CEQA PLUS INITIAL STUDY

AND

MITIGATED NEGATIVE DECLARATION

FOR THE

RIALTO HABITAT NATURE CENTER PROJECT

STATE CLEARINGHOUSE NUMBER 2024020570

Prepared For:

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Utilities Division

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LIST OF ABBREVIATIONS

BMP	best management practice
CAAQS	California ambient air quality standards
Cal/OSHA	California Occupational Safety and Health Administration
CalEEMod	California Emissions Estimator Model
CARB	California Air Resources Board
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife
CESA	California Endangered Species Act
CNDDB	California Natural Diversity Database
CO	Carbon monoxide
Cortese List	Hazardous Waste and Substances Sites List
CRHR	California Register of Historic Resources
dBA	A-weighted decibels
DOC	California Department of Conservation
DTSC	California Department of Toxic Substances Control
EPA	U.S. Environmental Protection Agency
ESA	federal Endangered Species Act
FHSZ	fire hazard severity zone
FMMP	Farmland Mapping and Monitoring Program
GHGs	greenhouse gases
IPaC	Information, Planning, and Consultation System

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Ldn	Day-Night Level
Leq	Equivalent Continuous Sound Level
LRA	Local Responsibility Area
MLD	Most Likely Descendant
MTCO2/year	metric tons of carbon dioxide-equivalent per year
MTP/SCS	Metropolitan Transportation Plan/Sustainable Communities Strategy
NAAQS	national ambient air quality standards
NAHC	Native American Heritage Commission
NCIC	North Central Information Center
NO2	nitrogen dioxide
NOX	nitrogen oxide
NPDES	National Pollution Discharge Elimination System
NRH	National Register of Historic Places
PM10	respirable particulate matter with an aerodynamic diameter less than or equal to 10 microns
PM2.5	fine particulate matter with an aerodynamic diameter less than or equal to 2.5 microns in diameter
PPV	peak particle velocity
PRC	Public Resources Code
RMS	root-mean-square
ROG	reactive organic gases
RPS	renewables portfolio standard
SARWQCB	Santa Ana Region Water Quality Control Board
SCAQMD	South Coast Air Quality Management District
SO2	Sulfur dioxide
SPL	sound pressure level
SRA	State Responsibility Area
SWPPP	stormwater pollution prevention plan
USFWS	U.S. Fish and Wildlife Service
VdB	vibration velocity
WDR	waste discharge requirements

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1.0 INTRODUCTION

1.1 INTRODUCTION AND REGULATORY GUIDANCE

This Initial Study/Mitigated Negative Declaration (IS/MND) has been prepared by the City of Rialto (City) to evaluate potential environmental effects resulting from the proposed Rialto Habitat Nature Center Project (the Project). Chapter 2 "Project Description" presents detailed Project information.

This document has been prepared in accordance with the California Environmental Quality Act (CEQA) (Public Resources Code Section 21000 et seq.) and the State CEQA Guidelines (California Code of Regulations Section 15000 et seq.). An initial study is prepared by a lead agency to determine if a project may have a significant effect on the environment (State CEQA Guidelines Section 15063[a]), and thus to determine the appropriate environmental document. In accordance with State CEQA Guidelines Section 15070, a "public agency shall prepare…a proposed negative declaration or mitigated negative declaration…when: (a) The Initial Study shows that there is no substantial evidence…that the Project may have a significant impact on the environment, or (b) The Initial Study identifies potentially significant effects but revisions to the Project plans or proposal are agreed to by the applicant and such revisions would reduce potentially significant effects to a less-than-significant level." In this circumstance, the lead agency prepares a written statement describing its reasons for concluding that the Project would not have a significant effect on the environment and, therefore, does not require the preparation of an Environmental Impact Report (EIR). By contrast, an EIR is required when the Project may have a significant environmental impact that cannot clearly be reduced to a less-than-significant effect by adoption of mitigation or by revisions in the Project design.

