0.0075      0.02  Q      v  |          |          |          |
7+35       0.0077      0.02  Q      v  |          |          |          |
7+40       0.0079      0.02  Q      v  |          |          |          |
7+45       0.0080      0.02  Q      v  |          |          |          |
7+50       0.0082      0.03  Q      v  |          |          |          |
7+55       0.0084      0.03  Q      v  |          |          |          |
8+ 0       0.0086      0.03  Q       v |          |          |          |
8+ 5       0.0088      0.03  Q       v |          |          |          |
8+10       0.0090      0.03  Q       v |          |          |          |
8+15       0.0092      0.03  Q       v |          |          |          |
8+20       0.0094      0.03  Q       v |          |          |          |
8+25       0.0096      0.03  Q        v|          |          |          |
8+30       0.0099      0.03  Q        v|          |          |          |
8+35       0.0101      0.03  Q        v|          |          |          |
8+40       0.0103      0.03  Q        v|          |          |          |
8+45       0.0105      0.03  Q        v|          |          |          |
8+50       0.0108      0.03  Q         v          |          |          |
8+55       0.0110      0.03  Q         v          |          |          |
9+ 0       0.0112      0.03  Q         v          |          |          |
9+ 5       0.0115      0.04  Q         v          |          |          |
9+10       0.0118      0.04  Q         |v         |          |          |
9+15       0.0120      0.04  Q         |v         |          |          |
9+20       0.0123      0.04  Q         |v         |          |          |
9+25       0.0126      0.04  Q         |v         |          |          |
9+30       0.0129      0.04  Q         | v        |          |          |
9+35       0.0132      0.04  Q         | v        |          |          |
9+40       0.0135      0.04  Q         | v        |          |          |
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15+15	0.0354	0.05	Q	|	|	| V	|
15+20	0.0358	0.05	Q	|	|	| V	|
15+25	0.0361	0.05	Q	|	|	| V	|
15+30	0.0364	0.05	Q	|	|	| V	|
15+35	0.0367	0.04	Q	|	|	| V	|
15+40	0.0370	0.04	Q	|	|	| V	|
15+45	0.0372	0.04	Q	|	|	| V	|
15+50	0.0375	0.04	Q	|	|	| V	|
15+55	0.0378	0.04	Q	|	|	| V	|
16+ 0	0.0380	0.04	Q	|	|	| V	|
16+ 5	0.0381	0.02	Q	|	|	| V	|
16+10	0.0382	0.01	Q	|	|	| V	|
16+15	0.0382	0.01	Q	|	|	| V	|
16+20	0.0383	0.01	Q	|	|	| V	|
16+25	0.0383	0.01	Q	|	|	| V	|
16+30	0.0384	0.01	Q	|	|	| V	|
16+35	0.0384	0.01	Q	|	|	| V	|
16+40	0.0385	0.01	Q	|	|	| V	|
16+45	0.0385	0.01	Q	|	|	| V	|
16+50	0.0386	0.01	Q	|	|	| V	|
16+55	0.0386	0.01	Q	|	|	| V	|
17+ 0	0.0387	0.01	Q	|	|	| V	|
17+ 5	0.0387	0.01	Q	|	|	| V	|
17+10	0.0388	0.01	Q	|	|	| V	|
17+15	0.0389	0.01	Q	|	|	| V	|
17+20	0.0389	0.01	Q	|	|	| V	|
17+25	0.0390	0.01	Q	|	|	| V	|
17+30	0.0391	0.01	Q	|	|	| V	|
17+35	0.0391	0.01	Q	|	|	| V	|
17+40	0.0392	0.01	Q	|	|	| V	|
17+45	0.0393	0.01	Q	|	|	| V	|
17+50	0.0393	0.01	Q	|	|	| V	|
17+55	0.0394	0.01	Q	|	|	| V	|
18+ 0	0.0395	0.01	Q	|	|	| V	|
18+ 5	0.0395	0.01	Q	|	|	| V	|
18+10	0.0396	0.01	Q	|	|	| V	|
18+15	0.0396	0.01	Q	|	|	| V	|
18+20	0.0397	0.01	Q	|	|	| V	|
18+25	0.0397	0.01	Q	|	|	| V	|
18+30	0.0398	0.01	Q	|	|	| V	|
18+35	0.0398	0.01	Q	|	|	| V	|
18+40	0.0399	0.01	Q	|	|	| V	|
18+45	0.0399	0.01	Q	|	|	| V	|
18+50	0.0400	0.00	Q	|	|	| V	|
18+55	0.0400	0.00	Q	|	|	| V	|
19+ 0	0.0400	0.00	Q	|	|	| V	|
19+ 5	0.0401	0.01	Q	|	|	| V	|
19+10	0.0401	0.01	Q	|	|	| V	|
19+15	0.0401	0.01	Q	|	|	| V	|
19+20	0.0402	0.01	Q	|	|	| V	|
19+25	0.0402	0.01	Q	|	|	| V	|
19+30	0.0403	0.01	Q	|	|	| V	|
19+35	0.0403	0.01	Q	|	|	| V	|
19+40	0.0404	0.01	Q	|	|	| V	|
19+45	0.0404	0.01	Q	|	|	| V	|
19+50	0.0405	0.00	Q	|	|	| V	|
19+55	0.0405	0.00	Q	|	|	| V	|
20+ 0	0.0405	0.00	Q	|	|	| V	|
20+ 5	0.0406	0.01	Q	|	|	| V	|
20+10	0.0406	0.01	Q	|	|	| V	|
20+15	0.0406	0.01	Q	|	|	| V	|
20+20	0.0407	0.01	Q	|	|	| V	|
20+25	0.0407	0.01	Q	|	|	| V	|
20+30	0.0408	0.01	Q	|	|	| V	|
20+35	0.0408	0.01	Q	|	|	| V	|
20+40	0.0409	0.01	Q	|	|	| V	|

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  20+45       0.0409      0.01  Q          |          |          |        V |
  20+50       0.0409      0.00  Q          |          |          |        V |
  20+55       0.0410      0.00  Q          |          |          |        V |
  21+ 0       0.0410      0.00  Q          |          |          |        V |
  21+ 5       0.0410      0.01  Q          |          |          |        V |
  21+10       0.0411      0.01  Q          |          |          |        V |
  21+15       0.0411      0.01  Q          |          |          |         V|
  21+20       0.0411      0.00  Q          |          |          |         V|
  21+25       0.0412      0.00  Q          |          |          |         V|
  21+30       0.0412      0.00  Q          |          |          |         V|
  21+35       0.0412      0.01  Q          |          |          |         V|
  21+40       0.0413      0.01  Q          |          |          |         V|
  21+45       0.0413      0.01  Q          |          |          |         V|
  21+50       0.0413      0.00  Q          |          |          |         V|
  21+55       0.0414      0.00  Q          |          |          |         V|
  22+ 0       0.0414      0.00  Q          |          |          |         V|
  22+ 5       0.0414      0.01  Q          |          |          |         V|
  22+10       0.0415      0.01  Q          |          |          |         V|
  22+15       0.0415      0.01  Q          |          |          |         V|
  22+20       0.0416      0.00  Q          |          |          |         V|
  22+25       0.0416      0.00  Q          |          |          |         V|
  22+30       0.0416      0.00  Q          |          |          |         V|
  22+35       0.0416      0.00  Q          |          |          |         V|
  22+40       0.0417      0.00  Q          |          |          |         V|
  22+45       0.0417      0.00  Q          |          |          |         V|
  22+50       0.0417      0.00  Q          |          |          |         V|
  22+55       0.0418      0.00  Q          |          |          |         V|
  23+ 0       0.0418      0.00  Q          |          |          |         V|
  23+ 5       0.0418      0.00  Q          |          |          |         V|
  23+10       0.0418      0.00  Q          |          |          |         V|
  23+15       0.0419      0.00  Q          |          |          |         V|
  23+20       0.0419      0.00  Q          |          |          |         V|
  23+25       0.0419      0.00  Q          |          |          |         V|
  23+30       0.0419      0.00  Q          |          |          |         V|
  23+35       0.0420      0.00  Q          |          |          |         V|
  23+40       0.0420      0.00  Q          |          |          |         V|
  23+45       0.0420      0.00  Q          |          |          |         V|
  23+50       0.0421      0.00  Q          |          |          |         V|
  23+55       0.0421      0.00  Q          |          |          |         V|
  24+ 0       0.0421      0.00  Q          |          |          |         V|
  24+ 5       0.0421      0.00  Q          |          |          |          V
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U n i t H y d r o g r a p h A n a l y s i s

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Study date 09/16/22 File: 2D242.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6545

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

XENIA
PRELIMINARY UNIT HYDROGRAPH ANALYSIS
AREA D2 DEVELOPED CONDITION
2-YEAR

Drainage Area = 14.83(Ac.) = 0.023 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 14.83(Ac.) = 0.023 Sq. Mi.
Length along longest watercourse = 1984.00(Ft.)
Length along longest watercourse measured to centroid = 1188.00(Ft.)
Length along longest watercourse = 0.376 Mi.
Length along longest watercourse measured to centroid = 0.225 Mi.
Difference in elevation = 16.20(Ft.)
Slope along watercourse = 43.1129 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.069 Hr.
Lag time = 4.13 Min.
25% of lag time = 1.03 Min.
40% of lag time = 1.65 Min.
Unit time = 5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
14.83	2.53	37.52

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
14.83	6.50	96.39

STORM EVENT (YEAR) = 2.00
Area Averaged 2-Year Rainfall = 2.530(In)
Area Averaged 100-Year Rainfall = 6.500(In)

Point rain (area averaged) = 2.530(In)
Areal adjustment factor = 100.00 %

Adjusted average point rain = 2.530(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
14.830	56.20	0.708

Total Area Entered = 14.83(Ac.)

RI AMC2	RI AMC-1	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
56.2	36.2	0.704	0.708	0.255	1.000	0.255
					Sum (F) =	0.255

Area averaged mean soil loss (F) (In/Hr) = 0.255
Minimum soil loss rate ((In/Hr)) = 0.128
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.334

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	121.003	25.489	3.810
2	0.167	242.007	48.687	7.277
3	0.250	363.010	13.222	1.976
4	0.333	484.013	5.978	0.893
5	0.417	605.017	3.345	0.500
6	0.500	726.020	1.901	0.284
7	0.583	847.023	1.378	0.206
			Sum = 100.000	Sum= 14.946

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.07	0.020	(0.453)	0.007	0.013
2	0.17	0.07	0.020	(0.451)	0.007	0.013
3	0.25	0.07	0.020	(0.449)	0.007	0.013
4	0.33	0.10	0.030	(0.448)	0.010	0.020
5	0.42	0.10	0.030	(0.446)	0.010	0.020
6	0.50	0.10	0.030	(0.444)	0.010	0.020
7	0.58	0.10	0.030	(0.442)	0.010	0.020
8	0.67	0.10	0.030	(0.441)	0.010	0.020
9	0.75	0.10	0.030	(0.439)	0.010	0.020
10	0.83	0.13	0.040	(0.437)	0.014	0.027
11	0.92	0.13	0.040	(0.436)	0.014	0.027
12	1.00	0.13	0.040	(0.434)	0.014	0.027
13	1.08	0.10	0.030	(0.432)	0.010	0.020
14	1.17	0.10	0.030	(0.430)	0.010	0.020
15	1.25	0.10	0.030	(0.429)	0.010	0.020
16	1.33	0.10	0.030	(0.427)	0.010	0.020
17	1.42	0.10	0.030	(0.425)	0.010	0.020
18	1.50	0.10	0.030	(0.424)	0.010	0.020
19	1.58	0.10	0.030	(0.422)	0.010	0.020
20	1.67	0.10	0.030	(0.420)	0.010	0.020
21	1.75	0.10	0.030	(0.419)	0.010	0.020
22	1.83	0.13	0.040	(0.417)	0.014	0.027
23	1.92	0.13	0.040	(0.415)	0.014	0.027
24	2.00	0.13	0.040	(0.413)	0.014	0.027

25	2.08	0.13	0.040	(0.412)	0.014	0.027
26	2.17	0.13	0.040	(0.410)	0.014	0.027
27	2.25	0.13	0.040	(0.408)	0.014	0.027
28	2.33	0.13	0.040	(0.407)	0.014	0.027
29	2.42	0.13	0.040	(0.405)	0.014	0.027
30	2.50	0.13	0.040	(0.403)	0.014	0.027
31	2.58	0.17	0.051	(0.402)	0.017	0.034
32	2.67	0.17	0.051	(0.400)	0.017	0.034
33	2.75	0.17	0.051	(0.399)	0.017	0.034
34	2.83	0.17	0.051	(0.397)	0.017	0.034
35	2.92	0.17	0.051	(0.395)	0.017	0.034
36	3.00	0.17	0.051	(0.394)	0.017	0.034
37	3.08	0.17	0.051	(0.392)	0.017	0.034
38	3.17	0.17	0.051	(0.390)	0.017	0.034
39	3.25	0.17	0.051	(0.389)	0.017	0.034
40	3.33	0.17	0.051	(0.387)	0.017	0.034
41	3.42	0.17	0.051	(0.386)	0.017	0.034
42	3.50	0.17	0.051	(0.384)	0.017	0.034
43	3.58	0.17	0.051	(0.382)	0.017	0.034
44	3.67	0.17	0.051	(0.381)	0.017	0.034
45	3.75	0.17	0.051	(0.379)	0.017	0.034
46	3.83	0.20	0.061	(0.377)	0.020	0.040
47	3.92	0.20	0.061	(0.376)	0.020	0.040
48	4.00	0.20	0.061	(0.374)	0.020	0.040
49	4.08	0.20	0.061	(0.373)	0.020	0.040
50	4.17	0.20	0.061	(0.371)	0.020	0.040
51	4.25	0.20	0.061	(0.370)	0.020	0.040
52	4.33	0.23	0.071	(0.368)	0.024	0.047
53	4.42	0.23	0.071	(0.366)	0.024	0.047
54	4.50	0.23	0.071	(0.365)	0.024	0.047
55	4.58	0.23	0.071	(0.363)	0.024	0.047
56	4.67	0.23	0.071	(0.362)	0.024	0.047
57	4.75	0.23	0.071	(0.360)	0.024	0.047
58	4.83	0.27	0.081	(0.359)	0.027	0.054
59	4.92	0.27	0.081	(0.357)	0.027	0.054
60	5.00	0.27	0.081	(0.356)	0.027	0.054
61	5.08	0.20	0.061	(0.354)	0.020	0.040
62	5.17	0.20	0.061	(0.352)	0.020	0.040
63	5.25	0.20	0.061	(0.351)	0.020	0.040
64	5.33	0.23	0.071	(0.349)	0.024	0.047
65	5.42	0.23	0.071	(0.348)	0.024	0.047
66	5.50	0.23	0.071	(0.346)	0.024	0.047
67	5.58	0.27	0.081	(0.345)	0.027	0.054
68	5.67	0.27	0.081	(0.343)	0.027	0.054
69	5.75	0.27	0.081	(0.342)	0.027	0.054
70	5.83	0.27	0.081	(0.340)	0.027	0.054
71	5.92	0.27	0.081	(0.339)	0.027	0.054
72	6.00	0.27	0.081	(0.337)	0.027	0.054
73	6.08	0.30	0.091	(0.336)	0.030	0.061
74	6.17	0.30	0.091	(0.334)	0.030	0.061
75	6.25	0.30	0.091	(0.333)	0.030	0.061
76	6.33	0.30	0.091	(0.331)	0.030	0.061
77	6.42	0.30	0.091	(0.330)	0.030	0.061
78	6.50	0.30	0.091	(0.328)	0.030	0.061
79	6.58	0.33	0.101	(0.327)	0.034	0.067
80	6.67	0.33	0.101	(0.325)	0.034	0.067
81	6.75	0.33	0.101	(0.324)	0.034	0.067
82	6.83	0.33	0.101	(0.322)	0.034	0.067
83	6.92	0.33	0.101	(0.321)	0.034	0.067
84	7.00	0.33	0.101	(0.320)	0.034	0.067
85	7.08	0.33	0.101	(0.318)	0.034	0.067
86	7.17	0.33	0.101	(0.317)	0.034	0.067
87	7.25	0.33	0.101	(0.315)	0.034	0.067
88	7.33	0.37	0.111	(0.314)	0.037	0.074
89	7.42	0.37	0.111	(0.312)	0.037	0.074
90	7.50	0.37	0.111	(0.311)	0.037	0.074

91	7.58	0.40	0.121	(0.309)	0.041	0.081
92	7.67	0.40	0.121	(0.308)	0.041	0.081
93	7.75	0.40	0.121	(0.307)	0.041	0.081
94	7.83	0.43	0.132	(0.305)	0.044	0.088
95	7.92	0.43	0.132	(0.304)	0.044	0.088
96	8.00	0.43	0.132	(0.302)	0.044	0.088
97	8.08	0.50	0.152	(0.301)	0.051	0.101
98	8.17	0.50	0.152	(0.300)	0.051	0.101
99	8.25	0.50	0.152	(0.298)	0.051	0.101
100	8.33	0.50	0.152	(0.297)	0.051	0.101
101	8.42	0.50	0.152	(0.295)	0.051	0.101
102	8.50	0.50	0.152	(0.294)	0.051	0.101
103	8.58	0.53	0.162	(0.293)	0.054	0.108
104	8.67	0.53	0.162	(0.291)	0.054	0.108
105	8.75	0.53	0.162	(0.290)	0.054	0.108
106	8.83	0.57	0.172	(0.288)	0.057	0.115
107	8.92	0.57	0.172	(0.287)	0.057	0.115
108	9.00	0.57	0.172	(0.286)	0.057	0.115
109	9.08	0.63	0.192	(0.284)	0.064	0.128
110	9.17	0.63	0.192	(0.283)	0.064	0.128
111	9.25	0.63	0.192	(0.282)	0.064	0.128
112	9.33	0.67	0.202	(0.280)	0.068	0.135
113	9.42	0.67	0.202	(0.279)	0.068	0.135
114	9.50	0.67	0.202	(0.278)	0.068	0.135
115	9.58	0.70	0.213	(0.276)	0.071	0.142
116	9.67	0.70	0.213	(0.275)	0.071	0.142
117	9.75	0.70	0.213	(0.274)	0.071	0.142
118	9.83	0.73	0.223	(0.272)	0.074	0.148
119	9.92	0.73	0.223	(0.271)	0.074	0.148
120	10.00	0.73	0.223	(0.270)	0.074	0.148
121	10.08	0.50	0.152	(0.268)	0.051	0.101
122	10.17	0.50	0.152	(0.267)	0.051	0.101
123	10.25	0.50	0.152	(0.266)	0.051	0.101
124	10.33	0.50	0.152	(0.265)	0.051	0.101
125	10.42	0.50	0.152	(0.263)	0.051	0.101
126	10.50	0.50	0.152	(0.262)	0.051	0.101
127	10.58	0.67	0.202	(0.261)	0.068	0.135
128	10.67	0.67	0.202	(0.259)	0.068	0.135
129	10.75	0.67	0.202	(0.258)	0.068	0.135
130	10.83	0.67	0.202	(0.257)	0.068	0.135
131	10.92	0.67	0.202	(0.256)	0.068	0.135
132	11.00	0.67	0.202	(0.254)	0.068	0.135
133	11.08	0.63	0.192	(0.253)	0.064	0.128
134	11.17	0.63	0.192	(0.252)	0.064	0.128
135	11.25	0.63	0.192	(0.251)	0.064	0.128
136	11.33	0.63	0.192	(0.249)	0.064	0.128
137	11.42	0.63	0.192	(0.248)	0.064	0.128
138	11.50	0.63	0.192	(0.247)	0.064	0.128
139	11.58	0.57	0.172	(0.246)	0.057	0.115
140	11.67	0.57	0.172	(0.245)	0.057	0.115
141	11.75	0.57	0.172	(0.243)	0.057	0.115
142	11.83	0.60	0.182	(0.242)	0.061	0.121
143	11.92	0.60	0.182	(0.241)	0.061	0.121
144	12.00	0.60	0.182	(0.240)	0.061	0.121
145	12.08	0.83	0.253	(0.238)	0.084	0.169
146	12.17	0.83	0.253	(0.237)	0.084	0.169
147	12.25	0.83	0.253	(0.236)	0.084	0.169
148	12.33	0.87	0.263	(0.235)	0.088	0.175
149	12.42	0.87	0.263	(0.234)	0.088	0.175
150	12.50	0.87	0.263	(0.233)	0.088	0.175
151	12.58	0.93	0.283	(0.231)	0.095	0.189
152	12.67	0.93	0.283	(0.230)	0.095	0.189
153	12.75	0.93	0.283	(0.229)	0.095	0.189
154	12.83	0.97	0.293	(0.228)	0.098	0.196
155	12.92	0.97	0.293	(0.227)	0.098	0.196
156	13.00	0.97	0.293	(0.226)	0.098	0.196

157	13.08	1.13	0.344	(0.224)	0.115	0.229
158	13.17	1.13	0.344	(0.223)	0.115	0.229
159	13.25	1.13	0.344	(0.222)	0.115	0.229
160	13.33	1.13	0.344	(0.221)	0.115	0.229
161	13.42	1.13	0.344	(0.220)	0.115	0.229
162	13.50	1.13	0.344	(0.219)	0.115	0.229
163	13.58	0.77	0.233	(0.218)	0.078	0.155
164	13.67	0.77	0.233	(0.217)	0.078	0.155
165	13.75	0.77	0.233	(0.216)	0.078	0.155
166	13.83	0.77	0.233	(0.214)	0.078	0.155
167	13.92	0.77	0.233	(0.213)	0.078	0.155
168	14.00	0.77	0.233	(0.212)	0.078	0.155
169	14.08	0.90	0.273	(0.211)	0.091	0.182
170	14.17	0.90	0.273	(0.210)	0.091	0.182
171	14.25	0.90	0.273	(0.209)	0.091	0.182
172	14.33	0.87	0.263	(0.208)	0.088	0.175
173	14.42	0.87	0.263	(0.207)	0.088	0.175
174	14.50	0.87	0.263	(0.206)	0.088	0.175
175	14.58	0.87	0.263	(0.205)	0.088	0.175
176	14.67	0.87	0.263	(0.204)	0.088	0.175
177	14.75	0.87	0.263	(0.203)	0.088	0.175
178	14.83	0.83	0.253	(0.202)	0.084	0.169
179	14.92	0.83	0.253	(0.201)	0.084	0.169
180	15.00	0.83	0.253	(0.200)	0.084	0.169
181	15.08	0.80	0.243	(0.199)	0.081	0.162
182	15.17	0.80	0.243	(0.198)	0.081	0.162
183	15.25	0.80	0.243	(0.196)	0.081	0.162
184	15.33	0.77	0.233	(0.195)	0.078	0.155
185	15.42	0.77	0.233	(0.194)	0.078	0.155
186	15.50	0.77	0.233	(0.193)	0.078	0.155
187	15.58	0.63	0.192	(0.192)	0.064	0.128
188	15.67	0.63	0.192	(0.192)	0.064	0.128
189	15.75	0.63	0.192	(0.191)	0.064	0.128
190	15.83	0.63	0.192	(0.190)	0.064	0.128
191	15.92	0.63	0.192	(0.189)	0.064	0.128
192	16.00	0.63	0.192	(0.188)	0.064	0.128
193	16.08	0.13	0.040	(0.187)	0.014	0.027
194	16.17	0.13	0.040	(0.186)	0.014	0.027
195	16.25	0.13	0.040	(0.185)	0.014	0.027
196	16.33	0.13	0.040	(0.184)	0.014	0.027
197	16.42	0.13	0.040	(0.183)	0.014	0.027
198	16.50	0.13	0.040	(0.182)	0.014	0.027
199	16.58	0.10	0.030	(0.181)	0.010	0.020
200	16.67	0.10	0.030	(0.180)	0.010	0.020
201	16.75	0.10	0.030	(0.179)	0.010	0.020
202	16.83	0.10	0.030	(0.178)	0.010	0.020
203	16.92	0.10	0.030	(0.177)	0.010	0.020
204	17.00	0.10	0.030	(0.176)	0.010	0.020
205	17.08	0.17	0.051	(0.176)	0.017	0.034
206	17.17	0.17	0.051	(0.175)	0.017	0.034
207	17.25	0.17	0.051	(0.174)	0.017	0.034
208	17.33	0.17	0.051	(0.173)	0.017	0.034
209	17.42	0.17	0.051	(0.172)	0.017	0.034
210	17.50	0.17	0.051	(0.171)	0.017	0.034
211	17.58	0.17	0.051	(0.170)	0.017	0.034
212	17.67	0.17	0.051	(0.170)	0.017	0.034
213	17.75	0.17	0.051	(0.169)	0.017	0.034
214	17.83	0.13	0.040	(0.168)	0.014	0.027
215	17.92	0.13	0.040	(0.167)	0.014	0.027
216	18.00	0.13	0.040	(0.166)	0.014	0.027
217	18.08	0.13	0.040	(0.165)	0.014	0.027
218	18.17	0.13	0.040	(0.165)	0.014	0.027
219	18.25	0.13	0.040	(0.164)	0.014	0.027
220	18.33	0.13	0.040	(0.163)	0.014	0.027
221	18.42	0.13	0.040	(0.162)	0.014	0.027
222	18.50	0.13	0.040	(0.161)	0.014	0.027

223	18.58	0.10	0.030	(0.161)	0.010	0.020
224	18.67	0.10	0.030	(0.160)	0.010	0.020
225	18.75	0.10	0.030	(0.159)	0.010	0.020
226	18.83	0.07	0.020	(0.158)	0.007	0.013
227	18.92	0.07	0.020	(0.158)	0.007	0.013
228	19.00	0.07	0.020	(0.157)	0.007	0.013
229	19.08	0.10	0.030	(0.156)	0.010	0.020
230	19.17	0.10	0.030	(0.155)	0.010	0.020
231	19.25	0.10	0.030	(0.155)	0.010	0.020
232	19.33	0.13	0.040	(0.154)	0.014	0.027
233	19.42	0.13	0.040	(0.153)	0.014	0.027
234	19.50	0.13	0.040	(0.152)	0.014	0.027
235	19.58	0.10	0.030	(0.152)	0.010	0.020
236	19.67	0.10	0.030	(0.151)	0.010	0.020
237	19.75	0.10	0.030	(0.150)	0.010	0.020
238	19.83	0.07	0.020	(0.150)	0.007	0.013
239	19.92	0.07	0.020	(0.149)	0.007	0.013
240	20.00	0.07	0.020	(0.148)	0.007	0.013
241	20.08	0.10	0.030	(0.148)	0.010	0.020
242	20.17	0.10	0.030	(0.147)	0.010	0.020
243	20.25	0.10	0.030	(0.146)	0.010	0.020
244	20.33	0.10	0.030	(0.146)	0.010	0.020
245	20.42	0.10	0.030	(0.145)	0.010	0.020
246	20.50	0.10	0.030	(0.145)	0.010	0.020
247	20.58	0.10	0.030	(0.144)	0.010	0.020
248	20.67	0.10	0.030	(0.143)	0.010	0.020
249	20.75	0.10	0.030	(0.143)	0.010	0.020
250	20.83	0.07	0.020	(0.142)	0.007	0.013
251	20.92	0.07	0.020	(0.142)	0.007	0.013
252	21.00	0.07	0.020	(0.141)	0.007	0.013
253	21.08	0.10	0.030	(0.140)	0.010	0.020
254	21.17	0.10	0.030	(0.140)	0.010	0.020
255	21.25	0.10	0.030	(0.139)	0.010	0.020
256	21.33	0.07	0.020	(0.139)	0.007	0.013
257	21.42	0.07	0.020	(0.138)	0.007	0.013
258	21.50	0.07	0.020	(0.138)	0.007	0.013
259	21.58	0.10	0.030	(0.137)	0.010	0.020
260	21.67	0.10	0.030	(0.137)	0.010	0.020
261	21.75	0.10	0.030	(0.136)	0.010	0.020
262	21.83	0.07	0.020	(0.136)	0.007	0.013
263	21.92	0.07	0.020	(0.135)	0.007	0.013
264	22.00	0.07	0.020	(0.135)	0.007	0.013
265	22.08	0.10	0.030	(0.134)	0.010	0.020
266	22.17	0.10	0.030	(0.134)	0.010	0.020
267	22.25	0.10	0.030	(0.134)	0.010	0.020
268	22.33	0.07	0.020	(0.133)	0.007	0.013
269	22.42	0.07	0.020	(0.133)	0.007	0.013
270	22.50	0.07	0.020	(0.132)	0.007	0.013
271	22.58	0.07	0.020	(0.132)	0.007	0.013
272	22.67	0.07	0.020	(0.132)	0.007	0.013
273	22.75	0.07	0.020	(0.131)	0.007	0.013
274	22.83	0.07	0.020	(0.131)	0.007	0.013
275	22.92	0.07	0.020	(0.131)	0.007	0.013
276	23.00	0.07	0.020	(0.130)	0.007	0.013
277	23.08	0.07	0.020	(0.130)	0.007	0.013
278	23.17	0.07	0.020	(0.130)	0.007	0.013
279	23.25	0.07	0.020	(0.129)	0.007	0.013
280	23.33	0.07	0.020	(0.129)	0.007	0.013
281	23.42	0.07	0.020	(0.129)	0.007	0.013
282	23.50	0.07	0.020	(0.129)	0.007	0.013
283	23.58	0.07	0.020	(0.128)	0.007	0.013
284	23.67	0.07	0.020	(0.128)	0.007	0.013
285	23.75	0.07	0.020	(0.128)	0.007	0.013
286	23.83	0.07	0.020	(0.128)	0.007	0.013
287	23.92	0.07	0.020	(0.128)	0.007	0.013
288	24.00	0.07	0.020	(0.128)	0.007	0.013

(Loss Rate Not Used)
Sum = 100.0 Sum = 20.2
Flood volume = Effective rainfall 1.69(In)
times area 14.8(Ac.)/[(In)/(Ft.)] = 2.1(Ac.Ft)
Total soil loss = 0.84(In)
Total soil loss = 1.043(Ac.Ft)
Total rainfall = 2.53(In)
Flood volume = 90759.2 Cubic Feet
Total soil loss = 45434.1 Cubic Feet

Peak flow rate of this hydrograph = 3.422(CFS)

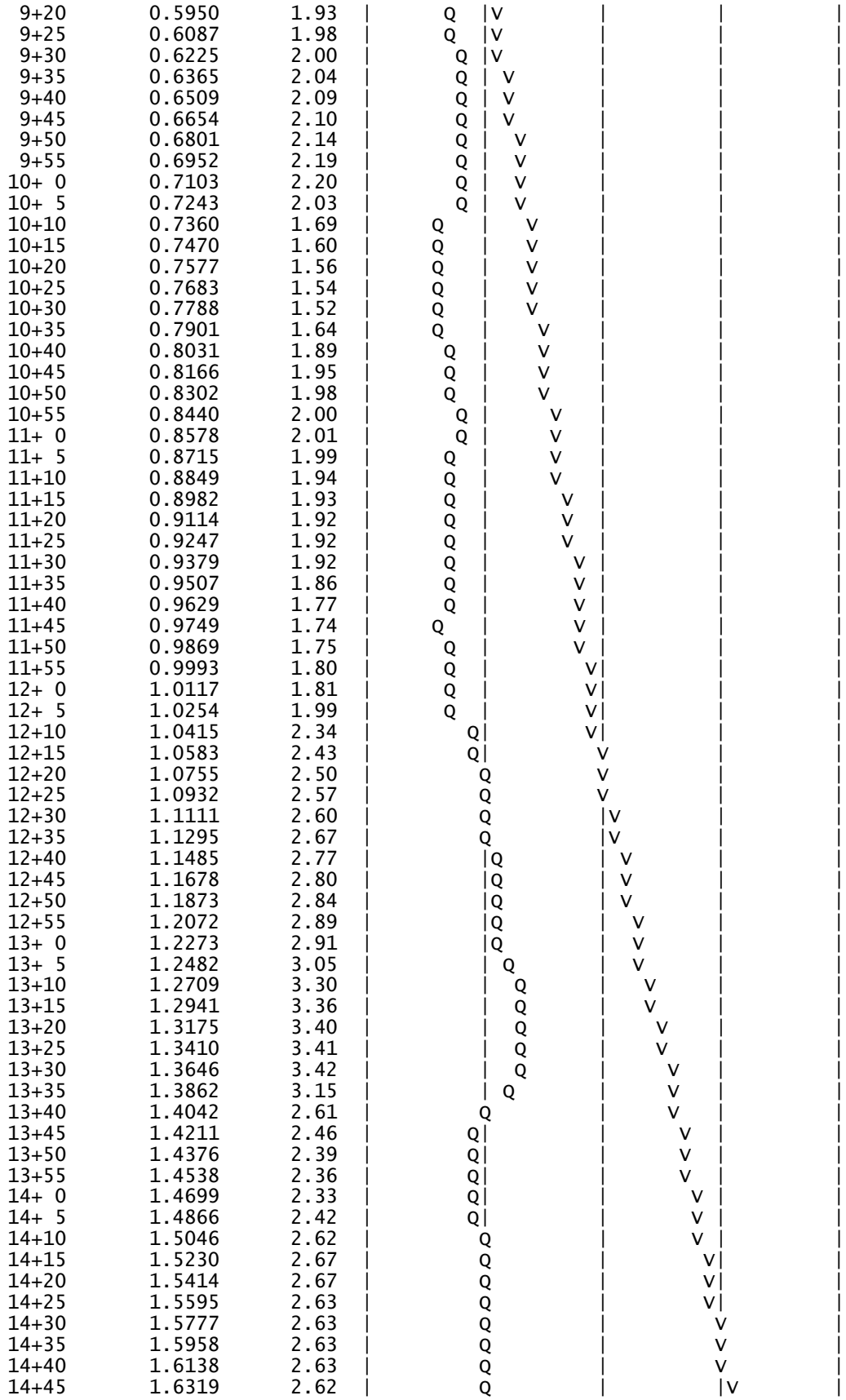
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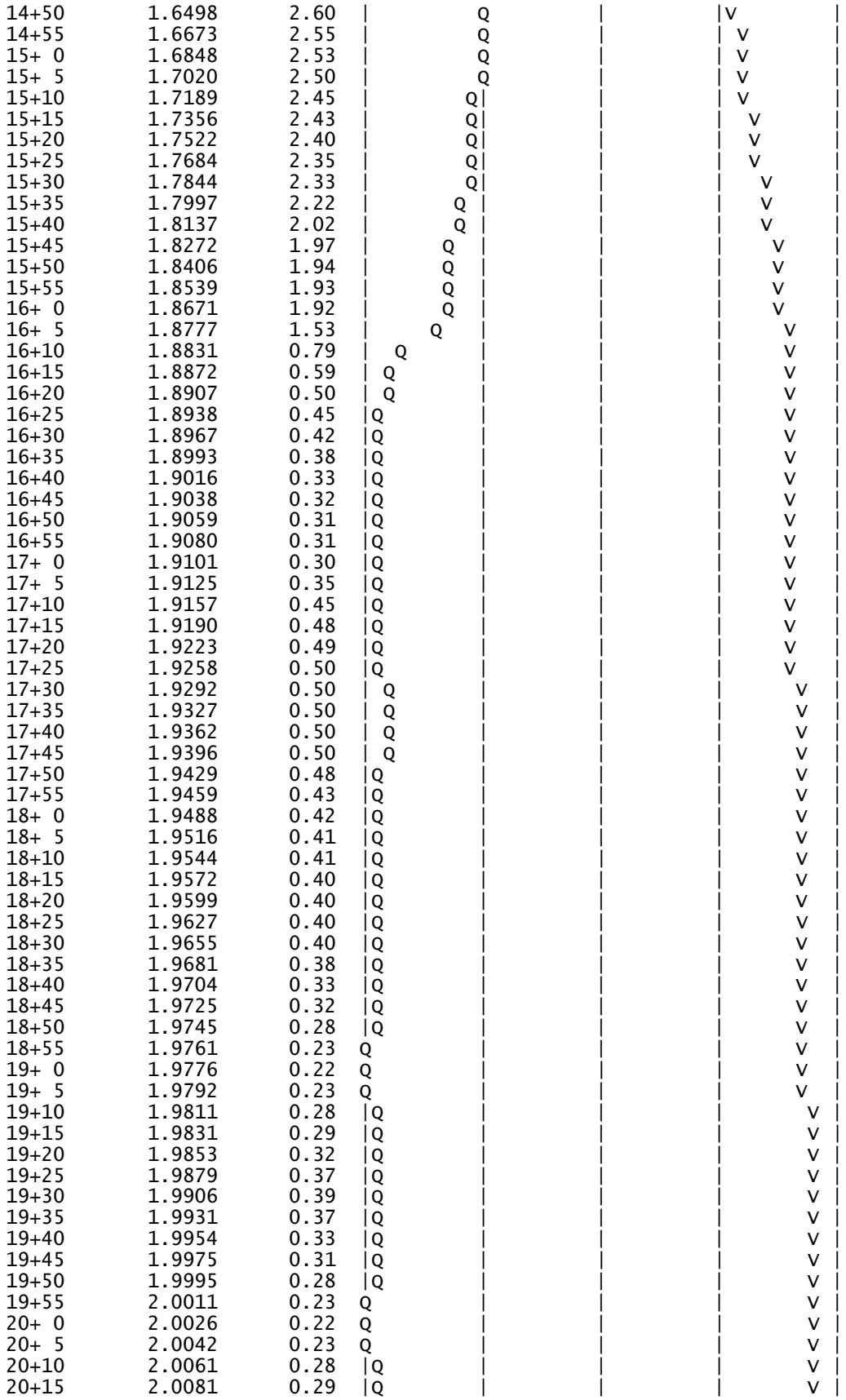
24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0004	0.05	Q				
0+10	0.0014	0.15	Q				
0+15	0.0026	0.18	Q				
0+20	0.0041	0.21	Q				
0+25	0.0059	0.27	VQ				
0+30	0.0079	0.29	VQ				
0+35	0.0099	0.30	VQ				
0+40	0.0120	0.30	VQ				
0+45	0.0141	0.30	VQ				
0+50	0.0163	0.33	VQ				
0+55	0.0189	0.38	VQ				
1+ 0	0.0216	0.39	VQ				
1+ 5	0.0242	0.37	VQ				
1+10	0.0264	0.33	VQ				
1+15	0.0286	0.31	VQ				
1+20	0.0307	0.31	VQ				
1+25	0.0328	0.31	VQ				
1+30	0.0349	0.30	VQ				
1+35	0.0370	0.30	VQ				
1+40	0.0391	0.30	VQ				
1+45	0.0412	0.30	VQ				
1+50	0.0434	0.33	VQ				
1+55	0.0460	0.38	VQ				
2+ 0	0.0487	0.39	VQ				
2+ 5	0.0514	0.40	VQ				
2+10	0.0542	0.40	|Q				
2+15	0.0570	0.40	|Q				
2+20	0.0597	0.40	|Q				
2+25	0.0625	0.40	|Q				
2+30	0.0653	0.40	|Q				
2+35	0.0683	0.43	|Q				
2+40	0.0716	0.48	|Q				
2+45	0.0749	0.49	|Q				
2+50	0.0784	0.50	|Q				
2+55	0.0818	0.50	|VQ				
3+ 0	0.0853	0.50	|VQ				
3+ 5	0.0888	0.50	|VQ				
3+10	0.0922	0.50	|VQ				
3+15	0.0957	0.50	|VQ				
3+20	0.0992	0.50	|VQ				
3+25	0.1026	0.50	|VQ				
3+30	0.1061	0.50	| Q				
3+35	0.1096	0.50	| Q				
3+40	0.1131	0.50	| Q				
3+45	0.1165	0.50	| Q				

3+50	0.1202	0.53	Q				
3+55	0.1242	0.58	Q				
4+ 0	0.1282	0.59	Q				
4+ 5	0.1324	0.60	Q				
4+10	0.1365	0.60	Q				
4+15	0.1407	0.60	Q				
4+20	0.1450	0.63	Q				
4+25	0.1497	0.68	Q				
4+30	0.1545	0.69	Q				
4+35	0.1593	0.70	QV				
4+40	0.1641	0.70	QV				
4+45	0.1690	0.70	QV				
4+50	0.1740	0.73	QV				
4+55	0.1794	0.78	Q				
5+ 0	0.1849	0.79	Q				
5+ 5	0.1900	0.75	QV				
5+10	0.1945	0.65	QV				
5+15	0.1989	0.63	QV				
5+20	0.2033	0.64	QV				
5+25	0.2080	0.69	QV				
5+30	0.2128	0.70	Q V				
5+35	0.2178	0.72	Q V				
5+40	0.2232	0.78	QV				
5+45	0.2286	0.79	QV				
5+50	0.2341	0.80	QV				
5+55	0.2397	0.80	QV				
6+ 0	0.2452	0.81	QV				
6+ 5	0.2509	0.83	QV				
6+10	0.2570	0.88	QV				
6+15	0.2632	0.89	Q V				
6+20	0.2694	0.90	Q V				
6+25	0.2756	0.90	Q V				
6+30	0.2818	0.91	Q V				
6+35	0.2883	0.93	Q V				
6+40	0.2950	0.98	Q V				
6+45	0.3019	1.00	Q V				
6+50	0.3088	1.00	QV				
6+55	0.3157	1.01	Q V				
7+ 0	0.3227	1.01	Q V				
7+ 5	0.3296	1.01	Q V				
7+10	0.3365	1.01	Q V				
7+15	0.3435	1.01	Q V				
7+20	0.3506	1.03	Q V				
7+25	0.3581	1.08	Q V				
7+30	0.3656	1.10	Q V				
7+35	0.3734	1.13	Q V				
7+40	0.3815	1.18	Q V				
7+45	0.3898	1.20	Q V				
7+50	0.3982	1.23	Q V				
7+55	0.4071	1.28	Q V				
8+ 0	0.4160	1.30	Q V				
8+ 5	0.4253	1.36	Q V				
8+10	0.4354	1.46	Q V				
8+15	0.4456	1.49	Q V				
8+20	0.4559	1.50	Q V				
8+25	0.4663	1.51	Q V				
8+30	0.4767	1.51	Q V				
8+35	0.4873	1.54	Q V				
8+40	0.4982	1.59	Q V				
8+45	0.5092	1.60	Q V				
8+50	0.5205	1.63	Q V				
8+55	0.5321	1.68	Q V				
9+ 0	0.5438	1.70	Q V				
9+ 5	0.5559	1.76	Q V				
9+10	0.5687	1.86	Q V				
9+15	0.5817	1.89	Q V				





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  20+20       2.0101      0.30  |Q        |         |         |       V |
  20+25       2.0122      0.30  |Q        |         |         |       V |
  20+30       2.0143      0.30  |Q        |         |         |       V |
  20+35       2.0164      0.30  |Q        |         |         |       V |
  20+40       2.0185      0.30  |Q        |         |         |       V |
  20+45       2.0205      0.30  |Q        |         |         |       V |
  20+50       2.0224      0.28  |Q        |         |         |       V |
  20+55       2.0240      0.23  Q         |         |         |       V |
  21+ 0       2.0255      0.21  Q         |         |         |       V |
  21+ 5       2.0271      0.23  Q         |         |         |       V |
  21+10       2.0290      0.28  |Q        |         |         |       V |
  21+15       2.0310      0.29  |Q        |         |         |       V |
  21+20       2.0329      0.27  |Q        |         |         |        V|
  21+25       2.0344      0.22  Q         |         |         |        V|
  21+30       2.0359      0.21  Q         |         |         |        V|
  21+35       2.0375      0.23  Q         |         |         |        V|
  21+40       2.0394      0.28  |Q        |         |         |        V|
  21+45       2.0414      0.29  |Q        |         |         |        V|
  21+50       2.0433      0.27  |Q        |         |         |        V|
  21+55       2.0449      0.22  Q         |         |         |        V|
  22+ 0       2.0463      0.21  Q         |         |         |        V|
  22+ 5       2.0479      0.23  Q         |         |         |        V|
  22+10       2.0499      0.28  |Q        |         |         |        V|
  22+15       2.0519      0.29  |Q        |         |         |        V|
  22+20       2.0537      0.27  |Q        |         |         |        V|
  22+25       2.0553      0.22  Q         |         |         |        V|
  22+30       2.0567      0.21  Q         |         |         |        V|
  22+35       2.0582      0.21  Q         |         |         |        V|
  22+40       2.0596      0.20  Q         |         |         |        V|
  22+45       2.0610      0.20  Q         |         |         |        V|
  22+50       2.0624      0.20  Q         |         |         |        V|
  22+55       2.0638      0.20  Q         |         |         |        V|
  23+ 0       2.0652      0.20  Q         |         |         |        V|
  23+ 5       2.0665      0.20  Q         |         |         |        V|
  23+10       2.0679      0.20  Q         |         |         |        V|
  23+15       2.0693      0.20  Q         |         |         |        V|
  23+20       2.0707      0.20  Q         |         |         |        V|
  23+25       2.0721      0.20  Q         |         |         |        V|
  23+30       2.0735      0.20  Q         |         |         |        V|
  23+35       2.0749      0.20  Q         |         |         |        V|
  23+40       2.0763      0.20  Q         |         |         |        V|
  23+45       2.0777      0.20  Q         |         |         |        V|
  23+50       2.0790      0.20  Q         |         |         |        V|
  23+55       2.0804      0.20  Q         |         |         |        V|
  24+ 0       2.0818      0.20  Q         |         |         |        V|
  24+ 5       2.0829      0.15  Q         |         |         |        V|
  24+10       2.0832      0.05  Q         |         |         |        V|
  24+15       2.0834      0.03  Q         |         |         |        V|
  24+20       2.0835      0.01  Q         |         |         |        V|
  24+25       2.0835      0.01  Q         |         |         |        V|
  24+30       2.0835      0.00  Q         |         |         |         V
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U n i t H y d r o g r a p h A n a l y s i s

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Study date 09/16/22 File: 3D242.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6545

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

XENIA
PRELIMINARY UNIT HYDROGRAPH ANALYSIS
AREA D3 DEVELOPED CONDITION
2-YEAR

Drainage Area = 0.14(Ac.) = 0.000 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 0.14(Ac.) = 0.000 Sq. Mi.
Length along longest watercourse = 261.00(Ft.)
Length along longest watercourse measured to centroid = 185.00(Ft.)
Length along longest watercourse = 0.049 Mi.
Length along longest watercourse measured to centroid = 0.035 Mi.
Difference in elevation = 4.70(Ft.)
Slope along watercourse = 95.0805 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.014 Hr.
Lag time = 0.81 Min.
25% of lag time = 0.20 Min.
40% of lag time = 0.32 Min.
Unit time = 5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
0.14	2.53	0.35

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
0.14	6.50	0.91

STORM EVENT (YEAR) = 2.00
Area Averaged 2-Year Rainfall = 2.530(In)
Area Averaged 100-Year Rainfall = 6.500(In)

Point rain (area averaged) = 2.530(In)
Areal adjustment factor = 100.00 %

Adjusted average point rain = 2.530(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
0.140	61.00	0.000

Total Area Entered = 0.14(Ac.)

RI AMC2	RI AMC-1	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
61.0	41.0	0.660	0.000	0.660	1.000	0.660
					Sum (F) =	0.660

Area averaged mean soil loss (F) (In/Hr) = 0.660
Minimum soil loss rate ((In/Hr)) = 0.330
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	616.179	75.839	0.107
2	0.167	1232.358	24.161	0.034
			Sum = 100.000 Sum=	0.141

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.07	0.020	(1.170)	0.018	0.002
2	0.17	0.07	0.020	(1.166)	0.018	0.002
3	0.25	0.07	0.020	(1.161)	0.018	0.002
4	0.33	0.10	0.030	(1.157)	0.027	0.003
5	0.42	0.10	0.030	(1.152)	0.027	0.003
6	0.50	0.10	0.030	(1.148)	0.027	0.003
7	0.58	0.10	0.030	(1.143)	0.027	0.003
8	0.67	0.10	0.030	(1.139)	0.027	0.003
9	0.75	0.10	0.030	(1.134)	0.027	0.003
10	0.83	0.13	0.040	(1.130)	0.036	0.004
11	0.92	0.13	0.040	(1.125)	0.036	0.004
12	1.00	0.13	0.040	(1.121)	0.036	0.004
13	1.08	0.10	0.030	(1.117)	0.027	0.003
14	1.17	0.10	0.030	(1.112)	0.027	0.003
15	1.25	0.10	0.030	(1.108)	0.027	0.003
16	1.33	0.10	0.030	(1.103)	0.027	0.003
17	1.42	0.10	0.030	(1.099)	0.027	0.003
18	1.50	0.10	0.030	(1.095)	0.027	0.003
19	1.58	0.10	0.030	(1.090)	0.027	0.003
20	1.67	0.10	0.030	(1.086)	0.027	0.003
21	1.75	0.10	0.030	(1.082)	0.027	0.003
22	1.83	0.13	0.040	(1.077)	0.036	0.004
23	1.92	0.13	0.040	(1.073)	0.036	0.004
24	2.00	0.13	0.040	(1.068)	0.036	0.004
25	2.08	0.13	0.040	(1.064)	0.036	0.004
26	2.17	0.13	0.040	(1.060)	0.036	0.004
27	2.25	0.13	0.040	(1.056)	0.036	0.004
28	2.33	0.13	0.040	(1.051)	0.036	0.004
29	2.42	0.13	0.040	(1.047)	0.036	0.004

30	2.50	0.13	0.040	(1.043)	0.036	0.004
31	2.58	0.17	0.051	(1.038)	0.046	0.005
32	2.67	0.17	0.051	(1.034)	0.046	0.005
33	2.75	0.17	0.051	(1.030)	0.046	0.005
34	2.83	0.17	0.051	(1.026)	0.046	0.005
35	2.92	0.17	0.051	(1.021)	0.046	0.005
36	3.00	0.17	0.051	(1.017)	0.046	0.005
37	3.08	0.17	0.051	(1.013)	0.046	0.005
38	3.17	0.17	0.051	(1.009)	0.046	0.005
39	3.25	0.17	0.051	(1.005)	0.046	0.005
40	3.33	0.17	0.051	(1.000)	0.046	0.005
41	3.42	0.17	0.051	(0.996)	0.046	0.005
42	3.50	0.17	0.051	(0.992)	0.046	0.005
43	3.58	0.17	0.051	(0.988)	0.046	0.005
44	3.67	0.17	0.051	(0.984)	0.046	0.005
45	3.75	0.17	0.051	(0.980)	0.046	0.005
46	3.83	0.20	0.061	(0.975)	0.055	0.006
47	3.92	0.20	0.061	(0.971)	0.055	0.006
48	4.00	0.20	0.061	(0.967)	0.055	0.006
49	4.08	0.20	0.061	(0.963)	0.055	0.006
50	4.17	0.20	0.061	(0.959)	0.055	0.006
51	4.25	0.20	0.061	(0.955)	0.055	0.006
52	4.33	0.23	0.071	(0.951)	0.064	0.007
53	4.42	0.23	0.071	(0.947)	0.064	0.007
54	4.50	0.23	0.071	(0.943)	0.064	0.007
55	4.58	0.23	0.071	(0.939)	0.064	0.007
56	4.67	0.23	0.071	(0.935)	0.064	0.007
57	4.75	0.23	0.071	(0.931)	0.064	0.007
58	4.83	0.27	0.081	(0.927)	0.073	0.008
59	4.92	0.27	0.081	(0.923)	0.073	0.008
60	5.00	0.27	0.081	(0.919)	0.073	0.008
61	5.08	0.20	0.061	(0.915)	0.055	0.006
62	5.17	0.20	0.061	(0.911)	0.055	0.006
63	5.25	0.20	0.061	(0.907)	0.055	0.006
64	5.33	0.23	0.071	(0.903)	0.064	0.007
65	5.42	0.23	0.071	(0.899)	0.064	0.007
66	5.50	0.23	0.071	(0.895)	0.064	0.007
67	5.58	0.27	0.081	(0.891)	0.073	0.008
68	5.67	0.27	0.081	(0.887)	0.073	0.008
69	5.75	0.27	0.081	(0.883)	0.073	0.008
70	5.83	0.27	0.081	(0.879)	0.073	0.008
71	5.92	0.27	0.081	(0.875)	0.073	0.008
72	6.00	0.27	0.081	(0.871)	0.073	0.008
73	6.08	0.30	0.091	(0.868)	0.082	0.009
74	6.17	0.30	0.091	(0.864)	0.082	0.009
75	6.25	0.30	0.091	(0.860)	0.082	0.009
76	6.33	0.30	0.091	(0.856)	0.082	0.009
77	6.42	0.30	0.091	(0.852)	0.082	0.009
78	6.50	0.30	0.091	(0.848)	0.082	0.009
79	6.58	0.33	0.101	(0.845)	0.091	0.010
80	6.67	0.33	0.101	(0.841)	0.091	0.010
81	6.75	0.33	0.101	(0.837)	0.091	0.010
82	6.83	0.33	0.101	(0.833)	0.091	0.010
83	6.92	0.33	0.101	(0.829)	0.091	0.010
84	7.00	0.33	0.101	(0.826)	0.091	0.010
85	7.08	0.33	0.101	(0.822)	0.091	0.010
86	7.17	0.33	0.101	(0.818)	0.091	0.010
87	7.25	0.33	0.101	(0.814)	0.091	0.010
88	7.33	0.37	0.111	(0.811)	0.100	0.011
89	7.42	0.37	0.111	(0.807)	0.100	0.011
90	7.50	0.37	0.111	(0.803)	0.100	0.011
91	7.58	0.40	0.121	(0.800)	0.109	0.012
92	7.67	0.40	0.121	(0.796)	0.109	0.012
93	7.75	0.40	0.121	(0.792)	0.109	0.012
94	7.83	0.43	0.132	(0.789)	0.118	0.013
95	7.92	0.43	0.132	(0.785)	0.118	0.013

96	8.00	0.43	0.132	(0.781)	0.118	0.013
97	8.08	0.50	0.152	(0.778)	0.137	0.015
98	8.17	0.50	0.152	(0.774)	0.137	0.015
99	8.25	0.50	0.152	(0.770)	0.137	0.015
100	8.33	0.50	0.152	(0.767)	0.137	0.015
101	8.42	0.50	0.152	(0.763)	0.137	0.015
102	8.50	0.50	0.152	(0.760)	0.137	0.015
103	8.58	0.53	0.162	(0.756)	0.146	0.016
104	8.67	0.53	0.162	(0.753)	0.146	0.016
105	8.75	0.53	0.162	(0.749)	0.146	0.016
106	8.83	0.57	0.172	(0.746)	0.155	0.017
107	8.92	0.57	0.172	(0.742)	0.155	0.017
108	9.00	0.57	0.172	(0.738)	0.155	0.017
109	9.08	0.63	0.192	(0.735)	0.173	0.019
110	9.17	0.63	0.192	(0.731)	0.173	0.019
111	9.25	0.63	0.192	(0.728)	0.173	0.019
112	9.33	0.67	0.202	(0.725)	0.182	0.020
113	9.42	0.67	0.202	(0.721)	0.182	0.020
114	9.50	0.67	0.202	(0.718)	0.182	0.020
115	9.58	0.70	0.213	(0.714)	0.191	0.021
116	9.67	0.70	0.213	(0.711)	0.191	0.021
117	9.75	0.70	0.213	(0.707)	0.191	0.021
118	9.83	0.73	0.223	(0.704)	0.200	0.022
119	9.92	0.73	0.223	(0.701)	0.200	0.022
120	10.00	0.73	0.223	(0.697)	0.200	0.022
121	10.08	0.50	0.152	(0.694)	0.137	0.015
122	10.17	0.50	0.152	(0.690)	0.137	0.015
123	10.25	0.50	0.152	(0.687)	0.137	0.015
124	10.33	0.50	0.152	(0.684)	0.137	0.015
125	10.42	0.50	0.152	(0.680)	0.137	0.015
126	10.50	0.50	0.152	(0.677)	0.137	0.015
127	10.58	0.67	0.202	(0.674)	0.182	0.020
128	10.67	0.67	0.202	(0.671)	0.182	0.020
129	10.75	0.67	0.202	(0.667)	0.182	0.020
130	10.83	0.67	0.202	(0.664)	0.182	0.020
131	10.92	0.67	0.202	(0.661)	0.182	0.020
132	11.00	0.67	0.202	(0.657)	0.182	0.020
133	11.08	0.63	0.192	(0.654)	0.173	0.019
134	11.17	0.63	0.192	(0.651)	0.173	0.019
135	11.25	0.63	0.192	(0.648)	0.173	0.019
136	11.33	0.63	0.192	(0.645)	0.173	0.019
137	11.42	0.63	0.192	(0.641)	0.173	0.019
138	11.50	0.63	0.192	(0.638)	0.173	0.019
139	11.58	0.57	0.172	(0.635)	0.155	0.017
140	11.67	0.57	0.172	(0.632)	0.155	0.017
141	11.75	0.57	0.172	(0.629)	0.155	0.017
142	11.83	0.60	0.182	(0.626)	0.164	0.018
143	11.92	0.60	0.182	(0.622)	0.164	0.018
144	12.00	0.60	0.182	(0.619)	0.164	0.018
145	12.08	0.83	0.253	(0.616)	0.228	0.025
146	12.17	0.83	0.253	(0.613)	0.228	0.025
147	12.25	0.83	0.253	(0.610)	0.228	0.025
148	12.33	0.87	0.263	(0.607)	0.237	0.026
149	12.42	0.87	0.263	(0.604)	0.237	0.026
150	12.50	0.87	0.263	(0.601)	0.237	0.026
151	12.58	0.93	0.283	(0.598)	0.255	0.028
152	12.67	0.93	0.283	(0.595)	0.255	0.028
153	12.75	0.93	0.283	(0.592)	0.255	0.028
154	12.83	0.97	0.293	(0.589)	0.264	0.029
155	12.92	0.97	0.293	(0.586)	0.264	0.029
156	13.00	0.97	0.293	(0.583)	0.264	0.029
157	13.08	1.13	0.344	(0.580)	0.310	0.034
158	13.17	1.13	0.344	(0.577)	0.310	0.034
159	13.25	1.13	0.344	(0.574)	0.310	0.034
160	13.33	1.13	0.344	(0.571)	0.310	0.034
161	13.42	1.13	0.344	(0.568)	0.310	0.034

162	13.50	1.13	0.344	(0.565)	0.310	0.034
163	13.58	0.77	0.233	(0.563)	0.209	0.023
164	13.67	0.77	0.233	(0.560)	0.209	0.023
165	13.75	0.77	0.233	(0.557)	0.209	0.023
166	13.83	0.77	0.233	(0.554)	0.209	0.023
167	13.92	0.77	0.233	(0.551)	0.209	0.023
168	14.00	0.77	0.233	(0.548)	0.209	0.023
169	14.08	0.90	0.273	(0.546)	0.246	0.027
170	14.17	0.90	0.273	(0.543)	0.246	0.027
171	14.25	0.90	0.273	(0.540)	0.246	0.027
172	14.33	0.87	0.263	(0.537)	0.237	0.026
173	14.42	0.87	0.263	(0.535)	0.237	0.026
174	14.50	0.87	0.263	(0.532)	0.237	0.026
175	14.58	0.87	0.263	(0.529)	0.237	0.026
176	14.67	0.87	0.263	(0.526)	0.237	0.026
177	14.75	0.87	0.263	(0.524)	0.237	0.026
178	14.83	0.83	0.253	(0.521)	0.228	0.025
179	14.92	0.83	0.253	(0.518)	0.228	0.025
180	15.00	0.83	0.253	(0.516)	0.228	0.025
181	15.08	0.80	0.243	(0.513)	0.219	0.024
182	15.17	0.80	0.243	(0.510)	0.219	0.024
183	15.25	0.80	0.243	(0.508)	0.219	0.024
184	15.33	0.77	0.233	(0.505)	0.209	0.023
185	15.42	0.77	0.233	(0.503)	0.209	0.023
186	15.50	0.77	0.233	(0.500)	0.209	0.023
187	15.58	0.63	0.192	(0.497)	0.173	0.019
188	15.67	0.63	0.192	(0.495)	0.173	0.019
189	15.75	0.63	0.192	(0.492)	0.173	0.019
190	15.83	0.63	0.192	(0.490)	0.173	0.019
191	15.92	0.63	0.192	(0.487)	0.173	0.019
192	16.00	0.63	0.192	(0.485)	0.173	0.019
193	16.08	0.13	0.040	(0.482)	0.036	0.004
194	16.17	0.13	0.040	(0.480)	0.036	0.004
195	16.25	0.13	0.040	(0.477)	0.036	0.004
196	16.33	0.13	0.040	(0.475)	0.036	0.004
197	16.42	0.13	0.040	(0.473)	0.036	0.004
198	16.50	0.13	0.040	(0.470)	0.036	0.004
199	16.58	0.10	0.030	(0.468)	0.027	0.003
200	16.67	0.10	0.030	(0.465)	0.027	0.003
201	16.75	0.10	0.030	(0.463)	0.027	0.003
202	16.83	0.10	0.030	(0.461)	0.027	0.003
203	16.92	0.10	0.030	(0.458)	0.027	0.003
204	17.00	0.10	0.030	(0.456)	0.027	0.003
205	17.08	0.17	0.051	(0.454)	0.046	0.005
206	17.17	0.17	0.051	(0.451)	0.046	0.005
207	17.25	0.17	0.051	(0.449)	0.046	0.005
208	17.33	0.17	0.051	(0.447)	0.046	0.005
209	17.42	0.17	0.051	(0.445)	0.046	0.005
210	17.50	0.17	0.051	(0.442)	0.046	0.005
211	17.58	0.17	0.051	(0.440)	0.046	0.005
212	17.67	0.17	0.051	(0.438)	0.046	0.005
213	17.75	0.17	0.051	(0.436)	0.046	0.005
214	17.83	0.13	0.040	(0.434)	0.036	0.004
215	17.92	0.13	0.040	(0.432)	0.036	0.004
216	18.00	0.13	0.040	(0.429)	0.036	0.004
217	18.08	0.13	0.040	(0.427)	0.036	0.004
218	18.17	0.13	0.040	(0.425)	0.036	0.004
219	18.25	0.13	0.040	(0.423)	0.036	0.004
220	18.33	0.13	0.040	(0.421)	0.036	0.004
221	18.42	0.13	0.040	(0.419)	0.036	0.004
222	18.50	0.13	0.040	(0.417)	0.036	0.004
223	18.58	0.10	0.030	(0.415)	0.027	0.003
224	18.67	0.10	0.030	(0.413)	0.027	0.003
225	18.75	0.10	0.030	(0.411)	0.027	0.003
226	18.83	0.07	0.020	(0.409)	0.018	0.002
227	18.92	0.07	0.020	(0.407)	0.018	0.002

228	19.00	0.07	0.020	(0.405)	0.018	0.002
229	19.08	0.10	0.030	(0.403)	0.027	0.003
230	19.17	0.10	0.030	(0.401)	0.027	0.003
231	19.25	0.10	0.030	(0.399)	0.027	0.003
232	19.33	0.13	0.040	(0.398)	0.036	0.004
233	19.42	0.13	0.040	(0.396)	0.036	0.004
234	19.50	0.13	0.040	(0.394)	0.036	0.004
235	19.58	0.10	0.030	(0.392)	0.027	0.003
236	19.67	0.10	0.030	(0.390)	0.027	0.003
237	19.75	0.10	0.030	(0.389)	0.027	0.003
238	19.83	0.07	0.020	(0.387)	0.018	0.002
239	19.92	0.07	0.020	(0.385)	0.018	0.002
240	20.00	0.07	0.020	(0.383)	0.018	0.002
241	20.08	0.10	0.030	(0.382)	0.027	0.003
242	20.17	0.10	0.030	(0.380)	0.027	0.003
243	20.25	0.10	0.030	(0.378)	0.027	0.003
244	20.33	0.10	0.030	(0.377)	0.027	0.003
245	20.42	0.10	0.030	(0.375)	0.027	0.003
246	20.50	0.10	0.030	(0.374)	0.027	0.003
247	20.58	0.10	0.030	(0.372)	0.027	0.003
248	20.67	0.10	0.030	(0.370)	0.027	0.003
249	20.75	0.10	0.030	(0.369)	0.027	0.003
250	20.83	0.07	0.020	(0.367)	0.018	0.002
251	20.92	0.07	0.020	(0.366)	0.018	0.002
252	21.00	0.07	0.020	(0.364)	0.018	0.002
253	21.08	0.10	0.030	(0.363)	0.027	0.003
254	21.17	0.10	0.030	(0.362)	0.027	0.003
255	21.25	0.10	0.030	(0.360)	0.027	0.003
256	21.33	0.07	0.020	(0.359)	0.018	0.002
257	21.42	0.07	0.020	(0.357)	0.018	0.002
258	21.50	0.07	0.020	(0.356)	0.018	0.002
259	21.58	0.10	0.030	(0.355)	0.027	0.003
260	21.67	0.10	0.030	(0.353)	0.027	0.003
261	21.75	0.10	0.030	(0.352)	0.027	0.003
262	21.83	0.07	0.020	(0.351)	0.018	0.002
263	21.92	0.07	0.020	(0.350)	0.018	0.002
264	22.00	0.07	0.020	(0.349)	0.018	0.002
265	22.08	0.10	0.030	(0.347)	0.027	0.003
266	22.17	0.10	0.030	(0.346)	0.027	0.003
267	22.25	0.10	0.030	(0.345)	0.027	0.003
268	22.33	0.07	0.020	(0.344)	0.018	0.002
269	22.42	0.07	0.020	(0.343)	0.018	0.002
270	22.50	0.07	0.020	(0.342)	0.018	0.002
271	22.58	0.07	0.020	(0.341)	0.018	0.002
272	22.67	0.07	0.020	(0.340)	0.018	0.002
273	22.75	0.07	0.020	(0.339)	0.018	0.002
274	22.83	0.07	0.020	(0.338)	0.018	0.002
275	22.92	0.07	0.020	(0.337)	0.018	0.002
276	23.00	0.07	0.020	(0.337)	0.018	0.002
277	23.08	0.07	0.020	(0.336)	0.018	0.002
278	23.17	0.07	0.020	(0.335)	0.018	0.002
279	23.25	0.07	0.020	(0.334)	0.018	0.002
280	23.33	0.07	0.020	(0.334)	0.018	0.002
281	23.42	0.07	0.020	(0.333)	0.018	0.002
282	23.50	0.07	0.020	(0.332)	0.018	0.002
283	23.58	0.07	0.020	(0.332)	0.018	0.002
284	23.67	0.07	0.020	(0.331)	0.018	0.002
285	23.75	0.07	0.020	(0.331)	0.018	0.002
286	23.83	0.07	0.020	(0.331)	0.018	0.002
287	23.92	0.07	0.020	(0.330)	0.018	0.002
288	24.00	0.07	0.020	(0.330)	0.018	0.002

(Loss Rate Not Used)

Sum = 100.0 Sum = 3.0

Flood volume = Effective rainfall 0.25(In)
times area 0.1(Ac.)/[(In)/(Ft.)] = 0.0(Ac.Ft)
Total soil loss = 2.28(In)

```
    Total soil loss =     0.027(Ac.Ft)
    Total rainfall =      2.53(In)
    Flood volume =         128.6 Cubic Feet
    Total soil loss =        1157.2 Cubic Feet
    ---------------------------------------------------------------------
     Peak flow rate of this hydrograph =      0.005(CFS)
    ---------------------------------------------------------------------
    +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                        24 - H O U R    S T O R M
                   R u n o f f      H y d r o g r a p h
    ---------------------------------------------------------------------
                Hydrograph in   5   Minute intervals ((CFS))

    ---------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0        2.5       5.0       7.5      10.0
---------------------------------------------------------------------------
  0+ 5       0.0000      0.00  Q          |         |         |         |
  0+10       0.0000      0.00  Q          |         |         |         |
  0+15       0.0000      0.00  Q          |         |         |         |
  0+20       0.0000      0.00  Q          |         |         |         |
  0+25       0.0000      0.00  Q          |         |         |         |
  0+30       0.0000      0.00  Q          |         |         |         |
  0+35       0.0000      0.00  Q          |         |         |         |
  0+40       0.0000      0.00  Q          |         |         |         |
  0+45       0.0000      0.00  Q          |         |         |         |
  0+50       0.0000      0.00  Q          |         |         |         |
  0+55       0.0000      0.00  Q          |         |         |         |
  1+ 0       0.0000      0.00  Q          |         |         |         |
  1+ 5       0.0000      0.00  Q          |         |         |         |
  1+10       0.0000      0.00  Q          |         |         |         |
  1+15       0.0000      0.00  Q          |         |         |         |
  1+20       0.0000      0.00  Q          |         |         |         |
  1+25       0.0000      0.00  Q          |         |         |         |
  1+30       0.0001      0.00  Q          |         |         |         |
  1+35       0.0001      0.00  Q          |         |         |         |
  1+40       0.0001      0.00  Q          |         |         |         |
  1+45       0.0001      0.00  Q          |         |         |         |
  1+50       0.0001      0.00  Q          |         |         |         |
  1+55       0.0001      0.00  Q          |         |         |         |
  2+ 0       0.0001      0.00  Q          |         |         |         |
  2+ 5       0.0001      0.00  QV         |         |         |         |
  2+10       0.0001      0.00  QV         |         |         |         |
  2+15       0.0001      0.00  QV         |         |         |         |
  2+20       0.0001      0.00  QV         |         |         |         |
  2+25       0.0001      0.00  QV         |         |         |         |
  2+30       0.0001      0.00  QV         |         |         |         |
  2+35       0.0001      0.00  QV         |         |         |         |
  2+40       0.0001      0.00  QV         |         |         |         |
  2+45       0.0001      0.00  QV         |         |         |         |
  2+50       0.0001      0.00  QV         |         |         |         |
  2+55       0.0001      0.00  QV         |         |         |         |
  3+ 0       0.0001      0.00  QV         |         |         |         |
  3+ 5       0.0001      0.00  QV         |         |         |         |
  3+10       0.0001      0.00  QV         |         |         |         |
  3+15       0.0001      0.00  QV         |         |         |         |
  3+20       0.0001      0.00  QV         |         |         |         |
  3+25       0.0002      0.00  Q V        |         |         |         |
  3+30       0.0002      0.00  Q V        |         |         |         |
  3+35       0.0002      0.00  Q V        |         |         |         |
  3+40       0.0002      0.00  Q V        |         |         |         |
  3+45       0.0002      0.00  Q V        |         |         |         |
  3+50       0.0002      0.00  Q V        |         |         |         |
  3+55       0.0002      0.00  Q V        |         |         |         |
  4+ 0       0.0002      0.00  Q V        |         |         |         |
  4+ 5       0.0002      0.00  Q V        |         |         |         |
  4+10       0.0002      0.00  Q V        |         |         |         |
```

```
4+15       0.0002      0.00  Q V       |          |          |          |
4+20       0.0002      0.00  Q V       |          |          |          |
4+25       0.0002      0.00  Q V       |          |          |          |
4+30       0.0002      0.00  Q  V      |          |          |          |
4+35       0.0002      0.00  Q  V      |          |          |          |
4+40       0.0002      0.00  Q  V      |          |          |          |
4+45       0.0002      0.00  Q  V      |          |          |          |
4+50       0.0003      0.00  Q  V      |          |          |          |
4+55       0.0003      0.00  Q  V      |          |          |          |
5+ 0       0.0003      0.00  Q  V      |          |          |          |
5+ 5       0.0003      0.00  Q  V      |          |          |          |
5+10       0.0003      0.00  Q  V      |          |          |          |
5+15       0.0003      0.00  Q  V      |          |          |          |
5+20       0.0003      0.00  Q  V      |          |          |          |
5+25       0.0003      0.00  Q   V     |          |          |          |
5+30       0.0003      0.00  Q   V     |          |          |          |
5+35       0.0003      0.00  Q   V     |          |          |          |
5+40       0.0003      0.00  Q   V     |          |          |          |
5+45       0.0003      0.00  Q   V     |          |          |          |
5+50       0.0003      0.00  Q   V     |          |          |          |
5+55       0.0003      0.00  Q   V     |          |          |          |
6+ 0       0.0004      0.00  Q   V     |          |          |          |
6+ 5       0.0004      0.00  Q   V     |          |          |          |
6+10       0.0004      0.00  Q    V    |          |          |          |
6+15       0.0004      0.00  Q    V    |          |          |          |
6+20       0.0004      0.00  Q    V    |          |          |          |
6+25       0.0004      0.00  Q    V    |          |          |          |
6+30       0.0004      0.00  Q    V    |          |          |          |
6+35       0.0004      0.00  Q    V    |          |          |          |
6+40       0.0004      0.00  Q    V    |          |          |          |
6+45       0.0004      0.00  Q    V    |          |          |          |
6+50       0.0004      0.00  Q     V   |          |          |          |
6+55       0.0005      0.00  Q     V   |          |          |          |
7+ 0       0.0005      0.00  Q     V   |          |          |          |
7+ 5       0.0005      0.00  Q     V   |          |          |          |
7+10       0.0005      0.00  Q     V   |          |          |          |
7+15       0.0005      0.00  Q     V   |          |          |          |
7+20       0.0005      0.00  Q     V   |          |          |          |
7+25       0.0005      0.00  Q      V  |          |          |          |
7+30       0.0005      0.00  Q      V  |          |          |          |
7+35       0.0005      0.00  Q      V  |          |          |          |
7+40       0.0006      0.00  Q      V  |          |          |          |
7+45       0.0006      0.00  Q      V  |          |          |          |
7+50       0.0006      0.00  Q      V  |          |          |          |
7+55       0.0006      0.00  Q      V  |          |          |          |
8+ 0       0.0006      0.00  Q       V |          |          |          |
8+ 5       0.0006      0.00  Q       V |          |          |          |
8+10       0.0006      0.00  Q       V |          |          |          |
8+15       0.0006      0.00  Q       V |          |          |          |
8+20       0.0007      0.00  Q       V |          |          |          |
8+25       0.0007      0.00  Q        V|          |          |          |
8+30       0.0007      0.00  Q        V|          |          |          |
8+35       0.0007      0.00  Q        V|          |          |          |
8+40       0.0007      0.00  Q        V|          |          |          |
8+45       0.0007      0.00  Q        V|          |          |          |
8+50       0.0008      0.00  Q         V          |          |          |
8+55       0.0008      0.00  Q         V          |          |          |
9+ 0       0.0008      0.00  Q         V          |          |          |
9+ 5       0.0008      0.00  Q         V          |          |          |
9+10       0.0008      0.00  Q         |V         |          |          |
9+15       0.0008      0.00  Q         |V         |          |          |
9+20       0.0009      0.00  Q         |V         |          |          |
9+25       0.0009      0.00  Q         |V         |          |          |
9+30       0.0009      0.00  Q         | V        |          |          |
9+35       0.0009      0.00  Q         | V        |          |          |
9+40       0.0009      0.00  Q         | V        |          |          |
```

```
 9+45       0.0010      0.00  Q        |  V      |         |         |
 9+50       0.0010      0.00  Q        |  V      |         |         |
 9+55       0.0010      0.00  Q        |  V      |         |         |
10+ 0       0.0010      0.00  Q        |  V      |         |         |
10+ 5       0.0010      0.00  Q        |   V     |         |         |
10+10       0.0011      0.00  Q        |   V     |         |         |
10+15       0.0011      0.00  Q        |   V     |         |         |
10+20       0.0011      0.00  Q        |   V     |         |         |
10+25       0.0011      0.00  Q        |   V     |         |         |
10+30       0.0011      0.00  Q        |    V    |         |         |
10+35       0.0011      0.00  Q        |    V    |         |         |
10+40       0.0012      0.00  Q        |    V    |         |         |
10+45       0.0012      0.00  Q        |    V    |         |         |
10+50       0.0012      0.00  Q        |     V   |         |         |
10+55       0.0012      0.00  Q        |     V   |         |         |
11+ 0       0.0012      0.00  Q        |     V   |         |         |
11+ 5       0.0013      0.00  Q        |     V   |         |         |
11+10       0.0013      0.00  Q        |      V  |         |         |
11+15       0.0013      0.00  Q        |      V  |         |         |
11+20       0.0013      0.00  Q        |      V  |         |         |
11+25       0.0013      0.00  Q        |       V |         |         |
11+30       0.0013      0.00  Q        |       V |         |         |
11+35       0.0014      0.00  Q        |       V |         |         |
11+40       0.0014      0.00  Q        |       V |         |         |
11+45       0.0014      0.00  Q        |       V |         |         |
11+50       0.0014      0.00  Q        |        V|         |         |
11+55       0.0014      0.00  Q        |        V|         |         |
12+ 0       0.0015      0.00  Q        |        V|         |         |
12+ 5       0.0015      0.00  Q        |        V|         |         |
12+10       0.0015      0.00  Q        |         V         |         |
12+15       0.0015      0.00  Q        |         V         |         |
12+20       0.0015      0.00  Q        |         V         |         |
12+25       0.0016      0.00  Q        |         |V        |         |
12+30       0.0016      0.00  Q        |         |V        |         |
12+35       0.0016      0.00  Q        |         | V       |         |
12+40       0.0017      0.00  Q        |         | V       |         |
12+45       0.0017      0.00  Q        |         | V       |         |
12+50       0.0017      0.00  Q        |         |  V      |         |
12+55       0.0017      0.00  Q        |         |  V      |         |
13+ 0       0.0018      0.00  Q        |         |  V      |         |
13+ 5       0.0018      0.00  Q        |         |   V     |         |
13+10       0.0018      0.00  Q        |         |   V     |         |
13+15       0.0019      0.00  Q        |         |    V    |         |
13+20       0.0019      0.00  Q        |         |    V    |         |
13+25       0.0019      0.00  Q        |         |     V   |         |
13+30       0.0020      0.00  Q        |         |     V   |         |
13+35       0.0020      0.00  Q        |         |     V   |         |
13+40       0.0020      0.00  Q        |         |      V  |         |
13+45       0.0020      0.00  Q        |         |      V  |         |
13+50       0.0021      0.00  Q        |         |      V  |         |
13+55       0.0021      0.00  Q        |         |       V |         |
14+ 0       0.0021      0.00  Q        |         |       V |         |
14+ 5       0.0021      0.00  Q        |         |       V |         |
14+10       0.0022      0.00  Q        |         |        V|         |
14+15       0.0022      0.00  Q        |         |        V|         |
14+20       0.0022      0.00  Q        |         |        V|         |
14+25       0.0022      0.00  Q        |         |         V         |
14+30       0.0023      0.00  Q        |         |         V         |
14+35       0.0023      0.00  Q        |         |         V         |
14+40       0.0023      0.00  Q        |         |         |V        |
14+45       0.0023      0.00  Q        |         |         |V        |
14+50       0.0024      0.00  Q        |         |         | V       |
14+55       0.0024      0.00  Q        |         |         | V       |
15+ 0       0.0024      0.00  Q        |         |         | V       |
15+ 5       0.0024      0.00  Q        |         |         |  V      |
15+10       0.0025      0.00  Q        |         |         |  V      |
```

15+15	0.0025	0.00	Q	|	|	| V	|
15+20	0.0025	0.00	Q	|	|	| V	|
15+25	0.0025	0.00	Q	|	|	| V	|
15+30	0.0026	0.00	Q	|	|	| V	|
15+35	0.0026	0.00	Q	|	|	| V	|
15+40	0.0026	0.00	Q	|	|	| V	|
15+45	0.0026	0.00	Q	|	|	| V	|
15+50	0.0026	0.00	Q	|	|	| V	|
15+55	0.0026	0.00	Q	|	|	| V	|
16+ 0	0.0027	0.00	Q	|	|	| V	|
16+ 5	0.0027	0.00	Q	|	|	| V	|
16+10	0.0027	0.00	Q	|	|	| V	|
16+15	0.0027	0.00	Q	|	|	| V	|
16+20	0.0027	0.00	Q	|	|	| V	|
16+25	0.0027	0.00	Q	|	|	| V	|
16+30	0.0027	0.00	Q	|	|	| V	|
16+35	0.0027	0.00	Q	|	|	| V	|
16+40	0.0027	0.00	Q	|	|	| V	|
16+45	0.0027	0.00	Q	|	|	| V	|
16+50	0.0027	0.00	Q	|	|	| V	|
16+55	0.0027	0.00	Q	|	|	| V	|
17+ 0	0.0027	0.00	Q	|	|	| V	|
17+ 5	0.0027	0.00	Q	|	|	| V	|
17+10	0.0027	0.00	Q	|	|	| V	|
17+15	0.0027	0.00	Q	|	|	| V	|
17+20	0.0027	0.00	Q	|	|	| V	|
17+25	0.0027	0.00	Q	|	|	| V	|
17+30	0.0027	0.00	Q	|	|	| V	|
17+35	0.0027	0.00	Q	|	|	| V	|
17+40	0.0027	0.00	Q	|	|	| V	|
17+45	0.0028	0.00	Q	|	|	| V	|
17+50	0.0028	0.00	Q	|	|	| V	|
17+55	0.0028	0.00	Q	|	|	| V	|
18+ 0	0.0028	0.00	Q	|	|	| V	|
18+ 5	0.0028	0.00	Q	|	|	| V	|
18+10	0.0028	0.00	Q	|	|	| V	|
18+15	0.0028	0.00	Q	|	|	| V	|
18+20	0.0028	0.00	Q	|	|	| V	|
18+25	0.0028	0.00	Q	|	|	| V	|
18+30	0.0028	0.00	Q	|	|	| V	|
18+35	0.0028	0.00	Q	|	|	| V	|
18+40	0.0028	0.00	Q	|	|	| V	|
18+45	0.0028	0.00	Q	|	|	| V	|
18+50	0.0028	0.00	Q	|	|	| V	|
18+55	0.0028	0.00	Q	|	|	| V	|
19+ 0	0.0028	0.00	Q	|	|	| V	|
19+ 5	0.0028	0.00	Q	|	|	| V	|
19+10	0.0028	0.00	Q	|	|	| V	|
19+15	0.0028	0.00	Q	|	|	| V	|
19+20	0.0028	0.00	Q	|	|	| V	|
19+25	0.0028	0.00	Q	|	|	| V	|
19+30	0.0028	0.00	Q	|	|	| V	|
19+35	0.0028	0.00	Q	|	|	| V	|
19+40	0.0028	0.00	Q	|	|	| V	|
19+45	0.0028	0.00	Q	|	|	| V	|
19+50	0.0028	0.00	Q	|	|	| V	|
19+55	0.0028	0.00	Q	|	|	| V	|
20+ 0	0.0028	0.00	Q	|	|	| V	|
20+ 5	0.0028	0.00	Q	|	|	| V	|
20+10	0.0028	0.00	Q	|	|	| V	|
20+15	0.0028	0.00	Q	|	|	| V	|
20+20	0.0029	0.00	Q	|	|	| V	|
20+25	0.0029	0.00	Q	|	|	| V	|
20+30	0.0029	0.00	Q	|	|	| V	|
20+35	0.0029	0.00	Q	|	|	| V	|
20+40	0.0029	0.00	Q	|	|	| V	|

```
  20+45       0.0029      0.00  Q          |          |          |        V |
  20+50       0.0029      0.00  Q          |          |          |        V |
  20+55       0.0029      0.00  Q          |          |          |        V |
  21+ 0       0.0029      0.00  Q          |          |          |        V |
  21+ 5       0.0029      0.00  Q          |          |          |        V |
  21+10       0.0029      0.00  Q          |          |          |        V |
  21+15       0.0029      0.00  Q          |          |          |         V|
  21+20       0.0029      0.00  Q          |          |          |         V|
  21+25       0.0029      0.00  Q          |          |          |         V|
  21+30       0.0029      0.00  Q          |          |          |         V|
  21+35       0.0029      0.00  Q          |          |          |         V|
  21+40       0.0029      0.00  Q          |          |          |         V|
  21+45       0.0029      0.00  Q          |          |          |         V|
  21+50       0.0029      0.00  Q          |          |          |         V|
  21+55       0.0029      0.00  Q          |          |          |         V|
  22+ 0       0.0029      0.00  Q          |          |          |         V|
  22+ 5       0.0029      0.00  Q          |          |          |         V|
  22+10       0.0029      0.00  Q          |          |          |         V|
  22+15       0.0029      0.00  Q          |          |          |         V|
  22+20       0.0029      0.00  Q          |          |          |         V|
  22+25       0.0029      0.00  Q          |          |          |         V|
  22+30       0.0029      0.00  Q          |          |          |         V|
  22+35       0.0029      0.00  Q          |          |          |         V|
  22+40       0.0029      0.00  Q          |          |          |         V|
  22+45       0.0029      0.00  Q          |          |          |         V|
  22+50       0.0029      0.00  Q          |          |          |         V|
  22+55       0.0029      0.00  Q          |          |          |         V|
  23+ 0       0.0029      0.00  Q          |          |          |         V|
  23+ 5       0.0029      0.00  Q          |          |          |         V|
  23+10       0.0029      0.00  Q          |          |          |         V|
  23+15       0.0029      0.00  Q          |          |          |         V|
  23+20       0.0029      0.00  Q          |          |          |         V|
  23+25       0.0029      0.00  Q          |          |          |         V|
  23+30       0.0029      0.00  Q          |          |          |         V|
  23+35       0.0029      0.00  Q          |          |          |         V|
  23+40       0.0029      0.00  Q          |          |          |         V|
  23+45       0.0029      0.00  Q          |          |          |         V|
  23+50       0.0029      0.00  Q          |          |          |         V|
  23+55       0.0029      0.00  Q          |          |          |         V|
  24+ 0       0.0030      0.00  Q          |          |          |         V|
  24+ 5       0.0030      0.00  Q          |          |          |          V
-------------------------------------------------------------------------
```

U n i t H y d r o g r a p h A n a l y s i s

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Study date 09/17/22 File: 1D1100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6545

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

XENIA
PRELIMINARY UNIT HYDROGRAPH ANALYSIS
AREA D1 DEVELOPED CONDITION
100-YEAR

Drainage Area = 0.27(Ac.) = 0.000 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 0.27(Ac.) = 0.000 Sq. Mi.
Length along longest watercourse = 309.00(Ft.)
Length along longest watercourse measured to centroid = 124.00(Ft.)
Length along longest watercourse = 0.059 Mi.
Length along longest watercourse measured to centroid = 0.023 Mi.
Difference in elevation = 4.30(Ft.)
Slope along watercourse = 73.4757 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.013 Hr.
Lag time = 0.78 Min.
25% of lag time = 0.20 Min.
40% of lag time = 0.31 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
0.27	0.57	0.15

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
0.27	1.27	0.34

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.570(In)
Area Averaged 100-Year Rainfall = 1.270(In)

Point rain (area averaged) = 1.270(In)
Areal adjustment factor = 100.00 %

Adjusted average point rain = 1.270(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
0.270	56.00	0.800

Total Area Entered = 0.27(Ac.)

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
56.0	74.8	0.305	0.800	0.086	1.000	0.086
					Sum (F) =	0.086

Area averaged mean soil loss (F) (In/Hr) = 0.086
Minimum soil loss rate ((In/Hr)) = 0.043
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.260

Slope of intensity-duration curve for a 1 hour storm =0.5300

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	640.621	76.692	0.209
2	0.167	1281.241	23.308	0.063
			Sum = 100.000 Sum=	0.272

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	3.40	0.518	0.086	(0.135)	0.433
2	0.17	4.70	0.716	0.086	(0.186)	0.631
3	0.25	4.70	0.716	0.086	(0.186)	0.631
4	0.33	5.10	0.777	0.086	(0.202)	0.692
5	0.42	5.80	0.884	0.086	(0.230)	0.798
6	0.50	5.90	0.899	0.086	(0.234)	0.814
7	0.58	7.10	1.082	0.086	(0.281)	0.997
8	0.67	8.70	1.326	0.086	(0.345)	1.240
9	0.75	13.20	2.012	0.086	(0.523)	1.926
10	0.83	29.70	4.526	0.086	(1.177)	4.441
11	0.92	7.70	1.173	0.086	(0.305)	1.088
12	1.00	4.00	0.610	0.086	(0.158)	0.524
		(Loss Rate Not Used)				
Sum =		100.0			Sum =	14.2

Flood volume = Effective rainfall 1.18(In)
times area 0.3(Ac.)/[(In)/(Ft.)] = 0.0(Ac.Ft)
Total soil loss = 0.09(In)
Total soil loss = 0.002(Ac.Ft)
Total rainfall = 1.27(In)
Flood volume = 1160.9 Cubic Feet
Total soil loss = 83.8 Cubic Feet

Peak flow rate of this hydrograph = 1.049(CFS)

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1 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0006	0.09	Q				
0+10	0.0017	0.16	Q V				
0+15	0.0029	0.17	Q V				
0+20	0.0042	0.18	Q V				
0+25	0.0056	0.21	Q V				
0+30	0.0071	0.22	Q V				
0+35	0.0089	0.26	Q V				
0+40	0.0111	0.32	Q V				
0+45	0.0145	0.48	Q V				
0+50	0.0217	1.05	Q			V	
0+55	0.0252	0.51	Q			V	
1+ 0	0.0264	0.18	Q			V	
1+ 5	0.0267	0.03	Q			V	

U n i t H y d r o g r a p h A n a l y s i s

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Study date 09/17/22 File: 1D3100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6545

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

XENIA
PRELIMINARY UNIT HYDROGRAPH ANALYSIS
AREA D1 DEVELOPED CONDITION
100-YEAR

Drainage Area = 0.27(Ac.) = 0.000 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 0.27(Ac.) = 0.000 Sq. Mi.
Length along longest watercourse = 309.00(Ft.)
Length along longest watercourse measured to centroid = 124.00(Ft.)
Length along longest watercourse = 0.059 Mi.
Length along longest watercourse measured to centroid = 0.023 Mi.
Difference in elevation = 4.30(Ft.)
Slope along watercourse = 73.4757 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.013 Hr.
Lag time = 0.78 Min.
25% of lag time = 0.20 Min.
40% of lag time = 0.31 Min.
Unit time = 5.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
0.27	0.98	0.26

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
0.27	2.13	0.58

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.980(In)
Area Averaged 100-Year Rainfall = 2.130(In)

Point rain (area averaged) = 2.130(In)
Areal adjustment factor = 100.00 %

Adjusted average point rain = 2.130(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
0.270	56.00	0.800

Total Area Entered = 0.27(Ac.)

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
56.0	74.8	0.305	0.800	0.086	1.000	0.086
					Sum (F) =	0.086

Area averaged mean soil loss (F) (In/Hr) = 0.086
Minimum soil loss rate ((In/Hr)) = 0.043
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.260

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	640.621	76.692	0.209
2	0.167	1281.241	23.308	0.063
			Sum = 100.000 Sum=	0.272

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max		Low	Effective (In/Hr)
1	0.08	1.30	0.332	0.086	(	0.086)	0.247
2	0.17	1.30	0.332	0.086	(	0.086)	0.247
3	0.25	1.10	0.281	(0.086)		0.073	0.208
4	0.33	1.50	0.383	0.086	(	0.100)	0.298
5	0.42	1.50	0.383	0.086	(	0.100)	0.298
6	0.50	1.80	0.460	0.086	(	0.120)	0.375
7	0.58	1.50	0.383	0.086	(	0.100)	0.298
8	0.67	1.80	0.460	0.086	(	0.120)	0.375
9	0.75	1.80	0.460	0.086	(	0.120)	0.375
10	0.83	1.50	0.383	0.086	(	0.100)	0.298
11	0.92	1.60	0.409	0.086	(	0.106)	0.323
12	1.00	1.80	0.460	0.086	(	0.120)	0.375
13	1.08	2.20	0.562	0.086	(	0.146)	0.477
14	1.17	2.20	0.562	0.086	(	0.146)	0.477
15	1.25	2.20	0.562	0.086	(	0.146)	0.477
16	1.33	2.00	0.511	0.086	(	0.133)	0.426
17	1.42	2.60	0.665	0.086	(	0.173)	0.579
18	1.50	2.70	0.690	0.086	(	0.179)	0.605
19	1.58	2.40	0.613	0.086	(	0.159)	0.528
20	1.67	2.70	0.690	0.086	(	0.179)	0.605
21	1.75	3.30	0.843	0.086	(	0.219)	0.758
22	1.83	3.10	0.792	0.086	(	0.206)	0.707
23	1.92	2.90	0.741	0.086	(	0.193)	0.656
24	2.00	3.00	0.767	0.086	(	0.199)	0.681
25	2.08	3.10	0.792	0.086	(	0.206)	0.707
26	2.17	4.20	1.074	0.086	(	0.279)	0.988
27	2.25	5.00	1.278	0.086	(	0.332)	1.192
28	2.33	3.50	0.895	0.086	(	0.233)	0.809
29	2.42	6.80	1.738	0.086	(	0.452)	1.653

30	2.50	7.30	1.866	0.086	(0.485)		1.780
31	2.58	8.20	2.096	0.086	(0.545)		2.010
32	2.67	5.90	1.508	0.086	(0.392)		1.423
33	2.75	2.00	0.511	0.086	(0.133)		0.426
34	2.83	1.80	0.460	0.086	(0.120)		0.375
35	2.92	1.80	0.460	0.086	(0.120)		0.375
36	3.00	0.60	0.153	(0.086)	0.040		0.113

(Loss Rate Not Used)

Sum = 100.0 Sum = 22.5

Flood volume = Effective rainfall 1.88(In)
times area 0.3(Ac.)/[(In)/(Ft.)] = 0.0(Ac.Ft)
Total soil loss = 0.25(In)
Total soil loss = 0.006(Ac.Ft)
Total rainfall = 2.13(In)
Flood volume = 1841.0 Cubic Feet
Total soil loss = 246.7 Cubic Feet

Peak flow rate of this hydrograph = 0.533(CFS)

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3 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0004	0.05	Q				
0+10	0.0008	0.07	Q				
0+15	0.0012	0.06	QV				
0+20	0.0017	0.08	QV				
0+25	0.0023	0.08	Q V				
0+30	0.0030	0.10	Q V				
0+35	0.0036	0.09	Q V				
0+40	0.0042	0.10	Q V				
0+45	0.0049	0.10	Q V				
0+50	0.0055	0.09	Q V				
0+55	0.0061	0.09	Q V				
1+ 0	0.0068	0.10	Q V				
1+ 5	0.0077	0.12	Q V				
1+10	0.0085	0.13	Q V				
1+15	0.0094	0.13	Q V				
1+20	0.0103	0.12	Q V				
1+25	0.0113	0.15	Q V				
1+30	0.0124	0.16	Q V				
1+35	0.0134	0.15	Q V				
1+40	0.0145	0.16	Q V				
1+45	0.0159	0.20	Q V				
1+50	0.0172	0.20	Q V				
1+55	0.0185	0.18	Q V				
2+ 0	0.0197	0.18	Q V				
2+ 5	0.0211	0.19	Q V				
2+10	0.0228	0.25	Q V				
2+15	0.0249	0.31	Q V				
2+20	0.0266	0.24	Q V				
2+25	0.0293	0.40	Q V				
2+30	0.0326	0.48	Q V				
2+35	0.0363	0.53	Q V				
2+40	0.0392	0.42	Q V				
2+45	0.0405	0.18	Q V				
2+50	0.0412	0.11	Q V				
2+55	0.0419	0.10	Q V				
3+ 0	0.0422	0.05	Q V				
3+ 5	0.0423	0.01	Q V				

U n i t H y d r o g r a p h A n a l y s i s

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Study date 09/17/22 File: 1D6100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6545

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

XENIA
PRELIMINARY UNIT HYDROGRAPH ANALYSIS
AREA D1 DEVELOPED CONDITION
100-YEAR

Drainage Area = 0.27(Ac.) = 0.000 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 0.27(Ac.) = 0.000 Sq. Mi.
Length along longest watercourse = 309.00(Ft.)
Length along longest watercourse measured to centroid = 124.00(Ft.)
Length along longest watercourse = 0.059 Mi.
Length along longest watercourse measured to centroid = 0.023 Mi.
Difference in elevation = 4.30(Ft.)
Slope along watercourse = 73.4757 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.013 Hr.
Lag time = 0.78 Min.
25% of lag time = 0.20 Min.
40% of lag time = 0.31 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
0.27	1.27	0.34

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
0.27	3.00	0.81

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 1.270(In)
Area Averaged 100-Year Rainfall = 3.000(In)

Point rain (area averaged) = 3.000(In)
Areal adjustment factor = 100.00 %

Adjusted average point rain = 3.000(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
0.270	56.00	0.800

Total Area Entered = 0.27(Ac.)

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
56.0	74.8	0.305	0.800	0.086	1.000	0.086
					Sum (F) =	0.086

Area averaged mean soil loss (F) (In/Hr) = 0.086
Minimum soil loss rate ((In/Hr)) = 0.043
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.260

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

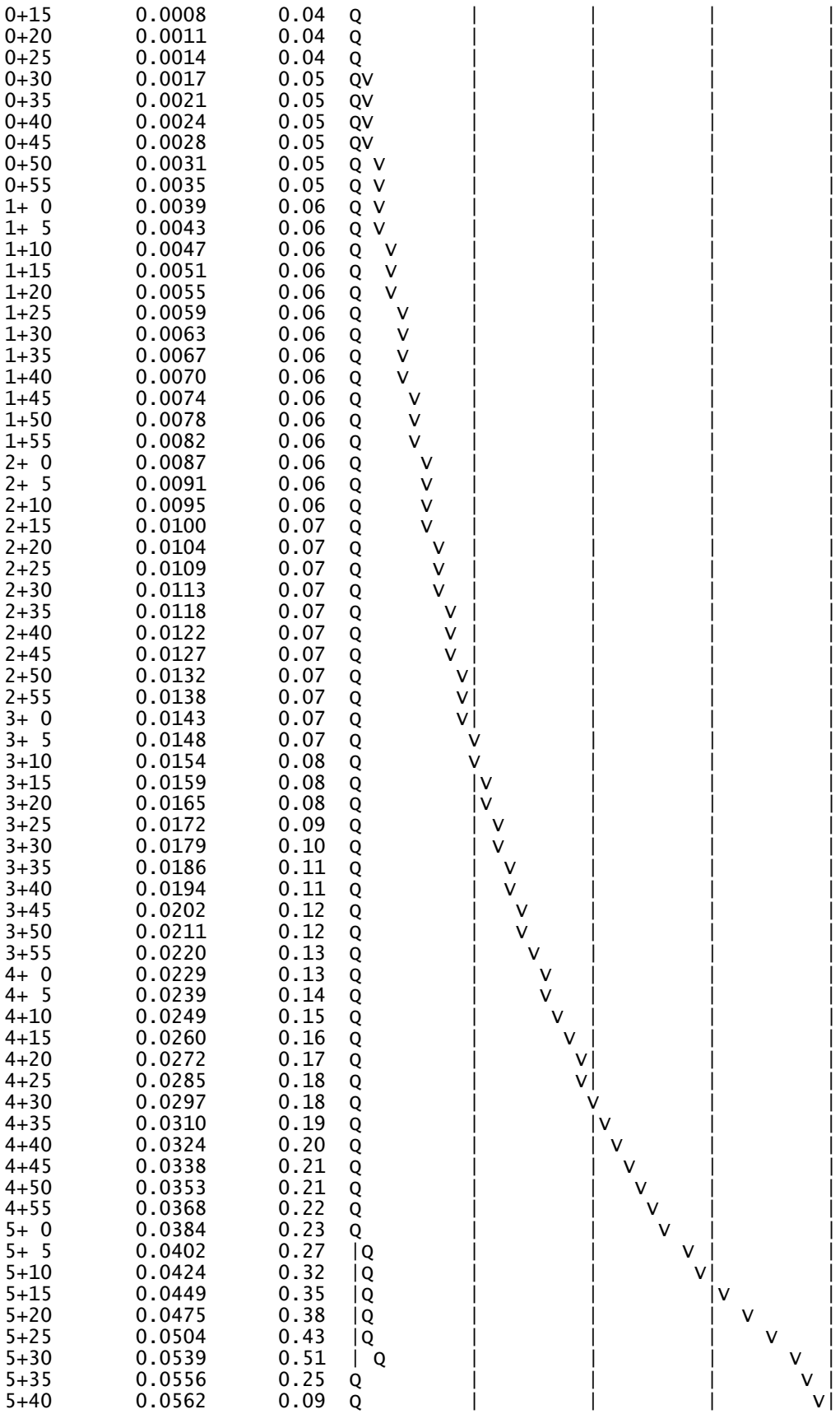
Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	640.621	76.692	0.209
2	0.167	1281.241	23.308	0.063
			Sum = 100.000 Sum=	0.272

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max		Low	Effective (In/Hr)
1	0.08	0.50	0.180	(0.086)		0.047	0.133
2	0.17	0.60	0.216	(0.086)		0.056	0.160
3	0.25	0.60	0.216	(0.086)		0.056	0.160
4	0.33	0.60	0.216	(0.086)		0.056	0.160
5	0.42	0.60	0.216	(0.086)		0.056	0.160
6	0.50	0.70	0.252	(0.086)		0.066	0.186
7	0.58	0.70	0.252	(0.086)		0.066	0.186
8	0.67	0.70	0.252	(0.086)		0.066	0.186
9	0.75	0.70	0.252	(0.086)		0.066	0.186
10	0.83	0.70	0.252	(0.086)		0.066	0.186
11	0.92	0.70	0.252	(0.086)		0.066	0.186
12	1.00	0.80	0.288	(0.086)		0.075	0.213
13	1.08	0.80	0.288	(0.086)		0.075	0.213
14	1.17	0.80	0.288	(0.086)		0.075	0.213
15	1.25	0.80	0.288	(0.086)		0.075	0.213
16	1.33	0.80	0.288	(0.086)		0.075	0.213
17	1.42	0.80	0.288	(0.086)		0.075	0.213
18	1.50	0.80	0.288	(0.086)		0.075	0.213
19	1.58	0.80	0.288	(0.086)		0.075	0.213
20	1.67	0.80	0.288	(0.086)		0.075	0.213
21	1.75	0.80	0.288	(0.086)		0.075	0.213
22	1.83	0.80	0.288	(0.086)		0.075	0.213
23	1.92	0.80	0.288	(0.086)		0.075	0.213
24	2.00	0.90	0.324	(0.086)		0.084	0.240
25	2.08	0.80	0.288	(0.086)		0.075	0.213
26	2.17	0.90	0.324	(0.086)		0.084	0.240
27	2.25	0.90	0.324	(0.086)		0.084	0.240
28	2.33	0.90	0.324	(0.086)		0.084	0.240
29	2.42	0.90	0.324	(0.086)		0.084	0.240

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30   2.50     0.90      0.324       (  0.086)       0.084        0.240
31   2.58     0.90      0.324       (  0.086)       0.084        0.240
32   2.67     0.90      0.324       (  0.086)       0.084        0.240
33   2.75     1.00      0.360          0.086    (  0.094)        0.274
34   2.83     1.00      0.360          0.086    (  0.094)        0.274
35   2.92     1.00      0.360          0.086    (  0.094)        0.274
36   3.00     1.00      0.360          0.086    (  0.094)        0.274
37   3.08     1.00      0.360          0.086    (  0.094)        0.274
38   3.17     1.10      0.396          0.086    (  0.103)        0.310
39   3.25     1.10      0.396          0.086    (  0.103)        0.310
40   3.33     1.10      0.396          0.086    (  0.103)        0.310
41   3.42     1.20      0.432          0.086    (  0.112)        0.346
42   3.50     1.30      0.468          0.086    (  0.122)        0.382
43   3.58     1.40      0.504          0.086    (  0.131)        0.418
44   3.67     1.40      0.504          0.086    (  0.131)        0.418
45   3.75     1.50      0.540          0.086    (  0.140)        0.454
46   3.83     1.50      0.540          0.086    (  0.140)        0.454
47   3.92     1.60      0.576          0.086    (  0.150)        0.490
48   4.00     1.60      0.576          0.086    (  0.150)        0.490
49   4.08     1.70      0.612          0.086    (  0.159)        0.526
50   4.17     1.80      0.648          0.086    (  0.168)        0.562
51   4.25     1.90      0.684          0.086    (  0.178)        0.598
52   4.33     2.00      0.720          0.086    (  0.187)        0.634
53   4.42     2.10      0.756          0.086    (  0.197)        0.670
54   4.50     2.10      0.756          0.086    (  0.197)        0.670
55   4.58     2.20      0.792          0.086    (  0.206)        0.706
56   4.67     2.30      0.828          0.086    (  0.215)        0.742
57   4.75     2.40      0.864          0.086    (  0.225)        0.778
58   4.83     2.40      0.864          0.086    (  0.225)        0.778
59   4.92     2.50      0.900          0.086    (  0.234)        0.814
60   5.00     2.60      0.936          0.086    (  0.243)        0.850
61   5.08     3.10      1.116          0.086    (  0.290)        1.030
62   5.17     3.60      1.296          0.086    (  0.337)        1.210
63   5.25     3.90      1.404          0.086    (  0.365)        1.318
64   5.33     4.20      1.512          0.086    (  0.393)        1.426
65   5.42     4.70      1.692          0.086    (  0.440)        1.606
66   5.50     5.60      2.016          0.086    (  0.524)        1.930
67   5.58     1.90      0.684          0.086    (  0.178)        0.598
68   5.67     0.90      0.324       (  0.086)       0.084        0.240
69   5.75     0.60      0.216       (  0.086)       0.056        0.160
70   5.83     0.50      0.180       (  0.086)       0.047        0.133
71   5.92     0.30      0.108       (  0.086)       0.028        0.080
72   6.00     0.20      0.072       (  0.086)       0.019        0.053
            (Loss Rate Not Used)
   Sum =     100.0                                    Sum =    30.5
     Flood volume = Effective rainfall      2.54(In)
      times area       0.3(Ac.)/[(In)/(Ft.)] =       0.1(Ac.Ft)
     Total soil loss =      0.46(In)
     Total soil loss =     0.010(Ac.Ft)
     Total rainfall =      3.00(In)
     Flood volume =        2487.9 Cubic Feet
     Total soil loss =         452.4 Cubic Feet
     ---------------------------------------------------------------------
      Peak flow rate of this hydrograph =      0.505(CFS)
     ---------------------------------------------------------------------
     +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                        6 - H O U R    S T O R M
                    R u n o f f     H y d r o g r a p h
     ---------------------------------------------------------------------
                 Hydrograph in   5   Minute intervals ((CFS))

     ---------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0        2.5       5.0       7.5      10.0
-------------------------------------------------------------------------
  0+ 5       0.0002      0.03  Q          |         |         |         |
  0+10       0.0005      0.04  Q          |         |         |         |
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    5+45       0.0565      0.05  Q          |          |          |        V|
    5+50       0.0568      0.04  Q          |          |          |        V|
    5+55       0.0570      0.03  Q          |          |          |        V|
    6+ 0       0.0571      0.02  Q          |          |          |        V|
    6+ 5       0.0571      0.00  Q          |          |          |         V
---------------------------------------------------------------------------
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U n i t H y d r o g r a p h A n a l y s i s

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Study date 09/17/22 File: 1D24100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6545

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

XENIA
PRELIMINARY UNIT HYDROGRAPH ANALYSIS
AREA D1 DEVELOPED CONDITION
100-YEAR

Drainage Area = 0.27(Ac.) = 0.000 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 0.27(Ac.) = 0.000 Sq. Mi.
Length along longest watercourse = 309.00(Ft.)
Length along longest watercourse measured to centroid = 124.00(Ft.)
Length along longest watercourse = 0.059 Mi.
Length along longest watercourse measured to centroid = 0.023 Mi.
Difference in elevation = 4.30(Ft.)
Slope along watercourse = 73.4757 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.013 Hr.
Lag time = 0.78 Min.
25% of lag time = 0.20 Min.
40% of lag time = 0.31 Min.
Unit time = 5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
0.27	2.53	0.68

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
0.27	6.50	1.76

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 2.530(In)
Area Averaged 100-Year Rainfall = 6.500(In)

Point rain (area averaged) = 6.500(In)
Areal adjustment factor = 100.00 %

Adjusted average point rain = 6.500(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
0.270	56.00	0.800

Total Area Entered = 0.27(Ac.)

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
56.0	74.8	0.305	0.800	0.086	1.000	0.086
					Sum (F) =	0.086

Area averaged mean soil loss (F) (In/Hr) = 0.086
Minimum soil loss rate ((In/Hr)) = 0.043
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.260

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	640.621	76.692	0.209
2	0.167	1281.241	23.308	0.063
			Sum = 100.000 Sum=	0.272

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.07	0.052	(0.152)	0.014	0.038
2	0.17	0.07	0.052	(0.151)	0.014	0.038
3	0.25	0.07	0.052	(0.150)	0.014	0.038
4	0.33	0.10	0.078	(0.150)	0.020	0.058
5	0.42	0.10	0.078	(0.149)	0.020	0.058
6	0.50	0.10	0.078	(0.149)	0.020	0.058
7	0.58	0.10	0.078	(0.148)	0.020	0.058
8	0.67	0.10	0.078	(0.147)	0.020	0.058
9	0.75	0.10	0.078	(0.147)	0.020	0.058
10	0.83	0.13	0.104	(0.146)	0.027	0.077
11	0.92	0.13	0.104	(0.146)	0.027	0.077
12	1.00	0.13	0.104	(0.145)	0.027	0.077
13	1.08	0.10	0.078	(0.145)	0.020	0.058
14	1.17	0.10	0.078	(0.144)	0.020	0.058
15	1.25	0.10	0.078	(0.143)	0.020	0.058
16	1.33	0.10	0.078	(0.143)	0.020	0.058
17	1.42	0.10	0.078	(0.142)	0.020	0.058
18	1.50	0.10	0.078	(0.142)	0.020	0.058
19	1.58	0.10	0.078	(0.141)	0.020	0.058
20	1.67	0.10	0.078	(0.141)	0.020	0.058
21	1.75	0.10	0.078	(0.140)	0.020	0.058
22	1.83	0.13	0.104	(0.139)	0.027	0.077
23	1.92	0.13	0.104	(0.139)	0.027	0.077
24	2.00	0.13	0.104	(0.138)	0.027	0.077
25	2.08	0.13	0.104	(0.138)	0.027	0.077
26	2.17	0.13	0.104	(0.137)	0.027	0.077
27	2.25	0.13	0.104	(0.137)	0.027	0.077
28	2.33	0.13	0.104	(0.136)	0.027	0.077
29	2.42	0.13	0.104	(0.136)	0.027	0.077

30	2.50	0.13	0.104	(0.135)	0.027	0.077
31	2.58	0.17	0.130	(0.134)	0.034	0.096
32	2.67	0.17	0.130	(0.134)	0.034	0.096
33	2.75	0.17	0.130	(0.133)	0.034	0.096
34	2.83	0.17	0.130	(0.133)	0.034	0.096
35	2.92	0.17	0.130	(0.132)	0.034	0.096
36	3.00	0.17	0.130	(0.132)	0.034	0.096
37	3.08	0.17	0.130	(0.131)	0.034	0.096
38	3.17	0.17	0.130	(0.131)	0.034	0.096
39	3.25	0.17	0.130	(0.130)	0.034	0.096
40	3.33	0.17	0.130	(0.130)	0.034	0.096
41	3.42	0.17	0.130	(0.129)	0.034	0.096
42	3.50	0.17	0.130	(0.128)	0.034	0.096
43	3.58	0.17	0.130	(0.128)	0.034	0.096
44	3.67	0.17	0.130	(0.127)	0.034	0.096
45	3.75	0.17	0.130	(0.127)	0.034	0.096
46	3.83	0.20	0.156	(0.126)	0.041	0.115
47	3.92	0.20	0.156	(0.126)	0.041	0.115
48	4.00	0.20	0.156	(0.125)	0.041	0.115
49	4.08	0.20	0.156	(0.125)	0.041	0.115
50	4.17	0.20	0.156	(0.124)	0.041	0.115
51	4.25	0.20	0.156	(0.124)	0.041	0.115
52	4.33	0.23	0.182	(0.123)	0.047	0.135
53	4.42	0.23	0.182	(0.123)	0.047	0.135
54	4.50	0.23	0.182	(0.122)	0.047	0.135
55	4.58	0.23	0.182	(0.122)	0.047	0.135
56	4.67	0.23	0.182	(0.121)	0.047	0.135
57	4.75	0.23	0.182	(0.121)	0.047	0.135
58	4.83	0.27	0.208	(0.120)	0.054	0.154
59	4.92	0.27	0.208	(0.119)	0.054	0.154
60	5.00	0.27	0.208	(0.119)	0.054	0.154
61	5.08	0.20	0.156	(0.118)	0.041	0.115
62	5.17	0.20	0.156	(0.118)	0.041	0.115
63	5.25	0.20	0.156	(0.117)	0.041	0.115
64	5.33	0.23	0.182	(0.117)	0.047	0.135
65	5.42	0.23	0.182	(0.116)	0.047	0.135
66	5.50	0.23	0.182	(0.116)	0.047	0.135
67	5.58	0.27	0.208	(0.115)	0.054	0.154
68	5.67	0.27	0.208	(0.115)	0.054	0.154
69	5.75	0.27	0.208	(0.114)	0.054	0.154
70	5.83	0.27	0.208	(0.114)	0.054	0.154
71	5.92	0.27	0.208	(0.113)	0.054	0.154
72	6.00	0.27	0.208	(0.113)	0.054	0.154
73	6.08	0.30	0.234	(0.112)	0.061	0.173
74	6.17	0.30	0.234	(0.112)	0.061	0.173
75	6.25	0.30	0.234	(0.111)	0.061	0.173
76	6.33	0.30	0.234	(0.111)	0.061	0.173
77	6.42	0.30	0.234	(0.110)	0.061	0.173
78	6.50	0.30	0.234	(0.110)	0.061	0.173
79	6.58	0.33	0.260	(0.109)	0.068	0.192
80	6.67	0.33	0.260	(0.109)	0.068	0.192
81	6.75	0.33	0.260	(0.108)	0.068	0.192
82	6.83	0.33	0.260	(0.108)	0.068	0.192
83	6.92	0.33	0.260	(0.107)	0.068	0.192
84	7.00	0.33	0.260	(0.107)	0.068	0.192
85	7.08	0.33	0.260	(0.106)	0.068	0.192
86	7.17	0.33	0.260	(0.106)	0.068	0.192
87	7.25	0.33	0.260	(0.105)	0.068	0.192
88	7.33	0.37	0.286	(0.105)	0.074	0.212
89	7.42	0.37	0.286	(0.105)	0.074	0.212
90	7.50	0.37	0.286	(0.104)	0.074	0.212
91	7.58	0.40	0.312	(0.104)	0.081	0.231
92	7.67	0.40	0.312	(0.103)	0.081	0.231
93	7.75	0.40	0.312	(0.103)	0.081	0.231
94	7.83	0.43	0.338	(0.102)	0.088	0.250
95	7.92	0.43	0.338	(0.102)	0.088	0.250

96	8.00	0.43	0.338	(0.101)	0.088	0.250
97	8.08	0.50	0.390	0.101	(0.101)	0.289
98	8.17	0.50	0.390	0.100	(0.101)	0.290
99	8.25	0.50	0.390	0.100	(0.101)	0.290
100	8.33	0.50	0.390	0.099	(0.101)	0.291
101	8.42	0.50	0.390	0.099	(0.101)	0.291
102	8.50	0.50	0.390	0.098	(0.101)	0.292
103	8.58	0.53	0.416	0.098	(0.108)	0.318
104	8.67	0.53	0.416	0.097	(0.108)	0.319
105	8.75	0.53	0.416	0.097	(0.108)	0.319
106	8.83	0.57	0.442	0.097	(0.115)	0.345
107	8.92	0.57	0.442	0.096	(0.115)	0.346
108	9.00	0.57	0.442	0.096	(0.115)	0.346
109	9.08	0.63	0.494	0.095	(0.128)	0.399
110	9.17	0.63	0.494	0.095	(0.128)	0.399
111	9.25	0.63	0.494	0.094	(0.128)	0.400
112	9.33	0.67	0.520	0.094	(0.135)	0.426
113	9.42	0.67	0.520	0.093	(0.135)	0.427
114	9.50	0.67	0.520	0.093	(0.135)	0.427
115	9.58	0.70	0.546	0.092	(0.142)	0.454
116	9.67	0.70	0.546	0.092	(0.142)	0.454
117	9.75	0.70	0.546	0.092	(0.142)	0.454
118	9.83	0.73	0.572	0.091	(0.149)	0.481
119	9.92	0.73	0.572	0.091	(0.149)	0.481
120	10.00	0.73	0.572	0.090	(0.149)	0.482
121	10.08	0.50	0.390	0.090	(0.101)	0.300
122	10.17	0.50	0.390	0.089	(0.101)	0.301
123	10.25	0.50	0.390	0.089	(0.101)	0.301
124	10.33	0.50	0.390	0.089	(0.101)	0.301
125	10.42	0.50	0.390	0.088	(0.101)	0.302
126	10.50	0.50	0.390	0.088	(0.101)	0.302
127	10.58	0.67	0.520	0.087	(0.135)	0.433
128	10.67	0.67	0.520	0.087	(0.135)	0.433
129	10.75	0.67	0.520	0.086	(0.135)	0.434
130	10.83	0.67	0.520	0.086	(0.135)	0.434
131	10.92	0.67	0.520	0.086	(0.135)	0.434
132	11.00	0.67	0.520	0.085	(0.135)	0.435
133	11.08	0.63	0.494	0.085	(0.128)	0.409
134	11.17	0.63	0.494	0.084	(0.128)	0.410
135	11.25	0.63	0.494	0.084	(0.128)	0.410
136	11.33	0.63	0.494	0.083	(0.128)	0.411
137	11.42	0.63	0.494	0.083	(0.128)	0.411
138	11.50	0.63	0.494	0.083	(0.128)	0.411
139	11.58	0.57	0.442	0.082	(0.115)	0.360
140	11.67	0.57	0.442	0.082	(0.115)	0.360
141	11.75	0.57	0.442	0.081	(0.115)	0.361
142	11.83	0.60	0.468	0.081	(0.122)	0.387
143	11.92	0.60	0.468	0.081	(0.122)	0.387
144	12.00	0.60	0.468	0.080	(0.122)	0.388
145	12.08	0.83	0.650	0.080	(0.169)	0.570
146	12.17	0.83	0.650	0.079	(0.169)	0.571
147	12.25	0.83	0.650	0.079	(0.169)	0.571
148	12.33	0.87	0.676	0.079	(0.176)	0.597
149	12.42	0.87	0.676	0.078	(0.176)	0.598
150	12.50	0.87	0.676	0.078	(0.176)	0.598
151	12.58	0.93	0.728	0.077	(0.189)	0.651
152	12.67	0.93	0.728	0.077	(0.189)	0.651
153	12.75	0.93	0.728	0.077	(0.189)	0.651
154	12.83	0.97	0.754	0.076	(0.196)	0.678
155	12.92	0.97	0.754	0.076	(0.196)	0.678
156	13.00	0.97	0.754	0.076	(0.196)	0.678
157	13.08	1.13	0.884	0.075	(0.230)	0.809
158	13.17	1.13	0.884	0.075	(0.230)	0.809
159	13.25	1.13	0.884	0.074	(0.230)	0.810
160	13.33	1.13	0.884	0.074	(0.230)	0.810
161	13.42	1.13	0.884	0.074	(0.230)	0.810

162	13.50	1.13	0.884	0.073	(0.230)	0.811
163	13.58	0.77	0.598	0.073	(0.155)	0.525
164	13.67	0.77	0.598	0.072	(0.155)	0.526
165	13.75	0.77	0.598	0.072	(0.155)	0.526
166	13.83	0.77	0.598	0.072	(0.155)	0.526
167	13.92	0.77	0.598	0.071	(0.155)	0.527
168	14.00	0.77	0.598	0.071	(0.155)	0.527
169	14.08	0.90	0.702	0.071	(0.183)	0.631
170	14.17	0.90	0.702	0.070	(0.183)	0.632
171	14.25	0.90	0.702	0.070	(0.183)	0.632
172	14.33	0.87	0.676	0.070	(0.176)	0.606
173	14.42	0.87	0.676	0.069	(0.176)	0.607
174	14.50	0.87	0.676	0.069	(0.176)	0.607
175	14.58	0.87	0.676	0.069	(0.176)	0.607
176	14.67	0.87	0.676	0.068	(0.176)	0.608
177	14.75	0.87	0.676	0.068	(0.176)	0.608
178	14.83	0.83	0.650	0.067	(0.169)	0.583
179	14.92	0.83	0.650	0.067	(0.169)	0.583
180	15.00	0.83	0.650	0.067	(0.169)	0.583
181	15.08	0.80	0.624	0.066	(0.162)	0.558
182	15.17	0.80	0.624	0.066	(0.162)	0.558
183	15.25	0.80	0.624	0.066	(0.162)	0.558
184	15.33	0.77	0.598	0.065	(0.155)	0.533
185	15.42	0.77	0.598	0.065	(0.155)	0.533
186	15.50	0.77	0.598	0.065	(0.155)	0.533
187	15.58	0.63	0.494	0.064	(0.128)	0.430
188	15.67	0.63	0.494	0.064	(0.128)	0.430
189	15.75	0.63	0.494	0.064	(0.128)	0.430
190	15.83	0.63	0.494	0.063	(0.128)	0.431
191	15.92	0.63	0.494	0.063	(0.128)	0.431
192	16.00	0.63	0.494	0.063	(0.128)	0.431
193	16.08	0.13	0.104	(0.062)	0.027	0.077
194	16.17	0.13	0.104	(0.062)	0.027	0.077
195	16.25	0.13	0.104	(0.062)	0.027	0.077
196	16.33	0.13	0.104	(0.062)	0.027	0.077
197	16.42	0.13	0.104	(0.061)	0.027	0.077
198	16.50	0.13	0.104	(0.061)	0.027	0.077
199	16.58	0.10	0.078	(0.061)	0.020	0.058
200	16.67	0.10	0.078	(0.060)	0.020	0.058
201	16.75	0.10	0.078	(0.060)	0.020	0.058
202	16.83	0.10	0.078	(0.060)	0.020	0.058
203	16.92	0.10	0.078	(0.059)	0.020	0.058
204	17.00	0.10	0.078	(0.059)	0.020	0.058
205	17.08	0.17	0.130	(0.059)	0.034	0.096
206	17.17	0.17	0.130	(0.058)	0.034	0.096
207	17.25	0.17	0.130	(0.058)	0.034	0.096
208	17.33	0.17	0.130	(0.058)	0.034	0.096
209	17.42	0.17	0.130	(0.058)	0.034	0.096
210	17.50	0.17	0.130	(0.057)	0.034	0.096
211	17.58	0.17	0.130	(0.057)	0.034	0.096
212	17.67	0.17	0.130	(0.057)	0.034	0.096
213	17.75	0.17	0.130	(0.056)	0.034	0.096
214	17.83	0.13	0.104	(0.056)	0.027	0.077
215	17.92	0.13	0.104	(0.056)	0.027	0.077
216	18.00	0.13	0.104	(0.056)	0.027	0.077
217	18.08	0.13	0.104	(0.055)	0.027	0.077
218	18.17	0.13	0.104	(0.055)	0.027	0.077
219	18.25	0.13	0.104	(0.055)	0.027	0.077
220	18.33	0.13	0.104	(0.055)	0.027	0.077
221	18.42	0.13	0.104	(0.054)	0.027	0.077
222	18.50	0.13	0.104	(0.054)	0.027	0.077
223	18.58	0.10	0.078	(0.054)	0.020	0.058
224	18.67	0.10	0.078	(0.053)	0.020	0.058
225	18.75	0.10	0.078	(0.053)	0.020	0.058
226	18.83	0.07	0.052	(0.053)	0.014	0.038
227	18.92	0.07	0.052	(0.053)	0.014	0.038

228	19.00	0.07	0.052	(0.052)	0.014	0.038
229	19.08	0.10	0.078	(0.052)	0.020	0.058
230	19.17	0.10	0.078	(0.052)	0.020	0.058
231	19.25	0.10	0.078	(0.052)	0.020	0.058
232	19.33	0.13	0.104	(0.051)	0.027	0.077
233	19.42	0.13	0.104	(0.051)	0.027	0.077
234	19.50	0.13	0.104	(0.051)	0.027	0.077
235	19.58	0.10	0.078	(0.051)	0.020	0.058
236	19.67	0.10	0.078	(0.051)	0.020	0.058
237	19.75	0.10	0.078	(0.050)	0.020	0.058
238	19.83	0.07	0.052	(0.050)	0.014	0.038
239	19.92	0.07	0.052	(0.050)	0.014	0.038
240	20.00	0.07	0.052	(0.050)	0.014	0.038
241	20.08	0.10	0.078	(0.049)	0.020	0.058
242	20.17	0.10	0.078	(0.049)	0.020	0.058
243	20.25	0.10	0.078	(0.049)	0.020	0.058
244	20.33	0.10	0.078	(0.049)	0.020	0.058
245	20.42	0.10	0.078	(0.049)	0.020	0.058
246	20.50	0.10	0.078	(0.048)	0.020	0.058
247	20.58	0.10	0.078	(0.048)	0.020	0.058
248	20.67	0.10	0.078	(0.048)	0.020	0.058
249	20.75	0.10	0.078	(0.048)	0.020	0.058
250	20.83	0.07	0.052	(0.048)	0.014	0.038
251	20.92	0.07	0.052	(0.047)	0.014	0.038
252	21.00	0.07	0.052	(0.047)	0.014	0.038
253	21.08	0.10	0.078	(0.047)	0.020	0.058
254	21.17	0.10	0.078	(0.047)	0.020	0.058
255	21.25	0.10	0.078	(0.047)	0.020	0.058
256	21.33	0.07	0.052	(0.046)	0.014	0.038
257	21.42	0.07	0.052	(0.046)	0.014	0.038
258	21.50	0.07	0.052	(0.046)	0.014	0.038
259	21.58	0.10	0.078	(0.046)	0.020	0.058
260	21.67	0.10	0.078	(0.046)	0.020	0.058
261	21.75	0.10	0.078	(0.046)	0.020	0.058
262	21.83	0.07	0.052	(0.045)	0.014	0.038
263	21.92	0.07	0.052	(0.045)	0.014	0.038
264	22.00	0.07	0.052	(0.045)	0.014	0.038
265	22.08	0.10	0.078	(0.045)	0.020	0.058
266	22.17	0.10	0.078	(0.045)	0.020	0.058
267	22.25	0.10	0.078	(0.045)	0.020	0.058
268	22.33	0.07	0.052	(0.045)	0.014	0.038
269	22.42	0.07	0.052	(0.044)	0.014	0.038
270	22.50	0.07	0.052	(0.044)	0.014	0.038
271	22.58	0.07	0.052	(0.044)	0.014	0.038
272	22.67	0.07	0.052	(0.044)	0.014	0.038
273	22.75	0.07	0.052	(0.044)	0.014	0.038
274	22.83	0.07	0.052	(0.044)	0.014	0.038
275	22.92	0.07	0.052	(0.044)	0.014	0.038
276	23.00	0.07	0.052	(0.044)	0.014	0.038
277	23.08	0.07	0.052	(0.043)	0.014	0.038
278	23.17	0.07	0.052	(0.043)	0.014	0.038
279	23.25	0.07	0.052	(0.043)	0.014	0.038
280	23.33	0.07	0.052	(0.043)	0.014	0.038
281	23.42	0.07	0.052	(0.043)	0.014	0.038
282	23.50	0.07	0.052	(0.043)	0.014	0.038
283	23.58	0.07	0.052	(0.043)	0.014	0.038
284	23.67	0.07	0.052	(0.043)	0.014	0.038
285	23.75	0.07	0.052	(0.043)	0.014	0.038
286	23.83	0.07	0.052	(0.043)	0.014	0.038
287	23.92	0.07	0.052	(0.043)	0.014	0.038
288	24.00	0.07	0.052	(0.043)	0.014	0.038

(Loss Rate Not Used)

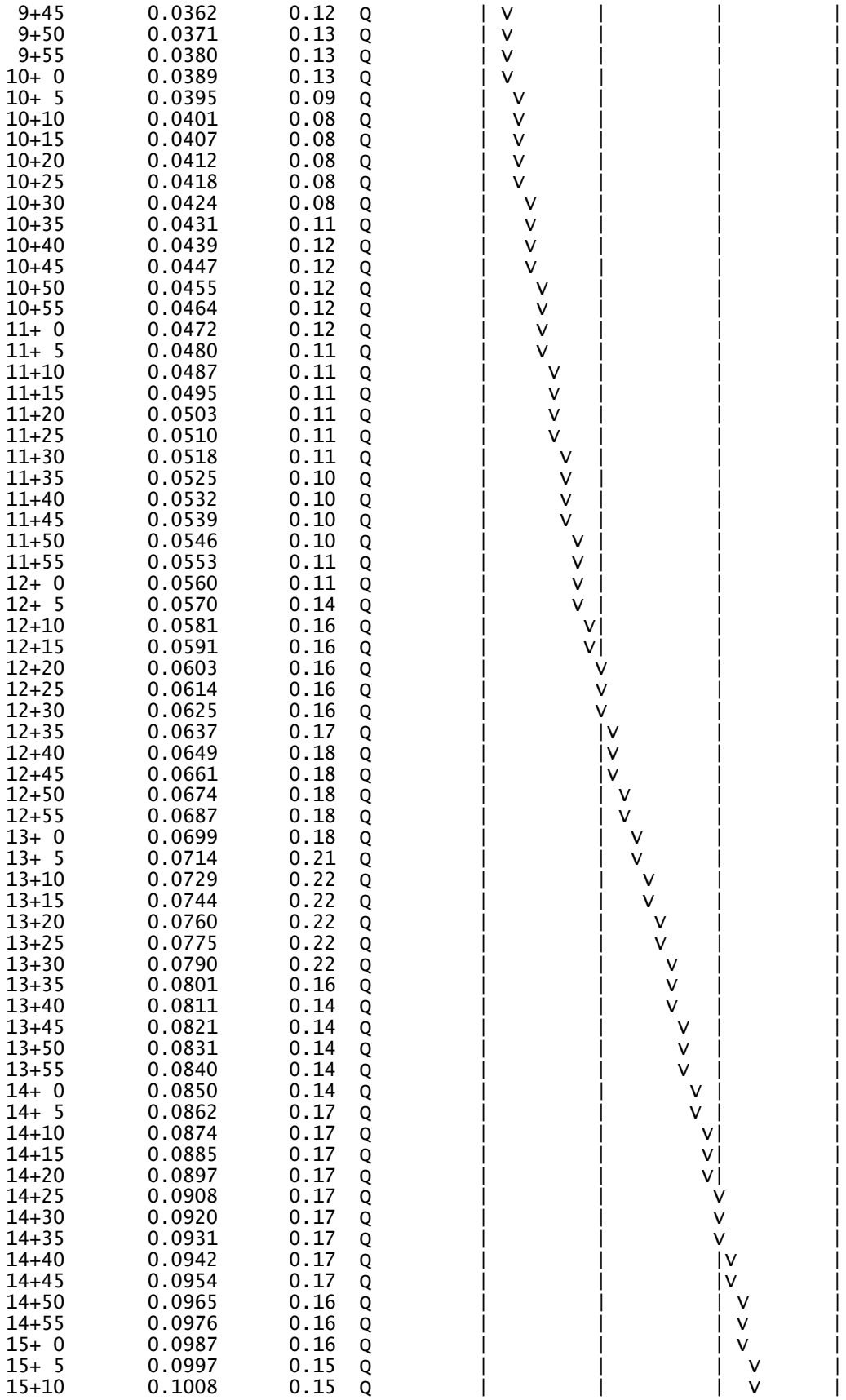
Sum = 100.0 Sum = 64.2

Flood volume = Effective rainfall 5.35(In)
times area 0.3(Ac.)/[(In)/(Ft.)] = 0.1(Ac.Ft)
Total soil loss = 1.15(In)

```
    Total soil loss =     0.026(Ac.Ft)
    Total rainfall =      6.50(In)
    Flood volume =        5240.1 Cubic Feet
    Total soil loss =        1130.6 Cubic Feet
    ---------------------------------------------------------------------
     Peak flow rate of this hydrograph =      0.221(CFS)
    ---------------------------------------------------------------------
    +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                        24 - H O U R    S T O R M
                   R u n o f f      H y d r o g r a p h
    ---------------------------------------------------------------------
                Hydrograph in   5   Minute intervals ((CFS))

    ---------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0        2.5       5.0       7.5      10.0
-------------------------------------------------------------------------
  0+ 5       0.0001      0.01  Q          |         |         |         |
  0+10       0.0001      0.01  Q          |         |         |         |
  0+15       0.0002      0.01  Q          |         |         |         |
  0+20       0.0003      0.01  Q          |         |         |         |
  0+25       0.0004      0.02  Q          |         |         |         |
  0+30       0.0005      0.02  Q          |         |         |         |
  0+35       0.0006      0.02  Q          |         |         |         |
  0+40       0.0007      0.02  Q          |         |         |         |
  0+45       0.0008      0.02  Q          |         |         |         |
  0+50       0.0010      0.02  Q          |         |         |         |
  0+55       0.0011      0.02  Q          |         |         |         |
  1+ 0       0.0013      0.02  Q          |         |         |         |
  1+ 5       0.0014      0.02  Q          |         |         |         |
  1+10       0.0015      0.02  Q          |         |         |         |
  1+15       0.0016      0.02  Q          |         |         |         |
  1+20       0.0017      0.02  Q          |         |         |         |
  1+25       0.0018      0.02  Q          |         |         |         |
  1+30       0.0019      0.02  Q          |         |         |         |
  1+35       0.0020      0.02  Q          |         |         |         |
  1+40       0.0021      0.02  Q          |         |         |         |
  1+45       0.0022      0.02  Q          |         |         |         |
  1+50       0.0024      0.02  Q          |         |         |         |
  1+55       0.0025      0.02  Q          |         |         |         |
  2+ 0       0.0027      0.02  Q          |         |         |         |
  2+ 5       0.0028      0.02  Q          |         |         |         |
  2+10       0.0030      0.02  Q          |         |         |         |
  2+15       0.0031      0.02  QV         |         |         |         |
  2+20       0.0032      0.02  QV         |         |         |         |
  2+25       0.0034      0.02  QV         |         |         |         |
  2+30       0.0035      0.02  QV         |         |         |         |
  2+35       0.0037      0.02  QV         |         |         |         |
  2+40       0.0039      0.03  QV         |         |         |         |
  2+45       0.0041      0.03  QV         |         |         |         |
  2+50       0.0043      0.03  QV         |         |         |         |
  2+55       0.0044      0.03  QV         |         |         |         |
  3+ 0       0.0046      0.03  QV         |         |         |         |
  3+ 5       0.0048      0.03  QV         |         |         |         |
  3+10       0.0050      0.03  QV         |         |         |         |
  3+15       0.0052      0.03  QV         |         |         |         |
  3+20       0.0053      0.03  QV         |         |         |         |
  3+25       0.0055      0.03  QV         |         |         |         |
  3+30       0.0057      0.03  QV         |         |         |         |
  3+35       0.0059      0.03  QV         |         |         |         |
  3+40       0.0061      0.03  Q V        |         |         |         |
  3+45       0.0062      0.03  Q V        |         |         |         |
  3+50       0.0064      0.03  Q V        |         |         |         |
  3+55       0.0067      0.03  Q V        |         |         |         |
  4+ 0       0.0069      0.03  Q V        |         |         |         |
  4+ 5       0.0071      0.03  Q V        |         |         |         |
  4+10       0.0073      0.03  Q V        |         |         |         |
```

4+15	0.0075	0.03	Q v	|	|	|	|
4+20	0.0078	0.04	Q v	|	|	|	|
4+25	0.0080	0.04	Q v	|	|	|	|
4+30	0.0083	0.04	Q v	|	|	|	|
4+35	0.0085	0.04	Q v	|	|	|	|
4+40	0.0088	0.04	Q v	|	|	|	|
4+45	0.0090	0.04	Q v	|	|	|	|
4+50	0.0093	0.04	Q v	|	|	|	|
4+55	0.0096	0.04	Q v	|	|	|	|
5+ 0	0.0099	0.04	Q v	|	|	|	|
5+ 5	0.0101	0.03	Q v	|	|	|	|
5+10	0.0103	0.03	Q v	|	|	|	|
5+15	0.0106	0.03	Q v	|	|	|	|
5+20	0.0108	0.04	Q v	|	|	|	|
5+25	0.0111	0.04	Q v	|	|	|	|
5+30	0.0113	0.04	Q v	|	|	|	|
5+35	0.0116	0.04	Q v	|	|	|	|
5+40	0.0119	0.04	Q v	|	|	|	|
5+45	0.0122	0.04	Q v	|	|	|	|
5+50	0.0125	0.04	Q v	|	|	|	|
5+55	0.0127	0.04	Q v	|	|	|	|
6+ 0	0.0130	0.04	Q v	|	|	|	|
6+ 5	0.0133	0.05	Q v	|	|	|	|
6+10	0.0137	0.05	Q v	|	|	|	|
6+15	0.0140	0.05	Q v	|	|	|	|
6+20	0.0143	0.05	Q v	|	|	|	|
6+25	0.0146	0.05	Q v	|	|	|	|
6+30	0.0150	0.05	Q v	|	|	|	|
6+35	0.0153	0.05	Q v	|	|	|	|
6+40	0.0157	0.05	Q v	|	|	|	|
6+45	0.0160	0.05	Q v	|	|	|	|
6+50	0.0164	0.05	Q v	|	|	|	|
6+55	0.0168	0.05	Q v	|	|	|	|
7+ 0	0.0171	0.05	Q v	|	|	|	|
7+ 5	0.0175	0.05	Q v	|	|	|	|
7+10	0.0178	0.05	Q v	|	|	|	|
7+15	0.0182	0.05	Q v	|	|	|	|
7+20	0.0186	0.06	Q v	|	|	|	|
7+25	0.0190	0.06	Q v	|	|	|	|
7+30	0.0194	0.06	Q v	|	|	|	|
7+35	0.0198	0.06	Q v	|	|	|	|
7+40	0.0202	0.06	Q v	|	|	|	|
7+45	0.0207	0.06	Q v	|	|	|	|
7+50	0.0211	0.07	Q v	|	|	|	|
7+55	0.0216	0.07	Q v	|	|	|	|
8+ 0	0.0221	0.07	Q v	|	|	|	|
8+ 5	0.0226	0.08	Q v	|	|	|	|
8+10	0.0231	0.08	Q v	|	|	|	|
8+15	0.0237	0.08	Q v	|	|	|	|
8+20	0.0242	0.08	Q v	|	|	|	|
8+25	0.0248	0.08	Q v	|	|	|	|
8+30	0.0253	0.08	Q v	|	|	|	|
8+35	0.0259	0.08	Q v	|	|	|	|
8+40	0.0265	0.09	Q v	|	|	|	|
8+45	0.0271	0.09	Q v	|	|	|	|
8+50	0.0277	0.09	Q v	|	|	|	|
8+55	0.0284	0.09	Q v	|	|	|	|
9+ 0	0.0290	0.09	Q v	|	|	|	|
9+ 5	0.0298	0.11	Q v	|	|	|	|
9+10	0.0305	0.11	Q v	|	|	|	|
9+15	0.0313	0.11	Q v	|	|	|	|
9+20	0.0320	0.11	Q v	|	|	|	|
9+25	0.0328	0.12	Q v	|	|	|	|
9+30	0.0337	0.12	Q v	|	|	|	|
9+35	0.0345	0.12	Q v	|	|	|	|
9+40	0.0353	0.12	Q v	|	|	|	|



15+15	0.1018	0.15	Q	|	|	| V	|
15+20	0.1028	0.15	Q	|	|	| V	|
15+25	0.1038	0.15	Q	|	|	| V	|
15+30	0.1048	0.15	Q	|	|	| V	|
15+35	0.1057	0.12	Q	|	|	| V	|
15+40	0.1065	0.12	Q	|	|	| V	|
15+45	0.1073	0.12	Q	|	|	| V	|
15+50	0.1081	0.12	Q	|	|	| V	|
15+55	0.1089	0.12	Q	|	|	| V	|
16+ 0	0.1097	0.12	Q	|	|	| V	|
16+ 5	0.1100	0.04	Q	|	|	| V	|
16+10	0.1102	0.02	Q	|	|	| V	|
16+15	0.1103	0.02	Q	|	|	| V	|
16+20	0.1104	0.02	Q	|	|	| V	|
16+25	0.1106	0.02	Q	|	|	| V	|
16+30	0.1107	0.02	Q	|	|	| V	|
16+35	0.1109	0.02	Q	|	|	| V	|
16+40	0.1110	0.02	Q	|	|	| V	|
16+45	0.1111	0.02	Q	|	|	| V	|
16+50	0.1112	0.02	Q	|	|	| V	|
16+55	0.1113	0.02	Q	|	|	| V	|
17+ 0	0.1114	0.02	Q	|	|	| V	|
17+ 5	0.1116	0.02	Q	|	|	| V	|
17+10	0.1117	0.03	Q	|	|	| V	|
17+15	0.1119	0.03	Q	|	|	| V	|
17+20	0.1121	0.03	Q	|	|	| V	|
17+25	0.1123	0.03	Q	|	|	| V	|
17+30	0.1125	0.03	Q	|	|	| V	|
17+35	0.1126	0.03	Q	|	|	| V	|
17+40	0.1128	0.03	Q	|	|	| V	|
17+45	0.1130	0.03	Q	|	|	| V	|
17+50	0.1132	0.02	Q	|	|	| V	|
17+55	0.1133	0.02	Q	|	|	| V	|
18+ 0	0.1134	0.02	Q	|	|	| V	|
18+ 5	0.1136	0.02	Q	|	|	| V	|
18+10	0.1137	0.02	Q	|	|	| V	|
18+15	0.1139	0.02	Q	|	|	| V	|
18+20	0.1140	0.02	Q	|	|	| V	|
18+25	0.1142	0.02	Q	|	|	| V	|
18+30	0.1143	0.02	Q	|	|	| V	|
18+35	0.1144	0.02	Q	|	|	| V	|
18+40	0.1145	0.02	Q	|	|	| V	|
18+45	0.1146	0.02	Q	|	|	| V	|
18+50	0.1147	0.01	Q	|	|	| V	|
18+55	0.1148	0.01	Q	|	|	| V	|
19+ 0	0.1149	0.01	Q	|	|	| V	|
19+ 5	0.1150	0.01	Q	|	|	| V	|
19+10	0.1151	0.02	Q	|	|	| V	|
19+15	0.1152	0.02	Q	|	|	| V	|
19+20	0.1153	0.02	Q	|	|	| V	|
19+25	0.1155	0.02	Q	|	|	| V	|
19+30	0.1156	0.02	Q	|	|	| V	|
19+35	0.1157	0.02	Q	|	|	| V	|
19+40	0.1158	0.02	Q	|	|	| V	|
19+45	0.1159	0.02	Q	|	|	| V	|
19+50	0.1160	0.01	Q	|	|	| V	|
19+55	0.1161	0.01	Q	|	|	| V	|
20+ 0	0.1162	0.01	Q	|	|	| V	|
20+ 5	0.1163	0.01	Q	|	|	| V	|
20+10	0.1164	0.02	Q	|	|	| V	|
20+15	0.1165	0.02	Q	|	|	| V	|
20+20	0.1166	0.02	Q	|	|	| V	|
20+25	0.1167	0.02	Q	|	|	| V	|
20+30	0.1168	0.02	Q	|	|	| V	|
20+35	0.1169	0.02	Q	|	|	| V	|
20+40	0.1170	0.02	Q	|	|	| V	|

20+45	0.1171	0.02	Q	|	|	|	V |
20+50	0.1172	0.01	Q	|	|	|	V |
20+55	0.1173	0.01	Q	|	|	|	V |
21+ 0	0.1174	0.01	Q	|	|	|	V|
21+ 5	0.1175	0.01	Q	|	|	|	V|
21+10	0.1176	0.02	Q	|	|	|	V|
21+15	0.1177	0.02	Q	|	|	|	V|
21+20	0.1178	0.01	Q	|	|	|	V|
21+25	0.1178	0.01	Q	|	|	|	V|
21+30	0.1179	0.01	Q	|	|	|	V|
21+35	0.1180	0.01	Q	|	|	|	V|
21+40	0.1181	0.02	Q	|	|	|	V|
21+45	0.1182	0.02	Q	|	|	|	V|
21+50	0.1183	0.01	Q	|	|	|	V|
21+55	0.1184	0.01	Q	|	|	|	V|
22+ 0	0.1184	0.01	Q	|	|	|	V|
22+ 5	0.1185	0.01	Q	|	|	|	V|
22+10	0.1186	0.02	Q	|	|	|	V|
22+15	0.1188	0.02	Q	|	|	|	V|
22+20	0.1188	0.01	Q	|	|	|	V|
22+25	0.1189	0.01	Q	|	|	|	V|
22+30	0.1190	0.01	Q	|	|	|	V|
22+35	0.1191	0.01	Q	|	|	|	V|
22+40	0.1191	0.01	Q	|	|	|	V|
22+45	0.1192	0.01	Q	|	|	|	V|
22+50	0.1193	0.01	Q	|	|	|	V|
22+55	0.1193	0.01	Q	|	|	|	V|
23+ 0	0.1194	0.01	Q	|	|	|	V|
23+ 5	0.1195	0.01	Q	|	|	|	V|
23+10	0.1196	0.01	Q	|	|	|	V|
23+15	0.1196	0.01	Q	|	|	|	V|
23+20	0.1197	0.01	Q	|	|	|	V|
23+25	0.1198	0.01	Q	|	|	|	V|
23+30	0.1198	0.01	Q	|	|	|	V|
23+35	0.1199	0.01	Q	|	|	|	V|
23+40	0.1200	0.01	Q	|	|	|	V|
23+45	0.1201	0.01	Q	|	|	|	V|
23+50	0.1201	0.01	Q	|	|	|	V|
23+55	0.1202	0.01	Q	|	|	|	V|
24+ 0	0.1203	0.01	Q	|	|	|	V|
24+ 5	0.1203	0.00	Q	|	|	|	V|

U n i t H y d r o g r a p h A n a l y s i s

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Study date 09/17/22 File: 2D1100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6545

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

XENIA
PRELIMINARY UNIT HYDROGRAPH ANALYSIS
AREA D2 DEVELOPED CONDITION
100-YEAR

Drainage Area = 14.83(Ac.) = 0.023 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 14.83(Ac.) = 0.023 Sq. Mi.
Length along longest watercourse = 1984.00(Ft.)
Length along longest watercourse measured to centroid = 1188.00(Ft.)
Length along longest watercourse = 0.376 Mi.
Length along longest watercourse measured to centroid = 0.225 Mi.
Difference in elevation = 16.20(Ft.)
Slope along watercourse = 43.1129 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.069 Hr.
Lag time = 4.13 Min.
25% of lag time = 1.03 Min.
40% of lag time = 1.65 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
14.83	0.57	8.45

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
14.83	1.27	18.83

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.570(In)
Area Averaged 100-Year Rainfall = 1.270(In)

Point rain (area averaged) = 1.270(In)
Areal adjustment factor = 99.99 %

Adjusted average point rain = 1.270(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
14.830	56.20	0.708

Total Area Entered = 14.83(Ac.)

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
56.2	75.0	0.303	0.708	0.110	1.000	0.110
					Sum (F) =	0.110

Area averaged mean soil loss (F) (In/Hr) = 0.110
Minimum soil loss rate ((In/Hr)) = 0.055
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.334

Slope of intensity-duration curve for a 1 hour storm =0.5300

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	121.003	25.489	3.810
2	0.167	242.007	48.687	7.277
3	0.250	363.010	13.222	1.976
4	0.333	484.013	5.978	0.893
5	0.417	605.017	3.345	0.500
6	0.500	726.020	1.901	0.284
7	0.583	847.023	1.378	0.206
		Sum = 100.000	Sum=	14.946

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1 0.08	3.40	0.518	0.110	(0.173)	0.408
2 0.17	4.70	0.716	0.110	(0.239)	0.606
3 0.25	4.70	0.716	0.110	(0.239)	0.606
4 0.33	5.10	0.777	0.110	(0.259)	0.667
5 0.42	5.80	0.884	0.110	(0.295)	0.774
6 0.50	5.90	0.899	0.110	(0.300)	0.789
7 0.58	7.10	1.082	0.110	(0.361)	0.972
8 0.67	8.70	1.326	0.110	(0.442)	1.216
9 0.75	13.20	2.011	0.110	(0.671)	1.901
10 0.83	29.70	4.526	0.110	(1.510)	4.416
11 0.92	7.70	1.173	0.110	(0.391)	1.063
12 1.00	4.00	0.610	0.110	(0.203)	0.499
	(Loss Rate Not Used)				
Sum =	100.0			Sum =	13.9

Flood volume = Effective rainfall 1.16(In)
times area 14.8(Ac.)/[(In)/(Ft.)] = 1.4(Ac.Ft)
Total soil loss = 0.11(In)
Total soil loss = 0.136(Ac.Ft)
Total rainfall = 1.27(In)
Flood volume = 62431.6 Cubic Feet
Total soil loss = 5927.0 Cubic Feet

Peak flow rate of this hydrograph = 41.915(CFS)

1 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	12.5	25.0	37.5	50.0
0+ 5	0.0107	1.56	VQ				
0+10	0.0471	5.28	V Q				
0+15	0.0989	7.53	V Q				
0+20	0.1576	8.52	V Q				
0+25	0.2247	9.75	VQ				
0+30	0.2999	10.92	Q				
0+35	0.3835	12.13	QV				
0+40	0.4840	14.59	Q V				
0+45	0.6178	19.43	Q V				
0+50	0.8567	34.70	V Q				
0+55	1.1454	41.92	V Q				
1+ 0	1.2909	21.12	Q V				
1+ 5	1.3679	11.18	Q V				
1+10	1.4019	4.94	Q V				
1+15	1.4200	2.63	Q V				
1+20	1.4300	1.46	Q V				
1+25	1.4325	0.36	Q V				
1+30	1.4332	0.10	Q V				

U n i t H y d r o g r a p h A n a l y s i s

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Study date 09/17/22 File: 2D3100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6545

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

XENIA
PRELIMINARY UNIT HYDROGRAPH ANALYSIS
AREA D2 DEVELOPED CONDITION
100-YEAR

Drainage Area = 14.83(Ac.) = 0.023 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 14.83(Ac.) = 0.023 Sq. Mi.
Length along longest watercourse = 1984.00(Ft.)
Length along longest watercourse measured to centroid = 1188.00(Ft.)
Length along longest watercourse = 0.376 Mi.
Length along longest watercourse measured to centroid = 0.225 Mi.
Difference in elevation = 16.20(Ft.)
Slope along watercourse = 43.1129 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.069 Hr.
Lag time = 4.13 Min.
25% of lag time = 1.03 Min.
40% of lag time = 1.65 Min.
Unit time = 5.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
14.83	0.98	14.53

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
14.83	2.13	31.59

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.980(In)
Area Averaged 100-Year Rainfall = 2.130(In)

Point rain (area averaged) = 2.130(In)
Areal adjustment factor = 99.99 %

Adjusted average point rain = 2.130(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
14.830	56.20	0.708

Total Area Entered = 14.83(Ac.)

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
56.2	75.0	0.303	0.708	0.110	1.000	0.110
					Sum (F) =	0.110

Area averaged mean soil loss (F) (In/Hr) = 0.110
Minimum soil loss rate ((In/Hr)) = 0.055
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.334

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	121.003	25.489	3.810
2	0.167	242.007	48.687	7.277
3	0.250	363.010	13.222	1.976
4	0.333	484.013	5.978	0.893
5	0.417	605.017	3.345	0.500
6	0.500	726.020	1.901	0.284
7	0.583	847.023	1.378	0.206
			Sum = 100.000 Sum=	14.946

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	1.30	0.332	0.110	(0.111)	0.222
2	0.17	1.30	0.332	0.110	(0.111)	0.222
3	0.25	1.10	0.281	(0.110)	0.094	0.187
4	0.33	1.50	0.383	0.110	(0.128)	0.273
5	0.42	1.50	0.383	0.110	(0.128)	0.273
6	0.50	1.80	0.460	0.110	(0.153)	0.350
7	0.58	1.50	0.383	0.110	(0.128)	0.273
8	0.67	1.80	0.460	0.110	(0.153)	0.350
9	0.75	1.80	0.460	0.110	(0.153)	0.350
10	0.83	1.50	0.383	0.110	(0.128)	0.273
11	0.92	1.60	0.409	0.110	(0.136)	0.299
12	1.00	1.80	0.460	0.110	(0.153)	0.350
13	1.08	2.20	0.562	0.110	(0.188)	0.452
14	1.17	2.20	0.562	0.110	(0.188)	0.452
15	1.25	2.20	0.562	0.110	(0.188)	0.452
16	1.33	2.00	0.511	0.110	(0.171)	0.401
17	1.42	2.60	0.665	0.110	(0.222)	0.554
18	1.50	2.70	0.690	0.110	(0.230)	0.580
19	1.58	2.40	0.613	0.110	(0.205)	0.503
20	1.67	2.70	0.690	0.110	(0.230)	0.580
21	1.75	3.30	0.843	0.110	(0.281)	0.733
22	1.83	3.10	0.792	0.110	(0.264)	0.682
23	1.92	2.90	0.741	0.110	(0.247)	0.631
24	2.00	3.00	0.767	0.110	(0.256)	0.657

25	2.08	3.10	0.792	0.110	(0.264)	0.682
26	2.17	4.20	1.073	0.110	(0.358)	0.963
27	2.25	5.00	1.278	0.110	(0.426)	1.168
28	2.33	3.50	0.895	0.110	(0.298)	0.784
29	2.42	6.80	1.738	0.110	(0.580)	1.628
30	2.50	7.30	1.866	0.110	(0.622)	1.756
31	2.58	8.20	2.096	0.110	(0.699)	1.986
32	2.67	5.90	1.508	0.110	(0.503)	1.398
33	2.75	2.00	0.511	0.110	(0.171)	0.401
34	2.83	1.80	0.460	0.110	(0.153)	0.350
35	2.92	1.80	0.460	0.110	(0.153)	0.350
36	3.00	0.60	0.153	(0.110)	0.051	0.102

(Loss Rate Not Used)

Sum = 100.0 Sum = 21.7

Flood volume = Effective rainfall 1.81(In)
times area 14.8(Ac.)/[(In)/(Ft.)] = 2.2(Ac.Ft)
Total soil loss = 0.32(In)
Total soil loss = 0.400(Ac.Ft)
Total rainfall = 2.13(In)
Flood volume = 97213.3 Cubic Feet
Total soil loss = 17443.4 Cubic Feet

Peak flow rate of this hydrograph = 25.634(CFS)

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3 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	7.5	15.0	22.5	30.0
0+ 5	0.0058	0.85	VQ	|	|	|	|
0+10	0.0228	2.46	V Q	|	|	|	|
0+15	0.0419	2.77	V Q	|	|	|	|
0+20	0.0628	3.04	|V Q	|	|	|	|
0+25	0.0884	3.71	|V Q	|	|	|	|
0+30	0.1174	4.21	| V Q	|	|	|	|
0+35	0.1489	4.58	| V Q	|	|	|	|
0+40	0.1798	4.50	| V Q	|	|	|	|
0+45	0.2142	4.99	| V Q	|	|	|	|
0+50	0.2475	4.83	| V Q	|	|	|	|
0+55	0.2780	4.43	| VQ	|	|	|	|
1+ 0	0.3103	4.69	| VQ	|	|	|	|
1+ 5	0.3477	5.44	| VQ	|	|	|	|
1+10	0.3910	6.28	| VQ	|	|	|	|
1+15	0.4359	6.52	| VQ	|	|	|	|
1+20	0.4802	6.44	| Q	|	|	|	|
1+25	0.5265	6.72	| QV	|	|	|	|
1+30	0.5807	7.87	| Q	|	|	|	|
1+35	0.6361	8.04	| QV	|	|	|	|
1+40	0.6908	7.94	| Q V	|	|	|	|
1+45	0.7529	9.02	| QV	|	|	|	|
1+50	0.8222	10.07	| QV	|	|	|	|
1+55	0.8902	9.87	| Q V	|	|	|	|
2+ 0	0.9567	9.65	| Q V	|	|	|	|
2+ 5	1.0247	9.87	| Q V	|	|	|	|
2+10	1.1016	11.17	| Q V	|	|	|	|
2+15	1.1984	14.06	| Q |V	|	|	|	|
2+20	1.2994	14.66	| Q| V	|	|	|	|
2+25	1.4078	15.74	| Q V	|	|	|	|
2+30	1.5590	21.95	| | V Q|	|	|	|
2+35	1.7330	25.27	| | |V Q	|	|	|
2+40	1.9095	25.63	| | | Q	|	|	|
2+45	2.0368	18.48	| | | Q |	| V	|	|

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    2+50       2.1077     10.30  |          |  Q       |          |       V  |
    2+55       2.1611      7.75  |          Q          |          |        V |
    3+ 0       2.1997      5.61  |       Q  |          |          |         V|
    3+ 5       2.2187      2.76  |  Q       |          |          |         V|
    3+10       2.2262      1.09  |Q         |          |          |         V|
    3+15       2.2293      0.45  Q          |          |          |         V|
    3+20       2.2309      0.22  Q          |          |          |         V|
    3+25       2.2316      0.10  Q          |          |          |         V|
    3+30       2.2317      0.02  Q          |          |          |          V
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U n i t H y d r o g r a p h A n a l y s i s

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Study date 09/17/22 File: 2D6100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6545

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

XENIA
PRELIMINARY UNIT HYDROGRAPH ANALYSIS
AREA D2 DEVELOPED CONDITION
100-YEAR

Drainage Area = 14.83(Ac.) = 0.023 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 14.83(Ac.) = 0.023 Sq. Mi.
Length along longest watercourse = 1984.00(Ft.)
Length along longest watercourse measured to centroid = 1188.00(Ft.)
Length along longest watercourse = 0.376 Mi.
Length along longest watercourse measured to centroid = 0.225 Mi.
Difference in elevation = 16.20(Ft.)
Slope along watercourse = 43.1129 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.069 Hr.
Lag time = 4.13 Min.
25% of lag time = 1.03 Min.
40% of lag time = 1.65 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
14.83	1.27	18.83

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
14.83	3.00	44.49

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 1.270(In)
Area Averaged 100-Year Rainfall = 3.000(In)

Point rain (area averaged) = 3.000(In)
Areal adjustment factor = 99.99 %

Adjusted average point rain = 3.000(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
14.830	56.20	0.708

Total Area Entered = 14.83(Ac.)

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
56.2	75.0	0.303	0.708	0.110	1.000	0.110
					Sum (F) =	0.110

Area averaged mean soil loss (F) (In/Hr) = 0.110
Minimum soil loss rate ((In/Hr)) = 0.055
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.334

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	121.003	25.489	3.810
2	0.167	242.007	48.687	7.277
3	0.250	363.010	13.222	1.976
4	0.333	484.013	5.978	0.893
5	0.417	605.017	3.345	0.500
6	0.500	726.020	1.901	0.284
7	0.583	847.023	1.378	0.206
			Sum = 100.000 Sum=	14.946

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max		Low	Effective (In/Hr)
1	0.08	0.50	0.180	(0.110)	0.060	0.120
2	0.17	0.60	0.216	(0.110)	0.072	0.144
3	0.25	0.60	0.216	(0.110)	0.072	0.144
4	0.33	0.60	0.216	(0.110)	0.072	0.144
5	0.42	0.60	0.216	(0.110)	0.072	0.144
6	0.50	0.70	0.252	(0.110)	0.084	0.168
7	0.58	0.70	0.252	(0.110)	0.084	0.168
8	0.67	0.70	0.252	(0.110)	0.084	0.168
9	0.75	0.70	0.252	(0.110)	0.084	0.168
10	0.83	0.70	0.252	(0.110)	0.084	0.168
11	0.92	0.70	0.252	(0.110)	0.084	0.168
12	1.00	0.80	0.288	(0.110)	0.096	0.192
13	1.08	0.80	0.288	(0.110)	0.096	0.192
14	1.17	0.80	0.288	(0.110)	0.096	0.192
15	1.25	0.80	0.288	(0.110)	0.096	0.192
16	1.33	0.80	0.288	(0.110)	0.096	0.192
17	1.42	0.80	0.288	(0.110)	0.096	0.192
18	1.50	0.80	0.288	(0.110)	0.096	0.192
19	1.58	0.80	0.288	(0.110)	0.096	0.192
20	1.67	0.80	0.288	(0.110)	0.096	0.192
21	1.75	0.80	0.288	(0.110)	0.096	0.192
22	1.83	0.80	0.288	(0.110)	0.096	0.192
23	1.92	0.80	0.288	(0.110)	0.096	0.192
24	2.00	0.90	0.324	(0.110)	0.108	0.216

25	2.08	0.80	0.288	(	0.110)	0.096		0.192
26	2.17	0.90	0.324	(	0.110)	0.108		0.216
27	2.25	0.90	0.324	(	0.110)	0.108		0.216
28	2.33	0.90	0.324	(	0.110)	0.108		0.216
29	2.42	0.90	0.324	(	0.110)	0.108		0.216
30	2.50	0.90	0.324	(	0.110)	0.108		0.216
31	2.58	0.90	0.324	(	0.110)	0.108		0.216
32	2.67	0.90	0.324	(	0.110)	0.108		0.216
33	2.75	1.00	0.360		0.110	(0.120)		0.250
34	2.83	1.00	0.360		0.110	(0.120)		0.250
35	2.92	1.00	0.360		0.110	(0.120)		0.250
36	3.00	1.00	0.360		0.110	(0.120)		0.250
37	3.08	1.00	0.360		0.110	(0.120)		0.250
38	3.17	1.10	0.396		0.110	(0.132)		0.286
39	3.25	1.10	0.396		0.110	(0.132)		0.286
40	3.33	1.10	0.396		0.110	(0.132)		0.286
41	3.42	1.20	0.432		0.110	(0.144)		0.322
42	3.50	1.30	0.468		0.110	(0.156)		0.358
43	3.58	1.40	0.504		0.110	(0.168)		0.394
44	3.67	1.40	0.504		0.110	(0.168)		0.394
45	3.75	1.50	0.540		0.110	(0.180)		0.430
46	3.83	1.50	0.540		0.110	(0.180)		0.430
47	3.92	1.60	0.576		0.110	(0.192)		0.466
48	4.00	1.60	0.576		0.110	(0.192)		0.466
49	4.08	1.70	0.612		0.110	(0.204)		0.502
50	4.17	1.80	0.648		0.110	(0.216)		0.538
51	4.25	1.90	0.684		0.110	(0.228)		0.574
52	4.33	2.00	0.720		0.110	(0.240)		0.610
53	4.42	2.10	0.756		0.110	(0.252)		0.646
54	4.50	2.10	0.756		0.110	(0.252)		0.646
55	4.58	2.20	0.792		0.110	(0.264)		0.682
56	4.67	2.30	0.828		0.110	(0.276)		0.718
57	4.75	2.40	0.864		0.110	(0.288)		0.754
58	4.83	2.40	0.864		0.110	(0.288)		0.754
59	4.92	2.50	0.900		0.110	(0.300)		0.790
60	5.00	2.60	0.936		0.110	(0.312)		0.826
61	5.08	3.10	1.116		0.110	(0.372)		1.006
62	5.17	3.60	1.296		0.110	(0.432)		1.186
63	5.25	3.90	1.404		0.110	(0.468)		1.294
64	5.33	4.20	1.512		0.110	(0.504)		1.402
65	5.42	4.70	1.692		0.110	(0.564)		1.582
66	5.50	5.60	2.016		0.110	(0.673)		1.906
67	5.58	1.90	0.684		0.110	(0.228)		0.574
68	5.67	0.90	0.324	(	0.110)	0.108		0.216
69	5.75	0.60	0.216	(	0.110)	0.072		0.144
70	5.83	0.50	0.180	(	0.110)	0.060		0.120
71	5.92	0.30	0.108	(	0.110)	0.036		0.072
72	6.00	0.20	0.072	(	0.110)	0.024		0.048

(Loss Rate Not Used)

Sum = 100.0 Sum = 28.9

Flood volume = Effective rainfall 2.41(In)
times area 14.8(Ac.)/[(In)/(Ft.)] = 3.0(Ac.Ft)
Total soil loss = 0.59(In)
Total soil loss = 0.733(Ac.Ft)
Total rainfall = 3.00(In)
Flood volume = 129549.9 Cubic Feet
Total soil loss = 31940.5 Cubic Feet

Peak flow rate of this hydrograph = 23.758(CFS)

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6 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	7.5	15.0	22.5	30.0
0+ 5	0.0031	0.46	Q				
0+10	0.0129	1.42	VQ				
0+15	0.0256	1.83	V Q				
0+20	0.0393	1.99	V Q				
0+25	0.0535	2.07	V Q				
0+30	0.0687	2.21	V Q				
0+35	0.0853	2.41	V Q				
0+40	0.1023	2.47	V Q				
0+45	0.1195	2.49	V Q				
0+50	0.1367	2.50	V Q				
0+55	0.1539	2.51	VQ				
1+ 0	0.1719	2.60	VQ				
1+ 5	0.1910	2.78	VQ				
1+10	0.2104	2.82	VQ				
1+15	0.2300	2.85	Q				
1+20	0.2497	2.86	Q				
1+25	0.2694	2.86	Q				
1+30	0.2892	2.87	Q				
1+35	0.3090	2.87	QV				
1+40	0.3287	2.87	QV				
1+45	0.3485	2.87	QV				
1+50	0.3683	2.87	QV				
1+55	0.3880	2.87	Q V				
2+ 0	0.4084	2.96	Q V				
2+ 5	0.4294	3.04	QV				
2+10	0.4501	3.01	Q V				
2+15	0.4719	3.16	Q V				
2+20	0.4939	3.20	Q V				
2+25	0.5160	3.21	Q V				
2+30	0.5382	3.22	Q V				
2+35	0.5604	3.22	Q V				
2+40	0.5826	3.23	Q V				
2+45	0.6057	3.36	Q V				
2+50	0.6306	3.61	Q V				
2+55	0.6559	3.67	Q V				
3+ 0	0.6814	3.70	Q V				
3+ 5	0.7070	3.72	Q V				
3+10	0.7336	3.87	Q V				
3+15	0.7621	4.14	Q V				
3+20	0.7911	4.21	Q V				
3+25	0.8212	4.38	Q V				
3+30	0.8542	4.79	Q V				
3+35	0.8906	5.27	Q V				
3+40	0.9294	5.65	Q V				
3+45	0.9701	5.91	Q V				
3+50	1.0130	6.23	Q V				
3+55	1.0576	6.47	Q V				
4+ 0	1.1043	6.78	Q V				
4+ 5	1.1526	7.02	Q V				
4+10	1.2040	7.46	Q V				
4+15	1.2588	7.96	Q V				
4+20	1.3171	8.47	Q V				
4+25	1.3791	9.00	Q V				
4+30	1.4438	9.39	Q V				
4+35	1.5103	9.67	Q V				
4+40	1.5801	10.13	Q V				
4+45	1.6534	10.64	Q V				
4+50	1.7293	11.02	Q V				
4+55	1.8071	11.29	Q V				
5+ 0	1.8880	11.75	Q V				
5+ 5	1.9762	12.80	Q V				
5+10	2.0789	14.92	Q V				
5+15	2.1964	17.06	Q V				

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    5+20       2.3259     18.80  |          |          |    Q     |V         |
    5+25       2.4688     20.75  |          |          |      Q   |  V       |
    5+30       2.6324     23.76  |          |          |          |Q   V     |
    5+35       2.7814     21.63  |          |          |        Q |      V   |
    5+40       2.8606     11.50  |          |    Q     |          |       V  |
    5+45       2.9048      6.42  |        Q |          |          |         V|
    5+50       2.9333      4.14  |    Q     |          |          |         V|
    5+55       2.9524      2.78  |  Q       |          |          |         V|
    6+ 0       2.9644      1.74  | Q        |          |          |         V|
    6+ 5       2.9702      0.85  |Q         |          |          |         V|
    6+10       2.9723      0.30  Q          |          |          |         V|
    6+15       2.9733      0.14  Q          |          |          |         V|
    6+20       2.9738      0.07  Q          |          |          |         V|
    6+25       2.9740      0.03  Q          |          |          |         V|
    6+30       2.9741      0.01  Q          |          |          |          V
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U n i t H y d r o g r a p h A n a l y s i s

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Study date 09/17/22 File: 2D24100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6545

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

XENIA
PRELIMINARY UNIT HYDROGRAPH ANALYSIS
AREA D2 DEVELOPED CONDITION
100-YEAR

Drainage Area = 14.83(Ac.) = 0.023 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 14.83(Ac.) = 0.023 Sq. Mi.
Length along longest watercourse = 1984.00(Ft.)
Length along longest watercourse measured to centroid = 1188.00(Ft.)
Length along longest watercourse = 0.376 Mi.
Length along longest watercourse measured to centroid = 0.225 Mi.
Difference in elevation = 16.20(Ft.)
Slope along watercourse = 43.1129 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.069 Hr.
Lag time = 4.13 Min.
25% of lag time = 1.03 Min.
40% of lag time = 1.65 Min.
Unit time = 5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
14.83	2.53	37.52

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
14.83	6.50	96.39

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 2.530(In)
Area Averaged 100-Year Rainfall = 6.500(In)

Point rain (area averaged) = 6.500(In)
Areal adjustment factor = 100.00 %

Adjusted average point rain = 6.500(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
14.830	56.20	0.708

Total Area Entered = 14.83(Ac.)

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
56.2	75.0	0.303	0.708	0.110	1.000	0.110
					Sum (F) =	0.110

Area averaged mean soil loss (F) (In/Hr) = 0.110
Minimum soil loss rate ((In/Hr)) = 0.055
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.334

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	121.003	25.489	3.810
2	0.167	242.007	48.687	7.277
3	0.250	363.010	13.222	1.976
4	0.333	484.013	5.978	0.893
5	0.417	605.017	3.345	0.500
6	0.500	726.020	1.901	0.284
7	0.583	847.023	1.378	0.206
			Sum = 100.000	Sum= 14.946

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.07	0.052	(0.195)	0.017	0.035
2	0.17	0.07	0.052	(0.194)	0.017	0.035
3	0.25	0.07	0.052	(0.194)	0.017	0.035
4	0.33	0.10	0.078	(0.193)	0.026	0.052
5	0.42	0.10	0.078	(0.192)	0.026	0.052
6	0.50	0.10	0.078	(0.191)	0.026	0.052
7	0.58	0.10	0.078	(0.191)	0.026	0.052
8	0.67	0.10	0.078	(0.190)	0.026	0.052
9	0.75	0.10	0.078	(0.189)	0.026	0.052
10	0.83	0.13	0.104	(0.188)	0.035	0.069
11	0.92	0.13	0.104	(0.188)	0.035	0.069
12	1.00	0.13	0.104	(0.187)	0.035	0.069
13	1.08	0.10	0.078	(0.186)	0.026	0.052
14	1.17	0.10	0.078	(0.185)	0.026	0.052
15	1.25	0.10	0.078	(0.185)	0.026	0.052
16	1.33	0.10	0.078	(0.184)	0.026	0.052
17	1.42	0.10	0.078	(0.183)	0.026	0.052
18	1.50	0.10	0.078	(0.183)	0.026	0.052
19	1.58	0.10	0.078	(0.182)	0.026	0.052
20	1.67	0.10	0.078	(0.181)	0.026	0.052
21	1.75	0.10	0.078	(0.180)	0.026	0.052
22	1.83	0.13	0.104	(0.180)	0.035	0.069
23	1.92	0.13	0.104	(0.179)	0.035	0.069
24	2.00	0.13	0.104	(0.178)	0.035	0.069

25	2.08	0.13	0.104	(0.177)	0.035	0.069
26	2.17	0.13	0.104	(0.177)	0.035	0.069
27	2.25	0.13	0.104	(0.176)	0.035	0.069
28	2.33	0.13	0.104	(0.175)	0.035	0.069
29	2.42	0.13	0.104	(0.175)	0.035	0.069
30	2.50	0.13	0.104	(0.174)	0.035	0.069
31	2.58	0.17	0.130	(0.173)	0.043	0.087
32	2.67	0.17	0.130	(0.172)	0.043	0.087
33	2.75	0.17	0.130	(0.172)	0.043	0.087
34	2.83	0.17	0.130	(0.171)	0.043	0.087
35	2.92	0.17	0.130	(0.170)	0.043	0.087
36	3.00	0.17	0.130	(0.170)	0.043	0.087
37	3.08	0.17	0.130	(0.169)	0.043	0.087
38	3.17	0.17	0.130	(0.168)	0.043	0.087
39	3.25	0.17	0.130	(0.168)	0.043	0.087
40	3.33	0.17	0.130	(0.167)	0.043	0.087
41	3.42	0.17	0.130	(0.166)	0.043	0.087
42	3.50	0.17	0.130	(0.165)	0.043	0.087
43	3.58	0.17	0.130	(0.165)	0.043	0.087
44	3.67	0.17	0.130	(0.164)	0.043	0.087
45	3.75	0.17	0.130	(0.163)	0.043	0.087
46	3.83	0.20	0.156	(0.163)	0.052	0.104
47	3.92	0.20	0.156	(0.162)	0.052	0.104
48	4.00	0.20	0.156	(0.161)	0.052	0.104
49	4.08	0.20	0.156	(0.161)	0.052	0.104
50	4.17	0.20	0.156	(0.160)	0.052	0.104
51	4.25	0.20	0.156	(0.159)	0.052	0.104
52	4.33	0.23	0.182	(0.159)	0.061	0.121
53	4.42	0.23	0.182	(0.158)	0.061	0.121
54	4.50	0.23	0.182	(0.157)	0.061	0.121
55	4.58	0.23	0.182	(0.157)	0.061	0.121
56	4.67	0.23	0.182	(0.156)	0.061	0.121
57	4.75	0.23	0.182	(0.155)	0.061	0.121
58	4.83	0.27	0.208	(0.155)	0.069	0.139
59	4.92	0.27	0.208	(0.154)	0.069	0.139
60	5.00	0.27	0.208	(0.153)	0.069	0.139
61	5.08	0.20	0.156	(0.153)	0.052	0.104
62	5.17	0.20	0.156	(0.152)	0.052	0.104
63	5.25	0.20	0.156	(0.151)	0.052	0.104
64	5.33	0.23	0.182	(0.151)	0.061	0.121
65	5.42	0.23	0.182	(0.150)	0.061	0.121
66	5.50	0.23	0.182	(0.149)	0.061	0.121
67	5.58	0.27	0.208	(0.149)	0.069	0.139
68	5.67	0.27	0.208	(0.148)	0.069	0.139
69	5.75	0.27	0.208	(0.147)	0.069	0.139
70	5.83	0.27	0.208	(0.147)	0.069	0.139
71	5.92	0.27	0.208	(0.146)	0.069	0.139
72	6.00	0.27	0.208	(0.145)	0.069	0.139
73	6.08	0.30	0.234	(0.145)	0.078	0.156
74	6.17	0.30	0.234	(0.144)	0.078	0.156
75	6.25	0.30	0.234	(0.143)	0.078	0.156
76	6.33	0.30	0.234	(0.143)	0.078	0.156
77	6.42	0.30	0.234	(0.142)	0.078	0.156
78	6.50	0.30	0.234	(0.141)	0.078	0.156
79	6.58	0.33	0.260	(0.141)	0.087	0.173
80	6.67	0.33	0.260	(0.140)	0.087	0.173
81	6.75	0.33	0.260	(0.140)	0.087	0.173
82	6.83	0.33	0.260	(0.139)	0.087	0.173
83	6.92	0.33	0.260	(0.138)	0.087	0.173
84	7.00	0.33	0.260	(0.138)	0.087	0.173
85	7.08	0.33	0.260	(0.137)	0.087	0.173
86	7.17	0.33	0.260	(0.136)	0.087	0.173
87	7.25	0.33	0.260	(0.136)	0.087	0.173
88	7.33	0.37	0.286	(0.135)	0.095	0.191
89	7.42	0.37	0.286	(0.135)	0.095	0.191
90	7.50	0.37	0.286	(0.134)	0.095	0.191

91	7.58	0.40	0.312	(0.133)	0.104	0.208
92	7.67	0.40	0.312	(0.133)	0.104	0.208
93	7.75	0.40	0.312	(0.132)	0.104	0.208
94	7.83	0.43	0.338	(0.132)	0.113	0.225
95	7.92	0.43	0.338	(0.131)	0.113	0.225
96	8.00	0.43	0.338	(0.130)	0.113	0.225
97	8.08	0.50	0.390	0.130	(0.130)	0.260
98	8.17	0.50	0.390	0.129	(0.130)	0.261
99	8.25	0.50	0.390	0.128	(0.130)	0.262
100	8.33	0.50	0.390	0.128	(0.130)	0.262
101	8.42	0.50	0.390	0.127	(0.130)	0.263
102	8.50	0.50	0.390	0.127	(0.130)	0.263
103	8.58	0.53	0.416	0.126	(0.139)	0.290
104	8.67	0.53	0.416	0.126	(0.139)	0.290
105	8.75	0.53	0.416	0.125	(0.139)	0.291
106	8.83	0.57	0.442	0.124	(0.147)	0.318
107	8.92	0.57	0.442	0.124	(0.147)	0.318
108	9.00	0.57	0.442	0.123	(0.147)	0.319
109	9.08	0.63	0.494	0.123	(0.165)	0.371
110	9.17	0.63	0.494	0.122	(0.165)	0.372
111	9.25	0.63	0.494	0.121	(0.165)	0.373
112	9.33	0.67	0.520	0.121	(0.173)	0.399
113	9.42	0.67	0.520	0.120	(0.173)	0.400
114	9.50	0.67	0.520	0.120	(0.173)	0.400
115	9.58	0.70	0.546	0.119	(0.182)	0.427
116	9.67	0.70	0.546	0.119	(0.182)	0.427
117	9.75	0.70	0.546	0.118	(0.182)	0.428
118	9.83	0.73	0.572	0.117	(0.191)	0.455
119	9.92	0.73	0.572	0.117	(0.191)	0.455
120	10.00	0.73	0.572	0.116	(0.191)	0.456
121	10.08	0.50	0.390	0.116	(0.130)	0.274
122	10.17	0.50	0.390	0.115	(0.130)	0.275
123	10.25	0.50	0.390	0.115	(0.130)	0.275
124	10.33	0.50	0.390	0.114	(0.130)	0.276
125	10.42	0.50	0.390	0.113	(0.130)	0.277
126	10.50	0.50	0.390	0.113	(0.130)	0.277
127	10.58	0.67	0.520	0.112	(0.173)	0.408
128	10.67	0.67	0.520	0.112	(0.173)	0.408
129	10.75	0.67	0.520	0.111	(0.173)	0.409
130	10.83	0.67	0.520	0.111	(0.173)	0.409
131	10.92	0.67	0.520	0.110	(0.173)	0.410
132	11.00	0.67	0.520	0.110	(0.173)	0.410
133	11.08	0.63	0.494	0.109	(0.165)	0.385
134	11.17	0.63	0.494	0.109	(0.165)	0.385
135	11.25	0.63	0.494	0.108	(0.165)	0.386
136	11.33	0.63	0.494	0.107	(0.165)	0.386
137	11.42	0.63	0.494	0.107	(0.165)	0.387
138	11.50	0.63	0.494	0.106	(0.165)	0.388
139	11.58	0.57	0.442	0.106	(0.147)	0.336
140	11.67	0.57	0.442	0.105	(0.147)	0.337
141	11.75	0.57	0.442	0.105	(0.147)	0.337
142	11.83	0.60	0.468	0.104	(0.156)	0.364
143	11.92	0.60	0.468	0.104	(0.156)	0.364
144	12.00	0.60	0.468	0.103	(0.156)	0.365
145	12.08	0.83	0.650	0.103	(0.217)	0.547
146	12.17	0.83	0.650	0.102	(0.217)	0.548
147	12.25	0.83	0.650	0.102	(0.217)	0.548
148	12.33	0.87	0.676	0.101	(0.226)	0.575
149	12.42	0.87	0.676	0.101	(0.226)	0.575
150	12.50	0.87	0.676	0.100	(0.226)	0.576
151	12.58	0.93	0.728	0.100	(0.243)	0.628
152	12.67	0.93	0.728	0.099	(0.243)	0.629
153	12.75	0.93	0.728	0.099	(0.243)	0.629
154	12.83	0.97	0.754	0.098	(0.252)	0.656
155	12.92	0.97	0.754	0.098	(0.252)	0.656
156	13.00	0.97	0.754	0.097	(0.252)	0.657

157	13.08	1.13	0.884	0.097	(0.295)	0.787
158	13.17	1.13	0.884	0.096	(0.295)	0.788
159	13.25	1.13	0.884	0.096	(0.295)	0.788
160	13.33	1.13	0.884	0.095	(0.295)	0.789
161	13.42	1.13	0.884	0.095	(0.295)	0.789
162	13.50	1.13	0.884	0.094	(0.295)	0.790
163	13.58	0.77	0.598	0.094	(0.199)	0.504
164	13.67	0.77	0.598	0.093	(0.199)	0.505
165	13.75	0.77	0.598	0.093	(0.199)	0.505
166	13.83	0.77	0.598	0.092	(0.199)	0.506
167	13.92	0.77	0.598	0.092	(0.199)	0.506
168	14.00	0.77	0.598	0.091	(0.199)	0.507
169	14.08	0.90	0.702	0.091	(0.234)	0.611
170	14.17	0.90	0.702	0.091	(0.234)	0.611
171	14.25	0.90	0.702	0.090	(0.234)	0.612
172	14.33	0.87	0.676	0.090	(0.226)	0.586
173	14.42	0.87	0.676	0.089	(0.226)	0.587
174	14.50	0.87	0.676	0.089	(0.226)	0.587
175	14.58	0.87	0.676	0.088	(0.226)	0.588
176	14.67	0.87	0.676	0.088	(0.226)	0.588
177	14.75	0.87	0.676	0.087	(0.226)	0.589
178	14.83	0.83	0.650	0.087	(0.217)	0.563
179	14.92	0.83	0.650	0.086	(0.217)	0.564
180	15.00	0.83	0.650	0.086	(0.217)	0.564
181	15.08	0.80	0.624	0.086	(0.208)	0.538
182	15.17	0.80	0.624	0.085	(0.208)	0.539
183	15.25	0.80	0.624	0.085	(0.208)	0.539
184	15.33	0.77	0.598	0.084	(0.199)	0.514
185	15.42	0.77	0.598	0.084	(0.199)	0.514
186	15.50	0.77	0.598	0.083	(0.199)	0.515
187	15.58	0.63	0.494	0.083	(0.165)	0.411
188	15.67	0.63	0.494	0.083	(0.165)	0.411
189	15.75	0.63	0.494	0.082	(0.165)	0.412
190	15.83	0.63	0.494	0.082	(0.165)	0.412
191	15.92	0.63	0.494	0.081	(0.165)	0.413
192	16.00	0.63	0.494	0.081	(0.165)	0.413
193	16.08	0.13	0.104	(0.080)	0.035	0.069
194	16.17	0.13	0.104	(0.080)	0.035	0.069
195	16.25	0.13	0.104	(0.080)	0.035	0.069
196	16.33	0.13	0.104	(0.079)	0.035	0.069
197	16.42	0.13	0.104	(0.079)	0.035	0.069
198	16.50	0.13	0.104	(0.078)	0.035	0.069
199	16.58	0.10	0.078	(0.078)	0.026	0.052
200	16.67	0.10	0.078	(0.078)	0.026	0.052
201	16.75	0.10	0.078	(0.077)	0.026	0.052
202	16.83	0.10	0.078	(0.077)	0.026	0.052
203	16.92	0.10	0.078	(0.076)	0.026	0.052
204	17.00	0.10	0.078	(0.076)	0.026	0.052
205	17.08	0.17	0.130	(0.076)	0.043	0.087
206	17.17	0.17	0.130	(0.075)	0.043	0.087
207	17.25	0.17	0.130	(0.075)	0.043	0.087
208	17.33	0.17	0.130	(0.075)	0.043	0.087
209	17.42	0.17	0.130	(0.074)	0.043	0.087
210	17.50	0.17	0.130	(0.074)	0.043	0.087
211	17.58	0.17	0.130	(0.073)	0.043	0.087
212	17.67	0.17	0.130	(0.073)	0.043	0.087
213	17.75	0.17	0.130	(0.073)	0.043	0.087
214	17.83	0.13	0.104	(0.072)	0.035	0.069
215	17.92	0.13	0.104	(0.072)	0.035	0.069
216	18.00	0.13	0.104	(0.072)	0.035	0.069
217	18.08	0.13	0.104	(0.071)	0.035	0.069
218	18.17	0.13	0.104	(0.071)	0.035	0.069
219	18.25	0.13	0.104	(0.071)	0.035	0.069
220	18.33	0.13	0.104	(0.070)	0.035	0.069
221	18.42	0.13	0.104	(0.070)	0.035	0.069
222	18.50	0.13	0.104	(0.070)	0.035	0.069

223	18.58	0.10	0.078	(0.069)	0.026	0.052
224	18.67	0.10	0.078	(0.069)	0.026	0.052
225	18.75	0.10	0.078	(0.069)	0.026	0.052
226	18.83	0.07	0.052	(0.068)	0.017	0.035
227	18.92	0.07	0.052	(0.068)	0.017	0.035
228	19.00	0.07	0.052	(0.068)	0.017	0.035
229	19.08	0.10	0.078	(0.067)	0.026	0.052
230	19.17	0.10	0.078	(0.067)	0.026	0.052
231	19.25	0.10	0.078	(0.067)	0.026	0.052
232	19.33	0.13	0.104	(0.066)	0.035	0.069
233	19.42	0.13	0.104	(0.066)	0.035	0.069
234	19.50	0.13	0.104	(0.066)	0.035	0.069
235	19.58	0.10	0.078	(0.065)	0.026	0.052
236	19.67	0.10	0.078	(0.065)	0.026	0.052
237	19.75	0.10	0.078	(0.065)	0.026	0.052
238	19.83	0.07	0.052	(0.065)	0.017	0.035
239	19.92	0.07	0.052	(0.064)	0.017	0.035
240	20.00	0.07	0.052	(0.064)	0.017	0.035
241	20.08	0.10	0.078	(0.064)	0.026	0.052
242	20.17	0.10	0.078	(0.063)	0.026	0.052
243	20.25	0.10	0.078	(0.063)	0.026	0.052
244	20.33	0.10	0.078	(0.063)	0.026	0.052
245	20.42	0.10	0.078	(0.063)	0.026	0.052
246	20.50	0.10	0.078	(0.062)	0.026	0.052
247	20.58	0.10	0.078	(0.062)	0.026	0.052
248	20.67	0.10	0.078	(0.062)	0.026	0.052
249	20.75	0.10	0.078	(0.062)	0.026	0.052
250	20.83	0.07	0.052	(0.061)	0.017	0.035
251	20.92	0.07	0.052	(0.061)	0.017	0.035
252	21.00	0.07	0.052	(0.061)	0.017	0.035
253	21.08	0.10	0.078	(0.061)	0.026	0.052
254	21.17	0.10	0.078	(0.060)	0.026	0.052
255	21.25	0.10	0.078	(0.060)	0.026	0.052
256	21.33	0.07	0.052	(0.060)	0.017	0.035
257	21.42	0.07	0.052	(0.060)	0.017	0.035
258	21.50	0.07	0.052	(0.059)	0.017	0.035
259	21.58	0.10	0.078	(0.059)	0.026	0.052
260	21.67	0.10	0.078	(0.059)	0.026	0.052
261	21.75	0.10	0.078	(0.059)	0.026	0.052
262	21.83	0.07	0.052	(0.059)	0.017	0.035
263	21.92	0.07	0.052	(0.058)	0.017	0.035
264	22.00	0.07	0.052	(0.058)	0.017	0.035
265	22.08	0.10	0.078	(0.058)	0.026	0.052
266	22.17	0.10	0.078	(0.058)	0.026	0.052
267	22.25	0.10	0.078	(0.058)	0.026	0.052
268	22.33	0.07	0.052	(0.057)	0.017	0.035
269	22.42	0.07	0.052	(0.057)	0.017	0.035
270	22.50	0.07	0.052	(0.057)	0.017	0.035
271	22.58	0.07	0.052	(0.057)	0.017	0.035
272	22.67	0.07	0.052	(0.057)	0.017	0.035
273	22.75	0.07	0.052	(0.057)	0.017	0.035
274	22.83	0.07	0.052	(0.056)	0.017	0.035
275	22.92	0.07	0.052	(0.056)	0.017	0.035
276	23.00	0.07	0.052	(0.056)	0.017	0.035
277	23.08	0.07	0.052	(0.056)	0.017	0.035
278	23.17	0.07	0.052	(0.056)	0.017	0.035
279	23.25	0.07	0.052	(0.056)	0.017	0.035
280	23.33	0.07	0.052	(0.056)	0.017	0.035
281	23.42	0.07	0.052	(0.056)	0.017	0.035
282	23.50	0.07	0.052	(0.055)	0.017	0.035
283	23.58	0.07	0.052	(0.055)	0.017	0.035
284	23.67	0.07	0.052	(0.055)	0.017	0.035
285	23.75	0.07	0.052	(0.055)	0.017	0.035
286	23.83	0.07	0.052	(0.055)	0.017	0.035
287	23.92	0.07	0.052	(0.055)	0.017	0.035
288	24.00	0.07	0.052	(0.055)	0.017	0.035

(Loss Rate Not Used)
Sum = 100.0 Sum = 60.2
Flood volume = Effective rainfall 5.02(In)
times area 14.8(Ac.)/[(In)/(Ft.)] = 6.2(Ac.Ft)
Total soil loss = 1.48(In)
Total soil loss = 1.833(Ac.Ft)
Total rainfall = 6.50(In)
Flood volume = 270068.5 Cubic Feet
Total soil loss = 79835.2 Cubic Feet

Peak flow rate of this hydrograph = 11.773(CFS)

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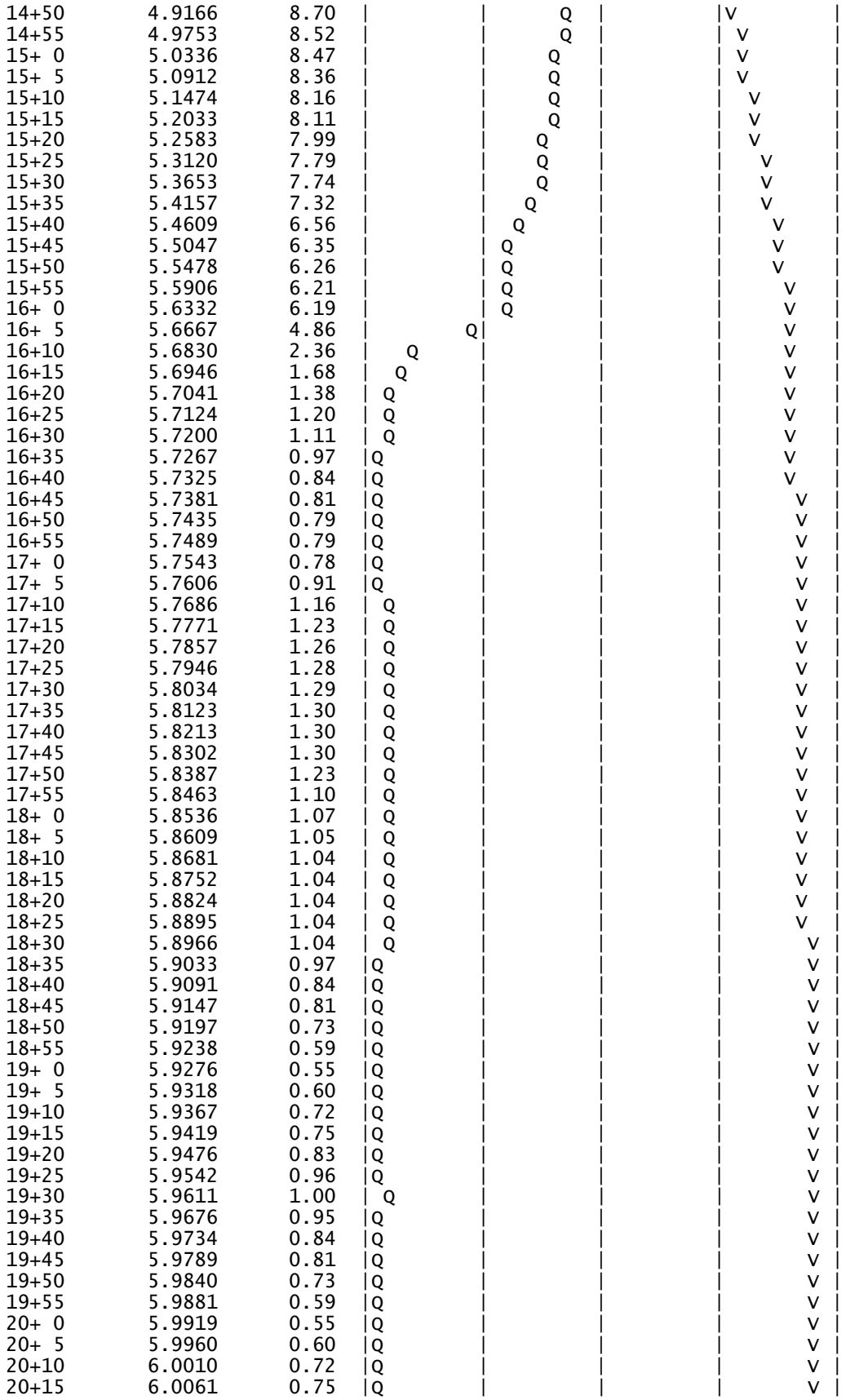
24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	5.0	10.0	15.0	20.0
0+ 5	0.0009	0.13	Q				
0+10	0.0036	0.38	Q				
0+15	0.0067	0.45	Q				
0+20	0.0105	0.55	VQ				
0+25	0.0152	0.69	VQ				
0+30	0.0203	0.74	VQ				
0+35	0.0256	0.76	VQ				
0+40	0.0308	0.77	VQ				
0+45	0.0362	0.77	VQ				
0+50	0.0420	0.84	VQ				
0+55	0.0487	0.97	VQ				
1+ 0	0.0556	1.00	V Q				
1+ 5	0.0621	0.95	VQ				
1+10	0.0679	0.84	VQ				
1+15	0.0734	0.81	VQ				
1+20	0.0789	0.79	VQ				
1+25	0.0843	0.79	VQ				
1+30	0.0897	0.78	VQ				
1+35	0.0951	0.78	VQ				
1+40	0.1004	0.78	VQ				
1+45	0.1058	0.78	VQ				
1+50	0.1116	0.84	VQ				
1+55	0.1182	0.97	VQ				
2+ 0	0.1252	1.00	V Q				
2+ 5	0.1322	1.02	V Q				
2+10	0.1393	1.03	V Q				
2+15	0.1464	1.03	V Q				
2+20	0.1535	1.04	V Q				
2+25	0.1606	1.04	|VQ				
2+30	0.1678	1.04	|VQ				
2+35	0.1754	1.10	|VQ				
2+40	0.1838	1.23	|VQ				
2+45	0.1925	1.26	|VQ				
2+50	0.2013	1.28	|VQ				
2+55	0.2102	1.29	|VQ				
3+ 0	0.2191	1.29	|VQ				
3+ 5	0.2280	1.30	|VQ				
3+10	0.2369	1.30	|VQ				
3+15	0.2459	1.30	|VQ				
3+20	0.2548	1.30	|VQ				
3+25	0.2637	1.30	|VQ				
3+30	0.2726	1.30	|VQ				
3+35	0.2815	1.30	|VQ				
3+40	0.2905	1.30	|VQ				
3+45	0.2994	1.30	|VQ				

3+50	0.3088	1.36	VQ				
3+55	0.3190	1.49	Q				
4+ 0	0.3295	1.52	VQ				
4+ 5	0.3401	1.54	VQ				
4+10	0.3507	1.55	VQ				
4+15	0.3614	1.55	VQ				
4+20	0.3726	1.62	VQ				
4+25	0.3846	1.75	VQ				
4+30	0.3969	1.78	VQ				
4+35	0.4092	1.80	VQ				
4+40	0.4217	1.81	VQ				
4+45	0.4341	1.81	VQ				
4+50	0.4471	1.88	VQ				
4+55	0.4609	2.01	V Q				
5+ 0	0.4749	2.04	VQ				
5+ 5	0.4882	1.92	Q				
5+10	0.4998	1.68	Q				
5+15	0.5109	1.62	Q				
5+20	0.5223	1.65	Q				
5+25	0.5344	1.76	Q				
5+30	0.5467	1.79	Q				
5+35	0.5596	1.86	Q				
5+40	0.5733	2.00	Q				
5+45	0.5874	2.04	VQ				
5+50	0.6015	2.06	VQ				
5+55	0.6157	2.06	VQ				
6+ 0	0.6300	2.07	Q				
6+ 5	0.6447	2.14	Q				
6+10	0.6603	2.26	Q				
6+15	0.6761	2.30	Q				
6+20	0.6921	2.31	Q				
6+25	0.7081	2.32	Q				
6+30	0.7241	2.33	Q				
6+35	0.7406	2.40	Q				
6+40	0.7580	2.52	VQ				
6+45	0.7756	2.56	Q				
6+50	0.7934	2.57	Q				
6+55	0.8111	2.58	Q				
7+ 0	0.8290	2.59	Q				
7+ 5	0.8468	2.59	Q				
7+10	0.8646	2.59	Q				
7+15	0.8825	2.59	Q				
7+20	0.9008	2.66	Q				
7+25	0.9200	2.78	Q				
7+30	0.9394	2.82	QV				
7+35	0.9593	2.90	QV				
7+40	0.9802	3.03	Q				
7+45	1.0014	3.07	Q				
7+50	1.0231	3.16	Q				
7+55	1.0458	3.29	Q				
8+ 0	1.0687	3.33	Q				
8+ 5	1.0927	3.48	QV				
8+10	1.1186	3.75	Q				
8+15	1.1450	3.83	Q				
8+20	1.1717	3.87	Q				
8+25	1.1985	3.90	Q				
8+30	1.2255	3.92	Q				
8+35	1.2533	4.03	Q				
8+40	1.2824	4.23	Q				
8+45	1.3120	4.29	Q				
8+50	1.3425	4.42	Q				
8+55	1.3744	4.63	VQ				
9+ 0	1.4068	4.70	Q				
9+ 5	1.4408	4.94	Q				
9+10	1.4775	5.34	VQ				
9+15	1.5151	5.46	VQ				

9+20	1.5538	5.62	VQ			
9+25	1.5940	5.84	VQ			
9+30	1.6348	5.92	VQ			
9+35	1.6765	6.06	V Q			
9+40	1.7197	6.27	|VQ			
9+45	1.7633	6.34	|VQ			
9+50	1.8079	6.47	|VQ			
9+55	1.8539	6.68	|V Q			
10+ 0	1.9004	6.75	| VQ			
10+ 5	1.9423	6.09	| Q			
10+10	1.9753	4.79	Q| V			
10+15	2.0059	4.45	Q | V			
10+20	2.0355	4.30	Q | V			
10+25	2.0646	4.21	Q | V			
10+30	2.0933	4.17	Q | V			
10+35	2.1252	4.64	Q| V			
10+40	2.1637	5.59	|Q V			
10+45	2.2041	5.86	|Q V			
10+50	2.2452	5.98	|Q V			
10+55	2.2869	6.05	| Q V			
11+ 0	2.3289	6.10	| Q V			
11+ 5	2.3705	6.04	| Q V			
11+10	2.4108	5.85	|Q V			
11+15	2.4508	5.81	|Q V			
11+20	2.4908	5.80	|Q V			
11+25	2.5306	5.79	|Q V			
11+30	2.5705	5.79	|Q V			
11+35	2.6090	5.60	|Q V			
11+40	2.6450	5.22	Q V			
11+45	2.6804	5.13	Q V			
11+50	2.7161	5.19	Q V			
11+55	2.7530	5.36	Q V			
12+ 0	2.7902	5.41	Q V			
12+ 5	2.8324	6.12	| Q V			
12+10	2.8838	7.47	| Q V			
12+15	2.9378	7.84	| Q V			
12+20	2.9937	8.11	| Q V|			
12+25	3.0516	8.40	| Q V|			
12+30	3.1102	8.51	| Q V			
12+35	3.1707	8.78	| Q V			
12+40	3.2339	9.18	| Q V			
12+45	3.2979	9.30	| Q |V			
12+50	3.3630	9.46	| Q |V			
12+55	3.4297	9.68	| Q| V			
13+ 0	3.4969	9.75	| Q| V			
13+ 5	3.5677	10.29	| Q V			
13+10	3.6452	11.26	| QV			
13+15	3.7246	11.53	| QV			
13+20	3.8049	11.66	| QV			
13+25	3.8857	11.73	| Q V			
13+30	3.9667	11.77	| Q V			
13+35	4.0406	10.72	|Q V			
13+40	4.1001	8.64	| Q | V			
13+45	4.1557	8.08	| Q | V			
13+50	4.2097	7.83	| Q | V			
13+55	4.2627	7.70	| Q | V			
14+ 0	4.3152	7.62	| Q | V			
14+ 5	4.3701	7.97	| Q | V			
14+10	4.4303	8.73	| Q | V			
14+15	4.4919	8.95	| Q | V			
14+20	4.5535	8.95	| Q | V|			
14+25	4.6142	8.82	| Q | V|			
14+30	4.6748	8.80	| Q | V			
14+35	4.7355	8.81	| Q | V			
14+40	4.7961	8.80	| Q | V			
14+45	4.8567	8.80	| Q | |V			



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  20+20       6.0114      0.76  |Q        |         |         |       V |
  20+25       6.0166      0.77  |Q        |         |         |       V |
  20+30       6.0220      0.77  |Q        |         |         |       V |
  20+35       6.0273      0.78  |Q        |         |         |       V |
  20+40       6.0327      0.78  |Q        |         |         |       V |
  20+45       6.0380      0.78  |Q        |         |         |       V |
  20+50       6.0429      0.71  |Q        |         |         |       V |
  20+55       6.0470      0.59  |Q        |         |         |        V|
  21+ 0       6.0508      0.55  |Q        |         |         |        V|
  21+ 5       6.0549      0.60  |Q        |         |         |        V|
  21+10       6.0598      0.72  |Q        |         |         |        V|
  21+15       6.0650      0.75  |Q        |         |         |        V|
  21+20       6.0698      0.69  |Q        |         |         |        V|
  21+25       6.0738      0.58  |Q        |         |         |        V|
  21+30       6.0775      0.55  |Q        |         |         |        V|
  21+35       6.0817      0.60  |Q        |         |         |        V|
  21+40       6.0866      0.72  |Q        |         |         |        V|
  21+45       6.0918      0.75  |Q        |         |         |        V|
  21+50       6.0965      0.69  |Q        |         |         |        V|
  21+55       6.1005      0.58  |Q        |         |         |        V|
  22+ 0       6.1043      0.55  |Q        |         |         |        V|
  22+ 5       6.1084      0.60  |Q        |         |         |        V|
  22+10       6.1134      0.72  |Q        |         |         |        V|
  22+15       6.1185      0.75  |Q        |         |         |        V|
  22+20       6.1233      0.69  |Q        |         |         |        V|
  22+25       6.1273      0.58  |Q        |         |         |        V|
  22+30       6.1310      0.55  |Q        |         |         |        V|
  22+35       6.1347      0.54  |Q        |         |         |        V|
  22+40       6.1384      0.53  |Q        |         |         |        V|
  22+45       6.1420      0.52  |Q        |         |         |        V|
  22+50       6.1455      0.52  |Q        |         |         |        V|
  22+55       6.1491      0.52  |Q        |         |         |        V|
  23+ 0       6.1527      0.52  |Q        |         |         |        V|
  23+ 5       6.1562      0.52  |Q        |         |         |        V|
  23+10       6.1598      0.52  |Q        |         |         |        V|
  23+15       6.1634      0.52  |Q        |         |         |        V|
  23+20       6.1669      0.52  |Q        |         |         |        V|
  23+25       6.1705      0.52  |Q        |         |         |        V|
  23+30       6.1741      0.52  |Q        |         |         |        V|
  23+35       6.1776      0.52  |Q        |         |         |        V|
  23+40       6.1812      0.52  |Q        |         |         |        V|
  23+45       6.1848      0.52  |Q        |         |         |        V|
  23+50       6.1883      0.52  |Q        |         |         |        V|
  23+55       6.1919      0.52  |Q        |         |         |        V|
  24+ 0       6.1955      0.52  |Q        |         |         |        V|
  24+ 5       6.1981      0.39  Q         |         |         |        V|
  24+10       6.1991      0.13  Q         |         |         |        V|
  24+15       6.1995      0.07  Q         |         |         |        V|
  24+20       6.1998      0.03  Q         |         |         |        V|
  24+25       6.1999      0.02  Q         |         |         |        V|
  24+30       6.1999      0.01  Q         |         |         |         V
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U n i t H y d r o g r a p h A n a l y s i s

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Study date 09/17/22 File: 3D1100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6545

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

XENIA
PRELIMINARY UNIT HYDROGRAPH ANALYSIS
AREA D3 DEVELOPED CONDITION
100-YEAR

Drainage Area = 0.14(Ac.) = 0.000 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 0.14(Ac.) = 0.000 Sq. Mi.
Length along longest watercourse = 261.00(Ft.)
Length along longest watercourse measured to centroid = 185.00(Ft.)
Length along longest watercourse = 0.049 Mi.
Length along longest watercourse measured to centroid = 0.035 Mi.
Difference in elevation = 4.70(Ft.)
Slope along watercourse = 95.0805 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.014 Hr.
Lag time = 0.81 Min.
25% of lag time = 0.20 Min.
40% of lag time = 0.32 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
0.14	0.57	0.08

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
0.14	1.27	0.18

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.570(In)
Area Averaged 100-Year Rainfall = 1.270(In)

Point rain (area averaged) = 1.270(In)
Areal adjustment factor = 100.00 %

Adjusted average point rain = 1.270(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
0.140	61.00	0.000

Total Area Entered = 0.14(Ac.)

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
61.0	78.8	0.258	0.000	0.258	1.000	0.258
					Sum (F) =	0.258

Area averaged mean soil loss (F) (In/Hr) = 0.258
Minimum soil loss rate ((In/Hr)) = 0.129
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

Slope of intensity-duration curve for a 1 hour storm =0.5300

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	616.179	75.839	0.107
2	0.167	1232.358	24.161	0.034
		Sum = 100.000	Sum=	0.141

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	3.40	0.518	0.258	(0.466)	0.260
2	0.17	4.70	0.716	0.258	(0.645)	0.458
3	0.25	4.70	0.716	0.258	(0.645)	0.458
4	0.33	5.10	0.777	0.258	(0.700)	0.519
5	0.42	5.80	0.884	0.258	(0.796)	0.626
6	0.50	5.90	0.899	0.258	(0.809)	0.641
7	0.58	7.10	1.082	0.258	(0.974)	0.824
8	0.67	8.70	1.326	0.258	(1.193)	1.068
9	0.75	13.20	2.012	0.258	(1.811)	1.754
10	0.83	29.70	4.526	0.258	(4.074)	4.268
11	0.92	7.70	1.173	0.258	(1.056)	0.915
12	1.00	4.00	0.610	0.258	(0.549)	0.351
		(Loss Rate Not Used)				
Sum =		100.0			Sum =	12.1

Flood volume = Effective rainfall 1.01(In)
times area 0.1(Ac.)/[(In)/(Ft.)] = 0.0(Ac.Ft)
Total soil loss = 0.26(In)
Total soil loss = 0.003(Ac.Ft)
Total rainfall = 1.27(In)
Flood volume = 514.2 Cubic Feet
Total soil loss = 131.2 Cubic Feet

Peak flow rate of this hydrograph = 0.517(CFS)

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1 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0002	0.03	Q				
0+10	0.0006	0.06	Q V				
0+15	0.0010	0.06	Q V				
0+20	0.0015	0.07	Q V				
0+25	0.0021	0.08	Q V				
0+30	0.0027	0.09	Q V				
0+35	0.0035	0.11	Q V				
0+40	0.0045	0.14	Q V				
0+45	0.0060	0.22	Q	V			
0+50	0.0096	0.52	Q			V	
0+55	0.0112	0.24	Q				V
1+ 0	0.0117	0.07	Q				V
1+ 5	0.0118	0.01	Q				V

U n i t H y d r o g r a p h A n a l y s i s

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Study date 09/17/22 File: 3D3100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6545

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

XENIA
PRELIMINARY UNIT HYDROGRAPH ANALYSIS
AREA D3 DEVELOPED CONDITION
100-YEAR

Drainage Area = 0.14(Ac.) = 0.000 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 0.14(Ac.) = 0.000 Sq. Mi.
Length along longest watercourse = 261.00(Ft.)
Length along longest watercourse measured to centroid = 185.00(Ft.)
Length along longest watercourse = 0.049 Mi.
Length along longest watercourse measured to centroid = 0.035 Mi.
Difference in elevation = 4.70(Ft.)
Slope along watercourse = 95.0805 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.014 Hr.
Lag time = 0.81 Min.
25% of lag time = 0.20 Min.
40% of lag time = 0.32 Min.
Unit time = 5.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
0.14	0.98	0.14

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
0.14	2.13	0.30

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.980(In)
Area Averaged 100-Year Rainfall = 2.130(In)

Point rain (area averaged) = 2.130(In)
Areal adjustment factor = 100.00 %

Adjusted average point rain = 2.130(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
0.140	61.00	0.000

Total Area Entered = 0.14(Ac.)

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
61.0	78.8	0.258	0.000	0.258	1.000	0.258
					Sum (F) =	0.258

Area averaged mean soil loss (F) (In/Hr) = 0.258
Minimum soil loss rate ((In/Hr)) = 0.129
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	616.179	75.839	0.107
2	0.167	1232.358	24.161	0.034
			Sum = 100.000 Sum=	0.141

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max		Low	Effective (In/Hr)
1	0.08	1.30	0.332	0.258	(	0.299)	0.074
2	0.17	1.30	0.332	0.258	(	0.299)	0.074
3	0.25	1.10	0.281	(0.258)		0.253	0.028
4	0.33	1.50	0.383	0.258	(	0.345)	0.125
5	0.42	1.50	0.383	0.258	(	0.345)	0.125
6	0.50	1.80	0.460	0.258	(	0.414)	0.202
7	0.58	1.50	0.383	0.258	(	0.345)	0.125
8	0.67	1.80	0.460	0.258	(	0.414)	0.202
9	0.75	1.80	0.460	0.258	(	0.414)	0.202
10	0.83	1.50	0.383	0.258	(	0.345)	0.125
11	0.92	1.60	0.409	0.258	(	0.368)	0.151
12	1.00	1.80	0.460	0.258	(	0.414)	0.202
13	1.08	2.20	0.562	0.258	(	0.506)	0.304
14	1.17	2.20	0.562	0.258	(	0.506)	0.304
15	1.25	2.20	0.562	0.258	(	0.506)	0.304
16	1.33	2.00	0.511	0.258	(	0.460)	0.253
17	1.42	2.60	0.665	0.258	(	0.598)	0.406
18	1.50	2.70	0.690	0.258	(	0.621)	0.432
19	1.58	2.40	0.613	0.258	(	0.552)	0.355
20	1.67	2.70	0.690	0.258	(	0.621)	0.432
21	1.75	3.30	0.843	0.258	(	0.759)	0.585
22	1.83	3.10	0.792	0.258	(	0.713)	0.534
23	1.92	2.90	0.741	0.258	(	0.667)	0.483
24	2.00	3.00	0.767	0.258	(	0.690)	0.509
25	2.08	3.10	0.792	0.258	(	0.713)	0.534
26	2.17	4.20	1.074	0.258	(	0.966)	0.815
27	2.25	5.00	1.278	0.258	(	1.150)	1.020
28	2.33	3.50	0.895	0.258	(	0.805)	0.636
29	2.42	6.80	1.738	0.258	(	1.564)	1.480

30	2.50	7.30	1.866	0.258	(1.679)	1.608	
31	2.58	8.20	2.096	0.258	(1.886)	1.838	
32	2.67	5.90	1.508	0.258	(1.357)	1.250	
33	2.75	2.00	0.511	0.258	(0.460)	0.253	
34	2.83	1.80	0.460	0.258	(0.414)	0.202	
35	2.92	1.80	0.460	0.258	(0.414)	0.202	
36	3.00	0.60	0.153	(0.258)	0.138	0.015	

(Loss Rate Not Used)

Sum = 100.0 Sum = 16.4

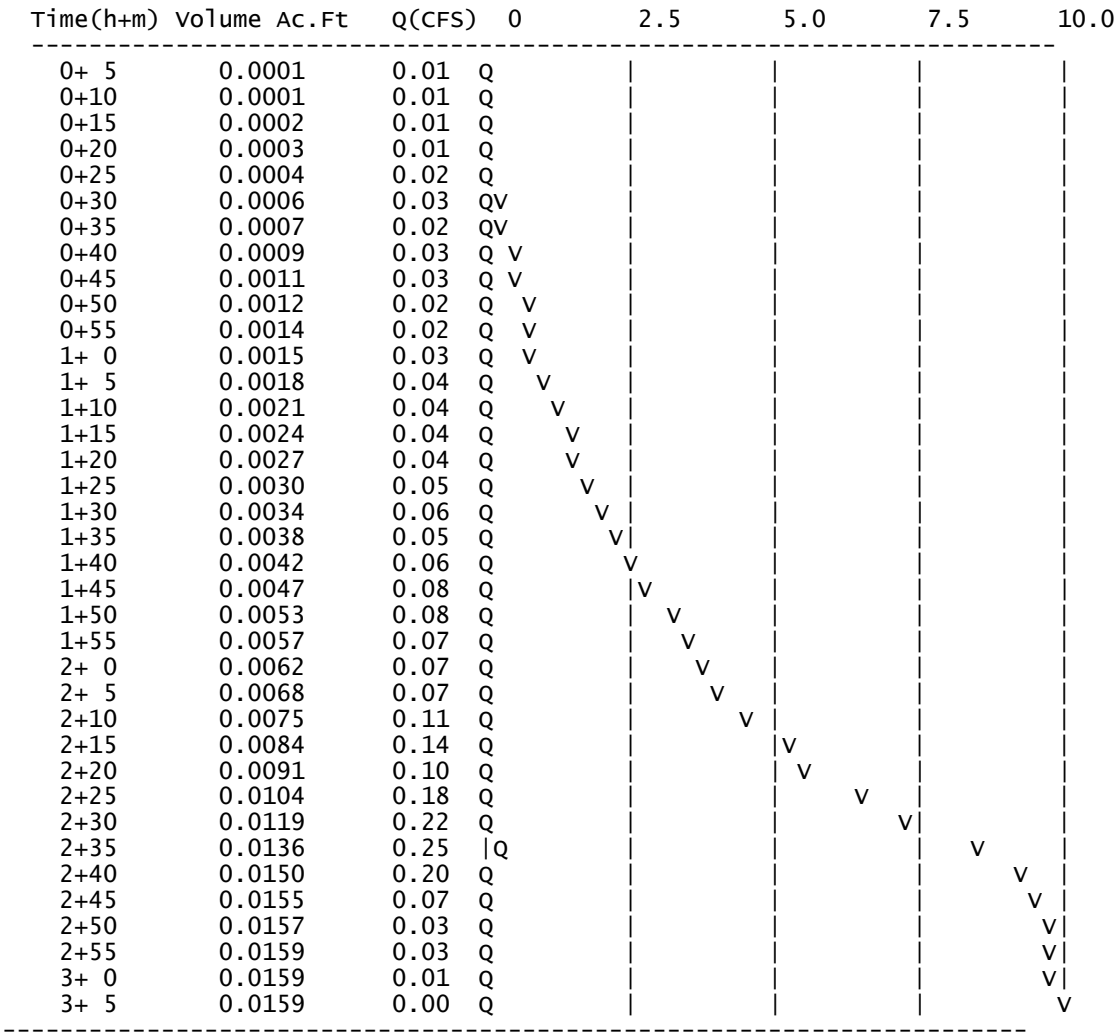
Flood volume = Effective rainfall 1.37(In)
times area 0.1(Ac.)/[(In)/(Ft.)] = 0.0(Ac.Ft)
Total soil loss = 0.76(In)
Total soil loss = 0.009(Ac.Ft)
Total rainfall = 2.13(In)
Flood volume = 694.2 Cubic Feet
Total soil loss = 388.3 Cubic Feet

Peak flow rate of this hydrograph = 0.252(CFS)

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3 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))



U n i t H y d r o g r a p h A n a l y s i s

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Study date 09/17/22 File: 3D6100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6545

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

XENIA
PRELIMINARY UNIT HYDROGRAPH ANALYSIS
AREA D3 DEVELOPED CONDITION
100-YEAR

Drainage Area = 0.14(Ac.) = 0.000 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 0.14(Ac.) = 0.000 Sq. Mi.
Length along longest watercourse = 261.00(Ft.)
Length along longest watercourse measured to centroid = 185.00(Ft.)
Length along longest watercourse = 0.049 Mi.
Length along longest watercourse measured to centroid = 0.035 Mi.
Difference in elevation = 4.70(Ft.)
Slope along watercourse = 95.0805 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.014 Hr.
Lag time = 0.81 Min.
25% of lag time = 0.20 Min.
40% of lag time = 0.32 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
0.14	1.27	0.18

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
0.14	3.00	0.42

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 1.270(In)
Area Averaged 100-Year Rainfall = 3.000(In)

Point rain (area averaged) = 3.000(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 3.000(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
0.140	61.00	0.000

Total Area Entered = 0.14(Ac.)