In addition, the proposed Project may be partially funded with a loan from the federal Clean Water State Revolving Fund (SRF) program established by the U.S. Environmental Protection Agency (EPA). This program is administered, nationally, by the EPA, and in certain instances the administration has been delegated to the states. In California, administration of the SRF program has been delegated to the State Water Resources Control Board (SWRCB). In turn, the SWRCB requires that all projects being considered under the SRF program must comply with CEQA and certain federal environmental protection laws. Collectively, the SWRCB refers to these requirements as "CEQA-Plus." Therefore, this IS/MND has been expanded beyond the typical content requirements of an initial study to include additional "CEQA-Plus" information. CEQA does not require consideration of alternatives in MNDs; however, an analysis of alternatives is provided to meet SRF Program requirements. Other CEQA-Plus requirements are fulfilled in the IS analysis and associated appendices (see Chapter 4, "Compliance with Federal Regulations," for a complete list of federal laws address in compliance with SRF Program requirements). The SWRCB, as a responsible agency for the Project, will consider this CEQA document prior to any SRF loan authorization.

1.2 PURPOSE OF THIS DOCUMENT

As described in the environmental checklist (Chapter 3), the proposed Project would not result in any unmitigated significant environmental impacts. Therefore, an IS/MND is the appropriate document for compliance with the requirements of CEQA. This IS/MND conforms to these requirements and to the content requirements of State CEQA Guidelines Section 15071.

Under CEQA, the lead agency is the public agency with primary responsibility over approval of the Project. The City is the CEQA lead agency because they are responsible for constructing, operating, and funding the Rialto Habitat Nature Center Project. The purpose of this document is to present to decision-makers and the public information about the environmental consequences of implementing the Project. This disclosure document is being made

available to the public for review and comment. Because state agencies will act as responsible or trustee agencies, the City will circulate the IS/MND to the State Clearinghouse of the Governor's Office of Planning and Research for distribution and a 30-day public review period from February 15, 2024, to March 18, 2024. A copy of the IS/MND and supporting documentation are available for review on the City's website:

https://www.yourrialto.com/755/Lake-Rialto

Comments should be addressed to:

John Rossi, Director of Utilities
Utilities Division
City of Rialto
150 South Palm Avenue
Rialto, CA 92376

E-mail comments may be addressed to: abrown@rialtoca.gov

If you have questions regarding the IS/MND, please call Arron Brown at: (909) 421-7219. If you wish to send written comments (including via e-mail), they must be postmarked by March 18, 2024. After comments are received from the public and reviewing agencies, the City may (1) adopt the MND and approve the Project; (2) undertake additional environmental studies; or (3) abandon the Project. If the Project is approved for funding, the City may proceed with the Project.

Revised and Final IS/MND Note: During the public review period, one comment letter was received from the California Department of Fish and Wildlife. Minor text edits and two figures were added to the IS/MND to provide the commenter with information to address their concerns. These minor changes do not represent significant new information or new mitigation measures that would otherwise require recirculation of the IS/MND. Commentor's letter with comments numbered and individual responses to each comment are provided in this Final IS/MND as Appendix E. Although the IS/MND determined there are no impacts anticipated with respect to Tribal Cultural Resources associated with the Project, a Mitigation Measure was added to the Tribal Cultural Resources analysis section requiring the City to implement archaeological monitoring during initial grading and related ground disturbing activities. This addition is a result of consultation with the Gabrieleno Band of Mission Indians - Kizh Na□on. Where a comment resulted in a change to the Public Review IS/MND text, the responses in Appendix E show the full text revision where added text is shown in double underline font (double underlined) and deleted text is shown in strikeout font (~~strikeout~~). However, the updated text in the body of this Final IS/MND is shown in clean text format.

1.3 SUMMARY OF FINDINGS

Chapter 3 of this document contains the analysis and discussion of potential environmental impacts of the Project. Based on the issues evaluated in that chapter, it was determined that the Project would have either no impact or a less-than-significant impact related to most of the issue areas identified in the Environmental Checklist, included as Appendix G of the State CEQA Guidelines. These include the following issue areas:

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

Potentially significant impacts were identified for biological resources, cultural resources, and geology and soils; however, mitigation measures included in the IS/MND would reduce all impacts to a less than significant level.

1.4 DOCUMENT ORGANIZATION

This IS/MND is organized as follows:

Chapter 1: Introduction. This chapter provides an introduction to the environmental review process and SRF process. It describes the purpose and organization of this document as well as presents a summary of findings.

Chapter 2: Project Description. This chapter describes the purpose of and need for the proposed Project, identifies Project objectives, and provides a detailed description of the Project.