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
61.0	78.8	0.258	0.000	0.258	1.000	0.258
					Sum (F) =	0.258

Area averaged mean soil loss (F) (In/Hr) = 0.258
Minimum soil loss rate ((In/Hr)) = 0.129
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

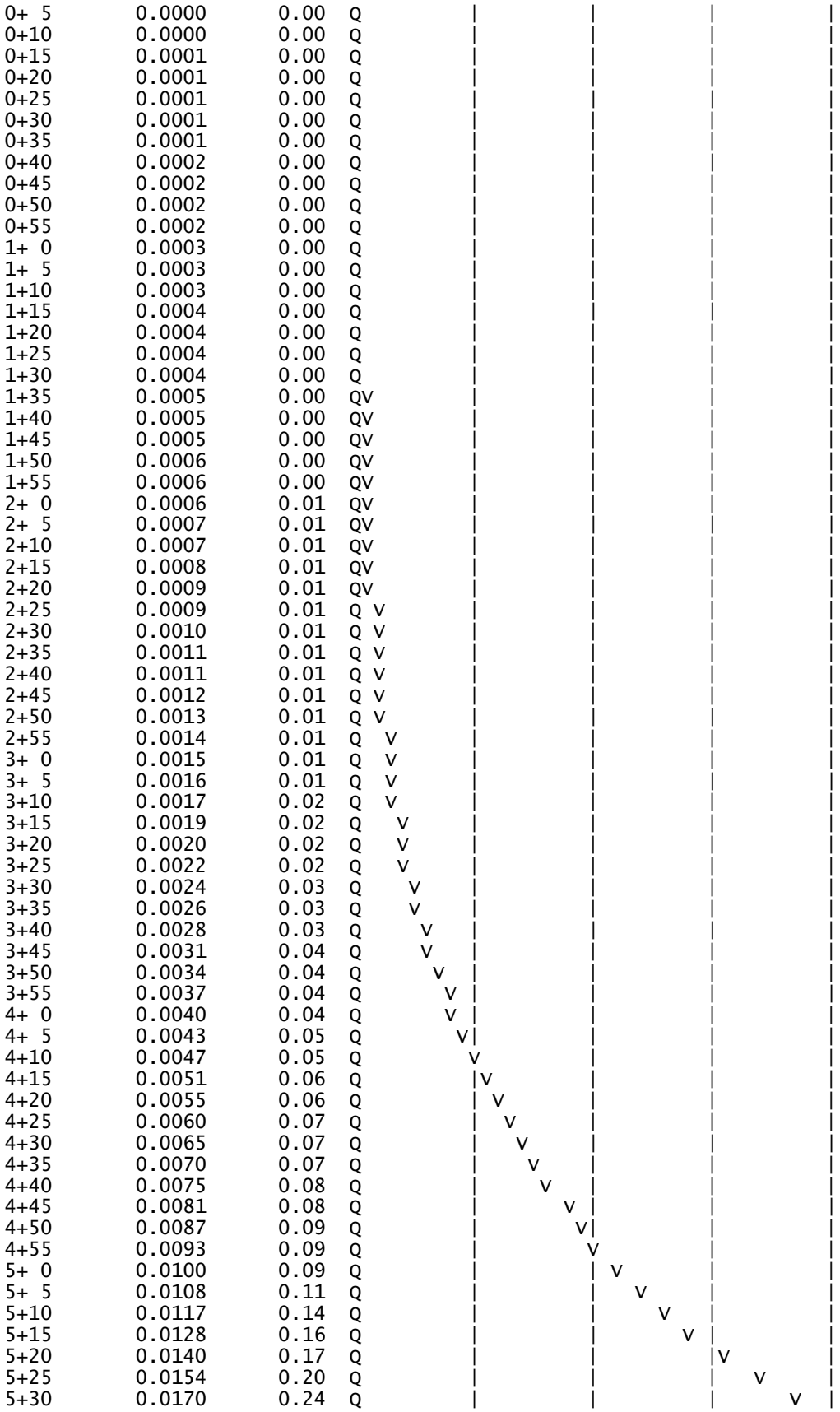
Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	616.179	75.839	0.107
2	0.167	1232.358	24.161	0.034
			Sum = 100.000 Sum=	0.141

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max		Low	Effective (In/Hr)
1	0.08	0.50	0.180	(0.258)		0.162	0.018
2	0.17	0.60	0.216	(0.258)		0.194	0.022
3	0.25	0.60	0.216	(0.258)		0.194	0.022
4	0.33	0.60	0.216	(0.258)		0.194	0.022
5	0.42	0.60	0.216	(0.258)		0.194	0.022
6	0.50	0.70	0.252	(0.258)		0.227	0.025
7	0.58	0.70	0.252	(0.258)		0.227	0.025
8	0.67	0.70	0.252	(0.258)		0.227	0.025
9	0.75	0.70	0.252	(0.258)		0.227	0.025
10	0.83	0.70	0.252	(0.258)		0.227	0.025
11	0.92	0.70	0.252	(0.258)		0.227	0.025
12	1.00	0.80	0.288	0.258	(	0.259)	0.030
13	1.08	0.80	0.288	0.258	(	0.259)	0.030
14	1.17	0.80	0.288	0.258	(	0.259)	0.030
15	1.25	0.80	0.288	0.258	(	0.259)	0.030
16	1.33	0.80	0.288	0.258	(	0.259)	0.030
17	1.42	0.80	0.288	0.258	(	0.259)	0.030
18	1.50	0.80	0.288	0.258	(	0.259)	0.030
19	1.58	0.80	0.288	0.258	(	0.259)	0.030
20	1.67	0.80	0.288	0.258	(	0.259)	0.030
21	1.75	0.80	0.288	0.258	(	0.259)	0.030
22	1.83	0.80	0.288	0.258	(	0.259)	0.030
23	1.92	0.80	0.288	0.258	(	0.259)	0.030
24	2.00	0.90	0.324	0.258	(	0.292)	0.066
25	2.08	0.80	0.288	0.258	(	0.259)	0.030
26	2.17	0.90	0.324	0.258	(	0.292)	0.066
27	2.25	0.90	0.324	0.258	(	0.292)	0.066

```
28   2.33     0.90      0.324          0.258    (  0.292)        0.066
29   2.42     0.90      0.324          0.258    (  0.292)        0.066
30   2.50     0.90      0.324          0.258    (  0.292)        0.066
31   2.58     0.90      0.324          0.258    (  0.292)        0.066
32   2.67     0.90      0.324          0.258    (  0.292)        0.066
33   2.75     1.00      0.360          0.258    (  0.324)        0.102
34   2.83     1.00      0.360          0.258    (  0.324)        0.102
35   2.92     1.00      0.360          0.258    (  0.324)        0.102
36   3.00     1.00      0.360          0.258    (  0.324)        0.102
37   3.08     1.00      0.360          0.258    (  0.324)        0.102
38   3.17     1.10      0.396          0.258    (  0.356)        0.138
39   3.25     1.10      0.396          0.258    (  0.356)        0.138
40   3.33     1.10      0.396          0.258    (  0.356)        0.138
41   3.42     1.20      0.432          0.258    (  0.389)        0.174
42   3.50     1.30      0.468          0.258    (  0.421)        0.210
43   3.58     1.40      0.504          0.258    (  0.454)        0.246
44   3.67     1.40      0.504          0.258    (  0.454)        0.246
45   3.75     1.50      0.540          0.258    (  0.486)        0.282
46   3.83     1.50      0.540          0.258    (  0.486)        0.282
47   3.92     1.60      0.576          0.258    (  0.518)        0.318
48   4.00     1.60      0.576          0.258    (  0.518)        0.318
49   4.08     1.70      0.612          0.258    (  0.551)        0.354
50   4.17     1.80      0.648          0.258    (  0.583)        0.390
51   4.25     1.90      0.684          0.258    (  0.616)        0.426
52   4.33     2.00      0.720          0.258    (  0.648)        0.462
53   4.42     2.10      0.756          0.258    (  0.680)        0.498
54   4.50     2.10      0.756          0.258    (  0.680)        0.498
55   4.58     2.20      0.792          0.258    (  0.713)        0.534
56   4.67     2.30      0.828          0.258    (  0.745)        0.570
57   4.75     2.40      0.864          0.258    (  0.778)        0.606
58   4.83     2.40      0.864          0.258    (  0.778)        0.606
59   4.92     2.50      0.900          0.258    (  0.810)        0.642
60   5.00     2.60      0.936          0.258    (  0.842)        0.678
61   5.08     3.10      1.116          0.258    (  1.004)        0.858
62   5.17     3.60      1.296          0.258    (  1.166)        1.038
63   5.25     3.90      1.404          0.258    (  1.264)        1.146
64   5.33     4.20      1.512          0.258    (  1.361)        1.254
65   5.42     4.70      1.692          0.258    (  1.523)        1.434
66   5.50     5.60      2.016          0.258    (  1.814)        1.758
67   5.58     1.90      0.684          0.258    (  0.616)        0.426
68   5.67     0.90      0.324          0.258    (  0.292)        0.066
69   5.75     0.60      0.216       (  0.258)       0.194        0.022
70   5.83     0.50      0.180       (  0.258)       0.162        0.018
71   5.92     0.30      0.108       (  0.258)       0.097        0.011
72   6.00     0.20      0.072       (  0.258)       0.065        0.007
            (Loss Rate Not Used)
   Sum =     100.0                                    Sum =    18.5
     Flood volume = Effective rainfall      1.54(In)
      times area       0.1(Ac.)/[(In)/(Ft.)] =       0.0(Ac.Ft)
     Total soil loss =      1.46(In)
     Total soil loss =     0.017(Ac.Ft)
     Total rainfall =      3.00(In)
     Flood volume =         782.0 Cubic Feet
     Total soil loss =         742.6 Cubic Feet
     ---------------------------------------------------------------------
      Peak flow rate of this hydrograph =      0.237(CFS)
     ---------------------------------------------------------------------
     +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          6 - H O U R    S T O R M
                      R u n o f f      H y d r o g r a p h
     ---------------------------------------------------------------------
                  Hydrograph in   5   Minute intervals ((CFS))

     ---------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0        2.5       5.0       7.5      10.0
----------------------------------------------------------------------
```



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    5+35       0.0177      0.11  Q          |          |          |        v|
    5+40       0.0179      0.02  Q          |          |          |        v|
    5+45       0.0179      0.00  Q          |          |          |        v|
    5+50       0.0179      0.00  Q          |          |          |        v|
    5+55       0.0179      0.00  Q          |          |          |        v|
    6+ 0       0.0180      0.00  Q          |          |          |        v|
    6+ 5       0.0180      0.00  Q          |          |          |        v|
---------------------------------------------------------------------------
```

U n i t H y d r o g r a p h A n a l y s i s

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Study date 09/17/22 File: 3D24100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6545

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

XENIA
PRELIMINARY UNIT HYDROGRAPH ANALYSIS
AREA D3 DEVELOPED CONDITION
100-YEAR

Drainage Area = 0.14(Ac.) = 0.000 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 0.14(Ac.) = 0.000 Sq. Mi.
Length along longest watercourse = 261.00(Ft.)
Length along longest watercourse measured to centroid = 185.00(Ft.)
Length along longest watercourse = 0.049 Mi.
Length along longest watercourse measured to centroid = 0.035 Mi.
Difference in elevation = 4.70(Ft.)
Slope along watercourse = 95.0805 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.014 Hr.
Lag time = 0.81 Min.
25% of lag time = 0.20 Min.
40% of lag time = 0.32 Min.
Unit time = 5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
0.14	2.53	0.35

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
0.14	6.50	0.91

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 2.530(In)
Area Averaged 100-Year Rainfall = 6.500(In)

Point rain (area averaged) = 6.500(In)
Areal adjustment factor = 100.00 %

Adjusted average point rain = 6.500(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
0.140	61.00	0.000

Total Area Entered = 0.14(Ac.)

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
61.0	78.8	0.258	0.000	0.258	1.000	0.258
					Sum (F) =	0.258

Area averaged mean soil loss (F) (In/Hr) = 0.258
Minimum soil loss rate ((In/Hr)) = 0.129
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	616.179	75.839	0.107
2	0.167	1232.358	24.161	0.034
			Sum = 100.000 Sum=	0.141

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.07	0.052	(0.458)	0.047	0.005
2	0.17	0.07	0.052	(0.456)	0.047	0.005
3	0.25	0.07	0.052	(0.454)	0.047	0.005
4	0.33	0.10	0.078	(0.452)	0.070	0.008
5	0.42	0.10	0.078	(0.451)	0.070	0.008
6	0.50	0.10	0.078	(0.449)	0.070	0.008
7	0.58	0.10	0.078	(0.447)	0.070	0.008
8	0.67	0.10	0.078	(0.445)	0.070	0.008
9	0.75	0.10	0.078	(0.444)	0.070	0.008
10	0.83	0.13	0.104	(0.442)	0.094	0.010
11	0.92	0.13	0.104	(0.440)	0.094	0.010
12	1.00	0.13	0.104	(0.438)	0.094	0.010
13	1.08	0.10	0.078	(0.437)	0.070	0.008
14	1.17	0.10	0.078	(0.435)	0.070	0.008
15	1.25	0.10	0.078	(0.433)	0.070	0.008
16	1.33	0.10	0.078	(0.431)	0.070	0.008
17	1.42	0.10	0.078	(0.430)	0.070	0.008
18	1.50	0.10	0.078	(0.428)	0.070	0.008
19	1.58	0.10	0.078	(0.426)	0.070	0.008
20	1.67	0.10	0.078	(0.425)	0.070	0.008
21	1.75	0.10	0.078	(0.423)	0.070	0.008
22	1.83	0.13	0.104	(0.421)	0.094	0.010
23	1.92	0.13	0.104	(0.420)	0.094	0.010
24	2.00	0.13	0.104	(0.418)	0.094	0.010
25	2.08	0.13	0.104	(0.416)	0.094	0.010
26	2.17	0.13	0.104	(0.414)	0.094	0.010
27	2.25	0.13	0.104	(0.413)	0.094	0.010
28	2.33	0.13	0.104	(0.411)	0.094	0.010
29	2.42	0.13	0.104	(0.409)	0.094	0.010

30	2.50	0.13	0.104	(0.408)	0.094	0.010
31	2.58	0.17	0.130	(0.406)	0.117	0.013
32	2.67	0.17	0.130	(0.404)	0.117	0.013
33	2.75	0.17	0.130	(0.403)	0.117	0.013
34	2.83	0.17	0.130	(0.401)	0.117	0.013
35	2.92	0.17	0.130	(0.399)	0.117	0.013
36	3.00	0.17	0.130	(0.398)	0.117	0.013
37	3.08	0.17	0.130	(0.396)	0.117	0.013
38	3.17	0.17	0.130	(0.394)	0.117	0.013
39	3.25	0.17	0.130	(0.393)	0.117	0.013
40	3.33	0.17	0.130	(0.391)	0.117	0.013
41	3.42	0.17	0.130	(0.390)	0.117	0.013
42	3.50	0.17	0.130	(0.388)	0.117	0.013
43	3.58	0.17	0.130	(0.386)	0.117	0.013
44	3.67	0.17	0.130	(0.385)	0.117	0.013
45	3.75	0.17	0.130	(0.383)	0.117	0.013
46	3.83	0.20	0.156	(0.381)	0.140	0.016
47	3.92	0.20	0.156	(0.380)	0.140	0.016
48	4.00	0.20	0.156	(0.378)	0.140	0.016
49	4.08	0.20	0.156	(0.377)	0.140	0.016
50	4.17	0.20	0.156	(0.375)	0.140	0.016
51	4.25	0.20	0.156	(0.373)	0.140	0.016
52	4.33	0.23	0.182	(0.372)	0.164	0.018
53	4.42	0.23	0.182	(0.370)	0.164	0.018
54	4.50	0.23	0.182	(0.369)	0.164	0.018
55	4.58	0.23	0.182	(0.367)	0.164	0.018
56	4.67	0.23	0.182	(0.366)	0.164	0.018
57	4.75	0.23	0.182	(0.364)	0.164	0.018
58	4.83	0.27	0.208	(0.362)	0.187	0.021
59	4.92	0.27	0.208	(0.361)	0.187	0.021
60	5.00	0.27	0.208	(0.359)	0.187	0.021
61	5.08	0.20	0.156	(0.358)	0.140	0.016
62	5.17	0.20	0.156	(0.356)	0.140	0.016
63	5.25	0.20	0.156	(0.355)	0.140	0.016
64	5.33	0.23	0.182	(0.353)	0.164	0.018
65	5.42	0.23	0.182	(0.351)	0.164	0.018
66	5.50	0.23	0.182	(0.350)	0.164	0.018
67	5.58	0.27	0.208	(0.348)	0.187	0.021
68	5.67	0.27	0.208	(0.347)	0.187	0.021
69	5.75	0.27	0.208	(0.345)	0.187	0.021
70	5.83	0.27	0.208	(0.344)	0.187	0.021
71	5.92	0.27	0.208	(0.342)	0.187	0.021
72	6.00	0.27	0.208	(0.341)	0.187	0.021
73	6.08	0.30	0.234	(0.339)	0.211	0.023
74	6.17	0.30	0.234	(0.338)	0.211	0.023
75	6.25	0.30	0.234	(0.336)	0.211	0.023
76	6.33	0.30	0.234	(0.335)	0.211	0.023
77	6.42	0.30	0.234	(0.333)	0.211	0.023
78	6.50	0.30	0.234	(0.332)	0.211	0.023
79	6.58	0.33	0.260	(0.330)	0.234	0.026
80	6.67	0.33	0.260	(0.329)	0.234	0.026
81	6.75	0.33	0.260	(0.327)	0.234	0.026
82	6.83	0.33	0.260	(0.326)	0.234	0.026
83	6.92	0.33	0.260	(0.324)	0.234	0.026
84	7.00	0.33	0.260	(0.323)	0.234	0.026
85	7.08	0.33	0.260	(0.321)	0.234	0.026
86	7.17	0.33	0.260	(0.320)	0.234	0.026
87	7.25	0.33	0.260	(0.318)	0.234	0.026
88	7.33	0.37	0.286	(0.317)	0.257	0.029
89	7.42	0.37	0.286	(0.316)	0.257	0.029
90	7.50	0.37	0.286	(0.314)	0.257	0.029
91	7.58	0.40	0.312	(0.313)	0.281	0.031
92	7.67	0.40	0.312	(0.311)	0.281	0.031
93	7.75	0.40	0.312	(0.310)	0.281	0.031
94	7.83	0.43	0.338	(0.308)	0.304	0.034
95	7.92	0.43	0.338	(0.307)	0.304	0.034

96	8.00	0.43	0.338	(0.306)	0.304	0.034
97	8.08	0.50	0.390	0.304	(0.351)	0.086
98	8.17	0.50	0.390	0.303	(0.351)	0.087
99	8.25	0.50	0.390	0.301	(0.351)	0.089
100	8.33	0.50	0.390	0.300	(0.351)	0.090
101	8.42	0.50	0.390	0.298	(0.351)	0.092
102	8.50	0.50	0.390	0.297	(0.351)	0.093
103	8.58	0.53	0.416	0.296	(0.374)	0.120
104	8.67	0.53	0.416	0.294	(0.374)	0.122
105	8.75	0.53	0.416	0.293	(0.374)	0.123
106	8.83	0.57	0.442	0.292	(0.398)	0.150
107	8.92	0.57	0.442	0.290	(0.398)	0.152
108	9.00	0.57	0.442	0.289	(0.398)	0.153
109	9.08	0.63	0.494	0.287	(0.445)	0.207
110	9.17	0.63	0.494	0.286	(0.445)	0.208
111	9.25	0.63	0.494	0.285	(0.445)	0.209
112	9.33	0.67	0.520	0.283	(0.468)	0.237
113	9.42	0.67	0.520	0.282	(0.468)	0.238
114	9.50	0.67	0.520	0.281	(0.468)	0.239
115	9.58	0.70	0.546	0.279	(0.491)	0.267
116	9.67	0.70	0.546	0.278	(0.491)	0.268
117	9.75	0.70	0.546	0.277	(0.491)	0.269
118	9.83	0.73	0.572	0.275	(0.515)	0.297
119	9.92	0.73	0.572	0.274	(0.515)	0.298
120	10.00	0.73	0.572	0.273	(0.515)	0.299
121	10.08	0.50	0.390	0.271	(0.351)	0.119
122	10.17	0.50	0.390	0.270	(0.351)	0.120
123	10.25	0.50	0.390	0.269	(0.351)	0.121
124	10.33	0.50	0.390	0.267	(0.351)	0.123
125	10.42	0.50	0.390	0.266	(0.351)	0.124
126	10.50	0.50	0.390	0.265	(0.351)	0.125
127	10.58	0.67	0.520	0.263	(0.468)	0.257
128	10.67	0.67	0.520	0.262	(0.468)	0.258
129	10.75	0.67	0.520	0.261	(0.468)	0.259
130	10.83	0.67	0.520	0.260	(0.468)	0.260
131	10.92	0.67	0.520	0.258	(0.468)	0.262
132	11.00	0.67	0.520	0.257	(0.468)	0.263
133	11.08	0.63	0.494	0.256	(0.445)	0.238
134	11.17	0.63	0.494	0.255	(0.445)	0.239
135	11.25	0.63	0.494	0.253	(0.445)	0.241
136	11.33	0.63	0.494	0.252	(0.445)	0.242
137	11.42	0.63	0.494	0.251	(0.445)	0.243
138	11.50	0.63	0.494	0.250	(0.445)	0.244
139	11.58	0.57	0.442	0.248	(0.398)	0.194
140	11.67	0.57	0.442	0.247	(0.398)	0.195
141	11.75	0.57	0.442	0.246	(0.398)	0.196
142	11.83	0.60	0.468	0.245	(0.421)	0.223
143	11.92	0.60	0.468	0.243	(0.421)	0.225
144	12.00	0.60	0.468	0.242	(0.421)	0.226
145	12.08	0.83	0.650	0.241	(0.585)	0.409
146	12.17	0.83	0.650	0.240	(0.585)	0.410
147	12.25	0.83	0.650	0.239	(0.585)	0.411
148	12.33	0.87	0.676	0.237	(0.608)	0.439
149	12.42	0.87	0.676	0.236	(0.608)	0.440
150	12.50	0.87	0.676	0.235	(0.608)	0.441
151	12.58	0.93	0.728	0.234	(0.655)	0.494
152	12.67	0.93	0.728	0.233	(0.655)	0.495
153	12.75	0.93	0.728	0.231	(0.655)	0.497
154	12.83	0.97	0.754	0.230	(0.679)	0.524
155	12.92	0.97	0.754	0.229	(0.679)	0.525
156	13.00	0.97	0.754	0.228	(0.679)	0.526
157	13.08	1.13	0.884	0.227	(0.796)	0.657
158	13.17	1.13	0.884	0.226	(0.796)	0.658
159	13.25	1.13	0.884	0.225	(0.796)	0.659
160	13.33	1.13	0.884	0.223	(0.796)	0.661
161	13.42	1.13	0.884	0.222	(0.796)	0.662

162	13.50	1.13	0.884		0.221	(0.796)	0.663
163	13.58	0.77	0.598		0.220	(0.538)	0.378
164	13.67	0.77	0.598		0.219	(0.538)	0.379
165	13.75	0.77	0.598		0.218	(0.538)	0.380
166	13.83	0.77	0.598		0.217	(0.538)	0.381
167	13.92	0.77	0.598		0.216	(0.538)	0.382
168	14.00	0.77	0.598		0.214	(0.538)	0.384
169	14.08	0.90	0.702		0.213	(0.632)	0.489
170	14.17	0.90	0.702		0.212	(0.632)	0.490
171	14.25	0.90	0.702		0.211	(0.632)	0.491
172	14.33	0.87	0.676		0.210	(0.608)	0.466
173	14.42	0.87	0.676		0.209	(0.608)	0.467
174	14.50	0.87	0.676		0.208	(0.608)	0.468
175	14.58	0.87	0.676		0.207	(0.608)	0.469
176	14.67	0.87	0.676		0.206	(0.608)	0.470
177	14.75	0.87	0.676		0.205	(0.608)	0.471
178	14.83	0.83	0.650		0.204	(0.585)	0.446
179	14.92	0.83	0.650		0.203	(0.585)	0.447
180	15.00	0.83	0.650		0.202	(0.585)	0.448
181	15.08	0.80	0.624		0.201	(0.562)	0.423
182	15.17	0.80	0.624		0.200	(0.562)	0.424
183	15.25	0.80	0.624		0.199	(0.562)	0.425
184	15.33	0.77	0.598		0.198	(0.538)	0.400
185	15.42	0.77	0.598		0.197	(0.538)	0.401
186	15.50	0.77	0.598		0.196	(0.538)	0.402
187	15.58	0.63	0.494		0.195	(0.445)	0.299
188	15.67	0.63	0.494		0.194	(0.445)	0.300
189	15.75	0.63	0.494		0.193	(0.445)	0.301
190	15.83	0.63	0.494		0.192	(0.445)	0.302
191	15.92	0.63	0.494		0.191	(0.445)	0.303
192	16.00	0.63	0.494		0.190	(0.445)	0.304
193	16.08	0.13	0.104	(0.189)		0.094	0.010
194	16.17	0.13	0.104	(0.188)		0.094	0.010
195	16.25	0.13	0.104	(0.187)		0.094	0.010
196	16.33	0.13	0.104	(0.186)		0.094	0.010
197	16.42	0.13	0.104	(0.185)		0.094	0.010
198	16.50	0.13	0.104	(0.184)		0.094	0.010
199	16.58	0.10	0.078	(0.183)		0.070	0.008
200	16.67	0.10	0.078	(0.182)		0.070	0.008
201	16.75	0.10	0.078	(0.181)		0.070	0.008
202	16.83	0.10	0.078	(0.180)		0.070	0.008
203	16.92	0.10	0.078	(0.179)		0.070	0.008
204	17.00	0.10	0.078	(0.178)		0.070	0.008
205	17.08	0.17	0.130	(0.177)		0.117	0.013
206	17.17	0.17	0.130	(0.177)		0.117	0.013
207	17.25	0.17	0.130	(0.176)		0.117	0.013
208	17.33	0.17	0.130	(0.175)		0.117	0.013
209	17.42	0.17	0.130	(0.174)		0.117	0.013
210	17.50	0.17	0.130	(0.173)		0.117	0.013
211	17.58	0.17	0.130	(0.172)		0.117	0.013
212	17.67	0.17	0.130	(0.171)		0.117	0.013
213	17.75	0.17	0.130	(0.170)		0.117	0.013
214	17.83	0.13	0.104	(0.170)		0.094	0.010
215	17.92	0.13	0.104	(0.169)		0.094	0.010
216	18.00	0.13	0.104	(0.168)		0.094	0.010
217	18.08	0.13	0.104	(0.167)		0.094	0.010
218	18.17	0.13	0.104	(0.166)		0.094	0.010
219	18.25	0.13	0.104	(0.165)		0.094	0.010
220	18.33	0.13	0.104	(0.165)		0.094	0.010
221	18.42	0.13	0.104	(0.164)		0.094	0.010
222	18.50	0.13	0.104	(0.163)		0.094	0.010
223	18.58	0.10	0.078	(0.162)		0.070	0.008
224	18.67	0.10	0.078	(0.161)		0.070	0.008
225	18.75	0.10	0.078	(0.161)		0.070	0.008
226	18.83	0.07	0.052	(0.160)		0.047	0.005
227	18.92	0.07	0.052	(0.159)		0.047	0.005

228	19.00	0.07	0.052	(0.158)	0.047	0.005
229	19.08	0.10	0.078	(0.158)	0.070	0.008
230	19.17	0.10	0.078	(0.157)	0.070	0.008
231	19.25	0.10	0.078	(0.156)	0.070	0.008
232	19.33	0.13	0.104	(0.155)	0.094	0.010
233	19.42	0.13	0.104	(0.155)	0.094	0.010
234	19.50	0.13	0.104	(0.154)	0.094	0.010
235	19.58	0.10	0.078	(0.153)	0.070	0.008
236	19.67	0.10	0.078	(0.153)	0.070	0.008
237	19.75	0.10	0.078	(0.152)	0.070	0.008
238	19.83	0.07	0.052	(0.151)	0.047	0.005
239	19.92	0.07	0.052	(0.151)	0.047	0.005
240	20.00	0.07	0.052	(0.150)	0.047	0.005
241	20.08	0.10	0.078	(0.149)	0.070	0.008
242	20.17	0.10	0.078	(0.149)	0.070	0.008
243	20.25	0.10	0.078	(0.148)	0.070	0.008
244	20.33	0.10	0.078	(0.147)	0.070	0.008
245	20.42	0.10	0.078	(0.147)	0.070	0.008
246	20.50	0.10	0.078	(0.146)	0.070	0.008
247	20.58	0.10	0.078	(0.145)	0.070	0.008
248	20.67	0.10	0.078	(0.145)	0.070	0.008
249	20.75	0.10	0.078	(0.144)	0.070	0.008
250	20.83	0.07	0.052	(0.144)	0.047	0.005
251	20.92	0.07	0.052	(0.143)	0.047	0.005
252	21.00	0.07	0.052	(0.142)	0.047	0.005
253	21.08	0.10	0.078	(0.142)	0.070	0.008
254	21.17	0.10	0.078	(0.141)	0.070	0.008
255	21.25	0.10	0.078	(0.141)	0.070	0.008
256	21.33	0.07	0.052	(0.140)	0.047	0.005
257	21.42	0.07	0.052	(0.140)	0.047	0.005
258	21.50	0.07	0.052	(0.139)	0.047	0.005
259	21.58	0.10	0.078	(0.139)	0.070	0.008
260	21.67	0.10	0.078	(0.138)	0.070	0.008
261	21.75	0.10	0.078	(0.138)	0.070	0.008
262	21.83	0.07	0.052	(0.137)	0.047	0.005
263	21.92	0.07	0.052	(0.137)	0.047	0.005
264	22.00	0.07	0.052	(0.136)	0.047	0.005
265	22.08	0.10	0.078	(0.136)	0.070	0.008
266	22.17	0.10	0.078	(0.135)	0.070	0.008
267	22.25	0.10	0.078	(0.135)	0.070	0.008
268	22.33	0.07	0.052	(0.135)	0.047	0.005
269	22.42	0.07	0.052	(0.134)	0.047	0.005
270	22.50	0.07	0.052	(0.134)	0.047	0.005
271	22.58	0.07	0.052	(0.133)	0.047	0.005
272	22.67	0.07	0.052	(0.133)	0.047	0.005
273	22.75	0.07	0.052	(0.133)	0.047	0.005
274	22.83	0.07	0.052	(0.132)	0.047	0.005
275	22.92	0.07	0.052	(0.132)	0.047	0.005
276	23.00	0.07	0.052	(0.132)	0.047	0.005
277	23.08	0.07	0.052	(0.131)	0.047	0.005
278	23.17	0.07	0.052	(0.131)	0.047	0.005
279	23.25	0.07	0.052	(0.131)	0.047	0.005
280	23.33	0.07	0.052	(0.130)	0.047	0.005
281	23.42	0.07	0.052	(0.130)	0.047	0.005
282	23.50	0.07	0.052	(0.130)	0.047	0.005
283	23.58	0.07	0.052	(0.130)	0.047	0.005
284	23.67	0.07	0.052	(0.130)	0.047	0.005
285	23.75	0.07	0.052	(0.129)	0.047	0.005
286	23.83	0.07	0.052	(0.129)	0.047	0.005
287	23.92	0.07	0.052	(0.129)	0.047	0.005
288	24.00	0.07	0.052	(0.129)	0.047	0.005

(Loss Rate Not Used)

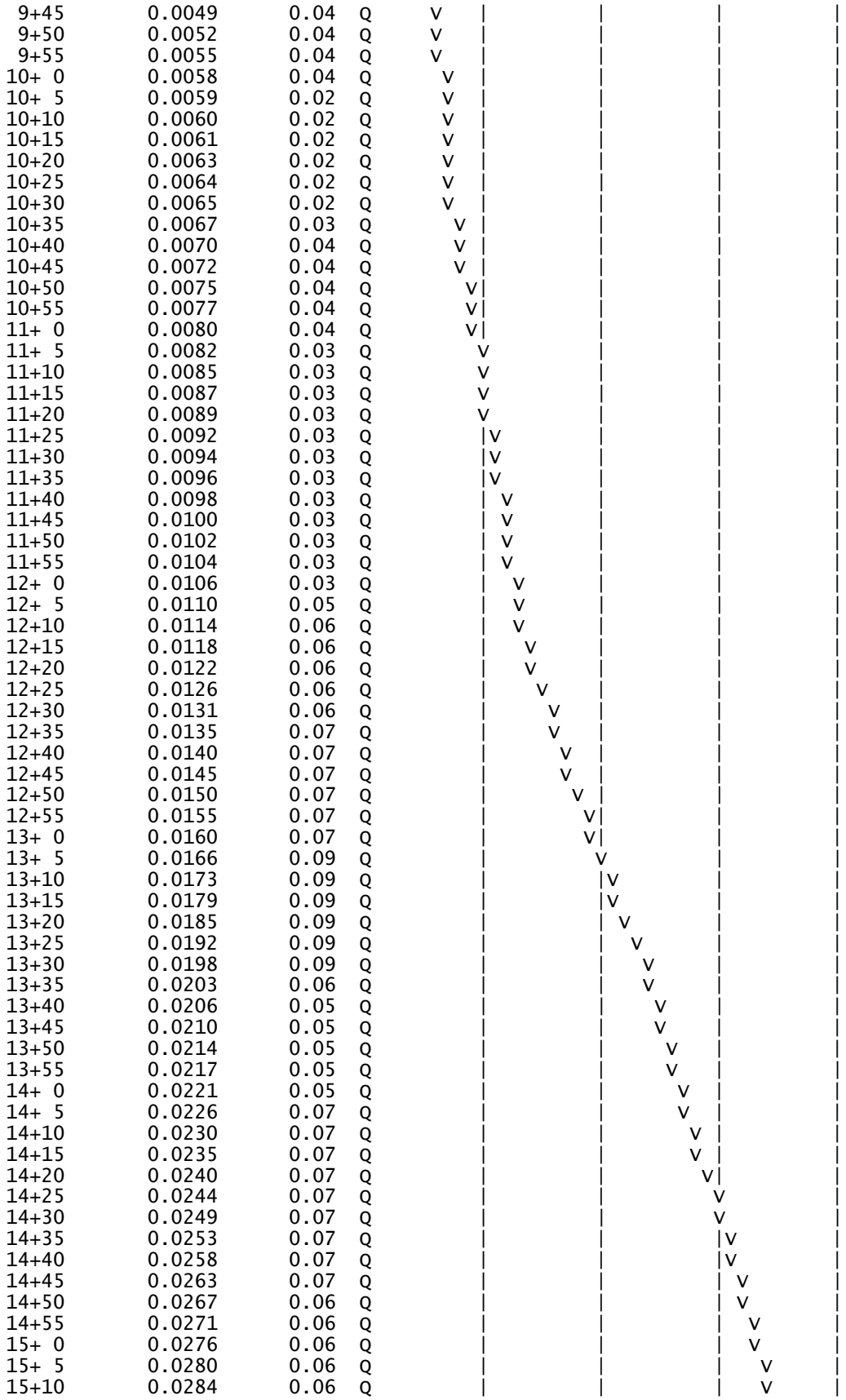
Sum = 100.0 Sum = 33.5

Flood volume = Effective rainfall 2.79(In)
times area 0.1(Ac.)/[(In)/(Ft.)] = 0.0(Ac.Ft)
Total soil loss = 3.71(In)

```
    Total soil loss =     0.043(Ac.Ft)
    Total rainfall =      6.50(In)
    Flood volume =        1419.0 Cubic Feet
    Total soil loss =        1884.3 Cubic Feet
    ---------------------------------------------------------------------
     Peak flow rate of this hydrograph =      0.094(CFS)
    ---------------------------------------------------------------------
    +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                        24 - H O U R    S T O R M
                   R u n o f f      H y d r o g r a p h
    ---------------------------------------------------------------------
                Hydrograph in   5   Minute intervals ((CFS))

    ---------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0        2.5       5.0       7.5      10.0
---------------------------------------------------------------------------
  0+ 5       0.0000      0.00  Q          |         |         |         |
  0+10       0.0000      0.00  Q          |         |         |         |
  0+15       0.0000      0.00  Q          |         |         |         |
  0+20       0.0000      0.00  Q          |         |         |         |
  0+25       0.0000      0.00  Q          |         |         |         |
  0+30       0.0000      0.00  Q          |         |         |         |
  0+35       0.0000      0.00  Q          |         |         |         |
  0+40       0.0001      0.00  Q          |         |         |         |
  0+45       0.0001      0.00  Q          |         |         |         |
  0+50       0.0001      0.00  Q          |         |         |         |
  0+55       0.0001      0.00  Q          |         |         |         |
  1+ 0       0.0001      0.00  Q          |         |         |         |
  1+ 5       0.0001      0.00  Q          |         |         |         |
  1+10       0.0001      0.00  Q          |         |         |         |
  1+15       0.0001      0.00  Q          |         |         |         |
  1+20       0.0001      0.00  Q          |         |         |         |
  1+25       0.0001      0.00  Q          |         |         |         |
  1+30       0.0001      0.00  Q          |         |         |         |
  1+35       0.0001      0.00  Q          |         |         |         |
  1+40       0.0001      0.00  Q          |         |         |         |
  1+45       0.0002      0.00  Q          |         |         |         |
  1+50       0.0002      0.00  Q          |         |         |         |
  1+55       0.0002      0.00  Q          |         |         |         |
  2+ 0       0.0002      0.00  Q          |         |         |         |
  2+ 5       0.0002      0.00  Q          |         |         |         |
  2+10       0.0002      0.00  Q          |         |         |         |
  2+15       0.0002      0.00  Q          |         |         |         |
  2+20       0.0002      0.00  Q          |         |         |         |
  2+25       0.0002      0.00  Q          |         |         |         |
  2+30       0.0002      0.00  Q          |         |         |         |
  2+35       0.0003      0.00  Q          |         |         |         |
  2+40       0.0003      0.00  Q          |         |         |         |
  2+45       0.0003      0.00  Q          |         |         |         |
  2+50       0.0003      0.00  Q          |         |         |         |
  2+55       0.0003      0.00  Q          |         |         |         |
  3+ 0       0.0003      0.00  Q          |         |         |         |
  3+ 5       0.0003      0.00  Q          |         |         |         |
  3+10       0.0003      0.00  Q          |         |         |         |
  3+15       0.0004      0.00  Q          |         |         |         |
  3+20       0.0004      0.00  Q          |         |         |         |
  3+25       0.0004      0.00  Q          |         |         |         |
  3+30       0.0004      0.00  Q          |         |         |         |
  3+35       0.0004      0.00  Q          |         |         |         |
  3+40       0.0004      0.00  Q          |         |         |         |
  3+45       0.0004      0.00  Q          |         |         |         |
  3+50       0.0005      0.00  Q          |         |         |         |
  3+55       0.0005      0.00  Q          |         |         |         |
  4+ 0       0.0005      0.00  Q          |         |         |         |
  4+ 5       0.0005      0.00  Q          |         |         |         |
  4+10       0.0005      0.00  Q          |         |         |         |
```

4+15	0.0005	0.00	Q				
4+20	0.0005	0.00	Q				
4+25	0.0006	0.00	Q				
4+30	0.0006	0.00	Q				
4+35	0.0006	0.00	Q				
4+40	0.0006	0.00	Q				
4+45	0.0006	0.00	Q				
4+50	0.0007	0.00	Q				
4+55	0.0007	0.00	Q				
5+ 0	0.0007	0.00	Q				
5+ 5	0.0007	0.00	Q				
5+10	0.0007	0.00	Q				
5+15	0.0007	0.00	Q				
5+20	0.0008	0.00	Q				
5+25	0.0008	0.00	Q				
5+30	0.0008	0.00	Q				
5+35	0.0008	0.00	Q				
5+40	0.0008	0.00	QV				
5+45	0.0009	0.00	QV				
5+50	0.0009	0.00	QV				
5+55	0.0009	0.00	QV				
6+ 0	0.0009	0.00	QV				
6+ 5	0.0009	0.00	QV				
6+10	0.0010	0.00	QV				
6+15	0.0010	0.00	QV				
6+20	0.0010	0.00	QV				
6+25	0.0010	0.00	QV				
6+30	0.0010	0.00	QV				
6+35	0.0011	0.00	QV				
6+40	0.0011	0.00	QV				
6+45	0.0011	0.00	QV				
6+50	0.0011	0.00	QV				
6+55	0.0012	0.00	QV				
7+ 0	0.0012	0.00	QV				
7+ 5	0.0012	0.00	QV				
7+10	0.0013	0.00	QV				
7+15	0.0013	0.00	QV				
7+20	0.0013	0.00	QV				
7+25	0.0013	0.00	QV				
7+30	0.0014	0.00	QV				
7+35	0.0014	0.00	QV				
7+40	0.0014	0.00	QV				
7+45	0.0014	0.00	QV				
7+50	0.0015	0.00	QV				
7+55	0.0015	0.00	QV				
8+ 0	0.0015	0.00	QV				
8+ 5	0.0016	0.01	QV				
8+10	0.0017	0.01	Q V				
8+15	0.0018	0.01	Q V				
8+20	0.0019	0.01	Q V				
8+25	0.0020	0.01	Q V				
8+30	0.0021	0.01	Q V				
8+35	0.0022	0.02	Q V				
8+40	0.0023	0.02	Q V				
8+45	0.0024	0.02	Q V				
8+50	0.0025	0.02	Q V				
8+55	0.0027	0.02	Q V				
9+ 0	0.0028	0.02	Q V				
9+ 5	0.0030	0.03	Q V				
9+10	0.0032	0.03	Q V				
9+15	0.0034	0.03	Q V				
9+20	0.0037	0.03	Q V				
9+25	0.0039	0.03	Q V				
9+30	0.0041	0.03	Q V				
9+35	0.0044	0.04	Q V				
9+40	0.0046	0.04	Q V				



15+15	0.0288	0.06	Q	|	|	|	V |
15+20	0.0292	0.06	Q	|	|	|	V |
15+25	0.0296	0.06	Q	|	|	|	V |
15+30	0.0300	0.06	Q	|	|	|	V |
15+35	0.0303	0.05	Q	|	|	|	V |
15+40	0.0306	0.04	Q	|	|	|	V |
15+45	0.0309	0.04	Q	|	|	|	V |
15+50	0.0312	0.04	Q	|	|	|	V |
15+55	0.0315	0.04	Q	|	|	|	V |
16+ 0	0.0318	0.04	Q	|	|	|	V|
16+ 5	0.0319	0.01	Q	|	|	|	V|
16+10	0.0319	0.00	Q	|	|	|	V|
16+15	0.0319	0.00	Q	|	|	|	V|
16+20	0.0319	0.00	Q	|	|	|	V|
16+25	0.0319	0.00	Q	|	|	|	V|
16+30	0.0319	0.00	Q	|	|	|	V|
16+35	0.0319	0.00	Q	|	|	|	V|
16+40	0.0319	0.00	Q	|	|	|	V|
16+45	0.0319	0.00	Q	|	|	|	V|
16+50	0.0319	0.00	Q	|	|	|	V|
16+55	0.0319	0.00	Q	|	|	|	V|
17+ 0	0.0320	0.00	Q	|	|	|	V|
17+ 5	0.0320	0.00	Q	|	|	|	V|
17+10	0.0320	0.00	Q	|	|	|	V|
17+15	0.0320	0.00	Q	|	|	|	V|
17+20	0.0320	0.00	Q	|	|	|	V|
17+25	0.0320	0.00	Q	|	|	|	V|
17+30	0.0320	0.00	Q	|	|	|	V|
17+35	0.0320	0.00	Q	|	|	|	V|
17+40	0.0321	0.00	Q	|	|	|	V|
17+45	0.0321	0.00	Q	|	|	|	V|
17+50	0.0321	0.00	Q	|	|	|	V|
17+55	0.0321	0.00	Q	|	|	|	V|
18+ 0	0.0321	0.00	Q	|	|	|	V|
18+ 5	0.0321	0.00	Q	|	|	|	V|
18+10	0.0321	0.00	Q	|	|	|	V|
18+15	0.0321	0.00	Q	|	|	|	V|
18+20	0.0321	0.00	Q	|	|	|	V|
18+25	0.0321	0.00	Q	|	|	|	V|
18+30	0.0322	0.00	Q	|	|	|	V|
18+35	0.0322	0.00	Q	|	|	|	V|
18+40	0.0322	0.00	Q	|	|	|	V|
18+45	0.0322	0.00	Q	|	|	|	V|
18+50	0.0322	0.00	Q	|	|	|	V|
18+55	0.0322	0.00	Q	|	|	|	V|
19+ 0	0.0322	0.00	Q	|	|	|	V|
19+ 5	0.0322	0.00	Q	|	|	|	V|
19+10	0.0322	0.00	Q	|	|	|	V|
19+15	0.0322	0.00	Q	|	|	|	V|
19+20	0.0322	0.00	Q	|	|	|	V|
19+25	0.0322	0.00	Q	|	|	|	V|
19+30	0.0322	0.00	Q	|	|	|	V|
19+35	0.0323	0.00	Q	|	|	|	V|
19+40	0.0323	0.00	Q	|	|	|	V|
19+45	0.0323	0.00	Q	|	|	|	V|
19+50	0.0323	0.00	Q	|	|	|	V|
19+55	0.0323	0.00	Q	|	|	|	V|
20+ 0	0.0323	0.00	Q	|	|	|	V|
20+ 5	0.0323	0.00	Q	|	|	|	V|
20+10	0.0323	0.00	Q	|	|	|	V|
20+15	0.0323	0.00	Q	|	|	|	V|
20+20	0.0323	0.00	Q	|	|	|	V|
20+25	0.0323	0.00	Q	|	|	|	V|
20+30	0.0323	0.00	Q	|	|	|	V|
20+35	0.0323	0.00	Q	|	|	|	V|
20+40	0.0323	0.00	Q	|	|	|	V|

20+45	0.0324	0.00	Q	|	|	|	V|
20+50	0.0324	0.00	Q	|	|	|	V|
20+55	0.0324	0.00	Q	|	|	|	V|
21+ 0	0.0324	0.00	Q	|	|	|	V|
21+ 5	0.0324	0.00	Q	|	|	|	V|
21+10	0.0324	0.00	Q	|	|	|	V|
21+15	0.0324	0.00	Q	|	|	|	V|
21+20	0.0324	0.00	Q	|	|	|	V|
21+25	0.0324	0.00	Q	|	|	|	V|
21+30	0.0324	0.00	Q	|	|	|	V|
21+35	0.0324	0.00	Q	|	|	|	V|
21+40	0.0324	0.00	Q	|	|	|	V|
21+45	0.0324	0.00	Q	|	|	|	V|
21+50	0.0324	0.00	Q	|	|	|	V|
21+55	0.0324	0.00	Q	|	|	|	V|
22+ 0	0.0324	0.00	Q	|	|	|	V|
22+ 5	0.0325	0.00	Q	|	|	|	V|
22+10	0.0325	0.00	Q	|	|	|	V|
22+15	0.0325	0.00	Q	|	|	|	V|
22+20	0.0325	0.00	Q	|	|	|	V|
22+25	0.0325	0.00	Q	|	|	|	V|
22+30	0.0325	0.00	Q	|	|	|	V|
22+35	0.0325	0.00	Q	|	|	|	V|
22+40	0.0325	0.00	Q	|	|	|	V|
22+45	0.0325	0.00	Q	|	|	|	V|
22+50	0.0325	0.00	Q	|	|	|	V|
22+55	0.0325	0.00	Q	|	|	|	V|
23+ 0	0.0325	0.00	Q	|	|	|	V|
23+ 5	0.0325	0.00	Q	|	|	|	V|
23+10	0.0325	0.00	Q	|	|	|	V|
23+15	0.0325	0.00	Q	|	|	|	V|
23+20	0.0325	0.00	Q	|	|	|	V|
23+25	0.0325	0.00	Q	|	|	|	V|
23+30	0.0325	0.00	Q	|	|	|	V|
23+35	0.0325	0.00	Q	|	|	|	V|
23+40	0.0326	0.00	Q	|	|	|	V|
23+45	0.0326	0.00	Q	|	|	|	V|
23+50	0.0326	0.00	Q	|	|	|	V|
23+55	0.0326	0.00	Q	|	|	|	V|
24+ 0	0.0326	0.00	Q	|	|	|	V|
24+ 5	0.0326	0.00	Q	|	|	|	V

Flood Routing Model (Basin C)..... VI

- Basin Model Summary
- Santa Ana VBMP Worksheet
- BMP Extended Detention Basin Worksheet (Basin A)
- Routing Models
    - 2-Year; 24-Hour
    - 100-Year; 1-Hour
    - 100-Year; 3-Hour
    - 100-Year; 6-Hour
    - 100-Year; 24-Hour

Xenia - Preliminary Drainage Study

Preliminary Extended Detention Basin "A"

Input	Basin Depth (ft)	El. (ft)	Contour Area (sf)	Inc. Vol (cf)	Inc. Vol (af)	Total Vol. (af)	WQ Orifice Outflow (cfs) [D=2.06"]	Stage 1: Orifice Outflow (cfs) [d=4.1"]	Stage 2: CB110 Rec. Weir Outflow (cfs) [L=20 ft]	Stage 3: V-Ditch (cfs)	Total Q_{out} (cfs)
1	0	2,597.50	8,640				0.00				**0.00**
2	0.33	2,597.83	9,067	2,921	0.07	**0.07**	0.06				**0.06**
3	0.67	2,598.17	9,532	3,069	0.07	**0.14**	0.08				**0.08**
4	1	2,598.50	9,984	3,220	0.07	**0.21**	0.10				**0.10**
5	1.33	2,598.83	10,440	3,370	0.08	**0.29**	0.11				**0.11**
6	1.67	2,599.17	10,907	3,522	0.08	**0.37**	0.13	0.27			**0.39**
7	2	2,599.50	11,394	3,679	0.08	**0.45**	0.14	0.39			**0.53**
8	2.33	2,599.83	11,904	3,844	0.09	**0.54**	0.15	0.48			**0.63**
9	2.67	2,600.17	12,385	4,007	0.09	**0.63**	0.16	0.55			**0.72**
10	3	2,600.50	12,900	4,172	0.10	**0.73**	0.17	0.62			**0.79**
11	3.5	2,601.00	13,696	4,388	0.10	**0.83**	0.18	0.71			**0.89**
12	4	2,601.50	14,522	4,655	0.11	**0.94**	0.20	0.79			**0.99**
13	4.5	2,602.00	15,372	4,932	0.11	**1.05**	0.21	0.86			**1.07**
14	5	2,602.50	16,235	5,215	0.12	**1.17**	0.22	0.93			**1.15**
15	5.5	2,603.00	17,110	5,501	0.13	**1.30**	0.23	0.99	0.00		**1.22**
16	6	2,603.50	17,998	5,792	0.13	**1.43**	0.24	1.04	23.55	0.59	**25.42**
17	6.5	2,604.00	18,900	6,088	0.14	**1.57**	0.25	1.10	66.60	3.73	**71.68**
18	7	2,604.50	19,824	6,389	0.15	**1.72**	0.26	1.15	122.35	8.71	**132.48**
19	7.5	2,605.00	20,768	6,697	0.15	**1.87**	0.27	1.20	188.37	16.57	**206.42**

Weir Flow	Q=(Cw)(L)(	Stage 1	Stage 2
	L (ft)	0	20
	Cw	3.33	3.33

Orifice Outflow	Q=Ca(2gh)^0.5	
d (in)=	1.85	4.1
C=	0.66	0.66
A (ft^2)=	0.019	0.092

Santa Ana Watershed - BMP Design Volume, V_{BMP}

(Rev. 10-2011)

Legend: Required Entries / Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name: SP2 | Date: 5/26/2022

Designed by: A. Jaramillo | Case No: PW2021-0822

Company Project Number/Name: Xenia Apartments

BMP Identification

BMP NAME / ID: DMA 1

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth, from the Isohyetal Map in Handbook Appendix E

D_{85} = 0.85 inches

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
Imperv: Roofs, Sidewalks & Parking/ Streets	*201,250*	*Concrete or Asphalt*	*1*	*0.89*	*179515*			
Pervious: Open Space/Landscaping	*44,922*	*Ornamental Landscaping*	*0.1*	*0.11*	*4962*			
Basin	*21341*	*Ornamental Landscaping*	*0.1*	*0.11*	*2357.3*			

Xenia Unit Hydrograph Flow Rates

Undeveloped								
Area X1	2Y 1H	2Y 3H	2Y 6H	2Y 24H	100Y 1H	100Y 3H	100Y 6H	100Y 24H
Peak Flow (cfs) 3.81 Ac.	3.1	1.6	1.1	0.3	10.3	6.7	6.2	2.9
Volume (cf)	3,258	3,730	4,127	7,480	15,457	23,173	29,060	53,504
Volume (ac/ft)	0.07	0.09	0.09	0.17	0.35	0.53	0.67	1.23
Area X2	2Y 1H	2Y 3H	2Y 6H	2Y 24H	100Y 1H	100Y 3H	100Y 6H	100Y 24H
Peak Flow (cfs) 10.08 Ac.	8.7	3.8	2.6	0.7	28.1	16.9	15.2	7.6
Volume (cf)	8,512	9,630	10,561	18,959	40,916	61,375	77,008	141,320
Volume (ac/ft)	0.20	0.22	0.24	0.44	0.94	1.41	1.77	3.24
Area X3	2Y 1H	2Y 3H	2Y 6H	2Y 24H	100Y 1H	100Y 3H	100Y 6H	100Y 24H
Peak Flow (cfs) 1.41 Ac.	1.4	0.6	0.5	0.2	4.2	2.5	2.4	1.1
Volume (cf)	1,427	1,857	2,254	4,382	5,668	8,432	10,530	20,422
Volume (ac/ft)	0.03	0.04	0.05	0.10	0.13	0.19	0.24	0.47

Xenia Unit Hydrograph Flow Rates

Developed								
Area D1	2Y 1H	2Y 3H	2Y 6H	2Y 24H	100Y 1H	100Y 3H	100Y 6H	100Y 24H
Peak Flow (cfs) 0.27 Ac.	0.4	0.2	0.2	0.07	1.0	0.5	0.5	0.2
Volume (cf)	443	718	923	1,835	1,161	1,841	2,488	5,240
Volume (ac/ft)	0.01	0.02	0.02	0.04	0.03	0.04	0.06	0.12
Area D2	2Y 1H	2Y 3H	2Y 6H	2Y 24H	2Y 1H	2Y 3H	2Y 6H	2Y 24H
Peak Flow (cfs) 14.83 Ac.	16.2	8.9	7.3	3.4	41.9	25.6	23.8	11.8
Volume (cf)	22,544	35,641	45,689	90,759	62,432	97,213	129,550	270,069
Volume (ac/ft)	0.52	0.82	1.05	2.08	1.43	2.23	2.97	6.20
Area D3	2Y 1H	2Y 3H	2Y 6H	2Y 24H	2Y 1H	2Y 3H	2Y 6H	2Y 24H
Peak Flow (cfs) 0.14 Ac.	0.16	0.04	0.02	0.01	0.5	0.3	0.2	0.1
Volume (cf)	85	66	69	129	514	694	782	1,419
Volume (ac/ft)	0.002	0.002	0.002	0.003	0.012	0.016	0.018	0.033
Area D2 w/Detention	2Y 1H	2Y 3H	2Y 6H	2Y 24H	2Y 1H	2Y 3H	2Y 6H	2Y 24H
Peak Flow 14.83 Ac.	0.6	0.8	0.9	1.2	5.7	24.4	22.5	11.7
Peak Basin Depth	2.2	3.1	3.8	5.3	5.6	6.0	5.9	5.7

Site Flow Rate Summary								
Undeveloped	2Y 1H	2Y 3H	2Y 6H	2Y 24H	100Y 1H	100Y 3H	100Y 6H	100Y 24H
Total Site Peak Flow (cfs) 15.3 Ac.	13.2	6.0	4.2	1.2	42.7	26.1	23.9	11.6
Developed	2Y 1H	2Y 3H	2Y 6H	2Y 24H	100Y 1H	100Y 3H	100Y 6H	100Y 24H
Total Site Peak Flow (cfs) 15.3 Ac.	16.8	9.2	7.5	3.5	43.5	26.4	24.5	12.1
Mitigation Status	Fail	Fail	Fail	Fail	Fail	Fail	Fail	Fail
Developed w/ Detention Routing	2Y 1H	2Y 3H	2Y 6H	2Y 24H	100Y 1H	100Y 3H	100Y 6H	100Y 24H
Total Site Peak Flow (cfs) 68.7 Ac.	1.2	1.0	1.1	1.3	7.3	25.2	23.2	12.0
Percent Difference	-91%	-83%	-73%	6%	-83%	-3%	-3%	4%
Mitigation Status	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Maximum Basin W.S.E. (ft)	2600.7	2601.6	2602.3	2603.8	2604.1	2604.5	2604.4	2604.2

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                FLOOD HYDROGRAPH ROUTING PROGRAM
          Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2022
                     Study date: 09/18/22

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XENIA
PRELIMINARY BASIN ROUTING MODEL
PRELIMINARY BASIN A
2-YEAR; 24-HOUR
------------------------------------------------------------------------


Program License Serial Number 6545

------------------------------------------------------------------------
********************* HYDROGRAPH INFORMATION **********************

             From study/file name: 2D242.rte
*****************************HYDROGRAPH DATA*****************************
             Number of intervals =   294
             Time interval =    5.0 (Min.)
             Maximum/Peak flow rate =        3.422 (CFS)
             Total volume =       2.084 (Ac.Ft)
      Status of hydrographs being held in storage
                  Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
      Peak (CFS)      0.000     0.000     0.000     0.000     0.000
      Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*************************************************************************



++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.000 to Point/Station        2.000
**** RETARDING BASIN ROUTING ****
________________________________________________________________________

User entry of depth-outflow-storage data
------------------------------------------------------------------------
Total number of inflow hydrograph intervals = 294
Hydrograph time unit =  5.000 (Min.)
Initial depth in storage basin =   0.00(Ft.)
------------------------------------------------------------------------
------------------------------------------------------------------------
Initial basin depth =   0.00 (Ft.)
Initial basin storage =      0.00 (Ac.Ft)
Initial basin outflow =   0.00 (CFS)
------------------------------------------------------------------------
------------------------------------------------------------------------
Depth vs. Storage and Depth vs. Discharge data:
 Basin Depth  Storage    Outflow   (S-O*dt/2)   (S+O*dt/2)
     (Ft.)    (Ac.Ft)    (CFS)     (Ac.Ft)    (Ac.Ft)
------------------------------------------------------------------------
   0.000      0.000      0.000      0.000        0.000
   0.330      0.070      0.060      0.070        0.070
   0.670      0.140      0.080      0.140        0.140
   1.000      0.210      0.100      0.210        0.210
   1.330      0.290      0.110      0.290        0.290
   1.670      0.370      0.390      0.369        0.371
   2.000      0.450      0.530      0.448        0.452
   2.330      0.540      0.630      0.538        0.542
   2.670      0.630      0.720      0.628        0.632
   3.000      0.730      0.790      0.727        0.733
```

3.500	0.830	0.890	0.827	0.833
4.000	0.940	0.990	0.937	0.943
4.500	1.050	1.070	1.046	1.054
5.000	1.170	1.150	1.166	1.174
5.500	1.300	1.220	1.296	1.304
6.000	1.430	25.420	1.342	1.518
6.500	1.570	71.680	1.323	1.817
7.000	1.720	132.480	1.264	2.176
7.500	1.870	206.420	1.159	2.581

Hydrograph Detention Basin Routing

Graph values: 'I'= unit inflow; 'O'=outflow at time shown

Time (Hours)	Inflow (CFS)	Outflow (CFS)	Storage (Ac.Ft)	.0	0.9	1.71	2.57	3.42	Depth (Ft.)
0.083	0.05	0.00	0.000	O	|	|	|	|	0.00
0.167	0.15	0.00	0.001	OI	|	|	|	|	0.00
0.250	0.18	0.00	0.002	OI	|	|	|	|	0.01
0.333	0.21	0.00	0.003	O I	|	|	|	|	0.02
0.417	0.27	0.00	0.005	O I	|	|	|	|	0.02
0.500	0.29	0.01	0.007	O I	|	|	|	|	0.03
0.583	0.30	0.01	0.009	O I	|	|	|	|	0.04
0.667	0.30	0.01	0.011	O I	|	|	|	|	0.05
0.750	0.30	0.01	0.013	O I	|	|	|	|	0.06
0.833	0.33	0.01	0.015	O I	|	|	|	|	0.07
0.917	0.38	0.01	0.017	O I	|	|	|	|	0.08
1.000	0.39	0.02	0.020	O I	|	|	|	|	0.09
1.083	0.37	0.02	0.022	O I	|	|	|	|	0.10
1.167	0.33	0.02	0.024	O I	|	|	|	|	0.12
1.250	0.31	0.02	0.027	O I	|	|	|	|	0.13
1.333	0.31	0.02	0.029	O I	|	|	|	|	0.13
1.417	0.31	0.03	0.030	O I	|	|	|	|	0.14
1.500	0.30	0.03	0.032	O I	|	|	|	|	0.15
1.583	0.30	0.03	0.034	O I	|	|	|	|	0.16
1.667	0.30	0.03	0.036	O I	|	|	|	|	0.17
1.750	0.30	0.03	0.038	O I	|	|	|	|	0.18
1.833	0.33	0.03	0.040	O I	|	|	|	|	0.19
1.917	0.38	0.04	0.042	O I	|	|	|	|	0.20
2.000	0.39	0.04	0.045	O I	|	|	|	|	0.21
2.083	0.40	0.04	0.047	O I	|	|	|	|	0.22
2.167	0.40	0.04	0.049	O I	|	|	|	|	0.23
2.250	0.40	0.04	0.052	O I	|	|	|	|	0.24
2.333	0.40	0.05	0.054	O I	|	|	|	|	0.26
2.417	0.40	0.05	0.057	O I	|	|	|	|	0.27
2.500	0.40	0.05	0.059	O I	|	|	|	|	0.28
2.583	0.43	0.05	0.062	O I	|	|	|	|	0.29
2.667	0.48	0.06	0.065	O I	|	|	|	|	0.30
2.750	0.49	0.06	0.067	O I	|	|	|	|	0.32
2.833	0.50	0.06	0.070	O I	|	|	|	|	0.33
2.917	0.50	0.06	0.073	O I	|	|	|	|	0.35
3.000	0.50	0.06	0.077	O I	|	|	|	|	0.36
3.083	0.50	0.06	0.080	O I	|	|	|	|	0.38
3.167	0.50	0.06	0.083	O I	|	|	|	|	0.39
3.250	0.50	0.06	0.086	O I	|	|	|	|	0.41
3.333	0.50	0.07	0.089	O I	|	|	|	|	0.42
3.417	0.50	0.07	0.092	O I	|	|	|	|	0.44
3.500	0.50	0.07	0.095	O I	|	|	|	|	0.45
3.583	0.50	0.07	0.098	O I	|	|	|	|	0.46
3.667	0.50	0.07	0.101	O I	|	|	|	|	0.48
3.750	0.50	0.07	0.104	O I	|	|	|	|	0.49
3.833	0.53	0.07	0.107	O I	|	|	|	|	0.51
3.917	0.58	0.07	0.110	O I	|	|	|	|	0.52
4.000	0.59	0.07	0.114	O I	|	|	|	|	0.54
4.083	0.60	0.07	0.117	O I	|	|	|	|	0.56

4.167	0.60	0.07	0.121	o	I	|	|	|	0.58
4.250	0.60	0.08	0.124	o	I	|	|	|	0.59
4.333	0.63	0.08	0.128	o	I	|	|	|	0.61
4.417	0.68	0.08	0.132	o	I	|	|	|	0.63
4.500	0.69	0.08	0.136	o	I	|	|	|	0.65
4.583	0.70	0.08	0.141	o	I	|	|	|	0.67
4.667	0.70	0.08	0.145	o	I	|	|	|	0.69
4.750	0.70	0.08	0.149	o	I	|	|	|	0.71
4.833	0.73	0.08	0.154	o	I	|	|	|	0.73
4.917	0.78	0.09	0.158	o	I	|	|	|	0.76
5.000	0.79	0.09	0.163	o	I	|	|	|	0.78
5.083	0.75	0.09	0.168	o	I	|	|	|	0.80
5.167	0.65	0.09	0.172	o	I	|	|	|	0.82
5.250	0.63	0.09	0.176	o	I	|	|	|	0.84
5.333	0.64	0.09	0.179	o	I	|	|	|	0.86
5.417	0.69	0.09	0.183	o	I	|	|	|	0.87
5.500	0.70	0.09	0.188	o	I	|	|	|	0.89
5.583	0.72	0.09	0.192	o	I	|	|	|	0.91
5.667	0.78	0.10	0.196	o	I	|	|	|	0.94
5.750	0.79	0.10	0.201	o	I	|	|	|	0.96
5.833	0.80	0.10	0.206	o	I	|	|	|	0.98
5.917	0.80	0.10	0.211	o	I	|	|	|	1.00
6.000	0.81	0.10	0.216	o	I	|	|	|	1.02
6.083	0.83	0.10	0.221	o	I	|	|	|	1.04
6.167	0.88	0.10	0.226	o	I	|	|	|	1.06
6.250	0.89	0.10	0.231	o	I	|	|	|	1.09
6.333	0.90	0.10	0.237	o	I	|	|	|	1.11
6.417	0.90	0.10	0.242	o	I	|	|	|	1.13
6.500	0.91	0.10	0.248	o	I	|	|	|	1.16
6.583	0.93	0.11	0.253	o	I	|	|	|	1.18
6.667	0.98	0.11	0.259	o	I	|	|	|	1.20
6.750	1.00	0.11	0.265	o	I	|	|	|	1.23
6.833	1.00	0.11	0.271	o	I	|	|	|	1.25
6.917	1.01	0.11	0.277	o	I	|	|	|	1.28
7.000	1.01	0.11	0.284	o	I	|	|	|	1.30
7.083	1.01	0.11	0.290	o	I	|	|	|	1.33
7.167	1.01	0.13	0.296	o	I	|	|	|	1.36
7.250	1.01	0.15	0.302	o	I	|	|	|	1.38
7.333	1.03	0.17	0.308	o	I	|	|	|	1.41
7.417	1.08	0.19	0.314	o	I	|	|	|	1.43
7.500	1.10	0.21	0.320	o	I	|	|	|	1.46
7.583	1.13	0.24	0.326	o	I	|	|	|	1.48
7.667	1.18	0.26	0.332	o	I	|	|	|	1.51
7.750	1.20	0.28	0.339	o	I	|	|	|	1.54
7.833	1.23	0.30	0.345	o	I	|	|	|	1.56
7.917	1.28	0.33	0.351	o	I	|	|	|	1.59
8.000	1.30	0.35	0.358	o	I	|	|	|	1.62
8.083	1.36	0.37	0.365	o	I	|	|	|	1.65
8.167	1.46	0.39	0.372	o	I	|	|	|	1.68
8.250	1.49	0.41	0.379	o	I	|	|	|	1.71
8.333	1.50	0.42	0.387	o	I	|	|	|	1.74
8.417	1.51	0.43	0.394	o	I	|	|	|	1.77
8.500	1.51	0.44	0.401	o	I	|	|	|	1.80
8.583	1.54	0.46	0.409	o	I	|	|	|	1.83
8.667	1.59	0.47	0.416	o	I	|	|	|	1.86
8.750	1.60	0.48	0.424	o	I	|	|	|	1.89
8.833	1.63	0.50	0.432	o	I	|	|	|	1.92
8.917	1.68	0.51	0.440	o	I	|	|	|	1.96
9.000	1.70	0.53	0.448	o	I	|	|	|	1.99
9.083	1.76	0.54	0.456	o	I	|	|	|	2.02
9.167	1.86	0.55	0.465	o	I	|	|	|	2.05
9.250	1.89	0.56	0.474	o	I	|	|	|	2.09
9.333	1.93	0.57	0.483	o	I	|	|	|	2.12
9.417	1.98	0.58	0.493	o	I	|	|	|	2.16
9.500	2.00	0.59	0.502	o	I	|	|	|	2.19
9.583	2.04	0.60	0.512	o	I	|	|	|	2.23

9.667	2.09	0.61	0.522	o		I		2.26
9.750	2.10	0.62	0.532	o		I		2.30
9.833	2.14	0.63	0.543	o		I		2.34
9.917	2.19	0.64	0.553	o		I		2.38
10.000	2.20	0.65	0.564	o		I		2.42
10.083	2.03	0.66	0.574	o		I		2.46
10.167	1.69	0.67	0.582	o	I			2.49
10.250	1.60	0.68	0.589	o	I			2.51
10.333	1.56	0.69	0.595	o	I			2.54
10.417	1.54	0.69	0.601	o	I			2.56
10.500	1.52	0.70	0.607	o	I			2.58
10.583	1.64	0.70	0.613	o	I			2.60
10.667	1.89	0.71	0.620	o	I			2.63
10.750	1.95	0.72	0.628	o	I			2.66
10.833	1.98	0.72	0.637	o	I			2.69
10.917	2.00	0.73	0.646	o	I			2.72
11.000	2.01	0.74	0.654	o	I			2.75
11.083	1.99	0.74	0.663	o	I			2.78
11.167	1.94	0.75	0.672	o	I			2.81
11.250	1.93	0.75	0.680	o	I			2.83
11.333	1.92	0.76	0.688	o	I			2.86
11.417	1.92	0.77	0.696	o	I			2.89
11.500	1.92	0.77	0.704	o	I			2.91
11.583	1.86	0.78	0.711	o	I			2.94
11.667	1.77	0.78	0.718	o	I			2.96
11.750	1.74	0.79	0.725	o	I			2.98
11.833	1.75	0.79	0.732	o	I			3.01
11.917	1.80	0.80	0.738	o	I			3.04
12.000	1.81	0.81	0.745	o	I			3.08
12.083	1.99	0.81	0.753	o	I			3.11
12.167	2.34	0.82	0.762	o	I			3.16
12.250	2.43	0.83	0.773	o	I			3.21
12.333	2.50	0.84	0.784	o	I			3.27
12.417	2.57	0.86	0.796	o	I			3.33
12.500	2.60	0.87	0.807	o	I			3.39
12.583	2.67	0.88	0.820	o	I			3.45
12.667	2.77	0.89	0.832	o	I			3.51
12.750	2.80	0.90	0.845	o	I			3.57
12.833	2.84	0.92	0.858	o	I			3.63
12.917	2.89	0.93	0.872	o	I			3.69
13.000	2.91	0.94	0.885	o	I			3.75
13.083	3.05	0.95	0.899	o	I			3.81
13.167	3.30	0.97	0.914	o	I			3.88
13.250	3.36	0.98	0.931	o	I			3.96
13.333	3.40	1.00	0.947	o	I			4.03
13.417	3.41	1.01	0.964	o	I			4.11
13.500	3.42	1.02	0.980	o	I			4.18
13.583	3.15	1.03	0.996	o	I			4.25
13.667	2.61	1.04	1.008	o	I			4.31
13.750	2.46	1.05	1.019	o	I			4.36
13.833	2.39	1.05	1.028	o	I			4.40
13.917	2.36	1.06	1.037	o	I			4.44
14.000	2.33	1.07	1.046	o	I			4.48
14.083	2.42	1.07	1.055	o	I			4.52
14.167	2.62	1.08	1.065	o	I			4.56
14.250	2.67	1.09	1.076	o	I			4.61
14.333	2.67	1.09	1.087	o	I			4.65
14.417	2.63	1.10	1.097	o	I			4.70
14.500	2.63	1.11	1.108	o	I			4.74
14.583	2.63	1.12	1.118	o	I			4.78
14.667	2.63	1.12	1.129	o	I			4.83
14.750	2.62	1.13	1.139	o	I			4.87
14.833	2.60	1.14	1.149	o	I			4.91
14.917	2.55	1.14	1.159	o	I			4.95
15.000	2.53	1.15	1.169	o	I			4.99
15.083	2.50	1.15	1.178	o	I			5.03

```
15.167    2.45    1.16      1.187  |        | o     |     I |       |     5.07
15.250    2.43    1.16      1.196  |        | o     |     I |       |     5.10
15.333    2.40    1.17      1.205  |        | o     |     I |       |     5.13
15.417    2.35    1.17      1.213  |        | o     |    I  |       |     5.17
15.500    2.33    1.18      1.221  |        |  o    |    I  |       |     5.20
15.583    2.22    1.18      1.229  |        |  o    |   I   |       |     5.23
15.667    2.02    1.18      1.235  |        |  o    | I     |       |     5.25
15.750    1.97    1.19      1.241  |        |  o    | I     |       |     5.27
15.833    1.94    1.19      1.246  |        |  o    | I     |       |     5.29
15.917    1.93    1.19      1.251  |        |  o    | I     |       |     5.31
16.000    1.92    1.20      1.256  |        |  o    |I      |       |     5.33
16.083    1.53    1.20      1.260  |        |  o  I |       |       |     5.34
16.167    0.79    1.20      1.259  |      I |  o    |       |       |     5.34
16.250    0.59    1.20      1.256  |    I   |  o    |       |       |     5.33
16.333    0.50    1.19      1.251  |   I    |  o    |       |       |     5.31
16.417    0.45    1.19      1.247  |   I    |  o    |       |       |     5.29
16.500    0.42    1.19      1.241  |  I     |  o    |       |       |     5.27
16.583    0.38    1.19      1.236  |  I     |  o    |       |       |     5.25
16.667    0.33    1.18      1.230  |  I     |  o    |       |       |     5.23
16.750    0.32    1.18      1.224  | I      |  o    |       |       |     5.21
16.833    0.31    1.18      1.218  | I      | o     |       |       |     5.19
16.917    0.31    1.17      1.212  | I      | o     |       |       |     5.16
17.000    0.30    1.17      1.206  | I      | o     |       |       |     5.14
17.083    0.35    1.17      1.201  |  I     | o     |       |       |     5.12
17.167    0.45    1.16      1.195  |   I    | o     |       |       |     5.10
17.250    0.48    1.16      1.191  |   I    | o     |       |       |     5.08
17.333    0.49    1.16      1.186  |   I    | o     |       |       |     5.06
17.417    0.50    1.16      1.181  |   I    | o     |       |       |     5.04
17.500    0.50    1.15      1.177  |   I    | o     |       |       |     5.03
17.583    0.50    1.15      1.172  |   I    | o     |       |       |     5.01
17.667    0.50    1.15      1.168  |   I    | o     |       |       |     4.99
17.750    0.50    1.15      1.164  |   I    | o     |       |       |     4.97
17.833    0.48    1.14      1.159  |   I    | o     |       |       |     4.95
17.917    0.43    1.14      1.154  |   I    | o     |       |       |     4.93
18.000    0.42    1.14      1.149  |  I     | o     |       |       |     4.91
18.083    0.41    1.13      1.144  |  I     | o     |       |       |     4.89
18.167    0.41    1.13      1.139  |  I     | o     |       |       |     4.87
18.250    0.40    1.13      1.134  |  I     | o     |       |       |     4.85
18.333    0.40    1.12      1.129  |  I     | o     |       |       |     4.83
18.417    0.40    1.12      1.125  |  I     | o     |       |       |     4.81
18.500    0.40    1.12      1.120  |  I     | o     |       |       |     4.79
18.583    0.38    1.11      1.115  |  I     | o     |       |       |     4.77
18.667    0.33    1.11      1.109  |  I     | o     |       |       |     4.75
18.750    0.32    1.11      1.104  | I      | o     |       |       |     4.72
18.833    0.28    1.10      1.098  | I      | o     |       |       |     4.70
18.917    0.23    1.10      1.093  | I      | o     |       |       |     4.68
19.000    0.22    1.09      1.087  | I      | o     |       |       |     4.65
19.083    0.23    1.09      1.081  | I      | o     |       |       |     4.63
19.167    0.28    1.09      1.075  | I      | o     |       |       |     4.60
19.250    0.29    1.08      1.069  | I      | o     |       |       |     4.58
19.333    0.32    1.08      1.064  |  I     | o     |       |       |     4.56
19.417    0.37    1.08      1.059  |  I     | o     |       |       |     4.54
19.500    0.39    1.07      1.054  |  I     | o     |       |       |     4.52
19.583    0.37    1.07      1.050  |  I     | o     |       |       |     4.50
19.667    0.33    1.07      1.045  |  I     |o      |       |       |     4.48
19.750    0.31    1.06      1.039  | I      |o      |       |       |     4.45
19.833    0.28    1.06      1.034  | I      |o      |       |       |     4.43
19.917    0.23    1.05      1.029  | I      |o      |       |       |     4.40
20.000    0.22    1.05      1.023  | I      |o      |       |       |     4.38
20.083    0.23    1.05      1.017  | I      |o      |       |       |     4.35
20.167    0.28    1.04      1.012  | I      |o      |       |       |     4.33
20.250    0.29    1.04      1.007  | I      |o      |       |       |     4.30
20.333    0.30    1.03      1.002  | I      |o      |       |       |     4.28
20.417    0.30    1.03      0.997  | I      |o      |       |       |     4.26
20.500    0.30    1.03      0.991  | I      |o      |       |       |     4.23
20.583    0.30    1.02      0.987  | I      |o      |       |       |     4.21
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20.667	0.30	1.02	0.982	| I |	o |	|	|	4.19
20.750	0.30	1.02	0.977	| I |	o |	|	|	4.17
20.833	0.28	1.01	0.972	| I |	o |	|	|	4.14
20.917	0.23	1.01	0.966	| I |	o |	|	|	4.12
21.000	0.21	1.01	0.961	| I |	o |	|	|	4.10
21.083	0.23	1.00	0.956	| I |	o |	|	|	4.07
21.167	0.28	1.00	0.951	| I |	o |	|	|	4.05
21.250	0.29	0.99	0.946	| I |	o |	|	|	4.03
21.333	0.27	0.99	0.941	| I |	o |	|	|	4.00
21.417	0.22	0.99	0.936	| I |	o |	|	|	3.98
21.500	0.21	0.98	0.930	I |	o |	|	|	3.96
21.583	0.23	0.98	0.925	| I |	o |	|	|	3.93
21.667	0.28	0.97	0.920	| I |	o |	|	|	3.91
21.750	0.29	0.97	0.915	| I |	o |	|	|	3.89
21.833	0.27	0.96	0.911	| I |	o |	|	|	3.87
21.917	0.22	0.96	0.906	| I |	o	|	|	3.84
22.000	0.21	0.95	0.901	I |	o	|	|	3.82
22.083	0.23	0.95	0.896	| I |	o	|	|	3.80
22.167	0.28	0.95	0.891	| I |	o	|	|	3.78
22.250	0.29	0.94	0.886	| I |	o	|	|	3.76
22.333	0.27	0.94	0.882	| I |	o	|	|	3.74
22.417	0.22	0.93	0.877	| I |	o	|	|	3.71
22.500	0.21	0.93	0.872	I |	o	|	|	3.69
22.583	0.21	0.92	0.867	I |	o	|	|	3.67
22.667	0.20	0.92	0.862	I |	o	|	|	3.65
22.750	0.20	0.92	0.858	I |	o	|	|	3.63
22.833	0.20	0.91	0.853	I |	o	|	|	3.60
22.917	0.20	0.91	0.848	I |	o	|	|	3.58
23.000	0.20	0.90	0.843	I |	o	|	|	3.56
23.083	0.20	0.90	0.838	I |	o	|	|	3.54
23.167	0.20	0.89	0.833	I |	o	|	|	3.52
23.250	0.20	0.89	0.829	I |	o	|	|	3.49
23.333	0.20	0.88	0.824	I |	o	|	|	3.47
23.417	0.20	0.88	0.819	I |	o	|	|	3.45
23.500	0.20	0.87	0.815	I |	o	|	|	3.42
23.583	0.20	0.87	0.810	I |	o	|	|	3.40
23.667	0.20	0.87	0.805	I |	o	|	|	3.38
23.750	0.20	0.86	0.801	I |	o	|	|	3.35
23.833	0.20	0.86	0.796	I |	o	|	|	3.33
23.917	0.20	0.85	0.792	I |	o |	|	|	3.31
24.000	0.20	0.85	0.787	I |	o |	|	|	3.29
24.083	0.15	0.84	0.783	I |	o |	|	|	3.26
24.167	0.05	0.84	0.778	I	o |	|	|	3.24
24.250	0.03	0.83	0.772	I	o |	|	|	3.21
24.333	0.01	0.83	0.767	I	o |	|	|	3.18
24.417	0.01	0.82	0.761	I	o |	|	|	3.15
24.500	0.00	0.82	0.755	I	o |	|	|	3.13
24.583	0.00	0.81	0.750	I	o |	|	|	3.10
24.667	0.00	0.80	0.744	I	o |	|	|	3.07
24.750	0.00	0.80	0.739	I	o |	|	|	3.04
24.833	0.00	0.79	0.733	I	o |	|	|	3.02
24.917	0.00	0.79	0.728	I	o |	|	|	2.99
25.000	0.00	0.78	0.722	I	o |	|	|	2.97
25.083	0.00	0.78	0.717	I	o |	|	|	2.96
25.167	0.00	0.78	0.712	I	o |	|	|	2.94
25.250	0.00	0.77	0.706	I	o |	|	|	2.92
25.333	0.00	0.77	0.701	I	o |	|	|	2.90
25.417	0.00	0.77	0.696	I	o |	|	|	2.89
25.500	0.00	0.76	0.690	I	o |	|	|	2.87
25.583	0.00	0.76	0.685	I	o |	|	|	2.85
25.667	0.00	0.75	0.680	I	o |	|	|	2.83
25.750	0.00	0.75	0.675	I	o |	|	|	2.82
25.833	0.00	0.75	0.670	I	o |	|	|	2.80
25.917	0.00	0.74	0.664	I	o |	|	|	2.78
26.000	0.00	0.74	0.659	I	o |	|	|	2.77
26.083	0.00	0.74	0.654	I	o |	|	|	2.75

26.167	0.00	0.73	0.649	I	o	|	|	|	2.73
26.250	0.00	0.73	0.644	I	o	|	|	|	2.72
26.333	0.00	0.73	0.639	I	o	|	|	|	2.70
26.417	0.00	0.72	0.634	I	o	|	|	|	2.68
26.500	0.00	0.72	0.629	I	o	|	|	|	2.67
26.583	0.00	0.71	0.624	I	o	|	|	|	2.65
26.667	0.00	0.71	0.619	I	o	|	|	|	2.63
26.750	0.00	0.70	0.614	I	o	|	|	|	2.61
26.833	0.00	0.70	0.610	I	o	|	|	|	2.59
26.917	0.00	0.69	0.605	I	o	|	|	|	2.57
27.000	0.00	0.69	0.600	I	o	|	|	|	2.56
27.083	0.00	0.69	0.595	I	o	|	|	|	2.54
27.167	0.00	0.68	0.591	I	o	|	|	|	2.52
27.250	0.00	0.68	0.586	I	o	|	|	|	2.50
27.333	0.00	0.67	0.581	I	o	|	|	|	2.49
27.417	0.00	0.67	0.577	I	o	|	|	|	2.47
27.500	0.00	0.66	0.572	I	o	|	|	|	2.45
27.583	0.00	0.66	0.568	I	o	|	|	|	2.43
27.667	0.00	0.65	0.563	I	o	|	|	|	2.42
27.750	0.00	0.65	0.559	I	o	|	|	|	2.40
27.833	0.00	0.64	0.554	I	o	|	|	|	2.38
27.917	0.00	0.64	0.550	I	o	|	|	|	2.37
28.000	0.00	0.64	0.545	I	o	|	|	|	2.35
28.083	0.00	0.63	0.541	I	o	|	|	|	2.33
28.167	0.00	0.63	0.537	I	o	|	|	|	2.32
28.250	0.00	0.62	0.532	I	o	|	|	|	2.30
28.333	0.00	0.62	0.528	I	o	|	|	|	2.29
28.417	0.00	0.61	0.524	I	o	|	|	|	2.27
28.500	0.00	0.61	0.520	I	o	|	|	|	2.26
28.583	0.00	0.60	0.515	I	o	|	|	|	2.24
28.667	0.00	0.60	0.511	I	o	|	|	|	2.22
28.750	0.00	0.59	0.507	I	o	|	|	|	2.21
28.833	0.00	0.59	0.503	I	o	|	|	|	2.19
28.917	0.00	0.58	0.499	I	o	|	|	|	2.18
29.000	0.00	0.58	0.495	I	o	|	|	|	2.17
29.083	0.00	0.58	0.491	I	o	|	|	|	2.15
29.167	0.00	0.57	0.487	I	o	|	|	|	2.14
29.250	0.00	0.57	0.483	I	o	|	|	|	2.12
29.333	0.00	0.56	0.479	I	o	|	|	|	2.11
29.417	0.00	0.56	0.476	I	o	|	|	|	2.09
29.500	0.00	0.55	0.472	I	o	|	|	|	2.08
29.583	0.00	0.55	0.468	I	o	|	|	|	2.07
29.667	0.00	0.55	0.464	I	o	|	|	|	2.05
29.750	0.00	0.54	0.460	I	o	|	|	|	2.04
29.833	0.00	0.54	0.457	I	o	|	|	|	2.02
29.917	0.00	0.53	0.453	I	o	|	|	|	2.01
30.000	0.00	0.53	0.449	I	o	|	|	|	2.00
30.083	0.00	0.52	0.446	I	o	|	|	|	1.98
30.167	0.00	0.52	0.442	I	o	|	|	|	1.97
30.250	0.00	0.51	0.439	I	o	|	|	|	1.95
30.333	0.00	0.50	0.435	I	o	|	|	|	1.94
30.417	0.00	0.50	0.432	I	o	|	|	|	1.92
30.500	0.00	0.49	0.428	I	o	|	|	|	1.91
30.583	0.00	0.49	0.425	I	o	|	|	|	1.90
30.667	0.00	0.48	0.422	I	o	|	|	|	1.88
30.750	0.00	0.47	0.418	I	o	|	|	|	1.87
30.833	0.00	0.47	0.415	I	o	|	|	|	1.86
30.917	0.00	0.46	0.412	I	o	|	|	|	1.84
31.000	0.00	0.46	0.409	I	o	|	|	|	1.83
31.083	0.00	0.45	0.405	I	o	|	|	|	1.82
31.167	0.00	0.45	0.402	I	o	|	|	|	1.80
31.250	0.00	0.44	0.399	I	o	|	|	|	1.79
31.333	0.00	0.44	0.396	I	o	|	|	|	1.78
31.417	0.00	0.43	0.393	I	o	|	|	|	1.77
31.500	0.00	0.43	0.390	I	o	|	|	|	1.75
31.583	0.00	0.42	0.387	I	o	|	|	|	1.74

31.667	0.00	0.42	0.385	I O				1.73
31.750	0.00	0.41	0.382	I O				1.72
31.833	0.00	0.41	0.379	I O				1.71
31.917	0.00	0.40	0.376	I O				1.70
32.000	0.00	0.40	0.373	I O				1.68
32.083	0.00	0.39	0.371	I O				1.67
32.167	0.00	0.38	0.368	I O				1.66
32.250	0.00	0.37	0.365	I O				1.65
32.333	0.00	0.37	0.363	I O				1.64
32.417	0.00	0.36	0.360	I O				1.63
32.500	0.00	0.35	0.358	I O				1.62
32.583	0.00	0.34	0.356	I O				1.61
32.667	0.00	0.33	0.353	I O				1.60
32.750	0.00	0.32	0.351	I O				1.59
32.833	0.00	0.32	0.349	I O				1.58
32.917	0.00	0.31	0.347	I O				1.57
33.000	0.00	0.30	0.345	I O				1.56
33.083	0.00	0.29	0.343	I O				1.55
33.167	0.00	0.29	0.341	I O				1.54
33.250	0.00	0.28	0.339	I O				1.54
33.333	0.00	0.27	0.337	I O				1.53
33.417	0.00	0.27	0.335	I O				1.52
33.500	0.00	0.26	0.333	I O				1.51
33.583	0.00	0.25	0.331	I O				1.51
33.667	0.00	0.25	0.329	I O				1.50
33.750	0.00	0.24	0.328	I O				1.49
33.833	0.00	0.24	0.326	I O				1.48
33.917	0.00	0.23	0.325	I O				1.48
34.000	0.00	0.23	0.323	I O				1.47
34.083	0.00	0.22	0.321	I O				1.46
34.167	0.00	0.21	0.320	I O				1.46
34.250	0.00	0.21	0.318	IO				1.45
34.333	0.00	0.20	0.317	IO				1.45
34.417	0.00	0.20	0.316	IO				1.44
34.500	0.00	0.20	0.314	IO				1.43
34.583	0.00	0.19	0.313	IO				1.43
34.667	0.00	0.19	0.312	IO				1.42
34.750	0.00	0.18	0.310	IO				1.42
34.833	0.00	0.18	0.309	IO				1.41
34.917	0.00	0.17	0.308	IO				1.41
35.000	0.00	0.17	0.307	IO				1.40
35.083	0.00	0.16	0.306	IO				1.40
35.167	0.00	0.16	0.305	IO				1.39
35.250	0.00	0.16	0.303	IO				1.39
35.333	0.00	0.15	0.302	IO				1.38
35.417	0.00	0.15	0.301	IO				1.38
35.500	0.00	0.15	0.300	IO				1.37
35.583	0.00	0.14	0.299	IO				1.37
35.667	0.00	0.14	0.298	IO				1.37
35.750	0.00	0.14	0.297	IO				1.36
35.833	0.00	0.13	0.296	IO				1.36
35.917	0.00	0.13	0.296	IO				1.35
36.000	0.00	0.13	0.295	IO				1.35
36.083	0.00	0.12	0.294	IO				1.35
36.167	0.00	0.12	0.293	IO				1.34
36.250	0.00	0.12	0.292	IO				1.34
36.333	0.00	0.11	0.291	IO				1.34
36.417	0.00	0.11	0.291	IO				1.33
36.500	0.00	0.11	0.290	IO				1.33
36.583	0.00	0.11	0.289	IO				1.33
36.667	0.00	0.11	0.288	IO				1.32
36.750	0.00	0.11	0.288	IO				1.32
36.833	0.00	0.11	0.287	IO				1.32
36.917	0.00	0.11	0.286	IO				1.31
37.000	0.00	0.11	0.285	IO				1.31
37.083	0.00	0.11	0.285	IO				1.31

37.167	0.00	0.11	0.284	IO				1.30
37.250	0.00	0.11	0.283	IO				1.30
37.333	0.00	0.11	0.282	IO				1.30
37.417	0.00	0.11	0.282	IO				1.30
37.500	0.00	0.11	0.281	IO				1.29
37.583	0.00	0.11	0.280	IO				1.29
37.667	0.00	0.11	0.279	IO				1.29
37.750	0.00	0.11	0.279	IO				1.28
37.833	0.00	0.11	0.278	IO				1.28
37.917	0.00	0.11	0.277	IO				1.28
38.000	0.00	0.11	0.276	IO				1.27
38.083	0.00	0.11	0.276	IO				1.27
38.167	0.00	0.11	0.275	IO				1.27
38.250	0.00	0.11	0.274	IO				1.26
38.333	0.00	0.11	0.273	IO				1.26
38.417	0.00	0.11	0.273	IO				1.26
38.500	0.00	0.11	0.272	IO				1.26
38.583	0.00	0.11	0.271	IO				1.25
38.667	0.00	0.11	0.270	IO				1.25
38.750	0.00	0.11	0.270	IO				1.25
38.833	0.00	0.11	0.269	IO				1.24
38.917	0.00	0.11	0.268	IO				1.24
39.000	0.00	0.11	0.267	IO				1.24
39.083	0.00	0.11	0.267	IO				1.23
39.167	0.00	0.11	0.266	IO				1.23
39.250	0.00	0.11	0.265	O				1.23
39.333	0.00	0.11	0.264	O				1.22
39.417	0.00	0.11	0.264	O				1.22
39.500	0.00	0.11	0.263	O				1.22
39.583	0.00	0.11	0.262	O				1.22
39.667	0.00	0.11	0.262	O				1.21
39.750	0.00	0.11	0.261	O				1.21
39.833	0.00	0.11	0.260	O				1.21
39.917	0.00	0.11	0.259	O				1.20
40.000	0.00	0.11	0.259	O				1.20
40.083	0.00	0.11	0.258	O				1.20
40.167	0.00	0.11	0.257	O				1.19
40.250	0.00	0.11	0.256	O				1.19
40.333	0.00	0.11	0.256	O				1.19
40.417	0.00	0.11	0.255	O				1.19
40.500	0.00	0.11	0.254	O				1.18
40.583	0.00	0.11	0.253	O				1.18
40.667	0.00	0.11	0.253	O				1.18
40.750	0.00	0.11	0.252	O				1.17
40.833	0.00	0.11	0.251	O				1.17
40.917	0.00	0.11	0.251	O				1.17
41.000	0.00	0.10	0.250	O				1.16
41.083	0.00	0.10	0.249	O				1.16
41.167	0.00	0.10	0.248	O				1.16
41.250	0.00	0.10	0.248	O				1.16
41.333	0.00	0.10	0.247	O				1.15
41.417	0.00	0.10	0.246	O				1.15
41.500	0.00	0.10	0.246	O				1.15
41.583	0.00	0.10	0.245	O				1.14
41.667	0.00	0.10	0.244	O				1.14
41.750	0.00	0.10	0.243	O				1.14
41.833	0.00	0.10	0.243	O				1.13
41.917	0.00	0.10	0.242	O				1.13
42.000	0.00	0.10	0.241	O				1.13
42.083	0.00	0.10	0.241	O				1.13
42.167	0.00	0.10	0.240	O				1.12
42.250	0.00	0.10	0.239	O				1.12
42.333	0.00	0.10	0.238	O				1.12
42.417	0.00	0.10	0.238	O				1.11
42.500	0.00	0.10	0.237	O				1.11
42.583	0.00	0.10	0.236	O				1.11

42.667	0.00	0.10	0.236	o	|	|	|	|	1.11
42.750	0.00	0.10	0.235	o	|	|	|	|	1.10
42.833	0.00	0.10	0.234	o	|	|	|	|	1.10
42.917	0.00	0.10	0.233	o	|	|	|	|	1.10
43.000	0.00	0.10	0.233	o	|	|	|	|	1.09
43.083	0.00	0.10	0.232	o	|	|	|	|	1.09
43.167	0.00	0.10	0.231	o	|	|	|	|	1.09
43.250	0.00	0.10	0.231	o	|	|	|	|	1.08
43.333	0.00	0.10	0.230	o	|	|	|	|	1.08
43.417	0.00	0.10	0.229	o	|	|	|	|	1.08
43.500	0.00	0.10	0.228	o	|	|	|	|	1.08
43.583	0.00	0.10	0.228	o	|	|	|	|	1.07
43.667	0.00	0.10	0.227	o	|	|	|	|	1.07
43.750	0.00	0.10	0.226	o	|	|	|	|	1.07
43.833	0.00	0.10	0.226	o	|	|	|	|	1.06
43.917	0.00	0.10	0.225	o	|	|	|	|	1.06
44.000	0.00	0.10	0.224	o	|	|	|	|	1.06
44.083	0.00	0.10	0.224	o	|	|	|	|	1.06
44.167	0.00	0.10	0.223	o	|	|	|	|	1.05
44.250	0.00	0.10	0.222	o	|	|	|	|	1.05
44.333	0.00	0.10	0.221	o	|	|	|	|	1.05
44.417	0.00	0.10	0.221	o	|	|	|	|	1.04
44.500	0.00	0.10	0.220	o	|	|	|	|	1.04
44.583	0.00	0.10	0.219	o	|	|	|	|	1.04
44.667	0.00	0.10	0.219	o	|	|	|	|	1.04
44.750	0.00	0.10	0.218	o	|	|	|	|	1.03
44.833	0.00	0.10	0.217	o	|	|	|	|	1.03
44.917	0.00	0.10	0.217	o	|	|	|	|	1.03
45.000	0.00	0.10	0.216	o	|	|	|	|	1.02
45.083	0.00	0.10	0.215	o	|	|	|	|	1.02
45.167	0.00	0.10	0.214	o	|	|	|	|	1.02
45.250	0.00	0.10	0.214	o	|	|	|	|	1.02
45.333	0.00	0.10	0.213	o	|	|	|	|	1.01
45.417	0.00	0.10	0.212	o	|	|	|	|	1.01
45.500	0.00	0.10	0.212	o	|	|	|	|	1.01
45.583	0.00	0.10	0.211	o	|	|	|	|	1.00
45.667	0.00	0.10	0.210	o	|	|	|	|	1.00
45.750	0.00	0.10	0.210	o	|	|	|	|	1.00
45.833	0.00	0.10	0.209	o	|	|	|	|	1.00
45.917	0.00	0.10	0.208	o	|	|	|	|	0.99
46.000	0.00	0.10	0.208	o	|	|	|	|	0.99
46.083	0.00	0.10	0.207	o	|	|	|	|	0.99
46.167	0.00	0.10	0.206	o	|	|	|	|	0.98
46.250	0.00	0.10	0.206	o	|	|	|	|	0.98
46.333	0.00	0.10	0.205	o	|	|	|	|	0.98
46.417	0.00	0.10	0.204	o	|	|	|	|	0.97
46.500	0.00	0.10	0.204	o	|	|	|	|	0.97
46.583	0.00	0.10	0.203	o	|	|	|	|	0.97
46.667	0.00	0.10	0.202	o	|	|	|	|	0.96
46.750	0.00	0.10	0.201	o	|	|	|	|	0.96
46.833	0.00	0.10	0.201	o	|	|	|	|	0.96
46.917	0.00	0.10	0.200	o	|	|	|	|	0.95
47.000	0.00	0.10	0.199	o	|	|	|	|	0.95
47.083	0.00	0.10	0.199	o	|	|	|	|	0.95
47.167	0.00	0.10	0.198	o	|	|	|	|	0.94
47.250	0.00	0.10	0.197	o	|	|	|	|	0.94
47.333	0.00	0.10	0.197	o	|	|	|	|	0.94
47.417	0.00	0.10	0.196	o	|	|	|	|	0.93
47.500	0.00	0.10	0.195	o	|	|	|	|	0.93
47.583	0.00	0.10	0.195	o	|	|	|	|	0.93
47.667	0.00	0.10	0.194	o	|	|	|	|	0.93
47.750	0.00	0.10	0.194	o	|	|	|	|	0.92
47.833	0.00	0.10	0.193	o	|	|	|	|	0.92
47.917	0.00	0.09	0.192	o	|	|	|	|	0.92
48.000	0.00	0.09	0.192	o	|	|	|	|	0.91
48.083	0.00	0.09	0.191	o	|	|	|	|	0.91

48.167	0.00	0.09	0.190	o				0.91
48.250	0.00	0.09	0.190	o				0.90
48.333	0.00	0.09	0.189	o				0.90
48.417	0.00	0.09	0.188	o				0.90
48.500	0.00	0.09	0.188	o				0.89
48.583	0.00	0.09	0.187	o				0.89
48.667	0.00	0.09	0.186	o				0.89
48.750	0.00	0.09	0.186	o				0.89
48.833	0.00	0.09	0.185	o				0.88
48.917	0.00	0.09	0.184	o				0.88
49.000	0.00	0.09	0.184	o				0.88
49.083	0.00	0.09	0.183	o				0.87
49.167	0.00	0.09	0.183	o				0.87
49.250	0.00	0.09	0.182	o				0.87
49.333	0.00	0.09	0.181	o				0.86
49.417	0.00	0.09	0.181	o				0.86
49.500	0.00	0.09	0.180	o				0.86
49.583	0.00	0.09	0.179	o				0.86
49.667	0.00	0.09	0.179	o				0.85
49.750	0.00	0.09	0.178	o				0.85
49.833	0.00	0.09	0.178	o				0.85
49.917	0.00	0.09	0.177	o				0.84
50.000	0.00	0.09	0.176	o				0.84
50.083	0.00	0.09	0.176	o				0.84
50.167	0.00	0.09	0.175	o				0.84
50.250	0.00	0.09	0.174	o				0.83
50.333	0.00	0.09	0.174	o				0.83
50.417	0.00	0.09	0.173	o				0.83
50.500	0.00	0.09	0.173	o				0.82
50.583	0.00	0.09	0.172	o				0.82
50.667	0.00	0.09	0.171	o				0.82
50.750	0.00	0.09	0.171	o				0.81
50.833	0.00	0.09	0.170	o				0.81
50.917	0.00	0.09	0.169	o				0.81
51.000	0.00	0.09	0.169	o				0.81
51.083	0.00	0.09	0.168	o				0.80
51.167	0.00	0.09	0.168	o				0.80
51.250	0.00	0.09	0.167	o				0.80
51.333	0.00	0.09	0.166	o				0.79
51.417	0.00	0.09	0.166	o				0.79
51.500	0.00	0.09	0.165	o				0.79
51.583	0.00	0.09	0.165	o				0.79
51.667	0.00	0.09	0.164	o				0.78
51.750	0.00	0.09	0.163	o				0.78
51.833	0.00	0.09	0.163	o				0.78
51.917	0.00	0.09	0.162	o				0.77
52.000	0.00	0.09	0.162	o				0.77
52.083	0.00	0.09	0.161	o				0.77
52.167	0.00	0.09	0.160	o				0.77
52.250	0.00	0.09	0.160	o				0.76
52.333	0.00	0.09	0.159	o				0.76
52.417	0.00	0.09	0.159	o				0.76
52.500	0.00	0.09	0.158	o				0.76
52.583	0.00	0.09	0.158	o				0.75
52.667	0.00	0.08	0.157	o				0.75
52.750	0.00	0.08	0.156	o				0.75
52.833	0.00	0.08	0.156	o				0.74
52.917	0.00	0.08	0.155	o				0.74
53.000	0.00	0.08	0.155	o				0.74
53.083	0.00	0.08	0.154	o				0.74
53.167	0.00	0.08	0.153	o				0.73
53.250	0.00	0.08	0.153	o				0.73
53.333	0.00	0.08	0.152	o				0.73
53.417	0.00	0.08	0.152	o				0.73
53.500	0.00	0.08	0.151	o				0.72
53.583	0.00	0.08	0.151	o				0.72

53.667	0.00	0.08	0.150	o	|	|	|	0.72
53.750	0.00	0.08	0.149	o	|	|	|	0.71
53.833	0.00	0.08	0.149	o	|	|	|	0.71
53.917	0.00	0.08	0.148	o	|	|	|	0.71
54.000	0.00	0.08	0.148	o	|	|	|	0.71
54.083	0.00	0.08	0.147	o	|	|	|	0.70
54.167	0.00	0.08	0.147	o	|	|	|	0.70
54.250	0.00	0.08	0.146	o	|	|	|	0.70
54.333	0.00	0.08	0.145	o	|	|	|	0.70
54.417	0.00	0.08	0.145	o	|	|	|	0.69
54.500	0.00	0.08	0.144	o	|	|	|	0.69
54.583	0.00	0.08	0.144	o	|	|	|	0.69
54.667	0.00	0.08	0.143	o	|	|	|	0.69
54.750	0.00	0.08	0.143	o	|	|	|	0.68
54.833	0.00	0.08	0.142	o	|	|	|	0.68
54.917	0.00	0.08	0.142	o	|	|	|	0.68
55.000	0.00	0.08	0.141	o	|	|	|	0.67
55.083	0.00	0.08	0.140	o	|	|	|	0.67
55.167	0.00	0.08	0.140	o	|	|	|	0.67
55.250	0.00	0.08	0.139	o	|	|	|	0.67
55.333	0.00	0.08	0.139	o	|	|	|	0.66
55.417	0.00	0.08	0.138	o	|	|	|	0.66
55.500	0.00	0.08	0.138	o	|	|	|	0.66
55.583	0.00	0.08	0.137	o	|	|	|	0.66
55.667	0.00	0.08	0.137	o	|	|	|	0.65
55.750	0.00	0.08	0.136	o	|	|	|	0.65
55.833	0.00	0.08	0.136	o	|	|	|	0.65
55.917	0.00	0.08	0.135	o	|	|	|	0.65
56.000	0.00	0.08	0.134	o	|	|	|	0.64
56.083	0.00	0.08	0.134	o	|	|	|	0.64
56.167	0.00	0.08	0.133	o	|	|	|	0.64
56.250	0.00	0.08	0.133	o	|	|	|	0.64
56.333	0.00	0.08	0.132	o	|	|	|	0.63
56.417	0.00	0.08	0.132	o	|	|	|	0.63
56.500	0.00	0.08	0.131	o	|	|	|	0.63
56.583	0.00	0.08	0.131	o	|	|	|	0.62
56.667	0.00	0.08	0.130	o	|	|	|	0.62
56.750	0.00	0.08	0.130	o	|	|	|	0.62
56.833	0.00	0.08	0.129	o	|	|	|	0.62
56.917	0.00	0.08	0.129	o	|	|	|	0.61
57.000	0.00	0.08	0.128	o	|	|	|	0.61
57.083	0.00	0.08	0.128	o	|	|	|	0.61
57.167	0.00	0.08	0.127	o	|	|	|	0.61
57.250	0.00	0.08	0.126	o	|	|	|	0.60
57.333	0.00	0.08	0.126	o	|	|	|	0.60
57.417	0.00	0.08	0.125	o	|	|	|	0.60
57.500	0.00	0.08	0.125	o	|	|	|	0.60
57.583	0.00	0.08	0.124	o	|	|	|	0.59
57.667	0.00	0.08	0.124	o	|	|	|	0.59
57.750	0.00	0.08	0.123	o	|	|	|	0.59
57.833	0.00	0.08	0.123	o	|	|	|	0.59
57.917	0.00	0.07	0.122	o	|	|	|	0.58
58.000	0.00	0.07	0.122	o	|	|	|	0.58
58.083	0.00	0.07	0.121	o	|	|	|	0.58
58.167	0.00	0.07	0.121	o	|	|	|	0.58
58.250	0.00	0.07	0.120	o	|	|	|	0.57
58.333	0.00	0.07	0.120	o	|	|	|	0.57
58.417	0.00	0.07	0.119	o	|	|	|	0.57
58.500	0.00	0.07	0.119	o	|	|	|	0.57
58.583	0.00	0.07	0.118	o	|	|	|	0.56
58.667	0.00	0.07	0.118	o	|	|	|	0.56
58.750	0.00	0.07	0.117	o	|	|	|	0.56
58.833	0.00	0.07	0.117	o	|	|	|	0.56
58.917	0.00	0.07	0.116	o	|	|	|	0.55
59.000	0.00	0.07	0.116	o	|	|	|	0.55
59.083	0.00	0.07	0.115	o	|	|	|	0.55

59.167	0.00	0.07	0.115	o	|	|	|	|	0.55
59.250	0.00	0.07	0.114	o	|	|	|	|	0.54
59.333	0.00	0.07	0.114	o	|	|	|	|	0.54
59.417	0.00	0.07	0.113	o	|	|	|	|	0.54
59.500	0.00	0.07	0.113	o	|	|	|	|	0.54
59.583	0.00	0.07	0.112	o	|	|	|	|	0.54
59.667	0.00	0.07	0.112	o	|	|	|	|	0.53
59.750	0.00	0.07	0.111	o	|	|	|	|	0.53
59.833	0.00	0.07	0.111	o	|	|	|	|	0.53
59.917	0.00	0.07	0.110	o	|	|	|	|	0.53
60.000	0.00	0.07	0.110	o	|	|	|	|	0.52
60.083	0.00	0.07	0.109	o	|	|	|	|	0.52
60.167	0.00	0.07	0.109	o	|	|	|	|	0.52
60.250	0.00	0.07	0.108	o	|	|	|	|	0.52
60.333	0.00	0.07	0.108	o	|	|	|	|	0.51
60.417	0.00	0.07	0.107	o	|	|	|	|	0.51
60.500	0.00	0.07	0.107	o	|	|	|	|	0.51
60.583	0.00	0.07	0.106	o	|	|	|	|	0.51
60.667	0.00	0.07	0.106	o	|	|	|	|	0.50
60.750	0.00	0.07	0.105	o	|	|	|	|	0.50
60.833	0.00	0.07	0.105	o	|	|	|	|	0.50
60.917	0.00	0.07	0.104	o	|	|	|	|	0.50
61.000	0.00	0.07	0.104	o	|	|	|	|	0.49
61.083	0.00	0.07	0.103	o	|	|	|	|	0.49
61.167	0.00	0.07	0.103	o	|	|	|	|	0.49
61.250	0.00	0.07	0.102	o	|	|	|	|	0.49
61.333	0.00	0.07	0.102	o	|	|	|	|	0.49
61.417	0.00	0.07	0.102	o	|	|	|	|	0.48
61.500	0.00	0.07	0.101	o	|	|	|	|	0.48
61.583	0.00	0.07	0.101	o	|	|	|	|	0.48
61.667	0.00	0.07	0.100	o	|	|	|	|	0.48
61.750	0.00	0.07	0.100	o	|	|	|	|	0.47
61.833	0.00	0.07	0.099	o	|	|	|	|	0.47
61.917	0.00	0.07	0.099	o	|	|	|	|	0.47
62.000	0.00	0.07	0.098	o	|	|	|	|	0.47
62.083	0.00	0.07	0.098	o	|	|	|	|	0.46
62.167	0.00	0.07	0.097	o	|	|	|	|	0.46
62.250	0.00	0.07	0.097	o	|	|	|	|	0.46
62.333	0.00	0.07	0.096	o	|	|	|	|	0.46
62.417	0.00	0.07	0.096	o	|	|	|	|	0.46
62.500	0.00	0.07	0.095	o	|	|	|	|	0.45
62.583	0.00	0.07	0.095	o	|	|	|	|	0.45
62.667	0.00	0.07	0.094	o	|	|	|	|	0.45
62.750	0.00	0.07	0.094	o	|	|	|	|	0.45
62.833	0.00	0.07	0.094	o	|	|	|	|	0.44
62.917	0.00	0.07	0.093	o	|	|	|	|	0.44
63.000	0.00	0.07	0.093	o	|	|	|	|	0.44
63.083	0.00	0.07	0.092	o	|	|	|	|	0.44
63.167	0.00	0.07	0.092	o	|	|	|	|	0.44
63.250	0.00	0.07	0.091	o	|	|	|	|	0.43
63.333	0.00	0.07	0.091	o	|	|	|	|	0.43
63.417	0.00	0.07	0.090	o	|	|	|	|	0.43
63.500	0.00	0.07	0.090	o	|	|	|	|	0.43
63.583	0.00	0.07	0.089	o	|	|	|	|	0.42
63.667	0.00	0.07	0.089	o	|	|	|	|	0.42
63.750	0.00	0.07	0.089	o	|	|	|	|	0.42
63.833	0.00	0.07	0.088	o	|	|	|	|	0.42
63.917	0.00	0.07	0.088	o	|	|	|	|	0.42
64.000	0.00	0.06	0.087	o	|	|	|	|	0.41
64.083	0.00	0.06	0.087	o	|	|	|	|	0.41
64.167	0.00	0.06	0.086	o	|	|	|	|	0.41
64.250	0.00	0.06	0.086	o	|	|	|	|	0.41
64.333	0.00	0.06	0.085	o	|	|	|	|	0.41
64.417	0.00	0.06	0.085	o	|	|	|	|	0.40
64.500	0.00	0.06	0.085	o	|	|	|	|	0.40
64.583	0.00	0.06	0.084	o	|	|	|	|	0.40

64.667	0.00	0.06	0.084	o	|	|	|	0.40
64.750	0.00	0.06	0.083	o	|	|	|	0.39
64.833	0.00	0.06	0.083	o	|	|	|	0.39
64.917	0.00	0.06	0.082	o	|	|	|	0.39
65.000	0.00	0.06	0.082	o	|	|	|	0.39
65.083	0.00	0.06	0.081	o	|	|	|	0.39
65.167	0.00	0.06	0.081	o	|	|	|	0.38
65.250	0.00	0.06	0.081	o	|	|	|	0.38
65.333	0.00	0.06	0.080	o	|	|	|	0.38
65.417	0.00	0.06	0.080	o	|	|	|	0.38
65.500	0.00	0.06	0.079	o	|	|	|	0.38
65.583	0.00	0.06	0.079	o	|	|	|	0.37
65.667	0.00	0.06	0.078	o	|	|	|	0.37
65.750	0.00	0.06	0.078	o	|	|	|	0.37
65.833	0.00	0.06	0.078	o	|	|	|	0.37
65.917	0.00	0.06	0.077	o	|	|	|	0.36
66.000	0.00	0.06	0.077	o	|	|	|	0.36
66.083	0.00	0.06	0.076	o	|	|	|	0.36
66.167	0.00	0.06	0.076	o	|	|	|	0.36
66.250	0.00	0.06	0.075	o	|	|	|	0.36
66.333	0.00	0.06	0.075	o	|	|	|	0.35
66.417	0.00	0.06	0.075	o	|	|	|	0.35
66.500	0.00	0.06	0.074	o	|	|	|	0.35
66.583	0.00	0.06	0.074	o	|	|	|	0.35
66.667	0.00	0.06	0.073	o	|	|	|	0.35
66.750	0.00	0.06	0.073	o	|	|	|	0.34
66.833	0.00	0.06	0.073	o	|	|	|	0.34
66.917	0.00	0.06	0.072	o	|	|	|	0.34
67.000	0.00	0.06	0.072	o	|	|	|	0.34
67.083	0.00	0.06	0.071	o	|	|	|	0.34
67.167	0.00	0.06	0.071	o	|	|	|	0.33
67.250	0.00	0.06	0.070	o	|	|	|	0.33
67.333	0.00	0.06	0.070	o	|	|	|	0.33
67.417	0.00	0.06	0.070	o	|	|	|	0.33
67.500	0.00	0.06	0.069	o	|	|	|	0.33
67.583	0.00	0.06	0.069	o	|	|	|	0.32
67.667	0.00	0.06	0.068	o	|	|	|	0.32
67.750	0.00	0.06	0.068	o	|	|	|	0.32
67.833	0.00	0.06	0.068	o	|	|	|	0.32
67.917	0.00	0.06	0.067	o	|	|	|	0.32
68.000	0.00	0.06	0.067	o	|	|	|	0.31
68.083	0.00	0.06	0.066	o	|	|	|	0.31
68.167	0.00	0.06	0.066	o	|	|	|	0.31
68.250	0.00	0.06	0.066	o	|	|	|	0.31
68.333	0.00	0.06	0.065	o	|	|	|	0.31
68.417	0.00	0.06	0.065	o	|	|	|	0.31
68.500	0.00	0.06	0.064	o	|	|	|	0.30
68.583	0.00	0.05	0.064	o	|	|	|	0.30
68.667	0.00	0.05	0.064	o	|	|	|	0.30
68.750	0.00	0.05	0.063	o	|	|	|	0.30
68.833	0.00	0.05	0.063	o	|	|	|	0.30
68.917	0.00	0.05	0.063	o	|	|	|	0.30
69.000	0.00	0.05	0.062	o	|	|	|	0.29
69.083	0.00	0.05	0.062	o	|	|	|	0.29
69.167	0.00	0.05	0.062	o	|	|	|	0.29
69.250	0.00	0.05	0.061	o	|	|	|	0.29
69.333	0.00	0.05	0.061	o	|	|	|	0.29
69.417	0.00	0.05	0.060	o	|	|	|	0.28
69.500	0.00	0.05	0.060	o	|	|	|	0.28
69.583	0.00	0.05	0.060	o	|	|	|	0.28
69.667	0.00	0.05	0.059	o	|	|	|	0.28
69.750	0.00	0.05	0.059	o	|	|	|	0.28
69.833	0.00	0.05	0.059	o	|	|	|	0.28
69.917	0.00	0.05	0.058	o	|	|	|	0.27
70.000	0.00	0.05	0.058	o	|	|	|	0.27
70.083	0.00	0.05	0.058	o	|	|	|	0.27

70.167	0.00	0.05	0.057	o	|	|	|	| 0.27
70.250	0.00	0.05	0.057	o	|	|	|	| 0.27
70.333	0.00	0.05	0.057	o	|	|	|	| 0.27
70.417	0.00	0.05	0.056	o	|	|	|	| 0.27
70.500	0.00	0.05	0.056	o	|	|	|	| 0.26
70.583	0.00	0.05	0.056	o	|	|	|	| 0.26
70.667	0.00	0.05	0.055	o	|	|	|	| 0.26
70.750	0.00	0.05	0.055	o	|	|	|	| 0.26
70.833	0.00	0.05	0.055	o	|	|	|	| 0.26
70.917	0.00	0.05	0.054	o	|	|	|	| 0.26
71.000	0.00	0.05	0.054	o	|	|	|	| 0.25
71.083	0.00	0.05	0.054	o	|	|	|	| 0.25
71.167	0.00	0.05	0.053	o	|	|	|	| 0.25
71.250	0.00	0.05	0.053	o	|	|	|	| 0.25
71.333	0.00	0.05	0.053	o	|	|	|	| 0.25
71.417	0.00	0.04	0.052	o	|	|	|	| 0.25
71.500	0.00	0.04	0.052	o	|	|	|	| 0.25
71.583	0.00	0.04	0.052	o	|	|	|	| 0.24
71.667	0.00	0.04	0.052	o	|	|	|	| 0.24
71.750	0.00	0.04	0.051	o	|	|	|	| 0.24
71.833	0.00	0.04	0.051	o	|	|	|	| 0.24
71.917	0.00	0.04	0.051	o	|	|	|	| 0.24
72.000	0.00	0.04	0.050	o	|	|	|	| 0.24
72.083	0.00	0.04	0.050	o	|	|	|	| 0.24
72.167	0.00	0.04	0.050	o	|	|	|	| 0.23
72.250	0.00	0.04	0.049	o	|	|	|	| 0.23
72.333	0.00	0.04	0.049	o	|	|	|	| 0.23
72.417	0.00	0.04	0.049	o	|	|	|	| 0.23
72.500	0.00	0.04	0.049	o	|	|	|	| 0.23
72.583	0.00	0.04	0.048	o	|	|	|	| 0.23
72.667	0.00	0.04	0.048	o	|	|	|	| 0.23
72.750	0.00	0.04	0.048	o	|	|	|	| 0.22
72.833	0.00	0.04	0.047	o	|	|	|	| 0.22
72.917	0.00	0.04	0.047	o	|	|	|	| 0.22
73.000	0.00	0.04	0.047	o	|	|	|	| 0.22
73.083	0.00	0.04	0.047	o	|	|	|	| 0.22
73.167	0.00	0.04	0.046	o	|	|	|	| 0.22
73.250	0.00	0.04	0.046	o	|	|	|	| 0.22
73.333	0.00	0.04	0.046	o	|	|	|	| 0.22
73.417	0.00	0.04	0.046	o	|	|	|	| 0.21
73.500	0.00	0.04	0.045	o	|	|	|	| 0.21
73.583	0.00	0.04	0.045	o	|	|	|	| 0.21
73.667	0.00	0.04	0.045	o	|	|	|	| 0.21
73.750	0.00	0.04	0.044	o	|	|	|	| 0.21
73.833	0.00	0.04	0.044	o	|	|	|	| 0.21
73.917	0.00	0.04	0.044	o	|	|	|	| 0.21
74.000	0.00	0.04	0.044	o	|	|	|	| 0.21
74.083	0.00	0.04	0.043	o	|	|	|	| 0.20
74.167	0.00	0.04	0.043	o	|	|	|	| 0.20
74.250	0.00	0.04	0.043	o	|	|	|	| 0.20
74.333	0.00	0.04	0.043	o	|	|	|	| 0.20
74.417	0.00	0.04	0.042	o	|	|	|	| 0.20
74.500	0.00	0.04	0.042	o	|	|	|	| 0.20
74.583	0.00	0.04	0.042	o	|	|	|	| 0.20
74.667	0.00	0.04	0.042	o	|	|	|	| 0.20
74.750	0.00	0.04	0.041	o	|	|	|	| 0.20
74.833	0.00	0.04	0.041	o	|	|	|	| 0.19
74.917	0.00	0.04	0.041	o	|	|	|	| 0.19
75.000	0.00	0.03	0.041	o	|	|	|	| 0.19
75.083	0.00	0.03	0.040	o	|	|	|	| 0.19
75.167	0.00	0.03	0.040	o	|	|	|	| 0.19
75.250	0.00	0.03	0.040	o	|	|	|	| 0.19
75.333	0.00	0.03	0.040	o	|	|	|	| 0.19
75.417	0.00	0.03	0.040	o	|	|	|	| 0.19
75.500	0.00	0.03	0.039	o	|	|	|	| 0.19
75.583	0.00	0.03	0.039	o	|	|	|	| 0.18

75.667	0.00	0.03	0.039	o	|	|	|	0.18
75.750	0.00	0.03	0.039	o	|	|	|	0.18
75.833	0.00	0.03	0.038	o	|	|	|	0.18
75.917	0.00	0.03	0.038	o	|	|	|	0.18
76.000	0.00	0.03	0.038	o	|	|	|	0.18
76.083	0.00	0.03	0.038	o	|	|	|	0.18
76.167	0.00	0.03	0.037	o	|	|	|	0.18
76.250	0.00	0.03	0.037	o	|	|	|	0.18
76.333	0.00	0.03	0.037	o	|	|	|	0.17
76.417	0.00	0.03	0.037	o	|	|	|	0.17
76.500	0.00	0.03	0.037	o	|	|	|	0.17
76.583	0.00	0.03	0.036	o	|	|	|	0.17
76.667	0.00	0.03	0.036	o	|	|	|	0.17
76.750	0.00	0.03	0.036	o	|	|	|	0.17
76.833	0.00	0.03	0.036	o	|	|	|	0.17
76.917	0.00	0.03	0.036	o	|	|	|	0.17
77.000	0.00	0.03	0.035	o	|	|	|	0.17
77.083	0.00	0.03	0.035	o	|	|	|	0.17
77.167	0.00	0.03	0.035	o	|	|	|	0.16
77.250	0.00	0.03	0.035	o	|	|	|	0.16
77.333	0.00	0.03	0.034	o	|	|	|	0.16
77.417	0.00	0.03	0.034	o	|	|	|	0.16
77.500	0.00	0.03	0.034	o	|	|	|	0.16
77.583	0.00	0.03	0.034	o	|	|	|	0.16
77.667	0.00	0.03	0.034	o	|	|	|	0.16
77.750	0.00	0.03	0.033	o	|	|	|	0.16
77.833	0.00	0.03	0.033	o	|	|	|	0.16
77.917	0.00	0.03	0.033	o	|	|	|	0.16
78.000	0.00	0.03	0.033	o	|	|	|	0.16
78.083	0.00	0.03	0.033	o	|	|	|	0.15
78.167	0.00	0.03	0.033	o	|	|	|	0.15
78.250	0.00	0.03	0.032	o	|	|	|	0.15
78.333	0.00	0.03	0.032	o	|	|	|	0.15
78.417	0.00	0.03	0.032	o	|	|	|	0.15
78.500	0.00	0.03	0.032	o	|	|	|	0.15
78.583	0.00	0.03	0.032	o	|	|	|	0.15
78.667	0.00	0.03	0.031	o	|	|	|	0.15
78.750	0.00	0.03	0.031	o	|	|	|	0.15
78.833	0.00	0.03	0.031	o	|	|	|	0.15
78.917	0.00	0.03	0.031	o	|	|	|	0.15
79.000	0.00	0.03	0.031	o	|	|	|	0.14
79.083	0.00	0.03	0.030	o	|	|	|	0.14
79.167	0.00	0.03	0.030	o	|	|	|	0.14
79.250	0.00	0.03	0.030	o	|	|	|	0.14
79.333	0.00	0.03	0.030	o	|	|	|	0.14
79.417	0.00	0.03	0.030	o	|	|	|	0.14
79.500	0.00	0.03	0.030	o	|	|	|	0.14
79.583	0.00	0.03	0.029	o	|	|	|	0.14
79.667	0.00	0.03	0.029	o	|	|	|	0.14
79.750	0.00	0.02	0.029	o	|	|	|	0.14
79.833	0.00	0.02	0.029	o	|	|	|	0.14
79.917	0.00	0.02	0.029	o	|	|	|	0.14
80.000	0.00	0.02	0.029	o	|	|	|	0.13
80.083	0.00	0.02	0.028	o	|	|	|	0.13
80.167	0.00	0.02	0.028	o	|	|	|	0.13
80.250	0.00	0.02	0.028	o	|	|	|	0.13
80.333	0.00	0.02	0.028	o	|	|	|	0.13
80.417	0.00	0.02	0.028	o	|	|	|	0.13
80.500	0.00	0.02	0.028	o	|	|	|	0.13
80.583	0.00	0.02	0.027	o	|	|	|	0.13
80.667	0.00	0.02	0.027	o	|	|	|	0.13
80.750	0.00	0.02	0.027	o	|	|	|	0.13
80.833	0.00	0.02	0.027	o	|	|	|	0.13
80.917	0.00	0.02	0.027	o	|	|	|	0.13
81.000	0.00	0.02	0.027	o	|	|	|	0.13
81.083	0.00	0.02	0.026	o	|	|	|	0.12

81.167	0.00	0.02	0.026	o	|	|	|	| 0.12
81.250	0.00	0.02	0.026	o	|	|	|	| 0.12
81.333	0.00	0.02	0.026	o	|	|	|	| 0.12
81.417	0.00	0.02	0.026	o	|	|	|	| 0.12
81.500	0.00	0.02	0.026	o	|	|	|	| 0.12
81.583	0.00	0.02	0.026	o	|	|	|	| 0.12
81.667	0.00	0.02	0.025	o	|	|	|	| 0.12
81.750	0.00	0.02	0.025	o	|	|	|	| 0.12
81.833	0.00	0.02	0.025	o	|	|	|	| 0.12
81.917	0.00	0.02	0.025	o	|	|	|	| 0.12
82.000	0.00	0.02	0.025	o	|	|	|	| 0.12
82.083	0.00	0.02	0.025	o	|	|	|	| 0.12
82.167	0.00	0.02	0.024	o	|	|	|	| 0.12
82.250	0.00	0.02	0.024	o	|	|	|	| 0.11
82.333	0.00	0.02	0.024	o	|	|	|	| 0.11
82.417	0.00	0.02	0.024	o	|	|	|	| 0.11
82.500	0.00	0.02	0.024	o	|	|	|	| 0.11
82.583	0.00	0.02	0.024	o	|	|	|	| 0.11
82.667	0.00	0.02	0.024	o	|	|	|	| 0.11
82.750	0.00	0.02	0.023	o	|	|	|	| 0.11
82.833	0.00	0.02	0.023	o	|	|	|	| 0.11
82.917	0.00	0.02	0.023	o	|	|	|	| 0.11
83.000	0.00	0.02	0.023	o	|	|	|	| 0.11
83.083	0.00	0.02	0.023	o	|	|	|	| 0.11
83.167	0.00	0.02	0.023	o	|	|	|	| 0.11
83.250	0.00	0.02	0.023	o	|	|	|	| 0.11
83.333	0.00	0.02	0.023	o	|	|	|	| 0.11
83.417	0.00	0.02	0.022	o	|	|	|	| 0.11
83.500	0.00	0.02	0.022	o	|	|	|	| 0.11
83.583	0.00	0.02	0.022	o	|	|	|	| 0.10
83.667	0.00	0.02	0.022	o	|	|	|	| 0.10
83.750	0.00	0.02	0.022	o	|	|	|	| 0.10
83.833	0.00	0.02	0.022	o	|	|	|	| 0.10
83.917	0.00	0.02	0.022	o	|	|	|	| 0.10
84.000	0.00	0.02	0.022	o	|	|	|	| 0.10
84.083	0.00	0.02	0.021	o	|	|	|	| 0.10
84.167	0.00	0.02	0.021	o	|	|	|	| 0.10
84.250	0.00	0.02	0.021	o	|	|	|	| 0.10
84.333	0.00	0.02	0.021	o	|	|	|	| 0.10
84.417	0.00	0.02	0.021	o	|	|	|	| 0.10
84.500	0.00	0.02	0.021	o	|	|	|	| 0.10
84.583	0.00	0.02	0.021	o	|	|	|	| 0.10
84.667	0.00	0.02	0.021	o	|	|	|	| 0.10
84.750	0.00	0.02	0.020	o	|	|	|	| 0.10
84.833	0.00	0.02	0.020	o	|	|	|	| 0.10
84.917	0.00	0.02	0.020	o	|	|	|	| 0.10
85.000	0.00	0.02	0.020	o	|	|	|	| 0.09
85.083	0.00	0.02	0.020	o	|	|	|	| 0.09
85.167	0.00	0.02	0.020	o	|	|	|	| 0.09
85.250	0.00	0.02	0.020	o	|	|	|	| 0.09
85.333	0.00	0.02	0.020	o	|	|	|	| 0.09
85.417	0.00	0.02	0.019	o	|	|	|	| 0.09
85.500	0.00	0.02	0.019	o	|	|	|	| 0.09
85.583	0.00	0.02	0.019	o	|	|	|	| 0.09
85.667	0.00	0.02	0.019	o	|	|	|	| 0.09
85.750	0.00	0.02	0.019	o	|	|	|	| 0.09
85.833	0.00	0.02	0.019	o	|	|	|	| 0.09
85.917	0.00	0.02	0.019	o	|	|	|	| 0.09
86.000	0.00	0.02	0.019	o	|	|	|	| 0.09
86.083	0.00	0.02	0.019	o	|	|	|	| 0.09
86.167	0.00	0.02	0.018	o	|	|	|	| 0.09
86.250	0.00	0.02	0.018	o	|	|	|	| 0.09
86.333	0.00	0.02	0.018	o	|	|	|	| 0.09
86.417	0.00	0.02	0.018	o	|	|	|	| 0.09
86.500	0.00	0.02	0.018	o	|	|	|	| 0.08
86.583	0.00	0.02	0.018	o	|	|	|	| 0.08

86.667	0.00	0.02	0.018	o	|	|	|	0.08
86.750	0.00	0.02	0.018	o	|	|	|	0.08
86.833	0.00	0.02	0.018	o	|	|	|	0.08
86.917	0.00	0.01	0.017	o	|	|	|	0.08
87.000	0.00	0.01	0.017	o	|	|	|	0.08
87.083	0.00	0.01	0.017	o	|	|	|	0.08
87.167	0.00	0.01	0.017	o	|	|	|	0.08
87.250	0.00	0.01	0.017	o	|	|	|	0.08
87.333	0.00	0.01	0.017	o	|	|	|	0.08
87.417	0.00	0.01	0.017	o	|	|	|	0.08
87.500	0.00	0.01	0.017	o	|	|	|	0.08
87.583	0.00	0.01	0.017	o	|	|	|	0.08
87.667	0.00	0.01	0.017	o	|	|	|	0.08
87.750	0.00	0.01	0.016	o	|	|	|	0.08
87.833	0.00	0.01	0.016	o	|	|	|	0.08
87.917	0.00	0.01	0.016	o	|	|	|	0.08
88.000	0.00	0.01	0.016	o	|	|	|	0.08
88.083	0.00	0.01	0.016	o	|	|	|	0.08
88.167	0.00	0.01	0.016	o	|	|	|	0.08
88.250	0.00	0.01	0.016	o	|	|	|	0.08
88.333	0.00	0.01	0.016	o	|	|	|	0.07
88.417	0.00	0.01	0.016	o	|	|	|	0.07
88.500	0.00	0.01	0.016	o	|	|	|	0.07
88.583	0.00	0.01	0.016	o	|	|	|	0.07
88.667	0.00	0.01	0.015	o	|	|	|	0.07
88.750	0.00	0.01	0.015	o	|	|	|	0.07
88.833	0.00	0.01	0.015	o	|	|	|	0.07
88.917	0.00	0.01	0.015	o	|	|	|	0.07
89.000	0.00	0.01	0.015	o	|	|	|	0.07
89.083	0.00	0.01	0.015	o	|	|	|	0.07
89.167	0.00	0.01	0.015	o	|	|	|	0.07
89.250	0.00	0.01	0.015	o	|	|	|	0.07
89.333	0.00	0.01	0.015	o	|	|	|	0.07
89.417	0.00	0.01	0.015	o	|	|	|	0.07
89.500	0.00	0.01	0.015	o	|	|	|	0.07
89.583	0.00	0.01	0.014	o	|	|	|	0.07
89.667	0.00	0.01	0.014	o	|	|	|	0.07
89.750	0.00	0.01	0.014	o	|	|	|	0.07
89.833	0.00	0.01	0.014	o	|	|	|	0.07
89.917	0.00	0.01	0.014	o	|	|	|	0.07
90.000	0.00	0.01	0.014	o	|	|	|	0.07
90.083	0.00	0.01	0.014	o	|	|	|	0.07
90.167	0.00	0.01	0.014	o	|	|	|	0.07
90.250	0.00	0.01	0.014	o	|	|	|	0.07
90.333	0.00	0.01	0.014	o	|	|	|	0.06
90.417	0.00	0.01	0.014	o	|	|	|	0.06
90.500	0.00	0.01	0.014	o	|	|	|	0.06
90.583	0.00	0.01	0.013	o	|	|	|	0.06
90.667	0.00	0.01	0.013	o	|	|	|	0.06
90.750	0.00	0.01	0.013	o	|	|	|	0.06
90.833	0.00	0.01	0.013	o	|	|	|	0.06
90.917	0.00	0.01	0.013	o	|	|	|	0.06
91.000	0.00	0.01	0.013	o	|	|	|	0.06
91.083	0.00	0.01	0.013	o	|	|	|	0.06
91.167	0.00	0.01	0.013	o	|	|	|	0.06
91.250	0.00	0.01	0.013	o	|	|	|	0.06
91.333	0.00	0.01	0.013	o	|	|	|	0.06
91.417	0.00	0.01	0.013	o	|	|	|	0.06
91.500	0.00	0.01	0.013	o	|	|	|	0.06
91.583	0.00	0.01	0.013	o	|	|	|	0.06
91.667	0.00	0.01	0.012	o	|	|	|	0.06
91.750	0.00	0.01	0.012	o	|	|	|	0.06
91.833	0.00	0.01	0.012	o	|	|	|	0.06
91.917	0.00	0.01	0.012	o	|	|	|	0.06
92.000	0.00	0.01	0.012	o	|	|	|	0.06
92.083	0.00	0.01	0.012	o	|	|	|	0.06

92.167	0.00	0.01	0.012	o	|	|	|	|	0.06
92.250	0.00	0.01	0.012	o	|	|	|	|	0.06
92.333	0.00	0.01	0.012	o	|	|	|	|	0.06
92.417	0.00	0.01	0.012	o	|	|	|	|	0.06
92.500	0.00	0.01	0.012	o	|	|	|	|	0.06
92.583	0.00	0.01	0.012	o	|	|	|	|	0.06
92.667	0.00	0.01	0.012	o	|	|	|	|	0.05
92.750	0.00	0.01	0.012	o	|	|	|	|	0.05
92.833	0.00	0.01	0.012	o	|	|	|	|	0.05
92.917	0.00	0.01	0.011	o	|	|	|	|	0.05
93.000	0.00	0.01	0.011	o	|	|	|	|	0.05
93.083	0.00	0.01	0.011	o	|	|	|	|	0.05
93.167	0.00	0.01	0.011	o	|	|	|	|	0.05
93.250	0.00	0.01	0.011	o	|	|	|	|	0.05
93.333	0.00	0.01	0.011	o	|	|	|	|	0.05
93.417	0.00	0.01	0.011	o	|	|	|	|	0.05
93.500	0.00	0.01	0.011	o	|	|	|	|	0.05
93.583	0.00	0.01	0.011	o	|	|	|	|	0.05
93.667	0.00	0.01	0.011	o	|	|	|	|	0.05
93.750	0.00	0.01	0.011	o	|	|	|	|	0.05
93.833	0.00	0.01	0.011	o	|	|	|	|	0.05
93.917	0.00	0.01	0.011	o	|	|	|	|	0.05
94.000	0.00	0.01	0.011	o	|	|	|	|	0.05
94.083	0.00	0.01	0.011	o	|	|	|	|	0.05
94.167	0.00	0.01	0.010	o	|	|	|	|	0.05
94.250	0.00	0.01	0.010	o	|	|	|	|	0.05
94.333	0.00	0.01	0.010	o	|	|	|	|	0.05
94.417	0.00	0.01	0.010	o	|	|	|	|	0.05
94.500	0.00	0.01	0.010	o	|	|	|	|	0.05
94.583	0.00	0.01	0.010	o	|	|	|	|	0.05
94.667	0.00	0.01	0.010	o	|	|	|	|	0.05
94.750	0.00	0.01	0.010	o	|	|	|	|	0.05
94.833	0.00	0.01	0.010	o	|	|	|	|	0.05
94.917	0.00	0.01	0.010	o	|	|	|	|	0.05
95.000	0.00	0.01	0.010	o	|	|	|	|	0.05
95.083	0.00	0.01	0.010	o	|	|	|	|	0.05
95.167	0.00	0.01	0.010	o	|	|	|	|	0.05
95.250	0.00	0.01	0.010	o	|	|	|	|	0.05
95.333	0.00	0.01	0.010	o	|	|	|	|	0.05
95.417	0.00	0.01	0.010	o	|	|	|	|	0.05
95.500	0.00	0.01	0.010	o	|	|	|	|	0.04
95.583	0.00	0.01	0.009	o	|	|	|	|	0.04
95.667	0.00	0.01	0.009	o	|	|	|	|	0.04
95.750	0.00	0.01	0.009	o	|	|	|	|	0.04
95.833	0.00	0.01	0.009	o	|	|	|	|	0.04
95.917	0.00	0.01	0.009	o	|	|	|	|	0.04
96.000	0.00	0.01	0.009	o	|	|	|	|	0.04
96.083	0.00	0.01	0.009	o	|	|	|	|	0.04
96.167	0.00	0.01	0.009	o	|	|	|	|	0.04
96.250	0.00	0.01	0.009	o	|	|	|	|	0.04
96.333	0.00	0.01	0.009	o	|	|	|	|	0.04
96.417	0.00	0.01	0.009	o	|	|	|	|	0.04
96.500	0.00	0.01	0.009	o	|	|	|	|	0.04
96.583	0.00	0.01	0.009	o	|	|	|	|	0.04
96.667	0.00	0.01	0.009	o	|	|	|	|	0.04
96.750	0.00	0.01	0.009	o	|	|	|	|	0.04
96.833	0.00	0.01	0.009	o	|	|	|	|	0.04
96.917	0.00	0.01	0.009	o	|	|	|	|	0.04
97.000	0.00	0.01	0.009	o	|	|	|	|	0.04
97.083	0.00	0.01	0.009	o	|	|	|	|	0.04
97.167	0.00	0.01	0.008	o	|	|	|	|	0.04
97.250	0.00	0.01	0.008	o	|	|	|	|	0.04
97.333	0.00	0.01	0.008	o	|	|	|	|	0.04
97.417	0.00	0.01	0.008	o	|	|	|	|	0.04
97.500	0.00	0.01	0.008	o	|	|	|	|	0.04
97.583	0.00	0.01	0.008	o	|	|	|	|	0.04

97.667	0.00	0.01	0.008	o	|	|	|	|	0.04
97.750	0.00	0.01	0.008	o	|	|	|	|	0.04
97.833	0.00	0.01	0.008	o	|	|	|	|	0.04
97.917	0.00	0.01	0.008	o	|	|	|	|	0.04
98.000	0.00	0.01	0.008	o	|	|	|	|	0.04
98.083	0.00	0.01	0.008	o	|	|	|	|	0.04
98.167	0.00	0.01	0.008	o	|	|	|	|	0.04
98.250	0.00	0.01	0.008	o	|	|	|	|	0.04
98.333	0.00	0.01	0.008	o	|	|	|	|	0.04
98.417	0.00	0.01	0.008	o	|	|	|	|	0.04
98.500	0.00	0.01	0.008	o	|	|	|	|	0.04
98.583	0.00	0.01	0.008	o	|	|	|	|	0.04
98.667	0.00	0.01	0.008	o	|	|	|	|	0.04
98.750	0.00	0.01	0.008	o	|	|	|	|	0.04
98.833	0.00	0.01	0.008	o	|	|	|	|	0.04
98.917	0.00	0.01	0.007	o	|	|	|	|	0.04
99.000	0.00	0.01	0.007	o	|	|	|	|	0.04
99.083	0.00	0.01	0.007	o	|	|	|	|	0.03
99.167	0.00	0.01	0.007	o	|	|	|	|	0.03
99.250	0.00	0.01	0.007	o	|	|	|	|	0.03
99.333	0.00	0.01	0.007	o	|	|	|	|	0.03
99.417	0.00	0.01	0.007	o	|	|	|	|	0.03
99.500	0.00	0.01	0.007	o	|	|	|	|	0.03
99.583	0.00	0.01	0.007	o	|	|	|	|	0.03
99.667	0.00	0.01	0.007	o	|	|	|	|	0.03
99.750	0.00	0.01	0.007	o	|	|	|	|	0.03
99.833	0.00	0.01	0.007	o	|	|	|	|	0.03
99.917	0.00	0.01	0.007	o	|	|	|	|	0.03
100.000	0.00	0.01	0.007	o	|	|	|	|	0.03
100.083	0.00	0.01	0.007	o	|	|	|	|	0.03
100.167	0.00	0.01	0.007	o	|	|	|	|	0.03
100.250	0.00	0.01	0.007	o	|	|	|	|	0.03
100.333	0.00	0.01	0.007	o	|	|	|	|	0.03
100.417	0.00	0.01	0.007	o	|	|	|	|	0.03
100.500	0.00	0.01	0.007	o	|	|	|	|	0.03
100.583	0.00	0.01	0.007	o	|	|	|	|	0.03
100.667	0.00	0.01	0.007	o	|	|	|	|	0.03
100.750	0.00	0.01	0.007	o	|	|	|	|	0.03
100.833	0.00	0.01	0.007	o	|	|	|	|	0.03
100.917	0.00	0.01	0.006	o	|	|	|	|	0.03
101.000	0.00	0.01	0.006	o	|	|	|	|	0.03
101.083	0.00	0.01	0.006	o	|	|	|	|	0.03
101.167	0.00	0.01	0.006	o	|	|	|	|	0.03
101.250	0.00	0.01	0.006	o	|	|	|	|	0.03
101.333	0.00	0.01	0.006	o	|	|	|	|	0.03
101.417	0.00	0.01	0.006	o	|	|	|	|	0.03
101.500	0.00	0.01	0.006	o	|	|	|	|	0.03
101.583	0.00	0.01	0.006	o	|	|	|	|	0.03
101.667	0.00	0.01	0.006	o	|	|	|	|	0.03
101.750	0.00	0.01	0.006	o	|	|	|	|	0.03
101.833	0.00	0.01	0.006	o	|	|	|	|	0.03
101.917	0.00	0.01	0.006	o	|	|	|	|	0.03
102.000	0.00	0.01	0.006	o	|	|	|	|	0.03
102.083	0.00	0.01	0.006	o	|	|	|	|	0.03
102.167	0.00	0.01	0.006	o	|	|	|	|	0.03
102.250	0.00	0.01	0.006	o	|	|	|	|	0.03
102.333	0.00	0.01	0.006	o	|	|	|	|	0.03
102.417	0.00	0.01	0.006	o	|	|	|	|	0.03
102.500	0.00	0.00	0.006	o	|	|	|	|	0.03
102.583	0.00	0.00	0.006	o	|	|	|	|	0.03
102.667	0.00	0.00	0.006	o	|	|	|	|	0.03
102.750	0.00	0.00	0.006	o	|	|	|	|	0.03
102.833	0.00	0.00	0.006	o	|	|	|	|	0.03
102.917	0.00	0.00	0.006	o	|	|	|	|	0.03
103.000	0.00	0.00	0.006	o	|	|	|	|	0.03
103.083	0.00	0.00	0.006	o	|	|	|	|	0.03

103.167	0.00	0.00	0.006	o	|	|	|	|	0.03
103.250	0.00	0.00	0.005	o	|	|	|	|	0.03
103.333	0.00	0.00	0.005	o	|	|	|	|	0.03
103.417	0.00	0.00	0.005	o	|	|	|	|	0.03
103.500	0.00	0.00	0.005	o	|	|	|	|	0.03
103.583	0.00	0.00	0.005	o	|	|	|	|	0.03
103.667	0.00	0.00	0.005	o	|	|	|	|	0.03
103.750	0.00	0.00	0.005	o	|	|	|	|	0.03
103.833	0.00	0.00	0.005	o	|	|	|	|	0.02
103.917	0.00	0.00	0.005	o	|	|	|	|	0.02
104.000	0.00	0.00	0.005	o	|	|	|	|	0.02
104.083	0.00	0.00	0.005	o	|	|	|	|	0.02
104.167	0.00	0.00	0.005	o	|	|	|	|	0.02
104.250	0.00	0.00	0.005	o	|	|	|	|	0.02
104.333	0.00	0.00	0.005	o	|	|	|	|	0.02
104.417	0.00	0.00	0.005	o	|	|	|	|	0.02
104.500	0.00	0.00	0.005	o	|	|	|	|	0.02
104.583	0.00	0.00	0.005	o	|	|	|	|	0.02
104.667	0.00	0.00	0.005	o	|	|	|	|	0.02
104.750	0.00	0.00	0.005	o	|	|	|	|	0.02
104.833	0.00	0.00	0.005	o	|	|	|	|	0.02
104.917	0.00	0.00	0.005	o	|	|	|	|	0.02
105.000	0.00	0.00	0.005	o	|	|	|	|	0.02
105.083	0.00	0.00	0.005	o	|	|	|	|	0.02
105.167	0.00	0.00	0.005	o	|	|	|	|	0.02
105.250	0.00	0.00	0.005	o	|	|	|	|	0.02
105.333	0.00	0.00	0.005	o	|	|	|	|	0.02
105.417	0.00	0.00	0.005	o	|	|	|	|	0.02
105.500	0.00	0.00	0.005	o	|	|	|	|	0.02
105.583	0.00	0.00	0.005	o	|	|	|	|	0.02
105.667	0.00	0.00	0.005	o	|	|	|	|	0.02
105.750	0.00	0.00	0.005	o	|	|	|	|	0.02
105.833	0.00	0.00	0.005	o	|	|	|	|	0.02
105.917	0.00	0.00	0.005	o	|	|	|	|	0.02
106.000	0.00	0.00	0.005	o	|	|	|	|	0.02
106.083	0.00	0.00	0.004	o	|	|	|	|	0.02
106.167	0.00	0.00	0.004	o	|	|	|	|	0.02
106.250	0.00	0.00	0.004	o	|	|	|	|	0.02
106.333	0.00	0.00	0.004	o	|	|	|	|	0.02
106.417	0.00	0.00	0.004	o	|	|	|	|	0.02
106.500	0.00	0.00	0.004	o	|	|	|	|	0.02
106.583	0.00	0.00	0.004	o	|	|	|	|	0.02
106.667	0.00	0.00	0.004	o	|	|	|	|	0.02
106.750	0.00	0.00	0.004	o	|	|	|	|	0.02
106.833	0.00	0.00	0.004	o	|	|	|	|	0.02
106.917	0.00	0.00	0.004	o	|	|	|	|	0.02
107.000	0.00	0.00	0.004	o	|	|	|	|	0.02
107.083	0.00	0.00	0.004	o	|	|	|	|	0.02
107.167	0.00	0.00	0.004	o	|	|	|	|	0.02
107.250	0.00	0.00	0.004	o	|	|	|	|	0.02
107.333	0.00	0.00	0.004	o	|	|	|	|	0.02
107.417	0.00	0.00	0.004	o	|	|	|	|	0.02
107.500	0.00	0.00	0.004	o	|	|	|	|	0.02
107.583	0.00	0.00	0.004	o	|	|	|	|	0.02
107.667	0.00	0.00	0.004	o	|	|	|	|	0.02
107.750	0.00	0.00	0.004	o	|	|	|	|	0.02
107.833	0.00	0.00	0.004	o	|	|	|	|	0.02
107.917	0.00	0.00	0.004	o	|	|	|	|	0.02
108.000	0.00	0.00	0.004	o	|	|	|	|	0.02
108.083	0.00	0.00	0.004	o	|	|	|	|	0.02
108.167	0.00	0.00	0.004	o	|	|	|	|	0.02
108.250	0.00	0.00	0.004	o	|	|	|	|	0.02
108.333	0.00	0.00	0.004	o	|	|	|	|	0.02
108.417	0.00	0.00	0.004	o	|	|	|	|	0.02
108.500	0.00	0.00	0.004	o	|	|	|	|	0.02
108.583	0.00	0.00	0.004	o	|	|	|	|	0.02

108.667	0.00	0.00	0.004	o	|	|	|	|	0.02
108.750	0.00	0.00	0.004	o	|	|	|	|	0.02
108.833	0.00	0.00	0.004	o	|	|	|	|	0.02
108.917	0.00	0.00	0.004	o	|	|	|	|	0.02
109.000	0.00	0.00	0.004	o	|	|	|	|	0.02
109.083	0.00	0.00	0.004	o	|	|	|	|	0.02
109.167	0.00	0.00	0.004	o	|	|	|	|	0.02
109.250	0.00	0.00	0.004	o	|	|	|	|	0.02
109.333	0.00	0.00	0.004	o	|	|	|	|	0.02
109.417	0.00	0.00	0.004	o	|	|	|	|	0.02
109.500	0.00	0.00	0.004	o	|	|	|	|	0.02
109.583	0.00	0.00	0.004	o	|	|	|	|	0.02
109.667	0.00	0.00	0.003	o	|	|	|	|	0.02
109.750	0.00	0.00	0.003	o	|	|	|	|	0.02
109.833	0.00	0.00	0.003	o	|	|	|	|	0.02
109.917	0.00	0.00	0.003	o	|	|	|	|	0.02
110.000	0.00	0.00	0.003	o	|	|	|	|	0.02
110.083	0.00	0.00	0.003	o	|	|	|	|	0.02
110.167	0.00	0.00	0.003	o	|	|	|	|	0.02
110.250	0.00	0.00	0.003	o	|	|	|	|	0.02
110.333	0.00	0.00	0.003	o	|	|	|	|	0.02
110.417	0.00	0.00	0.003	o	|	|	|	|	0.02
110.500	0.00	0.00	0.003	o	|	|	|	|	0.02
110.583	0.00	0.00	0.003	o	|	|	|	|	0.02
110.667	0.00	0.00	0.003	o	|	|	|	|	0.02
110.750	0.00	0.00	0.003	o	|	|	|	|	0.02
110.833	0.00	0.00	0.003	o	|	|	|	|	0.02
110.917	0.00	0.00	0.003	o	|	|	|	|	0.02
111.000	0.00	0.00	0.003	o	|	|	|	|	0.01
111.083	0.00	0.00	0.003	o	|	|	|	|	0.01
111.167	0.00	0.00	0.003	o	|	|	|	|	0.01
111.250	0.00	0.00	0.003	o	|	|	|	|	0.01
111.333	0.00	0.00	0.003	o	|	|	|	|	0.01
111.417	0.00	0.00	0.003	o	|	|	|	|	0.01
111.500	0.00	0.00	0.003	o	|	|	|	|	0.01
111.583	0.00	0.00	0.003	o	|	|	|	|	0.01
111.667	0.00	0.00	0.003	o	|	|	|	|	0.01
111.750	0.00	0.00	0.003	o	|	|	|	|	0.01
111.833	0.00	0.00	0.003	o	|	|	|	|	0.01
111.917	0.00	0.00	0.003	o	|	|	|	|	0.01
112.000	0.00	0.00	0.003	o	|	|	|	|	0.01
112.083	0.00	0.00	0.003	o	|	|	|	|	0.01
112.167	0.00	0.00	0.003	o	|	|	|	|	0.01
112.250	0.00	0.00	0.003	o	|	|	|	|	0.01
112.333	0.00	0.00	0.003	o	|	|	|	|	0.01
112.417	0.00	0.00	0.003	o	|	|	|	|	0.01
112.500	0.00	0.00	0.003	o	|	|	|	|	0.01
112.583	0.00	0.00	0.003	o	|	|	|	|	0.01
112.667	0.00	0.00	0.003	o	|	|	|	|	0.01
112.750	0.00	0.00	0.003	o	|	|	|	|	0.01
112.833	0.00	0.00	0.003	o	|	|	|	|	0.01
112.917	0.00	0.00	0.003	o	|	|	|	|	0.01
113.000	0.00	0.00	0.003	o	|	|	|	|	0.01
113.083	0.00	0.00	0.003	o	|	|	|	|	0.01
113.167	0.00	0.00	0.003	o	|	|	|	|	0.01
113.250	0.00	0.00	0.003	o	|	|	|	|	0.01
113.333	0.00	0.00	0.003	o	|	|	|	|	0.01
113.417	0.00	0.00	0.003	o	|	|	|	|	0.01
113.500	0.00	0.00	0.003	o	|	|	|	|	0.01
113.583	0.00	0.00	0.003	o	|	|	|	|	0.01
113.667	0.00	0.00	0.003	o	|	|	|	|	0.01
113.750	0.00	0.00	0.003	o	|	|	|	|	0.01
113.833	0.00	0.00	0.003	o	|	|	|	|	0.01
113.917	0.00	0.00	0.003	o	|	|	|	|	0.01
114.000	0.00	0.00	0.003	o	|	|	|	|	0.01
114.083	0.00	0.00	0.003	o	|	|	|	|	0.01

114.167	0.00	0.00	0.003	o	|	|	|	|	0.01
114.250	0.00	0.00	0.003	o	|	|	|	|	0.01
114.333	0.00	0.00	0.003	o	|	|	|	|	0.01
114.417	0.00	0.00	0.002	o	|	|	|	|	0.01
114.500	0.00	0.00	0.002	o	|	|	|	|	0.01
114.583	0.00	0.00	0.002	o	|	|	|	|	0.01
114.667	0.00	0.00	0.002	o	|	|	|	|	0.01
114.750	0.00	0.00	0.002	o	|	|	|	|	0.01
114.833	0.00	0.00	0.002	o	|	|	|	|	0.01
114.917	0.00	0.00	0.002	o	|	|	|	|	0.01
115.000	0.00	0.00	0.002	o	|	|	|	|	0.01
115.083	0.00	0.00	0.002	o	|	|	|	|	0.01
115.167	0.00	0.00	0.002	o	|	|	|	|	0.01
115.250	0.00	0.00	0.002	o	|	|	|	|	0.01
115.333	0.00	0.00	0.002	o	|	|	|	|	0.01
115.417	0.00	0.00	0.002	o	|	|	|	|	0.01
115.500	0.00	0.00	0.002	o	|	|	|	|	0.01
115.583	0.00	0.00	0.002	o	|	|	|	|	0.01
115.667	0.00	0.00	0.002	o	|	|	|	|	0.01
115.750	0.00	0.00	0.002	o	|	|	|	|	0.01
115.833	0.00	0.00	0.002	o	|	|	|	|	0.01
115.917	0.00	0.00	0.002	o	|	|	|	|	0.01
116.000	0.00	0.00	0.002	o	|	|	|	|	0.01
116.083	0.00	0.00	0.002	o	|	|	|	|	0.01
116.167	0.00	0.00	0.002	o	|	|	|	|	0.01
116.250	0.00	0.00	0.002	o	|	|	|	|	0.01
116.333	0.00	0.00	0.002	o	|	|	|	|	0.01
116.417	0.00	0.00	0.002	o	|	|	|	|	0.01
116.500	0.00	0.00	0.002	o	|	|	|	|	0.01
116.583	0.00	0.00	0.002	o	|	|	|	|	0.01
116.667	0.00	0.00	0.002	o	|	|	|	|	0.01
116.750	0.00	0.00	0.002	o	|	|	|	|	0.01
116.833	0.00	0.00	0.002	o	|	|	|	|	0.01
116.917	0.00	0.00	0.002	o	|	|	|	|	0.01
117.000	0.00	0.00	0.002	o	|	|	|	|	0.01
117.083	0.00	0.00	0.002	o	|	|	|	|	0.01
117.167	0.00	0.00	0.002	o	|	|	|	|	0.01
117.250	0.00	0.00	0.002	o	|	|	|	|	0.01
117.333	0.00	0.00	0.002	o	|	|	|	|	0.01
117.417	0.00	0.00	0.002	o	|	|	|	|	0.01
117.500	0.00	0.00	0.002	o	|	|	|	|	0.01
117.583	0.00	0.00	0.002	o	|	|	|	|	0.01
117.667	0.00	0.00	0.002	o	|	|	|	|	0.01
117.750	0.00	0.00	0.002	o	|	|	|	|	0.01
117.833	0.00	0.00	0.002	o	|	|	|	|	0.01
117.917	0.00	0.00	0.002	o	|	|	|	|	0.01
118.000	0.00	0.00	0.002	o	|	|	|	|	0.01
118.083	0.00	0.00	0.002	o	|	|	|	|	0.01
118.167	0.00	0.00	0.002	o	|	|	|	|	0.01
118.250	0.00	0.00	0.002	o	|	|	|	|	0.01
118.333	0.00	0.00	0.002	o	|	|	|	|	0.01
118.417	0.00	0.00	0.002	o	|	|	|	|	0.01
118.500	0.00	0.00	0.002	o	|	|	|	|	0.01
118.583	0.00	0.00	0.002	o	|	|	|	|	0.01
118.667	0.00	0.00	0.002	o	|	|	|	|	0.01
118.750	0.00	0.00	0.002	o	|	|	|	|	0.01
118.833	0.00	0.00	0.002	o	|	|	|	|	0.01
118.917	0.00	0.00	0.002	o	|	|	|	|	0.01
119.000	0.00	0.00	0.002	o	|	|	|	|	0.01
119.083	0.00	0.00	0.002	o	|	|	|	|	0.01
119.167	0.00	0.00	0.002	o	|	|	|	|	0.01
119.250	0.00	0.00	0.002	o	|	|	|	|	0.01
119.333	0.00	0.00	0.002	o	|	|	|	|	0.01
119.417	0.00	0.00	0.002	o	|	|	|	|	0.01
119.500	0.00	0.00	0.002	o	|	|	|	|	0.01
119.583	0.00	0.00	0.002	o	|	|	|	|	0.01

119.667	0.00	0.00	0.002	o	|	|	|	|	0.01
119.750	0.00	0.00	0.002	o	|	|	|	|	0.01
119.833	0.00	0.00	0.002	o	|	|	|	|	0.01
119.917	0.00	0.00	0.002	o	|	|	|	|	0.01
120.000	0.00	0.00	0.002	o	|	|	|	|	0.01
120.083	0.00	0.00	0.002	o	|	|	|	|	0.01
120.167	0.00	0.00	0.002	o	|	|	|	|	0.01
120.250	0.00	0.00	0.002	o	|	|	|	|	0.01
120.333	0.00	0.00	0.002	o	|	|	|	|	0.01
120.417	0.00	0.00	0.002	o	|	|	|	|	0.01
120.500	0.00	0.00	0.002	o	|	|	|	|	0.01
120.583	0.00	0.00	0.002	o	|	|	|	|	0.01
120.667	0.00	0.00	0.002	o	|	|	|	|	0.01
120.750	0.00	0.00	0.002	o	|	|	|	|	0.01
120.833	0.00	0.00	0.002	o	|	|	|	|	0.01
120.917	0.00	0.00	0.002	o	|	|	|	|	0.01
121.000	0.00	0.00	0.002	o	|	|	|	|	0.01
121.083	0.00	0.00	0.002	o	|	|	|	|	0.01
121.167	0.00	0.00	0.002	o	|	|	|	|	0.01
121.250	0.00	0.00	0.002	o	|	|	|	|	0.01
121.333	0.00	0.00	0.002	o	|	|	|	|	0.01
121.417	0.00	0.00	0.002	o	|	|	|	|	0.01
121.500	0.00	0.00	0.002	o	|	|	|	|	0.01
121.583	0.00	0.00	0.002	o	|	|	|	|	0.01
121.667	0.00	0.00	0.001	o	|	|	|	|	0.01
121.750	0.00	0.00	0.001	o	|	|	|	|	0.01
121.833	0.00	0.00	0.001	o	|	|	|	|	0.01
121.917	0.00	0.00	0.001	o	|	|	|	|	0.01
122.000	0.00	0.00	0.001	o	|	|	|	|	0.01
122.083	0.00	0.00	0.001	o	|	|	|	|	0.01
122.167	0.00	0.00	0.001	o	|	|	|	|	0.01
122.250	0.00	0.00	0.001	o	|	|	|	|	0.01
122.333	0.00	0.00	0.001	o	|	|	|	|	0.01
122.417	0.00	0.00	0.001	o	|	|	|	|	0.01
122.500	0.00	0.00	0.001	o	|	|	|	|	0.01
122.583	0.00	0.00	0.001	o	|	|	|	|	0.01
122.667	0.00	0.00	0.001	o	|	|	|	|	0.01
122.750	0.00	0.00	0.001	o	|	|	|	|	0.01
122.833	0.00	0.00	0.001	o	|	|	|	|	0.01
122.917	0.00	0.00	0.001	o	|	|	|	|	0.01
123.000	0.00	0.00	0.001	o	|	|	|	|	0.01
123.083	0.00	0.00	0.001	o	|	|	|	|	0.01
123.167	0.00	0.00	0.001	o	|	|	|	|	0.01
123.250	0.00	0.00	0.001	o	|	|	|	|	0.01
123.333	0.00	0.00	0.001	o	|	|	|	|	0.01
123.417	0.00	0.00	0.001	o	|	|	|	|	0.01
123.500	0.00	0.00	0.001	o	|	|	|	|	0.01
123.583	0.00	0.00	0.001	o	|	|	|	|	0.01
123.667	0.00	0.00	0.001	o	|	|	|	|	0.01
123.750	0.00	0.00	0.001	o	|	|	|	|	0.01
123.833	0.00	0.00	0.001	o	|	|	|	|	0.01
123.917	0.00	0.00	0.001	o	|	|	|	|	0.01
124.000	0.00	0.00	0.001	o	|	|	|	|	0.01
124.083	0.00	0.00	0.001	o	|	|	|	|	0.01
124.167	0.00	0.00	0.001	o	|	|	|	|	0.01
124.250	0.00	0.00	0.001	o	|	|	|	|	0.01
124.333	0.00	0.00	0.001	o	|	|	|	|	0.01
124.417	0.00	0.00	0.001	o	|	|	|	|	0.01
124.500	0.00	0.00	0.001	o	|	|	|	|	0.01
124.583	0.00	0.00	0.001	o	|	|	|	|	0.01
124.667	0.00	0.00	0.001	o	|	|	|	|	0.01
124.750	0.00	0.00	0.001	o	|	|	|	|	0.01
124.833	0.00	0.00	0.001	o	|	|	|	|	0.01
124.917	0.00	0.00	0.001	o	|	|	|	|	0.01
125.000	0.00	0.00	0.001	o	|	|	|	|	0.01
125.083	0.00	0.00	0.001	o	|	|	|	|	0.01

```
125.167    0.00    0.00      0.001  O       |       |       |       |     0.01

      Remaining water in basin =    0.00 (Ac.Ft)


      ****************************HYDROGRAPH DATA****************************
                  Number of intervals =  1502
                  Time interval =    5.0 (Min.)
                  Maximum/Peak flow rate =        1.198 (CFS)
                  Total volume =       2.082 (Ac.Ft)
            Status of hydrographs being held in storage
                        Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
            Peak (CFS)      0.000     0.000     0.000     0.000     0.000
            Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
      ***********************************************************************

      ---------------------------------------------------------------------
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                FLOOD HYDROGRAPH ROUTING PROGRAM
          Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2022
                     Study date: 09/18/22

------------------------------------------------------------------------


XENIA
PRELIMINARY BASIN ROUTING MODEL
BASIN A
100-YEAR; 1-HOUR
------------------------------------------------------------------------


Program License Serial Number 6545

------------------------------------------------------------------------
********************* HYDROGRAPH INFORMATION **********************

             From study/file name: 2D1100.rte
*****************************HYDROGRAPH DATA*****************************
             Number of intervals =    18
             Time interval =    5.0 (Min.)
             Maximum/Peak flow rate =       41.915 (CFS)
             Total volume =       1.433 (Ac.Ft)
      Status of hydrographs being held in storage
                 Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
      Peak (CFS)      0.000     0.000     0.000     0.000     0.000
      Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
************************************************************************



++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.000 to Point/Station        2.000
**** RETARDING BASIN ROUTING ****
________________________________________________________________________

User entry of depth-outflow-storage data
------------------------------------------------------------------------
Total number of inflow hydrograph intervals = 18
Hydrograph time unit =  5.000 (Min.)
Initial depth in storage basin =   0.00(Ft.)
------------------------------------------------------------------------
------------------------------------------------------------------------
Initial basin depth =   0.00 (Ft.)
Initial basin storage =      0.00 (Ac.Ft)
Initial basin outflow =   0.00 (CFS)
------------------------------------------------------------------------
------------------------------------------------------------------------
Depth vs. Storage and Depth vs. Discharge data:
 Basin Depth  Storage    Outflow   (S-O*dt/2)   (S+O*dt/2)
     (Ft.)    (Ac.Ft)    (CFS)     (Ac.Ft)    (Ac.Ft)
------------------------------------------------------------------------
   0.000      0.000      0.000      0.000        0.000
   0.330      0.070      0.060      0.070        0.070
   0.670      0.140      0.080      0.140        0.140
   1.000      0.210      0.100      0.210        0.210
   1.330      0.290      0.110      0.290        0.290
   1.670      0.370      0.390      0.369        0.371
   2.000      0.450      0.530      0.448        0.452
   2.330      0.540      0.630      0.538        0.542
   2.670      0.630      0.720      0.628        0.632
   3.000      0.730      0.790      0.727        0.733
```

3.500	0.830	0.890	0.827	0.833
4.000	0.940	0.990	0.937	0.943
4.500	1.050	1.070	1.046	1.054
5.000	1.170	1.150	1.166	1.174
5.500	1.300	1.220	1.296	1.304
6.000	1.430	25.420	1.342	1.518
6.500	1.570	71.680	1.323	1.817
7.000	1.720	132.480	1.264	2.176
7.500	1.870	206.420	1.159	2.581

Hydrograph Detention Basin Routing

Graph values: 'I'= unit inflow; 'O'=outflow at time shown

Time (Hours)	Inflow (CFS)	Outflow (CFS)	Storage (Ac.Ft)	.0 10.5 20.96 31.44 41.92	Depth (Ft.)
0.083	1.56	0.00	0.005	OI	0.03
0.167	5.28	0.02	0.029	O I	0.14
0.250	7.53	0.06	0.073	O I	0.34
0.333	8.52	0.08	0.127	O I	0.61
0.417	9.75	0.09	0.190	O I	0.90
0.500	10.92	0.11	0.260	O I	1.21
0.583	12.13	0.28	0.338	O I	1.54
0.667	14.59	0.49	0.428	O I	1.91
0.750	19.43	0.63	0.541	O I	2.33
0.833	34.70	0.78	0.722	O I	2.97
0.917	41.92	1.02	0.980	O I	4.18
1.000	21.12	1.16	1.190	O I	5.08
1.083	11.18	1.22	1.293	O I	5.47
1.167	4.94	5.73	1.324	IO	5.59
1.250	2.63	4.21	1.316	IO	5.56
1.333	1.46	2.52	1.307	O	5.53
1.417	0.36	1.26	1.300	O	5.50
1.500	0.10	1.22	1.293	O	5.47
1.583	0.00	1.21	1.285	O	5.44
1.667	0.00	1.21	1.277	O	5.41
1.750	0.00	1.20	1.269	O	5.38
1.833	0.00	1.20	1.260	O	5.35
1.917	0.00	1.19	1.252	O	5.32
2.000	0.00	1.19	1.244	O	5.28
2.083	0.00	1.19	1.236	O	5.25
2.167	0.00	1.18	1.228	O	5.22
2.250	0.00	1.18	1.219	O	5.19
2.333	0.00	1.17	1.211	O	5.16
2.417	0.00	1.17	1.203	O	5.13
2.500	0.00	1.16	1.195	O	5.10
2.583	0.00	1.16	1.187	O	5.07
2.667	0.00	1.16	1.179	O	5.04
2.750	0.00	1.15	1.171	O	5.01
2.833	0.00	1.15	1.163	O	4.97
2.917	0.00	1.14	1.156	O	4.94
3.000	0.00	1.14	1.148	O	4.91
3.083	0.00	1.13	1.140	O	4.87
3.167	0.00	1.12	1.132	O	4.84
3.250	0.00	1.12	1.124	O	4.81
3.333	0.00	1.11	1.117	O	4.78
3.417	0.00	1.11	1.109	O	4.75
3.500	0.00	1.10	1.102	O	4.71
3.583	0.00	1.10	1.094	O	4.68
3.667	0.00	1.09	1.086	O	4.65
3.750	0.00	1.09	1.079	O	4.62
3.833	0.00	1.08	1.071	O	4.59
3.917	0.00	1.08	1.064	O	4.56
4.000	0.00	1.07	1.057	O	4.53
4.083	0.00	1.07	1.049	O	4.50

4.167	0.00	1.06	1.042	o					4.46
4.250	0.00	1.06	1.034	o					4.43
4.333	0.00	1.05	1.027	o					4.40
4.417	0.00	1.05	1.020	o					4.36
4.500	0.00	1.04	1.013	o					4.33
4.583	0.00	1.04	1.006	o					4.30
4.667	0.00	1.03	0.998	o					4.27
4.750	0.00	1.03	0.991	o					4.23
4.833	0.00	1.02	0.984	o					4.20
4.917	0.00	1.02	0.977	o					4.17
5.000	0.00	1.01	0.970	o					4.14
5.083	0.00	1.01	0.963	o					4.11
5.167	0.00	1.00	0.956	o					4.07
5.250	0.00	1.00	0.950	o					4.04
5.333	0.00	0.99	0.943	o					4.01
5.417	0.00	0.99	0.936	o					3.98
5.500	0.00	0.98	0.929	o					3.95
5.583	0.00	0.97	0.922	o					3.92
5.667	0.00	0.97	0.916	o					3.89
5.750	0.00	0.96	0.909	o					3.86
5.833	0.00	0.96	0.902	o					3.83
5.917	0.00	0.95	0.896	o					3.80
6.000	0.00	0.94	0.889	o					3.77
6.083	0.00	0.94	0.883	o					3.74
6.167	0.00	0.93	0.876	o					3.71
6.250	0.00	0.93	0.870	o					3.68
6.333	0.00	0.92	0.864	o					3.65
6.417	0.00	0.91	0.857	o					3.62
6.500	0.00	0.91	0.851	o					3.60
6.583	0.00	0.90	0.845	o					3.57
6.667	0.00	0.90	0.839	o					3.54
6.750	0.00	0.89	0.832	o					3.51
6.833	0.00	0.89	0.826	o					3.48
6.917	0.00	0.88	0.820	o					3.45
7.000	0.00	0.87	0.814	o					3.42
7.083	0.00	0.87	0.808	o					3.39
7.167	0.00	0.86	0.802	o					3.36
7.250	0.00	0.86	0.796	o					3.33
7.333	0.00	0.85	0.790	o					3.30
7.417	0.00	0.84	0.785	o					3.27
7.500	0.00	0.84	0.779	o					3.24
7.583	0.00	0.83	0.773	o					3.22
7.667	0.00	0.83	0.767	o					3.19
7.750	0.00	0.82	0.762	o					3.16
7.833	0.00	0.82	0.756	o					3.13
7.917	0.00	0.81	0.750	o					3.10
8.000	0.00	0.80	0.745	o					3.07
8.083	0.00	0.80	0.739	o					3.05
8.167	0.00	0.79	0.734	o					3.02
8.250	0.00	0.79	0.728	o					2.99
8.333	0.00	0.79	0.723	o					2.98
8.417	0.00	0.78	0.718	o					2.96
8.500	0.00	0.78	0.712	o					2.94
8.583	0.00	0.77	0.707	o					2.92
8.667	0.00	0.77	0.702	o					2.91
8.750	0.00	0.77	0.696	o					2.89
8.833	0.00	0.76	0.691	o					2.87
8.917	0.00	0.76	0.686	o					2.85
9.000	0.00	0.76	0.681	o					2.84
9.083	0.00	0.75	0.675	o					2.82
9.167	0.00	0.75	0.670	o					2.80
9.250	0.00	0.74	0.665	o					2.79
9.333	0.00	0.74	0.660	o					2.77
9.417	0.00	0.74	0.655	o					2.75
9.500	0.00	0.73	0.650	o					2.74
9.583	0.00	0.73	0.645	o					2.72

9.667	0.00	0.73	0.640	o	|	|	|	2.70
9.750	0.00	0.72	0.635	o	|	|	|	2.69
9.833	0.00	0.72	0.630	o	|	|	|	2.67
9.917	0.00	0.71	0.625	o	|	|	|	2.65
10.000	0.00	0.71	0.620	o	|	|	|	2.63
10.083	0.00	0.71	0.615	o	|	|	|	2.61
10.167	0.00	0.70	0.610	o	|	|	|	2.60
10.250	0.00	0.70	0.605	o	|	|	|	2.58
10.333	0.00	0.69	0.601	o	|	|	|	2.56
10.417	0.00	0.69	0.596	o	|	|	|	2.54
10.500	0.00	0.68	0.591	o	|	|	|	2.52
10.583	0.00	0.68	0.587	o	|	|	|	2.51
10.667	0.00	0.67	0.582	o	|	|	|	2.49
10.750	0.00	0.67	0.577	o	|	|	|	2.47
10.833	0.00	0.66	0.573	o	|	|	|	2.45
10.917	0.00	0.66	0.568	o	|	|	|	2.44
11.000	0.00	0.65	0.564	o	|	|	|	2.42
11.083	0.00	0.65	0.559	o	|	|	|	2.40
11.167	0.00	0.64	0.555	o	|	|	|	2.39
11.250	0.00	0.64	0.550	o	|	|	|	2.37
11.333	0.00	0.64	0.546	o	|	|	|	2.35
11.417	0.00	0.63	0.541	o	|	|	|	2.34
11.500	0.00	0.63	0.537	o	|	|	|	2.32
11.583	0.00	0.62	0.533	o	|	|	|	2.30
11.667	0.00	0.62	0.529	o	|	|	|	2.29
11.750	0.00	0.61	0.524	o	|	|	|	2.27
11.833	0.00	0.61	0.520	o	|	|	|	2.26
11.917	0.00	0.60	0.516	o	|	|	|	2.24
12.000	0.00	0.60	0.512	o	|	|	|	2.23
12.083	0.00	0.59	0.508	o	|	|	|	2.21
12.167	0.00	0.59	0.504	o	|	|	|	2.20
12.250	0.00	0.59	0.500	o	|	|	|	2.18
12.333	0.00	0.58	0.496	o	|	|	|	2.17
12.417	0.00	0.58	0.492	o	|	|	|	2.15
12.500	0.00	0.57	0.488	o	|	|	|	2.14
12.583	0.00	0.57	0.484	o	|	|	|	2.12
12.667	0.00	0.56	0.480	o	|	|	|	2.11
12.750	0.00	0.56	0.476	o	|	|	|	2.10
12.833	0.00	0.55	0.472	o	|	|	|	2.08
12.917	0.00	0.55	0.468	o	|	|	|	2.07
13.000	0.00	0.55	0.465	o	|	|	|	2.05
13.083	0.00	0.54	0.461	o	|	|	|	2.04
13.167	0.00	0.54	0.457	o	|	|	|	2.03
13.250	0.00	0.53	0.453	o	|	|	|	2.01
13.333	0.00	0.53	0.450	o	|	|	|	2.00
13.417	0.00	0.52	0.446	o	|	|	|	1.98
13.500	0.00	0.52	0.443	o	|	|	|	1.97
13.583	0.00	0.51	0.439	o	|	|	|	1.95
13.667	0.00	0.50	0.436	o	|	|	|	1.94
13.750	0.00	0.50	0.432	o	|	|	|	1.93
13.833	0.00	0.49	0.429	o	|	|	|	1.91
13.917	0.00	0.49	0.425	o	|	|	|	1.90
14.000	0.00	0.48	0.422	o	|	|	|	1.88
14.083	0.00	0.48	0.419	o	|	|	|	1.87
14.167	0.00	0.47	0.415	o	|	|	|	1.86
14.250	0.00	0.46	0.412	o	|	|	|	1.84
14.333	0.00	0.46	0.409	o	|	|	|	1.83
14.417	0.00	0.45	0.406	o	|	|	|	1.82
14.500	0.00	0.45	0.403	o	|	|	|	1.81
14.583	0.00	0.44	0.400	o	|	|	|	1.79
14.667	0.00	0.44	0.397	o	|	|	|	1.78
14.750	0.00	0.43	0.394	o	|	|	|	1.77
14.833	0.00	0.43	0.391	o	|	|	|	1.76
14.917	0.00	0.42	0.388	o	|	|	|	1.74
15.000	0.00	0.42	0.385	o	|	|	|	1.73
15.083	0.00	0.41	0.382	o	|	|	|	1.72

15.167	0.00	0.41	0.379	o	|	|	|	| 1.71
15.250	0.00	0.40	0.376	o	|	|	|	| 1.70
15.333	0.00	0.40	0.374	o	|	|	|	| 1.69
15.417	0.00	0.39	0.371	o	|	|	|	| 1.67
15.500	0.00	0.38	0.368	o	|	|	|	| 1.66
15.583	0.00	0.38	0.366	o	|	|	|	| 1.65
15.667	0.00	0.37	0.363	o	|	|	|	| 1.64
15.750	0.00	0.36	0.361	o	|	|	|	| 1.63
15.833	0.00	0.35	0.358	o	|	|	|	| 1.62
15.917	0.00	0.34	0.356	o	|	|	|	| 1.61
16.000	0.00	0.33	0.354	o	|	|	|	| 1.60
16.083	0.00	0.32	0.351	o	|	|	|	| 1.59
16.167	0.00	0.32	0.349	o	|	|	|	| 1.58
16.250	0.00	0.31	0.347	o	|	|	|	| 1.57
16.333	0.00	0.30	0.345	o	|	|	|	| 1.56
16.417	0.00	0.29	0.343	o	|	|	|	| 1.55
16.500	0.00	0.29	0.341	o	|	|	|	| 1.55
16.583	0.00	0.28	0.339	o	|	|	|	| 1.54
16.667	0.00	0.27	0.337	o	|	|	|	| 1.53
16.750	0.00	0.27	0.335	o	|	|	|	| 1.52
16.833	0.00	0.26	0.333	o	|	|	|	| 1.51
16.917	0.00	0.26	0.331	o	|	|	|	| 1.51
17.000	0.00	0.25	0.330	o	|	|	|	| 1.50
17.083	0.00	0.24	0.328	o	|	|	|	| 1.49
17.167	0.00	0.24	0.326	o	|	|	|	| 1.48
17.250	0.00	0.23	0.325	o	|	|	|	| 1.48
17.333	0.00	0.23	0.323	o	|	|	|	| 1.47
17.417	0.00	0.22	0.322	o	|	|	|	| 1.46
17.500	0.00	0.22	0.320	o	|	|	|	| 1.46
17.583	0.00	0.21	0.319	o	|	|	|	| 1.45
17.667	0.00	0.21	0.317	o	|	|	|	| 1.45
17.750	0.00	0.20	0.316	o	|	|	|	| 1.44
17.833	0.00	0.20	0.314	o	|	|	|	| 1.43
17.917	0.00	0.19	0.313	o	|	|	|	| 1.43
18.000	0.00	0.19	0.312	o	|	|	|	| 1.42
18.083	0.00	0.18	0.311	o	|	|	|	| 1.42
18.167	0.00	0.18	0.309	o	|	|	|	| 1.41
18.250	0.00	0.17	0.308	o	|	|	|	| 1.41
18.333	0.00	0.17	0.307	o	|	|	|	| 1.40
18.417	0.00	0.17	0.306	o	|	|	|	| 1.40
18.500	0.00	0.16	0.305	o	|	|	|	| 1.39
18.583	0.00	0.16	0.304	o	|	|	|	| 1.39
18.667	0.00	0.15	0.302	o	|	|	|	| 1.38
18.750	0.00	0.15	0.301	o	|	|	|	| 1.38
18.833	0.00	0.15	0.300	o	|	|	|	| 1.37
18.917	0.00	0.14	0.299	o	|	|	|	| 1.37
19.000	0.00	0.14	0.298	o	|	|	|	| 1.37
19.083	0.00	0.14	0.298	o	|	|	|	| 1.36
19.167	0.00	0.13	0.297	o	|	|	|	| 1.36
19.250	0.00	0.13	0.296	o	|	|	|	| 1.35
19.333	0.00	0.13	0.295	o	|	|	|	| 1.35
19.417	0.00	0.12	0.294	o	|	|	|	| 1.35
19.500	0.00	0.12	0.293	o	|	|	|	| 1.34
19.583	0.00	0.12	0.292	o	|	|	|	| 1.34
19.667	0.00	0.12	0.291	o	|	|	|	| 1.34
19.750	0.00	0.11	0.291	o	|	|	|	| 1.33
19.833	0.00	0.11	0.290	o	|	|	|	| 1.33
19.917	0.00	0.11	0.289	o	|	|	|	| 1.33
20.000	0.00	0.11	0.288	o	|	|	|	| 1.32
20.083	0.00	0.11	0.288	o	|	|	|	| 1.32
20.167	0.00	0.11	0.287	o	|	|	|	| 1.32
20.250	0.00	0.11	0.286	o	|	|	|	| 1.31
20.333	0.00	0.11	0.285	o	|	|	|	| 1.31
20.417	0.00	0.11	0.285	o	|	|	|	| 1.31
20.500	0.00	0.11	0.284	o	|	|	|	| 1.30
20.583	0.00	0.11	0.283	o	|	|	|	| 1.30

20.667	0.00	0.11	0.282	o	|	|	|	| 1.30
20.750	0.00	0.11	0.282	o	|	|	|	| 1.30
20.833	0.00	0.11	0.281	o	|	|	|	| 1.29
20.917	0.00	0.11	0.280	o	|	|	|	| 1.29
21.000	0.00	0.11	0.279	o	|	|	|	| 1.29
21.083	0.00	0.11	0.279	o	|	|	|	| 1.28
21.167	0.00	0.11	0.278	o	|	|	|	| 1.28
21.250	0.00	0.11	0.277	o	|	|	|	| 1.28
21.333	0.00	0.11	0.276	o	|	|	|	| 1.27
21.417	0.00	0.11	0.276	o	|	|	|	| 1.27
21.500	0.00	0.11	0.275	o	|	|	|	| 1.27
21.583	0.00	0.11	0.274	o	|	|	|	| 1.26
21.667	0.00	0.11	0.273	o	|	|	|	| 1.26
21.750	0.00	0.11	0.273	o	|	|	|	| 1.26
21.833	0.00	0.11	0.272	o	|	|	|	| 1.26
21.917	0.00	0.11	0.271	o	|	|	|	| 1.25
22.000	0.00	0.11	0.270	o	|	|	|	| 1.25
22.083	0.00	0.11	0.270	o	|	|	|	| 1.25
22.167	0.00	0.11	0.269	o	|	|	|	| 1.24
22.250	0.00	0.11	0.268	o	|	|	|	| 1.24
22.333	0.00	0.11	0.267	o	|	|	|	| 1.24
22.417	0.00	0.11	0.267	o	|	|	|	| 1.23
22.500	0.00	0.11	0.266	o	|	|	|	| 1.23
22.583	0.00	0.11	0.265	o	|	|	|	| 1.23
22.667	0.00	0.11	0.265	o	|	|	|	| 1.22
22.750	0.00	0.11	0.264	o	|	|	|	| 1.22
22.833	0.00	0.11	0.263	o	|	|	|	| 1.22
22.917	0.00	0.11	0.262	o	|	|	|	| 1.22
23.000	0.00	0.11	0.262	o	|	|	|	| 1.21
23.083	0.00	0.11	0.261	o	|	|	|	| 1.21
23.167	0.00	0.11	0.260	o	|	|	|	| 1.21
23.250	0.00	0.11	0.259	o	|	|	|	| 1.20
23.333	0.00	0.11	0.259	o	|	|	|	| 1.20
23.417	0.00	0.11	0.258	o	|	|	|	| 1.20
23.500	0.00	0.11	0.257	o	|	|	|	| 1.19
23.583	0.00	0.11	0.256	o	|	|	|	| 1.19
23.667	0.00	0.11	0.256	o	|	|	|	| 1.19
23.750	0.00	0.11	0.255	o	|	|	|	| 1.19
23.833	0.00	0.11	0.254	o	|	|	|	| 1.18
23.917	0.00	0.11	0.254	o	|	|	|	| 1.18
24.000	0.00	0.11	0.253	o	|	|	|	| 1.18
24.083	0.00	0.11	0.252	o	|	|	|	| 1.17
24.167	0.00	0.11	0.251	o	|	|	|	| 1.17
24.250	0.00	0.11	0.251	o	|	|	|	| 1.17
24.333	0.00	0.10	0.250	o	|	|	|	| 1.16
24.417	0.00	0.10	0.249	o	|	|	|	| 1.16
24.500	0.00	0.10	0.248	o	|	|	|	| 1.16
24.583	0.00	0.10	0.248	o	|	|	|	| 1.16
24.667	0.00	0.10	0.247	o	|	|	|	| 1.15
24.750	0.00	0.10	0.246	o	|	|	|	| 1.15
24.833	0.00	0.10	0.246	o	|	|	|	| 1.15
24.917	0.00	0.10	0.245	o	|	|	|	| 1.14
25.000	0.00	0.10	0.244	o	|	|	|	| 1.14
25.083	0.00	0.10	0.243	o	|	|	|	| 1.14
25.167	0.00	0.10	0.243	o	|	|	|	| 1.14
25.250	0.00	0.10	0.242	o	|	|	|	| 1.13
25.333	0.00	0.10	0.241	o	|	|	|	| 1.13
25.417	0.00	0.10	0.241	o	|	|	|	| 1.13
25.500	0.00	0.10	0.240	o	|	|	|	| 1.12
25.583	0.00	0.10	0.239	o	|	|	|	| 1.12
25.667	0.00	0.10	0.238	o	|	|	|	| 1.12
25.750	0.00	0.10	0.238	o	|	|	|	| 1.11
25.833	0.00	0.10	0.237	o	|	|	|	| 1.11
25.917	0.00	0.10	0.236	o	|	|	|	| 1.11
26.000	0.00	0.10	0.236	o	|	|	|	| 1.11
26.083	0.00	0.10	0.235	o	|	|	|	| 1.10

26.167	0.00	0.10	0.234	o	|	|	|	|	1.10
26.250	0.00	0.10	0.233	o	|	|	|	|	1.10
26.333	0.00	0.10	0.233	o	|	|	|	|	1.09
26.417	0.00	0.10	0.232	o	|	|	|	|	1.09
26.500	0.00	0.10	0.231	o	|	|	|	|	1.09
26.583	0.00	0.10	0.231	o	|	|	|	|	1.09
26.667	0.00	0.10	0.230	o	|	|	|	|	1.08
26.750	0.00	0.10	0.229	o	|	|	|	|	1.08
26.833	0.00	0.10	0.229	o	|	|	|	|	1.08
26.917	0.00	0.10	0.228	o	|	|	|	|	1.07
27.000	0.00	0.10	0.227	o	|	|	|	|	1.07
27.083	0.00	0.10	0.226	o	|	|	|	|	1.07
27.167	0.00	0.10	0.226	o	|	|	|	|	1.06
27.250	0.00	0.10	0.225	o	|	|	|	|	1.06
27.333	0.00	0.10	0.224	o	|	|	|	|	1.06
27.417	0.00	0.10	0.224	o	|	|	|	|	1.06
27.500	0.00	0.10	0.223	o	|	|	|	|	1.05
27.583	0.00	0.10	0.222	o	|	|	|	|	1.05
27.667	0.00	0.10	0.222	o	|	|	|	|	1.05
27.750	0.00	0.10	0.221	o	|	|	|	|	1.04
27.833	0.00	0.10	0.220	o	|	|	|	|	1.04
27.917	0.00	0.10	0.219	o	|	|	|	|	1.04
28.000	0.00	0.10	0.219	o	|	|	|	|	1.04
28.083	0.00	0.10	0.218	o	|	|	|	|	1.03
28.167	0.00	0.10	0.217	o	|	|	|	|	1.03
28.250	0.00	0.10	0.217	o	|	|	|	|	1.03
28.333	0.00	0.10	0.216	o	|	|	|	|	1.02
28.417	0.00	0.10	0.215	o	|	|	|	|	1.02
28.500	0.00	0.10	0.215	o	|	|	|	|	1.02
28.583	0.00	0.10	0.214	o	|	|	|	|	1.02
28.667	0.00	0.10	0.213	o	|	|	|	|	1.01
28.750	0.00	0.10	0.212	o	|	|	|	|	1.01
28.833	0.00	0.10	0.212	o	|	|	|	|	1.01
28.917	0.00	0.10	0.211	o	|	|	|	|	1.00
29.000	0.00	0.10	0.210	o	|	|	|	|	1.00
29.083	0.00	0.10	0.210	o	|	|	|	|	1.00
29.167	0.00	0.10	0.209	o	|	|	|	|	1.00
29.250	0.00	0.10	0.208	o	|	|	|	|	0.99
29.333	0.00	0.10	0.208	o	|	|	|	|	0.99
29.417	0.00	0.10	0.207	o	|	|	|	|	0.99
29.500	0.00	0.10	0.206	o	|	|	|	|	0.98
29.583	0.00	0.10	0.206	o	|	|	|	|	0.98
29.667	0.00	0.10	0.205	o	|	|	|	|	0.98
29.750	0.00	0.10	0.204	o	|	|	|	|	0.97
29.833	0.00	0.10	0.204	o	|	|	|	|	0.97
29.917	0.00	0.10	0.203	o	|	|	|	|	0.97
30.000	0.00	0.10	0.202	o	|	|	|	|	0.96
30.083	0.00	0.10	0.202	o	|	|	|	|	0.96
30.167	0.00	0.10	0.201	o	|	|	|	|	0.96
30.250	0.00	0.10	0.200	o	|	|	|	|	0.95
30.333	0.00	0.10	0.200	o	|	|	|	|	0.95
30.417	0.00	0.10	0.199	o	|	|	|	|	0.95
30.500	0.00	0.10	0.198	o	|	|	|	|	0.94
30.583	0.00	0.10	0.198	o	|	|	|	|	0.94
30.667	0.00	0.10	0.197	o	|	|	|	|	0.94
30.750	0.00	0.10	0.196	o	|	|	|	|	0.94
30.833	0.00	0.10	0.196	o	|	|	|	|	0.93
30.917	0.00	0.10	0.195	o	|	|	|	|	0.93
31.000	0.00	0.10	0.194	o	|	|	|	|	0.93
31.083	0.00	0.10	0.194	o	|	|	|	|	0.92
31.167	0.00	0.10	0.193	o	|	|	|	|	0.92
31.250	0.00	0.09	0.192	o	|	|	|	|	0.92
31.333	0.00	0.09	0.192	o	|	|	|	|	0.91
31.417	0.00	0.09	0.191	o	|	|	|	|	0.91
31.500	0.00	0.09	0.190	o	|	|	|	|	0.91
31.583	0.00	0.09	0.190	o	|	|	|	|	0.90

31.667	0.00	0.09	0.189	o	|	|	|	0.90
31.750	0.00	0.09	0.188	o	|	|	|	0.90
31.833	0.00	0.09	0.188	o	|	|	|	0.90
31.917	0.00	0.09	0.187	o	|	|	|	0.89
32.000	0.00	0.09	0.186	o	|	|	|	0.89
32.083	0.00	0.09	0.186	o	|	|	|	0.89
32.167	0.00	0.09	0.185	o	|	|	|	0.88
32.250	0.00	0.09	0.185	o	|	|	|	0.88
32.333	0.00	0.09	0.184	o	|	|	|	0.88
32.417	0.00	0.09	0.183	o	|	|	|	0.87
32.500	0.00	0.09	0.183	o	|	|	|	0.87
32.583	0.00	0.09	0.182	o	|	|	|	0.87
32.667	0.00	0.09	0.181	o	|	|	|	0.86
32.750	0.00	0.09	0.181	o	|	|	|	0.86
32.833	0.00	0.09	0.180	o	|	|	|	0.86
32.917	0.00	0.09	0.179	o	|	|	|	0.86
33.000	0.00	0.09	0.179	o	|	|	|	0.85
33.083	0.00	0.09	0.178	o	|	|	|	0.85
33.167	0.00	0.09	0.178	o	|	|	|	0.85
33.250	0.00	0.09	0.177	o	|	|	|	0.84
33.333	0.00	0.09	0.176	o	|	|	|	0.84
33.417	0.00	0.09	0.176	o	|	|	|	0.84
33.500	0.00	0.09	0.175	o	|	|	|	0.84
33.583	0.00	0.09	0.174	o	|	|	|	0.83
33.667	0.00	0.09	0.174	o	|	|	|	0.83
33.750	0.00	0.09	0.173	o	|	|	|	0.83
33.833	0.00	0.09	0.173	o	|	|	|	0.82
33.917	0.00	0.09	0.172	o	|	|	|	0.82
34.000	0.00	0.09	0.171	o	|	|	|	0.82
34.083	0.00	0.09	0.171	o	|	|	|	0.82
34.167	0.00	0.09	0.170	o	|	|	|	0.81
34.250	0.00	0.09	0.170	o	|	|	|	0.81
34.333	0.00	0.09	0.169	o	|	|	|	0.81
34.417	0.00	0.09	0.168	o	|	|	|	0.80
34.500	0.00	0.09	0.168	o	|	|	|	0.80
34.583	0.00	0.09	0.167	o	|	|	|	0.80
34.667	0.00	0.09	0.167	o	|	|	|	0.80
34.750	0.00	0.09	0.166	o	|	|	|	0.79
34.833	0.00	0.09	0.165	o	|	|	|	0.79
34.917	0.00	0.09	0.165	o	|	|	|	0.79
35.000	0.00	0.09	0.164	o	|	|	|	0.78
35.083	0.00	0.09	0.164	o	|	|	|	0.78
35.167	0.00	0.09	0.163	o	|	|	|	0.78
35.250	0.00	0.09	0.162	o	|	|	|	0.78
35.333	0.00	0.09	0.162	o	|	|	|	0.77
35.417	0.00	0.09	0.161	o	|	|	|	0.77
35.500	0.00	0.09	0.161	o	|	|	|	0.77
35.583	0.00	0.09	0.160	o	|	|	|	0.76
35.667	0.00	0.09	0.159	o	|	|	|	0.76
35.750	0.00	0.09	0.159	o	|	|	|	0.76
35.833	0.00	0.09	0.158	o	|	|	|	0.76
35.917	0.00	0.09	0.158	o	|	|	|	0.75
36.000	0.00	0.08	0.157	o	|	|	|	0.75
36.083	0.00	0.08	0.156	o	|	|	|	0.75
36.167	0.00	0.08	0.156	o	|	|	|	0.74
36.250	0.00	0.08	0.155	o	|	|	|	0.74
36.333	0.00	0.08	0.155	o	|	|	|	0.74
36.417	0.00	0.08	0.154	o	|	|	|	0.74
36.500	0.00	0.08	0.154	o	|	|	|	0.73
36.583	0.00	0.08	0.153	o	|	|	|	0.73
36.667	0.00	0.08	0.152	o	|	|	|	0.73
36.750	0.00	0.08	0.152	o	|	|	|	0.73
36.833	0.00	0.08	0.151	o	|	|	|	0.72
36.917	0.00	0.08	0.151	o	|	|	|	0.72
37.000	0.00	0.08	0.150	o	|	|	|	0.72
37.083	0.00	0.08	0.150	o	|	|	|	0.71

37.167	0.00	0.08	0.149	o	|	|	|	0.71
37.250	0.00	0.08	0.148	o	|	|	|	0.71
37.333	0.00	0.08	0.148	o	|	|	|	0.71
37.417	0.00	0.08	0.147	o	|	|	|	0.70
37.500	0.00	0.08	0.147	o	|	|	|	0.70
37.583	0.00	0.08	0.146	o	|	|	|	0.70
37.667	0.00	0.08	0.146	o	|	|	|	0.70
37.750	0.00	0.08	0.145	o	|	|	|	0.69
37.833	0.00	0.08	0.144	o	|	|	|	0.69
37.917	0.00	0.08	0.144	o	|	|	|	0.69
38.000	0.00	0.08	0.143	o	|	|	|	0.69
38.083	0.00	0.08	0.143	o	|	|	|	0.68
38.167	0.00	0.08	0.142	o	|	|	|	0.68
38.250	0.00	0.08	0.142	o	|	|	|	0.68
38.333	0.00	0.08	0.141	o	|	|	|	0.68
38.417	0.00	0.08	0.141	o	|	|	|	0.67
38.500	0.00	0.08	0.140	o	|	|	|	0.67
38.583	0.00	0.08	0.139	o	|	|	|	0.67
38.667	0.00	0.08	0.139	o	|	|	|	0.66
38.750	0.00	0.08	0.138	o	|	|	|	0.66
38.833	0.00	0.08	0.138	o	|	|	|	0.66
38.917	0.00	0.08	0.137	o	|	|	|	0.66
39.000	0.00	0.08	0.137	o	|	|	|	0.65
39.083	0.00	0.08	0.136	o	|	|	|	0.65
39.167	0.00	0.08	0.136	o	|	|	|	0.65
39.250	0.00	0.08	0.135	o	|	|	|	0.65
39.333	0.00	0.08	0.135	o	|	|	|	0.64
39.417	0.00	0.08	0.134	o	|	|	|	0.64
39.500	0.00	0.08	0.133	o	|	|	|	0.64
39.583	0.00	0.08	0.133	o	|	|	|	0.64
39.667	0.00	0.08	0.132	o	|	|	|	0.63
39.750	0.00	0.08	0.132	o	|	|	|	0.63
39.833	0.00	0.08	0.131	o	|	|	|	0.63
39.917	0.00	0.08	0.131	o	|	|	|	0.63
40.000	0.00	0.08	0.130	o	|	|	|	0.62
40.083	0.00	0.08	0.130	o	|	|	|	0.62
40.167	0.00	0.08	0.129	o	|	|	|	0.62
40.250	0.00	0.08	0.129	o	|	|	|	0.61
40.333	0.00	0.08	0.128	o	|	|	|	0.61
40.417	0.00	0.08	0.128	o	|	|	|	0.61
40.500	0.00	0.08	0.127	o	|	|	|	0.61
40.583	0.00	0.08	0.127	o	|	|	|	0.60
40.667	0.00	0.08	0.126	o	|	|	|	0.60
40.750	0.00	0.08	0.126	o	|	|	|	0.60
40.833	0.00	0.08	0.125	o	|	|	|	0.60
40.917	0.00	0.08	0.124	o	|	|	|	0.59
41.000	0.00	0.08	0.124	o	|	|	|	0.59
41.083	0.00	0.08	0.123	o	|	|	|	0.59
41.167	0.00	0.08	0.123	o	|	|	|	0.59
41.250	0.00	0.07	0.122	o	|	|	|	0.58
41.333	0.00	0.07	0.122	o	|	|	|	0.58
41.417	0.00	0.07	0.121	o	|	|	|	0.58
41.500	0.00	0.07	0.121	o	|	|	|	0.58
41.583	0.00	0.07	0.120	o	|	|	|	0.57
41.667	0.00	0.07	0.120	o	|	|	|	0.57
41.750	0.00	0.07	0.119	o	|	|	|	0.57
41.833	0.00	0.07	0.119	o	|	|	|	0.57
41.917	0.00	0.07	0.118	o	|	|	|	0.56
42.000	0.00	0.07	0.118	o	|	|	|	0.56
42.083	0.00	0.07	0.117	o	|	|	|	0.56
42.167	0.00	0.07	0.117	o	|	|	|	0.56
42.250	0.00	0.07	0.116	o	|	|	|	0.55
42.333	0.00	0.07	0.116	o	|	|	|	0.55
42.417	0.00	0.07	0.115	o	|	|	|	0.55
42.500	0.00	0.07	0.115	o	|	|	|	0.55
42.583	0.00	0.07	0.114	o	|	|	|	0.54

42.667	0.00	0.07	0.114	o	|	|	|	|	0.54
42.750	0.00	0.07	0.113	o	|	|	|	|	0.54
42.833	0.00	0.07	0.113	o	|	|	|	|	0.54
42.917	0.00	0.07	0.112	o	|	|	|	|	0.54
43.000	0.00	0.07	0.112	o	|	|	|	|	0.53
43.083	0.00	0.07	0.111	o	|	|	|	|	0.53
43.167	0.00	0.07	0.111	o	|	|	|	|	0.53
43.250	0.00	0.07	0.110	o	|	|	|	|	0.53
43.333	0.00	0.07	0.110	o	|	|	|	|	0.52
43.417	0.00	0.07	0.109	o	|	|	|	|	0.52
43.500	0.00	0.07	0.109	o	|	|	|	|	0.52
43.583	0.00	0.07	0.108	o	|	|	|	|	0.52
43.667	0.00	0.07	0.108	o	|	|	|	|	0.51
43.750	0.00	0.07	0.107	o	|	|	|	|	0.51
43.833	0.00	0.07	0.107	o	|	|	|	|	0.51
43.917	0.00	0.07	0.106	o	|	|	|	|	0.51
44.000	0.00	0.07	0.106	o	|	|	|	|	0.50
44.083	0.00	0.07	0.105	o	|	|	|	|	0.50
44.167	0.00	0.07	0.105	o	|	|	|	|	0.50
44.250	0.00	0.07	0.104	o	|	|	|	|	0.50
44.333	0.00	0.07	0.104	o	|	|	|	|	0.49
44.417	0.00	0.07	0.103	o	|	|	|	|	0.49
44.500	0.00	0.07	0.103	o	|	|	|	|	0.49
44.583	0.00	0.07	0.103	o	|	|	|	|	0.49
44.667	0.00	0.07	0.102	o	|	|	|	|	0.49
44.750	0.00	0.07	0.102	o	|	|	|	|	0.48
44.833	0.00	0.07	0.101	o	|	|	|	|	0.48
44.917	0.00	0.07	0.101	o	|	|	|	|	0.48
45.000	0.00	0.07	0.100	o	|	|	|	|	0.48
45.083	0.00	0.07	0.100	o	|	|	|	|	0.47
45.167	0.00	0.07	0.099	o	|	|	|	|	0.47
45.250	0.00	0.07	0.099	o	|	|	|	|	0.47
45.333	0.00	0.07	0.098	o	|	|	|	|	0.47
45.417	0.00	0.07	0.098	o	|	|	|	|	0.47
45.500	0.00	0.07	0.097	o	|	|	|	|	0.46
45.583	0.00	0.07	0.097	o	|	|	|	|	0.46
45.667	0.00	0.07	0.096	o	|	|	|	|	0.46
45.750	0.00	0.07	0.096	o	|	|	|	|	0.46
45.833	0.00	0.07	0.095	o	|	|	|	|	0.45
45.917	0.00	0.07	0.095	o	|	|	|	|	0.45
46.000	0.00	0.07	0.095	o	|	|	|	|	0.45
46.083	0.00	0.07	0.094	o	|	|	|	|	0.45
46.167	0.00	0.07	0.094	o	|	|	|	|	0.44
46.250	0.00	0.07	0.093	o	|	|	|	|	0.44
46.333	0.00	0.07	0.093	o	|	|	|	|	0.44
46.417	0.00	0.07	0.092	o	|	|	|	|	0.44
46.500	0.00	0.07	0.092	o	|	|	|	|	0.44
46.583	0.00	0.07	0.091	o	|	|	|	|	0.43
46.667	0.00	0.07	0.091	o	|	|	|	|	0.43
46.750	0.00	0.07	0.090	o	|	|	|	|	0.43
46.833	0.00	0.07	0.090	o	|	|	|	|	0.43
46.917	0.00	0.07	0.090	o	|	|	|	|	0.42
47.000	0.00	0.07	0.089	o	|	|	|	|	0.42
47.083	0.00	0.07	0.089	o	|	|	|	|	0.42
47.167	0.00	0.07	0.088	o	|	|	|	|	0.42
47.250	0.00	0.07	0.088	o	|	|	|	|	0.42
47.333	0.00	0.06	0.087	o	|	|	|	|	0.41
47.417	0.00	0.06	0.087	o	|	|	|	|	0.41
47.500	0.00	0.06	0.086	o	|	|	|	|	0.41
47.583	0.00	0.06	0.086	o	|	|	|	|	0.41
47.667	0.00	0.06	0.086	o	|	|	|	|	0.41
47.750	0.00	0.06	0.085	o	|	|	|	|	0.40
47.833	0.00	0.06	0.085	o	|	|	|	|	0.40
47.917	0.00	0.06	0.084	o	|	|	|	|	0.40
48.000	0.00	0.06	0.084	o	|	|	|	|	0.40
48.083	0.00	0.06	0.083	o	|	|	|	|	0.39

48.167	0.00	0.06	0.083	o	|	|	|	|	0.39
48.250	0.00	0.06	0.082	o	|	|	|	|	0.39
48.333	0.00	0.06	0.082	o	|	|	|	|	0.39
48.417	0.00	0.06	0.082	o	|	|	|	|	0.39
48.500	0.00	0.06	0.081	o	|	|	|	|	0.38
48.583	0.00	0.06	0.081	o	|	|	|	|	0.38
48.667	0.00	0.06	0.080	o	|	|	|	|	0.38
48.750	0.00	0.06	0.080	o	|	|	|	|	0.38
48.833	0.00	0.06	0.079	o	|	|	|	|	0.38
48.917	0.00	0.06	0.079	o	|	|	|	|	0.37
49.000	0.00	0.06	0.079	o	|	|	|	|	0.37
49.083	0.00	0.06	0.078	o	|	|	|	|	0.37
49.167	0.00	0.06	0.078	o	|	|	|	|	0.37
49.250	0.00	0.06	0.077	o	|	|	|	|	0.37
49.333	0.00	0.06	0.077	o	|	|	|	|	0.36
49.417	0.00	0.06	0.076	o	|	|	|	|	0.36
49.500	0.00	0.06	0.076	o	|	|	|	|	0.36
49.583	0.00	0.06	0.076	o	|	|	|	|	0.36
49.667	0.00	0.06	0.075	o	|	|	|	|	0.35
49.750	0.00	0.06	0.075	o	|	|	|	|	0.35
49.833	0.00	0.06	0.074	o	|	|	|	|	0.35
49.917	0.00	0.06	0.074	o	|	|	|	|	0.35
50.000	0.00	0.06	0.073	o	|	|	|	|	0.35
50.083	0.00	0.06	0.073	o	|	|	|	|	0.34
50.167	0.00	0.06	0.073	o	|	|	|	|	0.34
50.250	0.00	0.06	0.072	o	|	|	|	|	0.34
50.333	0.00	0.06	0.072	o	|	|	|	|	0.34
50.417	0.00	0.06	0.071	o	|	|	|	|	0.34
50.500	0.00	0.06	0.071	o	|	|	|	|	0.33
50.583	0.00	0.06	0.070	o	|	|	|	|	0.33
50.667	0.00	0.06	0.070	o	|	|	|	|	0.33
50.750	0.00	0.06	0.070	o	|	|	|	|	0.33
50.833	0.00	0.06	0.069	o	|	|	|	|	0.33
50.917	0.00	0.06	0.069	o	|	|	|	|	0.32
51.000	0.00	0.06	0.068	o	|	|	|	|	0.32
51.083	0.00	0.06	0.068	o	|	|	|	|	0.32
51.167	0.00	0.06	0.068	o	|	|	|	|	0.32
51.250	0.00	0.06	0.067	o	|	|	|	|	0.32
51.333	0.00	0.06	0.067	o	|	|	|	|	0.32
51.417	0.00	0.06	0.066	o	|	|	|	|	0.31
51.500	0.00	0.06	0.066	o	|	|	|	|	0.31
51.583	0.00	0.06	0.066	o	|	|	|	|	0.31
51.667	0.00	0.06	0.065	o	|	|	|	|	0.31
51.750	0.00	0.06	0.065	o	|	|	|	|	0.31
51.833	0.00	0.06	0.065	o	|	|	|	|	0.30
51.917	0.00	0.05	0.064	o	|	|	|	|	0.30
52.000	0.00	0.05	0.064	o	|	|	|	|	0.30
52.083	0.00	0.05	0.063	o	|	|	|	|	0.30
52.167	0.00	0.05	0.063	o	|	|	|	|	0.30
52.250	0.00	0.05	0.063	o	|	|	|	|	0.30
52.333	0.00	0.05	0.062	o	|	|	|	|	0.29
52.417	0.00	0.05	0.062	o	|	|	|	|	0.29
52.500	0.00	0.05	0.062	o	|	|	|	|	0.29
52.583	0.00	0.05	0.061	o	|	|	|	|	0.29
52.667	0.00	0.05	0.061	o	|	|	|	|	0.29
52.750	0.00	0.05	0.060	o	|	|	|	|	0.29
52.833	0.00	0.05	0.060	o	|	|	|	|	0.28
52.917	0.00	0.05	0.060	o	|	|	|	|	0.28
53.000	0.00	0.05	0.059	o	|	|	|	|	0.28
53.083	0.00	0.05	0.059	o	|	|	|	|	0.28
53.167	0.00	0.05	0.059	o	|	|	|	|	0.28
53.250	0.00	0.05	0.058	o	|	|	|	|	0.28
53.333	0.00	0.05	0.058	o	|	|	|	|	0.27
53.417	0.00	0.05	0.058	o	|	|	|	|	0.27
53.500	0.00	0.05	0.057	o	|	|	|	|	0.27
53.583	0.00	0.05	0.057	o	|	|	|	|	0.27

53.667	0.00	0.05	0.057	o	|	|	|	0.27
53.750	0.00	0.05	0.056	o	|	|	|	0.27
53.833	0.00	0.05	0.056	o	|	|	|	0.26
53.917	0.00	0.05	0.056	o	|	|	|	0.26
54.000	0.00	0.05	0.055	o	|	|	|	0.26
54.083	0.00	0.05	0.055	o	|	|	|	0.26
54.167	0.00	0.05	0.055	o	|	|	|	0.26
54.250	0.00	0.05	0.054	o	|	|	|	0.26
54.333	0.00	0.05	0.054	o	|	|	|	0.25
54.417	0.00	0.05	0.054	o	|	|	|	0.25
54.500	0.00	0.05	0.053	o	|	|	|	0.25
54.583	0.00	0.05	0.053	o	|	|	|	0.25
54.667	0.00	0.05	0.053	o	|	|	|	0.25
54.750	0.00	0.04	0.052	o	|	|	|	0.25
54.833	0.00	0.04	0.052	o	|	|	|	0.25
54.917	0.00	0.04	0.052	o	|	|	|	0.24
55.000	0.00	0.04	0.052	o	|	|	|	0.24
55.083	0.00	0.04	0.051	o	|	|	|	0.24
55.167	0.00	0.04	0.051	o	|	|	|	0.24
55.250	0.00	0.04	0.051	o	|	|	|	0.24
55.333	0.00	0.04	0.050	o	|	|	|	0.24
55.417	0.00	0.04	0.050	o	|	|	|	0.24
55.500	0.00	0.04	0.050	o	|	|	|	0.23
55.583	0.00	0.04	0.049	o	|	|	|	0.23
55.667	0.00	0.04	0.049	o	|	|	|	0.23
55.750	0.00	0.04	0.049	o	|	|	|	0.23
55.833	0.00	0.04	0.049	o	|	|	|	0.23
55.917	0.00	0.04	0.048	o	|	|	|	0.23
56.000	0.00	0.04	0.048	o	|	|	|	0.23
56.083	0.00	0.04	0.048	o	|	|	|	0.23
56.167	0.00	0.04	0.047	o	|	|	|	0.22
56.250	0.00	0.04	0.047	o	|	|	|	0.22
56.333	0.00	0.04	0.047	o	|	|	|	0.22
56.417	0.00	0.04	0.047	o	|	|	|	0.22
56.500	0.00	0.04	0.046	o	|	|	|	0.22
56.583	0.00	0.04	0.046	o	|	|	|	0.22
56.667	0.00	0.04	0.046	o	|	|	|	0.22
56.750	0.00	0.04	0.046	o	|	|	|	0.21
56.833	0.00	0.04	0.045	o	|	|	|	0.21
56.917	0.00	0.04	0.045	o	|	|	|	0.21
57.000	0.00	0.04	0.045	o	|	|	|	0.21
57.083	0.00	0.04	0.044	o	|	|	|	0.21
57.167	0.00	0.04	0.044	o	|	|	|	0.21
57.250	0.00	0.04	0.044	o	|	|	|	0.21
57.333	0.00	0.04	0.044	o	|	|	|	0.21
57.417	0.00	0.04	0.043	o	|	|	|	0.20
57.500	0.00	0.04	0.043	o	|	|	|	0.20
57.583	0.00	0.04	0.043	o	|	|	|	0.20
57.667	0.00	0.04	0.043	o	|	|	|	0.20
57.750	0.00	0.04	0.042	o	|	|	|	0.20
57.833	0.00	0.04	0.042	o	|	|	|	0.20
57.917	0.00	0.04	0.042	o	|	|	|	0.20
58.000	0.00	0.04	0.042	o	|	|	|	0.20
58.083	0.00	0.04	0.041	o	|	|	|	0.20
58.167	0.00	0.04	0.041	o	|	|	|	0.19
58.250	0.00	0.04	0.041	o	|	|	|	0.19
58.333	0.00	0.03	0.041	o	|	|	|	0.19
58.417	0.00	0.03	0.040	o	|	|	|	0.19
58.500	0.00	0.03	0.040	o	|	|	|	0.19
58.583	0.00	0.03	0.040	o	|	|	|	0.19
58.667	0.00	0.03	0.040	o	|	|	|	0.19
58.750	0.00	0.03	0.040	o	|	|	|	0.19
58.833	0.00	0.03	0.039	o	|	|	|	0.19
58.917	0.00	0.03	0.039	o	|	|	|	0.18
59.000	0.00	0.03	0.039	o	|	|	|	0.18
59.083	0.00	0.03	0.039	o	|	|	|	0.18

59.167	0.00	0.03	0.038	o	|	|	|	0.18
59.250	0.00	0.03	0.038	o	|	|	|	0.18
59.333	0.00	0.03	0.038	o	|	|	|	0.18
59.417	0.00	0.03	0.038	o	|	|	|	0.18
59.500	0.00	0.03	0.037	o	|	|	|	0.18
59.583	0.00	0.03	0.037	o	|	|	|	0.18
59.667	0.00	0.03	0.037	o	|	|	|	0.17
59.750	0.00	0.03	0.037	o	|	|	|	0.17
59.833	0.00	0.03	0.037	o	|	|	|	0.17
59.917	0.00	0.03	0.036	o	|	|	|	0.17
60.000	0.00	0.03	0.036	o	|	|	|	0.17
60.083	0.00	0.03	0.036	o	|	|	|	0.17
60.167	0.00	0.03	0.036	o	|	|	|	0.17
60.250	0.00	0.03	0.036	o	|	|	|	0.17
60.333	0.00	0.03	0.035	o	|	|	|	0.17
60.417	0.00	0.03	0.035	o	|	|	|	0.17
60.500	0.00	0.03	0.035	o	|	|	|	0.16
60.583	0.00	0.03	0.035	o	|	|	|	0.16
60.667	0.00	0.03	0.035	o	|	|	|	0.16
60.750	0.00	0.03	0.034	o	|	|	|	0.16
60.833	0.00	0.03	0.034	o	|	|	|	0.16
60.917	0.00	0.03	0.034	o	|	|	|	0.16
61.000	0.00	0.03	0.034	o	|	|	|	0.16
61.083	0.00	0.03	0.034	o	|	|	|	0.16
61.167	0.00	0.03	0.033	o	|	|	|	0.16
61.250	0.00	0.03	0.033	o	|	|	|	0.16
61.333	0.00	0.03	0.033	o	|	|	|	0.16
61.417	0.00	0.03	0.033	o	|	|	|	0.15
61.500	0.00	0.03	0.033	o	|	|	|	0.15
61.583	0.00	0.03	0.032	o	|	|	|	0.15
61.667	0.00	0.03	0.032	o	|	|	|	0.15
61.750	0.00	0.03	0.032	o	|	|	|	0.15
61.833	0.00	0.03	0.032	o	|	|	|	0.15
61.917	0.00	0.03	0.032	o	|	|	|	0.15
62.000	0.00	0.03	0.031	o	|	|	|	0.15
62.083	0.00	0.03	0.031	o	|	|	|	0.15
62.167	0.00	0.03	0.031	o	|	|	|	0.15
62.250	0.00	0.03	0.031	o	|	|	|	0.15
62.333	0.00	0.03	0.031	o	|	|	|	0.14
62.417	0.00	0.03	0.030	o	|	|	|	0.14
62.500	0.00	0.03	0.030	o	|	|	|	0.14
62.583	0.00	0.03	0.030	o	|	|	|	0.14
62.667	0.00	0.03	0.030	o	|	|	|	0.14
62.750	0.00	0.03	0.030	o	|	|	|	0.14
62.833	0.00	0.03	0.030	o	|	|	|	0.14
62.917	0.00	0.03	0.029	o	|	|	|	0.14
63.000	0.00	0.03	0.029	o	|	|	|	0.14
63.083	0.00	0.02	0.029	o	|	|	|	0.14
63.167	0.00	0.02	0.029	o	|	|	|	0.14
63.250	0.00	0.02	0.029	o	|	|	|	0.14
63.333	0.00	0.02	0.029	o	|	|	|	0.13
63.417	0.00	0.02	0.028	o	|	|	|	0.13
63.500	0.00	0.02	0.028	o	|	|	|	0.13
63.583	0.00	0.02	0.028	o	|	|	|	0.13
63.667	0.00	0.02	0.028	o	|	|	|	0.13
63.750	0.00	0.02	0.028	o	|	|	|	0.13
63.833	0.00	0.02	0.028	o	|	|	|	0.13
63.917	0.00	0.02	0.027	o	|	|	|	0.13
64.000	0.00	0.02	0.027	o	|	|	|	0.13
64.083	0.00	0.02	0.027	o	|	|	|	0.13
64.167	0.00	0.02	0.027	o	|	|	|	0.13
64.250	0.00	0.02	0.027	o	|	|	|	0.13
64.333	0.00	0.02	0.027	o	|	|	|	0.13
64.417	0.00	0.02	0.026	o	|	|	|	0.12
64.500	0.00	0.02	0.026	o	|	|	|	0.12
64.583	0.00	0.02	0.026	o	|	|	|	0.12

64.667	0.00	0.02	0.026	o	|	|	|	|	0.12
64.750	0.00	0.02	0.026	o	|	|	|	|	0.12
64.833	0.00	0.02	0.026	o	|	|	|	|	0.12
64.917	0.00	0.02	0.026	o	|	|	|	|	0.12
65.000	0.00	0.02	0.025	o	|	|	|	|	0.12
65.083	0.00	0.02	0.025	o	|	|	|	|	0.12
65.167	0.00	0.02	0.025	o	|	|	|	|	0.12
65.250	0.00	0.02	0.025	o	|	|	|	|	0.12
65.333	0.00	0.02	0.025	o	|	|	|	|	0.12
65.417	0.00	0.02	0.025	o	|	|	|	|	0.12
65.500	0.00	0.02	0.025	o	|	|	|	|	0.12
65.583	0.00	0.02	0.024	o	|	|	|	|	0.11
65.667	0.00	0.02	0.024	o	|	|	|	|	0.11
65.750	0.00	0.02	0.024	o	|	|	|	|	0.11
65.833	0.00	0.02	0.024	o	|	|	|	|	0.11
65.917	0.00	0.02	0.024	o	|	|	|	|	0.11
66.000	0.00	0.02	0.024	o	|	|	|	|	0.11
66.083	0.00	0.02	0.024	o	|	|	|	|	0.11
66.167	0.00	0.02	0.023	o	|	|	|	|	0.11
66.250	0.00	0.02	0.023	o	|	|	|	|	0.11
66.333	0.00	0.02	0.023	o	|	|	|	|	0.11
66.417	0.00	0.02	0.023	o	|	|	|	|	0.11
66.500	0.00	0.02	0.023	o	|	|	|	|	0.11
66.583	0.00	0.02	0.023	o	|	|	|	|	0.11
66.667	0.00	0.02	0.023	o	|	|	|	|	0.11
66.750	0.00	0.02	0.022	o	|	|	|	|	0.11
66.833	0.00	0.02	0.022	o	|	|	|	|	0.11
66.917	0.00	0.02	0.022	o	|	|	|	|	0.10
67.000	0.00	0.02	0.022	o	|	|	|	|	0.10
67.083	0.00	0.02	0.022	o	|	|	|	|	0.10
67.167	0.00	0.02	0.022	o	|	|	|	|	0.10
67.250	0.00	0.02	0.022	o	|	|	|	|	0.10
67.333	0.00	0.02	0.022	o	|	|	|	|	0.10
67.417	0.00	0.02	0.021	o	|	|	|	|	0.10
67.500	0.00	0.02	0.021	o	|	|	|	|	0.10
67.583	0.00	0.02	0.021	o	|	|	|	|	0.10
67.667	0.00	0.02	0.021	o	|	|	|	|	0.10
67.750	0.00	0.02	0.021	o	|	|	|	|	0.10
67.833	0.00	0.02	0.021	o	|	|	|	|	0.10
67.917	0.00	0.02	0.021	o	|	|	|	|	0.10
68.000	0.00	0.02	0.021	o	|	|	|	|	0.10
68.083	0.00	0.02	0.020	o	|	|	|	|	0.10
68.167	0.00	0.02	0.020	o	|	|	|	|	0.10
68.250	0.00	0.02	0.020	o	|	|	|	|	0.10
68.333	0.00	0.02	0.020	o	|	|	|	|	0.09
68.417	0.00	0.02	0.020	o	|	|	|	|	0.09
68.500	0.00	0.02	0.020	o	|	|	|	|	0.09
68.583	0.00	0.02	0.020	o	|	|	|	|	0.09
68.667	0.00	0.02	0.020	o	|	|	|	|	0.09
68.750	0.00	0.02	0.019	o	|	|	|	|	0.09
68.833	0.00	0.02	0.019	o	|	|	|	|	0.09
68.917	0.00	0.02	0.019	o	|	|	|	|	0.09
69.000	0.00	0.02	0.019	o	|	|	|	|	0.09
69.083	0.00	0.02	0.019	o	|	|	|	|	0.09
69.167	0.00	0.02	0.019	o	|	|	|	|	0.09
69.250	0.00	0.02	0.019	o	|	|	|	|	0.09
69.333	0.00	0.02	0.019	o	|	|	|	|	0.09
69.417	0.00	0.02	0.019	o	|	|	|	|	0.09
69.500	0.00	0.02	0.018	o	|	|	|	|	0.09
69.583	0.00	0.02	0.018	o	|	|	|	|	0.09
69.667	0.00	0.02	0.018	o	|	|	|	|	0.09
69.750	0.00	0.02	0.018	o	|	|	|	|	0.09
69.833	0.00	0.02	0.018	o	|	|	|	|	0.08
69.917	0.00	0.02	0.018	o	|	|	|	|	0.08
70.000	0.00	0.02	0.018	o	|	|	|	|	0.08
70.083	0.00	0.02	0.018	o	|	|	|	|	0.08

70.167	0.00	0.02	0.018	o	|	|	|	|	0.08
70.250	0.00	0.02	0.018	o	|	|	|	|	0.08
70.333	0.00	0.01	0.017	o	|	|	|	|	0.08
70.417	0.00	0.01	0.017	o	|	|	|	|	0.08
70.500	0.00	0.01	0.017	o	|	|	|	|	0.08
70.583	0.00	0.01	0.017	o	|	|	|	|	0.08
70.667	0.00	0.01	0.017	o	|	|	|	|	0.08
70.750	0.00	0.01	0.017	o	|	|	|	|	0.08
70.833	0.00	0.01	0.017	o	|	|	|	|	0.08
70.917	0.00	0.01	0.017	o	|	|	|	|	0.08
71.000	0.00	0.01	0.017	o	|	|	|	|	0.08
71.083	0.00	0.01	0.017	o	|	|	|	|	0.08
71.167	0.00	0.01	0.016	o	|	|	|	|	0.08
71.250	0.00	0.01	0.016	o	|	|	|	|	0.08
71.333	0.00	0.01	0.016	o	|	|	|	|	0.08
71.417	0.00	0.01	0.016	o	|	|	|	|	0.08
71.500	0.00	0.01	0.016	o	|	|	|	|	0.08
71.583	0.00	0.01	0.016	o	|	|	|	|	0.08
71.667	0.00	0.01	0.016	o	|	|	|	|	0.07
71.750	0.00	0.01	0.016	o	|	|	|	|	0.07
71.833	0.00	0.01	0.016	o	|	|	|	|	0.07
71.917	0.00	0.01	0.016	o	|	|	|	|	0.07
72.000	0.00	0.01	0.015	o	|	|	|	|	0.07
72.083	0.00	0.01	0.015	o	|	|	|	|	0.07
72.167	0.00	0.01	0.015	o	|	|	|	|	0.07
72.250	0.00	0.01	0.015	o	|	|	|	|	0.07
72.333	0.00	0.01	0.015	o	|	|	|	|	0.07
72.417	0.00	0.01	0.015	o	|	|	|	|	0.07
72.500	0.00	0.01	0.015	o	|	|	|	|	0.07
72.583	0.00	0.01	0.015	o	|	|	|	|	0.07
72.667	0.00	0.01	0.015	o	|	|	|	|	0.07
72.750	0.00	0.01	0.015	o	|	|	|	|	0.07
72.833	0.00	0.01	0.015	o	|	|	|	|	0.07
72.917	0.00	0.01	0.014	o	|	|	|	|	0.07
73.000	0.00	0.01	0.014	o	|	|	|	|	0.07
73.083	0.00	0.01	0.014	o	|	|	|	|	0.07
73.167	0.00	0.01	0.014	o	|	|	|	|	0.07
73.250	0.00	0.01	0.014	o	|	|	|	|	0.07
73.333	0.00	0.01	0.014	o	|	|	|	|	0.07
73.417	0.00	0.01	0.014	o	|	|	|	|	0.07
73.500	0.00	0.01	0.014	o	|	|	|	|	0.07
73.583	0.00	0.01	0.014	o	|	|	|	|	0.07
73.667	0.00	0.01	0.014	o	|	|	|	|	0.06
73.750	0.00	0.01	0.014	o	|	|	|	|	0.06
73.833	0.00	0.01	0.014	o	|	|	|	|	0.06
73.917	0.00	0.01	0.013	o	|	|	|	|	0.06
74.000	0.00	0.01	0.013	o	|	|	|	|	0.06
74.083	0.00	0.01	0.013	o	|	|	|	|	0.06
74.167	0.00	0.01	0.013	o	|	|	|	|	0.06
74.250	0.00	0.01	0.013	o	|	|	|	|	0.06
74.333	0.00	0.01	0.013	o	|	|	|	|	0.06
74.417	0.00	0.01	0.013	o	|	|	|	|	0.06
74.500	0.00	0.01	0.013	o	|	|	|	|	0.06
74.583	0.00	0.01	0.013	o	|	|	|	|	0.06
74.667	0.00	0.01	0.013	o	|	|	|	|	0.06
74.750	0.00	0.01	0.013	o	|	|	|	|	0.06
74.833	0.00	0.01	0.013	o	|	|	|	|	0.06
74.917	0.00	0.01	0.013	o	|	|	|	|	0.06
75.000	0.00	0.01	0.013	o	|	|	|	|	0.06
75.083	0.00	0.01	0.012	o	|	|	|	|	0.06
75.167	0.00	0.01	0.012	o	|	|	|	|	0.06
75.250	0.00	0.01	0.012	o	|	|	|	|	0.06
75.333	0.00	0.01	0.012	o	|	|	|	|	0.06
75.417	0.00	0.01	0.012	o	|	|	|	|	0.06
75.500	0.00	0.01	0.012	o	|	|	|	|	0.06
75.583	0.00	0.01	0.012	o	|	|	|	|	0.06

75.667	0.00	0.01	0.012	o	|	|	|	|	0.06
75.750	0.00	0.01	0.012	o	|	|	|	|	0.06
75.833	0.00	0.01	0.012	o	|	|	|	|	0.06
75.917	0.00	0.01	0.012	o	|	|	|	|	0.06
76.000	0.00	0.01	0.012	o	|	|	|	|	0.05
76.083	0.00	0.01	0.012	o	|	|	|	|	0.05
76.167	0.00	0.01	0.012	o	|	|	|	|	0.05
76.250	0.00	0.01	0.011	o	|	|	|	|	0.05
76.333	0.00	0.01	0.011	o	|	|	|	|	0.05
76.417	0.00	0.01	0.011	o	|	|	|	|	0.05
76.500	0.00	0.01	0.011	o	|	|	|	|	0.05
76.583	0.00	0.01	0.011	o	|	|	|	|	0.05
76.667	0.00	0.01	0.011	o	|	|	|	|	0.05
76.750	0.00	0.01	0.011	o	|	|	|	|	0.05
76.833	0.00	0.01	0.011	o	|	|	|	|	0.05
76.917	0.00	0.01	0.011	o	|	|	|	|	0.05
77.000	0.00	0.01	0.011	o	|	|	|	|	0.05
77.083	0.00	0.01	0.011	o	|	|	|	|	0.05
77.167	0.00	0.01	0.011	o	|	|	|	|	0.05
77.250	0.00	0.01	0.011	o	|	|	|	|	0.05
77.333	0.00	0.01	0.011	o	|	|	|	|	0.05
77.417	0.00	0.01	0.011	o	|	|	|	|	0.05
77.500	0.00	0.01	0.010	o	|	|	|	|	0.05
77.583	0.00	0.01	0.010	o	|	|	|	|	0.05
77.667	0.00	0.01	0.010	o	|	|	|	|	0.05
77.750	0.00	0.01	0.010	o	|	|	|	|	0.05
77.833	0.00	0.01	0.010	o	|	|	|	|	0.05
77.917	0.00	0.01	0.010	o	|	|	|	|	0.05
78.000	0.00	0.01	0.010	o	|	|	|	|	0.05
78.083	0.00	0.01	0.010	o	|	|	|	|	0.05
78.167	0.00	0.01	0.010	o	|	|	|	|	0.05
78.250	0.00	0.01	0.010	o	|	|	|	|	0.05
78.333	0.00	0.01	0.010	o	|	|	|	|	0.05
78.417	0.00	0.01	0.010	o	|	|	|	|	0.05
78.500	0.00	0.01	0.010	o	|	|	|	|	0.05
78.583	0.00	0.01	0.010	o	|	|	|	|	0.05
78.667	0.00	0.01	0.010	o	|	|	|	|	0.05
78.750	0.00	0.01	0.010	o	|	|	|	|	0.05
78.833	0.00	0.01	0.010	o	|	|	|	|	0.04
78.917	0.00	0.01	0.009	o	|	|	|	|	0.04
79.000	0.00	0.01	0.009	o	|	|	|	|	0.04
79.083	0.00	0.01	0.009	o	|	|	|	|	0.04
79.167	0.00	0.01	0.009	o	|	|	|	|	0.04
79.250	0.00	0.01	0.009	o	|	|	|	|	0.04
79.333	0.00	0.01	0.009	o	|	|	|	|	0.04
79.417	0.00	0.01	0.009	o	|	|	|	|	0.04
79.500	0.00	0.01	0.009	o	|	|	|	|	0.04
79.583	0.00	0.01	0.009	o	|	|	|	|	0.04
79.667	0.00	0.01	0.009	o	|	|	|	|	0.04
79.750	0.00	0.01	0.009	o	|	|	|	|	0.04
79.833	0.00	0.01	0.009	o	|	|	|	|	0.04
79.917	0.00	0.01	0.009	o	|	|	|	|	0.04
80.000	0.00	0.01	0.009	o	|	|	|	|	0.04
80.083	0.00	0.01	0.009	o	|	|	|	|	0.04
80.167	0.00	0.01	0.009	o	|	|	|	|	0.04
80.250	0.00	0.01	0.009	o	|	|	|	|	0.04
80.333	0.00	0.01	0.009	o	|	|	|	|	0.04
80.417	0.00	0.01	0.009	o	|	|	|	|	0.04
80.500	0.00	0.01	0.008	o	|	|	|	|	0.04
80.583	0.00	0.01	0.008	o	|	|	|	|	0.04
80.667	0.00	0.01	0.008	o	|	|	|	|	0.04
80.750	0.00	0.01	0.008	o	|	|	|	|	0.04
80.833	0.00	0.01	0.008	o	|	|	|	|	0.04
80.917	0.00	0.01	0.008	o	|	|	|	|	0.04
81.000	0.00	0.01	0.008	o	|	|	|	|	0.04
81.083	0.00	0.01	0.008	o	|	|	|	|	0.04

81.167	0.00	0.01	0.008	o	|	|	|	|	0.04
81.250	0.00	0.01	0.008	o	|	|	|	|	0.04
81.333	0.00	0.01	0.008	o	|	|	|	|	0.04
81.417	0.00	0.01	0.008	o	|	|	|	|	0.04
81.500	0.00	0.01	0.008	o	|	|	|	|	0.04
81.583	0.00	0.01	0.008	o	|	|	|	|	0.04
81.667	0.00	0.01	0.008	o	|	|	|	|	0.04
81.750	0.00	0.01	0.008	o	|	|	|	|	0.04
81.833	0.00	0.01	0.008	o	|	|	|	|	0.04
81.917	0.00	0.01	0.008	o	|	|	|	|	0.04
82.000	0.00	0.01	0.008	o	|	|	|	|	0.04
82.083	0.00	0.01	0.008	o	|	|	|	|	0.04
82.167	0.00	0.01	0.008	o	|	|	|	|	0.04
82.250	0.00	0.01	0.007	o	|	|	|	|	0.04
82.333	0.00	0.01	0.007	o	|	|	|	|	0.04
82.417	0.00	0.01	0.007	o	|	|	|	|	0.03
82.500	0.00	0.01	0.007	o	|	|	|	|	0.03
82.583	0.00	0.01	0.007	o	|	|	|	|	0.03
82.667	0.00	0.01	0.007	o	|	|	|	|	0.03
82.750	0.00	0.01	0.007	o	|	|	|	|	0.03
82.833	0.00	0.01	0.007	o	|	|	|	|	0.03
82.917	0.00	0.01	0.007	o	|	|	|	|	0.03
83.000	0.00	0.01	0.007	o	|	|	|	|	0.03
83.083	0.00	0.01	0.007	o	|	|	|	|	0.03
83.167	0.00	0.01	0.007	o	|	|	|	|	0.03
83.250	0.00	0.01	0.007	o	|	|	|	|	0.03
83.333	0.00	0.01	0.007	o	|	|	|	|	0.03
83.417	0.00	0.01	0.007	o	|	|	|	|	0.03
83.500	0.00	0.01	0.007	o	|	|	|	|	0.03
83.583	0.00	0.01	0.007	o	|	|	|	|	0.03
83.667	0.00	0.01	0.007	o	|	|	|	|	0.03
83.750	0.00	0.01	0.007	o	|	|	|	|	0.03
83.833	0.00	0.01	0.007	o	|	|	|	|	0.03
83.917	0.00	0.01	0.007	o	|	|	|	|	0.03
84.000	0.00	0.01	0.007	o	|	|	|	|	0.03
84.083	0.00	0.01	0.007	o	|	|	|	|	0.03
84.167	0.00	0.01	0.007	o	|	|	|	|	0.03
84.250	0.00	0.01	0.006	o	|	|	|	|	0.03
84.333	0.00	0.01	0.006	o	|	|	|	|	0.03
84.417	0.00	0.01	0.006	o	|	|	|	|	0.03
84.500	0.00	0.01	0.006	o	|	|	|	|	0.03
84.583	0.00	0.01	0.006	o	|	|	|	|	0.03
84.667	0.00	0.01	0.006	o	|	|	|	|	0.03
84.750	0.00	0.01	0.006	o	|	|	|	|	0.03
84.833	0.00	0.01	0.006	o	|	|	|	|	0.03
84.917	0.00	0.01	0.006	o	|	|	|	|	0.03
85.000	0.00	0.01	0.006	o	|	|	|	|	0.03
85.083	0.00	0.01	0.006	o	|	|	|	|	0.03
85.167	0.00	0.01	0.006	o	|	|	|	|	0.03
85.250	0.00	0.01	0.006	o	|	|	|	|	0.03
85.333	0.00	0.01	0.006	o	|	|	|	|	0.03
85.417	0.00	0.01	0.006	o	|	|	|	|	0.03
85.500	0.00	0.01	0.006	o	|	|	|	|	0.03
85.583	0.00	0.01	0.006	o	|	|	|	|	0.03
85.667	0.00	0.01	0.006	o	|	|	|	|	0.03
85.750	0.00	0.01	0.006	o	|	|	|	|	0.03
85.833	0.00	0.00	0.006	o	|	|	|	|	0.03
85.917	0.00	0.00	0.006	o	|	|	|	|	0.03
86.000	0.00	0.00	0.006	o	|	|	|	|	0.03
86.083	0.00	0.00	0.006	o	|	|	|	|	0.03
86.167	0.00	0.00	0.006	o	|	|	|	|	0.03
86.250	0.00	0.00	0.006	o	|	|	|	|	0.03
86.333	0.00	0.00	0.006	o	|	|	|	|	0.03
86.417	0.00	0.00	0.006	o	|	|	|	|	0.03
86.500	0.00	0.00	0.006	o	|	|	|	|	0.03
86.583	0.00	0.00	0.006	o	|	|	|	|	0.03

86.667	0.00	0.00	0.005	o	|	|	|	|	0.03
86.750	0.00	0.00	0.005	o	|	|	|	|	0.03
86.833	0.00	0.00	0.005	o	|	|	|	|	0.03
86.917	0.00	0.00	0.005	o	|	|	|	|	0.03
87.000	0.00	0.00	0.005	o	|	|	|	|	0.03
87.083	0.00	0.00	0.005	o	|	|	|	|	0.03
87.167	0.00	0.00	0.005	o	|	|	|	|	0.02
87.250	0.00	0.00	0.005	o	|	|	|	|	0.02
87.333	0.00	0.00	0.005	o	|	|	|	|	0.02
87.417	0.00	0.00	0.005	o	|	|	|	|	0.02
87.500	0.00	0.00	0.005	o	|	|	|	|	0.02
87.583	0.00	0.00	0.005	o	|	|	|	|	0.02
87.667	0.00	0.00	0.005	o	|	|	|	|	0.02
87.750	0.00	0.00	0.005	o	|	|	|	|	0.02
87.833	0.00	0.00	0.005	o	|	|	|	|	0.02
87.917	0.00	0.00	0.005	o	|	|	|	|	0.02
88.000	0.00	0.00	0.005	o	|	|	|	|	0.02
88.083	0.00	0.00	0.005	o	|	|	|	|	0.02
88.167	0.00	0.00	0.005	o	|	|	|	|	0.02
88.250	0.00	0.00	0.005	o	|	|	|	|	0.02
88.333	0.00	0.00	0.005	o	|	|	|	|	0.02
88.417	0.00	0.00	0.005	o	|	|	|	|	0.02
88.500	0.00	0.00	0.005	o	|	|	|	|	0.02
88.583	0.00	0.00	0.005	o	|	|	|	|	0.02
88.667	0.00	0.00	0.005	o	|	|	|	|	0.02
88.750	0.00	0.00	0.005	o	|	|	|	|	0.02
88.833	0.00	0.00	0.005	o	|	|	|	|	0.02
88.917	0.00	0.00	0.005	o	|	|	|	|	0.02
89.000	0.00	0.00	0.005	o	|	|	|	|	0.02
89.083	0.00	0.00	0.005	o	|	|	|	|	0.02
89.167	0.00	0.00	0.005	o	|	|	|	|	0.02
89.250	0.00	0.00	0.005	o	|	|	|	|	0.02
89.333	0.00	0.00	0.005	o	|	|	|	|	0.02
89.417	0.00	0.00	0.005	o	|	|	|	|	0.02
89.500	0.00	0.00	0.004	o	|	|	|	|	0.02
89.583	0.00	0.00	0.004	o	|	|	|	|	0.02
89.667	0.00	0.00	0.004	o	|	|	|	|	0.02
89.750	0.00	0.00	0.004	o	|	|	|	|	0.02
89.833	0.00	0.00	0.004	o	|	|	|	|	0.02
89.917	0.00	0.00	0.004	o	|	|	|	|	0.02
90.000	0.00	0.00	0.004	o	|	|	|	|	0.02
90.083	0.00	0.00	0.004	o	|	|	|	|	0.02
90.167	0.00	0.00	0.004	o	|	|	|	|	0.02
90.250	0.00	0.00	0.004	o	|	|	|	|	0.02
90.333	0.00	0.00	0.004	o	|	|	|	|	0.02
90.417	0.00	0.00	0.004	o	|	|	|	|	0.02
90.500	0.00	0.00	0.004	o	|	|	|	|	0.02
90.583	0.00	0.00	0.004	o	|	|	|	|	0.02
90.667	0.00	0.00	0.004	o	|	|	|	|	0.02
90.750	0.00	0.00	0.004	o	|	|	|	|	0.02
90.833	0.00	0.00	0.004	o	|	|	|	|	0.02
90.917	0.00	0.00	0.004	o	|	|	|	|	0.02
91.000	0.00	0.00	0.004	o	|	|	|	|	0.02
91.083	0.00	0.00	0.004	o	|	|	|	|	0.02
91.167	0.00	0.00	0.004	o	|	|	|	|	0.02
91.250	0.00	0.00	0.004	o	|	|	|	|	0.02
91.333	0.00	0.00	0.004	o	|	|	|	|	0.02
91.417	0.00	0.00	0.004	o	|	|	|	|	0.02
91.500	0.00	0.00	0.004	o	|	|	|	|	0.02
91.583	0.00	0.00	0.004	o	|	|	|	|	0.02
91.667	0.00	0.00	0.004	o	|	|	|	|	0.02
91.750	0.00	0.00	0.004	o	|	|	|	|	0.02
91.833	0.00	0.00	0.004	o	|	|	|	|	0.02
91.917	0.00	0.00	0.004	o	|	|	|	|	0.02
92.000	0.00	0.00	0.004	o	|	|	|	|	0.02
92.083	0.00	0.00	0.004	o	|	|	|	|	0.02

92.167	0.00	0.00	0.004	o	|	|	|	|	0.02
92.250	0.00	0.00	0.004	o	|	|	|	|	0.02
92.333	0.00	0.00	0.004	o	|	|	|	|	0.02
92.417	0.00	0.00	0.004	o	|	|	|	|	0.02
92.500	0.00	0.00	0.004	o	|	|	|	|	0.02
92.583	0.00	0.00	0.004	o	|	|	|	|	0.02
92.667	0.00	0.00	0.004	o	|	|	|	|	0.02
92.750	0.00	0.00	0.004	o	|	|	|	|	0.02
92.833	0.00	0.00	0.004	o	|	|	|	|	0.02
92.917	0.00	0.00	0.004	o	|	|	|	|	0.02
93.000	0.00	0.00	0.003	o	|	|	|	|	0.02
93.083	0.00	0.00	0.003	o	|	|	|	|	0.02
93.167	0.00	0.00	0.003	o	|	|	|	|	0.02
93.250	0.00	0.00	0.003	o	|	|	|	|	0.02
93.333	0.00	0.00	0.003	o	|	|	|	|	0.02
93.417	0.00	0.00	0.003	o	|	|	|	|	0.02
93.500	0.00	0.00	0.003	o	|	|	|	|	0.02
93.583	0.00	0.00	0.003	o	|	|	|	|	0.02
93.667	0.00	0.00	0.003	o	|	|	|	|	0.02
93.750	0.00	0.00	0.003	o	|	|	|	|	0.02
93.833	0.00	0.00	0.003	o	|	|	|	|	0.02
93.917	0.00	0.00	0.003	o	|	|	|	|	0.02
94.000	0.00	0.00	0.003	o	|	|	|	|	0.02
94.083	0.00	0.00	0.003	o	|	|	|	|	0.02
94.167	0.00	0.00	0.003	o	|	|	|	|	0.02
94.250	0.00	0.00	0.003	o	|	|	|	|	0.02
94.333	0.00	0.00	0.003	o	|	|	|	|	0.01
94.417	0.00	0.00	0.003	o	|	|	|	|	0.01
94.500	0.00	0.00	0.003	o	|	|	|	|	0.01
94.583	0.00	0.00	0.003	o	|	|	|	|	0.01
94.667	0.00	0.00	0.003	o	|	|	|	|	0.01
94.750	0.00	0.00	0.003	o	|	|	|	|	0.01
94.833	0.00	0.00	0.003	o	|	|	|	|	0.01
94.917	0.00	0.00	0.003	o	|	|	|	|	0.01
95.000	0.00	0.00	0.003	o	|	|	|	|	0.01
95.083	0.00	0.00	0.003	o	|	|	|	|	0.01
95.167	0.00	0.00	0.003	o	|	|	|	|	0.01
95.250	0.00	0.00	0.003	o	|	|	|	|	0.01
95.333	0.00	0.00	0.003	o	|	|	|	|	0.01
95.417	0.00	0.00	0.003	o	|	|	|	|	0.01
95.500	0.00	0.00	0.003	o	|	|	|	|	0.01
95.583	0.00	0.00	0.003	o	|	|	|	|	0.01
95.667	0.00	0.00	0.003	o	|	|	|	|	0.01
95.750	0.00	0.00	0.003	o	|	|	|	|	0.01
95.833	0.00	0.00	0.003	o	|	|	|	|	0.01
95.917	0.00	0.00	0.003	o	|	|	|	|	0.01
96.000	0.00	0.00	0.003	o	|	|	|	|	0.01
96.083	0.00	0.00	0.003	o	|	|	|	|	0.01
96.167	0.00	0.00	0.003	o	|	|	|	|	0.01
96.250	0.00	0.00	0.003	o	|	|	|	|	0.01
96.333	0.00	0.00	0.003	o	|	|	|	|	0.01
96.417	0.00	0.00	0.003	o	|	|	|	|	0.01
96.500	0.00	0.00	0.003	o	|	|	|	|	0.01
96.583	0.00	0.00	0.003	o	|	|	|	|	0.01
96.667	0.00	0.00	0.003	o	|	|	|	|	0.01
96.750	0.00	0.00	0.003	o	|	|	|	|	0.01
96.833	0.00	0.00	0.003	o	|	|	|	|	0.01
96.917	0.00	0.00	0.003	o	|	|	|	|	0.01
97.000	0.00	0.00	0.003	o	|	|	|	|	0.01
97.083	0.00	0.00	0.003	o	|	|	|	|	0.01
97.167	0.00	0.00	0.003	o	|	|	|	|	0.01
97.250	0.00	0.00	0.003	o	|	|	|	|	0.01
97.333	0.00	0.00	0.003	o	|	|	|	|	0.01
97.417	0.00	0.00	0.003	o	|	|	|	|	0.01
97.500	0.00	0.00	0.003	o	|	|	|	|	0.01
97.583	0.00	0.00	0.003	o	|	|	|	|	0.01

97.667	0.00	0.00	0.003	o	|	|	|	|	0.01
97.750	0.00	0.00	0.002	o	|	|	|	|	0.01
97.833	0.00	0.00	0.002	o	|	|	|	|	0.01
97.917	0.00	0.00	0.002	o	|	|	|	|	0.01
98.000	0.00	0.00	0.002	o	|	|	|	|	0.01
98.083	0.00	0.00	0.002	o	|	|	|	|	0.01
98.167	0.00	0.00	0.002	o	|	|	|	|	0.01
98.250	0.00	0.00	0.002	o	|	|	|	|	0.01
98.333	0.00	0.00	0.002	o	|	|	|	|	0.01
98.417	0.00	0.00	0.002	o	|	|	|	|	0.01
98.500	0.00	0.00	0.002	o	|	|	|	|	0.01
98.583	0.00	0.00	0.002	o	|	|	|	|	0.01
98.667	0.00	0.00	0.002	o	|	|	|	|	0.01
98.750	0.00	0.00	0.002	o	|	|	|	|	0.01
98.833	0.00	0.00	0.002	o	|	|	|	|	0.01
98.917	0.00	0.00	0.002	o	|	|	|	|	0.01
99.000	0.00	0.00	0.002	o	|	|	|	|	0.01
99.083	0.00	0.00	0.002	o	|	|	|	|	0.01
99.167	0.00	0.00	0.002	o	|	|	|	|	0.01
99.250	0.00	0.00	0.002	o	|	|	|	|	0.01
99.333	0.00	0.00	0.002	o	|	|	|	|	0.01
99.417	0.00	0.00	0.002	o	|	|	|	|	0.01
99.500	0.00	0.00	0.002	o	|	|	|	|	0.01
99.583	0.00	0.00	0.002	o	|	|	|	|	0.01
99.667	0.00	0.00	0.002	o	|	|	|	|	0.01
99.750	0.00	0.00	0.002	o	|	|	|	|	0.01
99.833	0.00	0.00	0.002	o	|	|	|	|	0.01
99.917	0.00	0.00	0.002	o	|	|	|	|	0.01
100.000	0.00	0.00	0.002	o	|	|	|	|	0.01
100.083	0.00	0.00	0.002	o	|	|	|	|	0.01
100.167	0.00	0.00	0.002	o	|	|	|	|	0.01
100.250	0.00	0.00	0.002	o	|	|	|	|	0.01
100.333	0.00	0.00	0.002	o	|	|	|	|	0.01
100.417	0.00	0.00	0.002	o	|	|	|	|	0.01
100.500	0.00	0.00	0.002	o	|	|	|	|	0.01
100.583	0.00	0.00	0.002	o	|	|	|	|	0.01
100.667	0.00	0.00	0.002	o	|	|	|	|	0.01
100.750	0.00	0.00	0.002	o	|	|	|	|	0.01
100.833	0.00	0.00	0.002	o	|	|	|	|	0.01
100.917	0.00	0.00	0.002	o	|	|	|	|	0.01
101.000	0.00	0.00	0.002	o	|	|	|	|	0.01
101.083	0.00	0.00	0.002	o	|	|	|	|	0.01
101.167	0.00	0.00	0.002	o	|	|	|	|	0.01
101.250	0.00	0.00	0.002	o	|	|	|	|	0.01
101.333	0.00	0.00	0.002	o	|	|	|	|	0.01
101.417	0.00	0.00	0.002	o	|	|	|	|	0.01
101.500	0.00	0.00	0.002	o	|	|	|	|	0.01
101.583	0.00	0.00	0.002	o	|	|	|	|	0.01
101.667	0.00	0.00	0.002	o	|	|	|	|	0.01
101.750	0.00	0.00	0.002	o	|	|	|	|	0.01
101.833	0.00	0.00	0.002	o	|	|	|	|	0.01
101.917	0.00	0.00	0.002	o	|	|	|	|	0.01
102.000	0.00	0.00	0.002	o	|	|	|	|	0.01
102.083	0.00	0.00	0.002	o	|	|	|	|	0.01
102.167	0.00	0.00	0.002	o	|	|	|	|	0.01
102.250	0.00	0.00	0.002	o	|	|	|	|	0.01
102.333	0.00	0.00	0.002	o	|	|	|	|	0.01
102.417	0.00	0.00	0.002	o	|	|	|	|	0.01
102.500	0.00	0.00	0.002	o	|	|	|	|	0.01
102.583	0.00	0.00	0.002	o	|	|	|	|	0.01
102.667	0.00	0.00	0.002	o	|	|	|	|	0.01
102.750	0.00	0.00	0.002	o	|	|	|	|	0.01
102.833	0.00	0.00	0.002	o	|	|	|	|	0.01
102.917	0.00	0.00	0.002	o	|	|	|	|	0.01
103.000	0.00	0.00	0.002	o	|	|	|	|	0.01
103.083	0.00	0.00	0.002	o	|	|	|	|	0.01

103.167	0.00	0.00	0.002	o					0.01
103.250	0.00	0.00	0.002	o					0.01
103.333	0.00	0.00	0.002	o					0.01
103.417	0.00	0.00	0.002	o					0.01
103.500	0.00	0.00	0.002	o					0.01
103.583	0.00	0.00	0.002	o					0.01
103.667	0.00	0.00	0.002	o					0.01
103.750	0.00	0.00	0.002	o					0.01
103.833	0.00	0.00	0.002	o					0.01
103.917	0.00	0.00	0.002	o					0.01
104.000	0.00	0.00	0.002	o					0.01
104.083	0.00	0.00	0.002	o					0.01
104.167	0.00	0.00	0.002	o					0.01
104.250	0.00	0.00	0.002	o					0.01
104.333	0.00	0.00	0.002	o					0.01
104.417	0.00	0.00	0.002	o					0.01
104.500	0.00	0.00	0.002	o					0.01
104.583	0.00	0.00	0.002	o					0.01
104.667	0.00	0.00	0.002	o					0.01
104.750	0.00	0.00	0.002	o					0.01
104.833	0.00	0.00	0.002	o					0.01
104.917	0.00	0.00	0.002	o					0.01
105.000	0.00	0.00	0.001	o					0.01
105.083	0.00	0.00	0.001	o					0.01
105.167	0.00	0.00	0.001	o					0.01
105.250	0.00	0.00	0.001	o					0.01
105.333	0.00	0.00	0.001	o					0.01
105.417	0.00	0.00	0.001	o					0.01
105.500	0.00	0.00	0.001	o					0.01
105.583	0.00	0.00	0.001	o					0.01
105.667	0.00	0.00	0.001	o					0.01
105.750	0.00	0.00	0.001	o					0.01
105.833	0.00	0.00	0.001	o					0.01
105.917	0.00	0.00	0.001	o					0.01
106.000	0.00	0.00	0.001	o					0.01
106.083	0.00	0.00	0.001	o					0.01
106.167	0.00	0.00	0.001	o					0.01
106.250	0.00	0.00	0.001	o					0.01
106.333	0.00	0.00	0.001	o					0.01
106.417	0.00	0.00	0.001	o					0.01
106.500	0.00	0.00	0.001	o					0.01
106.583	0.00	0.00	0.001	o					0.01
106.667	0.00	0.00	0.001	o					0.01
106.750	0.00	0.00	0.001	o					0.01
106.833	0.00	0.00	0.001	o					0.01
106.917	0.00	0.00	0.001	o					0.01
107.000	0.00	0.00	0.001	o					0.01
107.083	0.00	0.00	0.001	o					0.01
107.167	0.00	0.00	0.001	o					0.01
107.250	0.00	0.00	0.001	o					0.01
107.333	0.00	0.00	0.001	o					0.01
107.417	0.00	0.00	0.001	o					0.01
107.500	0.00	0.00	0.001	o					0.01
107.583	0.00	0.00	0.001	o					0.01
107.667	0.00	0.00	0.001	o					0.01
107.750	0.00	0.00	0.001	o					0.01
107.833	0.00	0.00	0.001	o					0.01
107.917	0.00	0.00	0.001	o					0.01
108.000	0.00	0.00	0.001	o					0.01
108.083	0.00	0.00	0.001	o					0.01
108.167	0.00	0.00	0.001	o					0.01
108.250	0.00	0.00	0.001	o					0.01
108.333	0.00	0.00	0.001	o					0.01
108.417	0.00	0.00	0.001	o					0.01
108.500	0.00	0.00	0.001	o					0.01