Chapter 3: Environmental Checklist. This chapter presents an analysis of a range of environmental issues identified in the CEQA Environmental Checklist and determines if Project actions would result in no impact, a less-than-significant impact, a less-than-significant impact with mitigation incorporated, or a potentially significant impact. If any impacts were determined to be potentially significant, an EIR would be required. For this Project, however, none of the impacts were determined to be significant after implementation of mitigation measures.

Chapter 4: Compliance with Federal Regulations. This chapter provides a discussion of compliance with federal executive orders and regulations required for "CEQA-Plus" compliance.

Chapter 5: Alternatives. This chapter provides an analysis of alternatives to the proposed Project including the No Project Alternative.

Chapter 6: Mitigation Monitoring Report Plan. This chapter provides mitigation, monitoring, and reporting plan designed to fulfill Section 21081.6 of the California Environmental Quality Act (CEQA), which requires public agencies to adopt a reporting or monitoring program whenever a project or program is approved that includes mitigation measures identified in an environmental document.

Chapter 7: References. This chapter lists the references used in preparation of this IS/Proposed MND.

Chapter 8: List of Preparers. This chapter identifies report preparers.

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2.0 PROJECT DESCRIPTION

2.1 PROJECT OVERVIEW

The City of Rialto (City) is proposing to construct the Rialto Habitat Nature Center (RHNC) on a vacant portion of the City's Wastewater Treatment Plant (WWTP) property. The proposed Project would provide an approximately 13-acre outdoor public space including an approximately 10-acre non-contact/non-water craft lake consisting of two connected lakes, 1 mile of pedestrian perimeter trails, passive recreation, environmental education programming, and public outreach. The lakes would be created by intercepting fully treated (primary, secondary, and tertiary) effluent from the WWTP that is currently discharged into the lined Rialto Channel and routing a portion of the effluent flow into the proposed lake. The treated water from the WWTP would be reclaimed and temporarily stored in the lakes prior to being discharged back into the concrete-lined channel at the existing location. The City currently discharges treated effluent into the concrete-lined Rialto Channel that flows downstream and changes into an unlined portion of the channel south of Agua Mansa Road prior to flowing into the Santa Ana River. Agua Mansa Road is located approximately 0.25 miles and the Santa Ana River approximately 0.65 miles down channel from the discharge point. The proposed Project would not change the flow rate or discharge location of effluent into the Rialto Channel and Santa Ana River.

The proposed Project includes an 11-space public parking area located approximately 0.25 miles to the south on Agua Mansa Road. Access to the RHNC from the parking area would be provided by a path of travel along the service road that runs along the west side of Rialto Channel. The RHNC site, Agua Mansa Road parking area, and path of travel constitute the proposed Project or Project for the purposes of this document.

It should be noted that the City has the ability and capacity to choose not to divert any water into the lakes post construction, for the purposes of regulating flows into Rialto Channel or maintenance of the lakes. Reasons for temporarily or permanently stopping the diverting and storage of the water from the lakes could be for maintenance of the lined and unlined portions of Rialto Channel, or overall operations of the lakes.

2.2 PROJECT LOCATION

2.2.1 Rialto Habitat Nature Center

RHNC would be located on an approximately 13-acre site in the southern portion of the approximately 40-acre City-owned Rialto WWTP, located at 501 E. Santa Ana Avenue, City of Rialto, San Bernardino County (Figure 2-1, Regional Location). Parking for the proposed RHNC would be located approximately 0.25 miles to the south on Agua Mansa Road as discussed further in Section 2.4. The RHNC site is generally located northwest of the Santa Ana River, and south of Interstate 10 between Riverside Avenue to the west and Pepper Avenue (extended) to the east (Figure 2-2, Aerial View of Project Vicinity). The RHNC site is bordered by the existing WWTP to the north, So Cal Edison power poles and easement to the south, the concrete-lined Rialto Channel to the east, and undeveloped industrial-zoned property to the west.

2.2.2 Public Parking and Pedestrian Path

Due to safety concerns preventing parking within the WWTP property, the City considered various parking locations for the RHNC. Described in detail below is the preferred public parking location that was selected and is therefore analyzed in this Initial Study.