```
Remaining water in basin =    0.00 (Ac.Ft)


**************************HYDROGRAPH DATA**************************
              Number of intervals =  1302
              Time interval =    5.0 (Min.)
              Maximum/Peak flow rate =        5.725 (CFS)
              Total volume =       1.432 (Ac.Ft)
       Status of hydrographs being held in storage
                    Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*******************************************************************************

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FLOOD HYDROGRAPH ROUTING PROGRAM
Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2022
Study date: 09/18/22

XENIA
PRELIMINARY BASIN ROUTING MODEL
PRELIMINARY BASIN A
100-YEAR; 3-HOUR

Program License Serial Number 6545

********** HYDROGRAPH INFORMATION **********

From study/file name: 2D3100.rte
**********HYDROGRAPH DATA**********
Number of intervals = 42
Time interval = 5.0 (Min.)
Maximum/Peak flow rate = 25.634 (CFS)
Total volume = 2.232 (Ac.Ft)
Status of hydrographs being held in storage

	Stream 1	Stream 2	Stream 3	Stream 4	Stream 5
Peak (CFS)	0.000	0.000	0.000	0.000	0.000
Vol (Ac.Ft)	0.000	0.000	0.000	0.000	0.000

****

++
Process from Point/Station 1.000 to Point/Station 2.000
**** RETARDING BASIN ROUTING ****
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User entry of depth-outflow-storage data

Total number of inflow hydrograph intervals = 42
Hydrograph time unit = 5.000 (Min.)
Initial depth in storage basin = 0.00(Ft.)

Initial basin depth = 0.00 (Ft.)
Initial basin storage = 0.00 (Ac.Ft)
Initial basin outflow = 0.00 (CFS)

Depth vs. Storage and Depth vs. Discharge data:

Basin Depth (Ft.)	Storage (Ac.Ft)	Outflow (CFS)	(S-O*dt/2) (Ac.Ft)	(S+O*dt/2) (Ac.Ft)
0.000	0.000	0.000	0.000	0.000
0.330	0.070	0.060	0.070	0.070
0.670	0.140	0.080	0.140	0.140
1.000	0.210	0.100	0.210	0.210
1.330	0.290	0.110	0.290	0.290
1.670	0.370	0.390	0.369	0.371
2.000	0.450	0.530	0.448	0.452
2.330	0.540	0.630	0.538	0.542
2.670	0.630	0.720	0.628	0.632
3.000	0.730	0.790	0.727	0.733

3.500	0.830	0.890	0.827	0.833
4.000	0.940	0.990	0.937	0.943
4.500	1.050	1.070	1.046	1.054
5.000	1.170	1.150	1.166	1.174
5.500	1.300	1.220	1.296	1.304
6.000	1.430	25.420	1.342	1.518
6.500	1.570	71.680	1.323	1.817
7.000	1.720	132.480	1.264	2.176
7.500	1.870	206.420	1.159	2.581

Hydrograph Detention Basin Routing

Graph values: 'I'= unit inflow; 'O'=outflow at time shown

Time (Hours)	Inflow (CFS)	Outflow (CFS)	Storage (Ac.Ft)	Depth (Ft.)
0.083	0.85	0.00	0.003	0.01
0.167	2.46	0.01	0.014	0.07
0.250	2.77	0.03	0.032	0.15
0.333	3.04	0.04	0.052	0.24
0.417	3.71	0.06	0.075	0.35
0.500	4.21	0.07	0.102	0.48
0.583	4.58	0.08	0.131	0.63
0.667	4.50	0.09	0.162	0.77
0.750	4.99	0.10	0.194	0.92
0.833	4.83	0.10	0.227	1.07
0.917	4.43	0.11	0.258	1.20
1.000	4.69	0.11	0.289	1.33
1.083	5.44	0.22	0.323	1.47
1.167	6.28	0.36	0.361	1.63
1.250	6.52	0.45	0.402	1.80
1.333	6.44	0.52	0.444	1.97
1.417	6.72	0.57	0.485	2.13
1.500	7.87	0.62	0.531	2.30
1.583	8.04	0.67	0.582	2.49
1.667	7.94	0.72	0.632	2.68
1.750	9.02	0.76	0.685	2.85
1.833	10.07	0.81	0.746	3.08
1.917	9.87	0.87	0.808	3.39
2.000	9.65	0.93	0.870	3.68
2.083	9.87	0.98	0.930	3.96
2.167	11.17	1.03	0.996	4.25
2.250	14.06	1.09	1.075	4.61
2.333	14.66	1.15	1.167	4.99
2.417	15.74	1.20	1.263	5.36
2.500	21.95	10.82	1.352	5.70
2.583	25.27	20.81	1.405	5.90
2.667	25.63	24.44	1.425	5.98
2.750	18.48	22.58	1.415	5.94
2.833	10.30	16.18	1.380	5.81
2.917	7.75	10.59	1.350	5.69
3.000	5.61	7.54	1.334	5.63
3.083	2.76	4.92	1.320	5.58
3.167	1.09	2.58	1.307	5.53
3.250	0.45	1.22	1.300	5.50
3.333	0.22	1.22	1.293	5.47
3.417	0.10	1.21	1.286	5.45
3.500	0.02	1.21	1.278	5.42
3.583	0.00	1.20	1.270	5.38
3.667	0.00	1.20	1.262	5.35
3.750	0.00	1.19	1.254	5.32
3.833	0.00	1.19	1.245	5.29
3.917	0.00	1.19	1.237	5.26
4.000	0.00	1.18	1.229	5.23
4.083	0.00	1.18	1.221	5.20

4.167	0.00	1.17	1.213	IO				5.16
4.250	0.00	1.17	1.205	IO				5.13
4.333	0.00	1.16	1.197	IO				5.10
4.417	0.00	1.16	1.189	IO				5.07
4.500	0.00	1.16	1.181	IO				5.04
4.583	0.00	1.15	1.173	IO				5.01
4.667	0.00	1.15	1.165	IO				4.98
4.750	0.00	1.14	1.157	IO				4.95
4.833	0.00	1.14	1.149	IO				4.91
4.917	0.00	1.13	1.141	IO				4.88
5.000	0.00	1.13	1.134	IO				4.85
5.083	0.00	1.12	1.126	IO				4.82
5.167	0.00	1.12	1.118	IO				4.78
5.250	0.00	1.11	1.110	IO				4.75
5.333	0.00	1.11	1.103	IO				4.72
5.417	0.00	1.10	1.095	IO				4.69
5.500	0.00	1.10	1.088	IO				4.66
5.583	0.00	1.09	1.080	IO				4.63
5.667	0.00	1.09	1.073	IO				4.59
5.750	0.00	1.08	1.065	IO				4.56
5.833	0.00	1.08	1.058	IO				4.53
5.917	0.00	1.07	1.050	IO				4.50
6.000	0.00	1.06	1.043	IO				4.47
6.083	0.00	1.06	1.036	IO				4.43
6.167	0.00	1.05	1.028	IO				4.40
6.250	0.00	1.05	1.021	IO				4.37
6.333	0.00	1.04	1.014	IO				4.34
6.417	0.00	1.04	1.007	IO				4.30
6.500	0.00	1.03	1.000	IO				4.27
6.583	0.00	1.03	0.993	IO				4.24
6.667	0.00	1.02	0.985	IO				4.21
6.750	0.00	1.02	0.978	IO				4.17
6.833	0.00	1.01	0.971	IO				4.14
6.917	0.00	1.01	0.965	IO				4.11
7.000	0.00	1.00	0.958	IO				4.08
7.083	0.00	1.00	0.951	IO				4.05
7.167	0.00	0.99	0.944	IO				4.02
7.250	0.00	0.99	0.937	IO				3.99
7.333	0.00	0.98	0.930	IO				3.96
7.417	0.00	0.98	0.924	IO				3.93
7.500	0.00	0.97	0.917	IO				3.89
7.583	0.00	0.96	0.910	IO				3.86
7.667	0.00	0.96	0.904	IO				3.83
7.750	0.00	0.95	0.897	IO				3.80
7.833	0.00	0.94	0.890	IO				3.77
7.917	0.00	0.94	0.884	IO				3.75
8.000	0.00	0.93	0.878	IO				3.72
8.083	0.00	0.93	0.871	IO				3.69
8.167	0.00	0.92	0.865	IO				3.66
8.250	0.00	0.92	0.858	IO				3.63
8.333	0.00	0.91	0.852	IO				3.60
8.417	0.00	0.90	0.846	IO				3.57
8.500	0.00	0.90	0.840	IO				3.54
8.583	0.00	0.89	0.834	IO				3.52
8.667	0.00	0.89	0.827	IO				3.49
8.750	0.00	0.88	0.821	IO				3.46
8.833	0.00	0.88	0.815	IO				3.43
8.917	0.00	0.87	0.809	IO				3.40
9.000	0.00	0.86	0.803	IO				3.37
9.083	0.00	0.86	0.797	IO				3.34
9.167	0.00	0.85	0.791	IO				3.31
9.250	0.00	0.85	0.786	IO				3.28
9.333	0.00	0.84	0.780	IO				3.25
9.417	0.00	0.83	0.774	IO				3.22
9.500	0.00	0.83	0.768	IO				3.19
9.583	0.00	0.82	0.763	IO				3.16

9.667	0.00	0.82	0.757	IO				3.13
9.750	0.00	0.81	0.751	IO				3.11
9.833	0.00	0.81	0.746	IO				3.08
9.917	0.00	0.80	0.740	O				3.05
10.000	0.00	0.79	0.735	O				3.02
10.083	0.00	0.79	0.729	O				3.00
10.167	0.00	0.79	0.724	O				2.98
10.250	0.00	0.78	0.719	O				2.96
10.333	0.00	0.78	0.713	O				2.94
10.417	0.00	0.77	0.708	O				2.93
10.500	0.00	0.77	0.702	O				2.91
10.583	0.00	0.77	0.697	O				2.89
10.667	0.00	0.76	0.692	O				2.87
10.750	0.00	0.76	0.687	O				2.86
10.833	0.00	0.76	0.681	O				2.84
10.917	0.00	0.75	0.676	O				2.82
11.000	0.00	0.75	0.671	O				2.81
11.083	0.00	0.75	0.666	O				2.79
11.167	0.00	0.74	0.661	O				2.77
11.250	0.00	0.74	0.656	O				2.75
11.333	0.00	0.73	0.651	O				2.74
11.417	0.00	0.73	0.646	O				2.72
11.500	0.00	0.73	0.641	O				2.70
11.583	0.00	0.72	0.636	O				2.69
11.667	0.00	0.72	0.631	O				2.67
11.750	0.00	0.72	0.626	O				2.65
11.833	0.00	0.71	0.621	O				2.64
11.917	0.00	0.71	0.616	O				2.62
12.000	0.00	0.70	0.611	O				2.60
12.083	0.00	0.70	0.606	O				2.58
12.167	0.00	0.69	0.601	O				2.56
12.250	0.00	0.69	0.597	O				2.54
12.333	0.00	0.68	0.592	O				2.53
12.417	0.00	0.68	0.587	O				2.51
12.500	0.00	0.67	0.583	O				2.49
12.583	0.00	0.67	0.578	O				2.47
12.667	0.00	0.66	0.573	O				2.46
12.750	0.00	0.66	0.569	O				2.44
12.833	0.00	0.65	0.564	O				2.42
12.917	0.00	0.65	0.560	O				2.41
13.000	0.00	0.65	0.555	O				2.39
13.083	0.00	0.64	0.551	O				2.37
13.167	0.00	0.64	0.547	O				2.35
13.250	0.00	0.63	0.542	O				2.34
13.333	0.00	0.63	0.538	O				2.32
13.417	0.00	0.62	0.534	O				2.31
13.500	0.00	0.62	0.529	O				2.29
13.583	0.00	0.61	0.525	O				2.28
13.667	0.00	0.61	0.521	O				2.26
13.750	0.00	0.60	0.517	O				2.24
13.833	0.00	0.60	0.513	O				2.23
13.917	0.00	0.59	0.508	O				2.21
14.000	0.00	0.59	0.504	O				2.20
14.083	0.00	0.59	0.500	O				2.18
14.167	0.00	0.58	0.496	O				2.17
14.250	0.00	0.58	0.492	O				2.16
14.333	0.00	0.57	0.488	O				2.14
14.417	0.00	0.57	0.484	O				2.13
14.500	0.00	0.56	0.480	O				2.11
14.583	0.00	0.56	0.477	O				2.10
14.667	0.00	0.56	0.473	O				2.08
14.750	0.00	0.55	0.469	O				2.07
14.833	0.00	0.55	0.465	O				2.06
14.917	0.00	0.54	0.461	O				2.04
15.000	0.00	0.54	0.458	O				2.03
15.083	0.00	0.53	0.454	O				2.01

15.167	0.00	0.53	0.450	o	|	|	|	| 2.00
15.250	0.00	0.52	0.447	o	|	|	|	| 1.99
15.333	0.00	0.52	0.443	o	|	|	|	| 1.97
15.417	0.00	0.51	0.440	o	|	|	|	| 1.96
15.500	0.00	0.51	0.436	o	|	|	|	| 1.94
15.583	0.00	0.50	0.433	o	|	|	|	| 1.93
15.667	0.00	0.49	0.429	o	|	|	|	| 1.91
15.750	0.00	0.49	0.426	o	|	|	|	| 1.90
15.833	0.00	0.48	0.422	o	|	|	|	| 1.89
15.917	0.00	0.48	0.419	o	|	|	|	| 1.87
16.000	0.00	0.47	0.416	o	|	|	|	| 1.86
16.083	0.00	0.46	0.413	o	|	|	|	| 1.85
16.167	0.00	0.46	0.410	o	|	|	|	| 1.83
16.250	0.00	0.45	0.406	o	|	|	|	| 1.82
16.333	0.00	0.45	0.403	o	|	|	|	| 1.81
16.417	0.00	0.44	0.400	o	|	|	|	| 1.79
16.500	0.00	0.44	0.397	o	|	|	|	| 1.78
16.583	0.00	0.43	0.394	o	|	|	|	| 1.77
16.667	0.00	0.43	0.391	o	|	|	|	| 1.76
16.750	0.00	0.42	0.388	o	|	|	|	| 1.75
16.833	0.00	0.42	0.385	o	|	|	|	| 1.73
16.917	0.00	0.41	0.383	o	|	|	|	| 1.72
17.000	0.00	0.41	0.380	o	|	|	|	| 1.71
17.083	0.00	0.40	0.377	o	|	|	|	| 1.70
17.167	0.00	0.40	0.374	o	|	|	|	| 1.69
17.250	0.00	0.39	0.371	o	|	|	|	| 1.68
17.333	0.00	0.39	0.369	o	|	|	|	| 1.66
17.417	0.00	0.38	0.366	o	|	|	|	| 1.65
17.500	0.00	0.37	0.364	o	|	|	|	| 1.64
17.583	0.00	0.36	0.361	o	|	|	|	| 1.63
17.667	0.00	0.35	0.359	o	|	|	|	| 1.62
17.750	0.00	0.34	0.356	o	|	|	|	| 1.61
17.833	0.00	0.33	0.354	o	|	|	|	| 1.60
17.917	0.00	0.33	0.352	o	|	|	|	| 1.59
18.000	0.00	0.32	0.349	o	|	|	|	| 1.58
18.083	0.00	0.31	0.347	o	|	|	|	| 1.57
18.167	0.00	0.30	0.345	o	|	|	|	| 1.56
18.250	0.00	0.30	0.343	o	|	|	|	| 1.56
18.333	0.00	0.29	0.341	o	|	|	|	| 1.55
18.417	0.00	0.28	0.339	o	|	|	|	| 1.54
18.500	0.00	0.28	0.337	o	|	|	|	| 1.53
18.583	0.00	0.27	0.335	o	|	|	|	| 1.52
18.667	0.00	0.26	0.334	o	|	|	|	| 1.51
18.750	0.00	0.26	0.332	o	|	|	|	| 1.51
18.833	0.00	0.25	0.330	o	|	|	|	| 1.50
18.917	0.00	0.24	0.328	o	|	|	|	| 1.49
19.000	0.00	0.24	0.327	o	|	|	|	| 1.49
19.083	0.00	0.23	0.325	o	|	|	|	| 1.48
19.167	0.00	0.23	0.323	o	|	|	|	| 1.47
19.250	0.00	0.22	0.322	o	|	|	|	| 1.47
19.333	0.00	0.22	0.320	o	|	|	|	| 1.46
19.417	0.00	0.21	0.319	o	|	|	|	| 1.45
19.500	0.00	0.21	0.317	o	|	|	|	| 1.45
19.583	0.00	0.20	0.316	o	|	|	|	| 1.44
19.667	0.00	0.20	0.315	o	|	|	|	| 1.43
19.750	0.00	0.19	0.313	o	|	|	|	| 1.43
19.833	0.00	0.19	0.312	o	|	|	|	| 1.42
19.917	0.00	0.18	0.311	o	|	|	|	| 1.42
20.000	0.00	0.18	0.310	o	|	|	|	| 1.41
20.083	0.00	0.17	0.308	o	|	|	|	| 1.41
20.167	0.00	0.17	0.307	o	|	|	|	| 1.40
20.250	0.00	0.17	0.306	o	|	|	|	| 1.40
20.333	0.00	0.16	0.305	o	|	|	|	| 1.39
20.417	0.00	0.16	0.304	o	|	|	|	| 1.39
20.500	0.00	0.15	0.303	o	|	|	|	| 1.38
20.583	0.00	0.15	0.302	o	|	|	|	| 1.38

20.667	0.00	0.15	0.301	o	|	|	|	| 1.38
20.750	0.00	0.14	0.300	o	|	|	|	| 1.37
20.833	0.00	0.14	0.299	o	|	|	|	| 1.37
20.917	0.00	0.14	0.298	o	|	|	|	| 1.36
21.000	0.00	0.13	0.297	o	|	|	|	| 1.36
21.083	0.00	0.13	0.296	o	|	|	|	| 1.35
21.167	0.00	0.13	0.295	o	|	|	|	| 1.35
21.250	0.00	0.12	0.294	o	|	|	|	| 1.35
21.333	0.00	0.12	0.293	o	|	|	|	| 1.34
21.417	0.00	0.12	0.292	o	|	|	|	| 1.34
21.500	0.00	0.12	0.292	o	|	|	|	| 1.34
21.583	0.00	0.11	0.291	o	|	|	|	| 1.33
21.667	0.00	0.11	0.290	o	|	|	|	| 1.33
21.750	0.00	0.11	0.289	o	|	|	|	| 1.33
21.833	0.00	0.11	0.289	o	|	|	|	| 1.32
21.917	0.00	0.11	0.288	o	|	|	|	| 1.32
22.000	0.00	0.11	0.287	o	|	|	|	| 1.32
22.083	0.00	0.11	0.286	o	|	|	|	| 1.31
22.167	0.00	0.11	0.286	o	|	|	|	| 1.31
22.250	0.00	0.11	0.285	o	|	|	|	| 1.31
22.333	0.00	0.11	0.284	o	|	|	|	| 1.31
22.417	0.00	0.11	0.283	o	|	|	|	| 1.30
22.500	0.00	0.11	0.282	o	|	|	|	| 1.30
22.583	0.00	0.11	0.282	o	|	|	|	| 1.30
22.667	0.00	0.11	0.281	o	|	|	|	| 1.29
22.750	0.00	0.11	0.280	o	|	|	|	| 1.29
22.833	0.00	0.11	0.279	o	|	|	|	| 1.29
22.917	0.00	0.11	0.279	o	|	|	|	| 1.28
23.000	0.00	0.11	0.278	o	|	|	|	| 1.28
23.083	0.00	0.11	0.277	o	|	|	|	| 1.28
23.167	0.00	0.11	0.277	o	|	|	|	| 1.27
23.250	0.00	0.11	0.276	o	|	|	|	| 1.27
23.333	0.00	0.11	0.275	o	|	|	|	| 1.27
23.417	0.00	0.11	0.274	o	|	|	|	| 1.27
23.500	0.00	0.11	0.274	o	|	|	|	| 1.26
23.583	0.00	0.11	0.273	o	|	|	|	| 1.26
23.667	0.00	0.11	0.272	o	|	|	|	| 1.26
23.750	0.00	0.11	0.271	o	|	|	|	| 1.25
23.833	0.00	0.11	0.271	o	|	|	|	| 1.25
23.917	0.00	0.11	0.270	o	|	|	|	| 1.25
24.000	0.00	0.11	0.269	o	|	|	|	| 1.24
24.083	0.00	0.11	0.268	o	|	|	|	| 1.24
24.167	0.00	0.11	0.268	o	|	|	|	| 1.24
24.250	0.00	0.11	0.267	o	|	|	|	| 1.23
24.333	0.00	0.11	0.266	o	|	|	|	| 1.23
24.417	0.00	0.11	0.265	o	|	|	|	| 1.23
24.500	0.00	0.11	0.265	o	|	|	|	| 1.23
24.583	0.00	0.11	0.264	o	|	|	|	| 1.22
24.667	0.00	0.11	0.263	o	|	|	|	| 1.22
24.750	0.00	0.11	0.262	o	|	|	|	| 1.22
24.833	0.00	0.11	0.262	o	|	|	|	| 1.21
24.917	0.00	0.11	0.261	o	|	|	|	| 1.21
25.000	0.00	0.11	0.260	o	|	|	|	| 1.21
25.083	0.00	0.11	0.260	o	|	|	|	| 1.20
25.167	0.00	0.11	0.259	o	|	|	|	| 1.20
25.250	0.00	0.11	0.258	o	|	|	|	| 1.20
25.333	0.00	0.11	0.257	o	|	|	|	| 1.20
25.417	0.00	0.11	0.257	o	|	|	|	| 1.19
25.500	0.00	0.11	0.256	o	|	|	|	| 1.19
25.583	0.00	0.11	0.255	o	|	|	|	| 1.19
25.667	0.00	0.11	0.254	o	|	|	|	| 1.18
25.750	0.00	0.11	0.254	o	|	|	|	| 1.18
25.833	0.00	0.11	0.253	o	|	|	|	| 1.18
25.917	0.00	0.11	0.252	o	|	|	|	| 1.17
26.000	0.00	0.11	0.252	o	|	|	|	| 1.17
26.083	0.00	0.11	0.251	o	|	|	|	| 1.17

26.167	0.00	0.11	0.250	o	|	|	|	|	1.17
26.250	0.00	0.10	0.249	o	|	|	|	|	1.16
26.333	0.00	0.10	0.249	o	|	|	|	|	1.16
26.417	0.00	0.10	0.248	o	|	|	|	|	1.16
26.500	0.00	0.10	0.247	o	|	|	|	|	1.15
26.583	0.00	0.10	0.246	o	|	|	|	|	1.15
26.667	0.00	0.10	0.246	o	|	|	|	|	1.15
26.750	0.00	0.10	0.245	o	|	|	|	|	1.14
26.833	0.00	0.10	0.244	o	|	|	|	|	1.14
26.917	0.00	0.10	0.244	o	|	|	|	|	1.14
27.000	0.00	0.10	0.243	o	|	|	|	|	1.14
27.083	0.00	0.10	0.242	o	|	|	|	|	1.13
27.167	0.00	0.10	0.241	o	|	|	|	|	1.13
27.250	0.00	0.10	0.241	o	|	|	|	|	1.13
27.333	0.00	0.10	0.240	o	|	|	|	|	1.12
27.417	0.00	0.10	0.239	o	|	|	|	|	1.12
27.500	0.00	0.10	0.239	o	|	|	|	|	1.12
27.583	0.00	0.10	0.238	o	|	|	|	|	1.11
27.667	0.00	0.10	0.237	o	|	|	|	|	1.11
27.750	0.00	0.10	0.236	o	|	|	|	|	1.11
27.833	0.00	0.10	0.236	o	|	|	|	|	1.11
27.917	0.00	0.10	0.235	o	|	|	|	|	1.10
28.000	0.00	0.10	0.234	o	|	|	|	|	1.10
28.083	0.00	0.10	0.234	o	|	|	|	|	1.10
28.167	0.00	0.10	0.233	o	|	|	|	|	1.09
28.250	0.00	0.10	0.232	o	|	|	|	|	1.09
28.333	0.00	0.10	0.231	o	|	|	|	|	1.09
28.417	0.00	0.10	0.231	o	|	|	|	|	1.09
28.500	0.00	0.10	0.230	o	|	|	|	|	1.08
28.583	0.00	0.10	0.229	o	|	|	|	|	1.08
28.667	0.00	0.10	0.229	o	|	|	|	|	1.08
28.750	0.00	0.10	0.228	o	|	|	|	|	1.07
28.833	0.00	0.10	0.227	o	|	|	|	|	1.07
28.917	0.00	0.10	0.227	o	|	|	|	|	1.07
29.000	0.00	0.10	0.226	o	|	|	|	|	1.07
29.083	0.00	0.10	0.225	o	|	|	|	|	1.06
29.167	0.00	0.10	0.224	o	|	|	|	|	1.06
29.250	0.00	0.10	0.224	o	|	|	|	|	1.06
29.333	0.00	0.10	0.223	o	|	|	|	|	1.05
29.417	0.00	0.10	0.222	o	|	|	|	|	1.05
29.500	0.00	0.10	0.222	o	|	|	|	|	1.05
29.583	0.00	0.10	0.221	o	|	|	|	|	1.05
29.667	0.00	0.10	0.220	o	|	|	|	|	1.04
29.750	0.00	0.10	0.220	o	|	|	|	|	1.04
29.833	0.00	0.10	0.219	o	|	|	|	|	1.04
29.917	0.00	0.10	0.218	o	|	|	|	|	1.03
30.000	0.00	0.10	0.217	o	|	|	|	|	1.03
30.083	0.00	0.10	0.217	o	|	|	|	|	1.03
30.167	0.00	0.10	0.216	o	|	|	|	|	1.02
30.250	0.00	0.10	0.215	o	|	|	|	|	1.02
30.333	0.00	0.10	0.215	o	|	|	|	|	1.02
30.417	0.00	0.10	0.214	o	|	|	|	|	1.02
30.500	0.00	0.10	0.213	o	|	|	|	|	1.01
30.583	0.00	0.10	0.213	o	|	|	|	|	1.01
30.667	0.00	0.10	0.212	o	|	|	|	|	1.01
30.750	0.00	0.10	0.211	o	|	|	|	|	1.01
30.833	0.00	0.10	0.211	o	|	|	|	|	1.00
30.917	0.00	0.10	0.210	o	|	|	|	|	1.00
31.000	0.00	0.10	0.209	o	|	|	|	|	1.00
31.083	0.00	0.10	0.208	o	|	|	|	|	0.99
31.167	0.00	0.10	0.208	o	|	|	|	|	0.99
31.250	0.00	0.10	0.207	o	|	|	|	|	0.99
31.333	0.00	0.10	0.206	o	|	|	|	|	0.98
31.417	0.00	0.10	0.206	o	|	|	|	|	0.98
31.500	0.00	0.10	0.205	o	|	|	|	|	0.98
31.583	0.00	0.10	0.204	o	|	|	|	|	0.97

31.667	0.00	0.10	0.204	o	|	|	|	| 0.97
31.750	0.00	0.10	0.203	o	|	|	|	| 0.97
31.833	0.00	0.10	0.202	o	|	|	|	| 0.96
31.917	0.00	0.10	0.202	o	|	|	|	| 0.96
32.000	0.00	0.10	0.201	o	|	|	|	| 0.96
32.083	0.00	0.10	0.200	o	|	|	|	| 0.95
32.167	0.00	0.10	0.200	o	|	|	|	| 0.95
32.250	0.00	0.10	0.199	o	|	|	|	| 0.95
32.333	0.00	0.10	0.198	o	|	|	|	| 0.94
32.417	0.00	0.10	0.198	o	|	|	|	| 0.94
32.500	0.00	0.10	0.197	o	|	|	|	| 0.94
32.583	0.00	0.10	0.196	o	|	|	|	| 0.94
32.667	0.00	0.10	0.196	o	|	|	|	| 0.93
32.750	0.00	0.10	0.195	o	|	|	|	| 0.93
32.833	0.00	0.10	0.194	o	|	|	|	| 0.93
32.917	0.00	0.10	0.194	o	|	|	|	| 0.92
33.000	0.00	0.10	0.193	o	|	|	|	| 0.92
33.083	0.00	0.09	0.192	o	|	|	|	| 0.92
33.167	0.00	0.09	0.192	o	|	|	|	| 0.91
33.250	0.00	0.09	0.191	o	|	|	|	| 0.91
33.333	0.00	0.09	0.190	o	|	|	|	| 0.91
33.417	0.00	0.09	0.190	o	|	|	|	| 0.90
33.500	0.00	0.09	0.189	o	|	|	|	| 0.90
33.583	0.00	0.09	0.188	o	|	|	|	| 0.90
33.667	0.00	0.09	0.188	o	|	|	|	| 0.90
33.750	0.00	0.09	0.187	o	|	|	|	| 0.89
33.833	0.00	0.09	0.187	o	|	|	|	| 0.89
33.917	0.00	0.09	0.186	o	|	|	|	| 0.89
34.000	0.00	0.09	0.185	o	|	|	|	| 0.88
34.083	0.00	0.09	0.185	o	|	|	|	| 0.88
34.167	0.00	0.09	0.184	o	|	|	|	| 0.88
34.250	0.00	0.09	0.183	o	|	|	|	| 0.87
34.333	0.00	0.09	0.183	o	|	|	|	| 0.87
34.417	0.00	0.09	0.182	o	|	|	|	| 0.87
34.500	0.00	0.09	0.181	o	|	|	|	| 0.87
34.583	0.00	0.09	0.181	o	|	|	|	| 0.86
34.667	0.00	0.09	0.180	o	|	|	|	| 0.86
34.750	0.00	0.09	0.180	o	|	|	|	| 0.86
34.833	0.00	0.09	0.179	o	|	|	|	| 0.85
34.917	0.00	0.09	0.178	o	|	|	|	| 0.85
35.000	0.00	0.09	0.178	o	|	|	|	| 0.85
35.083	0.00	0.09	0.177	o	|	|	|	| 0.84
35.167	0.00	0.09	0.176	o	|	|	|	| 0.84
35.250	0.00	0.09	0.176	o	|	|	|	| 0.84
35.333	0.00	0.09	0.175	o	|	|	|	| 0.84
35.417	0.00	0.09	0.175	o	|	|	|	| 0.83
35.500	0.00	0.09	0.174	o	|	|	|	| 0.83
35.583	0.00	0.09	0.173	o	|	|	|	| 0.83
35.667	0.00	0.09	0.173	o	|	|	|	| 0.82
35.750	0.00	0.09	0.172	o	|	|	|	| 0.82
35.833	0.00	0.09	0.171	o	|	|	|	| 0.82
35.917	0.00	0.09	0.171	o	|	|	|	| 0.82
36.000	0.00	0.09	0.170	o	|	|	|	| 0.81
36.083	0.00	0.09	0.170	o	|	|	|	| 0.81
36.167	0.00	0.09	0.169	o	|	|	|	| 0.81
36.250	0.00	0.09	0.168	o	|	|	|	| 0.80
36.333	0.00	0.09	0.168	o	|	|	|	| 0.80
36.417	0.00	0.09	0.167	o	|	|	|	| 0.80
36.500	0.00	0.09	0.167	o	|	|	|	| 0.80
36.583	0.00	0.09	0.166	o	|	|	|	| 0.79
36.667	0.00	0.09	0.165	o	|	|	|	| 0.79
36.750	0.00	0.09	0.165	o	|	|	|	| 0.79
36.833	0.00	0.09	0.164	o	|	|	|	| 0.78
36.917	0.00	0.09	0.164	o	|	|	|	| 0.78
37.000	0.00	0.09	0.163	o	|	|	|	| 0.78
37.083	0.00	0.09	0.162	o	|	|	|	| 0.78

37.167	0.00	0.09	0.162	o	|	|	|	| 0.77
37.250	0.00	0.09	0.161	o	|	|	|	| 0.77
37.333	0.00	0.09	0.161	o	|	|	|	| 0.77
37.417	0.00	0.09	0.160	o	|	|	|	| 0.76
37.500	0.00	0.09	0.159	o	|	|	|	| 0.76
37.583	0.00	0.09	0.159	o	|	|	|	| 0.76
37.667	0.00	0.09	0.158	o	|	|	|	| 0.76
37.750	0.00	0.09	0.158	o	|	|	|	| 0.75
37.833	0.00	0.08	0.157	o	|	|	|	| 0.75
37.917	0.00	0.08	0.157	o	|	|	|	| 0.75
38.000	0.00	0.08	0.156	o	|	|	|	| 0.75
38.083	0.00	0.08	0.155	o	|	|	|	| 0.74
38.167	0.00	0.08	0.155	o	|	|	|	| 0.74
38.250	0.00	0.08	0.154	o	|	|	|	| 0.74
38.333	0.00	0.08	0.154	o	|	|	|	| 0.73
38.417	0.00	0.08	0.153	o	|	|	|	| 0.73
38.500	0.00	0.08	0.152	o	|	|	|	| 0.73
38.583	0.00	0.08	0.152	o	|	|	|	| 0.73
38.667	0.00	0.08	0.151	o	|	|	|	| 0.72
38.750	0.00	0.08	0.151	o	|	|	|	| 0.72
38.833	0.00	0.08	0.150	o	|	|	|	| 0.72
38.917	0.00	0.08	0.150	o	|	|	|	| 0.72
39.000	0.00	0.08	0.149	o	|	|	|	| 0.71
39.083	0.00	0.08	0.148	o	|	|	|	| 0.71
39.167	0.00	0.08	0.148	o	|	|	|	| 0.71
39.250	0.00	0.08	0.147	o	|	|	|	| 0.70
39.333	0.00	0.08	0.147	o	|	|	|	| 0.70
39.417	0.00	0.08	0.146	o	|	|	|	| 0.70
39.500	0.00	0.08	0.146	o	|	|	|	| 0.70
39.583	0.00	0.08	0.145	o	|	|	|	| 0.69
39.667	0.00	0.08	0.145	o	|	|	|	| 0.69
39.750	0.00	0.08	0.144	o	|	|	|	| 0.69
39.833	0.00	0.08	0.143	o	|	|	|	| 0.69
39.917	0.00	0.08	0.143	o	|	|	|	| 0.68
40.000	0.00	0.08	0.142	o	|	|	|	| 0.68
40.083	0.00	0.08	0.142	o	|	|	|	| 0.68
40.167	0.00	0.08	0.141	o	|	|	|	| 0.68
40.250	0.00	0.08	0.141	o	|	|	|	| 0.67
40.333	0.00	0.08	0.140	o	|	|	|	| 0.67
40.417	0.00	0.08	0.140	o	|	|	|	| 0.67
40.500	0.00	0.08	0.139	o	|	|	|	| 0.67
40.583	0.00	0.08	0.138	o	|	|	|	| 0.66
40.667	0.00	0.08	0.138	o	|	|	|	| 0.66
40.750	0.00	0.08	0.137	o	|	|	|	| 0.66
40.833	0.00	0.08	0.137	o	|	|	|	| 0.65
40.917	0.00	0.08	0.136	o	|	|	|	| 0.65
41.000	0.00	0.08	0.136	o	|	|	|	| 0.65
41.083	0.00	0.08	0.135	o	|	|	|	| 0.65
41.167	0.00	0.08	0.135	o	|	|	|	| 0.64
41.250	0.00	0.08	0.134	o	|	|	|	| 0.64
41.333	0.00	0.08	0.134	o	|	|	|	| 0.64
41.417	0.00	0.08	0.133	o	|	|	|	| 0.64
41.500	0.00	0.08	0.132	o	|	|	|	| 0.63
41.583	0.00	0.08	0.132	o	|	|	|	| 0.63
41.667	0.00	0.08	0.131	o	|	|	|	| 0.63
41.750	0.00	0.08	0.131	o	|	|	|	| 0.63
41.833	0.00	0.08	0.130	o	|	|	|	| 0.62
41.917	0.00	0.08	0.130	o	|	|	|	| 0.62
42.000	0.00	0.08	0.129	o	|	|	|	| 0.62
42.083	0.00	0.08	0.129	o	|	|	|	| 0.62
42.167	0.00	0.08	0.128	o	|	|	|	| 0.61
42.250	0.00	0.08	0.128	o	|	|	|	| 0.61
42.333	0.00	0.08	0.127	o	|	|	|	| 0.61
42.417	0.00	0.08	0.127	o	|	|	|	| 0.61
42.500	0.00	0.08	0.126	o	|	|	|	| 0.60
42.583	0.00	0.08	0.126	o	|	|	|	| 0.60

42.667	0.00	0.08	0.125	o	|	|	|	|	0.60
42.750	0.00	0.08	0.125	o	|	|	|	|	0.59
42.833	0.00	0.08	0.124	o	|	|	|	|	0.59
42.917	0.00	0.08	0.124	o	|	|	|	|	0.59
43.000	0.00	0.08	0.123	o	|	|	|	|	0.59
43.083	0.00	0.07	0.122	o	|	|	|	|	0.58
43.167	0.00	0.07	0.122	o	|	|	|	|	0.58
43.250	0.00	0.07	0.121	o	|	|	|	|	0.58
43.333	0.00	0.07	0.121	o	|	|	|	|	0.58
43.417	0.00	0.07	0.120	o	|	|	|	|	0.57
43.500	0.00	0.07	0.120	o	|	|	|	|	0.57
43.583	0.00	0.07	0.119	o	|	|	|	|	0.57
43.667	0.00	0.07	0.119	o	|	|	|	|	0.57
43.750	0.00	0.07	0.118	o	|	|	|	|	0.57
43.833	0.00	0.07	0.118	o	|	|	|	|	0.56
43.917	0.00	0.07	0.117	o	|	|	|	|	0.56
44.000	0.00	0.07	0.117	o	|	|	|	|	0.56
44.083	0.00	0.07	0.116	o	|	|	|	|	0.56
44.167	0.00	0.07	0.116	o	|	|	|	|	0.55
44.250	0.00	0.07	0.115	o	|	|	|	|	0.55
44.333	0.00	0.07	0.115	o	|	|	|	|	0.55
44.417	0.00	0.07	0.114	o	|	|	|	|	0.55
44.500	0.00	0.07	0.114	o	|	|	|	|	0.54
44.583	0.00	0.07	0.113	o	|	|	|	|	0.54
44.667	0.00	0.07	0.113	o	|	|	|	|	0.54
44.750	0.00	0.07	0.112	o	|	|	|	|	0.54
44.833	0.00	0.07	0.112	o	|	|	|	|	0.53
44.917	0.00	0.07	0.111	o	|	|	|	|	0.53
45.000	0.00	0.07	0.111	o	|	|	|	|	0.53
45.083	0.00	0.07	0.110	o	|	|	|	|	0.53
45.167	0.00	0.07	0.110	o	|	|	|	|	0.52
45.250	0.00	0.07	0.109	o	|	|	|	|	0.52
45.333	0.00	0.07	0.109	o	|	|	|	|	0.52
45.417	0.00	0.07	0.108	o	|	|	|	|	0.52
45.500	0.00	0.07	0.108	o	|	|	|	|	0.51
45.583	0.00	0.07	0.107	o	|	|	|	|	0.51
45.667	0.00	0.07	0.107	o	|	|	|	|	0.51
45.750	0.00	0.07	0.106	o	|	|	|	|	0.51
45.833	0.00	0.07	0.106	o	|	|	|	|	0.50
45.917	0.00	0.07	0.105	o	|	|	|	|	0.50
46.000	0.00	0.07	0.105	o	|	|	|	|	0.50
46.083	0.00	0.07	0.105	o	|	|	|	|	0.50
46.167	0.00	0.07	0.104	o	|	|	|	|	0.50
46.250	0.00	0.07	0.104	o	|	|	|	|	0.49
46.333	0.00	0.07	0.103	o	|	|	|	|	0.49
46.417	0.00	0.07	0.103	o	|	|	|	|	0.49
46.500	0.00	0.07	0.102	o	|	|	|	|	0.49
46.583	0.00	0.07	0.102	o	|	|	|	|	0.48
46.667	0.00	0.07	0.101	o	|	|	|	|	0.48
46.750	0.00	0.07	0.101	o	|	|	|	|	0.48
46.833	0.00	0.07	0.100	o	|	|	|	|	0.48
46.917	0.00	0.07	0.100	o	|	|	|	|	0.47
47.000	0.00	0.07	0.099	o	|	|	|	|	0.47
47.083	0.00	0.07	0.099	o	|	|	|	|	0.47
47.167	0.00	0.07	0.098	o	|	|	|	|	0.47
47.250	0.00	0.07	0.098	o	|	|	|	|	0.47
47.333	0.00	0.07	0.097	o	|	|	|	|	0.46
47.417	0.00	0.07	0.097	o	|	|	|	|	0.46
47.500	0.00	0.07	0.096	o	|	|	|	|	0.46
47.583	0.00	0.07	0.096	o	|	|	|	|	0.46
47.667	0.00	0.07	0.096	o	|	|	|	|	0.45
47.750	0.00	0.07	0.095	o	|	|	|	|	0.45
47.833	0.00	0.07	0.095	o	|	|	|	|	0.45
47.917	0.00	0.07	0.094	o	|	|	|	|	0.45
48.000	0.00	0.07	0.094	o	|	|	|	|	0.45
48.083	0.00	0.07	0.093	o	|	|	|	|	0.44

48.167	0.00	0.07	0.093	o				0.44
48.250	0.00	0.07	0.092	o				0.44
48.333	0.00	0.07	0.092	o				0.44
48.417	0.00	0.07	0.091	o				0.43
48.500	0.00	0.07	0.091	o				0.43
48.583	0.00	0.07	0.091	o				0.43
48.667	0.00	0.07	0.090	o				0.43
48.750	0.00	0.07	0.090	o				0.43
48.833	0.00	0.07	0.089	o				0.42
48.917	0.00	0.07	0.089	o				0.42
49.000	0.00	0.07	0.088	o				0.42
49.083	0.00	0.07	0.088	o				0.42
49.167	0.00	0.06	0.087	o				0.41
49.250	0.00	0.06	0.087	o				0.41
49.333	0.00	0.06	0.086	o				0.41
49.417	0.00	0.06	0.086	o				0.41
49.500	0.00	0.06	0.086	o				0.41
49.583	0.00	0.06	0.085	o				0.40
49.667	0.00	0.06	0.085	o				0.40
49.750	0.00	0.06	0.084	o				0.40
49.833	0.00	0.06	0.084	o				0.40
49.917	0.00	0.06	0.083	o				0.39
50.000	0.00	0.06	0.083	o				0.39
50.083	0.00	0.06	0.082	o				0.39
50.167	0.00	0.06	0.082	o				0.39
50.250	0.00	0.06	0.082	o				0.39
50.333	0.00	0.06	0.081	o				0.38
50.417	0.00	0.06	0.081	o				0.38
50.500	0.00	0.06	0.080	o				0.38
50.583	0.00	0.06	0.080	o				0.38
50.667	0.00	0.06	0.079	o				0.38
50.750	0.00	0.06	0.079	o				0.37
50.833	0.00	0.06	0.079	o				0.37
50.917	0.00	0.06	0.078	o				0.37
51.000	0.00	0.06	0.078	o				0.37
51.083	0.00	0.06	0.077	o				0.37
51.167	0.00	0.06	0.077	o				0.36
51.250	0.00	0.06	0.076	o				0.36
51.333	0.00	0.06	0.076	o				0.36
51.417	0.00	0.06	0.076	o				0.36
51.500	0.00	0.06	0.075	o				0.36
51.583	0.00	0.06	0.075	o				0.35
51.667	0.00	0.06	0.074	o				0.35
51.750	0.00	0.06	0.074	o				0.35
51.833	0.00	0.06	0.073	o				0.35
51.917	0.00	0.06	0.073	o				0.34
52.000	0.00	0.06	0.073	o				0.34
52.083	0.00	0.06	0.072	o				0.34
52.167	0.00	0.06	0.072	o				0.34
52.250	0.00	0.06	0.071	o				0.34
52.333	0.00	0.06	0.071	o				0.33
52.417	0.00	0.06	0.071	o				0.33
52.500	0.00	0.06	0.070	o				0.33
52.583	0.00	0.06	0.070	o				0.33
52.667	0.00	0.06	0.069	o				0.33
52.750	0.00	0.06	0.069	o				0.32
52.833	0.00	0.06	0.069	o				0.32
52.917	0.00	0.06	0.068	o				0.32
53.000	0.00	0.06	0.068	o				0.32
53.083	0.00	0.06	0.067	o				0.32
53.167	0.00	0.06	0.067	o				0.32
53.250	0.00	0.06	0.067	o				0.31
53.333	0.00	0.06	0.066	o				0.31
53.417	0.00	0.06	0.066	o				0.31
53.500	0.00	0.06	0.065	o				0.31
53.583	0.00	0.06	0.065	o				0.31

53.667	0.00	0.06	0.065	o					0.30
53.750	0.00	0.06	0.064	o					0.30
53.833	0.00	0.05	0.064	o					0.30
53.917	0.00	0.05	0.063	o					0.30
54.000	0.00	0.05	0.063	o					0.30
54.083	0.00	0.05	0.063	o					0.30
54.167	0.00	0.05	0.062	o					0.29
54.250	0.00	0.05	0.062	o					0.29
54.333	0.00	0.05	0.062	o					0.29
54.417	0.00	0.05	0.061	o					0.29
54.500	0.00	0.05	0.061	o					0.29
54.583	0.00	0.05	0.061	o					0.29
54.667	0.00	0.05	0.060	o					0.28
54.750	0.00	0.05	0.060	o					0.28
54.833	0.00	0.05	0.059	o					0.28
54.917	0.00	0.05	0.059	o					0.28
55.000	0.00	0.05	0.059	o					0.28
55.083	0.00	0.05	0.058	o					0.28
55.167	0.00	0.05	0.058	o					0.27
55.250	0.00	0.05	0.058	o					0.27
55.333	0.00	0.05	0.057	o					0.27
55.417	0.00	0.05	0.057	o					0.27
55.500	0.00	0.05	0.057	o					0.27
55.583	0.00	0.05	0.056	o					0.27
55.667	0.00	0.05	0.056	o					0.26
55.750	0.00	0.05	0.056	o					0.26
55.833	0.00	0.05	0.055	o					0.26
55.917	0.00	0.05	0.055	o					0.26
56.000	0.00	0.05	0.055	o					0.26
56.083	0.00	0.05	0.054	o					0.26
56.167	0.00	0.05	0.054	o					0.26
56.250	0.00	0.05	0.054	o					0.25
56.333	0.00	0.05	0.053	o					0.25
56.417	0.00	0.05	0.053	o					0.25
56.500	0.00	0.05	0.053	o					0.25
56.583	0.00	0.05	0.053	o					0.25
56.667	0.00	0.04	0.052	o					0.25
56.750	0.00	0.04	0.052	o					0.24
56.833	0.00	0.04	0.052	o					0.24
56.917	0.00	0.04	0.051	o					0.24
57.000	0.00	0.04	0.051	o					0.24
57.083	0.00	0.04	0.051	o					0.24
57.167	0.00	0.04	0.050	o					0.24
57.250	0.00	0.04	0.050	o					0.24
57.333	0.00	0.04	0.050	o					0.23
57.417	0.00	0.04	0.050	o					0.23
57.500	0.00	0.04	0.049	o					0.23
57.583	0.00	0.04	0.049	o					0.23
57.667	0.00	0.04	0.049	o					0.23
57.750	0.00	0.04	0.048	o					0.23
57.833	0.00	0.04	0.048	o					0.23
57.917	0.00	0.04	0.048	o					0.23
58.000	0.00	0.04	0.048	o					0.22
58.083	0.00	0.04	0.047	o					0.22
58.167	0.00	0.04	0.047	o					0.22
58.250	0.00	0.04	0.047	o					0.22
58.333	0.00	0.04	0.046	o					0.22
58.417	0.00	0.04	0.046	o					0.22
58.500	0.00	0.04	0.046	o					0.22
58.583	0.00	0.04	0.046	o					0.21
58.667	0.00	0.04	0.045	o					0.21
58.750	0.00	0.04	0.045	o					0.21
58.833	0.00	0.04	0.045	o					0.21
58.917	0.00	0.04	0.045	o					0.21
59.000	0.00	0.04	0.044	o					0.21
59.083	0.00	0.04	0.044	o					0.21

59.167	0.00	0.04	0.044	o	|	|	|	0.21
59.250	0.00	0.04	0.043	o	|	|	|	0.21
59.333	0.00	0.04	0.043	o	|	|	|	0.20
59.417	0.00	0.04	0.043	o	|	|	|	0.20
59.500	0.00	0.04	0.043	o	|	|	|	0.20
59.583	0.00	0.04	0.042	o	|	|	|	0.20
59.667	0.00	0.04	0.042	o	|	|	|	0.20
59.750	0.00	0.04	0.042	o	|	|	|	0.20
59.833	0.00	0.04	0.042	o	|	|	|	0.20
59.917	0.00	0.04	0.041	o	|	|	|	0.20
60.000	0.00	0.04	0.041	o	|	|	|	0.19
60.083	0.00	0.04	0.041	o	|	|	|	0.19
60.167	0.00	0.03	0.041	o	|	|	|	0.19
60.250	0.00	0.03	0.041	o	|	|	|	0.19
60.333	0.00	0.03	0.040	o	|	|	|	0.19
60.417	0.00	0.03	0.040	o	|	|	|	0.19
60.500	0.00	0.03	0.040	o	|	|	|	0.19
60.583	0.00	0.03	0.040	o	|	|	|	0.19
60.667	0.00	0.03	0.039	o	|	|	|	0.19
60.750	0.00	0.03	0.039	o	|	|	|	0.18
60.833	0.00	0.03	0.039	o	|	|	|	0.18
60.917	0.00	0.03	0.039	o	|	|	|	0.18
61.000	0.00	0.03	0.038	o	|	|	|	0.18
61.083	0.00	0.03	0.038	o	|	|	|	0.18
61.167	0.00	0.03	0.038	o	|	|	|	0.18
61.250	0.00	0.03	0.038	o	|	|	|	0.18
61.333	0.00	0.03	0.038	o	|	|	|	0.18
61.417	0.00	0.03	0.037	o	|	|	|	0.18
61.500	0.00	0.03	0.037	o	|	|	|	0.17
61.583	0.00	0.03	0.037	o	|	|	|	0.17
61.667	0.00	0.03	0.037	o	|	|	|	0.17
61.750	0.00	0.03	0.036	o	|	|	|	0.17
61.833	0.00	0.03	0.036	o	|	|	|	0.17
61.917	0.00	0.03	0.036	o	|	|	|	0.17
62.000	0.00	0.03	0.036	o	|	|	|	0.17
62.083	0.00	0.03	0.036	o	|	|	|	0.17
62.167	0.00	0.03	0.035	o	|	|	|	0.17
62.250	0.00	0.03	0.035	o	|	|	|	0.17
62.333	0.00	0.03	0.035	o	|	|	|	0.16
62.417	0.00	0.03	0.035	o	|	|	|	0.16
62.500	0.00	0.03	0.035	o	|	|	|	0.16
62.583	0.00	0.03	0.034	o	|	|	|	0.16
62.667	0.00	0.03	0.034	o	|	|	|	0.16
62.750	0.00	0.03	0.034	o	|	|	|	0.16
62.833	0.00	0.03	0.034	o	|	|	|	0.16
62.917	0.00	0.03	0.034	o	|	|	|	0.16
63.000	0.00	0.03	0.033	o	|	|	|	0.16
63.083	0.00	0.03	0.033	o	|	|	|	0.16
63.167	0.00	0.03	0.033	o	|	|	|	0.16
63.250	0.00	0.03	0.033	o	|	|	|	0.15
63.333	0.00	0.03	0.033	o	|	|	|	0.15
63.417	0.00	0.03	0.032	o	|	|	|	0.15
63.500	0.00	0.03	0.032	o	|	|	|	0.15
63.583	0.00	0.03	0.032	o	|	|	|	0.15
63.667	0.00	0.03	0.032	o	|	|	|	0.15
63.750	0.00	0.03	0.032	o	|	|	|	0.15
63.833	0.00	0.03	0.031	o	|	|	|	0.15
63.917	0.00	0.03	0.031	o	|	|	|	0.15
64.000	0.00	0.03	0.031	o	|	|	|	0.15
64.083	0.00	0.03	0.031	o	|	|	|	0.15
64.167	0.00	0.03	0.031	o	|	|	|	0.14
64.250	0.00	0.03	0.031	o	|	|	|	0.14
64.333	0.00	0.03	0.030	o	|	|	|	0.14
64.417	0.00	0.03	0.030	o	|	|	|	0.14
64.500	0.00	0.03	0.030	o	|	|	|	0.14
64.583	0.00	0.03	0.030	o	|	|	|	0.14

64.667	0.00	0.03	0.030	o	|	|	|	0.14
64.750	0.00	0.03	0.029	o	|	|	|	0.14
64.833	0.00	0.03	0.029	o	|	|	|	0.14
64.917	0.00	0.02	0.029	o	|	|	|	0.14
65.000	0.00	0.02	0.029	o	|	|	|	0.14
65.083	0.00	0.02	0.029	o	|	|	|	0.14
65.167	0.00	0.02	0.029	o	|	|	|	0.13
65.250	0.00	0.02	0.028	o	|	|	|	0.13
65.333	0.00	0.02	0.028	o	|	|	|	0.13
65.417	0.00	0.02	0.028	o	|	|	|	0.13
65.500	0.00	0.02	0.028	o	|	|	|	0.13
65.583	0.00	0.02	0.028	o	|	|	|	0.13
65.667	0.00	0.02	0.028	o	|	|	|	0.13
65.750	0.00	0.02	0.027	o	|	|	|	0.13
65.833	0.00	0.02	0.027	o	|	|	|	0.13
65.917	0.00	0.02	0.027	o	|	|	|	0.13
66.000	0.00	0.02	0.027	o	|	|	|	0.13
66.083	0.00	0.02	0.027	o	|	|	|	0.13
66.167	0.00	0.02	0.027	o	|	|	|	0.13
66.250	0.00	0.02	0.026	o	|	|	|	0.12
66.333	0.00	0.02	0.026	o	|	|	|	0.12
66.417	0.00	0.02	0.026	o	|	|	|	0.12
66.500	0.00	0.02	0.026	o	|	|	|	0.12
66.583	0.00	0.02	0.026	o	|	|	|	0.12
66.667	0.00	0.02	0.026	o	|	|	|	0.12
66.750	0.00	0.02	0.026	o	|	|	|	0.12
66.833	0.00	0.02	0.025	o	|	|	|	0.12
66.917	0.00	0.02	0.025	o	|	|	|	0.12
67.000	0.00	0.02	0.025	o	|	|	|	0.12
67.083	0.00	0.02	0.025	o	|	|	|	0.12
67.167	0.00	0.02	0.025	o	|	|	|	0.12
67.250	0.00	0.02	0.025	o	|	|	|	0.12
67.333	0.00	0.02	0.025	o	|	|	|	0.12
67.417	0.00	0.02	0.024	o	|	|	|	0.11
67.500	0.00	0.02	0.024	o	|	|	|	0.11
67.583	0.00	0.02	0.024	o	|	|	|	0.11
67.667	0.00	0.02	0.024	o	|	|	|	0.11
67.750	0.00	0.02	0.024	o	|	|	|	0.11
67.833	0.00	0.02	0.024	o	|	|	|	0.11
67.917	0.00	0.02	0.024	o	|	|	|	0.11
68.000	0.00	0.02	0.023	o	|	|	|	0.11
68.083	0.00	0.02	0.023	o	|	|	|	0.11
68.167	0.00	0.02	0.023	o	|	|	|	0.11
68.250	0.00	0.02	0.023	o	|	|	|	0.11
68.333	0.00	0.02	0.023	o	|	|	|	0.11
68.417	0.00	0.02	0.023	o	|	|	|	0.11
68.500	0.00	0.02	0.023	o	|	|	|	0.11
68.583	0.00	0.02	0.022	o	|	|	|	0.11
68.667	0.00	0.02	0.022	o	|	|	|	0.11
68.750	0.00	0.02	0.022	o	|	|	|	0.10
68.833	0.00	0.02	0.022	o	|	|	|	0.10
68.917	0.00	0.02	0.022	o	|	|	|	0.10
69.000	0.00	0.02	0.022	o	|	|	|	0.10
69.083	0.00	0.02	0.022	o	|	|	|	0.10
69.167	0.00	0.02	0.022	o	|	|	|	0.10
69.250	0.00	0.02	0.021	o	|	|	|	0.10
69.333	0.00	0.02	0.021	o	|	|	|	0.10
69.417	0.00	0.02	0.021	o	|	|	|	0.10
69.500	0.00	0.02	0.021	o	|	|	|	0.10
69.583	0.00	0.02	0.021	o	|	|	|	0.10
69.667	0.00	0.02	0.021	o	|	|	|	0.10
69.750	0.00	0.02	0.021	o	|	|	|	0.10
69.833	0.00	0.02	0.021	o	|	|	|	0.10
69.917	0.00	0.02	0.020	o	|	|	|	0.10
70.000	0.00	0.02	0.020	o	|	|	|	0.10
70.083	0.00	0.02	0.020	o	|	|	|	0.10

70.167	0.00	0.02	0.020	o	|	|	|	0.09
70.250	0.00	0.02	0.020	o	|	|	|	0.09
70.333	0.00	0.02	0.020	o	|	|	|	0.09
70.417	0.00	0.02	0.020	o	|	|	|	0.09
70.500	0.00	0.02	0.020	o	|	|	|	0.09
70.583	0.00	0.02	0.019	o	|	|	|	0.09
70.667	0.00	0.02	0.019	o	|	|	|	0.09
70.750	0.00	0.02	0.019	o	|	|	|	0.09
70.833	0.00	0.02	0.019	o	|	|	|	0.09
70.917	0.00	0.02	0.019	o	|	|	|	0.09
71.000	0.00	0.02	0.019	o	|	|	|	0.09
71.083	0.00	0.02	0.019	o	|	|	|	0.09
71.167	0.00	0.02	0.019	o	|	|	|	0.09
71.250	0.00	0.02	0.019	o	|	|	|	0.09
71.333	0.00	0.02	0.018	o	|	|	|	0.09
71.417	0.00	0.02	0.018	o	|	|	|	0.09
71.500	0.00	0.02	0.018	o	|	|	|	0.09
71.583	0.00	0.02	0.018	o	|	|	|	0.09
71.667	0.00	0.02	0.018	o	|	|	|	0.09
71.750	0.00	0.02	0.018	o	|	|	|	0.08
71.833	0.00	0.02	0.018	o	|	|	|	0.08
71.917	0.00	0.02	0.018	o	|	|	|	0.08
72.000	0.00	0.02	0.018	o	|	|	|	0.08
72.083	0.00	0.02	0.018	o	|	|	|	0.08
72.167	0.00	0.01	0.017	o	|	|	|	0.08
72.250	0.00	0.01	0.017	o	|	|	|	0.08
72.333	0.00	0.01	0.017	o	|	|	|	0.08
72.417	0.00	0.01	0.017	o	|	|	|	0.08
72.500	0.00	0.01	0.017	o	|	|	|	0.08
72.583	0.00	0.01	0.017	o	|	|	|	0.08
72.667	0.00	0.01	0.017	o	|	|	|	0.08
72.750	0.00	0.01	0.017	o	|	|	|	0.08
72.833	0.00	0.01	0.017	o	|	|	|	0.08
72.917	0.00	0.01	0.017	o	|	|	|	0.08
73.000	0.00	0.01	0.016	o	|	|	|	0.08
73.083	0.00	0.01	0.016	o	|	|	|	0.08
73.167	0.00	0.01	0.016	o	|	|	|	0.08
73.250	0.00	0.01	0.016	o	|	|	|	0.08
73.333	0.00	0.01	0.016	o	|	|	|	0.08
73.417	0.00	0.01	0.016	o	|	|	|	0.08
73.500	0.00	0.01	0.016	o	|	|	|	0.07
73.583	0.00	0.01	0.016	o	|	|	|	0.07
73.667	0.00	0.01	0.016	o	|	|	|	0.07
73.750	0.00	0.01	0.016	o	|	|	|	0.07
73.833	0.00	0.01	0.015	o	|	|	|	0.07
73.917	0.00	0.01	0.015	o	|	|	|	0.07
74.000	0.00	0.01	0.015	o	|	|	|	0.07
74.083	0.00	0.01	0.015	o	|	|	|	0.07
74.167	0.00	0.01	0.015	o	|	|	|	0.07
74.250	0.00	0.01	0.015	o	|	|	|	0.07
74.333	0.00	0.01	0.015	o	|	|	|	0.07
74.417	0.00	0.01	0.015	o	|	|	|	0.07
74.500	0.00	0.01	0.015	o	|	|	|	0.07
74.583	0.00	0.01	0.015	o	|	|	|	0.07
74.667	0.00	0.01	0.015	o	|	|	|	0.07
74.750	0.00	0.01	0.015	o	|	|	|	0.07
74.833	0.00	0.01	0.014	o	|	|	|	0.07
74.917	0.00	0.01	0.014	o	|	|	|	0.07
75.000	0.00	0.01	0.014	o	|	|	|	0.07
75.083	0.00	0.01	0.014	o	|	|	|	0.07
75.167	0.00	0.01	0.014	o	|	|	|	0.07
75.250	0.00	0.01	0.014	o	|	|	|	0.07
75.333	0.00	0.01	0.014	o	|	|	|	0.07
75.417	0.00	0.01	0.014	o	|	|	|	0.07
75.500	0.00	0.01	0.014	o	|	|	|	0.06
75.583	0.00	0.01	0.014	o	|	|	|	0.06

75.667	0.00	0.01	0.014	o	|	|	|	|	0.06
75.750	0.00	0.01	0.014	o	|	|	|	|	0.06
75.833	0.00	0.01	0.013	o	|	|	|	|	0.06
75.917	0.00	0.01	0.013	o	|	|	|	|	0.06
76.000	0.00	0.01	0.013	o	|	|	|	|	0.06
76.083	0.00	0.01	0.013	o	|	|	|	|	0.06
76.167	0.00	0.01	0.013	o	|	|	|	|	0.06
76.250	0.00	0.01	0.013	o	|	|	|	|	0.06
76.333	0.00	0.01	0.013	o	|	|	|	|	0.06
76.417	0.00	0.01	0.013	o	|	|	|	|	0.06
76.500	0.00	0.01	0.013	o	|	|	|	|	0.06
76.583	0.00	0.01	0.013	o	|	|	|	|	0.06
76.667	0.00	0.01	0.013	o	|	|	|	|	0.06
76.750	0.00	0.01	0.013	o	|	|	|	|	0.06
76.833	0.00	0.01	0.013	o	|	|	|	|	0.06
76.917	0.00	0.01	0.012	o	|	|	|	|	0.06
77.000	0.00	0.01	0.012	o	|	|	|	|	0.06
77.083	0.00	0.01	0.012	o	|	|	|	|	0.06
77.167	0.00	0.01	0.012	o	|	|	|	|	0.06
77.250	0.00	0.01	0.012	o	|	|	|	|	0.06
77.333	0.00	0.01	0.012	o	|	|	|	|	0.06
77.417	0.00	0.01	0.012	o	|	|	|	|	0.06
77.500	0.00	0.01	0.012	o	|	|	|	|	0.06
77.583	0.00	0.01	0.012	o	|	|	|	|	0.06
77.667	0.00	0.01	0.012	o	|	|	|	|	0.06
77.750	0.00	0.01	0.012	o	|	|	|	|	0.06
77.833	0.00	0.01	0.012	o	|	|	|	|	0.05
77.917	0.00	0.01	0.012	o	|	|	|	|	0.05
78.000	0.00	0.01	0.012	o	|	|	|	|	0.05
78.083	0.00	0.01	0.011	o	|	|	|	|	0.05
78.167	0.00	0.01	0.011	o	|	|	|	|	0.05
78.250	0.00	0.01	0.011	o	|	|	|	|	0.05
78.333	0.00	0.01	0.011	o	|	|	|	|	0.05
78.417	0.00	0.01	0.011	o	|	|	|	|	0.05
78.500	0.00	0.01	0.011	o	|	|	|	|	0.05
78.583	0.00	0.01	0.011	o	|	|	|	|	0.05
78.667	0.00	0.01	0.011	o	|	|	|	|	0.05
78.750	0.00	0.01	0.011	o	|	|	|	|	0.05
78.833	0.00	0.01	0.011	o	|	|	|	|	0.05
78.917	0.00	0.01	0.011	o	|	|	|	|	0.05
79.000	0.00	0.01	0.011	o	|	|	|	|	0.05
79.083	0.00	0.01	0.011	o	|	|	|	|	0.05
79.167	0.00	0.01	0.011	o	|	|	|	|	0.05
79.250	0.00	0.01	0.011	o	|	|	|	|	0.05
79.333	0.00	0.01	0.010	o	|	|	|	|	0.05
79.417	0.00	0.01	0.010	o	|	|	|	|	0.05
79.500	0.00	0.01	0.010	o	|	|	|	|	0.05
79.583	0.00	0.01	0.010	o	|	|	|	|	0.05
79.667	0.00	0.01	0.010	o	|	|	|	|	0.05
79.750	0.00	0.01	0.010	o	|	|	|	|	0.05
79.833	0.00	0.01	0.010	o	|	|	|	|	0.05
79.917	0.00	0.01	0.010	o	|	|	|	|	0.05
80.000	0.00	0.01	0.010	o	|	|	|	|	0.05
80.083	0.00	0.01	0.010	o	|	|	|	|	0.05
80.167	0.00	0.01	0.010	o	|	|	|	|	0.05
80.250	0.00	0.01	0.010	o	|	|	|	|	0.05
80.333	0.00	0.01	0.010	o	|	|	|	|	0.05
80.417	0.00	0.01	0.010	o	|	|	|	|	0.05
80.500	0.00	0.01	0.010	o	|	|	|	|	0.05
80.583	0.00	0.01	0.010	o	|	|	|	|	0.05
80.667	0.00	0.01	0.010	o	|	|	|	|	0.04
80.750	0.00	0.01	0.009	o	|	|	|	|	0.04
80.833	0.00	0.01	0.009	o	|	|	|	|	0.04
80.917	0.00	0.01	0.009	o	|	|	|	|	0.04
81.000	0.00	0.01	0.009	o	|	|	|	|	0.04
81.083	0.00	0.01	0.009	o	|	|	|	|	0.04

81.167	0.00	0.01	0.009	o	|	|	|	|	0.04
81.250	0.00	0.01	0.009	o	|	|	|	|	0.04
81.333	0.00	0.01	0.009	o	|	|	|	|	0.04
81.417	0.00	0.01	0.009	o	|	|	|	|	0.04
81.500	0.00	0.01	0.009	o	|	|	|	|	0.04
81.583	0.00	0.01	0.009	o	|	|	|	|	0.04
81.667	0.00	0.01	0.009	o	|	|	|	|	0.04
81.750	0.00	0.01	0.009	o	|	|	|	|	0.04
81.833	0.00	0.01	0.009	o	|	|	|	|	0.04
81.917	0.00	0.01	0.009	o	|	|	|	|	0.04
82.000	0.00	0.01	0.009	o	|	|	|	|	0.04
82.083	0.00	0.01	0.009	o	|	|	|	|	0.04
82.167	0.00	0.01	0.009	o	|	|	|	|	0.04
82.250	0.00	0.01	0.009	o	|	|	|	|	0.04
82.333	0.00	0.01	0.008	o	|	|	|	|	0.04
82.417	0.00	0.01	0.008	o	|	|	|	|	0.04
82.500	0.00	0.01	0.008	o	|	|	|	|	0.04
82.583	0.00	0.01	0.008	o	|	|	|	|	0.04
82.667	0.00	0.01	0.008	o	|	|	|	|	0.04
82.750	0.00	0.01	0.008	o	|	|	|	|	0.04
82.833	0.00	0.01	0.008	o	|	|	|	|	0.04
82.917	0.00	0.01	0.008	o	|	|	|	|	0.04
83.000	0.00	0.01	0.008	o	|	|	|	|	0.04
83.083	0.00	0.01	0.008	o	|	|	|	|	0.04
83.167	0.00	0.01	0.008	o	|	|	|	|	0.04
83.250	0.00	0.01	0.008	o	|	|	|	|	0.04
83.333	0.00	0.01	0.008	o	|	|	|	|	0.04
83.417	0.00	0.01	0.008	o	|	|	|	|	0.04
83.500	0.00	0.01	0.008	o	|	|	|	|	0.04
83.583	0.00	0.01	0.008	o	|	|	|	|	0.04
83.667	0.00	0.01	0.008	o	|	|	|	|	0.04
83.750	0.00	0.01	0.008	o	|	|	|	|	0.04
83.833	0.00	0.01	0.008	o	|	|	|	|	0.04
83.917	0.00	0.01	0.008	o	|	|	|	|	0.04
84.000	0.00	0.01	0.008	o	|	|	|	|	0.04
84.083	0.00	0.01	0.007	o	|	|	|	|	0.04
84.167	0.00	0.01	0.007	o	|	|	|	|	0.04
84.250	0.00	0.01	0.007	o	|	|	|	|	0.03
84.333	0.00	0.01	0.007	o	|	|	|	|	0.03
84.417	0.00	0.01	0.007	o	|	|	|	|	0.03
84.500	0.00	0.01	0.007	o	|	|	|	|	0.03
84.583	0.00	0.01	0.007	o	|	|	|	|	0.03
84.667	0.00	0.01	0.007	o	|	|	|	|	0.03
84.750	0.00	0.01	0.007	o	|	|	|	|	0.03
84.833	0.00	0.01	0.007	o	|	|	|	|	0.03
84.917	0.00	0.01	0.007	o	|	|	|	|	0.03
85.000	0.00	0.01	0.007	o	|	|	|	|	0.03
85.083	0.00	0.01	0.007	o	|	|	|	|	0.03
85.167	0.00	0.01	0.007	o	|	|	|	|	0.03
85.250	0.00	0.01	0.007	o	|	|	|	|	0.03
85.333	0.00	0.01	0.007	o	|	|	|	|	0.03
85.417	0.00	0.01	0.007	o	|	|	|	|	0.03
85.500	0.00	0.01	0.007	o	|	|	|	|	0.03
85.583	0.00	0.01	0.007	o	|	|	|	|	0.03
85.667	0.00	0.01	0.007	o	|	|	|	|	0.03
85.750	0.00	0.01	0.007	o	|	|	|	|	0.03
85.833	0.00	0.01	0.007	o	|	|	|	|	0.03
85.917	0.00	0.01	0.007	o	|	|	|	|	0.03
86.000	0.00	0.01	0.007	o	|	|	|	|	0.03
86.083	0.00	0.01	0.006	o	|	|	|	|	0.03
86.167	0.00	0.01	0.006	o	|	|	|	|	0.03
86.250	0.00	0.01	0.006	o	|	|	|	|	0.03
86.333	0.00	0.01	0.006	o	|	|	|	|	0.03
86.417	0.00	0.01	0.006	o	|	|	|	|	0.03
86.500	0.00	0.01	0.006	o	|	|	|	|	0.03
86.583	0.00	0.01	0.006	o	|	|	|	|	0.03

86.667	0.00	0.01	0.006	o	|	|	|	|	0.03
86.750	0.00	0.01	0.006	o	|	|	|	|	0.03
86.833	0.00	0.01	0.006	o	|	|	|	|	0.03
86.917	0.00	0.01	0.006	o	|	|	|	|	0.03
87.000	0.00	0.01	0.006	o	|	|	|	|	0.03
87.083	0.00	0.01	0.006	o	|	|	|	|	0.03
87.167	0.00	0.01	0.006	o	|	|	|	|	0.03
87.250	0.00	0.01	0.006	o	|	|	|	|	0.03
87.333	0.00	0.01	0.006	o	|	|	|	|	0.03
87.417	0.00	0.01	0.006	o	|	|	|	|	0.03
87.500	0.00	0.01	0.006	o	|	|	|	|	0.03
87.583	0.00	0.01	0.006	o	|	|	|	|	0.03
87.667	0.00	0.00	0.006	o	|	|	|	|	0.03
87.750	0.00	0.00	0.006	o	|	|	|	|	0.03
87.833	0.00	0.00	0.006	o	|	|	|	|	0.03
87.917	0.00	0.00	0.006	o	|	|	|	|	0.03
88.000	0.00	0.00	0.006	o	|	|	|	|	0.03
88.083	0.00	0.00	0.006	o	|	|	|	|	0.03
88.167	0.00	0.00	0.006	o	|	|	|	|	0.03
88.250	0.00	0.00	0.006	o	|	|	|	|	0.03
88.333	0.00	0.00	0.006	o	|	|	|	|	0.03
88.417	0.00	0.00	0.006	o	|	|	|	|	0.03
88.500	0.00	0.00	0.005	o	|	|	|	|	0.03
88.583	0.00	0.00	0.005	o	|	|	|	|	0.03
88.667	0.00	0.00	0.005	o	|	|	|	|	0.03
88.750	0.00	0.00	0.005	o	|	|	|	|	0.03
88.833	0.00	0.00	0.005	o	|	|	|	|	0.03
88.917	0.00	0.00	0.005	o	|	|	|	|	0.03
89.000	0.00	0.00	0.005	o	|	|	|	|	0.02
89.083	0.00	0.00	0.005	o	|	|	|	|	0.02
89.167	0.00	0.00	0.005	o	|	|	|	|	0.02
89.250	0.00	0.00	0.005	o	|	|	|	|	0.02
89.333	0.00	0.00	0.005	o	|	|	|	|	0.02
89.417	0.00	0.00	0.005	o	|	|	|	|	0.02
89.500	0.00	0.00	0.005	o	|	|	|	|	0.02
89.583	0.00	0.00	0.005	o	|	|	|	|	0.02
89.667	0.00	0.00	0.005	o	|	|	|	|	0.02
89.750	0.00	0.00	0.005	o	|	|	|	|	0.02
89.833	0.00	0.00	0.005	o	|	|	|	|	0.02
89.917	0.00	0.00	0.005	o	|	|	|	|	0.02
90.000	0.00	0.00	0.005	o	|	|	|	|	0.02
90.083	0.00	0.00	0.005	o	|	|	|	|	0.02
90.167	0.00	0.00	0.005	o	|	|	|	|	0.02
90.250	0.00	0.00	0.005	o	|	|	|	|	0.02
90.333	0.00	0.00	0.005	o	|	|	|	|	0.02
90.417	0.00	0.00	0.005	o	|	|	|	|	0.02
90.500	0.00	0.00	0.005	o	|	|	|	|	0.02
90.583	0.00	0.00	0.005	o	|	|	|	|	0.02
90.667	0.00	0.00	0.005	o	|	|	|	|	0.02
90.750	0.00	0.00	0.005	o	|	|	|	|	0.02
90.833	0.00	0.00	0.005	o	|	|	|	|	0.02
90.917	0.00	0.00	0.005	o	|	|	|	|	0.02
91.000	0.00	0.00	0.005	o	|	|	|	|	0.02
91.083	0.00	0.00	0.005	o	|	|	|	|	0.02
91.167	0.00	0.00	0.005	o	|	|	|	|	0.02
91.250	0.00	0.00	0.005	o	|	|	|	|	0.02
91.333	0.00	0.00	0.004	o	|	|	|	|	0.02
91.417	0.00	0.00	0.004	o	|	|	|	|	0.02
91.500	0.00	0.00	0.004	o	|	|	|	|	0.02
91.583	0.00	0.00	0.004	o	|	|	|	|	0.02
91.667	0.00	0.00	0.004	o	|	|	|	|	0.02
91.750	0.00	0.00	0.004	o	|	|	|	|	0.02
91.833	0.00	0.00	0.004	o	|	|	|	|	0.02
91.917	0.00	0.00	0.004	o	|	|	|	|	0.02
92.000	0.00	0.00	0.004	o	|	|	|	|	0.02
92.083	0.00	0.00	0.004	o	|	|	|	|	0.02

92.167	0.00	0.00	0.004	o	|	|	|	|	0.02
92.250	0.00	0.00	0.004	o	|	|	|	|	0.02
92.333	0.00	0.00	0.004	o	|	|	|	|	0.02
92.417	0.00	0.00	0.004	o	|	|	|	|	0.02
92.500	0.00	0.00	0.004	o	|	|	|	|	0.02
92.583	0.00	0.00	0.004	o	|	|	|	|	0.02
92.667	0.00	0.00	0.004	o	|	|	|	|	0.02
92.750	0.00	0.00	0.004	o	|	|	|	|	0.02
92.833	0.00	0.00	0.004	o	|	|	|	|	0.02
92.917	0.00	0.00	0.004	o	|	|	|	|	0.02
93.000	0.00	0.00	0.004	o	|	|	|	|	0.02
93.083	0.00	0.00	0.004	o	|	|	|	|	0.02
93.167	0.00	0.00	0.004	o	|	|	|	|	0.02
93.250	0.00	0.00	0.004	o	|	|	|	|	0.02
93.333	0.00	0.00	0.004	o	|	|	|	|	0.02
93.417	0.00	0.00	0.004	o	|	|	|	|	0.02
93.500	0.00	0.00	0.004	o	|	|	|	|	0.02
93.583	0.00	0.00	0.004	o	|	|	|	|	0.02
93.667	0.00	0.00	0.004	o	|	|	|	|	0.02
93.750	0.00	0.00	0.004	o	|	|	|	|	0.02
93.833	0.00	0.00	0.004	o	|	|	|	|	0.02
93.917	0.00	0.00	0.004	o	|	|	|	|	0.02
94.000	0.00	0.00	0.004	o	|	|	|	|	0.02
94.083	0.00	0.00	0.004	o	|	|	|	|	0.02
94.167	0.00	0.00	0.004	o	|	|	|	|	0.02
94.250	0.00	0.00	0.004	o	|	|	|	|	0.02
94.333	0.00	0.00	0.004	o	|	|	|	|	0.02
94.417	0.00	0.00	0.004	o	|	|	|	|	0.02
94.500	0.00	0.00	0.004	o	|	|	|	|	0.02
94.583	0.00	0.00	0.004	o	|	|	|	|	0.02
94.667	0.00	0.00	0.004	o	|	|	|	|	0.02
94.750	0.00	0.00	0.004	o	|	|	|	|	0.02
94.833	0.00	0.00	0.003	o	|	|	|	|	0.02
94.917	0.00	0.00	0.003	o	|	|	|	|	0.02
95.000	0.00	0.00	0.003	o	|	|	|	|	0.02
95.083	0.00	0.00	0.003	o	|	|	|	|	0.02
95.167	0.00	0.00	0.003	o	|	|	|	|	0.02
95.250	0.00	0.00	0.003	o	|	|	|	|	0.02
95.333	0.00	0.00	0.003	o	|	|	|	|	0.02
95.417	0.00	0.00	0.003	o	|	|	|	|	0.02
95.500	0.00	0.00	0.003	o	|	|	|	|	0.02
95.583	0.00	0.00	0.003	o	|	|	|	|	0.02
95.667	0.00	0.00	0.003	o	|	|	|	|	0.02
95.750	0.00	0.00	0.003	o	|	|	|	|	0.02
95.833	0.00	0.00	0.003	o	|	|	|	|	0.02
95.917	0.00	0.00	0.003	o	|	|	|	|	0.02
96.000	0.00	0.00	0.003	o	|	|	|	|	0.02
96.083	0.00	0.00	0.003	o	|	|	|	|	0.02
96.167	0.00	0.00	0.003	o	|	|	|	|	0.01
96.250	0.00	0.00	0.003	o	|	|	|	|	0.01
96.333	0.00	0.00	0.003	o	|	|	|	|	0.01
96.417	0.00	0.00	0.003	o	|	|	|	|	0.01
96.500	0.00	0.00	0.003	o	|	|	|	|	0.01
96.583	0.00	0.00	0.003	o	|	|	|	|	0.01
96.667	0.00	0.00	0.003	o	|	|	|	|	0.01
96.750	0.00	0.00	0.003	o	|	|	|	|	0.01
96.833	0.00	0.00	0.003	o	|	|	|	|	0.01
96.917	0.00	0.00	0.003	o	|	|	|	|	0.01
97.000	0.00	0.00	0.003	o	|	|	|	|	0.01
97.083	0.00	0.00	0.003	o	|	|	|	|	0.01
97.167	0.00	0.00	0.003	o	|	|	|	|	0.01
97.250	0.00	0.00	0.003	o	|	|	|	|	0.01
97.333	0.00	0.00	0.003	o	|	|	|	|	0.01
97.417	0.00	0.00	0.003	o	|	|	|	|	0.01
97.500	0.00	0.00	0.003	o	|	|	|	|	0.01
97.583	0.00	0.00	0.003	o	|	|	|	|	0.01

97.667	0.00	0.00	0.003	o	|	|	|	|	0.01
97.750	0.00	0.00	0.003	o	|	|	|	|	0.01
97.833	0.00	0.00	0.003	o	|	|	|	|	0.01
97.917	0.00	0.00	0.003	o	|	|	|	|	0.01
98.000	0.00	0.00	0.003	o	|	|	|	|	0.01
98.083	0.00	0.00	0.003	o	|	|	|	|	0.01
98.167	0.00	0.00	0.003	o	|	|	|	|	0.01
98.250	0.00	0.00	0.003	o	|	|	|	|	0.01
98.333	0.00	0.00	0.003	o	|	|	|	|	0.01
98.417	0.00	0.00	0.003	o	|	|	|	|	0.01
98.500	0.00	0.00	0.003	o	|	|	|	|	0.01
98.583	0.00	0.00	0.003	o	|	|	|	|	0.01
98.667	0.00	0.00	0.003	o	|	|	|	|	0.01
98.750	0.00	0.00	0.003	o	|	|	|	|	0.01
98.833	0.00	0.00	0.003	o	|	|	|	|	0.01
98.917	0.00	0.00	0.003	o	|	|	|	|	0.01
99.000	0.00	0.00	0.003	o	|	|	|	|	0.01
99.083	0.00	0.00	0.003	o	|	|	|	|	0.01
99.167	0.00	0.00	0.003	o	|	|	|	|	0.01
99.250	0.00	0.00	0.003	o	|	|	|	|	0.01
99.333	0.00	0.00	0.003	o	|	|	|	|	0.01
99.417	0.00	0.00	0.003	o	|	|	|	|	0.01
99.500	0.00	0.00	0.003	o	|	|	|	|	0.01
99.583	0.00	0.00	0.002	o	|	|	|	|	0.01
99.667	0.00	0.00	0.002	o	|	|	|	|	0.01
99.750	0.00	0.00	0.002	o	|	|	|	|	0.01
99.833	0.00	0.00	0.002	o	|	|	|	|	0.01
99.917	0.00	0.00	0.002	o	|	|	|	|	0.01
100.000	0.00	0.00	0.002	o	|	|	|	|	0.01
100.083	0.00	0.00	0.002	o	|	|	|	|	0.01
100.167	0.00	0.00	0.002	o	|	|	|	|	0.01
100.250	0.00	0.00	0.002	o	|	|	|	|	0.01
100.333	0.00	0.00	0.002	o	|	|	|	|	0.01
100.417	0.00	0.00	0.002	o	|	|	|	|	0.01
100.500	0.00	0.00	0.002	o	|	|	|	|	0.01
100.583	0.00	0.00	0.002	o	|	|	|	|	0.01
100.667	0.00	0.00	0.002	o	|	|	|	|	0.01
100.750	0.00	0.00	0.002	o	|	|	|	|	0.01
100.833	0.00	0.00	0.002	o	|	|	|	|	0.01
100.917	0.00	0.00	0.002	o	|	|	|	|	0.01
101.000	0.00	0.00	0.002	o	|	|	|	|	0.01
101.083	0.00	0.00	0.002	o	|	|	|	|	0.01
101.167	0.00	0.00	0.002	o	|	|	|	|	0.01
101.250	0.00	0.00	0.002	o	|	|	|	|	0.01
101.333	0.00	0.00	0.002	o	|	|	|	|	0.01
101.417	0.00	0.00	0.002	o	|	|	|	|	0.01
101.500	0.00	0.00	0.002	o	|	|	|	|	0.01
101.583	0.00	0.00	0.002	o	|	|	|	|	0.01
101.667	0.00	0.00	0.002	o	|	|	|	|	0.01
101.750	0.00	0.00	0.002	o	|	|	|	|	0.01
101.833	0.00	0.00	0.002	o	|	|	|	|	0.01
101.917	0.00	0.00	0.002	o	|	|	|	|	0.01
102.000	0.00	0.00	0.002	o	|	|	|	|	0.01
102.083	0.00	0.00	0.002	o	|	|	|	|	0.01
102.167	0.00	0.00	0.002	o	|	|	|	|	0.01
102.250	0.00	0.00	0.002	o	|	|	|	|	0.01
102.333	0.00	0.00	0.002	o	|	|	|	|	0.01
102.417	0.00	0.00	0.002	o	|	|	|	|	0.01
102.500	0.00	0.00	0.002	o	|	|	|	|	0.01
102.583	0.00	0.00	0.002	o	|	|	|	|	0.01
102.667	0.00	0.00	0.002	o	|	|	|	|	0.01
102.750	0.00	0.00	0.002	o	|	|	|	|	0.01
102.833	0.00	0.00	0.002	o	|	|	|	|	0.01
102.917	0.00	0.00	0.002	o	|	|	|	|	0.01
103.000	0.00	0.00	0.002	o	|	|	|	|	0.01
103.083	0.00	0.00	0.002	o	|	|	|	|	0.01

103.167	0.00	0.00	0.002	o	|	|	|	|	0.01
103.250	0.00	0.00	0.002	o	|	|	|	|	0.01
103.333	0.00	0.00	0.002	o	|	|	|	|	0.01
103.417	0.00	0.00	0.002	o	|	|	|	|	0.01
103.500	0.00	0.00	0.002	o	|	|	|	|	0.01
103.583	0.00	0.00	0.002	o	|	|	|	|	0.01
103.667	0.00	0.00	0.002	o	|	|	|	|	0.01
103.750	0.00	0.00	0.002	o	|	|	|	|	0.01
103.833	0.00	0.00	0.002	o	|	|	|	|	0.01
103.917	0.00	0.00	0.002	o	|	|	|	|	0.01
104.000	0.00	0.00	0.002	o	|	|	|	|	0.01
104.083	0.00	0.00	0.002	o	|	|	|	|	0.01
104.167	0.00	0.00	0.002	o	|	|	|	|	0.01
104.250	0.00	0.00	0.002	o	|	|	|	|	0.01
104.333	0.00	0.00	0.002	o	|	|	|	|	0.01
104.417	0.00	0.00	0.002	o	|	|	|	|	0.01
104.500	0.00	0.00	0.002	o	|	|	|	|	0.01
104.583	0.00	0.00	0.002	o	|	|	|	|	0.01
104.667	0.00	0.00	0.002	o	|	|	|	|	0.01
104.750	0.00	0.00	0.002	o	|	|	|	|	0.01
104.833	0.00	0.00	0.002	o	|	|	|	|	0.01
104.917	0.00	0.00	0.002	o	|	|	|	|	0.01
105.000	0.00	0.00	0.002	o	|	|	|	|	0.01
105.083	0.00	0.00	0.002	o	|	|	|	|	0.01
105.167	0.00	0.00	0.002	o	|	|	|	|	0.01
105.250	0.00	0.00	0.002	o	|	|	|	|	0.01
105.333	0.00	0.00	0.002	o	|	|	|	|	0.01
105.417	0.00	0.00	0.002	o	|	|	|	|	0.01
105.500	0.00	0.00	0.002	o	|	|	|	|	0.01
105.583	0.00	0.00	0.002	o	|	|	|	|	0.01
105.667	0.00	0.00	0.002	o	|	|	|	|	0.01
105.750	0.00	0.00	0.002	o	|	|	|	|	0.01
105.833	0.00	0.00	0.002	o	|	|	|	|	0.01
105.917	0.00	0.00	0.002	o	|	|	|	|	0.01
106.000	0.00	0.00	0.002	o	|	|	|	|	0.01
106.083	0.00	0.00	0.002	o	|	|	|	|	0.01
106.167	0.00	0.00	0.002	o	|	|	|	|	0.01
106.250	0.00	0.00	0.002	o	|	|	|	|	0.01
106.333	0.00	0.00	0.002	o	|	|	|	|	0.01
106.417	0.00	0.00	0.002	o	|	|	|	|	0.01
106.500	0.00	0.00	0.002	o	|	|	|	|	0.01
106.583	0.00	0.00	0.002	o	|	|	|	|	0.01
106.667	0.00	0.00	0.002	o	|	|	|	|	0.01
106.750	0.00	0.00	0.002	o	|	|	|	|	0.01
106.833	0.00	0.00	0.001	o	|	|	|	|	0.01
106.917	0.00	0.00	0.001	o	|	|	|	|	0.01
107.000	0.00	0.00	0.001	o	|	|	|	|	0.01
107.083	0.00	0.00	0.001	o	|	|	|	|	0.01
107.167	0.00	0.00	0.001	o	|	|	|	|	0.01
107.250	0.00	0.00	0.001	o	|	|	|	|	0.01
107.333	0.00	0.00	0.001	o	|	|	|	|	0.01
107.417	0.00	0.00	0.001	o	|	|	|	|	0.01
107.500	0.00	0.00	0.001	o	|	|	|	|	0.01
107.583	0.00	0.00	0.001	o	|	|	|	|	0.01
107.667	0.00	0.00	0.001	o	|	|	|	|	0.01
107.750	0.00	0.00	0.001	o	|	|	|	|	0.01
107.833	0.00	0.00	0.001	o	|	|	|	|	0.01
107.917	0.00	0.00	0.001	o	|	|	|	|	0.01
108.000	0.00	0.00	0.001	o	|	|	|	|	0.01
108.083	0.00	0.00	0.001	o	|	|	|	|	0.01
108.167	0.00	0.00	0.001	o	|	|	|	|	0.01
108.250	0.00	0.00	0.001	o	|	|	|	|	0.01
108.333	0.00	0.00	0.001	o	|	|	|	|	0.01
108.417	0.00	0.00	0.001	o	|	|	|	|	0.01
108.500	0.00	0.00	0.001	o	|	|	|	|	0.01
108.583	0.00	0.00	0.001	o	|	|	|	|	0.01

```
108.667    0.00    0.00      0.001  o       |       |       |       |     0.01
108.750    0.00    0.00      0.001  o       |       |       |       |     0.01
108.833    0.00    0.00      0.001  o       |       |       |       |     0.01
108.917    0.00    0.00      0.001  o       |       |       |       |     0.01
109.000    0.00    0.00      0.001  o       |       |       |       |     0.01
109.083    0.00    0.00      0.001  o       |       |       |       |     0.01
109.167    0.00    0.00      0.001  o       |       |       |       |     0.01
109.250    0.00    0.00      0.001  o       |       |       |       |     0.01
109.333    0.00    0.00      0.001  o       |       |       |       |     0.01
109.417    0.00    0.00      0.001  o       |       |       |       |     0.01
109.500    0.00    0.00      0.001  o       |       |       |       |     0.01
109.583    0.00    0.00      0.001  o       |       |       |       |     0.01
109.667    0.00    0.00      0.001  o       |       |       |       |     0.01
109.750    0.00    0.00      0.001  o       |       |       |       |     0.01
109.833    0.00    0.00      0.001  o       |       |       |       |     0.01
109.917    0.00    0.00      0.001  o       |       |       |       |     0.01
110.000    0.00    0.00      0.001  o       |       |       |       |     0.01
110.083    0.00    0.00      0.001  o       |       |       |       |     0.01
110.167    0.00    0.00      0.001  o       |       |       |       |     0.01
110.250    0.00    0.00      0.001  o       |       |       |       |     0.01
110.333    0.00    0.00      0.001  o       |       |       |       |     0.01

 Remaining water in basin =    0.00 (Ac.Ft)

 ****************************HYDROGRAPH DATA****************************
              Number of intervals =  1324
              Time interval =    5.0 (Min.)
              Maximum/Peak flow rate =       24.436 (CFS)
              Total volume =       2.231 (Ac.Ft)
       Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
 ************************************************************************

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                FLOOD HYDROGRAPH ROUTING PROGRAM
          Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2022
                     Study date: 09/18/22

------------------------------------------------------------------------


XENIA
PRELIMINARY BASIN ROUTING MODEL
PRELIMINARY BASIN A
100-YEAR; 6-HOUR
------------------------------------------------------------------------


Program License Serial Number 6545

------------------------------------------------------------------------
********************* HYDROGRAPH INFORMATION **********************

             From study/file name: 2D6100.rte
*****************************HYDROGRAPH DATA*****************************
             Number of intervals =    78
             Time interval =    5.0 (Min.)
             Maximum/Peak flow rate =       23.758 (CFS)
             Total volume =       2.974 (Ac.Ft)
      Status of hydrographs being held in storage
                  Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
      Peak (CFS)      0.000     0.000     0.000     0.000     0.000
      Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*************************************************************************



++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.000 to Point/Station        2.000
**** RETARDING BASIN ROUTING ****
________________________________________________________________________

User entry of depth-outflow-storage data
------------------------------------------------------------------------
Total number of inflow hydrograph intervals = 78
Hydrograph time unit =  5.000 (Min.)
Initial depth in storage basin =   0.00(Ft.)
------------------------------------------------------------------------
------------------------------------------------------------------------
Initial basin depth =   0.00 (Ft.)
Initial basin storage =      0.00 (Ac.Ft)
Initial basin outflow =   0.00 (CFS)
------------------------------------------------------------------------
------------------------------------------------------------------------
Depth vs. Storage and Depth vs. Discharge data:
 Basin Depth  Storage    Outflow   (S-O*dt/2)   (S+O*dt/2)
     (Ft.)    (Ac.Ft)    (CFS)     (Ac.Ft)    (Ac.Ft)
------------------------------------------------------------------------
   0.000      0.000      0.000      0.000        0.000
   0.330      0.070      0.060      0.070        0.070
   0.670      0.140      0.080      0.140        0.140
   1.000      0.210      0.100      0.210        0.210
   1.330      0.290      0.110      0.290        0.290
   1.670      0.370      0.390      0.369        0.371
   2.000      0.450      0.530      0.448        0.452
   2.330      0.540      0.630      0.538        0.542
   2.670      0.630      0.720      0.628        0.632
   3.000      0.730      0.790      0.727        0.733
```

3.500	0.830	0.890	0.827	0.833
4.000	0.940	0.990	0.937	0.943
4.500	1.050	1.070	1.046	1.054
5.000	1.170	1.150	1.166	1.174
5.500	1.300	1.220	1.296	1.304
6.000	1.430	25.420	1.342	1.518
6.500	1.570	71.680	1.323	1.817
7.000	1.720	132.480	1.264	2.176
7.500	1.870	206.420	1.159	2.581

Hydrograph Detention Basin Routing

Graph values: 'I'= unit inflow; 'O'=outflow at time shown

Time (Hours)	Inflow (CFS)	Outflow (CFS)	Storage (Ac.Ft)	.0 5.9 11.88 17.82 23.76	Depth (Ft.)
0.083	0.46	0.00	0.002	O | | | |	0.01
0.167	1.42	0.01	0.008	OI | | | |	0.04
0.250	1.83	0.02	0.019	O I | | | |	0.09
0.333	1.99	0.03	0.032	O I | | | |	0.15
0.417	2.07	0.04	0.046	O I | | | |	0.22
0.500	2.21	0.05	0.060	O I | | | |	0.28
0.583	2.41	0.06	0.076	O I | | | |	0.36
0.667	2.47	0.07	0.092	O I | | | |	0.44
0.750	2.49	0.07	0.109	O I | | | |	0.52
0.833	2.50	0.08	0.125	O I | | | |	0.60
0.917	2.51	0.08	0.142	O I | | | |	0.68
1.000	2.60	0.09	0.159	O I | | | |	0.76
1.083	2.78	0.09	0.177	O I | | | |	0.84
1.167	2.82	0.10	0.196	O I | | | |	0.93
1.250	2.85	0.10	0.215	O I | | | |	1.02
1.333	2.86	0.10	0.234	O I | | | |	1.10
1.417	2.86	0.11	0.253	O I | | | |	1.18
1.500	2.87	0.11	0.272	O I | | | |	1.25
1.583	2.87	0.11	0.291	O I | | | |	1.33
1.667	2.87	0.18	0.309	O I | | | |	1.41
1.750	2.87	0.24	0.328	O I | | | |	1.49
1.833	2.87	0.30	0.346	O I | | | |	1.57
1.917	2.87	0.37	0.363	O I | | | |	1.64
2.000	2.96	0.41	0.380	O I | | | |	1.71
2.083	3.04	0.44	0.398	O I | | | |	1.79
2.167	3.01	0.47	0.416	O I | | | |	1.86
2.250	3.16	0.50	0.434	O I | | | |	1.93
2.333	3.20	0.53	0.452	O I | | | |	2.01
2.417	3.21	0.55	0.470	O I | | | |	2.07
2.500	3.22	0.57	0.489	O I | | | |	2.14
2.583	3.22	0.59	0.507	O I | | | |	2.21
2.667	3.23	0.61	0.525	O I | | | |	2.27
2.750	3.36	0.63	0.543	O I | | | |	2.34
2.833	3.61	0.65	0.563	O I | | | |	2.42
2.917	3.67	0.67	0.583	O I | | | |	2.49
3.000	3.70	0.69	0.604	O I | | | |	2.57
3.083	3.72	0.71	0.625	O I | | | |	2.65
3.167	3.87	0.73	0.646	O I | | | |	2.72
3.250	4.14	0.75	0.668	|O I | | | |	2.80
3.333	4.21	0.76	0.692	|O I | | | |	2.87
3.417	4.38	0.78	0.716	|O I | | | |	2.95
3.500	4.79	0.80	0.742	|O I | | | |	3.06
3.583	5.27	0.83	0.771	|O I| | | |	3.21
3.667	5.65	0.86	0.803	|O I| | | |	3.37
3.750	5.91	0.90	0.837	|O I| | | |	3.53
3.833	6.23	0.93	0.872	|O I | | |	3.69
3.917	6.47	0.96	0.910	|O I | | |	3.86
4.000	6.78	1.00	0.948	|O |I | | |	4.04
4.083	7.02	1.03	0.989	|O |I | | |	4.22

4.167	7.46	1.06	1.032	O	I				4.42
4.250	7.96	1.09	1.077	O	I				4.61
4.333	8.47	1.12	1.126	O	I				4.82
4.417	9.00	1.15	1.179	O	I				5.03
4.500	9.39	1.18	1.234	O	I				5.25
4.583	9.67	1.22	1.291	O	I				5.47
4.667	10.13	7.01	1.331	O	I				5.62
4.750	10.64	9.65	1.345	O	I				5.67
4.833	11.02	10.57	1.350	O	I				5.69
4.917	11.29	11.03	1.353	O	I				5.70
5.000	11.75	11.41	1.355	O	I				5.71
5.083	12.80	12.09	1.358	O	I				5.72
5.167	14.92	13.47	1.366	O	I				5.75
5.250	17.06	15.44	1.376	O	I				5.79
5.333	18.80	17.38	1.387	O	I				5.83
5.417	20.75	19.25	1.397	O	I				5.87
5.500	23.76	21.60	1.409	O	I				5.92
5.583	21.63	22.46	1.414	O	I				5.94
5.667	11.50	17.85	1.389	O	I				5.84
5.750	6.42	10.90	1.352	O	I				5.70
5.833	4.14	6.51	1.328	O	I				5.61
5.917	2.78	4.13	1.316	O	I				5.56
6.000	1.74	2.67	1.308	O	I				5.53
6.083	0.85	1.59	1.302	O	I				5.51
6.167	0.30	1.22	1.296	O	I				5.49
6.250	0.14	1.21	1.289	O	I				5.46
6.333	0.07	1.21	1.282	O	I				5.43
6.417	0.03	1.21	1.274	O	I				5.40
6.500	0.01	1.20	1.266	O	I				5.37
6.583	0.00	1.20	1.257	O	I				5.34
6.667	0.00	1.19	1.249	O	I				5.30
6.750	0.00	1.19	1.241	O	I				5.27
6.833	0.00	1.18	1.233	O	I				5.24
6.917	0.00	1.18	1.225	O	I				5.21
7.000	0.00	1.18	1.217	O	I				5.18
7.083	0.00	1.17	1.209	O	I				5.15
7.167	0.00	1.17	1.201	O	I				5.12
7.250	0.00	1.16	1.192	O	I				5.09
7.333	0.00	1.16	1.185	O	I				5.06
7.417	0.00	1.15	1.177	O	I				5.03
7.500	0.00	1.15	1.169	O	I				4.99
7.583	0.00	1.14	1.161	O	I				4.96
7.667	0.00	1.14	1.153	O	I				4.93
7.750	0.00	1.13	1.145	O	I				4.90
7.833	0.00	1.13	1.137	O	I				4.86
7.917	0.00	1.12	1.129	O	I				4.83
8.000	0.00	1.12	1.122	O	I				4.80
8.083	0.00	1.11	1.114	O	I				4.77
8.167	0.00	1.11	1.106	O	I				4.74
8.250	0.00	1.10	1.099	O	I				4.70
8.333	0.00	1.10	1.091	O	I				4.67
8.417	0.00	1.09	1.084	O	I				4.64
8.500	0.00	1.09	1.076	O	I				4.61
8.583	0.00	1.08	1.069	O	I				4.58
8.667	0.00	1.08	1.061	O	I				4.55
8.750	0.00	1.07	1.054	O	I				4.52
8.833	0.00	1.07	1.047	O	I				4.48
8.917	0.00	1.06	1.039	O	I				4.45
9.000	0.00	1.06	1.032	O	I				4.42
9.083	0.00	1.05	1.025	O	I				4.38
9.167	0.00	1.05	1.017	O	I				4.35
9.250	0.00	1.04	1.010	O	I				4.32
9.333	0.00	1.04	1.003	O	I				4.29
9.417	0.00	1.03	0.996	O	I				4.25
9.500	0.00	1.03	0.989	O	I				4.22
9.583	0.00	1.02	0.982	O	I				4.19

9.667	0.00	1.02	0.975	IO				4.16
9.750	0.00	1.01	0.968	IO				4.13
9.833	0.00	1.01	0.961	IO				4.10
9.917	0.00	1.00	0.954	IO				4.06
10.000	0.00	1.00	0.947	IO				4.03
10.083	0.00	0.99	0.940	IO				4.00
10.167	0.00	0.98	0.934	IO				3.97
10.250	0.00	0.98	0.927	IO				3.94
10.333	0.00	0.97	0.920	IO				3.91
10.417	0.00	0.97	0.913	IO				3.88
10.500	0.00	0.96	0.907	IO				3.85
10.583	0.00	0.95	0.900	IO				3.82
10.667	0.00	0.95	0.894	IO				3.79
10.750	0.00	0.94	0.887	IO				3.76
10.833	0.00	0.94	0.881	IO				3.73
10.917	0.00	0.93	0.874	IO				3.70
11.000	0.00	0.92	0.868	IO				3.67
11.083	0.00	0.92	0.861	IO				3.64
11.167	0.00	0.91	0.855	IO				3.61
11.250	0.00	0.91	0.849	IO				3.59
11.333	0.00	0.90	0.843	IO				3.56
11.417	0.00	0.90	0.836	IO				3.53
11.500	0.00	0.89	0.830	IO				3.50
11.583	0.00	0.88	0.824	IO				3.47
11.667	0.00	0.88	0.818	IO				3.44
11.750	0.00	0.87	0.812	IO				3.41
11.833	0.00	0.87	0.806	IO				3.38
11.917	0.00	0.86	0.800	IO				3.35
12.000	0.00	0.85	0.794	IO				3.32
12.083	0.00	0.85	0.788	IO				3.29
12.167	0.00	0.84	0.783	IO				3.26
12.250	0.00	0.84	0.777	IO				3.23
12.333	0.00	0.83	0.771	IO				3.21
12.417	0.00	0.83	0.765	IO				3.18
12.500	0.00	0.82	0.760	IO				3.15
12.583	0.00	0.81	0.754	IO				3.12
12.667	0.00	0.81	0.748	IO				3.09
12.750	0.00	0.80	0.743	IO				3.06
12.833	0.00	0.80	0.737	IO				3.04
12.917	0.00	0.79	0.732	IO				3.01
13.000	0.00	0.79	0.727	IO				2.99
13.083	0.00	0.78	0.721	IO				2.97
13.167	0.00	0.78	0.716	IO				2.95
13.250	0.00	0.78	0.710	IO				2.94
13.333	0.00	0.77	0.705	IO				2.92
13.417	0.00	0.77	0.700	IO				2.90
13.500	0.00	0.77	0.694	IO				2.88
13.583	0.00	0.76	0.689	IO				2.87
13.667	0.00	0.76	0.684	IO				2.85
13.750	0.00	0.75	0.679	IO				2.83
13.833	0.00	0.75	0.674	IO				2.81
13.917	0.00	0.75	0.668	IO				2.80
14.000	0.00	0.74	0.663	IO				2.78
14.083	0.00	0.74	0.658	O				2.76
14.167	0.00	0.74	0.653	O				2.75
14.250	0.00	0.73	0.648	O				2.73
14.333	0.00	0.73	0.643	O				2.71
14.417	0.00	0.73	0.638	O				2.70
14.500	0.00	0.72	0.633	O				2.68
14.583	0.00	0.72	0.628	O				2.66
14.667	0.00	0.71	0.623	O				2.64
14.750	0.00	0.71	0.618	O				2.63
14.833	0.00	0.70	0.613	O				2.61
14.917	0.00	0.70	0.609	O				2.59
15.000	0.00	0.69	0.604	O				2.57
15.083	0.00	0.69	0.599	O				2.55

15.167	0.00	0.68	0.594	o					2.53
15.250	0.00	0.68	0.590	o					2.52
15.333	0.00	0.67	0.585	o					2.50
15.417	0.00	0.67	0.580	o					2.48
15.500	0.00	0.67	0.576	o					2.46
15.583	0.00	0.66	0.571	o					2.45
15.667	0.00	0.66	0.567	o					2.43
15.750	0.00	0.65	0.562	o					2.41
15.833	0.00	0.65	0.558	o					2.40
15.917	0.00	0.64	0.553	o					2.38
16.000	0.00	0.64	0.549	o					2.36
16.083	0.00	0.63	0.544	o					2.35
16.167	0.00	0.63	0.540	o					2.33
16.250	0.00	0.63	0.536	o					2.31
16.333	0.00	0.62	0.531	o					2.30
16.417	0.00	0.62	0.527	o					2.28
16.500	0.00	0.61	0.523	o					2.27
16.583	0.00	0.61	0.519	o					2.25
16.667	0.00	0.60	0.515	o					2.24
16.750	0.00	0.60	0.510	o					2.22
16.833	0.00	0.59	0.506	o					2.21
16.917	0.00	0.59	0.502	o					2.19
17.000	0.00	0.58	0.498	o					2.18
17.083	0.00	0.58	0.494	o					2.16
17.167	0.00	0.57	0.490	o					2.15
17.250	0.00	0.57	0.486	o					2.13
17.333	0.00	0.57	0.482	o					2.12
17.417	0.00	0.56	0.478	o					2.10
17.500	0.00	0.56	0.475	o					2.09
17.583	0.00	0.55	0.471	o					2.08
17.667	0.00	0.55	0.467	o					2.06
17.750	0.00	0.54	0.463	o					2.05
17.833	0.00	0.54	0.460	o					2.03
17.917	0.00	0.54	0.456	o					2.02
18.000	0.00	0.53	0.452	o					2.01
18.083	0.00	0.53	0.448	o					1.99
18.167	0.00	0.52	0.445	o					1.98
18.250	0.00	0.51	0.441	o					1.96
18.333	0.00	0.51	0.438	o					1.95
18.417	0.00	0.50	0.434	o					1.94
18.500	0.00	0.50	0.431	o					1.92
18.583	0.00	0.49	0.427	o					1.91
18.667	0.00	0.48	0.424	o					1.89
18.750	0.00	0.48	0.421	o					1.88
18.833	0.00	0.47	0.417	o					1.87
18.917	0.00	0.47	0.414	o					1.85
19.000	0.00	0.46	0.411	o					1.84
19.083	0.00	0.46	0.408	o					1.83
19.167	0.00	0.45	0.405	o					1.81
19.250	0.00	0.45	0.402	o					1.80
19.333	0.00	0.44	0.399	o					1.79
19.417	0.00	0.43	0.396	o					1.78
19.500	0.00	0.43	0.393	o					1.76
19.583	0.00	0.42	0.390	o					1.75
19.667	0.00	0.42	0.387	o					1.74
19.750	0.00	0.41	0.384	o					1.73
19.833	0.00	0.41	0.381	o					1.72
19.917	0.00	0.40	0.378	o					1.70
20.000	0.00	0.40	0.376	o					1.69
20.083	0.00	0.39	0.373	o					1.68
20.167	0.00	0.39	0.370	o					1.67
20.250	0.00	0.38	0.367	o					1.66
20.333	0.00	0.37	0.365	o					1.65
20.417	0.00	0.36	0.362	o					1.64
20.500	0.00	0.35	0.360	o					1.63
20.583	0.00	0.35	0.357	o					1.62

20.667	0.00	0.34	0.355	o	|	|	|	| 1.61
20.750	0.00	0.33	0.353	o	|	|	|	| 1.60
20.833	0.00	0.32	0.351	o	|	|	|	| 1.59
20.917	0.00	0.31	0.348	o	|	|	|	| 1.58
21.000	0.00	0.31	0.346	o	|	|	|	| 1.57
21.083	0.00	0.30	0.344	o	|	|	|	| 1.56
21.167	0.00	0.29	0.342	o	|	|	|	| 1.55
21.250	0.00	0.29	0.340	o	|	|	|	| 1.54
21.333	0.00	0.28	0.338	o	|	|	|	| 1.53
21.417	0.00	0.27	0.336	o	|	|	|	| 1.53
21.500	0.00	0.27	0.334	o	|	|	|	| 1.52
21.583	0.00	0.26	0.333	o	|	|	|	| 1.51
21.667	0.00	0.25	0.331	o	|	|	|	| 1.50
21.750	0.00	0.25	0.329	o	|	|	|	| 1.50
21.833	0.00	0.24	0.327	o	|	|	|	| 1.49
21.917	0.00	0.24	0.326	o	|	|	|	| 1.48
22.000	0.00	0.23	0.324	o	|	|	|	| 1.48
22.083	0.00	0.22	0.323	o	|	|	|	| 1.47
22.167	0.00	0.22	0.321	o	|	|	|	| 1.46
22.250	0.00	0.21	0.320	o	|	|	|	| 1.46
22.333	0.00	0.21	0.318	o	|	|	|	| 1.45
22.417	0.00	0.20	0.317	o	|	|	|	| 1.44
22.500	0.00	0.20	0.315	o	|	|	|	| 1.44
22.583	0.00	0.19	0.314	o	|	|	|	| 1.43
22.667	0.00	0.19	0.313	o	|	|	|	| 1.43
22.750	0.00	0.18	0.311	o	|	|	|	| 1.42
22.833	0.00	0.18	0.310	o	|	|	|	| 1.42
22.917	0.00	0.18	0.309	o	|	|	|	| 1.41
23.000	0.00	0.17	0.308	o	|	|	|	| 1.41
23.083	0.00	0.17	0.307	o	|	|	|	| 1.40
23.167	0.00	0.16	0.305	o	|	|	|	| 1.40
23.250	0.00	0.16	0.304	o	|	|	|	| 1.39
23.333	0.00	0.16	0.303	o	|	|	|	| 1.39
23.417	0.00	0.15	0.302	o	|	|	|	| 1.38
23.500	0.00	0.15	0.301	o	|	|	|	| 1.38
23.583	0.00	0.15	0.300	o	|	|	|	| 1.37
23.667	0.00	0.14	0.299	o	|	|	|	| 1.37
23.750	0.00	0.14	0.298	o	|	|	|	| 1.36
23.833	0.00	0.14	0.297	o	|	|	|	| 1.36
23.917	0.00	0.13	0.296	o	|	|	|	| 1.36
24.000	0.00	0.13	0.295	o	|	|	|	| 1.35
24.083	0.00	0.13	0.294	o	|	|	|	| 1.35
24.167	0.00	0.12	0.294	o	|	|	|	| 1.35
24.250	0.00	0.12	0.293	o	|	|	|	| 1.34
24.333	0.00	0.12	0.292	o	|	|	|	| 1.34
24.417	0.00	0.11	0.291	o	|	|	|	| 1.34
24.500	0.00	0.11	0.290	o	|	|	|	| 1.33
24.583	0.00	0.11	0.290	o	|	|	|	| 1.33
24.667	0.00	0.11	0.289	o	|	|	|	| 1.33
24.750	0.00	0.11	0.288	o	|	|	|	| 1.32
24.833	0.00	0.11	0.287	o	|	|	|	| 1.32
24.917	0.00	0.11	0.287	o	|	|	|	| 1.32
25.000	0.00	0.11	0.286	o	|	|	|	| 1.31
25.083	0.00	0.11	0.285	o	|	|	|	| 1.31
25.167	0.00	0.11	0.284	o	|	|	|	| 1.31
25.250	0.00	0.11	0.284	o	|	|	|	| 1.30
25.333	0.00	0.11	0.283	o	|	|	|	| 1.30
25.417	0.00	0.11	0.282	o	|	|	|	| 1.30
25.500	0.00	0.11	0.281	o	|	|	|	| 1.29
25.583	0.00	0.11	0.281	o	|	|	|	| 1.29
25.667	0.00	0.11	0.280	o	|	|	|	| 1.29
25.750	0.00	0.11	0.279	o	|	|	|	| 1.29
25.833	0.00	0.11	0.278	o	|	|	|	| 1.28
25.917	0.00	0.11	0.278	o	|	|	|	| 1.28
26.000	0.00	0.11	0.277	o	|	|	|	| 1.28
26.083	0.00	0.11	0.276	o	|	|	|	| 1.27

26.167	0.00	0.11	0.275	o	|	|	|	|	1.27
26.250	0.00	0.11	0.275	o	|	|	|	|	1.27
26.333	0.00	0.11	0.274	o	|	|	|	|	1.26
26.417	0.00	0.11	0.273	o	|	|	|	|	1.26
26.500	0.00	0.11	0.272	o	|	|	|	|	1.26
26.583	0.00	0.11	0.272	o	|	|	|	|	1.25
26.667	0.00	0.11	0.271	o	|	|	|	|	1.25
26.750	0.00	0.11	0.270	o	|	|	|	|	1.25
26.833	0.00	0.11	0.269	o	|	|	|	|	1.25
26.917	0.00	0.11	0.269	o	|	|	|	|	1.24
27.000	0.00	0.11	0.268	o	|	|	|	|	1.24
27.083	0.00	0.11	0.267	o	|	|	|	|	1.24
27.167	0.00	0.11	0.266	o	|	|	|	|	1.23
27.250	0.00	0.11	0.266	o	|	|	|	|	1.23
27.333	0.00	0.11	0.265	o	|	|	|	|	1.23
27.417	0.00	0.11	0.264	o	|	|	|	|	1.22
27.500	0.00	0.11	0.264	o	|	|	|	|	1.22
27.583	0.00	0.11	0.263	o	|	|	|	|	1.22
27.667	0.00	0.11	0.262	o	|	|	|	|	1.21
27.750	0.00	0.11	0.261	o	|	|	|	|	1.21
27.833	0.00	0.11	0.261	o	|	|	|	|	1.21
27.917	0.00	0.11	0.260	o	|	|	|	|	1.21
28.000	0.00	0.11	0.259	o	|	|	|	|	1.20
28.083	0.00	0.11	0.258	o	|	|	|	|	1.20
28.167	0.00	0.11	0.258	o	|	|	|	|	1.20
28.250	0.00	0.11	0.257	o	|	|	|	|	1.19
28.333	0.00	0.11	0.256	o	|	|	|	|	1.19
28.417	0.00	0.11	0.255	o	|	|	|	|	1.19
28.500	0.00	0.11	0.255	o	|	|	|	|	1.18
28.583	0.00	0.11	0.254	o	|	|	|	|	1.18
28.667	0.00	0.11	0.253	o	|	|	|	|	1.18
28.750	0.00	0.11	0.253	o	|	|	|	|	1.18
28.833	0.00	0.11	0.252	o	|	|	|	|	1.17
28.917	0.00	0.11	0.251	o	|	|	|	|	1.17
29.000	0.00	0.11	0.250	o	|	|	|	|	1.17
29.083	0.00	0.10	0.250	o	|	|	|	|	1.16
29.167	0.00	0.10	0.249	o	|	|	|	|	1.16
29.250	0.00	0.10	0.248	o	|	|	|	|	1.16
29.333	0.00	0.10	0.248	o	|	|	|	|	1.15
29.417	0.00	0.10	0.247	o	|	|	|	|	1.15
29.500	0.00	0.10	0.246	o	|	|	|	|	1.15
29.583	0.00	0.10	0.245	o	|	|	|	|	1.15
29.667	0.00	0.10	0.245	o	|	|	|	|	1.14
29.750	0.00	0.10	0.244	o	|	|	|	|	1.14
29.833	0.00	0.10	0.243	o	|	|	|	|	1.14
29.917	0.00	0.10	0.242	o	|	|	|	|	1.13
30.000	0.00	0.10	0.242	o	|	|	|	|	1.13
30.083	0.00	0.10	0.241	o	|	|	|	|	1.13
30.167	0.00	0.10	0.240	o	|	|	|	|	1.13
30.250	0.00	0.10	0.240	o	|	|	|	|	1.12
30.333	0.00	0.10	0.239	o	|	|	|	|	1.12
30.417	0.00	0.10	0.238	o	|	|	|	|	1.12
30.500	0.00	0.10	0.237	o	|	|	|	|	1.11
30.583	0.00	0.10	0.237	o	|	|	|	|	1.11
30.667	0.00	0.10	0.236	o	|	|	|	|	1.11
30.750	0.00	0.10	0.235	o	|	|	|	|	1.10
30.833	0.00	0.10	0.235	o	|	|	|	|	1.10
30.917	0.00	0.10	0.234	o	|	|	|	|	1.10
31.000	0.00	0.10	0.233	o	|	|	|	|	1.10
31.083	0.00	0.10	0.233	o	|	|	|	|	1.09
31.167	0.00	0.10	0.232	o	|	|	|	|	1.09
31.250	0.00	0.10	0.231	o	|	|	|	|	1.09
31.333	0.00	0.10	0.230	o	|	|	|	|	1.08
31.417	0.00	0.10	0.230	o	|	|	|	|	1.08
31.500	0.00	0.10	0.229	o	|	|	|	|	1.08
31.583	0.00	0.10	0.228	o	|	|	|	|	1.08

31.667	0.00	0.10	0.228	o	|	|	|	| 1.07
31.750	0.00	0.10	0.227	o	|	|	|	| 1.07
31.833	0.00	0.10	0.226	o	|	|	|	| 1.07
31.917	0.00	0.10	0.225	o	|	|	|	| 1.06
32.000	0.00	0.10	0.225	o	|	|	|	| 1.06
32.083	0.00	0.10	0.224	o	|	|	|	| 1.06
32.167	0.00	0.10	0.223	o	|	|	|	| 1.06
32.250	0.00	0.10	0.223	o	|	|	|	| 1.05
32.333	0.00	0.10	0.222	o	|	|	|	| 1.05
32.417	0.00	0.10	0.221	o	|	|	|	| 1.05
32.500	0.00	0.10	0.221	o	|	|	|	| 1.04
32.583	0.00	0.10	0.220	o	|	|	|	| 1.04
32.667	0.00	0.10	0.219	o	|	|	|	| 1.04
32.750	0.00	0.10	0.218	o	|	|	|	| 1.03
32.833	0.00	0.10	0.218	o	|	|	|	| 1.03
32.917	0.00	0.10	0.217	o	|	|	|	| 1.03
33.000	0.00	0.10	0.216	o	|	|	|	| 1.03
33.083	0.00	0.10	0.216	o	|	|	|	| 1.02
33.167	0.00	0.10	0.215	o	|	|	|	| 1.02
33.250	0.00	0.10	0.214	o	|	|	|	| 1.02
33.333	0.00	0.10	0.214	o	|	|	|	| 1.01
33.417	0.00	0.10	0.213	o	|	|	|	| 1.01
33.500	0.00	0.10	0.212	o	|	|	|	| 1.01
33.583	0.00	0.10	0.212	o	|	|	|	| 1.01
33.667	0.00	0.10	0.211	o	|	|	|	| 1.00
33.750	0.00	0.10	0.210	o	|	|	|	| 1.00
33.833	0.00	0.10	0.209	o	|	|	|	| 1.00
33.917	0.00	0.10	0.209	o	|	|	|	| 0.99
34.000	0.00	0.10	0.208	o	|	|	|	| 0.99
34.083	0.00	0.10	0.207	o	|	|	|	| 0.99
34.167	0.00	0.10	0.207	o	|	|	|	| 0.98
34.250	0.00	0.10	0.206	o	|	|	|	| 0.98
34.333	0.00	0.10	0.205	o	|	|	|	| 0.98
34.417	0.00	0.10	0.205	o	|	|	|	| 0.98
34.500	0.00	0.10	0.204	o	|	|	|	| 0.97
34.583	0.00	0.10	0.203	o	|	|	|	| 0.97
34.667	0.00	0.10	0.203	o	|	|	|	| 0.97
34.750	0.00	0.10	0.202	o	|	|	|	| 0.96
34.833	0.00	0.10	0.201	o	|	|	|	| 0.96
34.917	0.00	0.10	0.201	o	|	|	|	| 0.96
35.000	0.00	0.10	0.200	o	|	|	|	| 0.95
35.083	0.00	0.10	0.199	o	|	|	|	| 0.95
35.167	0.00	0.10	0.199	o	|	|	|	| 0.95
35.250	0.00	0.10	0.198	o	|	|	|	| 0.94
35.333	0.00	0.10	0.197	o	|	|	|	| 0.94
35.417	0.00	0.10	0.197	o	|	|	|	| 0.94
35.500	0.00	0.10	0.196	o	|	|	|	| 0.93
35.583	0.00	0.10	0.195	o	|	|	|	| 0.93
35.667	0.00	0.10	0.195	o	|	|	|	| 0.93
35.750	0.00	0.10	0.194	o	|	|	|	| 0.92
35.833	0.00	0.10	0.193	o	|	|	|	| 0.92
35.917	0.00	0.10	0.193	o	|	|	|	| 0.92
36.000	0.00	0.09	0.192	o	|	|	|	| 0.92
36.083	0.00	0.09	0.191	o	|	|	|	| 0.91
36.167	0.00	0.09	0.191	o	|	|	|	| 0.91
36.250	0.00	0.09	0.190	o	|	|	|	| 0.91
36.333	0.00	0.09	0.189	o	|	|	|	| 0.90
36.417	0.00	0.09	0.189	o	|	|	|	| 0.90
36.500	0.00	0.09	0.188	o	|	|	|	| 0.90
36.583	0.00	0.09	0.188	o	|	|	|	| 0.89
36.667	0.00	0.09	0.187	o	|	|	|	| 0.89
36.750	0.00	0.09	0.186	o	|	|	|	| 0.89
36.833	0.00	0.09	0.186	o	|	|	|	| 0.88
36.917	0.00	0.09	0.185	o	|	|	|	| 0.88
37.000	0.00	0.09	0.184	o	|	|	|	| 0.88
37.083	0.00	0.09	0.184	o	|	|	|	| 0.88

37.167	0.00	0.09	0.183	o	|	|	|	| 0.87
37.250	0.00	0.09	0.182	o	|	|	|	| 0.87
37.333	0.00	0.09	0.182	o	|	|	|	| 0.87
37.417	0.00	0.09	0.181	o	|	|	|	| 0.86
37.500	0.00	0.09	0.180	o	|	|	|	| 0.86
37.583	0.00	0.09	0.180	o	|	|	|	| 0.86
37.667	0.00	0.09	0.179	o	|	|	|	| 0.85
37.750	0.00	0.09	0.179	o	|	|	|	| 0.85
37.833	0.00	0.09	0.178	o	|	|	|	| 0.85
37.917	0.00	0.09	0.177	o	|	|	|	| 0.85
38.000	0.00	0.09	0.177	o	|	|	|	| 0.84
38.083	0.00	0.09	0.176	o	|	|	|	| 0.84
38.167	0.00	0.09	0.175	o	|	|	|	| 0.84
38.250	0.00	0.09	0.175	o	|	|	|	| 0.83
38.333	0.00	0.09	0.174	o	|	|	|	| 0.83
38.417	0.00	0.09	0.174	o	|	|	|	| 0.83
38.500	0.00	0.09	0.173	o	|	|	|	| 0.83
38.583	0.00	0.09	0.172	o	|	|	|	| 0.82
38.667	0.00	0.09	0.172	o	|	|	|	| 0.82
38.750	0.00	0.09	0.171	o	|	|	|	| 0.82
38.833	0.00	0.09	0.171	o	|	|	|	| 0.81
38.917	0.00	0.09	0.170	o	|	|	|	| 0.81
39.000	0.00	0.09	0.169	o	|	|	|	| 0.81
39.083	0.00	0.09	0.169	o	|	|	|	| 0.81
39.167	0.00	0.09	0.168	o	|	|	|	| 0.80
39.250	0.00	0.09	0.168	o	|	|	|	| 0.80
39.333	0.00	0.09	0.167	o	|	|	|	| 0.80
39.417	0.00	0.09	0.166	o	|	|	|	| 0.79
39.500	0.00	0.09	0.166	o	|	|	|	| 0.79
39.583	0.00	0.09	0.165	o	|	|	|	| 0.79
39.667	0.00	0.09	0.165	o	|	|	|	| 0.79
39.750	0.00	0.09	0.164	o	|	|	|	| 0.78
39.833	0.00	0.09	0.163	o	|	|	|	| 0.78
39.917	0.00	0.09	0.163	o	|	|	|	| 0.78
40.000	0.00	0.09	0.162	o	|	|	|	| 0.77
40.083	0.00	0.09	0.162	o	|	|	|	| 0.77
40.167	0.00	0.09	0.161	o	|	|	|	| 0.77
40.250	0.00	0.09	0.160	o	|	|	|	| 0.77
40.333	0.00	0.09	0.160	o	|	|	|	| 0.76
40.417	0.00	0.09	0.159	o	|	|	|	| 0.76
40.500	0.00	0.09	0.159	o	|	|	|	| 0.76
40.583	0.00	0.09	0.158	o	|	|	|	| 0.75
40.667	0.00	0.08	0.157	o	|	|	|	| 0.75
40.750	0.00	0.08	0.157	o	|	|	|	| 0.75
40.833	0.00	0.08	0.156	o	|	|	|	| 0.75
40.917	0.00	0.08	0.156	o	|	|	|	| 0.74
41.000	0.00	0.08	0.155	o	|	|	|	| 0.74
41.083	0.00	0.08	0.154	o	|	|	|	| 0.74
41.167	0.00	0.08	0.154	o	|	|	|	| 0.74
41.250	0.00	0.08	0.153	o	|	|	|	| 0.73
41.333	0.00	0.08	0.153	o	|	|	|	| 0.73
41.417	0.00	0.08	0.152	o	|	|	|	| 0.73
41.500	0.00	0.08	0.152	o	|	|	|	| 0.72
41.583	0.00	0.08	0.151	o	|	|	|	| 0.72
41.667	0.00	0.08	0.150	o	|	|	|	| 0.72
41.750	0.00	0.08	0.150	o	|	|	|	| 0.72
41.833	0.00	0.08	0.149	o	|	|	|	| 0.71
41.917	0.00	0.08	0.149	o	|	|	|	| 0.71
42.000	0.00	0.08	0.148	o	|	|	|	| 0.71
42.083	0.00	0.08	0.148	o	|	|	|	| 0.71
42.167	0.00	0.08	0.147	o	|	|	|	| 0.70
42.250	0.00	0.08	0.146	o	|	|	|	| 0.70
42.333	0.00	0.08	0.146	o	|	|	|	| 0.70
42.417	0.00	0.08	0.145	o	|	|	|	| 0.70
42.500	0.00	0.08	0.145	o	|	|	|	| 0.69
42.583	0.00	0.08	0.144	o	|	|	|	| 0.69

42.667	0.00	0.08	0.144	o	|	|	|	|	0.69
42.750	0.00	0.08	0.143	o	|	|	|	|	0.68
42.833	0.00	0.08	0.143	o	|	|	|	|	0.68
42.917	0.00	0.08	0.142	o	|	|	|	|	0.68
43.000	0.00	0.08	0.141	o	|	|	|	|	0.68
43.083	0.00	0.08	0.141	o	|	|	|	|	0.67
43.167	0.00	0.08	0.140	o	|	|	|	|	0.67
43.250	0.00	0.08	0.140	o	|	|	|	|	0.67
43.333	0.00	0.08	0.139	o	|	|	|	|	0.67
43.417	0.00	0.08	0.139	o	|	|	|	|	0.66
43.500	0.00	0.08	0.138	o	|	|	|	|	0.66
43.583	0.00	0.08	0.138	o	|	|	|	|	0.66
43.667	0.00	0.08	0.137	o	|	|	|	|	0.66
43.750	0.00	0.08	0.137	o	|	|	|	|	0.65
43.833	0.00	0.08	0.136	o	|	|	|	|	0.65
43.917	0.00	0.08	0.135	o	|	|	|	|	0.65
44.000	0.00	0.08	0.135	o	|	|	|	|	0.65
44.083	0.00	0.08	0.134	o	|	|	|	|	0.64
44.167	0.00	0.08	0.134	o	|	|	|	|	0.64
44.250	0.00	0.08	0.133	o	|	|	|	|	0.64
44.333	0.00	0.08	0.133	o	|	|	|	|	0.63
44.417	0.00	0.08	0.132	o	|	|	|	|	0.63
44.500	0.00	0.08	0.132	o	|	|	|	|	0.63
44.583	0.00	0.08	0.131	o	|	|	|	|	0.63
44.667	0.00	0.08	0.131	o	|	|	|	|	0.62
44.750	0.00	0.08	0.130	o	|	|	|	|	0.62
44.833	0.00	0.08	0.130	o	|	|	|	|	0.62
44.917	0.00	0.08	0.129	o	|	|	|	|	0.62
45.000	0.00	0.08	0.128	o	|	|	|	|	0.61
45.083	0.00	0.08	0.128	o	|	|	|	|	0.61
45.167	0.00	0.08	0.127	o	|	|	|	|	0.61
45.250	0.00	0.08	0.127	o	|	|	|	|	0.61
45.333	0.00	0.08	0.126	o	|	|	|	|	0.60
45.417	0.00	0.08	0.126	o	|	|	|	|	0.60
45.500	0.00	0.08	0.125	o	|	|	|	|	0.60
45.583	0.00	0.08	0.125	o	|	|	|	|	0.60
45.667	0.00	0.08	0.124	o	|	|	|	|	0.59
45.750	0.00	0.08	0.124	o	|	|	|	|	0.59
45.833	0.00	0.08	0.123	o	|	|	|	|	0.59
45.917	0.00	0.08	0.123	o	|	|	|	|	0.59
46.000	0.00	0.07	0.122	o	|	|	|	|	0.58
46.083	0.00	0.07	0.122	o	|	|	|	|	0.58
46.167	0.00	0.07	0.121	o	|	|	|	|	0.58
46.250	0.00	0.07	0.121	o	|	|	|	|	0.58
46.333	0.00	0.07	0.120	o	|	|	|	|	0.57
46.417	0.00	0.07	0.120	o	|	|	|	|	0.57
46.500	0.00	0.07	0.119	o	|	|	|	|	0.57
46.583	0.00	0.07	0.119	o	|	|	|	|	0.57
46.667	0.00	0.07	0.118	o	|	|	|	|	0.56
46.750	0.00	0.07	0.118	o	|	|	|	|	0.56
46.833	0.00	0.07	0.117	o	|	|	|	|	0.56
46.917	0.00	0.07	0.117	o	|	|	|	|	0.56
47.000	0.00	0.07	0.116	o	|	|	|	|	0.55
47.083	0.00	0.07	0.116	o	|	|	|	|	0.55
47.167	0.00	0.07	0.115	o	|	|	|	|	0.55
47.250	0.00	0.07	0.115	o	|	|	|	|	0.55
47.333	0.00	0.07	0.114	o	|	|	|	|	0.54
47.417	0.00	0.07	0.114	o	|	|	|	|	0.54
47.500	0.00	0.07	0.113	o	|	|	|	|	0.54
47.583	0.00	0.07	0.113	o	|	|	|	|	0.54
47.667	0.00	0.07	0.112	o	|	|	|	|	0.53
47.750	0.00	0.07	0.112	o	|	|	|	|	0.53
47.833	0.00	0.07	0.111	o	|	|	|	|	0.53
47.917	0.00	0.07	0.111	o	|	|	|	|	0.53
48.000	0.00	0.07	0.110	o	|	|	|	|	0.52
48.083	0.00	0.07	0.110	o	|	|	|	|	0.52

48.167	0.00	0.07	0.109	o	|	|	|	|	0.52
48.250	0.00	0.07	0.109	o	|	|	|	|	0.52
48.333	0.00	0.07	0.108	o	|	|	|	|	0.52
48.417	0.00	0.07	0.108	o	|	|	|	|	0.51
48.500	0.00	0.07	0.107	o	|	|	|	|	0.51
48.583	0.00	0.07	0.107	o	|	|	|	|	0.51
48.667	0.00	0.07	0.106	o	|	|	|	|	0.51
48.750	0.00	0.07	0.106	o	|	|	|	|	0.50
48.833	0.00	0.07	0.105	o	|	|	|	|	0.50
48.917	0.00	0.07	0.105	o	|	|	|	|	0.50
49.000	0.00	0.07	0.104	o	|	|	|	|	0.50
49.083	0.00	0.07	0.104	o	|	|	|	|	0.49
49.167	0.00	0.07	0.103	o	|	|	|	|	0.49
49.250	0.00	0.07	0.103	o	|	|	|	|	0.49
49.333	0.00	0.07	0.102	o	|	|	|	|	0.49
49.417	0.00	0.07	0.102	o	|	|	|	|	0.48
49.500	0.00	0.07	0.101	o	|	|	|	|	0.48
49.583	0.00	0.07	0.101	o	|	|	|	|	0.48
49.667	0.00	0.07	0.100	o	|	|	|	|	0.48
49.750	0.00	0.07	0.100	o	|	|	|	|	0.48
49.833	0.00	0.07	0.100	o	|	|	|	|	0.47
49.917	0.00	0.07	0.099	o	|	|	|	|	0.47
50.000	0.00	0.07	0.099	o	|	|	|	|	0.47
50.083	0.00	0.07	0.098	o	|	|	|	|	0.47
50.167	0.00	0.07	0.098	o	|	|	|	|	0.46
50.250	0.00	0.07	0.097	o	|	|	|	|	0.46
50.333	0.00	0.07	0.097	o	|	|	|	|	0.46
50.417	0.00	0.07	0.096	o	|	|	|	|	0.46
50.500	0.00	0.07	0.096	o	|	|	|	|	0.46
50.583	0.00	0.07	0.095	o	|	|	|	|	0.45
50.667	0.00	0.07	0.095	o	|	|	|	|	0.45
50.750	0.00	0.07	0.094	o	|	|	|	|	0.45
50.833	0.00	0.07	0.094	o	|	|	|	|	0.45
50.917	0.00	0.07	0.093	o	|	|	|	|	0.44
51.000	0.00	0.07	0.093	o	|	|	|	|	0.44
51.083	0.00	0.07	0.093	o	|	|	|	|	0.44
51.167	0.00	0.07	0.092	o	|	|	|	|	0.44
51.250	0.00	0.07	0.092	o	|	|	|	|	0.44
51.333	0.00	0.07	0.091	o	|	|	|	|	0.43
51.417	0.00	0.07	0.091	o	|	|	|	|	0.43
51.500	0.00	0.07	0.090	o	|	|	|	|	0.43
51.583	0.00	0.07	0.090	o	|	|	|	|	0.43
51.667	0.00	0.07	0.089	o	|	|	|	|	0.42
51.750	0.00	0.07	0.089	o	|	|	|	|	0.42
51.833	0.00	0.07	0.088	o	|	|	|	|	0.42
51.917	0.00	0.07	0.088	o	|	|	|	|	0.42
52.000	0.00	0.07	0.088	o	|	|	|	|	0.42
52.083	0.00	0.06	0.087	o	|	|	|	|	0.41
52.167	0.00	0.06	0.087	o	|	|	|	|	0.41
52.250	0.00	0.06	0.086	o	|	|	|	|	0.41
52.333	0.00	0.06	0.086	o	|	|	|	|	0.41
52.417	0.00	0.06	0.085	o	|	|	|	|	0.40
52.500	0.00	0.06	0.085	o	|	|	|	|	0.40
52.583	0.00	0.06	0.084	o	|	|	|	|	0.40
52.667	0.00	0.06	0.084	o	|	|	|	|	0.40
52.750	0.00	0.06	0.084	o	|	|	|	|	0.40
52.833	0.00	0.06	0.083	o	|	|	|	|	0.39
52.917	0.00	0.06	0.083	o	|	|	|	|	0.39
53.000	0.00	0.06	0.082	o	|	|	|	|	0.39
53.083	0.00	0.06	0.082	o	|	|	|	|	0.39
53.167	0.00	0.06	0.081	o	|	|	|	|	0.39
53.250	0.00	0.06	0.081	o	|	|	|	|	0.38
53.333	0.00	0.06	0.081	o	|	|	|	|	0.38
53.417	0.00	0.06	0.080	o	|	|	|	|	0.38
53.500	0.00	0.06	0.080	o	|	|	|	|	0.38
53.583	0.00	0.06	0.079	o	|	|	|	|	0.37

53.667	0.00	0.06	0.079	o	|	|	|	| 0.37
53.750	0.00	0.06	0.078	o	|	|	|	| 0.37
53.833	0.00	0.06	0.078	o	|	|	|	| 0.37
53.917	0.00	0.06	0.078	o	|	|	|	| 0.37
54.000	0.00	0.06	0.077	o	|	|	|	| 0.36
54.083	0.00	0.06	0.077	o	|	|	|	| 0.36
54.167	0.00	0.06	0.076	o	|	|	|	| 0.36
54.250	0.00	0.06	0.076	o	|	|	|	| 0.36
54.333	0.00	0.06	0.075	o	|	|	|	| 0.36
54.417	0.00	0.06	0.075	o	|	|	|	| 0.35
54.500	0.00	0.06	0.075	o	|	|	|	| 0.35
54.583	0.00	0.06	0.074	o	|	|	|	| 0.35
54.667	0.00	0.06	0.074	o	|	|	|	| 0.35
54.750	0.00	0.06	0.073	o	|	|	|	| 0.35
54.833	0.00	0.06	0.073	o	|	|	|	| 0.34
54.917	0.00	0.06	0.072	o	|	|	|	| 0.34
55.000	0.00	0.06	0.072	o	|	|	|	| 0.34
55.083	0.00	0.06	0.072	o	|	|	|	| 0.34
55.167	0.00	0.06	0.071	o	|	|	|	| 0.34
55.250	0.00	0.06	0.071	o	|	|	|	| 0.33
55.333	0.00	0.06	0.070	o	|	|	|	| 0.33
55.417	0.00	0.06	0.070	o	|	|	|	| 0.33
55.500	0.00	0.06	0.070	o	|	|	|	| 0.33
55.583	0.00	0.06	0.069	o	|	|	|	| 0.33
55.667	0.00	0.06	0.069	o	|	|	|	| 0.32
55.750	0.00	0.06	0.068	o	|	|	|	| 0.32
55.833	0.00	0.06	0.068	o	|	|	|	| 0.32
55.917	0.00	0.06	0.068	o	|	|	|	| 0.32
56.000	0.00	0.06	0.067	o	|	|	|	| 0.32
56.083	0.00	0.06	0.067	o	|	|	|	| 0.31
56.167	0.00	0.06	0.066	o	|	|	|	| 0.31
56.250	0.00	0.06	0.066	o	|	|	|	| 0.31
56.333	0.00	0.06	0.066	o	|	|	|	| 0.31
56.417	0.00	0.06	0.065	o	|	|	|	| 0.31
56.500	0.00	0.06	0.065	o	|	|	|	| 0.31
56.583	0.00	0.06	0.064	o	|	|	|	| 0.30
56.667	0.00	0.05	0.064	o	|	|	|	| 0.30
56.750	0.00	0.05	0.064	o	|	|	|	| 0.30
56.833	0.00	0.05	0.063	o	|	|	|	| 0.30
56.917	0.00	0.05	0.063	o	|	|	|	| 0.30
57.000	0.00	0.05	0.063	o	|	|	|	| 0.29
57.083	0.00	0.05	0.062	o	|	|	|	| 0.29
57.167	0.00	0.05	0.062	o	|	|	|	| 0.29
57.250	0.00	0.05	0.061	o	|	|	|	| 0.29
57.333	0.00	0.05	0.061	o	|	|	|	| 0.29
57.417	0.00	0.05	0.061	o	|	|	|	| 0.29
57.500	0.00	0.05	0.060	o	|	|	|	| 0.28
57.583	0.00	0.05	0.060	o	|	|	|	| 0.28
57.667	0.00	0.05	0.060	o	|	|	|	| 0.28
57.750	0.00	0.05	0.059	o	|	|	|	| 0.28
57.833	0.00	0.05	0.059	o	|	|	|	| 0.28
57.917	0.00	0.05	0.059	o	|	|	|	| 0.28
58.000	0.00	0.05	0.058	o	|	|	|	| 0.27
58.083	0.00	0.05	0.058	o	|	|	|	| 0.27
58.167	0.00	0.05	0.058	o	|	|	|	| 0.27
58.250	0.00	0.05	0.057	o	|	|	|	| 0.27
58.333	0.00	0.05	0.057	o	|	|	|	| 0.27
58.417	0.00	0.05	0.057	o	|	|	|	| 0.27
58.500	0.00	0.05	0.056	o	|	|	|	| 0.27
58.583	0.00	0.05	0.056	o	|	|	|	| 0.26
58.667	0.00	0.05	0.056	o	|	|	|	| 0.26
58.750	0.00	0.05	0.055	o	|	|	|	| 0.26
58.833	0.00	0.05	0.055	o	|	|	|	| 0.26
58.917	0.00	0.05	0.055	o	|	|	|	| 0.26
59.000	0.00	0.05	0.054	o	|	|	|	| 0.26
59.083	0.00	0.05	0.054	o	|	|	|	| 0.25

59.167	0.00	0.05	0.054	o	|	|	|	|	0.25
59.250	0.00	0.05	0.053	o	|	|	|	|	0.25
59.333	0.00	0.05	0.053	o	|	|	|	|	0.25
59.417	0.00	0.05	0.053	o	|	|	|	|	0.25
59.500	0.00	0.04	0.052	o	|	|	|	|	0.25
59.583	0.00	0.04	0.052	o	|	|	|	|	0.25
59.667	0.00	0.04	0.052	o	|	|	|	|	0.24
59.750	0.00	0.04	0.051	o	|	|	|	|	0.24
59.833	0.00	0.04	0.051	o	|	|	|	|	0.24
59.917	0.00	0.04	0.051	o	|	|	|	|	0.24
60.000	0.00	0.04	0.051	o	|	|	|	|	0.24
60.083	0.00	0.04	0.050	o	|	|	|	|	0.24
60.167	0.00	0.04	0.050	o	|	|	|	|	0.24
60.250	0.00	0.04	0.050	o	|	|	|	|	0.23
60.333	0.00	0.04	0.049	o	|	|	|	|	0.23
60.417	0.00	0.04	0.049	o	|	|	|	|	0.23
60.500	0.00	0.04	0.049	o	|	|	|	|	0.23
60.583	0.00	0.04	0.049	o	|	|	|	|	0.23
60.667	0.00	0.04	0.048	o	|	|	|	|	0.23
60.750	0.00	0.04	0.048	o	|	|	|	|	0.23
60.833	0.00	0.04	0.048	o	|	|	|	|	0.22
60.917	0.00	0.04	0.047	o	|	|	|	|	0.22
61.000	0.00	0.04	0.047	o	|	|	|	|	0.22
61.083	0.00	0.04	0.047	o	|	|	|	|	0.22
61.167	0.00	0.04	0.047	o	|	|	|	|	0.22
61.250	0.00	0.04	0.046	o	|	|	|	|	0.22
61.333	0.00	0.04	0.046	o	|	|	|	|	0.22
61.417	0.00	0.04	0.046	o	|	|	|	|	0.22
61.500	0.00	0.04	0.045	o	|	|	|	|	0.21
61.583	0.00	0.04	0.045	o	|	|	|	|	0.21
61.667	0.00	0.04	0.045	o	|	|	|	|	0.21
61.750	0.00	0.04	0.045	o	|	|	|	|	0.21
61.833	0.00	0.04	0.044	o	|	|	|	|	0.21
61.917	0.00	0.04	0.044	o	|	|	|	|	0.21
62.000	0.00	0.04	0.044	o	|	|	|	|	0.21
62.083	0.00	0.04	0.044	o	|	|	|	|	0.21
62.167	0.00	0.04	0.043	o	|	|	|	|	0.20
62.250	0.00	0.04	0.043	o	|	|	|	|	0.20
62.333	0.00	0.04	0.043	o	|	|	|	|	0.20
62.417	0.00	0.04	0.043	o	|	|	|	|	0.20
62.500	0.00	0.04	0.042	o	|	|	|	|	0.20
62.583	0.00	0.04	0.042	o	|	|	|	|	0.20
62.667	0.00	0.04	0.042	o	|	|	|	|	0.20
62.750	0.00	0.04	0.042	o	|	|	|	|	0.20
62.833	0.00	0.04	0.041	o	|	|	|	|	0.19
62.917	0.00	0.04	0.041	o	|	|	|	|	0.19
63.000	0.00	0.04	0.041	o	|	|	|	|	0.19
63.083	0.00	0.03	0.041	o	|	|	|	|	0.19
63.167	0.00	0.03	0.040	o	|	|	|	|	0.19
63.250	0.00	0.03	0.040	o	|	|	|	|	0.19
63.333	0.00	0.03	0.040	o	|	|	|	|	0.19
63.417	0.00	0.03	0.040	o	|	|	|	|	0.19
63.500	0.00	0.03	0.039	o	|	|	|	|	0.19
63.583	0.00	0.03	0.039	o	|	|	|	|	0.18
63.667	0.00	0.03	0.039	o	|	|	|	|	0.18
63.750	0.00	0.03	0.039	o	|	|	|	|	0.18
63.833	0.00	0.03	0.039	o	|	|	|	|	0.18
63.917	0.00	0.03	0.038	o	|	|	|	|	0.18
64.000	0.00	0.03	0.038	o	|	|	|	|	0.18
64.083	0.00	0.03	0.038	o	|	|	|	|	0.18
64.167	0.00	0.03	0.038	o	|	|	|	|	0.18
64.250	0.00	0.03	0.037	o	|	|	|	|	0.18
64.333	0.00	0.03	0.037	o	|	|	|	|	0.18
64.417	0.00	0.03	0.037	o	|	|	|	|	0.17
64.500	0.00	0.03	0.037	o	|	|	|	|	0.17
64.583	0.00	0.03	0.037	o	|	|	|	|	0.17

64.667	0.00	0.03	0.036	o	|	|	|	0.17
64.750	0.00	0.03	0.036	o	|	|	|	0.17
64.833	0.00	0.03	0.036	o	|	|	|	0.17
64.917	0.00	0.03	0.036	o	|	|	|	0.17
65.000	0.00	0.03	0.035	o	|	|	|	0.17
65.083	0.00	0.03	0.035	o	|	|	|	0.17
65.167	0.00	0.03	0.035	o	|	|	|	0.17
65.250	0.00	0.03	0.035	o	|	|	|	0.16
65.333	0.00	0.03	0.035	o	|	|	|	0.16
65.417	0.00	0.03	0.034	o	|	|	|	0.16
65.500	0.00	0.03	0.034	o	|	|	|	0.16
65.583	0.00	0.03	0.034	o	|	|	|	0.16
65.667	0.00	0.03	0.034	o	|	|	|	0.16
65.750	0.00	0.03	0.034	o	|	|	|	0.16
65.833	0.00	0.03	0.033	o	|	|	|	0.16
65.917	0.00	0.03	0.033	o	|	|	|	0.16
66.000	0.00	0.03	0.033	o	|	|	|	0.16
66.083	0.00	0.03	0.033	o	|	|	|	0.15
66.167	0.00	0.03	0.033	o	|	|	|	0.15
66.250	0.00	0.03	0.032	o	|	|	|	0.15
66.333	0.00	0.03	0.032	o	|	|	|	0.15
66.417	0.00	0.03	0.032	o	|	|	|	0.15
66.500	0.00	0.03	0.032	o	|	|	|	0.15
66.583	0.00	0.03	0.032	o	|	|	|	0.15
66.667	0.00	0.03	0.032	o	|	|	|	0.15
66.750	0.00	0.03	0.031	o	|	|	|	0.15
66.833	0.00	0.03	0.031	o	|	|	|	0.15
66.917	0.00	0.03	0.031	o	|	|	|	0.15
67.000	0.00	0.03	0.031	o	|	|	|	0.15
67.083	0.00	0.03	0.031	o	|	|	|	0.14
67.167	0.00	0.03	0.030	o	|	|	|	0.14
67.250	0.00	0.03	0.030	o	|	|	|	0.14
67.333	0.00	0.03	0.030	o	|	|	|	0.14
67.417	0.00	0.03	0.030	o	|	|	|	0.14
67.500	0.00	0.03	0.030	o	|	|	|	0.14
67.583	0.00	0.03	0.030	o	|	|	|	0.14
67.667	0.00	0.03	0.029	o	|	|	|	0.14
67.750	0.00	0.03	0.029	o	|	|	|	0.14
67.833	0.00	0.02	0.029	o	|	|	|	0.14
67.917	0.00	0.02	0.029	o	|	|	|	0.14
68.000	0.00	0.02	0.029	o	|	|	|	0.14
68.083	0.00	0.02	0.029	o	|	|	|	0.13
68.167	0.00	0.02	0.028	o	|	|	|	0.13
68.250	0.00	0.02	0.028	o	|	|	|	0.13
68.333	0.00	0.02	0.028	o	|	|	|	0.13
68.417	0.00	0.02	0.028	o	|	|	|	0.13
68.500	0.00	0.02	0.028	o	|	|	|	0.13
68.583	0.00	0.02	0.028	o	|	|	|	0.13
68.667	0.00	0.02	0.027	o	|	|	|	0.13
68.750	0.00	0.02	0.027	o	|	|	|	0.13
68.833	0.00	0.02	0.027	o	|	|	|	0.13
68.917	0.00	0.02	0.027	o	|	|	|	0.13
69.000	0.00	0.02	0.027	o	|	|	|	0.13
69.083	0.00	0.02	0.027	o	|	|	|	0.13
69.167	0.00	0.02	0.026	o	|	|	|	0.12
69.250	0.00	0.02	0.026	o	|	|	|	0.12
69.333	0.00	0.02	0.026	o	|	|	|	0.12
69.417	0.00	0.02	0.026	o	|	|	|	0.12
69.500	0.00	0.02	0.026	o	|	|	|	0.12
69.583	0.00	0.02	0.026	o	|	|	|	0.12
69.667	0.00	0.02	0.025	o	|	|	|	0.12
69.750	0.00	0.02	0.025	o	|	|	|	0.12
69.833	0.00	0.02	0.025	o	|	|	|	0.12
69.917	0.00	0.02	0.025	o	|	|	|	0.12
70.000	0.00	0.02	0.025	o	|	|	|	0.12
70.083	0.00	0.02	0.025	o	|	|	|	0.12

70.167	0.00	0.02	0.025	o	|	|	|	|	0.12
70.250	0.00	0.02	0.024	o	|	|	|	|	0.12
70.333	0.00	0.02	0.024	o	|	|	|	|	0.11
70.417	0.00	0.02	0.024	o	|	|	|	|	0.11
70.500	0.00	0.02	0.024	o	|	|	|	|	0.11
70.583	0.00	0.02	0.024	o	|	|	|	|	0.11
70.667	0.00	0.02	0.024	o	|	|	|	|	0.11
70.750	0.00	0.02	0.024	o	|	|	|	|	0.11
70.833	0.00	0.02	0.023	o	|	|	|	|	0.11
70.917	0.00	0.02	0.023	o	|	|	|	|	0.11
71.000	0.00	0.02	0.023	o	|	|	|	|	0.11
71.083	0.00	0.02	0.023	o	|	|	|	|	0.11
71.167	0.00	0.02	0.023	o	|	|	|	|	0.11
71.250	0.00	0.02	0.023	o	|	|	|	|	0.11
71.333	0.00	0.02	0.023	o	|	|	|	|	0.11
71.417	0.00	0.02	0.023	o	|	|	|	|	0.11
71.500	0.00	0.02	0.022	o	|	|	|	|	0.11
71.583	0.00	0.02	0.022	o	|	|	|	|	0.10
71.667	0.00	0.02	0.022	o	|	|	|	|	0.10
71.750	0.00	0.02	0.022	o	|	|	|	|	0.10
71.833	0.00	0.02	0.022	o	|	|	|	|	0.10
71.917	0.00	0.02	0.022	o	|	|	|	|	0.10
72.000	0.00	0.02	0.022	o	|	|	|	|	0.10
72.083	0.00	0.02	0.021	o	|	|	|	|	0.10
72.167	0.00	0.02	0.021	o	|	|	|	|	0.10
72.250	0.00	0.02	0.021	o	|	|	|	|	0.10
72.333	0.00	0.02	0.021	o	|	|	|	|	0.10
72.417	0.00	0.02	0.021	o	|	|	|	|	0.10
72.500	0.00	0.02	0.021	o	|	|	|	|	0.10
72.583	0.00	0.02	0.021	o	|	|	|	|	0.10
72.667	0.00	0.02	0.021	o	|	|	|	|	0.10
72.750	0.00	0.02	0.020	o	|	|	|	|	0.10
72.833	0.00	0.02	0.020	o	|	|	|	|	0.10
72.917	0.00	0.02	0.020	o	|	|	|	|	0.10
73.000	0.00	0.02	0.020	o	|	|	|	|	0.09
73.083	0.00	0.02	0.020	o	|	|	|	|	0.09
73.167	0.00	0.02	0.020	o	|	|	|	|	0.09
73.250	0.00	0.02	0.020	o	|	|	|	|	0.09
73.333	0.00	0.02	0.020	o	|	|	|	|	0.09
73.417	0.00	0.02	0.020	o	|	|	|	|	0.09
73.500	0.00	0.02	0.019	o	|	|	|	|	0.09
73.583	0.00	0.02	0.019	o	|	|	|	|	0.09
73.667	0.00	0.02	0.019	o	|	|	|	|	0.09
73.750	0.00	0.02	0.019	o	|	|	|	|	0.09
73.833	0.00	0.02	0.019	o	|	|	|	|	0.09
73.917	0.00	0.02	0.019	o	|	|	|	|	0.09
74.000	0.00	0.02	0.019	o	|	|	|	|	0.09
74.083	0.00	0.02	0.019	o	|	|	|	|	0.09
74.167	0.00	0.02	0.019	o	|	|	|	|	0.09
74.250	0.00	0.02	0.018	o	|	|	|	|	0.09
74.333	0.00	0.02	0.018	o	|	|	|	|	0.09
74.417	0.00	0.02	0.018	o	|	|	|	|	0.09
74.500	0.00	0.02	0.018	o	|	|	|	|	0.09
74.583	0.00	0.02	0.018	o	|	|	|	|	0.08
74.667	0.00	0.02	0.018	o	|	|	|	|	0.08
74.750	0.00	0.02	0.018	o	|	|	|	|	0.08
74.833	0.00	0.02	0.018	o	|	|	|	|	0.08
74.917	0.00	0.02	0.018	o	|	|	|	|	0.08
75.000	0.00	0.01	0.017	o	|	|	|	|	0.08
75.083	0.00	0.01	0.017	o	|	|	|	|	0.08
75.167	0.00	0.01	0.017	o	|	|	|	|	0.08
75.250	0.00	0.01	0.017	o	|	|	|	|	0.08
75.333	0.00	0.01	0.017	o	|	|	|	|	0.08
75.417	0.00	0.01	0.017	o	|	|	|	|	0.08
75.500	0.00	0.01	0.017	o	|	|	|	|	0.08
75.583	0.00	0.01	0.017	o	|	|	|	|	0.08

75.667	0.00	0.01	0.017	o	|	|	|	|	0.08
75.750	0.00	0.01	0.017	o	|	|	|	|	0.08
75.833	0.00	0.01	0.016	o	|	|	|	|	0.08
75.917	0.00	0.01	0.016	o	|	|	|	|	0.08
76.000	0.00	0.01	0.016	o	|	|	|	|	0.08
76.083	0.00	0.01	0.016	o	|	|	|	|	0.08
76.167	0.00	0.01	0.016	o	|	|	|	|	0.08
76.250	0.00	0.01	0.016	o	|	|	|	|	0.08
76.333	0.00	0.01	0.016	o	|	|	|	|	0.07
76.417	0.00	0.01	0.016	o	|	|	|	|	0.07
76.500	0.00	0.01	0.016	o	|	|	|	|	0.07
76.583	0.00	0.01	0.016	o	|	|	|	|	0.07
76.667	0.00	0.01	0.016	o	|	|	|	|	0.07
76.750	0.00	0.01	0.015	o	|	|	|	|	0.07
76.833	0.00	0.01	0.015	o	|	|	|	|	0.07
76.917	0.00	0.01	0.015	o	|	|	|	|	0.07
77.000	0.00	0.01	0.015	o	|	|	|	|	0.07
77.083	0.00	0.01	0.015	o	|	|	|	|	0.07
77.167	0.00	0.01	0.015	o	|	|	|	|	0.07
77.250	0.00	0.01	0.015	o	|	|	|	|	0.07
77.333	0.00	0.01	0.015	o	|	|	|	|	0.07
77.417	0.00	0.01	0.015	o	|	|	|	|	0.07
77.500	0.00	0.01	0.015	o	|	|	|	|	0.07
77.583	0.00	0.01	0.015	o	|	|	|	|	0.07
77.667	0.00	0.01	0.014	o	|	|	|	|	0.07
77.750	0.00	0.01	0.014	o	|	|	|	|	0.07
77.833	0.00	0.01	0.014	o	|	|	|	|	0.07
77.917	0.00	0.01	0.014	o	|	|	|	|	0.07
78.000	0.00	0.01	0.014	o	|	|	|	|	0.07
78.083	0.00	0.01	0.014	o	|	|	|	|	0.07
78.167	0.00	0.01	0.014	o	|	|	|	|	0.07
78.250	0.00	0.01	0.014	o	|	|	|	|	0.07
78.333	0.00	0.01	0.014	o	|	|	|	|	0.07
78.417	0.00	0.01	0.014	o	|	|	|	|	0.06
78.500	0.00	0.01	0.014	o	|	|	|	|	0.06
78.583	0.00	0.01	0.014	o	|	|	|	|	0.06
78.667	0.00	0.01	0.013	o	|	|	|	|	0.06
78.750	0.00	0.01	0.013	o	|	|	|	|	0.06
78.833	0.00	0.01	0.013	o	|	|	|	|	0.06
78.917	0.00	0.01	0.013	o	|	|	|	|	0.06
79.000	0.00	0.01	0.013	o	|	|	|	|	0.06
79.083	0.00	0.01	0.013	o	|	|	|	|	0.06
79.167	0.00	0.01	0.013	o	|	|	|	|	0.06
79.250	0.00	0.01	0.013	o	|	|	|	|	0.06
79.333	0.00	0.01	0.013	o	|	|	|	|	0.06
79.417	0.00	0.01	0.013	o	|	|	|	|	0.06
79.500	0.00	0.01	0.013	o	|	|	|	|	0.06
79.583	0.00	0.01	0.013	o	|	|	|	|	0.06
79.667	0.00	0.01	0.013	o	|	|	|	|	0.06
79.750	0.00	0.01	0.012	o	|	|	|	|	0.06
79.833	0.00	0.01	0.012	o	|	|	|	|	0.06
79.917	0.00	0.01	0.012	o	|	|	|	|	0.06
80.000	0.00	0.01	0.012	o	|	|	|	|	0.06
80.083	0.00	0.01	0.012	o	|	|	|	|	0.06
80.167	0.00	0.01	0.012	o	|	|	|	|	0.06
80.250	0.00	0.01	0.012	o	|	|	|	|	0.06
80.333	0.00	0.01	0.012	o	|	|	|	|	0.06
80.417	0.00	0.01	0.012	o	|	|	|	|	0.06
80.500	0.00	0.01	0.012	o	|	|	|	|	0.06
80.583	0.00	0.01	0.012	o	|	|	|	|	0.06
80.667	0.00	0.01	0.012	o	|	|	|	|	0.06
80.750	0.00	0.01	0.012	o	|	|	|	|	0.05
80.833	0.00	0.01	0.012	o	|	|	|	|	0.05
80.917	0.00	0.01	0.011	o	|	|	|	|	0.05
81.000	0.00	0.01	0.011	o	|	|	|	|	0.05
81.083	0.00	0.01	0.011	o	|	|	|	|	0.05

81.167	0.00	0.01	0.011	o	|	|	|	|	0.05
81.250	0.00	0.01	0.011	o	|	|	|	|	0.05
81.333	0.00	0.01	0.011	o	|	|	|	|	0.05
81.417	0.00	0.01	0.011	o	|	|	|	|	0.05
81.500	0.00	0.01	0.011	o	|	|	|	|	0.05
81.583	0.00	0.01	0.011	o	|	|	|	|	0.05
81.667	0.00	0.01	0.011	o	|	|	|	|	0.05
81.750	0.00	0.01	0.011	o	|	|	|	|	0.05
81.833	0.00	0.01	0.011	o	|	|	|	|	0.05
81.917	0.00	0.01	0.011	o	|	|	|	|	0.05
82.000	0.00	0.01	0.011	o	|	|	|	|	0.05
82.083	0.00	0.01	0.011	o	|	|	|	|	0.05
82.167	0.00	0.01	0.011	o	|	|	|	|	0.05
82.250	0.00	0.01	0.010	o	|	|	|	|	0.05
82.333	0.00	0.01	0.010	o	|	|	|	|	0.05
82.417	0.00	0.01	0.010	o	|	|	|	|	0.05
82.500	0.00	0.01	0.010	o	|	|	|	|	0.05
82.583	0.00	0.01	0.010	o	|	|	|	|	0.05
82.667	0.00	0.01	0.010	o	|	|	|	|	0.05
82.750	0.00	0.01	0.010	o	|	|	|	|	0.05
82.833	0.00	0.01	0.010	o	|	|	|	|	0.05
82.917	0.00	0.01	0.010	o	|	|	|	|	0.05
83.000	0.00	0.01	0.010	o	|	|	|	|	0.05
83.083	0.00	0.01	0.010	o	|	|	|	|	0.05
83.167	0.00	0.01	0.010	o	|	|	|	|	0.05
83.250	0.00	0.01	0.010	o	|	|	|	|	0.05
83.333	0.00	0.01	0.010	o	|	|	|	|	0.05
83.417	0.00	0.01	0.010	o	|	|	|	|	0.05
83.500	0.00	0.01	0.010	o	|	|	|	|	0.05
83.583	0.00	0.01	0.010	o	|	|	|	|	0.04
83.667	0.00	0.01	0.009	o	|	|	|	|	0.04
83.750	0.00	0.01	0.009	o	|	|	|	|	0.04
83.833	0.00	0.01	0.009	o	|	|	|	|	0.04
83.917	0.00	0.01	0.009	o	|	|	|	|	0.04
84.000	0.00	0.01	0.009	o	|	|	|	|	0.04
84.083	0.00	0.01	0.009	o	|	|	|	|	0.04
84.167	0.00	0.01	0.009	o	|	|	|	|	0.04
84.250	0.00	0.01	0.009	o	|	|	|	|	0.04
84.333	0.00	0.01	0.009	o	|	|	|	|	0.04
84.417	0.00	0.01	0.009	o	|	|	|	|	0.04
84.500	0.00	0.01	0.009	o	|	|	|	|	0.04
84.583	0.00	0.01	0.009	o	|	|	|	|	0.04
84.667	0.00	0.01	0.009	o	|	|	|	|	0.04
84.750	0.00	0.01	0.009	o	|	|	|	|	0.04
84.833	0.00	0.01	0.009	o	|	|	|	|	0.04
84.917	0.00	0.01	0.009	o	|	|	|	|	0.04
85.000	0.00	0.01	0.009	o	|	|	|	|	0.04
85.083	0.00	0.01	0.009	o	|	|	|	|	0.04
85.167	0.00	0.01	0.009	o	|	|	|	|	0.04
85.250	0.00	0.01	0.008	o	|	|	|	|	0.04
85.333	0.00	0.01	0.008	o	|	|	|	|	0.04
85.417	0.00	0.01	0.008	o	|	|	|	|	0.04
85.500	0.00	0.01	0.008	o	|	|	|	|	0.04
85.583	0.00	0.01	0.008	o	|	|	|	|	0.04
85.667	0.00	0.01	0.008	o	|	|	|	|	0.04
85.750	0.00	0.01	0.008	o	|	|	|	|	0.04
85.833	0.00	0.01	0.008	o	|	|	|	|	0.04
85.917	0.00	0.01	0.008	o	|	|	|	|	0.04
86.000	0.00	0.01	0.008	o	|	|	|	|	0.04
86.083	0.00	0.01	0.008	o	|	|	|	|	0.04
86.167	0.00	0.01	0.008	o	|	|	|	|	0.04
86.250	0.00	0.01	0.008	o	|	|	|	|	0.04
86.333	0.00	0.01	0.008	o	|	|	|	|	0.04
86.417	0.00	0.01	0.008	o	|	|	|	|	0.04
86.500	0.00	0.01	0.008	o	|	|	|	|	0.04
86.583	0.00	0.01	0.008	o	|	|	|	|	0.04

86.667	0.00	0.01	0.008	o	|	|	|	|	0.04
86.750	0.00	0.01	0.008	o	|	|	|	|	0.04
86.833	0.00	0.01	0.008	o	|	|	|	|	0.04
86.917	0.00	0.01	0.008	o	|	|	|	|	0.04
87.000	0.00	0.01	0.007	o	|	|	|	|	0.04
87.083	0.00	0.01	0.007	o	|	|	|	|	0.03
87.167	0.00	0.01	0.007	o	|	|	|	|	0.03
87.250	0.00	0.01	0.007	o	|	|	|	|	0.03
87.333	0.00	0.01	0.007	o	|	|	|	|	0.03
87.417	0.00	0.01	0.007	o	|	|	|	|	0.03
87.500	0.00	0.01	0.007	o	|	|	|	|	0.03
87.583	0.00	0.01	0.007	o	|	|	|	|	0.03
87.667	0.00	0.01	0.007	o	|	|	|	|	0.03
87.750	0.00	0.01	0.007	o	|	|	|	|	0.03
87.833	0.00	0.01	0.007	o	|	|	|	|	0.03
87.917	0.00	0.01	0.007	o	|	|	|	|	0.03
88.000	0.00	0.01	0.007	o	|	|	|	|	0.03
88.083	0.00	0.01	0.007	o	|	|	|	|	0.03
88.167	0.00	0.01	0.007	o	|	|	|	|	0.03
88.250	0.00	0.01	0.007	o	|	|	|	|	0.03
88.333	0.00	0.01	0.007	o	|	|	|	|	0.03
88.417	0.00	0.01	0.007	o	|	|	|	|	0.03
88.500	0.00	0.01	0.007	o	|	|	|	|	0.03
88.583	0.00	0.01	0.007	o	|	|	|	|	0.03
88.667	0.00	0.01	0.007	o	|	|	|	|	0.03
88.750	0.00	0.01	0.007	o	|	|	|	|	0.03
88.833	0.00	0.01	0.007	o	|	|	|	|	0.03
88.917	0.00	0.01	0.007	o	|	|	|	|	0.03
89.000	0.00	0.01	0.006	o	|	|	|	|	0.03
89.083	0.00	0.01	0.006	o	|	|	|	|	0.03
89.167	0.00	0.01	0.006	o	|	|	|	|	0.03
89.250	0.00	0.01	0.006	o	|	|	|	|	0.03
89.333	0.00	0.01	0.006	o	|	|	|	|	0.03
89.417	0.00	0.01	0.006	o	|	|	|	|	0.03
89.500	0.00	0.01	0.006	o	|	|	|	|	0.03
89.583	0.00	0.01	0.006	o	|	|	|	|	0.03
89.667	0.00	0.01	0.006	o	|	|	|	|	0.03
89.750	0.00	0.01	0.006	o	|	|	|	|	0.03
89.833	0.00	0.01	0.006	o	|	|	|	|	0.03
89.917	0.00	0.01	0.006	o	|	|	|	|	0.03
90.000	0.00	0.01	0.006	o	|	|	|	|	0.03
90.083	0.00	0.01	0.006	o	|	|	|	|	0.03
90.167	0.00	0.01	0.006	o	|	|	|	|	0.03
90.250	0.00	0.01	0.006	o	|	|	|	|	0.03
90.333	0.00	0.01	0.006	o	|	|	|	|	0.03
90.417	0.00	0.01	0.006	o	|	|	|	|	0.03
90.500	0.00	0.00	0.006	o	|	|	|	|	0.03
90.583	0.00	0.00	0.006	o	|	|	|	|	0.03
90.667	0.00	0.00	0.006	o	|	|	|	|	0.03
90.750	0.00	0.00	0.006	o	|	|	|	|	0.03
90.833	0.00	0.00	0.006	o	|	|	|	|	0.03
90.917	0.00	0.00	0.006	o	|	|	|	|	0.03
91.000	0.00	0.00	0.006	o	|	|	|	|	0.03
91.083	0.00	0.00	0.006	o	|	|	|	|	0.03
91.167	0.00	0.00	0.006	o	|	|	|	|	0.03
91.250	0.00	0.00	0.006	o	|	|	|	|	0.03
91.333	0.00	0.00	0.005	o	|	|	|	|	0.03
91.417	0.00	0.00	0.005	o	|	|	|	|	0.03
91.500	0.00	0.00	0.005	o	|	|	|	|	0.03
91.583	0.00	0.00	0.005	o	|	|	|	|	0.03
91.667	0.00	0.00	0.005	o	|	|	|	|	0.03
91.750	0.00	0.00	0.005	o	|	|	|	|	0.03
91.833	0.00	0.00	0.005	o	|	|	|	|	0.02
91.917	0.00	0.00	0.005	o	|	|	|	|	0.02
92.000	0.00	0.00	0.005	o	|	|	|	|	0.02
92.083	0.00	0.00	0.005	o	|	|	|	|	0.02

92.167	0.00	0.00	0.005	o	|	|	|	|	0.02
92.250	0.00	0.00	0.005	o	|	|	|	|	0.02
92.333	0.00	0.00	0.005	o	|	|	|	|	0.02
92.417	0.00	0.00	0.005	o	|	|	|	|	0.02
92.500	0.00	0.00	0.005	o	|	|	|	|	0.02
92.583	0.00	0.00	0.005	o	|	|	|	|	0.02
92.667	0.00	0.00	0.005	o	|	|	|	|	0.02
92.750	0.00	0.00	0.005	o	|	|	|	|	0.02
92.833	0.00	0.00	0.005	o	|	|	|	|	0.02
92.917	0.00	0.00	0.005	o	|	|	|	|	0.02
93.000	0.00	0.00	0.005	o	|	|	|	|	0.02
93.083	0.00	0.00	0.005	o	|	|	|	|	0.02
93.167	0.00	0.00	0.005	o	|	|	|	|	0.02
93.250	0.00	0.00	0.005	o	|	|	|	|	0.02
93.333	0.00	0.00	0.005	o	|	|	|	|	0.02
93.417	0.00	0.00	0.005	o	|	|	|	|	0.02
93.500	0.00	0.00	0.005	o	|	|	|	|	0.02
93.583	0.00	0.00	0.005	o	|	|	|	|	0.02
93.667	0.00	0.00	0.005	o	|	|	|	|	0.02
93.750	0.00	0.00	0.005	o	|	|	|	|	0.02
93.833	0.00	0.00	0.005	o	|	|	|	|	0.02
93.917	0.00	0.00	0.005	o	|	|	|	|	0.02
94.000	0.00	0.00	0.005	o	|	|	|	|	0.02
94.083	0.00	0.00	0.005	o	|	|	|	|	0.02
94.167	0.00	0.00	0.004	o	|	|	|	|	0.02
94.250	0.00	0.00	0.004	o	|	|	|	|	0.02
94.333	0.00	0.00	0.004	o	|	|	|	|	0.02
94.417	0.00	0.00	0.004	o	|	|	|	|	0.02
94.500	0.00	0.00	0.004	o	|	|	|	|	0.02
94.583	0.00	0.00	0.004	o	|	|	|	|	0.02
94.667	0.00	0.00	0.004	o	|	|	|	|	0.02
94.750	0.00	0.00	0.004	o	|	|	|	|	0.02
94.833	0.00	0.00	0.004	o	|	|	|	|	0.02
94.917	0.00	0.00	0.004	o	|	|	|	|	0.02
95.000	0.00	0.00	0.004	o	|	|	|	|	0.02
95.083	0.00	0.00	0.004	o	|	|	|	|	0.02
95.167	0.00	0.00	0.004	o	|	|	|	|	0.02
95.250	0.00	0.00	0.004	o	|	|	|	|	0.02
95.333	0.00	0.00	0.004	o	|	|	|	|	0.02
95.417	0.00	0.00	0.004	o	|	|	|	|	0.02
95.500	0.00	0.00	0.004	o	|	|	|	|	0.02
95.583	0.00	0.00	0.004	o	|	|	|	|	0.02
95.667	0.00	0.00	0.004	o	|	|	|	|	0.02
95.750	0.00	0.00	0.004	o	|	|	|	|	0.02
95.833	0.00	0.00	0.004	o	|	|	|	|	0.02
95.917	0.00	0.00	0.004	o	|	|	|	|	0.02
96.000	0.00	0.00	0.004	o	|	|	|	|	0.02
96.083	0.00	0.00	0.004	o	|	|	|	|	0.02
96.167	0.00	0.00	0.004	o	|	|	|	|	0.02
96.250	0.00	0.00	0.004	o	|	|	|	|	0.02
96.333	0.00	0.00	0.004	o	|	|	|	|	0.02
96.417	0.00	0.00	0.004	o	|	|	|	|	0.02
96.500	0.00	0.00	0.004	o	|	|	|	|	0.02
96.583	0.00	0.00	0.004	o	|	|	|	|	0.02
96.667	0.00	0.00	0.004	o	|	|	|	|	0.02
96.750	0.00	0.00	0.004	o	|	|	|	|	0.02
96.833	0.00	0.00	0.004	o	|	|	|	|	0.02
96.917	0.00	0.00	0.004	o	|	|	|	|	0.02
97.000	0.00	0.00	0.004	o	|	|	|	|	0.02
97.083	0.00	0.00	0.004	o	|	|	|	|	0.02
97.167	0.00	0.00	0.004	o	|	|	|	|	0.02
97.250	0.00	0.00	0.004	o	|	|	|	|	0.02
97.333	0.00	0.00	0.004	o	|	|	|	|	0.02
97.417	0.00	0.00	0.004	o	|	|	|	|	0.02
97.500	0.00	0.00	0.004	o	|	|	|	|	0.02
97.583	0.00	0.00	0.004	o	|	|	|	|	0.02

97.667	0.00	0.00	0.004	o	|	|	|	|	0.02
97.750	0.00	0.00	0.003	o	|	|	|	|	0.02
97.833	0.00	0.00	0.003	o	|	|	|	|	0.02
97.917	0.00	0.00	0.003	o	|	|	|	|	0.02
98.000	0.00	0.00	0.003	o	|	|	|	|	0.02
98.083	0.00	0.00	0.003	o	|	|	|	|	0.02
98.167	0.00	0.00	0.003	o	|	|	|	|	0.02
98.250	0.00	0.00	0.003	o	|	|	|	|	0.02
98.333	0.00	0.00	0.003	o	|	|	|	|	0.02
98.417	0.00	0.00	0.003	o	|	|	|	|	0.02
98.500	0.00	0.00	0.003	o	|	|	|	|	0.02
98.583	0.00	0.00	0.003	o	|	|	|	|	0.02
98.667	0.00	0.00	0.003	o	|	|	|	|	0.02
98.750	0.00	0.00	0.003	o	|	|	|	|	0.02
98.833	0.00	0.00	0.003	o	|	|	|	|	0.02
98.917	0.00	0.00	0.003	o	|	|	|	|	0.02
99.000	0.00	0.00	0.003	o	|	|	|	|	0.02
99.083	0.00	0.00	0.003	o	|	|	|	|	0.01
99.167	0.00	0.00	0.003	o	|	|	|	|	0.01
99.250	0.00	0.00	0.003	o	|	|	|	|	0.01
99.333	0.00	0.00	0.003	o	|	|	|	|	0.01
99.417	0.00	0.00	0.003	o	|	|	|	|	0.01
99.500	0.00	0.00	0.003	o	|	|	|	|	0.01
99.583	0.00	0.00	0.003	o	|	|	|	|	0.01
99.667	0.00	0.00	0.003	o	|	|	|	|	0.01
99.750	0.00	0.00	0.003	o	|	|	|	|	0.01
99.833	0.00	0.00	0.003	o	|	|	|	|	0.01
99.917	0.00	0.00	0.003	o	|	|	|	|	0.01
100.000	0.00	0.00	0.003	o	|	|	|	|	0.01
100.083	0.00	0.00	0.003	o	|	|	|	|	0.01
100.167	0.00	0.00	0.003	o	|	|	|	|	0.01
100.250	0.00	0.00	0.003	o	|	|	|	|	0.01
100.333	0.00	0.00	0.003	o	|	|	|	|	0.01
100.417	0.00	0.00	0.003	o	|	|	|	|	0.01
100.500	0.00	0.00	0.003	o	|	|	|	|	0.01
100.583	0.00	0.00	0.003	o	|	|	|	|	0.01
100.667	0.00	0.00	0.003	o	|	|	|	|	0.01
100.750	0.00	0.00	0.003	o	|	|	|	|	0.01
100.833	0.00	0.00	0.003	o	|	|	|	|	0.01
100.917	0.00	0.00	0.003	o	|	|	|	|	0.01
101.000	0.00	0.00	0.003	o	|	|	|	|	0.01
101.083	0.00	0.00	0.003	o	|	|	|	|	0.01
101.167	0.00	0.00	0.003	o	|	|	|	|	0.01
101.250	0.00	0.00	0.003	o	|	|	|	|	0.01
101.333	0.00	0.00	0.003	o	|	|	|	|	0.01
101.417	0.00	0.00	0.003	o	|	|	|	|	0.01
101.500	0.00	0.00	0.003	o	|	|	|	|	0.01
101.583	0.00	0.00	0.003	o	|	|	|	|	0.01
101.667	0.00	0.00	0.003	o	|	|	|	|	0.01
101.750	0.00	0.00	0.003	o	|	|	|	|	0.01
101.833	0.00	0.00	0.003	o	|	|	|	|	0.01
101.917	0.00	0.00	0.003	o	|	|	|	|	0.01
102.000	0.00	0.00	0.003	o	|	|	|	|	0.01
102.083	0.00	0.00	0.003	o	|	|	|	|	0.01
102.167	0.00	0.00	0.003	o	|	|	|	|	0.01
102.250	0.00	0.00	0.003	o	|	|	|	|	0.01
102.333	0.00	0.00	0.003	o	|	|	|	|	0.01
102.417	0.00	0.00	0.003	o	|	|	|	|	0.01
102.500	0.00	0.00	0.002	o	|	|	|	|	0.01
102.583	0.00	0.00	0.002	o	|	|	|	|	0.01
102.667	0.00	0.00	0.002	o	|	|	|	|	0.01
102.750	0.00	0.00	0.002	o	|	|	|	|	0.01
102.833	0.00	0.00	0.002	o	|	|	|	|	0.01
102.917	0.00	0.00	0.002	o	|	|	|	|	0.01
103.000	0.00	0.00	0.002	o	|	|	|	|	0.01
103.083	0.00	0.00	0.002	o	|	|	|	|	0.01

103.167	0.00	0.00	0.002	o	|	|	|	|	0.01
103.250	0.00	0.00	0.002	o	|	|	|	|	0.01
103.333	0.00	0.00	0.002	o	|	|	|	|	0.01
103.417	0.00	0.00	0.002	o	|	|	|	|	0.01
103.500	0.00	0.00	0.002	o	|	|	|	|	0.01
103.583	0.00	0.00	0.002	o	|	|	|	|	0.01
103.667	0.00	0.00	0.002	o	|	|	|	|	0.01
103.750	0.00	0.00	0.002	o	|	|	|	|	0.01
103.833	0.00	0.00	0.002	o	|	|	|	|	0.01
103.917	0.00	0.00	0.002	o	|	|	|	|	0.01
104.000	0.00	0.00	0.002	o	|	|	|	|	0.01
104.083	0.00	0.00	0.002	o	|	|	|	|	0.01
104.167	0.00	0.00	0.002	o	|	|	|	|	0.01
104.250	0.00	0.00	0.002	o	|	|	|	|	0.01
104.333	0.00	0.00	0.002	o	|	|	|	|	0.01
104.417	0.00	0.00	0.002	o	|	|	|	|	0.01
104.500	0.00	0.00	0.002	o	|	|	|	|	0.01
104.583	0.00	0.00	0.002	o	|	|	|	|	0.01
104.667	0.00	0.00	0.002	o	|	|	|	|	0.01
104.750	0.00	0.00	0.002	o	|	|	|	|	0.01
104.833	0.00	0.00	0.002	o	|	|	|	|	0.01
104.917	0.00	0.00	0.002	o	|	|	|	|	0.01
105.000	0.00	0.00	0.002	o	|	|	|	|	0.01
105.083	0.00	0.00	0.002	o	|	|	|	|	0.01
105.167	0.00	0.00	0.002	o	|	|	|	|	0.01
105.250	0.00	0.00	0.002	o	|	|	|	|	0.01
105.333	0.00	0.00	0.002	o	|	|	|	|	0.01
105.417	0.00	0.00	0.002	o	|	|	|	|	0.01
105.500	0.00	0.00	0.002	o	|	|	|	|	0.01
105.583	0.00	0.00	0.002	o	|	|	|	|	0.01
105.667	0.00	0.00	0.002	o	|	|	|	|	0.01
105.750	0.00	0.00	0.002	o	|	|	|	|	0.01
105.833	0.00	0.00	0.002	o	|	|	|	|	0.01
105.917	0.00	0.00	0.002	o	|	|	|	|	0.01
106.000	0.00	0.00	0.002	o	|	|	|	|	0.01
106.083	0.00	0.00	0.002	o	|	|	|	|	0.01
106.167	0.00	0.00	0.002	o	|	|	|	|	0.01
106.250	0.00	0.00	0.002	o	|	|	|	|	0.01
106.333	0.00	0.00	0.002	o	|	|	|	|	0.01
106.417	0.00	0.00	0.002	o	|	|	|	|	0.01
106.500	0.00	0.00	0.002	o	|	|	|	|	0.01
106.583	0.00	0.00	0.002	o	|	|	|	|	0.01
106.667	0.00	0.00	0.002	o	|	|	|	|	0.01
106.750	0.00	0.00	0.002	o	|	|	|	|	0.01
106.833	0.00	0.00	0.002	o	|	|	|	|	0.01
106.917	0.00	0.00	0.002	o	|	|	|	|	0.01
107.000	0.00	0.00	0.002	o	|	|	|	|	0.01
107.083	0.00	0.00	0.002	o	|	|	|	|	0.01
107.167	0.00	0.00	0.002	o	|	|	|	|	0.01
107.250	0.00	0.00	0.002	o	|	|	|	|	0.01
107.333	0.00	0.00	0.002	o	|	|	|	|	0.01
107.417	0.00	0.00	0.002	o	|	|	|	|	0.01
107.500	0.00	0.00	0.002	o	|	|	|	|	0.01
107.583	0.00	0.00	0.002	o	|	|	|	|	0.01
107.667	0.00	0.00	0.002	o	|	|	|	|	0.01
107.750	0.00	0.00	0.002	o	|	|	|	|	0.01
107.833	0.00	0.00	0.002	o	|	|	|	|	0.01
107.917	0.00	0.00	0.002	o	|	|	|	|	0.01
108.000	0.00	0.00	0.002	o	|	|	|	|	0.01
108.083	0.00	0.00	0.002	o	|	|	|	|	0.01
108.167	0.00	0.00	0.002	o	|	|	|	|	0.01
108.250	0.00	0.00	0.002	o	|	|	|	|	0.01
108.333	0.00	0.00	0.002	o	|	|	|	|	0.01
108.417	0.00	0.00	0.002	o	|	|	|	|	0.01
108.500	0.00	0.00	0.002	o	|	|	|	|	0.01
108.583	0.00	0.00	0.002	o	|	|	|	|	0.01

108.667	0.00	0.00	0.002	o	|	|	|	|	0.01
108.750	0.00	0.00	0.002	o	|	|	|	|	0.01
108.833	0.00	0.00	0.002	o	|	|	|	|	0.01
108.917	0.00	0.00	0.002	o	|	|	|	|	0.01
109.000	0.00	0.00	0.002	o	|	|	|	|	0.01
109.083	0.00	0.00	0.002	o	|	|	|	|	0.01
109.167	0.00	0.00	0.002	o	|	|	|	|	0.01
109.250	0.00	0.00	0.002	o	|	|	|	|	0.01
109.333	0.00	0.00	0.002	o	|	|	|	|	0.01
109.417	0.00	0.00	0.002	o	|	|	|	|	0.01
109.500	0.00	0.00	0.002	o	|	|	|	|	0.01
109.583	0.00	0.00	0.002	o	|	|	|	|	0.01
109.667	0.00	0.00	0.001	o	|	|	|	|	0.01
109.750	0.00	0.00	0.001	o	|	|	|	|	0.01
109.833	0.00	0.00	0.001	o	|	|	|	|	0.01
109.917	0.00	0.00	0.001	o	|	|	|	|	0.01
110.000	0.00	0.00	0.001	o	|	|	|	|	0.01
110.083	0.00	0.00	0.001	o	|	|	|	|	0.01
110.167	0.00	0.00	0.001	o	|	|	|	|	0.01
110.250	0.00	0.00	0.001	o	|	|	|	|	0.01
110.333	0.00	0.00	0.001	o	|	|	|	|	0.01
110.417	0.00	0.00	0.001	o	|	|	|	|	0.01
110.500	0.00	0.00	0.001	o	|	|	|	|	0.01
110.583	0.00	0.00	0.001	o	|	|	|	|	0.01
110.667	0.00	0.00	0.001	o	|	|	|	|	0.01
110.750	0.00	0.00	0.001	o	|	|	|	|	0.01
110.833	0.00	0.00	0.001	o	|	|	|	|	0.01
110.917	0.00	0.00	0.001	o	|	|	|	|	0.01
111.000	0.00	0.00	0.001	o	|	|	|	|	0.01
111.083	0.00	0.00	0.001	o	|	|	|	|	0.01
111.167	0.00	0.00	0.001	o	|	|	|	|	0.01
111.250	0.00	0.00	0.001	o	|	|	|	|	0.01
111.333	0.00	0.00	0.001	o	|	|	|	|	0.01
111.417	0.00	0.00	0.001	o	|	|	|	|	0.01
111.500	0.00	0.00	0.001	o	|	|	|	|	0.01
111.583	0.00	0.00	0.001	o	|	|	|	|	0.01
111.667	0.00	0.00	0.001	o	|	|	|	|	0.01
111.750	0.00	0.00	0.001	o	|	|	|	|	0.01
111.833	0.00	0.00	0.001	o	|	|	|	|	0.01
111.917	0.00	0.00	0.001	o	|	|	|	|	0.01
112.000	0.00	0.00	0.001	o	|	|	|	|	0.01
112.083	0.00	0.00	0.001	o	|	|	|	|	0.01
112.167	0.00	0.00	0.001	o	|	|	|	|	0.01
112.250	0.00	0.00	0.001	o	|	|	|	|	0.01
112.333	0.00	0.00	0.001	o	|	|	|	|	0.01
112.417	0.00	0.00	0.001	o	|	|	|	|	0.01
112.500	0.00	0.00	0.001	o	|	|	|	|	0.01
112.583	0.00	0.00	0.001	o	|	|	|	|	0.01
112.667	0.00	0.00	0.001	o	|	|	|	|	0.01
112.750	0.00	0.00	0.001	o	|	|	|	|	0.01
112.833	0.00	0.00	0.001	o	|	|	|	|	0.01
112.917	0.00	0.00	0.001	o	|	|	|	|	0.01
113.000	0.00	0.00	0.001	o	|	|	|	|	0.01
113.083	0.00	0.00	0.001	o	|	|	|	|	0.01
113.167	0.00	0.00	0.001	o	|	|	|	|	0.01
113.250	0.00	0.00	0.001	o	|	|	|	|	0.01

Remaining water in basin = 0.00 (Ac.Ft)

**********HYDROGRAPH DATA**********

Number of intervals = 1359
Time interval = 5.0 (Min.)
Maximum/Peak flow rate = 22.456 (CFS)
Total volume = 2.973 (Ac.Ft)

```
       Status of hydrographs being held in storage
                  Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*******************************************************************************

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```

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                FLOOD HYDROGRAPH ROUTING PROGRAM
          Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2022
                     Study date: 09/18/22

------------------------------------------------------------------------


XENIA
PRELIMINARY BASIN ROUTING MODEL
PRELIMINARY BASIN A
100-YEAR; 24-HOUR
------------------------------------------------------------------------


Program License Serial Number 6545

------------------------------------------------------------------------
********************* HYDROGRAPH INFORMATION **********************

             From study/file name: 2D24100.rte
*****************************HYDROGRAPH DATA*****************************
             Number of intervals =   294
             Time interval =    5.0 (Min.)
             Maximum/Peak flow rate =       11.773 (CFS)
             Total volume =       6.200 (Ac.Ft)
      Status of hydrographs being held in storage
                  Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
      Peak (CFS)      0.000     0.000     0.000     0.000     0.000
      Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*************************************************************************



++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.000 to Point/Station        2.000
**** RETARDING BASIN ROUTING ****
________________________________________________________________________

User entry of depth-outflow-storage data
------------------------------------------------------------------------
Total number of inflow hydrograph intervals = 294
Hydrograph time unit =  5.000 (Min.)
Initial depth in storage basin =   0.00(Ft.)
------------------------------------------------------------------------
------------------------------------------------------------------------
Initial basin depth =   0.00 (Ft.)
Initial basin storage =      0.00 (Ac.Ft)
Initial basin outflow =   0.00 (CFS)
------------------------------------------------------------------------
------------------------------------------------------------------------
Depth vs. Storage and Depth vs. Discharge data:
 Basin Depth  Storage    Outflow   (S-O*dt/2)   (S+O*dt/2)
     (Ft.)    (Ac.Ft)    (CFS)     (Ac.Ft)    (Ac.Ft)
------------------------------------------------------------------------
   0.000      0.000      0.000      0.000        0.000
   0.330      0.070      0.060      0.070        0.070
   0.670      0.140      0.080      0.140        0.140
   1.000      0.210      0.100      0.210        0.210
   1.330      0.290      0.110      0.290        0.290
   1.670      0.370      0.390      0.369        0.371
   2.000      0.450      0.530      0.448        0.452
   2.330      0.540      0.630      0.538        0.542
   2.670      0.630      0.720      0.628        0.632
   3.000      0.730      0.790      0.727        0.733
```

3.500	0.830	0.890	0.827	0.833
4.000	0.940	0.990	0.937	0.943
4.500	1.050	1.070	1.046	1.054
5.000	1.170	1.150	1.166	1.174
5.500	1.300	1.220	1.296	1.304
6.000	1.430	25.420	1.342	1.518
6.500	1.570	71.680	1.323	1.817
7.000	1.720	132.480	1.264	2.176
7.500	1.870	206.420	1.159	2.581

Hydrograph Detention Basin Routing

Graph values: 'I'= unit inflow; 'O'=outflow at time shown

Time (Hours)	Inflow (CFS)	Outflow (CFS)	Storage (Ac.Ft)	.0 2.9 5.89 8.83 11.77	Depth (Ft.)
0.083	0.13	0.00	0.000	O | | | |	0.00
0.167	0.38	0.00	0.002	OI | | | |	0.01
0.250	0.45	0.00	0.005	OI | | | |	0.02
0.333	0.55	0.01	0.008	OI | | | |	0.04
0.417	0.69	0.01	0.013	OI | | | |	0.06
0.500	0.74	0.02	0.018	O I | | | |	0.08
0.583	0.76	0.02	0.023	O I | | | |	0.11
0.667	0.77	0.02	0.028	O I | | | |	0.13
0.750	0.77	0.03	0.033	O I | | | |	0.15
0.833	0.84	0.03	0.038	O I | | | |	0.18
0.917	0.97	0.04	0.044	O I | | | |	0.21
1.000	1.00	0.04	0.051	O I | | | |	0.24
1.083	0.95	0.05	0.057	O I | | | |	0.27
1.167	0.84	0.05	0.063	O I | | | |	0.30
1.250	0.81	0.06	0.068	O I | | | |	0.32
1.333	0.79	0.06	0.073	O I | | | |	0.35
1.417	0.79	0.06	0.078	O I | | | |	0.37
1.500	0.78	0.06	0.083	O I | | | |	0.39
1.583	0.78	0.07	0.088	O I | | | |	0.42
1.667	0.78	0.07	0.093	O I | | | |	0.44
1.750	0.78	0.07	0.098	O I | | | |	0.47
1.833	0.84	0.07	0.103	O I | | | |	0.49
1.917	0.97	0.07	0.109	O I | | | |	0.52
2.000	1.00	0.07	0.115	O I | | | |	0.55
2.083	1.02	0.07	0.122	O I | | | |	0.58
2.167	1.03	0.08	0.128	O I | | | |	0.61
2.250	1.03	0.08	0.135	O I | | | |	0.64
2.333	1.04	0.08	0.141	O I | | | |	0.68
2.417	1.04	0.08	0.148	O I | | | |	0.71
2.500	1.04	0.08	0.154	O I | | | |	0.74
2.583	1.10	0.09	0.161	O I | | | |	0.77
2.667	1.23	0.09	0.169	O I | | | |	0.80
2.750	1.26	0.09	0.177	O I | | | |	0.84
2.833	1.28	0.09	0.185	O I | | | |	0.88
2.917	1.29	0.10	0.193	O I | | | |	0.92
3.000	1.29	0.10	0.201	O I | | | |	0.96
3.083	1.30	0.10	0.209	O I | | | |	1.00
3.167	1.30	0.10	0.218	O I | | | |	1.03
3.250	1.30	0.10	0.226	O I | | | |	1.07
3.333	1.30	0.10	0.234	O I | | | |	1.10
3.417	1.30	0.10	0.242	O I | | | |	1.13
3.500	1.30	0.11	0.250	O I | | | |	1.17
3.583	1.30	0.11	0.259	O I | | | |	1.20
3.667	1.30	0.11	0.267	O I | | | |	1.23
3.750	1.30	0.11	0.275	O I | | | |	1.27
3.833	1.36	0.11	0.283	O I | | | |	1.30
3.917	1.49	0.12	0.292	O I | | | |	1.34
4.000	1.52	0.15	0.302	O I | | | |	1.38
4.083	1.54	0.18	0.311	O I | | | |	1.42

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4.167    1.55    0.22      0.320  o   I   |       |       |       |     1.46
4.250    1.55    0.25      0.330  o   I   |       |       |       |     1.50
4.333    1.62    0.28      0.339  o   I   |       |       |       |     1.54
4.417    1.75    0.31      0.348  o   I   |       |       |       |     1.58
4.500    1.78    0.35      0.358  o   I   |       |       |       |     1.62
4.583    1.80    0.38      0.368  |o  I   |       |       |       |     1.66
4.667    1.81    0.40      0.378  |o  I   |       |       |       |     1.70
4.750    1.81    0.42      0.387  |o  I   |       |       |       |     1.74
4.833    1.88    0.44      0.397  |o   I  |       |       |       |     1.78
4.917    2.01    0.46      0.407  |o   I  |       |       |       |     1.82
5.000    2.04    0.47      0.418  |o   I  |       |       |       |     1.87
5.083    1.92    0.49      0.428  |o   I  |       |       |       |     1.91
5.167    1.68    0.51      0.437  |o  I   |       |       |       |     1.95
5.250    1.62    0.52      0.445  |o  I   |       |       |       |     1.98
5.333    1.65    0.53      0.453  |o  I   |       |       |       |     2.01
5.417    1.76    0.54      0.461  |o  I   |       |       |       |     2.04
5.500    1.79    0.55      0.469  |o  I   |       |       |       |     2.07
5.583    1.86    0.56      0.478  |o   I  |       |       |       |     2.10
5.667    2.00    0.57      0.487  |o   I  |       |       |       |     2.14
5.750    2.04    0.58      0.497  |o   I  |       |       |       |     2.17
5.833    2.06    0.59      0.507  |o   I  |       |       |       |     2.21
5.917    2.06    0.60      0.517  |o   I  |       |       |       |     2.25
6.000    2.07    0.62      0.527  |o   I  |       |       |       |     2.28
6.083    2.14    0.63      0.538  |o   I  |       |       |       |     2.32
6.167    2.26    0.64      0.548  |o    I |       |       |       |     2.36
6.250    2.30    0.65      0.560  |o    I |       |       |       |     2.40
6.333    2.31    0.66      0.571  |o    I |       |       |       |     2.45
6.417    2.32    0.67      0.582  |o    I |       |       |       |     2.49
6.500    2.33    0.68      0.594  |o    I |       |       |       |     2.53
6.583    2.40    0.70      0.605  |o    I |       |       |       |     2.58
6.667    2.52    0.71      0.617  |o    I |       |       |       |     2.62
6.750    2.56    0.72      0.630  |o    I |       |       |       |     2.67
6.833    2.57    0.73      0.643  |o    I |       |       |       |     2.71
6.917    2.58    0.74      0.655  | o    I|       |       |       |     2.75
7.000    2.59    0.75      0.668  | o    I|       |       |       |     2.80
7.083    2.59    0.76      0.681  | o    I|       |       |       |     2.84
7.167    2.59    0.76      0.693  | o    I|       |       |       |     2.88
7.250    2.59    0.77      0.706  | o    I|       |       |       |     2.92
7.333    2.66    0.78      0.719  | o    I|       |       |       |     2.96
7.417    2.78    0.79      0.732  | o    I|       |       |       |     3.01
7.500    2.82    0.81      0.746  | o    I|       |       |       |     3.08
7.583    2.90    0.82      0.760  | o    I|       |       |       |     3.15
7.667    3.03    0.83      0.775  | o     I       |       |       |     3.22
7.750    3.07    0.85      0.790  | o     I       |       |       |     3.30
7.833    3.16    0.87      0.805  | o     I       |       |       |     3.38
7.917    3.29    0.88      0.822  | o     I       |       |       |     3.46
8.000    3.33    0.90      0.838  | o     |I      |       |       |     3.54
8.083    3.48    0.91      0.855  | o     |I      |       |       |     3.62
8.167    3.75    0.93      0.874  | o     | I     |       |       |     3.70
8.250    3.83    0.95      0.894  | o     | I     |       |       |     3.79
8.333    3.87    0.97      0.914  | o     | I     |       |       |     3.88
8.417    3.90    0.98      0.934  | o     | I     |       |       |     3.97
8.500    3.92    1.00      0.954  | o     | I     |       |       |     4.06
8.583    4.03    1.01      0.974  | o     | I     |       |       |     4.16
8.667    4.23    1.03      0.996  | o     |  I    |       |       |     4.25
8.750    4.29    1.05      1.018  | o     |  I    |       |       |     4.35
8.833    4.42    1.06      1.041  | o     |   I   |       |       |     4.46
8.917    4.63    1.08      1.064  | o     |   I   |       |       |     4.56
9.000    4.70    1.10      1.089  | o     |   I   |       |       |     4.66
9.083    4.94    1.11      1.115  |  o    |    I  |       |       |     4.77
9.167    5.34    1.13      1.142  |  o    |     I |       |       |     4.88
9.250    5.46    1.15      1.172  |  o    |     I |       |       |     5.01
9.333    5.62    1.17      1.202  |  o    |      I|       |       |     5.12
9.417    5.84    1.18      1.233  |  o    |      I|       |       |     5.24
9.500    5.92    1.20      1.265  |  o    |       I       |       |     5.37
9.583    6.06    1.22      1.298  |  o    |       I       |       |     5.49
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9.667	6.27	4.89	1.320	|	|	o |I |	|	5.58
9.750	6.34	5.99	1.326	|	|	OI |	|	5.60
9.833	6.47	6.31	1.327	|	|	|O |	|	5.61
9.917	6.68	6.52	1.328	|	|	|OI |	|	5.61
10.000	6.75	6.67	1.329	|	|	| O |	|	5.61
10.083	6.09	6.48	1.328	|	|	IO |	|	5.61
10.167	4.79	5.67	1.324	|	|	I O| |	|	5.59
10.250	4.45	4.85	1.319	|	|	IO | |	|	5.57
10.333	4.30	4.48	1.317	|	|	IO | |	|	5.57
10.417	4.21	4.30	1.317	|	|	O | |	|	5.56
10.500	4.17	4.22	1.316	|	|	O | |	|	5.56
10.583	4.64	4.36	1.317	|	|	OI | |	|	5.56
10.667	5.59	4.95	1.320	|	|	O I| |	|	5.58
10.750	5.86	5.55	1.323	|	|	O| |	|	5.59
10.833	5.98	5.84	1.325	|	|	OI |	|	5.60
10.917	6.05	5.98	1.326	|	|	O |	|	5.60
11.000	6.10	6.06	1.326	|	|	O |	|	5.60
11.083	6.04	6.06	1.326	|	|	O |	|	5.60
11.167	5.85	5.97	1.326	|	|	IO |	|	5.60
11.250	5.81	5.86	1.325	|	|	O| |	|	5.60
11.333	5.80	5.82	1.325	|	|	O| |	|	5.59
11.417	5.79	5.80	1.325	|	|	O| |	|	5.59
11.500	5.79	5.79	1.325	|	|	O| |	|	5.59
11.583	5.60	5.71	1.324	|	|	O| |	|	5.59
11.667	5.22	5.48	1.323	|	|	O | |	|	5.59
11.750	5.13	5.24	1.322	|	|	IO | |	|	5.58
11.833	5.19	5.18	1.321	|	|	O | |	|	5.58
11.917	5.36	5.25	1.322	|	|	O | |	|	5.58
12.000	5.41	5.36	1.322	|	|	O | |	|	5.59
12.083	6.12	5.67	1.324	|	|	OI |	|	5.59
12.167	7.47	6.55	1.329	|	|	|O I |	|	5.61
12.250	7.84	7.41	1.333	|	|	| OI |	|	5.63
12.333	8.11	7.85	1.336	|	|	| OI |	|	5.64
12.417	8.40	8.17	1.337	|	|	| O |	|	5.64
12.500	8.51	8.40	1.339	|	|	| OI|	|	5.65
12.583	8.78	8.59	1.340	|	|	| O|	|	5.65
12.667	9.18	8.89	1.341	|	|	| O	|	5.66
12.750	9.30	9.16	1.343	|	|	| OI	|	5.66
12.833	9.46	9.33	1.344	|	|	|O	|	5.67
12.917	9.68	9.51	1.345	|	|	|OI	|	5.67
13.000	9.75	9.67	1.345	|	|	| O	|	5.67
13.083	10.29	9.94	1.347	|	|	| O	|	5.68
13.167	11.26	10.59	1.350	|	|	| O I |	|	5.69
13.250	11.53	11.22	1.354	|	|	| OI|	|	5.71
13.333	11.66	11.51	1.355	|	|	| O|	|	5.71
13.417	11.73	11.65	1.356	|	|	| O|	|	5.72
13.500	11.77	11.73	1.356	|	|	| OI	|	5.72
13.583	10.72	11.35	1.354	|	|	| IO |	|	5.71
13.667	8.64	10.04	1.347	|	|	I| O |	|	5.68
13.750	8.08	8.73	1.340	|	|	I O| |	|	5.66
13.833	7.83	8.13	1.337	|	|	IO | |	|	5.64
13.917	7.70	7.85	1.336	|	|	IO | |	|	5.64
14.000	7.62	7.70	1.335	|	|	O | |	|	5.63
14.083	7.97	7.78	1.335	|	|	O | |	|	5.64
14.167	8.73	8.23	1.338	|	|	OI| |	|	5.64
14.250	8.95	8.71	1.340	|	|	OI |	|	5.65
14.333	8.95	8.89	1.341	|	|	O |	|	5.66
14.417	8.82	8.88	1.341	|	|	IO |	|	5.66
14.500	8.80	8.83	1.341	|	|	O| |	|	5.66
14.583	8.81	8.81	1.341	|	|	O| |	|	5.66
14.667	8.80	8.80	1.341	|	|	O| |	|	5.66
14.750	8.80	8.80	1.341	|	|	O| |	|	5.66
14.833	8.70	8.76	1.341	|	|	O| |	|	5.66
14.917	8.52	8.64	1.340	|	|	O| |	|	5.65
15.000	8.47	8.53	1.339	|	|	O| |	|	5.65
15.083	8.36	8.44	1.339	|	|	O | |	|	5.65

15.167	8.16	8.30	1.338				O		5.65
15.250	8.11	8.17	1.337				O		5.64
15.333	7.99	8.08	1.337				O		5.64
15.417	7.79	7.93	1.336				O		5.64
15.500	7.74	7.80	1.335				O		5.64
15.583	7.32	7.59	1.334				IO		5.63
15.667	6.56	7.08	1.331			I O			5.62
15.750	6.35	6.59	1.329			O			5.61
15.833	6.26	6.37	1.328			O			5.61
15.917	6.21	6.27	1.327			IO			5.60
16.000	6.19	6.22	1.327			O			5.60
16.083	4.86	5.68	1.324		I O				5.59
16.167	2.36	4.07	1.315	I	O				5.56
16.250	1.68	2.47	1.307	I O					5.53
16.333	1.38	1.74	1.303	IO					5.51
16.417	1.20	1.39	1.301	O					5.50
16.500	1.11	1.22	1.300	O					5.50
16.583	0.97	1.22	1.299	IO					5.49
16.667	0.84	1.22	1.296	IO					5.49
16.750	0.81	1.22	1.294	IO					5.48
16.833	0.79	1.22	1.291	IO					5.47
16.917	0.79	1.21	1.288	IO					5.45
17.000	0.78	1.21	1.285	IO					5.44
17.083	0.91	1.21	1.283	IO					5.43
17.167	1.16	1.21	1.281	O					5.43
17.250	1.23	1.21	1.281	O					5.43
17.333	1.26	1.21	1.281	O					5.43
17.417	1.28	1.21	1.282	O					5.43
17.500	1.29	1.21	1.282	O					5.43
17.583	1.30	1.21	1.283	O					5.43
17.667	1.30	1.21	1.284	O					5.44
17.750	1.30	1.21	1.284	O					5.44
17.833	1.23	1.21	1.284	O					5.44
17.917	1.10	1.21	1.284	IO					5.44
18.000	1.07	1.21	1.283	IO					5.44
18.083	1.05	1.21	1.282	IO					5.43
18.167	1.04	1.21	1.281	IO					5.43
18.250	1.04	1.21	1.280	IO					5.42
18.333	1.04	1.21	1.279	IO					5.42
18.417	1.04	1.21	1.278	IO					5.41
18.500	1.04	1.21	1.276	IO					5.41
18.583	0.97	1.21	1.275	IO					5.40
18.667	0.84	1.21	1.273	IO					5.40
18.750	0.81	1.20	1.270	IO					5.39
18.833	0.73	1.20	1.267	I O					5.37
18.917	0.59	1.20	1.264	I O					5.36
19.000	0.55	1.20	1.259	I O					5.34
19.083	0.60	1.20	1.255	I O					5.33
19.167	0.72	1.19	1.251	I O					5.31
19.250	0.75	1.19	1.248	IO					5.30
19.333	0.83	1.19	1.246	IO					5.29
19.417	0.96	1.19	1.243	IO					5.28
19.500	1.00	1.19	1.242	IO					5.28
19.583	0.95	1.19	1.241	IO					5.27
19.667	0.84	1.19	1.239	IO					5.26
19.750	0.81	1.19	1.236	IO					5.25
19.833	0.73	1.18	1.233	I O					5.24
19.917	0.59	1.18	1.230	I O					5.23
20.000	0.55	1.18	1.225	I O					5.21
20.083	0.60	1.18	1.221	I O					5.20
20.167	0.72	1.18	1.218	I O					5.18
20.250	0.75	1.17	1.215	IO					5.17
20.333	0.76	1.17	1.212	IO					5.16
20.417	0.77	1.17	1.209	IO					5.15
20.500	0.77	1.17	1.206	IO					5.14
20.583	0.78	1.17	1.203	IO					5.13

20.667	0.78	1.17	1.201	| IO	|	|	|	| 5.12
20.750	0.78	1.17	1.198	| IO	|	|	|	| 5.11
20.833	0.71	1.16	1.195	|I O	|	|	|	| 5.10
20.917	0.59	1.16	1.192	|I O	|	|	|	| 5.08
21.000	0.55	1.16	1.188	|I O	|	|	|	| 5.07
21.083	0.60	1.16	1.184	|I O	|	|	|	| 5.05
21.167	0.72	1.16	1.180	|I O	|	|	|	| 5.04
21.250	0.75	1.15	1.177	| IO	|	|	|	| 5.03
21.333	0.69	1.15	1.174	|I O	|	|	|	| 5.02
21.417	0.58	1.15	1.171	|I O	|	|	|	| 5.00
21.500	0.55	1.15	1.167	|I O	|	|	|	| 4.99
21.583	0.60	1.15	1.163	|I O	|	|	|	| 4.97
21.667	0.72	1.14	1.159	|I O	|	|	|	| 4.96
21.750	0.75	1.14	1.157	| IO	|	|	|	| 4.94
21.833	0.69	1.14	1.154	|I O	|	|	|	| 4.93
21.917	0.58	1.14	1.150	|I O	|	|	|	| 4.92
22.000	0.55	1.13	1.146	|I O	|	|	|	| 4.90
22.083	0.60	1.13	1.142	|I O	|	|	|	| 4.89
22.167	0.72	1.13	1.139	|I O	|	|	|	| 4.87
22.250	0.75	1.13	1.137	| IO	|	|	|	| 4.86
22.333	0.69	1.13	1.134	|I O	|	|	|	| 4.85
22.417	0.58	1.12	1.130	|I O	|	|	|	| 4.83
22.500	0.55	1.12	1.126	|I O	|	|	|	| 4.82
22.583	0.54	1.12	1.123	|I O	|	|	|	| 4.80
22.667	0.53	1.12	1.118	|I O	|	|	|	| 4.79
22.750	0.52	1.11	1.114	|I O	|	|	|	| 4.77
22.833	0.52	1.11	1.110	|I O	|	|	|	| 4.75
22.917	0.52	1.11	1.106	|I O	|	|	|	| 4.73
23.000	0.52	1.10	1.102	|I O	|	|	|	| 4.72
23.083	0.52	1.10	1.098	|IO	|	|	|	| 4.70
23.167	0.52	1.10	1.094	|IO	|	|	|	| 4.68
23.250	0.52	1.10	1.090	|IO	|	|	|	| 4.67
23.333	0.52	1.09	1.086	|IO	|	|	|	| 4.65
23.417	0.52	1.09	1.082	|IO	|	|	|	| 4.63
23.500	0.52	1.09	1.078	|IO	|	|	|	| 4.62
23.583	0.52	1.09	1.074	|IO	|	|	|	| 4.60
23.667	0.52	1.08	1.070	|IO	|	|	|	| 4.59
23.750	0.52	1.08	1.067	|IO	|	|	|	| 4.57
23.833	0.52	1.08	1.063	|IO	|	|	|	| 4.55
23.917	0.52	1.08	1.059	|IO	|	|	|	| 4.54
24.000	0.52	1.07	1.055	|IO	|	|	|	| 4.52
24.083	0.39	1.07	1.051	|IO	|	|	|	| 4.50
24.167	0.13	1.07	1.045	I O	|	|	|	| 4.48
24.250	0.07	1.06	1.039	I O	|	|	|	| 4.45
24.333	0.03	1.06	1.032	I O	|	|	|	| 4.42
24.417	0.02	1.05	1.025	I O	|	|	|	| 4.38
24.500	0.01	1.05	1.017	I O	|	|	|	| 4.35
24.583	0.00	1.04	1.010	I O	|	|	|	| 4.32
24.667	0.00	1.04	1.003	I O	|	|	|	| 4.29
24.750	0.00	1.03	0.996	I O	|	|	|	| 4.25
24.833	0.00	1.03	0.989	I O	|	|	|	| 4.22
24.917	0.00	1.02	0.982	I O	|	|	|	| 4.19
25.000	0.00	1.02	0.975	I O	|	|	|	| 4.16
25.083	0.00	1.01	0.968	I O	|	|	|	| 4.13
25.167	0.00	1.01	0.961	I O	|	|	|	| 4.10
25.250	0.00	1.00	0.954	I O	|	|	|	| 4.06
25.333	0.00	1.00	0.947	I O	|	|	|	| 4.03
25.417	0.00	0.99	0.940	I O	|	|	|	| 4.00
25.500	0.00	0.98	0.933	I O	|	|	|	| 3.97
25.583	0.00	0.98	0.927	I O	|	|	|	| 3.94
25.667	0.00	0.97	0.920	I O	|	|	|	| 3.91
25.750	0.00	0.97	0.913	I O	|	|	|	| 3.88
25.833	0.00	0.96	0.907	I O	|	|	|	| 3.85
25.917	0.00	0.95	0.900	I O	|	|	|	| 3.82
26.000	0.00	0.95	0.894	I O	|	|	|	| 3.79
26.083	0.00	0.94	0.887	I O	|	|	|	| 3.76

26.167	0.00	0.94	0.881	I O				3.73
26.250	0.00	0.93	0.874	I O				3.70
26.333	0.00	0.92	0.868	I O				3.67
26.417	0.00	0.92	0.861	I O				3.64
26.500	0.00	0.91	0.855	I O				3.61
26.583	0.00	0.91	0.849	I O				3.59
26.667	0.00	0.90	0.843	I O				3.56
26.750	0.00	0.90	0.836	I O				3.53
26.833	0.00	0.89	0.830	I O				3.50
26.917	0.00	0.88	0.824	I O				3.47
27.000	0.00	0.88	0.818	I O				3.44
27.083	0.00	0.87	0.812	I O				3.41
27.167	0.00	0.87	0.806	I O				3.38
27.250	0.00	0.86	0.800	I O				3.35
27.333	0.00	0.85	0.794	I O				3.32
27.417	0.00	0.85	0.788	I O				3.29
27.500	0.00	0.84	0.783	I O				3.26
27.583	0.00	0.84	0.777	I O				3.23
27.667	0.00	0.83	0.771	I O				3.21
27.750	0.00	0.83	0.765	I O				3.18
27.833	0.00	0.82	0.760	I O				3.15
27.917	0.00	0.81	0.754	I O				3.12
28.000	0.00	0.81	0.748	I O				3.09
28.083	0.00	0.80	0.743	I O				3.06
28.167	0.00	0.80	0.737	I O				3.04
28.250	0.00	0.79	0.732	I O				3.01
28.333	0.00	0.79	0.727	I O				2.99
28.417	0.00	0.78	0.721	I O				2.97
28.500	0.00	0.78	0.716	I O				2.95
28.583	0.00	0.78	0.710	I O				2.94
28.667	0.00	0.77	0.705	I O				2.92
28.750	0.00	0.77	0.700	I O				2.90
28.833	0.00	0.77	0.694	I O				2.88
28.917	0.00	0.76	0.689	I O				2.87
29.000	0.00	0.76	0.684	I O				2.85
29.083	0.00	0.75	0.679	I O				2.83
29.167	0.00	0.75	0.674	I O				2.81
29.250	0.00	0.75	0.668	I O				2.80
29.333	0.00	0.74	0.663	I O				2.78
29.417	0.00	0.74	0.658	I O				2.76
29.500	0.00	0.74	0.653	I O				2.75
29.583	0.00	0.73	0.648	IO				2.73
29.667	0.00	0.73	0.643	IO				2.71
29.750	0.00	0.73	0.638	IO				2.70
29.833	0.00	0.72	0.633	IO				2.68
29.917	0.00	0.72	0.628	IO				2.66
30.000	0.00	0.71	0.623	IO				2.64
30.083	0.00	0.71	0.618	IO				2.63
30.167	0.00	0.70	0.613	IO				2.61
30.250	0.00	0.70	0.609	IO				2.59
30.333	0.00	0.69	0.604	IO				2.57
30.417	0.00	0.69	0.599	IO				2.55
30.500	0.00	0.68	0.594	IO				2.53
30.583	0.00	0.68	0.590	IO				2.52
30.667	0.00	0.67	0.585	IO				2.50
30.750	0.00	0.67	0.580	IO				2.48
30.833	0.00	0.67	0.576	IO				2.46
30.917	0.00	0.66	0.571	IO				2.45
31.000	0.00	0.66	0.567	IO				2.43
31.083	0.00	0.65	0.562	IO				2.41
31.167	0.00	0.65	0.558	IO				2.40
31.250	0.00	0.64	0.553	IO				2.38
31.333	0.00	0.64	0.549	IO				2.36
31.417	0.00	0.63	0.544	IO				2.35
31.500	0.00	0.63	0.540	IO				2.33
31.583	0.00	0.63	0.536	IO				2.31

31.667	0.00	0.62	0.531	IO				2.30
31.750	0.00	0.62	0.527	IO				2.28
31.833	0.00	0.61	0.523	IO				2.27
31.917	0.00	0.61	0.519	IO				2.25
32.000	0.00	0.60	0.515	IO				2.24
32.083	0.00	0.60	0.510	IO				2.22
32.167	0.00	0.59	0.506	IO				2.21
32.250	0.00	0.59	0.502	IO				2.19
32.333	0.00	0.58	0.498	IO				2.18
32.417	0.00	0.58	0.494	IO				2.16
32.500	0.00	0.57	0.490	IO				2.15
32.583	0.00	0.57	0.486	IO				2.13
32.667	0.00	0.57	0.482	IO				2.12
32.750	0.00	0.56	0.478	IO				2.10
32.833	0.00	0.56	0.475	IO				2.09
32.917	0.00	0.55	0.471	IO				2.08
33.000	0.00	0.55	0.467	IO				2.06
33.083	0.00	0.54	0.463	IO				2.05
33.167	0.00	0.54	0.460	IO				2.03
33.250	0.00	0.54	0.456	IO				2.02
33.333	0.00	0.53	0.452	IO				2.01
33.417	0.00	0.53	0.448	IO				1.99
33.500	0.00	0.52	0.445	IO				1.98
33.583	0.00	0.51	0.441	IO				1.96
33.667	0.00	0.51	0.438	IO				1.95
33.750	0.00	0.50	0.434	IO				1.94
33.833	0.00	0.50	0.431	IO				1.92
33.917	0.00	0.49	0.427	IO				1.91
34.000	0.00	0.48	0.424	IO				1.89
34.083	0.00	0.48	0.421	IO				1.88
34.167	0.00	0.47	0.417	IO				1.87
34.250	0.00	0.47	0.414	IO				1.85
34.333	0.00	0.46	0.411	IO				1.84
34.417	0.00	0.46	0.408	IO				1.83
34.500	0.00	0.45	0.405	IO				1.81
34.583	0.00	0.45	0.402	IO				1.80
34.667	0.00	0.44	0.399	IO				1.79
34.750	0.00	0.43	0.396	IO				1.78
34.833	0.00	0.43	0.393	IO				1.76
34.917	0.00	0.42	0.390	IO				1.75
35.000	0.00	0.42	0.387	IO				1.74
35.083	0.00	0.41	0.384	IO				1.73
35.167	0.00	0.41	0.381	IO				1.72
35.250	0.00	0.40	0.378	IO				1.70
35.333	0.00	0.40	0.376	IO				1.69
35.417	0.00	0.39	0.373	IO				1.68
35.500	0.00	0.39	0.370	IO				1.67
35.583	0.00	0.38	0.367	IO				1.66
35.667	0.00	0.37	0.365	IO				1.65
35.750	0.00	0.36	0.362	O				1.64
35.833	0.00	0.35	0.360	O				1.63
35.917	0.00	0.35	0.357	O				1.62
36.000	0.00	0.34	0.355	O				1.61
36.083	0.00	0.33	0.353	O				1.60
36.167	0.00	0.32	0.351	O				1.59
36.250	0.00	0.31	0.348	O				1.58
36.333	0.00	0.31	0.346	O				1.57
36.417	0.00	0.30	0.344	O				1.56
36.500	0.00	0.29	0.342	O				1.55
36.583	0.00	0.29	0.340	O				1.54
36.667	0.00	0.28	0.338	O				1.53
36.750	0.00	0.27	0.336	O				1.53
36.833	0.00	0.27	0.334	O				1.52
36.917	0.00	0.26	0.333	O				1.51
37.000	0.00	0.25	0.331	O				1.50
37.083	0.00	0.25	0.329	O				1.50

37.167	0.00	0.24	0.327	o	|	|	|	| 1.49
37.250	0.00	0.24	0.326	o	|	|	|	| 1.48
37.333	0.00	0.23	0.324	o	|	|	|	| 1.48
37.417	0.00	0.22	0.323	o	|	|	|	| 1.47
37.500	0.00	0.22	0.321	o	|	|	|	| 1.46
37.583	0.00	0.21	0.320	o	|	|	|	| 1.46
37.667	0.00	0.21	0.318	o	|	|	|	| 1.45
37.750	0.00	0.20	0.317	o	|	|	|	| 1.44
37.833	0.00	0.20	0.315	o	|	|	|	| 1.44
37.917	0.00	0.19	0.314	o	|	|	|	| 1.43
38.000	0.00	0.19	0.313	o	|	|	|	| 1.43
38.083	0.00	0.18	0.311	o	|	|	|	| 1.42
38.167	0.00	0.18	0.310	o	|	|	|	| 1.42
38.250	0.00	0.18	0.309	o	|	|	|	| 1.41
38.333	0.00	0.17	0.308	o	|	|	|	| 1.41
38.417	0.00	0.17	0.307	o	|	|	|	| 1.40
38.500	0.00	0.16	0.305	o	|	|	|	| 1.40
38.583	0.00	0.16	0.304	o	|	|	|	| 1.39
38.667	0.00	0.16	0.303	o	|	|	|	| 1.39
38.750	0.00	0.15	0.302	o	|	|	|	| 1.38
38.833	0.00	0.15	0.301	o	|	|	|	| 1.38
38.917	0.00	0.15	0.300	o	|	|	|	| 1.37
39.000	0.00	0.14	0.299	o	|	|	|	| 1.37
39.083	0.00	0.14	0.298	o	|	|	|	| 1.36
39.167	0.00	0.14	0.297	o	|	|	|	| 1.36
39.250	0.00	0.13	0.296	o	|	|	|	| 1.36
39.333	0.00	0.13	0.295	o	|	|	|	| 1.35
39.417	0.00	0.13	0.294	o	|	|	|	| 1.35
39.500	0.00	0.12	0.294	o	|	|	|	| 1.35
39.583	0.00	0.12	0.293	o	|	|	|	| 1.34
39.667	0.00	0.12	0.292	o	|	|	|	| 1.34
39.750	0.00	0.11	0.291	o	|	|	|	| 1.34
39.833	0.00	0.11	0.290	o	|	|	|	| 1.33
39.917	0.00	0.11	0.290	o	|	|	|	| 1.33
40.000	0.00	0.11	0.289	o	|	|	|	| 1.33
40.083	0.00	0.11	0.288	o	|	|	|	| 1.32
40.167	0.00	0.11	0.287	o	|	|	|	| 1.32
40.250	0.00	0.11	0.287	o	|	|	|	| 1.32
40.333	0.00	0.11	0.286	o	|	|	|	| 1.31
40.417	0.00	0.11	0.285	o	|	|	|	| 1.31
40.500	0.00	0.11	0.284	o	|	|	|	| 1.31
40.583	0.00	0.11	0.284	o	|	|	|	| 1.30
40.667	0.00	0.11	0.283	o	|	|	|	| 1.30
40.750	0.00	0.11	0.282	o	|	|	|	| 1.30
40.833	0.00	0.11	0.281	o	|	|	|	| 1.29
40.917	0.00	0.11	0.281	o	|	|	|	| 1.29
41.000	0.00	0.11	0.280	o	|	|	|	| 1.29
41.083	0.00	0.11	0.279	o	|	|	|	| 1.29
41.167	0.00	0.11	0.278	o	|	|	|	| 1.28
41.250	0.00	0.11	0.278	o	|	|	|	| 1.28
41.333	0.00	0.11	0.277	o	|	|	|	| 1.28
41.417	0.00	0.11	0.276	o	|	|	|	| 1.27
41.500	0.00	0.11	0.275	o	|	|	|	| 1.27
41.583	0.00	0.11	0.275	o	|	|	|	| 1.27
41.667	0.00	0.11	0.274	o	|	|	|	| 1.26
41.750	0.00	0.11	0.273	o	|	|	|	| 1.26
41.833	0.00	0.11	0.272	o	|	|	|	| 1.26
41.917	0.00	0.11	0.272	o	|	|	|	| 1.25
42.000	0.00	0.11	0.271	o	|	|	|	| 1.25
42.083	0.00	0.11	0.270	o	|	|	|	| 1.25
42.167	0.00	0.11	0.269	o	|	|	|	| 1.25
42.250	0.00	0.11	0.269	o	|	|	|	| 1.24
42.333	0.00	0.11	0.268	o	|	|	|	| 1.24
42.417	0.00	0.11	0.267	o	|	|	|	| 1.24
42.500	0.00	0.11	0.266	o	|	|	|	| 1.23
42.583	0.00	0.11	0.266	o	|	|	|	| 1.23

42.667	0.00	0.11	0.265	o	|	|	|	|	1.23
42.750	0.00	0.11	0.264	o	|	|	|	|	1.22
42.833	0.00	0.11	0.264	o	|	|	|	|	1.22
42.917	0.00	0.11	0.263	o	|	|	|	|	1.22
43.000	0.00	0.11	0.262	o	|	|	|	|	1.21
43.083	0.00	0.11	0.261	o	|	|	|	|	1.21
43.167	0.00	0.11	0.261	o	|	|	|	|	1.21
43.250	0.00	0.11	0.260	o	|	|	|	|	1.21
43.333	0.00	0.11	0.259	o	|	|	|	|	1.20
43.417	0.00	0.11	0.258	o	|	|	|	|	1.20
43.500	0.00	0.11	0.258	o	|	|	|	|	1.20
43.583	0.00	0.11	0.257	o	|	|	|	|	1.19
43.667	0.00	0.11	0.256	o	|	|	|	|	1.19
43.750	0.00	0.11	0.255	o	|	|	|	|	1.19
43.833	0.00	0.11	0.255	o	|	|	|	|	1.18
43.917	0.00	0.11	0.254	o	|	|	|	|	1.18
44.000	0.00	0.11	0.253	o	|	|	|	|	1.18
44.083	0.00	0.11	0.253	o	|	|	|	|	1.18
44.167	0.00	0.11	0.252	o	|	|	|	|	1.17
44.250	0.00	0.11	0.251	o	|	|	|	|	1.17
44.333	0.00	0.11	0.250	o	|	|	|	|	1.17
44.417	0.00	0.10	0.250	o	|	|	|	|	1.16
44.500	0.00	0.10	0.249	o	|	|	|	|	1.16
44.583	0.00	0.10	0.248	o	|	|	|	|	1.16
44.667	0.00	0.10	0.248	o	|	|	|	|	1.15
44.750	0.00	0.10	0.247	o	|	|	|	|	1.15
44.833	0.00	0.10	0.246	o	|	|	|	|	1.15
44.917	0.00	0.10	0.245	o	|	|	|	|	1.15
45.000	0.00	0.10	0.245	o	|	|	|	|	1.14
45.083	0.00	0.10	0.244	o	|	|	|	|	1.14
45.167	0.00	0.10	0.243	o	|	|	|	|	1.14
45.250	0.00	0.10	0.242	o	|	|	|	|	1.13
45.333	0.00	0.10	0.242	o	|	|	|	|	1.13
45.417	0.00	0.10	0.241	o	|	|	|	|	1.13
45.500	0.00	0.10	0.240	o	|	|	|	|	1.13
45.583	0.00	0.10	0.240	o	|	|	|	|	1.12
45.667	0.00	0.10	0.239	o	|	|	|	|	1.12
45.750	0.00	0.10	0.238	o	|	|	|	|	1.12
45.833	0.00	0.10	0.237	o	|	|	|	|	1.11
45.917	0.00	0.10	0.237	o	|	|	|	|	1.11
46.000	0.00	0.10	0.236	o	|	|	|	|	1.11
46.083	0.00	0.10	0.235	o	|	|	|	|	1.10
46.167	0.00	0.10	0.235	o	|	|	|	|	1.10
46.250	0.00	0.10	0.234	o	|	|	|	|	1.10
46.333	0.00	0.10	0.233	o	|	|	|	|	1.10
46.417	0.00	0.10	0.233	o	|	|	|	|	1.09
46.500	0.00	0.10	0.232	o	|	|	|	|	1.09
46.583	0.00	0.10	0.231	o	|	|	|	|	1.09
46.667	0.00	0.10	0.230	o	|	|	|	|	1.08
46.750	0.00	0.10	0.230	o	|	|	|	|	1.08
46.833	0.00	0.10	0.229	o	|	|	|	|	1.08
46.917	0.00	0.10	0.228	o	|	|	|	|	1.08
47.000	0.00	0.10	0.228	o	|	|	|	|	1.07
47.083	0.00	0.10	0.227	o	|	|	|	|	1.07
47.167	0.00	0.10	0.226	o	|	|	|	|	1.07
47.250	0.00	0.10	0.225	o	|	|	|	|	1.06
47.333	0.00	0.10	0.225	o	|	|	|	|	1.06
47.417	0.00	0.10	0.224	o	|	|	|	|	1.06
47.500	0.00	0.10	0.223	o	|	|	|	|	1.06
47.583	0.00	0.10	0.223	o	|	|	|	|	1.05
47.667	0.00	0.10	0.222	o	|	|	|	|	1.05
47.750	0.00	0.10	0.221	o	|	|	|	|	1.05
47.833	0.00	0.10	0.221	o	|	|	|	|	1.04
47.917	0.00	0.10	0.220	o	|	|	|	|	1.04
48.000	0.00	0.10	0.219	o	|	|	|	|	1.04
48.083	0.00	0.10	0.218	o	|	|	|	|	1.03

48.167	0.00	0.10	0.218	o	|	|	|	|	1.03
48.250	0.00	0.10	0.217	o	|	|	|	|	1.03
48.333	0.00	0.10	0.216	o	|	|	|	|	1.03
48.417	0.00	0.10	0.216	o	|	|	|	|	1.02
48.500	0.00	0.10	0.215	o	|	|	|	|	1.02
48.583	0.00	0.10	0.214	o	|	|	|	|	1.02
48.667	0.00	0.10	0.214	o	|	|	|	|	1.01
48.750	0.00	0.10	0.213	o	|	|	|	|	1.01
48.833	0.00	0.10	0.212	o	|	|	|	|	1.01
48.917	0.00	0.10	0.212	o	|	|	|	|	1.01
49.000	0.00	0.10	0.211	o	|	|	|	|	1.00
49.083	0.00	0.10	0.210	o	|	|	|	|	1.00
49.167	0.00	0.10	0.209	o	|	|	|	|	1.00
49.250	0.00	0.10	0.209	o	|	|	|	|	0.99
49.333	0.00	0.10	0.208	o	|	|	|	|	0.99
49.417	0.00	0.10	0.207	o	|	|	|	|	0.99
49.500	0.00	0.10	0.207	o	|	|	|	|	0.98
49.583	0.00	0.10	0.206	o	|	|	|	|	0.98
49.667	0.00	0.10	0.205	o	|	|	|	|	0.98
49.750	0.00	0.10	0.205	o	|	|	|	|	0.98
49.833	0.00	0.10	0.204	o	|	|	|	|	0.97
49.917	0.00	0.10	0.203	o	|	|	|	|	0.97
50.000	0.00	0.10	0.203	o	|	|	|	|	0.97
50.083	0.00	0.10	0.202	o	|	|	|	|	0.96
50.167	0.00	0.10	0.201	o	|	|	|	|	0.96
50.250	0.00	0.10	0.201	o	|	|	|	|	0.96
50.333	0.00	0.10	0.200	o	|	|	|	|	0.95
50.417	0.00	0.10	0.199	o	|	|	|	|	0.95
50.500	0.00	0.10	0.199	o	|	|	|	|	0.95
50.583	0.00	0.10	0.198	o	|	|	|	|	0.94
50.667	0.00	0.10	0.197	o	|	|	|	|	0.94
50.750	0.00	0.10	0.197	o	|	|	|	|	0.94
50.833	0.00	0.10	0.196	o	|	|	|	|	0.93
50.917	0.00	0.10	0.195	o	|	|	|	|	0.93
51.000	0.00	0.10	0.195	o	|	|	|	|	0.93
51.083	0.00	0.10	0.194	o	|	|	|	|	0.92
51.167	0.00	0.10	0.193	o	|	|	|	|	0.92
51.250	0.00	0.10	0.193	o	|	|	|	|	0.92
51.333	0.00	0.09	0.192	o	|	|	|	|	0.92
51.417	0.00	0.09	0.191	o	|	|	|	|	0.91
51.500	0.00	0.09	0.191	o	|	|	|	|	0.91
51.583	0.00	0.09	0.190	o	|	|	|	|	0.91
51.667	0.00	0.09	0.189	o	|	|	|	|	0.90
51.750	0.00	0.09	0.189	o	|	|	|	|	0.90
51.833	0.00	0.09	0.188	o	|	|	|	|	0.90
51.917	0.00	0.09	0.188	o	|	|	|	|	0.89
52.000	0.00	0.09	0.187	o	|	|	|	|	0.89
52.083	0.00	0.09	0.186	o	|	|	|	|	0.89
52.167	0.00	0.09	0.186	o	|	|	|	|	0.88
52.250	0.00	0.09	0.185	o	|	|	|	|	0.88
52.333	0.00	0.09	0.184	o	|	|	|	|	0.88
52.417	0.00	0.09	0.184	o	|	|	|	|	0.88
52.500	0.00	0.09	0.183	o	|	|	|	|	0.87
52.583	0.00	0.09	0.182	o	|	|	|	|	0.87
52.667	0.00	0.09	0.182	o	|	|	|	|	0.87
52.750	0.00	0.09	0.181	o	|	|	|	|	0.86
52.833	0.00	0.09	0.180	o	|	|	|	|	0.86
52.917	0.00	0.09	0.180	o	|	|	|	|	0.86
53.000	0.00	0.09	0.179	o	|	|	|	|	0.85
53.083	0.00	0.09	0.179	o	|	|	|	|	0.85
53.167	0.00	0.09	0.178	o	|	|	|	|	0.85
53.250	0.00	0.09	0.177	o	|	|	|	|	0.85
53.333	0.00	0.09	0.177	o	|	|	|	|	0.84
53.417	0.00	0.09	0.176	o	|	|	|	|	0.84
53.500	0.00	0.09	0.175	o	|	|	|	|	0.84
53.583	0.00	0.09	0.175	o	|	|	|	|	0.83

53.667	0.00	0.09	0.174	o	|	|	|	|	0.83
53.750	0.00	0.09	0.174	o	|	|	|	|	0.83
53.833	0.00	0.09	0.173	o	|	|	|	|	0.83
53.917	0.00	0.09	0.172	o	|	|	|	|	0.82
54.000	0.00	0.09	0.172	o	|	|	|	|	0.82
54.083	0.00	0.09	0.171	o	|	|	|	|	0.82
54.167	0.00	0.09	0.171	o	|	|	|	|	0.81
54.250	0.00	0.09	0.170	o	|	|	|	|	0.81
54.333	0.00	0.09	0.169	o	|	|	|	|	0.81
54.417	0.00	0.09	0.169	o	|	|	|	|	0.81
54.500	0.00	0.09	0.168	o	|	|	|	|	0.80
54.583	0.00	0.09	0.168	o	|	|	|	|	0.80
54.667	0.00	0.09	0.167	o	|	|	|	|	0.80
54.750	0.00	0.09	0.166	o	|	|	|	|	0.79
54.833	0.00	0.09	0.166	o	|	|	|	|	0.79
54.917	0.00	0.09	0.165	o	|	|	|	|	0.79
55.000	0.00	0.09	0.165	o	|	|	|	|	0.79
55.083	0.00	0.09	0.164	o	|	|	|	|	0.78
55.167	0.00	0.09	0.163	o	|	|	|	|	0.78
55.250	0.00	0.09	0.163	o	|	|	|	|	0.78
55.333	0.00	0.09	0.162	o	|	|	|	|	0.77
55.417	0.00	0.09	0.162	o	|	|	|	|	0.77
55.500	0.00	0.09	0.161	o	|	|	|	|	0.77
55.583	0.00	0.09	0.160	o	|	|	|	|	0.77
55.667	0.00	0.09	0.160	o	|	|	|	|	0.76
55.750	0.00	0.09	0.159	o	|	|	|	|	0.76
55.833	0.00	0.09	0.159	o	|	|	|	|	0.76
55.917	0.00	0.09	0.158	o	|	|	|	|	0.75
56.000	0.00	0.08	0.157	o	|	|	|	|	0.75
56.083	0.00	0.08	0.157	o	|	|	|	|	0.75
56.167	0.00	0.08	0.156	o	|	|	|	|	0.75
56.250	0.00	0.08	0.156	o	|	|	|	|	0.74
56.333	0.00	0.08	0.155	o	|	|	|	|	0.74
56.417	0.00	0.08	0.154	o	|	|	|	|	0.74
56.500	0.00	0.08	0.154	o	|	|	|	|	0.74
56.583	0.00	0.08	0.153	o	|	|	|	|	0.73
56.667	0.00	0.08	0.153	o	|	|	|	|	0.73
56.750	0.00	0.08	0.152	o	|	|	|	|	0.73
56.833	0.00	0.08	0.152	o	|	|	|	|	0.72
56.917	0.00	0.08	0.151	o	|	|	|	|	0.72
57.000	0.00	0.08	0.150	o	|	|	|	|	0.72
57.083	0.00	0.08	0.150	o	|	|	|	|	0.72
57.167	0.00	0.08	0.149	o	|	|	|	|	0.71
57.250	0.00	0.08	0.149	o	|	|	|	|	0.71
57.333	0.00	0.08	0.148	o	|	|	|	|	0.71
57.417	0.00	0.08	0.148	o	|	|	|	|	0.71
57.500	0.00	0.08	0.147	o	|	|	|	|	0.70
57.583	0.00	0.08	0.146	o	|	|	|	|	0.70
57.667	0.00	0.08	0.146	o	|	|	|	|	0.70
57.750	0.00	0.08	0.145	o	|	|	|	|	0.70
57.833	0.00	0.08	0.145	o	|	|	|	|	0.69
57.917	0.00	0.08	0.144	o	|	|	|	|	0.69
58.000	0.00	0.08	0.144	o	|	|	|	|	0.69
58.083	0.00	0.08	0.143	o	|	|	|	|	0.68
58.167	0.00	0.08	0.143	o	|	|	|	|	0.68
58.250	0.00	0.08	0.142	o	|	|	|	|	0.68
58.333	0.00	0.08	0.141	o	|	|	|	|	0.68
58.417	0.00	0.08	0.141	o	|	|	|	|	0.67
58.500	0.00	0.08	0.140	o	|	|	|	|	0.67
58.583	0.00	0.08	0.140	o	|	|	|	|	0.67
58.667	0.00	0.08	0.139	o	|	|	|	|	0.67
58.750	0.00	0.08	0.139	o	|	|	|	|	0.66
58.833	0.00	0.08	0.138	o	|	|	|	|	0.66
58.917	0.00	0.08	0.138	o	|	|	|	|	0.66
59.000	0.00	0.08	0.137	o	|	|	|	|	0.66
59.083	0.00	0.08	0.137	o	|	|	|	|	0.65

59.167	0.00	0.08	0.136	o	|	|	|	|	0.65
59.250	0.00	0.08	0.135	o	|	|	|	|	0.65
59.333	0.00	0.08	0.135	o	|	|	|	|	0.65
59.417	0.00	0.08	0.134	o	|	|	|	|	0.64
59.500	0.00	0.08	0.134	o	|	|	|	|	0.64
59.583	0.00	0.08	0.133	o	|	|	|	|	0.64
59.667	0.00	0.08	0.133	o	|	|	|	|	0.63
59.750	0.00	0.08	0.132	o	|	|	|	|	0.63
59.833	0.00	0.08	0.132	o	|	|	|	|	0.63
59.917	0.00	0.08	0.131	o	|	|	|	|	0.63
60.000	0.00	0.08	0.131	o	|	|	|	|	0.62
60.083	0.00	0.08	0.130	o	|	|	|	|	0.62
60.167	0.00	0.08	0.130	o	|	|	|	|	0.62
60.250	0.00	0.08	0.129	o	|	|	|	|	0.62
60.333	0.00	0.08	0.128	o	|	|	|	|	0.61
60.417	0.00	0.08	0.128	o	|	|	|	|	0.61
60.500	0.00	0.08	0.127	o	|	|	|	|	0.61
60.583	0.00	0.08	0.127	o	|	|	|	|	0.61
60.667	0.00	0.08	0.126	o	|	|	|	|	0.60
60.750	0.00	0.08	0.126	o	|	|	|	|	0.60
60.833	0.00	0.08	0.125	o	|	|	|	|	0.60
60.917	0.00	0.08	0.125	o	|	|	|	|	0.60
61.000	0.00	0.08	0.124	o	|	|	|	|	0.59
61.083	0.00	0.08	0.124	o	|	|	|	|	0.59
61.167	0.00	0.08	0.123	o	|	|	|	|	0.59
61.250	0.00	0.08	0.123	o	|	|	|	|	0.59
61.333	0.00	0.07	0.122	o	|	|	|	|	0.58
61.417	0.00	0.07	0.122	o	|	|	|	|	0.58
61.500	0.00	0.07	0.121	o	|	|	|	|	0.58
61.583	0.00	0.07	0.121	o	|	|	|	|	0.58
61.667	0.00	0.07	0.120	o	|	|	|	|	0.57
61.750	0.00	0.07	0.120	o	|	|	|	|	0.57
61.833	0.00	0.07	0.119	o	|	|	|	|	0.57
61.917	0.00	0.07	0.119	o	|	|	|	|	0.57
62.000	0.00	0.07	0.118	o	|	|	|	|	0.56
62.083	0.00	0.07	0.118	o	|	|	|	|	0.56
62.167	0.00	0.07	0.117	o	|	|	|	|	0.56
62.250	0.00	0.07	0.117	o	|	|	|	|	0.56
62.333	0.00	0.07	0.116	o	|	|	|	|	0.55
62.417	0.00	0.07	0.116	o	|	|	|	|	0.55
62.500	0.00	0.07	0.115	o	|	|	|	|	0.55
62.583	0.00	0.07	0.115	o	|	|	|	|	0.55
62.667	0.00	0.07	0.114	o	|	|	|	|	0.54
62.750	0.00	0.07	0.114	o	|	|	|	|	0.54
62.833	0.00	0.07	0.113	o	|	|	|	|	0.54
62.917	0.00	0.07	0.113	o	|	|	|	|	0.54
63.000	0.00	0.07	0.112	o	|	|	|	|	0.53
63.083	0.00	0.07	0.112	o	|	|	|	|	0.53
63.167	0.00	0.07	0.111	o	|	|	|	|	0.53
63.250	0.00	0.07	0.111	o	|	|	|	|	0.53
63.333	0.00	0.07	0.110	o	|	|	|	|	0.52
63.417	0.00	0.07	0.110	o	|	|	|	|	0.52
63.500	0.00	0.07	0.109	o	|	|	|	|	0.52
63.583	0.00	0.07	0.109	o	|	|	|	|	0.52
63.667	0.00	0.07	0.108	o	|	|	|	|	0.52
63.750	0.00	0.07	0.108	o	|	|	|	|	0.51
63.833	0.00	0.07	0.107	o	|	|	|	|	0.51
63.917	0.00	0.07	0.107	o	|	|	|	|	0.51
64.000	0.00	0.07	0.106	o	|	|	|	|	0.51
64.083	0.00	0.07	0.106	o	|	|	|	|	0.50
64.167	0.00	0.07	0.105	o	|	|	|	|	0.50
64.250	0.00	0.07	0.105	o	|	|	|	|	0.50
64.333	0.00	0.07	0.104	o	|	|	|	|	0.50
64.417	0.00	0.07	0.104	o	|	|	|	|	0.49
64.500	0.00	0.07	0.103	o	|	|	|	|	0.49
64.583	0.00	0.07	0.103	o	|	|	|	|	0.49

64.667	0.00	0.07	0.102	o	|	|	|	|	0.49
64.750	0.00	0.07	0.102	o	|	|	|	|	0.48
64.833	0.00	0.07	0.101	o	|	|	|	|	0.48
64.917	0.00	0.07	0.101	o	|	|	|	|	0.48
65.000	0.00	0.07	0.100	o	|	|	|	|	0.48
65.083	0.00	0.07	0.100	o	|	|	|	|	0.48
65.167	0.00	0.07	0.100	o	|	|	|	|	0.47
65.250	0.00	0.07	0.099	o	|	|	|	|	0.47
65.333	0.00	0.07	0.099	o	|	|	|	|	0.47
65.417	0.00	0.07	0.098	o	|	|	|	|	0.47
65.500	0.00	0.07	0.098	o	|	|	|	|	0.46
65.583	0.00	0.07	0.097	o	|	|	|	|	0.46
65.667	0.00	0.07	0.097	o	|	|	|	|	0.46
65.750	0.00	0.07	0.096	o	|	|	|	|	0.46
65.833	0.00	0.07	0.096	o	|	|	|	|	0.46
65.917	0.00	0.07	0.095	o	|	|	|	|	0.45
66.000	0.00	0.07	0.095	o	|	|	|	|	0.45
66.083	0.00	0.07	0.094	o	|	|	|	|	0.45
66.167	0.00	0.07	0.094	o	|	|	|	|	0.45
66.250	0.00	0.07	0.093	o	|	|	|	|	0.44
66.333	0.00	0.07	0.093	o	|	|	|	|	0.44
66.417	0.00	0.07	0.093	o	|	|	|	|	0.44
66.500	0.00	0.07	0.092	o	|	|	|	|	0.44
66.583	0.00	0.07	0.092	o	|	|	|	|	0.44
66.667	0.00	0.07	0.091	o	|	|	|	|	0.43
66.750	0.00	0.07	0.091	o	|	|	|	|	0.43
66.833	0.00	0.07	0.090	o	|	|	|	|	0.43
66.917	0.00	0.07	0.090	o	|	|	|	|	0.43
67.000	0.00	0.07	0.089	o	|	|	|	|	0.42
67.083	0.00	0.07	0.089	o	|	|	|	|	0.42
67.167	0.00	0.07	0.088	o	|	|	|	|	0.42
67.250	0.00	0.07	0.088	o	|	|	|	|	0.42
67.333	0.00	0.07	0.088	o	|	|	|	|	0.42
67.417	0.00	0.06	0.087	o	|	|	|	|	0.41
67.500	0.00	0.06	0.087	o	|	|	|	|	0.41
67.583	0.00	0.06	0.086	o	|	|	|	|	0.41
67.667	0.00	0.06	0.086	o	|	|	|	|	0.41
67.750	0.00	0.06	0.085	o	|	|	|	|	0.40
67.833	0.00	0.06	0.085	o	|	|	|	|	0.40
67.917	0.00	0.06	0.084	o	|	|	|	|	0.40
68.000	0.00	0.06	0.084	o	|	|	|	|	0.40
68.083	0.00	0.06	0.084	o	|	|	|	|	0.40
68.167	0.00	0.06	0.083	o	|	|	|	|	0.39
68.250	0.00	0.06	0.083	o	|	|	|	|	0.39
68.333	0.00	0.06	0.082	o	|	|	|	|	0.39
68.417	0.00	0.06	0.082	o	|	|	|	|	0.39
68.500	0.00	0.06	0.081	o	|	|	|	|	0.39
68.583	0.00	0.06	0.081	o	|	|	|	|	0.38
68.667	0.00	0.06	0.081	o	|	|	|	|	0.38
68.750	0.00	0.06	0.080	o	|	|	|	|	0.38
68.833	0.00	0.06	0.080	o	|	|	|	|	0.38
68.917	0.00	0.06	0.079	o	|	|	|	|	0.37
69.000	0.00	0.06	0.079	o	|	|	|	|	0.37
69.083	0.00	0.06	0.078	o	|	|	|	|	0.37
69.167	0.00	0.06	0.078	o	|	|	|	|	0.37
69.250	0.00	0.06	0.078	o	|	|	|	|	0.37
69.333	0.00	0.06	0.077	o	|	|	|	|	0.36
69.417	0.00	0.06	0.077	o	|	|	|	|	0.36
69.500	0.00	0.06	0.076	o	|	|	|	|	0.36
69.583	0.00	0.06	0.076	o	|	|	|	|	0.36
69.667	0.00	0.06	0.075	o	|	|	|	|	0.36
69.750	0.00	0.06	0.075	o	|	|	|	|	0.35
69.833	0.00	0.06	0.075	o	|	|	|	|	0.35
69.917	0.00	0.06	0.074	o	|	|	|	|	0.35
70.000	0.00	0.06	0.074	o	|	|	|	|	0.35
70.083	0.00	0.06	0.073	o	|	|	|	|	0.35

70.167	0.00	0.06	0.073	o	|	|	|	0.34
70.250	0.00	0.06	0.072	o	|	|	|	0.34
70.333	0.00	0.06	0.072	o	|	|	|	0.34
70.417	0.00	0.06	0.072	o	|	|	|	0.34
70.500	0.00	0.06	0.071	o	|	|	|	0.34
70.583	0.00	0.06	0.071	o	|	|	|	0.33
70.667	0.00	0.06	0.070	o	|	|	|	0.33
70.750	0.00	0.06	0.070	o	|	|	|	0.33
70.833	0.00	0.06	0.070	o	|	|	|	0.33
70.917	0.00	0.06	0.069	o	|	|	|	0.33
71.000	0.00	0.06	0.069	o	|	|	|	0.32
71.083	0.00	0.06	0.068	o	|	|	|	0.32
71.167	0.00	0.06	0.068	o	|	|	|	0.32
71.250	0.00	0.06	0.068	o	|	|	|	0.32
71.333	0.00	0.06	0.067	o	|	|	|	0.32
71.417	0.00	0.06	0.067	o	|	|	|	0.31
71.500	0.00	0.06	0.066	o	|	|	|	0.31
71.583	0.00	0.06	0.066	o	|	|	|	0.31
71.667	0.00	0.06	0.066	o	|	|	|	0.31
71.750	0.00	0.06	0.065	o	|	|	|	0.31
71.833	0.00	0.06	0.065	o	|	|	|	0.31
71.917	0.00	0.06	0.064	o	|	|	|	0.30
72.000	0.00	0.05	0.064	o	|	|	|	0.30
72.083	0.00	0.05	0.064	o	|	|	|	0.30
72.167	0.00	0.05	0.063	o	|	|	|	0.30
72.250	0.00	0.05	0.063	o	|	|	|	0.30
72.333	0.00	0.05	0.063	o	|	|	|	0.29
72.417	0.00	0.05	0.062	o	|	|	|	0.29
72.500	0.00	0.05	0.062	o	|	|	|	0.29
72.583	0.00	0.05	0.061	o	|	|	|	0.29
72.667	0.00	0.05	0.061	o	|	|	|	0.29
72.750	0.00	0.05	0.061	o	|	|	|	0.29
72.833	0.00	0.05	0.060	o	|	|	|	0.28
72.917	0.00	0.05	0.060	o	|	|	|	0.28
73.000	0.00	0.05	0.060	o	|	|	|	0.28
73.083	0.00	0.05	0.059	o	|	|	|	0.28
73.167	0.00	0.05	0.059	o	|	|	|	0.28
73.250	0.00	0.05	0.059	o	|	|	|	0.28
73.333	0.00	0.05	0.058	o	|	|	|	0.27
73.417	0.00	0.05	0.058	o	|	|	|	0.27
73.500	0.00	0.05	0.058	o	|	|	|	0.27
73.583	0.00	0.05	0.057	o	|	|	|	0.27
73.667	0.00	0.05	0.057	o	|	|	|	0.27
73.750	0.00	0.05	0.057	o	|	|	|	0.27
73.833	0.00	0.05	0.056	o	|	|	|	0.27
73.917	0.00	0.05	0.056	o	|	|	|	0.26
74.000	0.00	0.05	0.056	o	|	|	|	0.26
74.083	0.00	0.05	0.055	o	|	|	|	0.26
74.167	0.00	0.05	0.055	o	|	|	|	0.26
74.250	0.00	0.05	0.055	o	|	|	|	0.26
74.333	0.00	0.05	0.054	o	|	|	|	0.26
74.417	0.00	0.05	0.054	o	|	|	|	0.25
74.500	0.00	0.05	0.054	o	|	|	|	0.25
74.583	0.00	0.05	0.053	o	|	|	|	0.25
74.667	0.00	0.05	0.053	o	|	|	|	0.25
74.750	0.00	0.05	0.053	o	|	|	|	0.25
74.833	0.00	0.04	0.052	o	|	|	|	0.25
74.917	0.00	0.04	0.052	o	|	|	|	0.25
75.000	0.00	0.04	0.052	o	|	|	|	0.24
75.083	0.00	0.04	0.051	o	|	|	|	0.24
75.167	0.00	0.04	0.051	o	|	|	|	0.24
75.250	0.00	0.04	0.051	o	|	|	|	0.24
75.333	0.00	0.04	0.051	o	|	|	|	0.24
75.417	0.00	0.04	0.050	o	|	|	|	0.24
75.500	0.00	0.04	0.050	o	|	|	|	0.24
75.583	0.00	0.04	0.050	o	|	|	|	0.23

75.667	0.00	0.04	0.049	o	|	|	|	0.23
75.750	0.00	0.04	0.049	o	|	|	|	0.23
75.833	0.00	0.04	0.049	o	|	|	|	0.23
75.917	0.00	0.04	0.049	o	|	|	|	0.23
76.000	0.00	0.04	0.048	o	|	|	|	0.23
76.083	0.00	0.04	0.048	o	|	|	|	0.23
76.167	0.00	0.04	0.048	o	|	|	|	0.22
76.250	0.00	0.04	0.047	o	|	|	|	0.22
76.333	0.00	0.04	0.047	o	|	|	|	0.22
76.417	0.00	0.04	0.047	o	|	|	|	0.22
76.500	0.00	0.04	0.047	o	|	|	|	0.22
76.583	0.00	0.04	0.046	o	|	|	|	0.22
76.667	0.00	0.04	0.046	o	|	|	|	0.22
76.750	0.00	0.04	0.046	o	|	|	|	0.22
76.833	0.00	0.04	0.045	o	|	|	|	0.21
76.917	0.00	0.04	0.045	o	|	|	|	0.21
77.000	0.00	0.04	0.045	o	|	|	|	0.21
77.083	0.00	0.04	0.045	o	|	|	|	0.21
77.167	0.00	0.04	0.044	o	|	|	|	0.21
77.250	0.00	0.04	0.044	o	|	|	|	0.21
77.333	0.00	0.04	0.044	o	|	|	|	0.21
77.417	0.00	0.04	0.044	o	|	|	|	0.21
77.500	0.00	0.04	0.043	o	|	|	|	0.20
77.583	0.00	0.04	0.043	o	|	|	|	0.20
77.667	0.00	0.04	0.043	o	|	|	|	0.20
77.750	0.00	0.04	0.043	o	|	|	|	0.20
77.833	0.00	0.04	0.042	o	|	|	|	0.20
77.917	0.00	0.04	0.042	o	|	|	|	0.20
78.000	0.00	0.04	0.042	o	|	|	|	0.20
78.083	0.00	0.04	0.042	o	|	|	|	0.20
78.167	0.00	0.04	0.041	o	|	|	|	0.19
78.250	0.00	0.04	0.041	o	|	|	|	0.19
78.333	0.00	0.04	0.041	o	|	|	|	0.19
78.417	0.00	0.03	0.041	o	|	|	|	0.19
78.500	0.00	0.03	0.040	o	|	|	|	0.19
78.583	0.00	0.03	0.040	o	|	|	|	0.19
78.667	0.00	0.03	0.040	o	|	|	|	0.19
78.750	0.00	0.03	0.040	o	|	|	|	0.19
78.833	0.00	0.03	0.039	o	|	|	|	0.19
78.917	0.00	0.03	0.039	o	|	|	|	0.18
79.000	0.00	0.03	0.039	o	|	|	|	0.18
79.083	0.00	0.03	0.039	o	|	|	|	0.18
79.167	0.00	0.03	0.039	o	|	|	|	0.18
79.250	0.00	0.03	0.038	o	|	|	|	0.18
79.333	0.00	0.03	0.038	o	|	|	|	0.18
79.417	0.00	0.03	0.038	o	|	|	|	0.18
79.500	0.00	0.03	0.038	o	|	|	|	0.18
79.583	0.00	0.03	0.037	o	|	|	|	0.18
79.667	0.00	0.03	0.037	o	|	|	|	0.18
79.750	0.00	0.03	0.037	o	|	|	|	0.17
79.833	0.00	0.03	0.037	o	|	|	|	0.17
79.917	0.00	0.03	0.037	o	|	|	|	0.17
80.000	0.00	0.03	0.036	o	|	|	|	0.17
80.083	0.00	0.03	0.036	o	|	|	|	0.17
80.167	0.00	0.03	0.036	o	|	|	|	0.17
80.250	0.00	0.03	0.036	o	|	|	|	0.17
80.333	0.00	0.03	0.035	o	|	|	|	0.17
80.417	0.00	0.03	0.035	o	|	|	|	0.17
80.500	0.00	0.03	0.035	o	|	|	|	0.17
80.583	0.00	0.03	0.035	o	|	|	|	0.16
80.667	0.00	0.03	0.035	o	|	|	|	0.16
80.750	0.00	0.03	0.034	o	|	|	|	0.16
80.833	0.00	0.03	0.034	o	|	|	|	0.16
80.917	0.00	0.03	0.034	o	|	|	|	0.16
81.000	0.00	0.03	0.034	o	|	|	|	0.16
81.083	0.00	0.03	0.034	o	|	|	|	0.16

81.167	0.00	0.03	0.033	o	|	|	|	0.16
81.250	0.00	0.03	0.033	o	|	|	|	0.16
81.333	0.00	0.03	0.033	o	|	|	|	0.16
81.417	0.00	0.03	0.033	o	|	|	|	0.15
81.500	0.00	0.03	0.033	o	|	|	|	0.15
81.583	0.00	0.03	0.032	o	|	|	|	0.15
81.667	0.00	0.03	0.032	o	|	|	|	0.15
81.750	0.00	0.03	0.032	o	|	|	|	0.15
81.833	0.00	0.03	0.032	o	|	|	|	0.15
81.917	0.00	0.03	0.032	o	|	|	|	0.15
82.000	0.00	0.03	0.032	o	|	|	|	0.15
82.083	0.00	0.03	0.031	o	|	|	|	0.15
82.167	0.00	0.03	0.031	o	|	|	|	0.15
82.250	0.00	0.03	0.031	o	|	|	|	0.15
82.333	0.00	0.03	0.031	o	|	|	|	0.15
82.417	0.00	0.03	0.031	o	|	|	|	0.14
82.500	0.00	0.03	0.030	o	|	|	|	0.14
82.583	0.00	0.03	0.030	o	|	|	|	0.14
82.667	0.00	0.03	0.030	o	|	|	|	0.14
82.750	0.00	0.03	0.030	o	|	|	|	0.14
82.833	0.00	0.03	0.030	o	|	|	|	0.14
82.917	0.00	0.03	0.030	o	|	|	|	0.14
83.000	0.00	0.03	0.029	o	|	|	|	0.14
83.083	0.00	0.03	0.029	o	|	|	|	0.14
83.167	0.00	0.02	0.029	o	|	|	|	0.14
83.250	0.00	0.02	0.029	o	|	|	|	0.14
83.333	0.00	0.02	0.029	o	|	|	|	0.14
83.417	0.00	0.02	0.029	o	|	|	|	0.13
83.500	0.00	0.02	0.028	o	|	|	|	0.13
83.583	0.00	0.02	0.028	o	|	|	|	0.13
83.667	0.00	0.02	0.028	o	|	|	|	0.13
83.750	0.00	0.02	0.028	o	|	|	|	0.13
83.833	0.00	0.02	0.028	o	|	|	|	0.13
83.917	0.00	0.02	0.028	o	|	|	|	0.13
84.000	0.00	0.02	0.027	o	|	|	|	0.13
84.083	0.00	0.02	0.027	o	|	|	|	0.13
84.167	0.00	0.02	0.027	o	|	|	|	0.13
84.250	0.00	0.02	0.027	o	|	|	|	0.13
84.333	0.00	0.02	0.027	o	|	|	|	0.13
84.417	0.00	0.02	0.027	o	|	|	|	0.13
84.500	0.00	0.02	0.026	o	|	|	|	0.12
84.583	0.00	0.02	0.026	o	|	|	|	0.12
84.667	0.00	0.02	0.026	o	|	|	|	0.12
84.750	0.00	0.02	0.026	o	|	|	|	0.12
84.833	0.00	0.02	0.026	o	|	|	|	0.12
84.917	0.00	0.02	0.026	o	|	|	|	0.12
85.000	0.00	0.02	0.025	o	|	|	|	0.12
85.083	0.00	0.02	0.025	o	|	|	|	0.12
85.167	0.00	0.02	0.025	o	|	|	|	0.12
85.250	0.00	0.02	0.025	o	|	|	|	0.12
85.333	0.00	0.02	0.025	o	|	|	|	0.12
85.417	0.00	0.02	0.025	o	|	|	|	0.12
85.500	0.00	0.02	0.025	o	|	|	|	0.12
85.583	0.00	0.02	0.024	o	|	|	|	0.12
85.667	0.00	0.02	0.024	o	|	|	|	0.11
85.750	0.00	0.02	0.024	o	|	|	|	0.11
85.833	0.00	0.02	0.024	o	|	|	|	0.11
85.917	0.00	0.02	0.024	o	|	|	|	0.11
86.000	0.00	0.02	0.024	o	|	|	|	0.11
86.083	0.00	0.02	0.024	o	|	|	|	0.11
86.167	0.00	0.02	0.023	o	|	|	|	0.11
86.250	0.00	0.02	0.023	o	|	|	|	0.11
86.333	0.00	0.02	0.023	o	|	|	|	0.11
86.417	0.00	0.02	0.023	o	|	|	|	0.11
86.500	0.00	0.02	0.023	o	|	|	|	0.11
86.583	0.00	0.02	0.023	o	|	|	|	0.11

86.667	0.00	0.02	0.023	o	|	|	|	|	0.11
86.750	0.00	0.02	0.023	o	|	|	|	|	0.11
86.833	0.00	0.02	0.022	o	|	|	|	|	0.11
86.917	0.00	0.02	0.022	o	|	|	|	|	0.10
87.000	0.00	0.02	0.022	o	|	|	|	|	0.10
87.083	0.00	0.02	0.022	o	|	|	|	|	0.10
87.167	0.00	0.02	0.022	o	|	|	|	|	0.10
87.250	0.00	0.02	0.022	o	|	|	|	|	0.10
87.333	0.00	0.02	0.022	o	|	|	|	|	0.10
87.417	0.00	0.02	0.021	o	|	|	|	|	0.10
87.500	0.00	0.02	0.021	o	|	|	|	|	0.10
87.583	0.00	0.02	0.021	o	|	|	|	|	0.10
87.667	0.00	0.02	0.021	o	|	|	|	|	0.10
87.750	0.00	0.02	0.021	o	|	|	|	|	0.10
87.833	0.00	0.02	0.021	o	|	|	|	|	0.10
87.917	0.00	0.02	0.021	o	|	|	|	|	0.10
88.000	0.00	0.02	0.021	o	|	|	|	|	0.10
88.083	0.00	0.02	0.020	o	|	|	|	|	0.10
88.167	0.00	0.02	0.020	o	|	|	|	|	0.10
88.250	0.00	0.02	0.020	o	|	|	|	|	0.10
88.333	0.00	0.02	0.020	o	|	|	|	|	0.09
88.417	0.00	0.02	0.020	o	|	|	|	|	0.09
88.500	0.00	0.02	0.020	o	|	|	|	|	0.09
88.583	0.00	0.02	0.020	o	|	|	|	|	0.09
88.667	0.00	0.02	0.020	o	|	|	|	|	0.09
88.750	0.00	0.02	0.020	o	|	|	|	|	0.09
88.833	0.00	0.02	0.019	o	|	|	|	|	0.09
88.917	0.00	0.02	0.019	o	|	|	|	|	0.09
89.000	0.00	0.02	0.019	o	|	|	|	|	0.09
89.083	0.00	0.02	0.019	o	|	|	|	|	0.09
89.167	0.00	0.02	0.019	o	|	|	|	|	0.09
89.250	0.00	0.02	0.019	o	|	|	|	|	0.09
89.333	0.00	0.02	0.019	o	|	|	|	|	0.09
89.417	0.00	0.02	0.019	o	|	|	|	|	0.09
89.500	0.00	0.02	0.019	o	|	|	|	|	0.09
89.583	0.00	0.02	0.018	o	|	|	|	|	0.09
89.667	0.00	0.02	0.018	o	|	|	|	|	0.09
89.750	0.00	0.02	0.018	o	|	|	|	|	0.09
89.833	0.00	0.02	0.018	o	|	|	|	|	0.09
89.917	0.00	0.02	0.018	o	|	|	|	|	0.08
90.000	0.00	0.02	0.018	o	|	|	|	|	0.08
90.083	0.00	0.02	0.018	o	|	|	|	|	0.08
90.167	0.00	0.02	0.018	o	|	|	|	|	0.08
90.250	0.00	0.02	0.018	o	|	|	|	|	0.08
90.333	0.00	0.01	0.017	o	|	|	|	|	0.08
90.417	0.00	0.01	0.017	o	|	|	|	|	0.08
90.500	0.00	0.01	0.017	o	|	|	|	|	0.08
90.583	0.00	0.01	0.017	o	|	|	|	|	0.08
90.667	0.00	0.01	0.017	o	|	|	|	|	0.08
90.750	0.00	0.01	0.017	o	|	|	|	|	0.08
90.833	0.00	0.01	0.017	o	|	|	|	|	0.08
90.917	0.00	0.01	0.017	o	|	|	|	|	0.08
91.000	0.00	0.01	0.017	o	|	|	|	|	0.08
91.083	0.00	0.01	0.017	o	|	|	|	|	0.08
91.167	0.00	0.01	0.016	o	|	|	|	|	0.08
91.250	0.00	0.01	0.016	o	|	|	|	|	0.08
91.333	0.00	0.01	0.016	o	|	|	|	|	0.08
91.417	0.00	0.01	0.016	o	|	|	|	|	0.08
91.500	0.00	0.01	0.016	o	|	|	|	|	0.08
91.583	0.00	0.01	0.016	o	|	|	|	|	0.08
91.667	0.00	0.01	0.016	o	|	|	|	|	0.07
91.750	0.00	0.01	0.016	o	|	|	|	|	0.07
91.833	0.00	0.01	0.016	o	|	|	|	|	0.07
91.917	0.00	0.01	0.016	o	|	|	|	|	0.07
92.000	0.00	0.01	0.016	o	|	|	|	|	0.07
92.083	0.00	0.01	0.015	o	|	|	|	|	0.07

92.167	0.00	0.01	0.015	o	|	|	|	|	0.07
92.250	0.00	0.01	0.015	o	|	|	|	|	0.07
92.333	0.00	0.01	0.015	o	|	|	|	|	0.07
92.417	0.00	0.01	0.015	o	|	|	|	|	0.07
92.500	0.00	0.01	0.015	o	|	|	|	|	0.07
92.583	0.00	0.01	0.015	o	|	|	|	|	0.07
92.667	0.00	0.01	0.015	o	|	|	|	|	0.07
92.750	0.00	0.01	0.015	o	|	|	|	|	0.07
92.833	0.00	0.01	0.015	o	|	|	|	|	0.07
92.917	0.00	0.01	0.015	o	|	|	|	|	0.07
93.000	0.00	0.01	0.014	o	|	|	|	|	0.07
93.083	0.00	0.01	0.014	o	|	|	|	|	0.07
93.167	0.00	0.01	0.014	o	|	|	|	|	0.07
93.250	0.00	0.01	0.014	o	|	|	|	|	0.07
93.333	0.00	0.01	0.014	o	|	|	|	|	0.07
93.417	0.00	0.01	0.014	o	|	|	|	|	0.07
93.500	0.00	0.01	0.014	o	|	|	|	|	0.07
93.583	0.00	0.01	0.014	o	|	|	|	|	0.07
93.667	0.00	0.01	0.014	o	|	|	|	|	0.07
93.750	0.00	0.01	0.014	o	|	|	|	|	0.06
93.833	0.00	0.01	0.014	o	|	|	|	|	0.06
93.917	0.00	0.01	0.014	o	|	|	|	|	0.06
94.000	0.00	0.01	0.013	o	|	|	|	|	0.06
94.083	0.00	0.01	0.013	o	|	|	|	|	0.06
94.167	0.00	0.01	0.013	o	|	|	|	|	0.06
94.250	0.00	0.01	0.013	o	|	|	|	|	0.06
94.333	0.00	0.01	0.013	o	|	|	|	|	0.06
94.417	0.00	0.01	0.013	o	|	|	|	|	0.06
94.500	0.00	0.01	0.013	o	|	|	|	|	0.06
94.583	0.00	0.01	0.013	o	|	|	|	|	0.06
94.667	0.00	0.01	0.013	o	|	|	|	|	0.06
94.750	0.00	0.01	0.013	o	|	|	|	|	0.06
94.833	0.00	0.01	0.013	o	|	|	|	|	0.06
94.917	0.00	0.01	0.013	o	|	|	|	|	0.06
95.000	0.00	0.01	0.013	o	|	|	|	|	0.06
95.083	0.00	0.01	0.012	o	|	|	|	|	0.06
95.167	0.00	0.01	0.012	o	|	|	|	|	0.06
95.250	0.00	0.01	0.012	o	|	|	|	|	0.06
95.333	0.00	0.01	0.012	o	|	|	|	|	0.06
95.417	0.00	0.01	0.012	o	|	|	|	|	0.06
95.500	0.00	0.01	0.012	o	|	|	|	|	0.06
95.583	0.00	0.01	0.012	o	|	|	|	|	0.06
95.667	0.00	0.01	0.012	o	|	|	|	|	0.06
95.750	0.00	0.01	0.012	o	|	|	|	|	0.06
95.833	0.00	0.01	0.012	o	|	|	|	|	0.06
95.917	0.00	0.01	0.012	o	|	|	|	|	0.06
96.000	0.00	0.01	0.012	o	|	|	|	|	0.06
96.083	0.00	0.01	0.012	o	|	|	|	|	0.05
96.167	0.00	0.01	0.012	o	|	|	|	|	0.05
96.250	0.00	0.01	0.011	o	|	|	|	|	0.05
96.333	0.00	0.01	0.011	o	|	|	|	|	0.05
96.417	0.00	0.01	0.011	o	|	|	|	|	0.05
96.500	0.00	0.01	0.011	o	|	|	|	|	0.05
96.583	0.00	0.01	0.011	o	|	|	|	|	0.05
96.667	0.00	0.01	0.011	o	|	|	|	|	0.05
96.750	0.00	0.01	0.011	o	|	|	|	|	0.05
96.833	0.00	0.01	0.011	o	|	|	|	|	0.05
96.917	0.00	0.01	0.011	o	|	|	|	|	0.05
97.000	0.00	0.01	0.011	o	|	|	|	|	0.05
97.083	0.00	0.01	0.011	o	|	|	|	|	0.05
97.167	0.00	0.01	0.011	o	|	|	|	|	0.05
97.250	0.00	0.01	0.011	o	|	|	|	|	0.05
97.333	0.00	0.01	0.011	o	|	|	|	|	0.05
97.417	0.00	0.01	0.011	o	|	|	|	|	0.05
97.500	0.00	0.01	0.011	o	|	|	|	|	0.05
97.583	0.00	0.01	0.010	o	|	|	|	|	0.05

97.667	0.00	0.01	0.010	o	|	|	|	|	0.05
97.750	0.00	0.01	0.010	o	|	|	|	|	0.05
97.833	0.00	0.01	0.010	o	|	|	|	|	0.05
97.917	0.00	0.01	0.010	o	|	|	|	|	0.05
98.000	0.00	0.01	0.010	o	|	|	|	|	0.05
98.083	0.00	0.01	0.010	o	|	|	|	|	0.05
98.167	0.00	0.01	0.010	o	|	|	|	|	0.05
98.250	0.00	0.01	0.010	o	|	|	|	|	0.05
98.333	0.00	0.01	0.010	o	|	|	|	|	0.05
98.417	0.00	0.01	0.010	o	|	|	|	|	0.05
98.500	0.00	0.01	0.010	o	|	|	|	|	0.05
98.583	0.00	0.01	0.010	o	|	|	|	|	0.05
98.667	0.00	0.01	0.010	o	|	|	|	|	0.05
98.750	0.00	0.01	0.010	o	|	|	|	|	0.05
98.833	0.00	0.01	0.010	o	|	|	|	|	0.05
98.917	0.00	0.01	0.010	o	|	|	|	|	0.04
99.000	0.00	0.01	0.009	o	|	|	|	|	0.04
99.083	0.00	0.01	0.009	o	|	|	|	|	0.04
99.167	0.00	0.01	0.009	o	|	|	|	|	0.04
99.250	0.00	0.01	0.009	o	|	|	|	|	0.04
99.333	0.00	0.01	0.009	o	|	|	|	|	0.04
99.417	0.00	0.01	0.009	o	|	|	|	|	0.04
99.500	0.00	0.01	0.009	o	|	|	|	|	0.04
99.583	0.00	0.01	0.009	o	|	|	|	|	0.04
99.667	0.00	0.01	0.009	o	|	|	|	|	0.04
99.750	0.00	0.01	0.009	o	|	|	|	|	0.04
99.833	0.00	0.01	0.009	o	|	|	|	|	0.04
99.917	0.00	0.01	0.009	o	|	|	|	|	0.04
100.000	0.00	0.01	0.009	o	|	|	|	|	0.04
100.083	0.00	0.01	0.009	o	|	|	|	|	0.04
100.167	0.00	0.01	0.009	o	|	|	|	|	0.04
100.250	0.00	0.01	0.009	o	|	|	|	|	0.04
100.333	0.00	0.01	0.009	o	|	|	|	|	0.04
100.417	0.00	0.01	0.009	o	|	|	|	|	0.04
100.500	0.00	0.01	0.009	o	|	|	|	|	0.04
100.583	0.00	0.01	0.008	o	|	|	|	|	0.04
100.667	0.00	0.01	0.008	o	|	|	|	|	0.04
100.750	0.00	0.01	0.008	o	|	|	|	|	0.04
100.833	0.00	0.01	0.008	o	|	|	|	|	0.04
100.917	0.00	0.01	0.008	o	|	|	|	|	0.04
101.000	0.00	0.01	0.008	o	|	|	|	|	0.04
101.083	0.00	0.01	0.008	o	|	|	|	|	0.04
101.167	0.00	0.01	0.008	o	|	|	|	|	0.04
101.250	0.00	0.01	0.008	o	|	|	|	|	0.04
101.333	0.00	0.01	0.008	o	|	|	|	|	0.04
101.417	0.00	0.01	0.008	o	|	|	|	|	0.04
101.500	0.00	0.01	0.008	o	|	|	|	|	0.04
101.583	0.00	0.01	0.008	o	|	|	|	|	0.04
101.667	0.00	0.01	0.008	o	|	|	|	|	0.04
101.750	0.00	0.01	0.008	o	|	|	|	|	0.04
101.833	0.00	0.01	0.008	o	|	|	|	|	0.04
101.917	0.00	0.01	0.008	o	|	|	|	|	0.04
102.000	0.00	0.01	0.008	o	|	|	|	|	0.04
102.083	0.00	0.01	0.008	o	|	|	|	|	0.04
102.167	0.00	0.01	0.008	o	|	|	|	|	0.04
102.250	0.00	0.01	0.008	o	|	|	|	|	0.04
102.333	0.00	0.01	0.007	o	|	|	|	|	0.04
102.417	0.00	0.01	0.007	o	|	|	|	|	0.03
102.500	0.00	0.01	0.007	o	|	|	|	|	0.03
102.583	0.00	0.01	0.007	o	|	|	|	|	0.03
102.667	0.00	0.01	0.007	o	|	|	|	|	0.03
102.750	0.00	0.01	0.007	o	|	|	|	|	0.03
102.833	0.00	0.01	0.007	o	|	|	|	|	0.03
102.917	0.00	0.01	0.007	o	|	|	|	|	0.03
103.000	0.00	0.01	0.007	o	|	|	|	|	0.03
103.083	0.00	0.01	0.007	o	|	|	|	|	0.03

103.167	0.00	0.01	0.007	o	|	|	|	|	0.03
103.250	0.00	0.01	0.007	o	|	|	|	|	0.03
103.333	0.00	0.01	0.007	o	|	|	|	|	0.03
103.417	0.00	0.01	0.007	o	|	|	|	|	0.03
103.500	0.00	0.01	0.007	o	|	|	|	|	0.03
103.583	0.00	0.01	0.007	o	|	|	|	|	0.03
103.667	0.00	0.01	0.007	o	|	|	|	|	0.03
103.750	0.00	0.01	0.007	o	|	|	|	|	0.03
103.833	0.00	0.01	0.007	o	|	|	|	|	0.03
103.917	0.00	0.01	0.007	o	|	|	|	|	0.03
104.000	0.00	0.01	0.007	o	|	|	|	|	0.03
104.083	0.00	0.01	0.007	o	|	|	|	|	0.03
104.167	0.00	0.01	0.007	o	|	|	|	|	0.03
104.250	0.00	0.01	0.007	o	|	|	|	|	0.03
104.333	0.00	0.01	0.006	o	|	|	|	|	0.03
104.417	0.00	0.01	0.006	o	|	|	|	|	0.03
104.500	0.00	0.01	0.006	o	|	|	|	|	0.03
104.583	0.00	0.01	0.006	o	|	|	|	|	0.03
104.667	0.00	0.01	0.006	o	|	|	|	|	0.03
104.750	0.00	0.01	0.006	o	|	|	|	|	0.03
104.833	0.00	0.01	0.006	o	|	|	|	|	0.03
104.917	0.00	0.01	0.006	o	|	|	|	|	0.03
105.000	0.00	0.01	0.006	o	|	|	|	|	0.03
105.083	0.00	0.01	0.006	o	|	|	|	|	0.03
105.167	0.00	0.01	0.006	o	|	|	|	|	0.03
105.250	0.00	0.01	0.006	o	|	|	|	|	0.03
105.333	0.00	0.01	0.006	o	|	|	|	|	0.03
105.417	0.00	0.01	0.006	o	|	|	|	|	0.03
105.500	0.00	0.01	0.006	o	|	|	|	|	0.03
105.583	0.00	0.01	0.006	o	|	|	|	|	0.03
105.667	0.00	0.01	0.006	o	|	|	|	|	0.03
105.750	0.00	0.01	0.006	o	|	|	|	|	0.03
105.833	0.00	0.00	0.006	o	|	|	|	|	0.03
105.917	0.00	0.00	0.006	o	|	|	|	|	0.03
106.000	0.00	0.00	0.006	o	|	|	|	|	0.03
106.083	0.00	0.00	0.006	o	|	|	|	|	0.03
106.167	0.00	0.00	0.006	o	|	|	|	|	0.03
106.250	0.00	0.00	0.006	o	|	|	|	|	0.03
106.333	0.00	0.00	0.006	o	|	|	|	|	0.03
106.417	0.00	0.00	0.006	o	|	|	|	|	0.03
106.500	0.00	0.00	0.006	o	|	|	|	|	0.03
106.583	0.00	0.00	0.006	o	|	|	|	|	0.03
106.667	0.00	0.00	0.005	o	|	|	|	|	0.03
106.750	0.00	0.00	0.005	o	|	|	|	|	0.03
106.833	0.00	0.00	0.005	o	|	|	|	|	0.03
106.917	0.00	0.00	0.005	o	|	|	|	|	0.03
107.000	0.00	0.00	0.005	o	|	|	|	|	0.03
107.083	0.00	0.00	0.005	o	|	|	|	|	0.03
107.167	0.00	0.00	0.005	o	|	|	|	|	0.02
107.250	0.00	0.00	0.005	o	|	|	|	|	0.02
107.333	0.00	0.00	0.005	o	|	|	|	|	0.02
107.417	0.00	0.00	0.005	o	|	|	|	|	0.02
107.500	0.00	0.00	0.005	o	|	|	|	|	0.02
107.583	0.00	0.00	0.005	o	|	|	|	|	0.02
107.667	0.00	0.00	0.005	o	|	|	|	|	0.02
107.750	0.00	0.00	0.005	o	|	|	|	|	0.02
107.833	0.00	0.00	0.005	o	|	|	|	|	0.02
107.917	0.00	0.00	0.005	o	|	|	|	|	0.02
108.000	0.00	0.00	0.005	o	|	|	|	|	0.02
108.083	0.00	0.00	0.005	o	|	|	|	|	0.02
108.167	0.00	0.00	0.005	o	|	|	|	|	0.02
108.250	0.00	0.00	0.005	o	|	|	|	|	0.02
108.333	0.00	0.00	0.005	o	|	|	|	|	0.02
108.417	0.00	0.00	0.005	o	|	|	|	|	0.02
108.500	0.00	0.00	0.005	o	|	|	|	|	0.02
108.583	0.00	0.00	0.005	o	|	|	|	|	0.02

108.667	0.00	0.00	0.005	o	|	|	|	|	0.02
108.750	0.00	0.00	0.005	o	|	|	|	|	0.02
108.833	0.00	0.00	0.005	o	|	|	|	|	0.02
108.917	0.00	0.00	0.005	o	|	|	|	|	0.02
109.000	0.00	0.00	0.005	o	|	|	|	|	0.02
109.083	0.00	0.00	0.005	o	|	|	|	|	0.02
109.167	0.00	0.00	0.005	o	|	|	|	|	0.02
109.250	0.00	0.00	0.005	o	|	|	|	|	0.02
109.333	0.00	0.00	0.005	o	|	|	|	|	0.02
109.417	0.00	0.00	0.005	o	|	|	|	|	0.02
109.500	0.00	0.00	0.004	o	|	|	|	|	0.02
109.583	0.00	0.00	0.004	o	|	|	|	|	0.02
109.667	0.00	0.00	0.004	o	|	|	|	|	0.02
109.750	0.00	0.00	0.004	o	|	|	|	|	0.02
109.833	0.00	0.00	0.004	o	|	|	|	|	0.02
109.917	0.00	0.00	0.004	o	|	|	|	|	0.02
110.000	0.00	0.00	0.004	o	|	|	|	|	0.02
110.083	0.00	0.00	0.004	o	|	|	|	|	0.02
110.167	0.00	0.00	0.004	o	|	|	|	|	0.02
110.250	0.00	0.00	0.004	o	|	|	|	|	0.02
110.333	0.00	0.00	0.004	o	|	|	|	|	0.02
110.417	0.00	0.00	0.004	o	|	|	|	|	0.02
110.500	0.00	0.00	0.004	o	|	|	|	|	0.02
110.583	0.00	0.00	0.004	o	|	|	|	|	0.02
110.667	0.00	0.00	0.004	o	|	|	|	|	0.02
110.750	0.00	0.00	0.004	o	|	|	|	|	0.02
110.833	0.00	0.00	0.004	o	|	|	|	|	0.02
110.917	0.00	0.00	0.004	o	|	|	|	|	0.02
111.000	0.00	0.00	0.004	o	|	|	|	|	0.02
111.083	0.00	0.00	0.004	o	|	|	|	|	0.02
111.167	0.00	0.00	0.004	o	|	|	|	|	0.02
111.250	0.00	0.00	0.004	o	|	|	|	|	0.02
111.333	0.00	0.00	0.004	o	|	|	|	|	0.02
111.417	0.00	0.00	0.004	o	|	|	|	|	0.02
111.500	0.00	0.00	0.004	o	|	|	|	|	0.02
111.583	0.00	0.00	0.004	o	|	|	|	|	0.02
111.667	0.00	0.00	0.004	o	|	|	|	|	0.02
111.750	0.00	0.00	0.004	o	|	|	|	|	0.02
111.833	0.00	0.00	0.004	o	|	|	|	|	0.02
111.917	0.00	0.00	0.004	o	|	|	|	|	0.02
112.000	0.00	0.00	0.004	o	|	|	|	|	0.02
112.083	0.00	0.00	0.004	o	|	|	|	|	0.02
112.167	0.00	0.00	0.004	o	|	|	|	|	0.02
112.250	0.00	0.00	0.004	o	|	|	|	|	0.02
112.333	0.00	0.00	0.004	o	|	|	|	|	0.02
112.417	0.00	0.00	0.004	o	|	|	|	|	0.02
112.500	0.00	0.00	0.004	o	|	|	|	|	0.02
112.583	0.00	0.00	0.004	o	|	|	|	|	0.02
112.667	0.00	0.00	0.004	o	|	|	|	|	0.02
112.750	0.00	0.00	0.004	o	|	|	|	|	0.02
112.833	0.00	0.00	0.004	o	|	|	|	|	0.02
112.917	0.00	0.00	0.004	o	|	|	|	|	0.02
113.000	0.00	0.00	0.004	o	|	|	|	|	0.02
113.083	0.00	0.00	0.003	o	|	|	|	|	0.02
113.167	0.00	0.00	0.003	o	|	|	|	|	0.02
113.250	0.00	0.00	0.003	o	|	|	|	|	0.02
113.333	0.00	0.00	0.003	o	|	|	|	|	0.02
113.417	0.00	0.00	0.003	o	|	|	|	|	0.02
113.500	0.00	0.00	0.003	o	|	|	|	|	0.02
113.583	0.00	0.00	0.003	o	|	|	|	|	0.02
113.667	0.00	0.00	0.003	o	|	|	|	|	0.02
113.750	0.00	0.00	0.003	o	|	|	|	|	0.02
113.833	0.00	0.00	0.003	o	|	|	|	|	0.02
113.917	0.00	0.00	0.003	o	|	|	|	|	0.02
114.000	0.00	0.00	0.003	o	|	|	|	|	0.02
114.083	0.00	0.00	0.003	o	|	|	|	|	0.02

114.167	0.00	0.00	0.003	o	|	|	|	|	0.02
114.250	0.00	0.00	0.003	o	|	|	|	|	0.02
114.333	0.00	0.00	0.003	o	|	|	|	|	0.02
114.417	0.00	0.00	0.003	o	|	|	|	|	0.01
114.500	0.00	0.00	0.003	o	|	|	|	|	0.01
114.583	0.00	0.00	0.003	o	|	|	|	|	0.01
114.667	0.00	0.00	0.003	o	|	|	|	|	0.01
114.750	0.00	0.00	0.003	o	|	|	|	|	0.01
114.833	0.00	0.00	0.003	o	|	|	|	|	0.01
114.917	0.00	0.00	0.003	o	|	|	|	|	0.01
115.000	0.00	0.00	0.003	o	|	|	|	|	0.01
115.083	0.00	0.00	0.003	o	|	|	|	|	0.01
115.167	0.00	0.00	0.003	o	|	|	|	|	0.01
115.250	0.00	0.00	0.003	o	|	|	|	|	0.01
115.333	0.00	0.00	0.003	o	|	|	|	|	0.01
115.417	0.00	0.00	0.003	o	|	|	|	|	0.01
115.500	0.00	0.00	0.003	o	|	|	|	|	0.01
115.583	0.00	0.00	0.003	o	|	|	|	|	0.01
115.667	0.00	0.00	0.003	o	|	|	|	|	0.01
115.750	0.00	0.00	0.003	o	|	|	|	|	0.01
115.833	0.00	0.00	0.003	o	|	|	|	|	0.01
115.917	0.00	0.00	0.003	o	|	|	|	|	0.01
116.000	0.00	0.00	0.003	o	|	|	|	|	0.01
116.083	0.00	0.00	0.003	o	|	|	|	|	0.01
116.167	0.00	0.00	0.003	o	|	|	|	|	0.01
116.250	0.00	0.00	0.003	o	|	|	|	|	0.01
116.333	0.00	0.00	0.003	o	|	|	|	|	0.01
116.417	0.00	0.00	0.003	o	|	|	|	|	0.01
116.500	0.00	0.00	0.003	o	|	|	|	|	0.01
116.583	0.00	0.00	0.003	o	|	|	|	|	0.01
116.667	0.00	0.00	0.003	o	|	|	|	|	0.01
116.750	0.00	0.00	0.003	o	|	|	|	|	0.01
116.833	0.00	0.00	0.003	o	|	|	|	|	0.01
116.917	0.00	0.00	0.003	o	|	|	|	|	0.01
117.000	0.00	0.00	0.003	o	|	|	|	|	0.01
117.083	0.00	0.00	0.003	o	|	|	|	|	0.01
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117.417	0.00	0.00	0.003	o	|	|	|	|	0.01
117.500	0.00	0.00	0.003	o	|	|	|	|	0.01
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120.750	0.00	0.00	0.002	o	|	|	|	|	0.01
120.833	0.00	0.00	0.002	o	|	|	|	|	0.01
120.917	0.00	0.00	0.002	o	|	|	|	|	0.01
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121.250	0.00	0.00	0.002	o	|	|	|	|	0.01
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122.083	0.00	0.00	0.002	o	|	|	|	|	0.01
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122.750	0.00	0.00	0.002	o	|	|	|	|	0.01
122.833	0.00	0.00	0.002	o	|	|	|	|	0.01
122.917	0.00	0.00	0.002	o	|	|	|	|	0.01
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125.917    0.00    0.00      0.001  o       |       |       |       |     0.01
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126.917    0.00    0.00      0.001  o       |       |       |       |     0.01
127.000    0.00    0.00      0.001  o       |       |       |       |     0.01
127.083    0.00    0.00      0.001  o       |       |       |       |     0.01
127.167    0.00    0.00      0.001  o       |       |       |       |     0.01
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127.417    0.00    0.00      0.001  o       |       |       |       |     0.01
127.500    0.00    0.00      0.001  o       |       |       |       |     0.01
127.583    0.00    0.00      0.001  o       |       |       |       |     0.01
127.667    0.00    0.00      0.001  o       |       |       |       |     0.01
127.750    0.00    0.00      0.001  o       |       |       |       |     0.01
127.833    0.00    0.00      0.001  o       |       |       |       |     0.01
127.917    0.00    0.00      0.001  o       |       |       |       |     0.01
128.000    0.00    0.00      0.001  o       |       |       |       |     0.01
128.083    0.00    0.00      0.001  o       |       |       |       |     0.01
128.167    0.00    0.00      0.001  o       |       |       |       |     0.01
128.250    0.00    0.00      0.001  o       |       |       |       |     0.01
128.333    0.00    0.00      0.001  o       |       |       |       |     0.01
128.417    0.00    0.00      0.001  o       |       |       |       |     0.01
128.500    0.00    0.00      0.001  o       |       |       |       |     0.01
128.583    0.00    0.00      0.001  o       |       |       |       |     0.01

 Remaining water in basin =    0.00 (Ac.Ft)

 ****************************HYDROGRAPH DATA****************************
              Number of intervals =  1543
              Time interval =    5.0 (Min.)
              Maximum/Peak flow rate =       11.729 (CFS)
              Total volume =       6.199 (Ac.Ft)
       Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
 ***********************************************************************

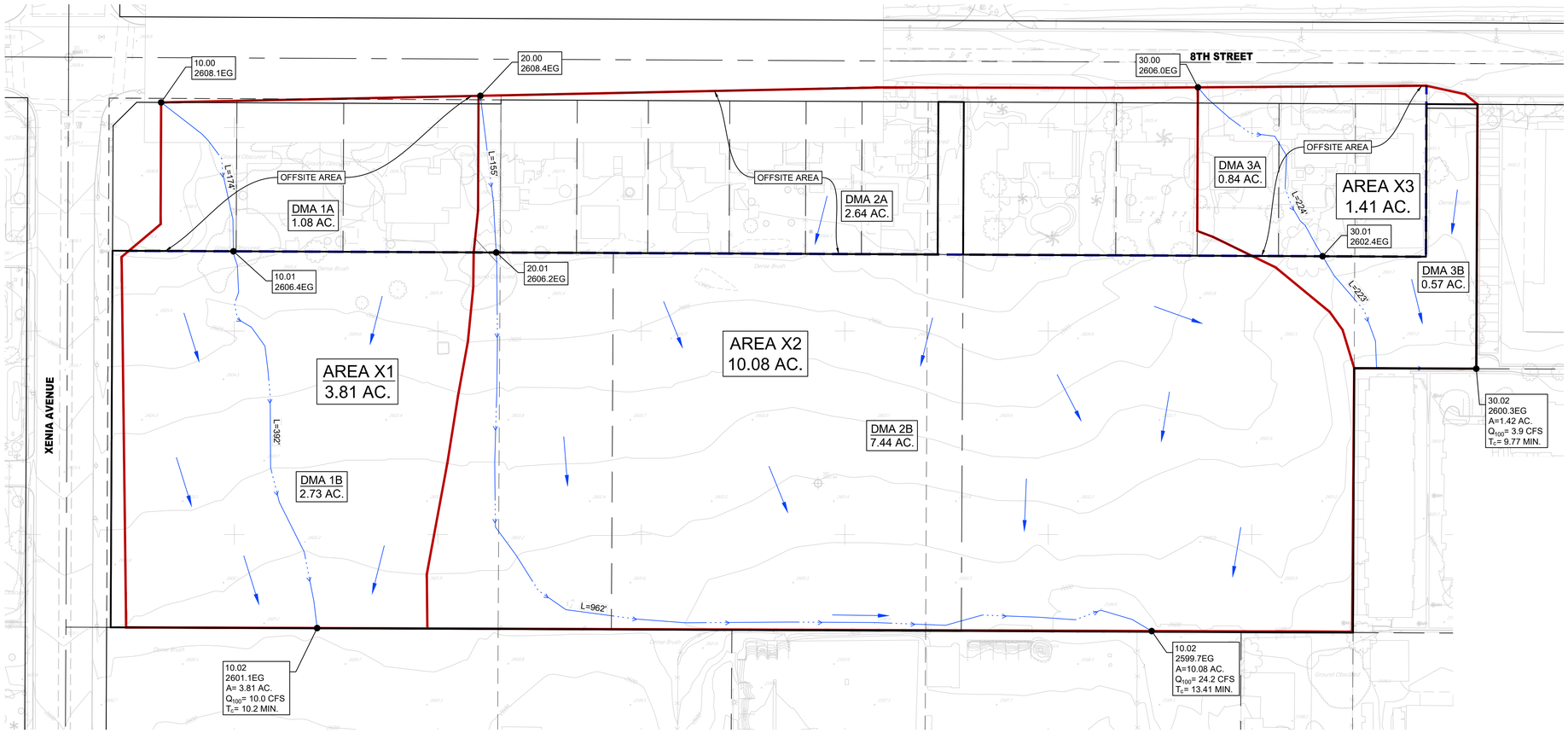
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Hydraulic Analysis..... VII

- To be included with final report

Key Maps VIII

- Pre-Developed Hydrology
- Developed Hydrology
- Pre-Developed Unit Hydrograph
- Developed Unit Hydrograph



LEGEND:

- FLOW PATH
- MAJOR DMA BOUNDARY
- MINOR DMA BOUNDARY
- NODE No. / ELEVATION — DRAINAGE NODE & ELEVATION

60' 0 60' 120' 180'

SCALE: 1" = 60'

PREPARED BY:

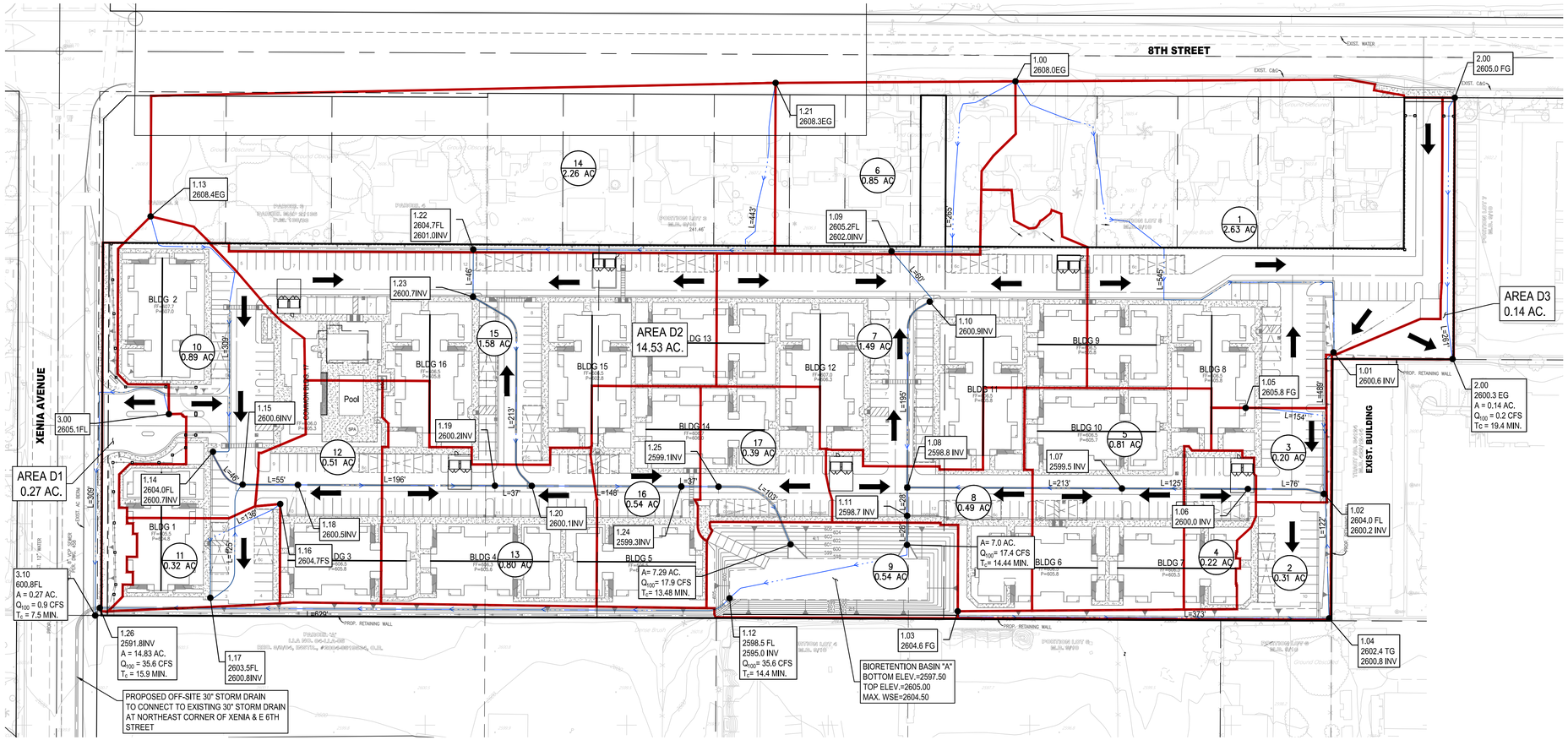
SP2 & Co.
A LAND DEVELOPMENT SERVICES COMPANY
265 S. RANDOLPH AVENUE #105
BREA, CA 92821
PHONE: (714) 490-1500
"SERVING THE DEVELOPMENT COMMUNITY SINCE 1985"

XENIA APARTMENTS

PRELIMINARY DRAINAGE STUDY

PRE-DEVELOPED HYDROLOGY KEY MAP

Plotted: Sep 19, 2022 – 12:28am By: AlexanderJaramillo DWG: C:\Users\AlexanderJaramillo\OneDrive – sp2inc.com\Projects\Xenia\Beaumont-10\Stormwater\Drainage\Drawings\Xenia-Pre-HM.dwg



LEGEND:

- FLOW PATH
- DMA BOUNDARY
- NODE No. / ELEVATION — DRAINAGE NODE No. & ELEVATION
- ID No. / ACRES — DRAINAGE AREA ID & ACREAGE
- FLOW DIRECTION

60' 0 60' 120' 180'

SCALE: 1" = 60'

PREPARED BY:
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BREA, CA 92821
PHONE: (714) 490-1500
"SERVING THE DEVELOPMENT COMMUNITY SINCE 1985"

XENIA APARTMENTS

PRELIMINARY DRAINAGE STUDY

POST-DEVELOPED HYDROLOGY KEY MAP

Plotted: Sep 19, 2022 - 12:30pm By: AlexanderJaramillo DWG: C:\Users\AlexanderJaramillo\OneDrive - sp2inc.com\Projects\Xenia\Beaumont-10\Stormwater\Drainage\Drawings\Xenia-DH10.dwg



LEGEND:

- FLOW PATH
- DMA BOUNDARY
- TRIBUTARY CENTROID

60' 0 60' 120' 180'

SCALE: 1" = 60'

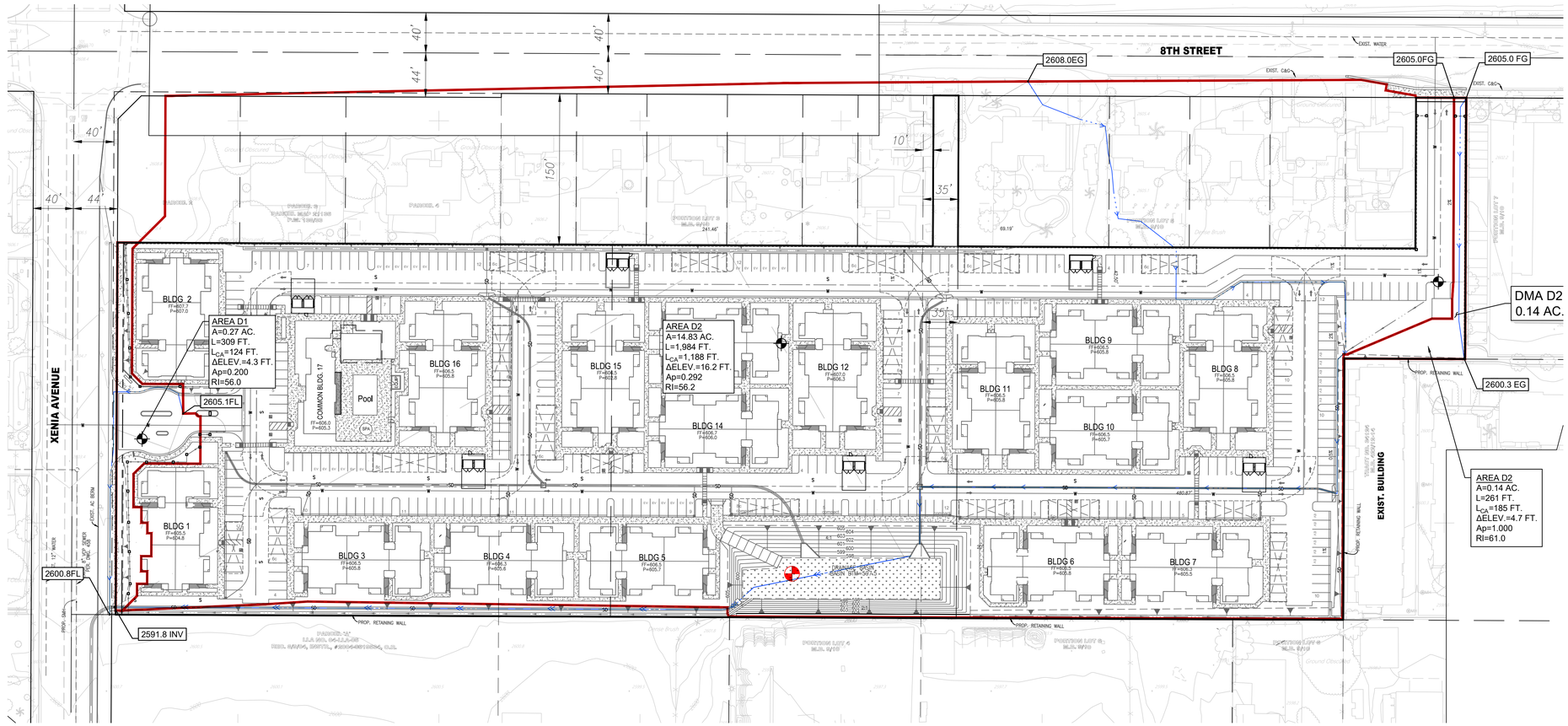
PREPARED BY:
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XENIA APARTMENTS

PRELIMINARY DRAINAGE STUDY

PRE-DEVELOPED UNIT HYDROGRAPH KEY MAP

Plotted: Sep 19, 2022 - 12:32pm By: AlexanderJaramillo DWG: C:\Users\AlexanderJaramillo\OneDrive - sp2inc.com\Projects\Xenia\Beaumont-10\Stormwater\Drainage\Drawings\Xenia-PUH.dwg



LEGEND:

- FLOW PATH
- DMA BOUNDARY
- TRIBUTARY CENTROID

60' 0 60' 120' 180'

SCALE: 1" = 60'

PREPARED BY:
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A LAND DEVELOPMENT SERVICES COMPANY
451 W. LAMBERT RD. STE 216
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XENIA APARTMENTS

PRELIMINARY DRAINAGE STUDY
POST-DEVELOPED UNIT HYDROGRAPH KEY MAP

Plotted: Sep 19, 2022 - 12:33am By: AlexanderJaramillo DWG: C:\Users\AlexanderJaramillo\OneDrive - sp2inc.com\Projects\Xenia\Beaumont-10\Stormwater\Drainage\Drawings\Xenia-DUH.dwg

Appendix L

Energy Conservation Analysis
RK Engineering Group, Inc.
March 27, 2023

March 27, 2023

Mr. Paul Onufer
BEAUMONT LAND PARTNERS, LLC.
556 South Fair Oaks Avenue, Suite 337
Pasadena, CA 91105

Subject: Xenia Multifamily Residential Project Energy Conservation Analysis, City of Beaumont

Dear Mr. Onufer:

1.0 Introduction

RK ENGINEERING GROUP, INC. (RK) is pleased to provide this energy conservation analysis for the proposed Xenia Multifamily Residential project (hereinafter referred to as "project"). The project site is located near the southeast corner of Xenia Avenue and Eighth Street, in the City of Beaumont, California.

The purpose of this analysis is to review the energy implications of the proposed project and provide recommendations to reduce wasteful, inefficient, and unnecessary consumption of energy during construction and operation. This analysis has been prepared within the context of the California Environmental Quality Act (CEQA, California Public Resources Code Sections 21000, et seq.).

CEQA Guidelines, Appendix F, Energy Conservation, describes the framework within which energy conservation should be analyzed. Conserving energy implies the wise and efficient use of energy through decreasing overall per capita energy consumption, decreasing reliance on fossil fuels (such as coal, natural gas, and oil), and increasing reliance on renewable energy sources.

2.0 Project Description

The project proposes to construct and operate 192 multifamily residential homes on an approximately 10.93-acre vacant site. The project location map is illustrated in Exhibit A, and the site plan used for this analysis, provided by SJA DESIGN GROUP, is illustrated in Exhibit B. Table 1 summarizes the proposed project land uses.

1401 dove street, ste. 540
newport beach, ca 92660
P (949) 474-0809
W rkengineer.com

Table 1
Land Use Summary

Land Use	CalEEMod Land Use Category	Quantity	Metric
Multifamily Residential – Low Rise	Apartments Low-Rise	192	Dwelling Units
Swimming Pool	Recreational Swimming Pool	4,462.0	Square Feet
Paved Surfaces (On-site Parking and Drive Aisles)	Parking Lot	163,504.8	Square Feet

Construction of the project is estimated to begin in the year 2023 and last approximately 18 months. Construction activities are expected to consist of site preparation, grading, building construction, paving, and architectural coating.

The project site is currently vacant and is not expected to require any demolition. The project will require the import of approximately 65,000 cubic yards of earthwork material during the grading phase of construction. The project is expected to be operational in year 2024.

3.0 Utility Providers

The project will be served by the following utility providers, as shown in Table 2.

Table 2
Utility Providers

Utility	Provider
Electricity	Southern California Edison
Natural Gas	Southern California Gas Company

4.0 Summary of CEQA Impacts

Table 3 provides a summary of the project's impact on Energy resources, per the impact criteria described in CEQA Guidelines, Appendix G.

Table 3
CEQA Energy Impact Criteria

Energy Impact Criteria	Potentially Significant	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?			X	
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?			X	

5.0 Project Energy Consumption

The three (3) main types of energy expected to be consumed by the project include electricity, natural gas, and petroleum products in the form of gasoline and diesel fuel.

The California Emissions Estimator Model Version 2020.4.4 (CalEEMod) was used to calculate energy usage from project construction and operational activities. The daily and annual CalEEMod calculation sheets for the project are provided in Appendices A and B, respectively.

5.1 Electricity Consumption

The project will use electricity for many different operational activities including, but not limited to, building heating and cooling, lighting, appliances, electronics, mechanical equipment, parking lot lighting, and electric vehicle charging. Indirect electricity usage will also be required to supply, distribute, and treat water and wastewater. Electricity will be provided to the site by Southern California Edison.

Temporary electricity usage for construction activities may include lighting, electric equipment and mobile office uses, however, CalEEMod does not calculate electricity usage during construction. Electricity usage during construction is expected to be short-term and relatively minor compared to the operational demand, and therefore electricity usage during construction is not counted in this analysis.

Table 4 shows the project's estimated operational electricity consumption in kilowatt-hours per year (kWh/year) and millions of Btu per year (MBtu/yr).

Table 4
Project Electricity Usage

Land Use/Activity	Electricity Usage[1]	
	(kWhr/yr)[2]	(MBtu/yr)[2]
Apartments Low Rise	800,630.00	2,731.75
Parking Lot	57,226.70	195.26
Recreational Swimming Pool	--	--
Water Supply and Treatment	271,116.65	925.05
Electric Vehicle Charging	462,398.00	1,577.70
Total	**1,591,371.35**	**5,429.76**

[1] CalEEMod default estimates.
[2] kWhr/yr = kilowatt-hours per year
MBtu/yr = millions of Btu per year

5.2 Natural Gas Consumption

The project will use natural gas for such things as building heating and cooling and gas water heaters. Natural gas is not expected to be used during construction in any significant quantities and is not included in the overall calculation of the project's natural gas consumption.

Table 5 shows the project's estimated operational natural gas consumption in millions of Btu per year.

Table 5
Project Natural Gas Consumption

Land Use/Activity	Gas Usage (MBtu/yr)[1]
Apartments Low Rise	2,904.17
Parking Lot	-
Recreational Swimming Pool	-
Total	**2,904.17**

1 MBtu/yr = millions of Btu per year

5.3 Petroleum Consumption

The project's energy consumption from petroleum products is primarily associated with transportation-related activities. This includes gasoline and diesel fuel usage for auto and truck trips during construction and operation and off-road equipment usage during construction.

The California Emission Factors 2017 model (EMFAC2017) is used to estimate petroleum energy consumption. The CalEEMod option to apply adjustments factors to account for the SAFE Vehicle Rule has been selected. No other adjustments have been made to the default emission factors.

Petroleum Consumption – Construction

Construction of the project is estimated to last approximately 18 months and consist of site preparation, grading, building construction, paving, and architectural coating phases. Construction activities will consume energy in the form of motor vehicle fuel (gasoline and diesel) for off-road construction equipment and on-road vehicle trips. Vehicle trips include workers, vendors, and haulers traveling to and from the job site.

Table 6 shows the project's energy consumption for all off-road equipment during construction. For purposes of this analysis, all off-road equipment is assumed to run on diesel fuel. Table 7 shows the project's energy consumption from on-road vehicle trips during construction.

Table 6
Construction Off-Road Equipment Energy Consumption

Phase[1]	Phase Duration (Days)[1]	Equipment[1]	Amount[1]	Hours/ Day[1]	Horspower (HP)[1]	Load Factor[1]	HP-hrs[2]	Fuel Consumption Rate[3] (hp-hr/gal)	Diesel Fuel Consumption (gal.)	Diesel Fuel Consumption by Phase (gal.)	MBtu[4]
Site Preparation	10	Rubber Tired Dozers	3	8	247	0.40	23,712.0	18.5	1,281.7	1,902.5	261.371
		Tractors/Loaders/Backhoes	4	8	97	0.37	11,484.8		620.8		
Grading	30	Excavator	2	8	158	0.38	28,819.2		1,557.8	8,739.2	1,200.602
		Graders	1	8	187	0.41	7,360.3		397.9		
		Rubber Tired Dozers	1	8	247	0.40	23,712.0		1,281.7		
		Scrapers	2	8	367	0.48	84,556.8		4,570.6		
		Tractors/Loaders/Backhoes	2	8	97	0.37	17,227.2		931.2		
Building Construction	300	Cranes	1	7	231	0.29	140,679.0		7,604.3	37,503.2	5,152.233
		Forklifts	3	8	89	0.20	128,160.0		6,927.6		
		Generator Sets	1	8	84	0.74	149,184.0		8,064.0		
		Tractors/Loaders/Backhoes	3	7	97	0.37	226,107.0		12,222.0		
		Welders	1	8	46	0.45	49,680.0		2,685.4		
Paving	20	Pavers	2	8	130	0.42	17,472.0		944.4	2,292.2	314.910
		Paving Equipment	2	8	132	0.36	15,206.4		822.0		
		Rollers	2	8	80	0.38	9,728.0		525.8		
Architectural Coating	20	Air Compressors	1	6	78	0.48	4,492.8		242.9	242.9	33.364
								Total Energy Requirements		**50,680.1**	**6,962.480**

[1] Source: CalEEMod Defaults (CalEEMod v.2020.4.0)

[2] HP-hrs = Horsepower Hours.

[3] Source: Carl Moyer Program Guidelines. 2017 Revisions. Table D-21. https://www.arb.ca.gov/msprog/moyer/guidelines/current.htm

[4] Mbtu = Millions of Btu; assuming 1 gallon of diesel fuel = 137,381 Btu.

Table 7
Construction On-Road Trips Energy Consumption

Construction Phase[1]	Phase Duration (Days)[1]	Trips /Day[1]	Trip Length[1]	Phase VMT	Vehicle Class[1]	Vehicle Mix[1]	Average Fuel Economy (MPG)[2]	Gasoline			Diesel			Total MBtu[3]
								Fuel Split[2]	Fuel Consumption by Veh. Class (gal.)	Fuel Consumption by Phase (gal.)	Fuel Split[2]	Fuel Consumption by Veh. Class (gal.)	Fuel Consumption by Phase	
Worker Trips														
Site Preparation	10	18	14.7	2,646	LDA	0.50	32.61	0.9936	40.31	89.02	0.0064	0.26	0.41	10.78
					LDT1	0.25	27.78	0.9997	23.80		0.0003	0.01		
					LDT2	0.25	26.41	0.9944	24.90		0.0056	0.14		
Grading	30	20	14.7	8,820	LDA	0.50	32.61	0.9936	134.37	296.73	0.0064	0.87	1.36	35.92
					LDT1	0.25	27.78	0.9997	79.35		0.0003	0.03		
					LDT2	0.25	26.41	0.9944	83.02		0.0056	0.47		
Building Construction	300	209	14.7	921,690	LDA	0.50	32.61	0.9936	14,041.51	31,008.61	0.0064	90.57	142.15	3,753.86
					LDT1	0.25	27.78	0.9997	8,291.93		0.0003	2.75		
					LDT2	0.25	26.41	0.9944	8,675.17		0.0056	48.83		
Paving	20	15	14.7	4,410	LDA	0.50	32.61	0.9936	67.18	148.37	0.0064	0.43	0.68	17.96
					LDT1	0.25	27.78	0.9997	39.67		0.0003	0.01		
					LDT2	0.25	26.41	0.9944	41.51		0.0056	0.23		
Architectural Coating	20	42	14.7	12,348	LDA	0.50	32.61	0.9936	188.12	415.43	0.0064	1.21	1.90	50.29
					LDT1	0.25	27.78	0.9997	111.09		0.0003	0.04		
					LDT2	0.25	26.41	0.9944	116.22		0.0056	0.65		
Sub-Total Worker Trips Energy Consumption									Gasoline (gal.)	31,958.16		Diesel (gal.)	146.50	3,868.82
Vendor Trips														
Building Construction	300	48	6.9	99,360	MHDT	0.50	9.73	0.2629	1,341.80	1,348.82	0.7371	3,762.38	10,620.11	1,621.44
					HHDT	0.50	7.24	0.0010	7.02		0.9990	6,857.73		
Hauling Trips														
Grading	30	8,125	20.0	4,875,000	HHDT	1.00	7.24	0.0010	689.18	689.18	0.9990	672,935.95	672,935.95	92,531.61
Total On-Road Construction Trips Energy Consumption									**Gasoline (gal.)**	**33,996.16**		**Diesel (gal.)**	**683,702.56**	**98,021.87**

[1] Source: CalEEMod Defaults (CalEEMod v.2020.4.0)

[2] Source: EMFAC2017 Web Database. https://www.arb.ca.gov/emfac/2017/. (See Appendix C for more details.)

[3] Mbtu = Millions of Btu; assuming 1 gallon of gasoline fuel = 120,429 Btu and 1 gallon of diesel fuel = 137,381 Btu

Petroleum Consumption – Operation

The project is expected to consume energy from auto and truck trips generated by the proposed land uses. Operational vehicle trips are associated with workers, residents, and vendors/non-workers (i.e., delivery, service, maintenance vehicles, etc.) traveling to and from the site. EMFAC2017 vehicle fuel consumption data is provided in Appendix C.

Table 8 shows the project's petroleum energy consumption for all operational trips generated by the project on an annual basis.

Table 8
Operational Trips Energy Consumption - Annual

Vehicle Class	Vehicle Mix	Average Fuel Economy (MPG)	Annual VMT[1]	Gasoline		Diesel		MBtu
				Fuel Split	Fuel Consumption (gal.)	Fuel Split	Fuel Consumption (gal.)	
LDA	54.88%	32.61		0.9936	79,954.51	0.0064	515.70	9,699.69
LDT1	5.75%	27.78		0.9997	9,891.05	0.0003	3.29	1,191.62
LDT2	17.71%	26.41		0.9944	31,889.29	0.0056	179.48	3,865.05
MDV	14.47%	21.44		0.9804	31,630.32	0.0196	631.23	3,895.93
LHD1	2.73%	14.06		0.7108	6,595.12	0.2892	2,683.41	1,162.89
LHD2	0.33%	14.44		0.5241	566.15	0.4759	514.01	138.80
MHD	0.51%	9.73	4,781,982	0.2629	652.68	0.7371	1,830.10	330.02
HHD	0.83%	7.24		0.0010	5.64	0.9990	5,505.00	756.96
OBUS	0.03%	6.84		0.5457	104.86	0.4543	87.31	24.62
UBUS	0.01%	5.27		0.9878	125.86	0.0122	1.55	15.37
MCY	2.47%	36.21		1.0000	3,259.27	0.0000	0.00	392.51
SBUS	0.05%	8.26		0.3158	89.74	0.6842	194.41	37.52
MH	0.24%	6.17		0.8411	1,590.47	0.1589	300.36	232.80
Total Operational Trips Energy Usage				Gasoline Consumption (gal.)	166,354.96	Diesel Consumption (gal.)	12,445.85	21,743.78

[1] CalEEMod Defaults.

6.0 Summary of Project Energy Consumption

Table 9 provides a summary of the project's annual operational energy consumption.

Table 9
Total Operational Energy Consumption (MBtu/yr)[1]

Activity	Annual Energy Consumption
Electricity	5,429.76
Natural Gas	2,904.17
Petroleum	21,743.78
Total Annual Energy Consumption	**30,077.71**

7.0 Energy Impact Analysis

This qualitative analysis has been prepared within the context of the CEQA Guidelines, Appendix F, Energy Conservation, and Appendix G, Environmental Checklist Form. According to CEQA, the goal of conserving energy implies the wise and efficient use of energy through decreasing overall per capita energy consumption, decreasing reliance on fossil fuels (such as coal, natural gas, and oil), and increasing reliance on renewable energy sources.

A significant environmental impact would result if the project would;

a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation, or;

b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency.

7.1 Energy Impact - A

Would the project result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?

The project will implement the mandatory requirements of California's Building Efficiency Standards (Title 24, Part 6) to reduce energy consumption. California's building standards are some of the strictest in the nation and the project's compliance with the Building Code will ensure that wasteful, inefficient, or unnecessary consumption of energy is minimized. The California Building Code is designed to reduce the amount of energy needed to heat or cool a building, reduce energy usage for lighting and appliances and promote usage of energy from renewable sources.

In particular, the project will provide solar installations to satisfy the prescribed Energy Design Ratings from the Energy Code. Thus, the project will significantly reduce its reliance on fossil fuels for building energy.

Recent court rulings indicate that when determining if a project would have a potentially significant impact to energy conservation, the analysis should consider whether any renewable energy features could be incorporated into the project[1]. By including on-site renewable energy sources as part of the project's design, the proposed project is compatible with recent court rulings regarding the use of renewable energy sources and ensures that wasteful, inefficient, or unnecessary consumption of energy is minimized.

Therefore, the project impact is considered less than significant.

7.2 Energy Impact - B

Would the project conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

The project is not expected to conflict with or obstruct a state or local plan for renewable energy or energy efficiency. The project will purchase electricity through Southern California Edison which is subject to the requirements of California Senate Bill 100 (SB 100).

[1] *League to Save Lake Tahoe Mountain Area Preservation Foundation, et al. v. County of Placer, et al.*

SB 100 is the most stringent and current energy legislation in California; requiring that renewable energy resources and zero-carbon resources supply 100% of retail sales of electricity to California end-use customers and 100% of electricity procured to serve all state agencies by December 31, 2045.[2]

The project will also comply with the mandatory requirements of California's Green Building and Building Energy Efficiency standards that promote renewable energy and energy efficiency. In addition, the project will include solar panels for each building. The final location and orientation of the solar panels will be identified at Site Plan Review.

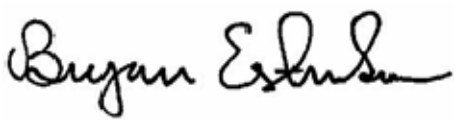
Hence, the project will not conflict with or obstruct a state or local plan for renewable energy or energy efficiency and **the impact is considered less than significant.**

8.0 Conclusion

RK ENGINEERING GROUP, INC. has completed this energy conservation analysis for the proposed Xenia Multifamily Residential project. Based upon this review, the proposed project's impact to energy resources is considered less than significant.

If you have any questions regarding this study, or would like further review, please do not hesitate to contact us at (949) 474-0809 or be@rkengineer.com.

Sincerely,
RK ENGINEERING GROUP, INC.



Bryan Estrada, AICP, PTP
Principal



Becca Morrison
Environmental Specialist

Attachments:

[2] SB-100 California Renewables Portfolio Standard Program.
http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201720180SB100

Exhibits

Exhibit A

Location Map

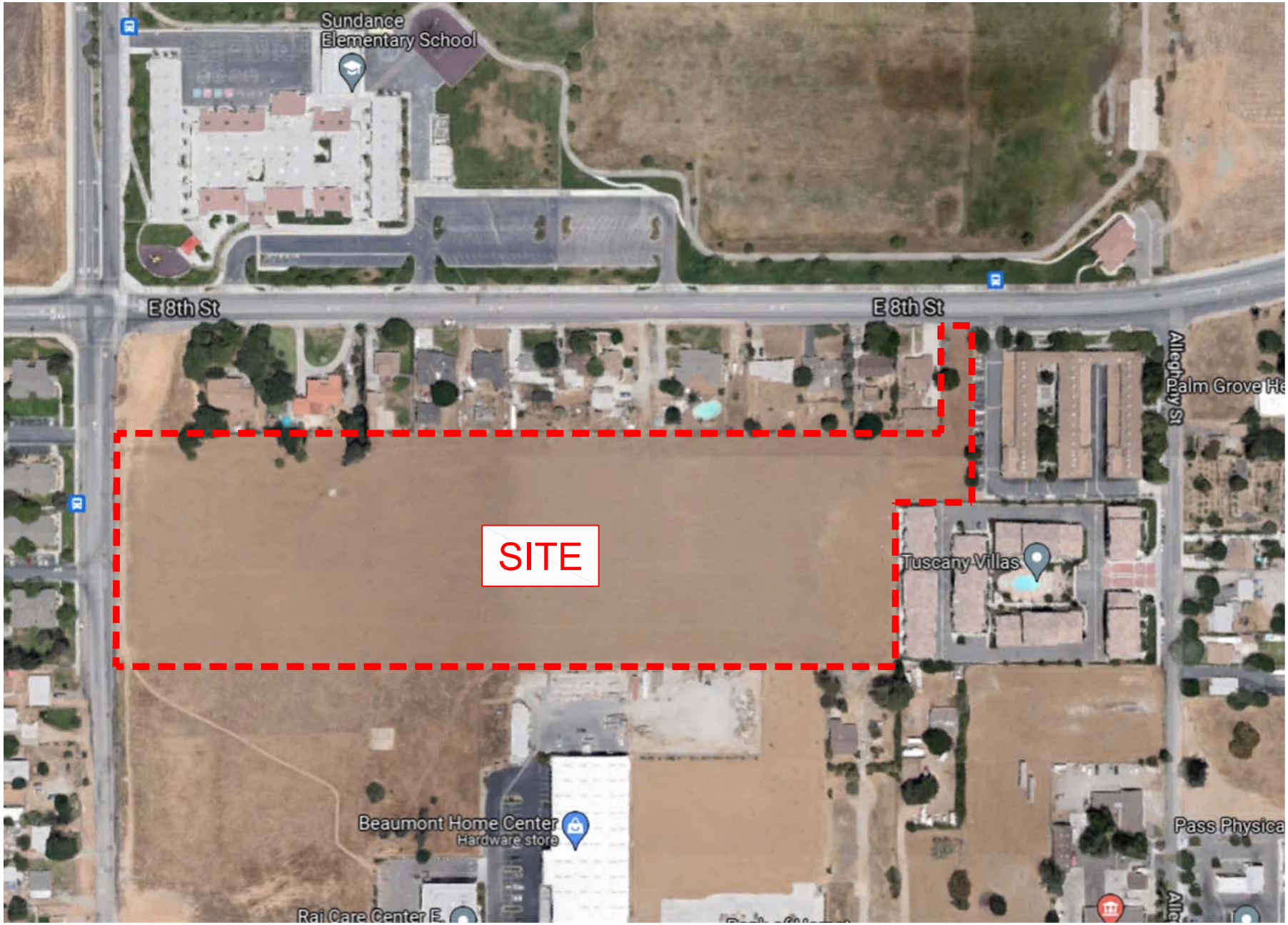
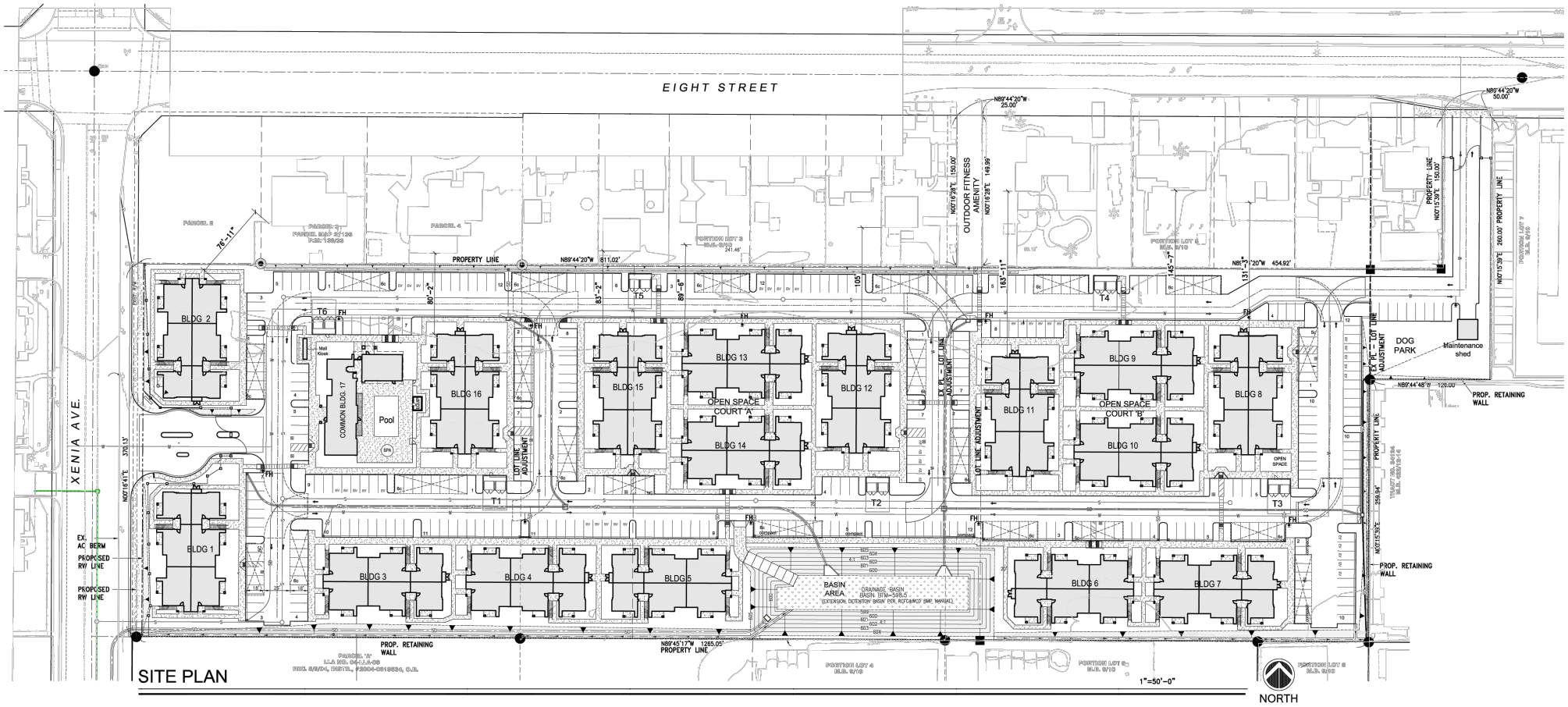


Exhibit B

Site Plan



N

Appendices

Appendix A

Unmitigated Daily Emissions Calculations Output
(CalEEMod)

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Xenia and Eight Street Multifamily Residential Project

Riverside-South Coast County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	163.50	1000sqft	3.75	163,504.80	0
Apartments Low Rise	192.00	Dwelling Unit	7.18	192,000.00	549
Recreational Swimming Pool	4.46	1000sqft	0.10	4,462.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.4	**Precipitation Freq (Days)**	28
Climate Zone	10			**Operational Year**	2024
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	390.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - The project is proposing to build 192 multifamily apartment homes and a swimming pool, and pave approximately 163,504.8 Square Feet as a part of on-site street improvement and parking lot.

Construction Phase - The site is currently vacant and requires no demolition.

Grading - The project is expected to import approximately 65,000 cubic yard of earthwork materials

Woodstoves - Per SCAQMD Rule 445, no wood-burning devices will be allowed. Project will not include natural gas hearths.

Construction Off-road Equipment Mitigation - Project will be required to comply with SCAQMD Rule 403 regarding fugitive dust control. Construction equipment will have Tier 4 "clean diesel" engines.

Fleet Mix - Operational fleet mix adjusted to equal 2% trucks with GVWR > 10,000 lbs.

Vehicle Trips - The project swimming pool is not expected to generate any additional trips.

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadMoistureContent	0	12
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	9.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

tblFireplaces	NumberGas	163.20	0.00
tblFireplaces	NumberNoFireplace	19.20	192.00
tblFireplaces	NumberWood	9.60	0.00
tblFleetMix	HHD	0.02	8.3400e-003
tblFleetMix	LDA	0.54	0.55
tblFleetMix	LDT1	0.06	0.06
tblFleetMix	LDT2	0.17	0.18
tblFleetMix	LHD1	0.03	0.03
tblFleetMix	LHD2	7.1910e-003	3.2610e-003
tblFleetMix	MCY	0.02	0.02
tblFleetMix	MDV	0.14	0.14
tblFleetMix	MH	5.1890e-003	2.4390e-003
tblFleetMix	MHD	0.01	5.0530e-003
tblFleetMix	OBUS	6.1100e-004	2.7500e-004
tblFleetMix	SBUS	1.0970e-003	4.9100e-004
tblFleetMix	UBUS	3.0900e-004	1.4100e-004
tblGrading	MaterialImported	0.00	65,000.00
tblLandUse	LandUseSquareFeet	163,505.00	163,504.80
tblLandUse	LandUseSquareFeet	4,460.00	4,462.00
tblLandUse	LotAcreage	12.00	7.18
tblVehicleTrips	ST_TR	9.10	0.00
tblVehicleTrips	SU_TR	13.60	0.00
tblVehicleTrips	WD_TR	28.82	0.00
tblWoodstoves	NumberCatalytic	9.60	0.00
tblWoodstoves	NumberNoncatalytic	9.60	0.00

2.0 Emissions Summary

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2023	3.9875	61.6072	36.2223	0.2129	19.8582	1.7520	21.1252	10.1558	1.6238	11.3214	0.0000	22,105.1014	22,105.1014	2.1742	2.5089	22,907.1159
2024	2.2367	15.4326	23.9845	0.0551	2.6436	0.6374	3.2809	0.7081	0.5995	1.3076	0.0000	5,483.5179	5,483.5179	0.7171	0.1747	5,552.0225
2025	62.6477	8.6087	15.0582	0.0242	0.4695	0.4192	0.5869	0.1245	0.3857	0.4302	0.0000	2,350.4254	2,350.4254	0.7165	8.5400e-003	2,369.2476
Maximum	**62.6477**	**61.6072**	**36.2223**	**0.2129**	**19.8582**	**1.7520**	**21.1252**	**10.1558**	**1.6238**	**11.3214**	**0.0000**	**22,105.1014**	**22,105.1014**	**2.1742**	**2.5089**	**22,907.1159**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2023	1.4273	30.3917	41.1703	0.2129	8.5890	0.4290	9.0180	3.9176	0.4148	3.9805	0.0000	22,105.1014	22,105.1014	2.1742	2.5089	22,907.1159
2024	1.0930	4.2235	25.2779	0.0551	2.6436	0.0648	2.7084	0.7081	0.0634	0.7715	0.0000	5,483.5179	5,483.5179	0.7171	0.1747	5,552.0225
2025	62.5065	1.2424	17.7759	0.0242	0.4695	0.0381	0.4754	0.1245	0.0381	0.1303	0.0000	2,350.4254	2,350.4254	0.7165	8.5400e-003	2,369.2476
Maximum	**62.5065**	**30.3917**	**41.1703**	**0.2129**	**8.5890**	**0.4290**	**9.0180**	**3.9176**	**0.4148**	**3.9805**	**0.0000**	**22,105.1014**	**22,105.1014**	**2.1742**	**2.5089**	**22,907.1159**

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**5.58**	**58.13**	**-11.90**	**0.00**	**49.06**	**81.06**	**51.18**	**56.77**	**80.21**	**62.61**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	4.6788	0.1826	15.8507	8.4000e-004		0.0878	0.0878		0.0878	0.0878	0.0000	28.5588	28.5588	0.0275	0.0000	29.2454
Energy	0.0858	0.7333	0.3120	4.6800e-003		0.0593	0.0593		0.0593	0.0593		936.0757	936.0757	0.0179	0.0172	941.6383
Mobile	4.9420	4.9521	48.4997	0.1048	11.2162	0.0692	11.2854	2.9833	0.0646	3.0479		10,830.5682	10,830.5682	0.5263	0.4084	10,965.4163
Total	**9.7066**	**5.8679**	**64.6625**	**0.1104**	**11.2162**	**0.2163**	**11.4325**	**2.9833**	**0.2117**	**3.1950**	**0.0000**	**11,795.2027**	**11,795.2027**	**0.5717**	**0.4255**	**11,936.3000**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	4.6788	0.1826	15.8507	8.4000e-004		0.0878	0.0878		0.0878	0.0878	0.0000	28.5588	28.5588	0.0275	0.0000	29.2454
Energy	0.0858	0.7333	0.3120	4.6800e-003		0.0593	0.0593		0.0593	0.0593		936.0757	936.0757	0.0179	0.0172	941.6383
Mobile	4.9420	4.9521	48.4997	0.1048	11.2162	0.0692	11.2854	2.9833	0.0646	3.0479		10,830.5682	10,830.5682	0.5263	0.4084	10,965.4163
Total	**9.7066**	**5.8679**	**64.6625**	**0.1104**	**11.2162**	**0.2163**	**11.4325**	**2.9833**	**0.2117**	**3.1950**	**0.0000**	**11,795.2027**	**11,795.2027**	**0.5717**	**0.4255**	**11,936.3000**

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	9/1/2023	9/14/2023	5	10	
2	Grading	Grading	9/15/2023	10/26/2023	5	30	
3	Building Construction	Building Construction	10/27/2023	12/19/2024	5	300	
4	Paving	Paving	12/20/2024	1/16/2025	5	20	
5	Architectural Coating	Architectural Coating	1/17/2025	2/13/2025	5	20	

Acres of Grading (Site Preparation Phase): 15

Acres of Grading (Grading Phase): 90

Acres of Paving: 3.75

Residential Indoor: 388,800; Residential Outdoor: 129,600; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 9,810 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	8,125.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	209.00	48.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	42.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Use Soil Stabilizer

Replace Ground Cover

Water Exposed Area

Water Unpaved Roads

Reduce Vehicle Speed on Unpaved Roads

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.2 Site Preparation - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					19.6570	0.0000	19.6570	10.1025	0.0000	10.1025			0.0000			0.0000
Off-Road	2.6595	27.5242	18.2443	0.0381		1.2660	1.2660		1.1647	1.1647		3,687.3081	3,687.3081	1.1926		3,717.1219
Total	**2.6595**	**27.5242**	**18.2443**	**0.0381**	**19.6570**	**1.2660**	**20.9230**	**10.1025**	**1.1647**	**11.2672**		**3,687.3081**	**3,687.3081**	**1.1926**		**3,717.1219**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0658	0.0406	0.6603	1.7700e-003	0.2012	9.4000e-004	0.2021	0.0534	8.7000e-004	0.0542		181.1165	181.1165	4.1400e-003	4.2200e-003	182.4783
Total	**0.0658**	**0.0406**	**0.6603**	**1.7700e-003**	**0.2012**	**9.4000e-004**	**0.2021**	**0.0534**	**8.7000e-004**	**0.0542**		**181.1165**	**181.1165**	**4.1400e-003**	**4.2200e-003**	**182.4783**

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.2 Site Preparation - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					7.5188	0.0000	7.5188	3.8642	0.0000	3.8642			0.0000			0.0000
Off-Road	0.4656	2.0175	20.8690	0.0381		0.0621	0.0621		0.0621	0.0621	0.0000	3,687.3081	3,687.3081	1.1926		3,717.1219
Total	**0.4656**	**2.0175**	**20.8690**	**0.0381**	**7.5188**	**0.0621**	**7.5809**	**3.8642**	**0.0621**	**3.9263**	**0.0000**	**3,687.3081**	**3,687.3081**	**1.1926**		**3,717.1219**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0658	0.0406	0.6603	1.7700e-003	0.2012	9.4000e-004	0.2021	0.0534	8.7000e-004	0.0542		181.1165	181.1165	4.1400e-003	4.2200e-003	182.4783
Total	**0.0658**	**0.0406**	**0.6603**	**1.7700e-003**	**0.2012**	**9.4000e-004**	**0.2021**	**0.0534**	**8.7000e-004**	**0.0542**		**181.1165**	**181.1165**	**4.1400e-003**	**4.2200e-003**	**182.4783**

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.3 Grading - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.4780	0.0000	9.4780	3.6953	0.0000	3.6953			0.0000			0.0000
Off-Road	3.3217	34.5156	28.0512	0.0621		1.4245	1.4245		1.3105	1.3105		6,011.4777	6,011.4777	1.9442		6,060.0836
Total	**3.3217**	**34.5156**	**28.0512**	**0.0621**	**9.4780**	**1.4245**	**10.9025**	**3.6953**	**1.3105**	**5.0058**		**6,011.4777**	**6,011.4777**	**1.9442**		**6,060.0836**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.5927	27.0465	7.4374	0.1488	4.7401	0.3264	5.0665	1.2995	0.3123	1.6118		15,892.3831	15,892.3831	0.2254	2.5042	16,644.2787
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0731	0.0452	0.7337	1.9700e-003	0.2236	1.0500e-003	0.2246	0.0593	9.7000e-004	0.0603		201.2406	201.2406	4.5900e-003	4.6900e-003	202.7537
Total	**0.6658**	**27.0916**	**8.1711**	**0.1508**	**4.9636**	**0.3275**	**5.2911**	**1.3588**	**0.3133**	**1.6721**		**16,093.6237**	**16,093.6237**	**0.2300**	**2.5089**	**16,847.0324**

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.3 Grading - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					3.6253	0.0000	3.6253	1.4135	0.0000	1.4135			0.0000			0.0000
Off-Road	0.7616	3.3000	32.9991	0.0621		0.1015	0.1015		0.1015	0.1015	0.0000	6,011.4777	6,011.4777	1.9442		6,060.0836
Total	**0.7616**	**3.3000**	**32.9991**	**0.0621**	**3.6253**	**0.1015**	**3.7269**	**1.4135**	**0.1015**	**1.5150**	**0.0000**	**6,011.4777**	**6,011.4777**	**1.9442**		**6,060.0836**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.5927	27.0465	7.4374	0.1488	4.7401	0.3264	5.0665	1.2995	0.3123	1.6118		15,892.3831	15,892.3831	0.2254	2.5042	16,644.2787
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0731	0.0452	0.7337	1.9700e-003	0.2236	1.0500e-003	0.2246	0.0593	9.7000e-004	0.0603		201.2406	201.2406	4.5900e-003	4.6900e-003	202.7537
Total	**0.6658**	**27.0916**	**8.1711**	**0.1508**	**4.9636**	**0.3275**	**5.2911**	**1.3588**	**0.3133**	**1.6721**		**16,093.6237**	**16,093.6237**	**0.2300**	**2.5089**	**16,847.0324**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.4 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5728	14.3849	16.2440	0.0269		0.6997	0.6997		0.6584	0.6584		2,555.2099	2,555.2099	0.6079		2,570.4061
Total	**1.5728**	**14.3849**	**16.2440**	**0.0269**		**0.6997**	**0.6997**		**0.6584**	**0.6584**		**2,555.2099**	**2,555.2099**	**0.6079**		**2,570.4061**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0541	1.5682	0.6457	8.3900e-003	0.3074	0.0137	0.3211	0.0885	0.0131	0.1016		889.3008	889.3008	9.0700e-003	0.1314	928.6883
Worker	0.7636	0.4718	7.6673	0.0206	2.3361	0.0110	2.3471	0.6196	0.0101	0.6296		2,102.9643	2,102.9643	0.0480	0.0490	2,118.7760
Total	**0.8177**	**2.0400**	**8.3130**	**0.0289**	**2.6436**	**0.0246**	**2.6682**	**0.7081**	**0.0232**	**0.7312**		**2,992.2651**	**2,992.2651**	**0.0571**	**0.1804**	**3,047.4643**

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.4 Building Construction - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.3278	2.2347	17.4603	0.0269		0.0408	0.0408		0.0408	0.0408	0.0000	2,555.2099	2,555.2099	0.6079		2,570.4061
Total	**0.3278**	**2.2347**	**17.4603**	**0.0269**		**0.0408**	**0.0408**		**0.0408**	**0.0408**	**0.0000**	**2,555.2099**	**2,555.2099**	**0.6079**		**2,570.4061**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0541	1.5682	0.6457	8.3900e-003	0.3074	0.0137	0.3211	0.0885	0.0131	0.1016		889.3008	889.3008	9.0700e-003	0.1314	928.6883
Worker	0.7636	0.4718	7.6673	0.0206	2.3361	0.0110	2.3471	0.6196	0.0101	0.6296		2,102.9643	2,102.9643	0.0480	0.0490	2,118.7760
Total	**0.8177**	**2.0400**	**8.3130**	**0.0289**	**2.6436**	**0.0246**	**2.6682**	**0.7081**	**0.0232**	**0.7312**		**2,992.2651**	**2,992.2651**	**0.0571**	**0.1804**	**3,047.4643**

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.4 Building Construction - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.4716	13.4438	16.1668	0.0270		0.6133	0.6133		0.5769	0.5769		2,555.6989	2,555.6989	0.6044		2,570.8077
Total	**1.4716**	**13.4438**	**16.1668**	**0.0270**		**0.6133**	**0.6133**		**0.5769**	**0.5769**		**2,555.6989**	**2,555.6989**	**0.6044**		**2,570.8077**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0533	1.5683	0.6383	8.2500e-003	0.3074	0.0136	0.3210	0.0885	0.0130	0.1015		875.5948	875.5948	9.3900e-003	0.1292	914.3286
Worker	0.7119	0.4205	7.1794	0.0199	2.3361	0.0105	2.3466	0.6196	9.6400e-003	0.6292		2,052.2242	2,052.2242	0.0435	0.0456	2,066.8862
Total	**0.7651**	**1.9888**	**7.8177**	**0.0281**	**2.6436**	**0.0240**	**2.6676**	**0.7081**	**0.0226**	**0.7307**		**2,927.8190**	**2,927.8190**	**0.0529**	**0.1747**	**2,981.2148**

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.4 Building Construction - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.3278	2.2347	17.4603	0.0270		0.0408	0.0408		0.0408	0.0408	0.0000	2,555.6989	2,555.6989	0.6044		2,570.8077
Total	**0.3278**	**2.2347**	**17.4603**	**0.0270**		**0.0408**	**0.0408**		**0.0408**	**0.0408**	**0.0000**	**2,555.6989**	**2,555.6989**	**0.6044**		**2,570.8077**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0533	1.5683	0.6383	8.2500e-003	0.3074	0.0136	0.3210	0.0885	0.0130	0.1015		875.5948	875.5948	9.3900e-003	0.1292	914.3286
Worker	0.7119	0.4205	7.1794	0.0199	2.3361	0.0105	2.3466	0.6196	9.6400e-003	0.6292		2,052.2242	2,052.2242	0.0435	0.0456	2,066.8862
Total	**0.7651**	**1.9888**	**7.8177**	**0.0281**	**2.6436**	**0.0240**	**2.6676**	**0.7081**	**0.0226**	**0.7307**		**2,927.8190**	**2,927.8190**	**0.0529**	**0.1747**	**2,981.2148**

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Paving - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9882	9.5246	14.6258	0.0228		0.4685	0.4685		0.4310	0.4310		2,207.5472	2,207.5472	0.7140		2,225.3963
Paving	0.4913					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.4794**	**9.5246**	**14.6258**	**0.0228**		**0.4685**	**0.4685**		**0.4310**	**0.4310**		**2,207.5472**	**2,207.5472**	**0.7140**		**2,225.3963**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0511	0.0302	0.5153	1.4300e-003	0.1677	7.5000e-004	0.1684	0.0445	6.9000e-004	0.0452		147.2888	147.2888	3.1200e-003	3.2700e-003	148.3411
Total	**0.0511**	**0.0302**	**0.5153**	**1.4300e-003**	**0.1677**	**7.5000e-004**	**0.1684**	**0.0445**	**6.9000e-004**	**0.0452**		**147.2888**	**147.2888**	**3.1200e-003**	**3.2700e-003**	**148.3411**

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Paving - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.2805	1.2154	17.2957	0.0228		0.0374	0.0374		0.0374	0.0374	0.0000	2,207.5472	2,207.5472	0.7140		2,225.3963
Paving	0.4913					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.7717**	**1.2154**	**17.2957**	**0.0228**		**0.0374**	**0.0374**		**0.0374**	**0.0374**	**0.0000**	**2,207.5472**	**2,207.5472**	**0.7140**		**2,225.3963**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0511	0.0302	0.5153	1.4300e-003	0.1677	7.5000e-004	0.1684	0.0445	6.9000e-004	0.0452		147.2888	147.2888	3.1200e-003	3.2700e-003	148.3411
Total	**0.0511**	**0.0302**	**0.5153**	**1.4300e-003**	**0.1677**	**7.5000e-004**	**0.1684**	**0.0445**	**6.9000e-004**	**0.0452**		**147.2888**	**147.2888**	**3.1200e-003**	**3.2700e-003**	**148.3411**

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Paving - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9152	8.5816	14.5780	0.0228		0.4185	0.4185		0.3850	0.3850		2,206.7452	2,206.7452	0.7137		2,224.5878
Paving	0.4913					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.4064**	**8.5816**	**14.5780**	**0.0228**		**0.4185**	**0.4185**		**0.3850**	**0.3850**		**2,206.7452**	**2,206.7452**	**0.7137**		**2,224.5878**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0478	0.0271	0.4802	1.3800e-003	0.1677	7.1000e-004	0.1684	0.0445	6.6000e-004	0.0451		143.6803	143.6803	2.8100e-003	3.0500e-003	144.6598
Total	**0.0478**	**0.0271**	**0.4802**	**1.3800e-003**	**0.1677**	**7.1000e-004**	**0.1684**	**0.0445**	**6.6000e-004**	**0.0451**		**143.6803**	**143.6803**	**2.8100e-003**	**3.0500e-003**	**144.6598**

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Paving - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.2805	1.2154	17.2957	0.0228		0.0374	0.0374		0.0374	0.0374	0.0000	2,206.7452	2,206.7452	0.7137		2,224.5878
Paving	0.4913					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.7717**	**1.2154**	**17.2957**	**0.0228**		**0.0374**	**0.0374**		**0.0374**	**0.0374**	**0.0000**	**2,206.7452**	**2,206.7452**	**0.7137**		**2,224.5878**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0478	0.0271	0.4802	1.3800e-003	0.1677	7.1000e-004	0.1684	0.0445	6.6000e-004	0.0451		143.6803	143.6803	2.8100e-003	3.0500e-003	144.6598
Total	**0.0478**	**0.0271**	**0.4802**	**1.3800e-003**	**0.1677**	**7.1000e-004**	**0.1684**	**0.0445**	**6.6000e-004**	**0.0451**		**143.6803**	**143.6803**	**2.8100e-003**	**3.0500e-003**	**144.6598**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.6 Architectural Coating - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	62.3431					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1709	1.1455	1.8091	2.9700e-003		0.0515	0.0515		0.0515	0.0515		281.4481	281.4481	0.0154		281.8319
Total	**62.5139**	**1.1455**	**1.8091**	**2.9700e-003**		**0.0515**	**0.0515**		**0.0515**	**0.0515**		**281.4481**	**281.4481**	**0.0154**		**281.8319**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1337	0.0758	1.3445	3.8600e-003	0.4695	2.0000e-003	0.4715	0.1245	1.8400e-003	0.1264		402.3048	402.3048	7.8800e-003	8.5400e-003	405.0474
Total	**0.1337**	**0.0758**	**1.3445**	**3.8600e-003**	**0.4695**	**2.0000e-003**	**0.4715**	**0.1245**	**1.8400e-003**	**0.1264**		**402.3048**	**402.3048**	**7.8800e-003**	**8.5400e-003**	**405.0474**

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.6 Architectural Coating - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	62.3431					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0297	0.1288	1.8324	2.9700e-003		3.9600e-003	3.9600e-003		3.9600e-003	3.9600e-003	0.0000	281.4481	281.4481	0.0154		281.8319
Total	**62.3728**	**0.1288**	**1.8324**	**2.9700e-003**		**3.9600e-003**	**3.9600e-003**		**3.9600e-003**	**3.9600e-003**	**0.0000**	**281.4481**	**281.4481**	**0.0154**		**281.8319**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1337	0.0758	1.3445	3.8600e-003	0.4695	2.0000e-003	0.4715	0.1245	1.8400e-003	0.1264		402.3048	402.3048	7.8800e-003	8.5400e-003	405.0474
Total	**0.1337**	**0.0758**	**1.3445**	**3.8600e-003**	**0.4695**	**2.0000e-003**	**0.4715**	**0.1245**	**1.8400e-003**	**0.1264**		**402.3048**	**402.3048**	**7.8800e-003**	**8.5400e-003**	**405.0474**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	4.9420	4.9521	48.4997	0.1048	11.2162	0.0692	11.2854	2.9833	0.0646	3.0479		10,830.5682	10,830.5682	0.5263	0.4084	10,965.4163
Unmitigated	4.9420	4.9521	48.4997	0.1048	11.2162	0.0692	11.2854	2.9833	0.0646	3.0479		10,830.5682	10,830.5682	0.5263	0.4084	10,965.4163

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Low Rise	1,405.44	1,562.88	1205.76	4,781,982	4,781,982
Parking Lot	0.00	0.00	0.00		
Recreational Swimming Pool	0.00	0.00	0.00		
Total	1,405.44	1,562.88	1,205.76	4,781,982	4,781,982

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Low Rise	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3
Parking Lot	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0
Recreational Swimming Pool	16.60	8.40	6.90	33.00	48.00	19.00	52	39	9

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Low Rise	0.548752	0.057478	0.177127	0.144672	0.027288	0.003261	0.005053	0.008340	0.000275	0.000141	0.024682	0.000491	0.002439
Parking Lot	0.537845	0.056225	0.173186	0.138405	0.025906	0.007191	0.011447	0.018769	0.000611	0.000309	0.023821	0.001097	0.005189
Recreational Swimming Pool	0.537845	0.056225	0.173186	0.138405	0.025906	0.007191	0.011447	0.018769	0.000611	0.000309	0.023821	0.001097	0.005189

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0858	0.7333	0.3120	4.6800e-003		0.0593	0.0593		0.0593	0.0593		936.0757	936.0757	0.0179	0.0172	941.6383
NaturalGas Unmitigated	0.0858	0.7333	0.3120	4.6800e-003		0.0593	0.0593		0.0593	0.0593		936.0757	936.0757	0.0179	0.0172	941.6383

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Low Rise	7956.64	0.0858	0.7333	0.3120	4.6800e-003		0.0593	0.0593		0.0593	0.0593		936.0757	936.0757	0.0179	0.0172	941.6383
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0858**	**0.7333**	**0.3120**	**4.6800e-003**		**0.0593**	**0.0593**		**0.0593**	**0.0593**		**936.0757**	**936.0757**	**0.0179**	**0.0172**	**941.6383**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Low Rise	7.95664	0.0858	0.7333	0.3120	4.6800e-003		0.0593	0.0593		0.0593	0.0593		936.0757	936.0757	0.0179	0.0172	941.6383
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0858**	**0.7333**	**0.3120**	**4.6800e-003**		**0.0593**	**0.0593**		**0.0593**	**0.0593**		**936.0757**	**936.0757**	**0.0179**	**0.0172**	**941.6383**

6.0 Area Detail

6.1 Mitigation Measures Area

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	4.6788	0.1826	15.8507	8.4000e-004		0.0878	0.0878		0.0878	0.0878	0.0000	28.5588	28.5588	0.0275	0.0000	29.2454
Unmitigated	4.6788	0.1826	15.8507	8.4000e-004		0.0878	0.0878		0.0878	0.0878	0.0000	28.5588	28.5588	0.0275	0.0000	29.2454

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.3416					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	3.8595					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.4777	0.1826	15.8507	8.4000e-004		0.0878	0.0878		0.0878	0.0878		28.5588	28.5588	0.0275		29.2454
Total	**4.6788**	**0.1826**	**15.8507**	**8.4000e-004**		**0.0878**	**0.0878**		**0.0878**	**0.0878**	**0.0000**	**28.5588**	**28.5588**	**0.0275**	**0.0000**	**29.2454**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.3416					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	3.8595					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.4777	0.1826	15.8507	8.4000e-004		0.0878	0.0878		0.0878	0.0878		28.5588	28.5588	0.0275		29.2454
Total	**4.6788**	**0.1826**	**15.8507**	**8.4000e-004**		**0.0878**	**0.0878**		**0.0878**	**0.0878**	**0.0000**	**28.5588**	**28.5588**	**0.0275**	**0.0000**	**29.2454**

7.0 Water Detail

7.1 Mitigation Measures Water

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Xenia and Eight Street Multifamily Residential Project

Riverside-South Coast County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	163.50	1000sqft	3.75	163,504.80	0
Apartments Low Rise	192.00	Dwelling Unit	7.18	192,000.00	549
Recreational Swimming Pool	4.46	1000sqft	0.10	4,462.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.4	**Precipitation Freq (Days)**	28
Climate Zone	10			**Operational Year**	2024
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	390.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - The project is proposing to build 192 multifamily apartment homes and a swimming pool, and pave approximately 163,504.8 Square Feet as a part of on-site street improvement and parking lot.

Construction Phase - The site is currently vacant and requires no demolition.

Grading - The project is expected to import approximately 65,000 cubic yard of earthwork materials

Woodstoves - Per SCAQMD Rule 445, no wood-burning devices will be allowed. Project will not include natural gas hearths.

Construction Off-road Equipment Mitigation - Project will be required to comply with SCAQMD Rule 403 regarding fugitive dust control. Construction equipment will have Tier 4 "clean diesel" engines.

Fleet Mix - Operational fleet mix adjusted to equal 2% trucks with GVWR > 10,000 lbs.

Vehicle Trips - The project swimming pool is not expected to generate any additional trips.

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadMoistureContent	0	12
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	9.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

tblFireplaces	NumberGas	163.20	0.00
tblFireplaces	NumberNoFireplace	19.20	192.00
tblFireplaces	NumberWood	9.60	0.00
tblFleetMix	HHD	0.02	8.3400e-003
tblFleetMix	LDA	0.54	0.55
tblFleetMix	LDT1	0.06	0.06
tblFleetMix	LDT2	0.17	0.18
tblFleetMix	LHD1	0.03	0.03
tblFleetMix	LHD2	7.1910e-003	3.2610e-003
tblFleetMix	MCY	0.02	0.02
tblFleetMix	MDV	0.14	0.14
tblFleetMix	MH	5.1890e-003	2.4390e-003
tblFleetMix	MHD	0.01	5.0530e-003
tblFleetMix	OBUS	6.1100e-004	2.7500e-004
tblFleetMix	SBUS	1.0970e-003	4.9100e-004
tblFleetMix	UBUS	3.0900e-004	1.4100e-004
tblGrading	MaterialImported	0.00	65,000.00
tblLandUse	LandUseSquareFeet	163,505.00	163,504.80
tblLandUse	LandUseSquareFeet	4,460.00	4,462.00
tblLandUse	LotAcreage	12.00	7.18
tblVehicleTrips	ST_TR	9.10	0.00
tblVehicleTrips	SU_TR	13.60	0.00
tblVehicleTrips	WD_TR	28.82	0.00
tblWoodstoves	NumberCatalytic	9.60	0.00
tblWoodstoves	NumberNoncatalytic	9.60	0.00

2.0 Emissions Summary

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2023	3.9350	63.2205	36.2410	0.2129	19.8582	1.7524	21.1252	10.1558	1.6242	11.3214	0.0000	22,111.0571	22,111.0571	2.1719	2.5130	22,914.2177
2024	2.1901	15.5432	22.6593	0.0533	2.6436	0.6374	3.2810	0.7081	0.5996	1.3076	0.0000	5,293.3280	5,293.3280	0.7171	0.1762	5,362.2685
2025	62.6400	8.6097	14.9686	0.0241	0.4695	0.4192	0.5869	0.1245	0.3857	0.4302	0.0000	2,336.9905	2,336.9905	0.7165	8.7400e-003	2,355.8337
Maximum	**62.6400**	**63.2205**	**36.2410**	**0.2129**	**19.8582**	**1.7524**	**21.1252**	**10.1558**	**1.6242**	**11.3214**	**0.0000**	**22,111.0571**	**22,111.0571**	**2.1719**	**2.5130**	**22,914.2177**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2023	1.3748	32.0050	41.1890	0.2129	8.5890	0.4295	9.0184	3.9176	0.4153	3.9805	0.0000	22,111.0571	22,111.0571	2.1719	2.5130	22,914.2177
2024	1.0464	4.3341	23.9528	0.0533	2.6436	0.0649	2.7084	0.7081	0.0635	0.7715	0.0000	5,293.3280	5,293.3280	0.7171	0.1762	5,362.2685
2025	62.4989	1.2434	17.6863	0.0241	0.4695	0.0381	0.4754	0.1245	0.0381	0.1303	0.0000	2,336.9905	2,336.9905	0.7165	8.7400e-003	2,355.8337
Maximum	**62.4989**	**32.0050**	**41.1890**	**0.2129**	**8.5890**	**0.4295**	**9.0184**	**3.9176**	**0.4153**	**3.9805**	**0.0000**	**22,111.0571**	**22,111.0571**	**2.1719**	**2.5130**	**22,914.2177**

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**5.59**	**56.99**	**-12.13**	**0.00**	**49.06**	**81.04**	**51.18**	**56.77**	**80.20**	**62.61**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	4.6788	0.1826	15.8507	8.4000e-004		0.0878	0.0878		0.0878	0.0878	0.0000	28.5588	28.5588	0.0275	0.0000	29.2454
Energy	0.0858	0.7333	0.3120	4.6800e-003		0.0593	0.0593		0.0593	0.0593		936.0757	936.0757	0.0179	0.0172	941.6383
Mobile	4.2187	5.2558	42.7439	0.0967	11.2162	0.0693	11.2855	2.9833	0.0646	3.0479		9,988.6031	9,988.6031	0.5386	0.4190	10,126.9373
Total	**8.9833**	**6.1716**	**58.9067**	**0.1022**	**11.2162**	**0.2164**	**11.4326**	**2.9833**	**0.2117**	**3.1950**	**0.0000**	**10,953.2375**	**10,953.2375**	**0.5840**	**0.4362**	**11,097.8209**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	4.6788	0.1826	15.8507	8.4000e-004		0.0878	0.0878		0.0878	0.0878	0.0000	28.5588	28.5588	0.0275	0.0000	29.2454
Energy	0.0858	0.7333	0.3120	4.6800e-003		0.0593	0.0593		0.0593	0.0593		936.0757	936.0757	0.0179	0.0172	941.6383
Mobile	4.2187	5.2558	42.7439	0.0967	11.2162	0.0693	11.2855	2.9833	0.0646	3.0479		9,988.6031	9,988.6031	0.5386	0.4190	10,126.9373
Total	**8.9833**	**6.1716**	**58.9067**	**0.1022**	**11.2162**	**0.2164**	**11.4326**	**2.9833**	**0.2117**	**3.1950**	**0.0000**	**10,953.2375**	**10,953.2375**	**0.5840**	**0.4362**	**11,097.8209**

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	9/1/2023	9/14/2023	5	10	
2	Grading	Grading	9/15/2023	10/26/2023	5	30	
3	Building Construction	Building Construction	10/27/2023	12/19/2024	5	300	
4	Paving	Paving	12/20/2024	1/16/2025	5	20	
5	Architectural Coating	Architectural Coating	1/17/2025	2/13/2025	5	20	

Acres of Grading (Site Preparation Phase): 15

Acres of Grading (Grading Phase): 90

Acres of Paving: 3.75

Residential Indoor: 388,800; Residential Outdoor: 129,600; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 9,810 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	8,125.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	209.00	48.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	42.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Use Soil Stabilizer

Replace Ground Cover

Water Exposed Area

Water Unpaved Roads

Reduce Vehicle Speed on Unpaved Roads

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.2 Site Preparation - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					19.6570	0.0000	19.6570	10.1025	0.0000	10.1025			0.0000			0.0000
Off-Road	2.6595	27.5242	18.2443	0.0381		1.2660	1.2660		1.1647	1.1647		3,687.3081	3,687.3081	1.1926		3,717.1219
Total	**2.6595**	**27.5242**	**18.2443**	**0.0381**	**19.6570**	**1.2660**	**20.9230**	**10.1025**	**1.1647**	**11.2672**		**3,687.3081**	**3,687.3081**	**1.1926**		**3,717.1219**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0616	0.0422	0.5362	1.6000e-003	0.2012	9.4000e-004	0.2021	0.0534	8.7000e-004	0.0542		164.1079	164.1079	4.1200e-003	4.3200e-003	165.4988
Total	**0.0616**	**0.0422**	**0.5362**	**1.6000e-003**	**0.2012**	**9.4000e-004**	**0.2021**	**0.0534**	**8.7000e-004**	**0.0542**		**164.1079**	**164.1079**	**4.1200e-003**	**4.3200e-003**	**165.4988**

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.2 Site Preparation - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					7.5188	0.0000	7.5188	3.8642	0.0000	3.8642			0.0000			0.0000
Off-Road	0.4656	2.0175	20.8690	0.0381		0.0621	0.0621		0.0621	0.0621	0.0000	3,687.3081	3,687.3081	1.1926		3,717.1219
Total	**0.4656**	**2.0175**	**20.8690**	**0.0381**	**7.5188**	**0.0621**	**7.5809**	**3.8642**	**0.0621**	**3.9263**	**0.0000**	**3,687.3081**	**3,687.3081**	**1.1926**		**3,717.1219**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0616	0.0422	0.5362	1.6000e-003	0.2012	9.4000e-004	0.2021	0.0534	8.7000e-004	0.0542		164.1079	164.1079	4.1200e-003	4.3200e-003	165.4988
Total	**0.0616**	**0.0422**	**0.5362**	**1.6000e-003**	**0.2012**	**9.4000e-004**	**0.2021**	**0.0534**	**8.7000e-004**	**0.0542**		**164.1079**	**164.1079**	**4.1200e-003**	**4.3200e-003**	**165.4988**

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.3 Grading - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.4780	0.0000	9.4780	3.6953	0.0000	3.6953			0.0000			0.0000
Off-Road	3.3217	34.5156	28.0512	0.0621		1.4245	1.4245		1.3105	1.3105		6,011.4777	6,011.4777	1.9442		6,060.0836
Total	**3.3217**	**34.5156**	**28.0512**	**0.0621**	**9.4780**	**1.4245**	**10.9025**	**3.6953**	**1.3105**	**5.0058**		**6,011.4777**	**6,011.4777**	**1.9442**		**6,060.0836**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.5448	28.6581	7.5940	0.1491	4.7401	0.3269	5.0670	1.2995	0.3128	1.6123		15,917.2373	15,917.2373	0.2231	2.5082	16,670.2466
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0685	0.0469	0.5958	1.7800e-003	0.2236	1.0500e-003	0.2246	0.0593	9.7000e-004	0.0603		182.3421	182.3421	4.5800e-003	4.8000e-003	183.8876
Total	**0.6133**	**28.7049**	**8.1898**	**0.1508**	**4.9636**	**0.3279**	**5.2916**	**1.3588**	**0.3137**	**1.6725**		**16,099.5793**	**16,099.5793**	**0.2277**	**2.5130**	**16,854.1341**

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.3 Grading - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					3.6253	0.0000	3.6253	1.4135	0.0000	1.4135			0.0000			0.0000
Off-Road	0.7616	3.3000	32.9991	0.0621		0.1015	0.1015		0.1015	0.1015	0.0000	6,011.4777	6,011.4777	1.9442		6,060.0836
Total	**0.7616**	**3.3000**	**32.9991**	**0.0621**	**3.6253**	**0.1015**	**3.7269**	**1.4135**	**0.1015**	**1.5150**	**0.0000**	**6,011.4777**	**6,011.4777**	**1.9442**		**6,060.0836**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.5448	28.6581	7.5940	0.1491	4.7401	0.3269	5.0670	1.2995	0.3128	1.6123		15,917.2373	15,917.2373	0.2231	2.5082	16,670.2466
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0685	0.0469	0.5958	1.7800e-003	0.2236	1.0500e-003	0.2246	0.0593	9.7000e-004	0.0603		182.3421	182.3421	4.5800e-003	4.8000e-003	183.8876
Total	**0.6133**	**28.7049**	**8.1898**	**0.1508**	**4.9636**	**0.3279**	**5.2916**	**1.3588**	**0.3137**	**1.6725**		**16,099.5793**	**16,099.5793**	**0.2277**	**2.5130**	**16,854.1341**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.4 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5728	14.3849	16.2440	0.0269		0.6997	0.6997		0.6584	0.6584		2,555.2099	2,555.2099	0.6079		2,570.4061
Total	**1.5728**	**14.3849**	**16.2440**	**0.0269**		**0.6997**	**0.6997**		**0.6584**	**0.6584**		**2,555.2099**	**2,555.2099**	**0.6079**		**2,570.4061**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0501	1.6631	0.6674	8.4100e-003	0.3074	0.0137	0.3212	0.0885	0.0131	0.1016		891.5078	891.5078	8.8900e-003	0.1319	931.0213
Worker	0.7157	0.4896	6.2260	0.0186	2.3361	0.0110	2.3471	0.6196	0.0101	0.6296		1,905.4746	1,905.4746	0.0479	0.0502	1,921.6249
Total	**0.7658**	**2.1527**	**6.8935**	**0.0270**	**2.6436**	**0.0247**	**2.6682**	**0.7081**	**0.0232**	**0.7313**		**2,796.9824**	**2,796.9824**	**0.0568**	**0.1820**	**2,852.6462**

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.4 Building Construction - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.3278	2.2347	17.4603	0.0269		0.0408	0.0408		0.0408	0.0408	0.0000	2,555.2099	2,555.2099	0.6079		2,570.4061
Total	**0.3278**	**2.2347**	**17.4603**	**0.0269**		**0.0408**	**0.0408**		**0.0408**	**0.0408**	**0.0000**	**2,555.2099**	**2,555.2099**	**0.6079**		**2,570.4061**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0501	1.6631	0.6674	8.4100e-003	0.3074	0.0137	0.3212	0.0885	0.0131	0.1016		891.5078	891.5078	8.8900e-003	0.1319	931.0213
Worker	0.7157	0.4896	6.2260	0.0186	2.3361	0.0110	2.3471	0.6196	0.0101	0.6296		1,905.4746	1,905.4746	0.0479	0.0502	1,921.6249
Total	**0.7658**	**2.1527**	**6.8935**	**0.0270**	**2.6436**	**0.0247**	**2.6682**	**0.7081**	**0.0232**	**0.7313**		**2,796.9824**	**2,796.9824**	**0.0568**	**0.1820**	**2,852.6462**

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.4 Building Construction - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.4716	13.4438	16.1668	0.0270		0.6133	0.6133		0.5769	0.5769		2,555.6989	2,555.6989	0.6044		2,570.8077
Total	**1.4716**	**13.4438**	**16.1668**	**0.0270**		**0.6133**	**0.6133**		**0.5769**	**0.5769**		**2,555.6989**	**2,555.6989**	**0.6044**		**2,570.8077**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0493	1.6633	0.6600	8.2800e-003	0.3074	0.0136	0.3211	0.0885	0.0130	0.1015		877.7830	877.7830	9.2100e-003	0.1296	916.6397
Worker	0.6693	0.4361	5.8325	0.0180	2.3361	0.0105	2.3466	0.6196	9.6400e-003	0.6292		1,859.8461	1,859.8461	0.0434	0.0466	1,874.8212
Total	**0.7185**	**2.0994**	**6.4925**	**0.0263**	**2.6436**	**0.0241**	**2.6677**	**0.7081**	**0.0227**	**0.7307**		**2,737.6291**	**2,737.6291**	**0.0526**	**0.1762**	**2,791.4609**

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.4 Building Construction - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.3278	2.2347	17.4603	0.0270		0.0408	0.0408		0.0408	0.0408	0.0000	2,555.6989	2,555.6989	0.6044		2,570.8077
Total	**0.3278**	**2.2347**	**17.4603**	**0.0270**		**0.0408**	**0.0408**		**0.0408**	**0.0408**	**0.0000**	**2,555.6989**	**2,555.6989**	**0.6044**		**2,570.8077**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0493	1.6633	0.6600	8.2800e-003	0.3074	0.0136	0.3211	0.0885	0.0130	0.1015		877.7830	877.7830	9.2100e-003	0.1296	916.6397
Worker	0.6693	0.4361	5.8325	0.0180	2.3361	0.0105	2.3466	0.6196	9.6400e-003	0.6292		1,859.8461	1,859.8461	0.0434	0.0466	1,874.8212
Total	**0.7185**	**2.0994**	**6.4925**	**0.0263**	**2.6436**	**0.0241**	**2.6677**	**0.7081**	**0.0227**	**0.7307**		**2,737.6291**	**2,737.6291**	**0.0526**	**0.1762**	**2,791.4609**

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Paving - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9882	9.5246	14.6258	0.0228		0.4685	0.4685		0.4310	0.4310		2,207.5472	2,207.5472	0.7140		2,225.3963
Paving	0.4913					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.4794**	**9.5246**	**14.6258**	**0.0228**		**0.4685**	**0.4685**		**0.4310**	**0.4310**		**2,207.5472**	**2,207.5472**	**0.7140**		**2,225.3963**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0480	0.0313	0.4186	1.2900e-003	0.1677	7.5000e-004	0.1684	0.0445	6.9000e-004	0.0452		133.4818	133.4818	3.1200e-003	3.3500e-003	134.5565
Total	**0.0480**	**0.0313**	**0.4186**	**1.2900e-003**	**0.1677**	**7.5000e-004**	**0.1684**	**0.0445**	**6.9000e-004**	**0.0452**		**133.4818**	**133.4818**	**3.1200e-003**	**3.3500e-003**	**134.5565**

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Paving - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.2805	1.2154	17.2957	0.0228		0.0374	0.0374		0.0374	0.0374	0.0000	2,207.5472	2,207.5472	0.7140		2,225.3963
Paving	0.4913					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.7717**	**1.2154**	**17.2957**	**0.0228**		**0.0374**	**0.0374**		**0.0374**	**0.0374**	**0.0000**	**2,207.5472**	**2,207.5472**	**0.7140**		**2,225.3963**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0480	0.0313	0.4186	1.2900e-003	0.1677	7.5000e-004	0.1684	0.0445	6.9000e-004	0.0452		133.4818	133.4818	3.1200e-003	3.3500e-003	134.5565
Total	**0.0480**	**0.0313**	**0.4186**	**1.2900e-003**	**0.1677**	**7.5000e-004**	**0.1684**	**0.0445**	**6.9000e-004**	**0.0452**		**133.4818**	**133.4818**	**3.1200e-003**	**3.3500e-003**	**134.5565**

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Paving - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9152	8.5816	14.5780	0.0228		0.4185	0.4185		0.3850	0.3850		2,206.7452	2,206.7452	0.7137		2,224.5878
Paving	0.4913					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.4064**	**8.5816**	**14.5780**	**0.0228**		**0.4185**	**0.4185**		**0.3850**	**0.3850**		**2,206.7452**	**2,206.7452**	**0.7137**		**2,224.5878**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0450	0.0281	0.3906	1.2500e-003	0.1677	7.1000e-004	0.1684	0.0445	6.6000e-004	0.0451		130.2454	130.2454	2.8200e-003	3.1200e-003	131.2459
Total	**0.0450**	**0.0281**	**0.3906**	**1.2500e-003**	**0.1677**	**7.1000e-004**	**0.1684**	**0.0445**	**6.6000e-004**	**0.0451**		**130.2454**	**130.2454**	**2.8200e-003**	**3.1200e-003**	**131.2459**

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Paving - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.2805	1.2154	17.2957	0.0228		0.0374	0.0374		0.0374	0.0374	0.0000	2,206.7452	2,206.7452	0.7137		2,224.5878
Paving	0.4913					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.7717**	**1.2154**	**17.2957**	**0.0228**		**0.0374**	**0.0374**		**0.0374**	**0.0374**	**0.0000**	**2,206.7452**	**2,206.7452**	**0.7137**		**2,224.5878**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0450	0.0281	0.3906	1.2500e-003	0.1677	7.1000e-004	0.1684	0.0445	6.6000e-004	0.0451		130.2454	130.2454	2.8200e-003	3.1200e-003	131.2459
Total	**0.0450**	**0.0281**	**0.3906**	**1.2500e-003**	**0.1677**	**7.1000e-004**	**0.1684**	**0.0445**	**6.6000e-004**	**0.0451**		**130.2454**	**130.2454**	**2.8200e-003**	**3.1200e-003**	**131.2459**

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.6 Architectural Coating - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	62.3431					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1709	1.1455	1.8091	2.9700e-003		0.0515	0.0515		0.0515	0.0515		281.4481	281.4481	0.0154		281.8319
Total	**62.5139**	**1.1455**	**1.8091**	**2.9700e-003**		**0.0515**	**0.0515**		**0.0515**	**0.0515**		**281.4481**	**281.4481**	**0.0154**		**281.8319**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1261	0.0786	1.0937	3.5000e-003	0.4695	2.0000e-003	0.4715	0.1245	1.8400e-003	0.1264		364.6871	364.6871	7.8900e-003	8.7400e-003	367.4885
Total	**0.1261**	**0.0786**	**1.0937**	**3.5000e-003**	**0.4695**	**2.0000e-003**	**0.4715**	**0.1245**	**1.8400e-003**	**0.1264**		**364.6871**	**364.6871**	**7.8900e-003**	**8.7400e-003**	**367.4885**

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.6 Architectural Coating - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	62.3431					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0297	0.1288	1.8324	2.9700e-003		3.9600e-003	3.9600e-003		3.9600e-003	3.9600e-003	0.0000	281.4481	281.4481	0.0154		281.8319
Total	**62.3728**	**0.1288**	**1.8324**	**2.9700e-003**		**3.9600e-003**	**3.9600e-003**		**3.9600e-003**	**3.9600e-003**	**0.0000**	**281.4481**	**281.4481**	**0.0154**		**281.8319**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1261	0.0786	1.0937	3.5000e-003	0.4695	2.0000e-003	0.4715	0.1245	1.8400e-003	0.1264		364.6871	364.6871	7.8900e-003	8.7400e-003	367.4885
Total	**0.1261**	**0.0786**	**1.0937**	**3.5000e-003**	**0.4695**	**2.0000e-003**	**0.4715**	**0.1245**	**1.8400e-003**	**0.1264**		**364.6871**	**364.6871**	**7.8900e-003**	**8.7400e-003**	**367.4885**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	4.2187	5.2558	42.7439	0.0967	11.2162	0.0693	11.2855	2.9833	0.0646	3.0479		9,988.6031	9,988.6031	0.5386	0.4190	10,126.9373
Unmitigated	4.2187	5.2558	42.7439	0.0967	11.2162	0.0693	11.2855	2.9833	0.0646	3.0479		9,988.6031	9,988.6031	0.5386	0.4190	10,126.9373

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Low Rise	1,405.44	1,562.88	1205.76	4,781,982	4,781,982
Parking Lot	0.00	0.00	0.00		
Recreational Swimming Pool	0.00	0.00	0.00		
Total	1,405.44	1,562.88	1,205.76	4,781,982	4,781,982

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Low Rise	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3
Parking Lot	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0
Recreational Swimming Pool	16.60	8.40	6.90	33.00	48.00	19.00	52	39	9

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Low Rise	0.548752	0.057478	0.177127	0.144672	0.027288	0.003261	0.005053	0.008340	0.000275	0.000141	0.024682	0.000491	0.002439
Parking Lot	0.537845	0.056225	0.173186	0.138405	0.025906	0.007191	0.011447	0.018769	0.000611	0.000309	0.023821	0.001097	0.005189
Recreational Swimming Pool	0.537845	0.056225	0.173186	0.138405	0.025906	0.007191	0.011447	0.018769	0.000611	0.000309	0.023821	0.001097	0.005189

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0858	0.7333	0.3120	4.6800e-003		0.0593	0.0593		0.0593	0.0593		936.0757	936.0757	0.0179	0.0172	941.6383
NaturalGas Unmitigated	0.0858	0.7333	0.3120	4.6800e-003		0.0593	0.0593		0.0593	0.0593		936.0757	936.0757	0.0179	0.0172	941.6383

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Low Rise	7956.64	0.0858	0.7333	0.3120	4.6800e-003		0.0593	0.0593		0.0593	0.0593		936.0757	936.0757	0.0179	0.0172	941.6383
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0858**	**0.7333**	**0.3120**	**4.6800e-003**		**0.0593**	**0.0593**		**0.0593**	**0.0593**		**936.0757**	**936.0757**	**0.0179**	**0.0172**	**941.6383**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Low Rise	7.95664	0.0858	0.7333	0.3120	4.6800e-003		0.0593	0.0593		0.0593	0.0593		936.0757	936.0757	0.0179	0.0172	941.6383
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0858**	**0.7333**	**0.3120**	**4.6800e-003**		**0.0593**	**0.0593**		**0.0593**	**0.0593**		**936.0757**	**936.0757**	**0.0179**	**0.0172**	**941.6383**

6.0 Area Detail

6.1 Mitigation Measures Area

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	4.6788	0.1826	15.8507	8.4000e-004		0.0878	0.0878		0.0878	0.0878	0.0000	28.5588	28.5588	0.0275	0.0000	29.2454
Unmitigated	4.6788	0.1826	15.8507	8.4000e-004		0.0878	0.0878		0.0878	0.0878	0.0000	28.5588	28.5588	0.0275	0.0000	29.2454

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.3416					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	3.8595					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.4777	0.1826	15.8507	8.4000e-004		0.0878	0.0878		0.0878	0.0878		28.5588	28.5588	0.0275		29.2454
Total	**4.6788**	**0.1826**	**15.8507**	**8.4000e-004**		**0.0878**	**0.0878**		**0.0878**	**0.0878**	**0.0000**	**28.5588**	**28.5588**	**0.0275**	**0.0000**	**29.2454**

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.3416					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	3.8595					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.4777	0.1826	15.8507	8.4000e-004		0.0878	0.0878		0.0878	0.0878		28.5588	28.5588	0.0275		29.2454
Total	**4.6788**	**0.1826**	**15.8507**	**8.4000e-004**		**0.0878**	**0.0878**		**0.0878**	**0.0878**	**0.0000**	**28.5588**	**28.5588**	**0.0275**	**0.0000**	**29.2454**

7.0 Water Detail

7.1 Mitigation Measures Water

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Appendix B

Unmitigated Annual Emissions Calculations Output
(CalEEMod)

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Xenia and Eight Street Multifamily Residential Project

Riverside-South Coast County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	163.50	1000sqft	3.75	163,504.80	0
Apartments Low Rise	192.00	Dwelling Unit	7.18	192,000.00	549
Recreational Swimming Pool	4.46	1000sqft	0.10	4,462.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.4	**Precipitation Freq (Days)**	28
Climate Zone	10			**Operational Year**	2024
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	390.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - The project is proposing to build 192 multifamily apartment homes and a swimming pool, and pave approximately 163,504.8 Square Feet as a part of on-site street improvement and parking lot.

Construction Phase - The site is currently vacant and requires no demolition.

Grading - The project is expected to import approximately 65,000 cubic yard of earthwork materials

Woodstoves - Per SCAQMD Rule 445, no wood-burning devices will be allowed. Project will not include natural gas hearths.

Construction Off-road Equipment Mitigation - Project will be required to comply with SCAQMD Rule 403 regarding fugitive dust control. Construction equipment will have Tier 4 "clean diesel" engines.

Fleet Mix - Operational fleet mix adjusted to equal 2% trucks with GVWR > 10,000 lbs.

Vehicle Trips - The project swimming pool is not expected to generate any additional trips.

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadMoistureContent	0	12
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	9.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

tblFireplaces	NumberGas	163.20	0.00
tblFireplaces	NumberNoFireplace	19.20	192.00
tblFireplaces	NumberWood	9.60	0.00
tblFleetMix	HHD	0.02	8.3400e-003
tblFleetMix	LDA	0.54	0.55
tblFleetMix	LDT1	0.06	0.06
tblFleetMix	LDT2	0.17	0.18
tblFleetMix	LHD1	0.03	0.03
tblFleetMix	LHD2	7.1910e-003	3.2610e-003
tblFleetMix	MCY	0.02	0.02
tblFleetMix	MDV	0.14	0.14
tblFleetMix	MH	5.1890e-003	2.4390e-003
tblFleetMix	MHD	0.01	5.0530e-003
tblFleetMix	OBUS	6.1100e-004	2.7500e-004
tblFleetMix	SBUS	1.0970e-003	4.9100e-004
tblFleetMix	UBUS	3.0900e-004	1.4100e-004
tblGrading	MaterialImported	0.00	65,000.00
tblLandUse	LandUseSquareFeet	163,505.00	163,504.80
tblLandUse	LandUseSquareFeet	4,460.00	4,462.00
tblLandUse	LotAcreage	12.00	7.18
tblVehicleTrips	ST_TR	9.10	0.00
tblVehicleTrips	SU_TR	13.60	0.00
tblVehicleTrips	WD_TR	28.82	0.00
tblWoodstoves	NumberCatalytic	9.60	0.00
tblWoodstoves	NumberNoncatalytic	9.60	0.00

2.0 Emissions Summary

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2023	0.1260	1.4646	1.1764	4.6400e-003	0.3746	0.0493	0.4239	0.1424	0.0459	0.1882	0.0000	430.8039	430.8039	0.0489	0.0380	443.3497
2024	0.2799	2.0115	2.9764	6.9100e-003	0.3309	0.0828	0.4137	0.0888	0.0779	0.1666	0.0000	623.1995	623.1995	0.0783	0.0204	631.2347
2025	0.6350	0.0639	0.1196	2.1000e-004	5.6100e-003	3.0500e-003	8.6600e-003	1.4900e-003	2.8500e-003	4.3400e-003	0.0000	18.6752	18.6752	4.1100e-003	1.0000e-004	18.8073
Maximum	**0.6350**	**2.0115**	**2.9764**	**6.9100e-003**	**0.3746**	**0.0828**	**0.4239**	**0.1424**	**0.0779**	**0.1882**	**0.0000**	**623.1995**	**623.1995**	**0.0783**	**0.0380**	**631.2347**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2023	0.0480	0.5893	1.2917	4.6400e-003	0.2261	8.2600e-003	0.2344	0.0769	8.0100e-003	0.0850	0.0000	430.8037	430.8037	0.0489	0.0380	443.3495
2024	0.1319	0.5547	3.1513	6.9100e-003	0.3309	8.3900e-003	0.3393	0.0888	8.2100e-003	0.0970	0.0000	623.1992	623.1992	0.0783	0.0204	631.2343
2025	0.6298	9.5600e-003	0.1361	2.1000e-004	5.6100e-003	2.9000e-004	5.8900e-003	1.4900e-003	2.9000e-004	1.7700e-003	0.0000	18.6752	18.6752	4.1100e-003	1.0000e-004	18.8072
Maximum	**0.6298**	**0.5893**	**3.1513**	**6.9100e-003**	**0.3309**	**8.3900e-003**	**0.3393**	**0.0888**	**8.2100e-003**	**0.0970**	**0.0000**	**623.1992**	**623.1992**	**0.0783**	**0.0380**	**631.2343**

Xenia and Eight Street Multifamily Residential Project - Riverside-South Coast County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**22.22**	**67.41**	**-7.18**	**0.00**	**20.88**	**87.47**	**31.51**	**28.12**	**86.96**	**48.86**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**9-1-2023**	**11-30-2023**	1.3858	0.5732
2	**12-1-2023**	**2-29-2024**	0.5890	0.1760
3	**3-1-2024**	**5-31-2024**	0.5813	0.1754
4	**6-1-2024**	**8-31-2024**	0.5806	0.1747
5	**9-1-2024**	**11-30-2024**	0.5756	0.1742
6	**12-1-2024**	**2-28-2025**	0.8640	0.6842
		Highest	1.3858	0.6842

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.8264	0.0228	1.9813	1.0000e-004		0.0110	0.0110		0.0110	0.0110	0.0000	3.2385	3.2385	3.1100e-003	0.0000	3.3164
Energy	0.0157	0.1338	0.0569	8.5000e-004		0.0108	0.0108		0.0108	0.0108	0.0000	307.1150	307.1150	0.0158	4.4000e-003	308.8208
Mobile	0.6951	0.8647	7.2044	0.0160	1.7975	0.0113	1.8088	0.4787	0.0105	0.4892	0.0000	1,502.6312	1,502.6312	0.0795	0.0624	1,523.2158
Waste						0.0000	0.0000		0.0000	0.0000	23.0882	0.0000	23.0882	1.3645	0.0000	57.2000
Water						0.0000	0.0000		0.0000	0.0000	4.0524	45.3538	49.4062	0.4201	0.0103	62.9743
Total	**1.5372**	**1.0213**	**9.2427**	**0.0170**	**1.7975**	**0.0331**	**1.8306**	**0.4787**	**0.0323**	**0.5110**	**27.1406**	**1,858.3384**	**1,885.4790**	**1.8829**	**0.0771**	**1,955.5273**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.8264	0.0228	1.9813	1.0000e-004		0.0110	0.0110		0.0110	0.0110	0.0000	3.2385	3.2385	3.1100e-003	0.0000	3.3164
Energy	0.0157	0.1338	0.0569	8.5000e-004		0.0108	0.0108		0.0108	0.0108	0.0000	307.1150	307.1150	0.0158	4.4000e-003	308.8208
Mobile	0.6951	0.8647	7.2044	0.0160	1.7975	0.0113	1.8088	0.4787	0.0105	0.4892	0.0000	1,502.6312	1,502.6312	0.0795	0.0624	1,523.2158
Waste						0.0000	0.0000		0.0000	0.0000	23.0882	0.0000	23.0882	1.3645	0.0000	57.2000
Water						0.0000	0.0000		0.0000	0.0000	4.0524	45.3538	49.4062	0.4201	0.0103	62.9743
Total	**1.5372**	**1.0213**	**9.2427**	**0.0170**	**1.7975**	**0.0331**	**1.8306**	**0.4787**	**0.0323**	**0.5110**	**27.1406**	**1,858.3384**	**1,885.4790**	**1.8829**	**0.0771**	**1,955.5273**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	9/1/2023	9/14/2023	5	10	
2	Grading	Grading	9/15/2023	10/26/2023	5	30	
3	Building Construction	Building Construction	10/27/2023	12/19/2024	5	300	

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

4	Paving	Paving	12/20/2024	1/16/2025	5	20	
5	Architectural Coating	Architectural Coating	1/17/2025	2/13/2025	5	20	

Acres of Grading (Site Preparation Phase): 15

Acres of Grading (Grading Phase): 90

Acres of Paving: 3.75

Residential Indoor: 388,800; Residential Outdoor: 129,600; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 9,810 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	8,125.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	209.00	48.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	42.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Use Soil Stabilizer

Replace Ground Cover

Water Exposed Area

Water Unpaved Roads

Reduce Vehicle Speed on Unpaved Roads

3.2 Site Preparation - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0983	0.0000	0.0983	0.0505	0.0000	0.0505	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0133	0.1376	0.0912	1.9000e-004		6.3300e-003	6.3300e-003		5.8200e-003	5.8200e-003	0.0000	16.7254	16.7254	5.4100e-003	0.0000	16.8606
Total	**0.0133**	**0.1376**	**0.0912**	**1.9000e-004**	**0.0983**	**6.3300e-003**	**0.1046**	**0.0505**	**5.8200e-003**	**0.0563**	**0.0000**	**16.7254**	**16.7254**	**5.4100e-003**	**0.0000**	**16.8606**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.2 Site Preparation - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.9000e-004	2.2000e-004	2.8300e-003	1.0000e-005	9.9000e-004	0.0000	9.9000e-004	2.6000e-004	0.0000	2.7000e-004	0.0000	0.7617	0.7617	2.0000e-005	2.0000e-005	0.7681
Total	**2.9000e-004**	**2.2000e-004**	**2.8300e-003**	**1.0000e-005**	**9.9000e-004**	**0.0000**	**9.9000e-004**	**2.6000e-004**	**0.0000**	**2.7000e-004**	**0.0000**	**0.7617**	**0.7617**	**2.0000e-005**	**2.0000e-005**	**0.7681**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0376	0.0000	0.0376	0.0193	0.0000	0.0193	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.3300e-003	0.0101	0.1043	1.9000e-004		3.1000e-004	3.1000e-004		3.1000e-004	3.1000e-004	0.0000	16.7253	16.7253	5.4100e-003	0.0000	16.8606
Total	**2.3300e-003**	**0.0101**	**0.1043**	**1.9000e-004**	**0.0376**	**3.1000e-004**	**0.0379**	**0.0193**	**3.1000e-004**	**0.0196**	**0.0000**	**16.7253**	**16.7253**	**5.4100e-003**	**0.0000**	**16.8606**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.2 Site Preparation - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.9000e-004	2.2000e-004	2.8300e-003	1.0000e-005	9.9000e-004	0.0000	9.9000e-004	2.6000e-004	0.0000	2.7000e-004	0.0000	0.7617	0.7617	2.0000e-005	2.0000e-005	0.7681
Total	**2.9000e-004**	**2.2000e-004**	**2.8300e-003**	**1.0000e-005**	**9.9000e-004**	**0.0000**	**9.9000e-004**	**2.6000e-004**	**0.0000**	**2.7000e-004**	**0.0000**	**0.7617**	**0.7617**	**2.0000e-005**	**2.0000e-005**	**0.7681**

3.3 Grading - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1422	0.0000	0.1422	0.0554	0.0000	0.0554	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0498	0.5177	0.4208	9.3000e-004		0.0214	0.0214		0.0197	0.0197	0.0000	81.8028	81.8028	0.0265	0.0000	82.4642
Total	**0.0498**	**0.5177**	**0.4208**	**9.3000e-004**	**0.1422**	**0.0214**	**0.1635**	**0.0554**	**0.0197**	**0.0751**	**0.0000**	**81.8028**	**81.8028**	**0.0265**	**0.0000**	**82.4642**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.3 Grading - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	8.5900e-003	0.4280	0.1125	2.2300e-003	0.0701	4.9000e-003	0.0750	0.0192	4.6900e-003	0.0239	0.0000	216.4020	216.4020	3.0500e-003	0.0341	226.6400
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.7000e-004	7.2000e-004	9.4200e-003	3.0000e-005	3.3000e-003	2.0000e-005	3.3100e-003	8.8000e-004	1.0000e-005	8.9000e-004	0.0000	2.5390	2.5390	6.0000e-005	7.0000e-005	2.5604
Total	**9.5600e-003**	**0.4287**	**0.1220**	**2.2600e-003**	**0.0734**	**4.9200e-003**	**0.0783**	**0.0201**	**4.7000e-003**	**0.0248**	**0.0000**	**218.9409**	**218.9409**	**3.1100e-003**	**0.0342**	**229.2004**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0544	0.0000	0.0544	0.0212	0.0000	0.0212	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0114	0.0495	0.4950	9.3000e-004		1.5200e-003	1.5200e-003		1.5200e-003	1.5200e-003	0.0000	81.8027	81.8027	0.0265	0.0000	82.4641
Total	**0.0114**	**0.0495**	**0.4950**	**9.3000e-004**	**0.0544**	**1.5200e-003**	**0.0559**	**0.0212**	**1.5200e-003**	**0.0227**	**0.0000**	**81.8027**	**81.8027**	**0.0265**	**0.0000**	**82.4641**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.3 Grading - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	8.5900e-003	0.4280	0.1125	2.2300e-003	0.0701	4.9000e-003	0.0750	0.0192	4.6900e-003	0.0239	0.0000	216.4020	216.4020	3.0500e-003	0.0341	226.6400
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.7000e-004	7.2000e-004	9.4200e-003	3.0000e-005	3.3000e-003	2.0000e-005	3.3100e-003	8.8000e-004	1.0000e-005	8.9000e-004	0.0000	2.5390	2.5390	6.0000e-005	7.0000e-005	2.5604
Total	**9.5600e-003**	**0.4287**	**0.1220**	**2.2600e-003**	**0.0734**	**4.9200e-003**	**0.0783**	**0.0201**	**4.7000e-003**	**0.0248**	**0.0000**	**218.9409**	**218.9409**	**3.1100e-003**	**0.0342**	**229.2004**

3.4 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0362	0.3309	0.3736	6.2000e-004		0.0161	0.0161		0.0151	0.0151	0.0000	53.3151	53.3151	0.0127	0.0000	53.6322
Total	**0.0362**	**0.3309**	**0.3736**	**6.2000e-004**		**0.0161**	**0.0161**		**0.0151**	**0.0151**	**0.0000**	**53.3151**	**53.3151**	**0.0127**	**0.0000**	**53.6322**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.4 Building Construction - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.2000e-003	0.0379	0.0151	1.9000e-004	6.9700e-003	3.1000e-004	7.2900e-003	2.0100e-003	3.0000e-004	2.3100e-003	0.0000	18.5749	18.5749	1.9000e-004	2.7500e-003	19.3980
Worker	0.0156	0.0116	0.1509	4.4000e-004	0.0528	2.5000e-004	0.0531	0.0140	2.3000e-004	0.0143	0.0000	40.6832	40.6832	1.0000e-003	1.0700e-003	41.0262
Total	**0.0168**	**0.0494**	**0.1660**	**6.3000e-004**	**0.0598**	**5.6000e-004**	**0.0604**	**0.0160**	**5.3000e-004**	**0.0166**	**0.0000**	**59.2580**	**59.2580**	**1.1900e-003**	**3.8200e-003**	**60.4242**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	7.5400e-003	0.0514	0.4016	6.2000e-004		9.4000e-004	9.4000e-004		9.4000e-004	9.4000e-004	0.0000	53.3150	53.3150	0.0127	0.0000	53.6321
Total	**7.5400e-003**	**0.0514**	**0.4016**	**6.2000e-004**		**9.4000e-004**	**9.4000e-004**		**9.4000e-004**	**9.4000e-004**	**0.0000**	**53.3150**	**53.3150**	**0.0127**	**0.0000**	**53.6321**

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3.4 Building Construction - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.2000e-003	0.0379	0.0151	1.9000e-004	6.9700e-003	3.1000e-004	7.2900e-003	2.0100e-003	3.0000e-004	2.3100e-003	0.0000	18.5749	18.5749	1.9000e-004	2.7500e-003	19.3980
Worker	0.0156	0.0116	0.1509	4.4000e-004	0.0528	2.5000e-004	0.0531	0.0140	2.3000e-004	0.0143	0.0000	40.6832	40.6832	1.0000e-003	1.0700e-003	41.0262
Total	**0.0168**	**0.0494**	**0.1660**	**6.3000e-004**	**0.0598**	**5.6000e-004**	**0.0604**	**0.0160**	**5.3000e-004**	**0.0166**	**0.0000**	**59.2580**	**59.2580**	**1.1900e-003**	**3.8200e-003**	**60.4242**

3.4 Building Construction - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1869	1.7074	2.0532	3.4200e-003		0.0779	0.0779		0.0733	0.0733	0.0000	294.4484	294.4484	0.0696	0.0000	296.1891
Total	**0.1869**	**1.7074**	**2.0532**	**3.4200e-003**		**0.0779**	**0.0779**		**0.0733**	**0.0733**	**0.0000**	**294.4484**	**294.4484**	**0.0696**	**0.0000**	**296.1891**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.4 Building Construction - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.5000e-003	0.2090	0.0823	1.0500e-003	0.0385	1.7300e-003	0.0402	0.0111	1.6500e-003	0.0128	0.0000	100.9855	100.9855	1.0700e-003	0.0149	105.4553
Worker	0.0805	0.0568	0.7806	2.3400e-003	0.2917	1.3300e-003	0.2931	0.0775	1.2200e-003	0.0787	0.0000	219.2594	219.2594	5.0200e-003	5.4700e-003	221.0153
Total	**0.0870**	**0.2659**	**0.8629**	**3.3900e-003**	**0.3303**	**3.0600e-003**	**0.3333**	**0.0886**	**2.8700e-003**	**0.0915**	**0.0000**	**320.2449**	**320.2449**	**6.0900e-003**	**0.0204**	**326.4706**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0416	0.2838	2.2175	3.4200e-003		5.1800e-003	5.1800e-003		5.1800e-003	5.1800e-003	0.0000	294.4480	294.4480	0.0696	0.0000	296.1887
Total	**0.0416**	**0.2838**	**2.2175**	**3.4200e-003**		**5.1800e-003**	**5.1800e-003**		**5.1800e-003**	**5.1800e-003**	**0.0000**	**294.4480**	**294.4480**	**0.0696**	**0.0000**	**296.1887**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.4 Building Construction - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.5000e-003	0.2090	0.0823	1.0500e-003	0.0385	1.7300e-003	0.0402	0.0111	1.6500e-003	0.0128	0.0000	100.9855	100.9855	1.0700e-003	0.0149	105.4553
Worker	0.0805	0.0568	0.7806	2.3400e-003	0.2917	1.3300e-003	0.2931	0.0775	1.2200e-003	0.0787	0.0000	219.2594	219.2594	5.0200e-003	5.4700e-003	221.0153
Total	**0.0870**	**0.2659**	**0.8629**	**3.3900e-003**	**0.3303**	**3.0600e-003**	**0.3333**	**0.0886**	**2.8700e-003**	**0.0915**	**0.0000**	**320.2449**	**320.2449**	**6.0900e-003**	**0.0204**	**326.4706**

3.5 Paving - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.9500e-003	0.0381	0.0585	9.0000e-005		1.8700e-003	1.8700e-003		1.7200e-003	1.7200e-003	0.0000	8.0106	8.0106	2.5900e-003	0.0000	8.0754
Paving	1.9700e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**5.9200e-003**	**0.0381**	**0.0585**	**9.0000e-005**		**1.8700e-003**	**1.8700e-003**		**1.7200e-003**	**1.7200e-003**	**0.0000**	**8.0106**	**8.0106**	**2.5900e-003**	**0.0000**	**8.0754**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Paving - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.8000e-004	1.3000e-004	1.7600e-003	1.0000e-005	6.6000e-004	0.0000	6.6000e-004	1.8000e-004	0.0000	1.8000e-004	0.0000	0.4956	0.4956	1.0000e-005	1.0000e-005	0.4996
Total	**1.8000e-004**	**1.3000e-004**	**1.7600e-003**	**1.0000e-005**	**6.6000e-004**	**0.0000**	**6.6000e-004**	**1.8000e-004**	**0.0000**	**1.8000e-004**	**0.0000**	**0.4956**	**0.4956**	**1.0000e-005**	**1.0000e-005**	**0.4996**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.1200e-003	4.8600e-003	0.0692	9.0000e-005		1.5000e-004	1.5000e-004		1.5000e-004	1.5000e-004	0.0000	8.0106	8.0106	2.5900e-003	0.0000	8.0754
Paving	1.9700e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**3.0900e-003**	**4.8600e-003**	**0.0692**	**9.0000e-005**		**1.5000e-004**	**1.5000e-004**		**1.5000e-004**	**1.5000e-004**	**0.0000**	**8.0106**	**8.0106**	**2.5900e-003**	**0.0000**	**8.0754**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Paving - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.8000e-004	1.3000e-004	1.7600e-003	1.0000e-005	6.6000e-004	0.0000	6.6000e-004	1.8000e-004	0.0000	1.8000e-004	0.0000	0.4956	0.4956	1.0000e-005	1.0000e-005	0.4996
Total	**1.8000e-004**	**1.3000e-004**	**1.7600e-003**	**1.0000e-005**	**6.6000e-004**	**0.0000**	**6.6000e-004**	**1.8000e-004**	**0.0000**	**1.8000e-004**	**0.0000**	**0.4956**	**0.4956**	**1.0000e-005**	**1.0000e-005**	**0.4996**

3.5 Paving - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	5.4900e-003	0.0515	0.0875	1.4000e-004		2.5100e-003	2.5100e-003		2.3100e-003	2.3100e-003	0.0000	12.0116	12.0116	3.8800e-003	0.0000	12.1087
Paving	2.9500e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**8.4400e-003**	**0.0515**	**0.0875**	**1.4000e-004**		**2.5100e-003**	**2.5100e-003**		**2.3100e-003**	**2.3100e-003**	**0.0000**	**12.0116**	**12.0116**	**3.8800e-003**	**0.0000**	**12.1087**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Paving - 2025

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.6000e-004	1.7000e-004	2.4700e-003	1.0000e-005	9.9000e-004	0.0000	9.9000e-004	2.6000e-004	0.0000	2.7000e-004	0.0000	0.7254	0.7254	2.0000e-005	2.0000e-005	0.7309
Total	**2.6000e-004**	**1.7000e-004**	**2.4700e-003**	**1.0000e-005**	**9.9000e-004**	**0.0000**	**9.9000e-004**	**2.6000e-004**	**0.0000**	**2.7000e-004**	**0.0000**	**0.7254**	**0.7254**	**2.0000e-005**	**2.0000e-005**	**0.7309**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.6800e-003	7.2900e-003	0.1038	1.4000e-004		2.2000e-004	2.2000e-004		2.2000e-004	2.2000e-004	0.0000	12.0115	12.0115	3.8800e-003	0.0000	12.1087
Paving	2.9500e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**4.6300e-003**	**7.2900e-003**	**0.1038**	**1.4000e-004**		**2.2000e-004**	**2.2000e-004**		**2.2000e-004**	**2.2000e-004**	**0.0000**	**12.0115**	**12.0115**	**3.8800e-003**	**0.0000**	**12.1087**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Paving - 2025

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.6000e-004	1.7000e-004	2.4700e-003	1.0000e-005	9.9000e-004	0.0000	9.9000e-004	2.6000e-004	0.0000	2.7000e-004	0.0000	0.7254	0.7254	2.0000e-005	2.0000e-005	0.7309
Total	**2.6000e-004**	**1.7000e-004**	**2.4700e-003**	**1.0000e-005**	**9.9000e-004**	**0.0000**	**9.9000e-004**	**2.6000e-004**	**0.0000**	**2.7000e-004**	**0.0000**	**0.7254**	**0.7254**	**2.0000e-005**	**2.0000e-005**	**0.7309**

3.6 Architectural Coating - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.6234					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.7100e-003	0.0115	0.0181	3.0000e-005		5.2000e-004	5.2000e-004		5.2000e-004	5.2000e-004	0.0000	2.5533	2.5533	1.4000e-004	0.0000	2.5567
Total	**0.6251**	**0.0115**	**0.0181**	**3.0000e-005**		**5.2000e-004**	**5.2000e-004**		**5.2000e-004**	**5.2000e-004**	**0.0000**	**2.5533**	**2.5533**	**1.4000e-004**	**0.0000**	**2.5567**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.6 Architectural Coating - 2025

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1900e-003	8.1000e-004	0.0115	4.0000e-005	4.6200e-003	2.0000e-005	4.6400e-003	1.2300e-003	2.0000e-005	1.2400e-003	0.0000	3.3851	3.3851	7.0000e-005	8.0000e-005	3.4109
Total	**1.1900e-003**	**8.1000e-004**	**0.0115**	**4.0000e-005**	**4.6200e-003**	**2.0000e-005**	**4.6400e-003**	**1.2300e-003**	**2.0000e-005**	**1.2400e-003**	**0.0000**	**3.3851**	**3.3851**	**7.0000e-005**	**8.0000e-005**	**3.4109**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.6234					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.0000e-004	1.2900e-003	0.0183	3.0000e-005		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005	0.0000	2.5533	2.5533	1.4000e-004	0.0000	2.5567
Total	**0.6237**	**1.2900e-003**	**0.0183**	**3.0000e-005**		**4.0000e-005**	**4.0000e-005**		**4.0000e-005**	**4.0000e-005**	**0.0000**	**2.5533**	**2.5533**	**1.4000e-004**	**0.0000**	**2.5567**

3.6 Architectural Coating - 2025

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1900e-003	8.1000e-004	0.0115	4.0000e-005	4.6200e-003	2.0000e-005	4.6400e-003	1.2300e-003	2.0000e-005	1.2400e-003	0.0000	3.3851	3.3851	7.0000e-005	8.0000e-005	3.4109
Total	**1.1900e-003**	**8.1000e-004**	**0.0115**	**4.0000e-005**	**4.6200e-003**	**2.0000e-005**	**4.6400e-003**	**1.2300e-003**	**2.0000e-005**	**1.2400e-003**	**0.0000**	**3.3851**	**3.3851**	**7.0000e-005**	**8.0000e-005**	**3.4109**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.6951	0.8647	7.2044	0.0160	1.7975	0.0113	1.8088	0.4787	0.0105	0.4892	0.0000	1,502.6312	1,502.6312	0.0795	0.0624	1,523.2158
Unmitigated	0.6951	0.8647	7.2044	0.0160	1.7975	0.0113	1.8088	0.4787	0.0105	0.4892	0.0000	1,502.6312	1,502.6312	0.0795	0.0624	1,523.2158

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Low Rise	1,405.44	1,562.88	1205.76	4,781,982	4,781,982
Parking Lot	0.00	0.00	0.00		
Recreational Swimming Pool	0.00	0.00	0.00		
Total	1,405.44	1,562.88	1,205.76	4,781,982	4,781,982

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Low Rise	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3
Parking Lot	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0
Recreational Swimming Pool	16.60	8.40	6.90	33.00	48.00	19.00	52	39	9

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Low Rise	0.548752	0.057478	0.177127	0.144672	0.027288	0.003261	0.005053	0.008340	0.000275	0.000141	0.024682	0.000491	0.002439
Parking Lot	0.537845	0.056225	0.173186	0.138405	0.025906	0.007191	0.011447	0.018769	0.000611	0.000309	0.023821	0.001097	0.005189

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Recreational Swimming Pool	0.537845	0.056225	0.173186	0.138405	0.025906	0.007191	0.011447	0.018769	0.000611	0.000309	0.023821	0.001097	0.005189

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	152.1371	152.1371	0.0128	1.5600e-003	152.9220
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	152.1371	152.1371	0.0128	1.5600e-003	152.9220
NaturalGas Mitigated	0.0157	0.1338	0.0569	8.5000e-004		0.0108	0.0108		0.0108	0.0108	0.0000	154.9778	154.9778	2.9700e-003	2.8400e-003	155.8988
NaturalGas Unmitigated	0.0157	0.1338	0.0569	8.5000e-004		0.0108	0.0108		0.0108	0.0108	0.0000	154.9778	154.9778	2.9700e-003	2.8400e-003	155.8988

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Low Rise	2.90417e+006	0.0157	0.1338	0.0569	8.5000e-004		0.0108	0.0108		0.0108	0.0108	0.0000	154.9778	154.9778	2.9700e-003	2.8400e-003	155.8988
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0157**	**0.1338**	**0.0569**	**8.5000e-004**		**0.0108**	**0.0108**		**0.0108**	**0.0108**	**0.0000**	**154.9778**	**154.9778**	**2.9700e-003**	**2.8400e-003**	**155.8988**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Low Rise	2.90417e+006	0.0157	0.1338	0.0569	8.5000e-004		0.0108	0.0108		0.0108	0.0108	0.0000	154.9778	154.9778	2.9700e-003	2.8400e-003	155.8988
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0157**	**0.1338**	**0.0569**	**8.5000e-004**		**0.0108**	**0.0108**		**0.0108**	**0.0108**	**0.0000**	**154.9778**	**154.9778**	**2.9700e-003**	**2.8400e-003**	**155.8988**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Low Rise	800630	141.9882	0.0120	1.4500e-003	142.7207
Parking Lot	57226.7	10.1489	8.6000e-004	1.0000e-004	10.2013
Recreational Swimming Pool	0	0.0000	0.0000	0.0000	0.0000
Total		**152.1371**	**0.0128**	**1.5500e-003**	**152.9220**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Low Rise	800630	141.9882	0.0120	1.4500e-003	142.7207
Parking Lot	57226.7	10.1489	8.6000e-004	1.0000e-004	10.2013
Recreational Swimming Pool	0	0.0000	0.0000	0.0000	0.0000
Total		**152.1371**	**0.0128**	**1.5500e-003**	**152.9220**

6.0 Area Detail

6.1 Mitigation Measures Area

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.8264	0.0228	1.9813	1.0000e-004		0.0110	0.0110		0.0110	0.0110	0.0000	3.2385	3.2385	3.1100e-003	0.0000	3.3164
Unmitigated	0.8264	0.0228	1.9813	1.0000e-004		0.0110	0.0110		0.0110	0.0110	0.0000	3.2385	3.2385	3.1100e-003	0.0000	3.3164

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0623					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.7044					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0597	0.0228	1.9813	1.0000e-004		0.0110	0.0110		0.0110	0.0110	0.0000	3.2385	3.2385	3.1100e-003	0.0000	3.3164
Total	**0.8264**	**0.0228**	**1.9813**	**1.0000e-004**		**0.0110**	**0.0110**		**0.0110**	**0.0110**	**0.0000**	**3.2385**	**3.2385**	**3.1100e-003**	**0.0000**	**3.3164**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0623					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.7044					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0597	0.0228	1.9813	1.0000e-004		0.0110	0.0110		0.0110	0.0110	0.0000	3.2385	3.2385	3.1100e-003	0.0000	3.3164
Total	**0.8264**	**0.0228**	**1.9813**	**1.0000e-004**		**0.0110**	**0.0110**		**0.0110**	**0.0110**	**0.0000**	**3.2385**	**3.2385**	**3.1100e-003**	**0.0000**	**3.3164**

7.0 Water Detail

7.1 Mitigation Measures Water

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	49.4062	0.4201	0.0103	62.9743
Unmitigated	49.4062	0.4201	0.0103	62.9743

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Low Rise	12.5096 / 7.88647	48.3948	0.4114	0.0101	61.6828
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	0.263778 / 0.161671	1.0114	8.6700e-003	2.1000e-004	1.2915
Total		**49.4062**	**0.4200**	**0.0103**	**62.9743**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Low Rise	12.5096 / 7.88647	48.3948	0.4114	0.0101	61.6828
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	0.263778 / 0.161671	1.0114	8.6700e-003	2.1000e-004	1.2915
Total		**49.4062**	**0.4200**	**0.0103**	**62.9743**

8.0 Waste Detail

8.1 Mitigation Measures Waste

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	23.0882	1.3645	0.0000	57.2000
Unmitigated	23.0882	1.3645	0.0000	57.2000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Low Rise	88.32	17.9282	1.0595	0.0000	44.4163
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	25.42	5.1600	0.3050	0.0000	12.7838
Total		**23.0882**	**1.3645**	**0.0000**	**57.2000**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Low Rise	88.32	17.9282	1.0595	0.0000	44.4163
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	25.42	5.1600	0.3050	0.0000	12.7838
Total		**23.0882**	**1.3645**	**0.0000**	**57.2000**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Appendix C

EMFAC2017 Vehicle Fuel Consumption Data

Source: EMFAC2017 (v1.0.3) Emissions Inventory
Region Type: Air District
Region: South Coast AQMD
Calendar Year: 2024
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Units: miles/day for VMT, trips/day for Trips, tons/day for Emissions, 1000 gallons/day for Fuel Consumption

Region	CalYr	VehClass	MdlYr	Speed	Fuel	Population	VMT	Fuel_Consumption	Fuel Split (Gas:Diesel)	MPG, by Fuel Type	MPG, Average
SOUTH COAST AQMD	2024	LDA	Aggregate	Aggregate	Gasoline	6721891.297	253006673.7	7787.150873	0.993591401	32.49027505	32.609858
SOUTH COAST AQMD	2024	LDA	Aggregate	Aggregate	Diesel	65701.80516	2569094.642	50.2266094	0.006408599	51.15007109	
SOUTH COAST AQMD	2024	LDT1	Aggregate	Aggregate	Gasoline	779748.6283	28286817.37	1018.205639	0.999667891	27.78104569	27.779533
SOUTH COAST AQMD	2024	LDT1	Aggregate	Aggregate	Diesel	336.6362364	7857.181353	0.338267227	0.000332109	23.22773457	
SOUTH COAST AQMD	2024	LDT2	Aggregate	Aggregate	Gasoline	2324381.709	85796127.87	3256.04031	0.99440326	26.3498359	26.412498
SOUTH COAST AQMD	2024	LDT2	Aggregate	Aggregate	Diesel	16866.70208	688058.7876	18.32577707	0.00559674	37.54595427	
SOUTH COAST AQMD	2024	MDV	Aggregate	Aggregate	Gasoline	1599677.021	55496538.13	2605.861943	0.980433943	21.29680671	21.44412
SOUTH COAST AQMD	2024	MDV	Aggregate	Aggregate	Diesel	38789.91307	1499058.187	52.00395627	0.019566057	28.82584893	
SOUTH COAST AQMD	2024	LHDT1	Aggregate	Aggregate	Gasoline	174005.1304	6143072.551	571.0938215	0.710793487	10.75667836	14.06391
SOUTH COAST AQMD	2024	LHDT1	Aggregate	Aggregate	Diesel	131545.2386	5156710.286	232.3657373	0.289206513	22.19221451	
SOUTH COAST AQMD	2024	LHDT2	Aggregate	Aggregate	Gasoline	30198.85656	1028982.266	110.0044405	0.524136642	9.354006634	14.438065
SOUTH COAST AQMD	2024	LHDT2	Aggregate	Aggregate	Diesel	52580.787	2001241.348	99.87296869	0.475863358	20.03786785	
SOUTH COAST AQMD	2024	MHDT	Aggregate	Aggregate	Gasoline	25804.01311	1359447.346	260.9695593	0.262882364	5.209218076	9.7332055
SOUTH COAST AQMD	2024	MHDT	Aggregate	Aggregate	Diesel	127715.0631	8302936.698	731.7541635	0.737117636	11.34662037	
SOUTH COAST AQMD	2024	HHDT	Aggregate	Aggregate	Gasoline	74.26701173	8620.013986	1.970996537	0.001023098	4.373429291	7.2369628
SOUTH COAST AQMD	2024	HHDT	Aggregate	Aggregate	Diesel	112561.0217	13933380.76	1924.527902	0.998976902	7.239895427	
SOUTH COAST AQMD	2024	OBUS	Aggregate	Aggregate	Gasoline	5954.495306	241431.3981	46.57584459	0.545658396	5.183618252	6.8388074
SOUTH COAST AQMD	2024	OBUS	Aggregate	Aggregate	Diesel	4446.352976	342309.6953	38.78130359	0.454341604	8.826668099	
SOUTH COAST AQMD	2024	UBUS	Aggregate	Aggregate	Gasoline	963.3912088	90309.26527	17.13863049	0.987830384	5.269339654	5.2746433
SOUTH COAST AQMD	2024	UBUS	Aggregate	Aggregate	Diesel	10.4228222	1204.585498	0.211140045	0.012169616	5.705149394	
SOUTH COAST AQMD	2024	SBUS	Aggregate	Aggregate	Gasoline	2938.097706	117037.9587	12.58591075	0.315821259	9.299125111	8.2591136
SOUTH COAST AQMD	2024	SBUS	Aggregate	Aggregate	Diesel	6709.767948	212099.0577	27.2654621	0.684178741	7.779037705	
SOUTH COAST AQMD	2024	MCY	Aggregate	Aggregate	Gasoline	313845.7262	2132419.376	58.88420697	1	36.21377421	36.213774
SOUTH COAST AQMD	2024	MH	Aggregate	Aggregate	Gasoline	34296.13104	327056.6532	61.78369342	0.841147789	5.29357562	6.1695474
SOUTH COAST AQMD	2024	MH	Aggregate	Aggregate	Diesel	13472.14217	126106.7887	11.66795706	0.158852211	10.8079579	



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