Public parking for the proposed project would be constructed on an approximately 0.15-acre vacant site, identified as APN 805-36-185A, located on the north side of Agua Mansa Road, east of 687 West Agua Mansa Road, and directly

west of the Agua Mansa Road crossing of the Rialto Channel. The parking location is approximately 0.25 miles to the south of the RHNC site in the City of Colton and within San Bernardino County right-of-way (Agua Mansa Road). Development of the parking area may require approvals or permits from other jurisdictions including San Bernardino County and the City of Colton. Development of the parking area would require site preparation, earthwork, and paving. The parking area would include installation of AC pavement comprised of the 11 parking spaces and a drive aisle, plus a pedestrian connection to RHNC via an existing utility road on the western edge of the Rialto Channel. Development of a pedestrian pathway between the parking area and RHNC on the existing utility road would require minimal improvements including brush clearing, signage, loose rock removal and tread improvement for drainage. The path of travel between the RHNC and the parking area would be approximately 1,300 feet (0.25 miles).

FIGURE 2-1: REGIONAL LOCATION

SOURCE: ENPLANNERS INC. 2024

FIGURE 2-2: AERIAL VIEW OF PROJECT VICINITY

SOURCE: ENPLANNERS INC. 2024

2.3 PROJECT OBJECTIVES

The objective of the Project is to create an outdoor, passive recreational park with environmental education opportunities for Rialto residents, underserved Disadvantaged Communities (DAC) and Severely Disadvantaged Communities (SDAC) communities, and neighboring community residents. The Project would provide surface water quality improvements, open space, and ecosystem and freshwater wildlife habitat through achieving the following basic objectives:

- Creating Wetlands & Wildlife Habitat
- Creating a Community Water Feature, Walking Trails, and Education Experience.

2.4 EXISTING SETTING

2.4.1 RHNC Site

The approximately 13-acre RHNC site is currently vacant and consists of an abandoned, unused pit. The pit was originally used up to the early 1970's as a receiving basin for partially treated discharge from the WWTP. In the early 1970's, implementation of federal Clean Water Act regulations prohibited discharge of partially treated water onto the earth and water ways and as a result the design and discharge was revised to comply with newly adopted regulations. An existing 36-inch discharge pipe near the east side of the pit discharges treated effluent flow directly from the WWTP into the Rialto Channel. A majority of the RHNC site is disturbed or developed. The remaining portions of the site are covered by brittlebush and California buckwheat scrub, mulefat and tamarisk thicket, non-native grasslands, and ruderal vegetation.

2.4.2 Parking Area and Pedestrian Path

The public parking area on Agua Mansa Road is currently an unimproved roadway shoulder consisting of a 0.15-acre generally level site. The site is regularly maintained for weed abatement purposes. The location is within San Bernardino County's Agua Mansa Road right-of-way.

2.4.3 Wastewater Treatment Plant Effluent Flows

The existing wastewater system for the City encompasses approximately 25 square miles and collects and treats wastewater from domestic, commercial, and industrial customers at the City's WWTP located in the southeast portion of the WWTP service area. The WWTP property occupies approximately 25 acres inclusive of the proposed 13-acre RHNC site and has a maximum treatment capacity of 11.7 million gallons per day (mgd). The WWTP provides secondary and tertiary treatment prior to discharging the treated effluent into the concrete-lined Rialto Channel, which is a tributary to the Santa Ana River Watershed. Rialto Channel is concrete-lined for approximately 0.50 miles along the east property boundary of the WWTP and extends to Agua Mansa Road, and the channel is unlined from Agua Mansa Road south approximately 0.30 miles before discharging into the Santa Ana River. The WWTP discharges 100 percent of its treated effluent into the concrete-lined Rialto Channel via a 36-inch diameter effluent pipeline at a location adjacent to the southeast portion of the proposed eastern lake.

Effluent discharged into the channel has varied over the years. To assist with characterizing existing effluent conditions at the WWTP, the most recent 5-year historical period has been used, October 2019 thru October 2024. Based on the last 5 years, the average monthly effluent flow to the Rialto Channel was 6.9 mgd, with a minimum average monthly flow of 5.74 mgd and maximum monthly flow of 7.62 mgd. The high variability of effluent flows to the Rialto Channel is expected and will likely continue as a result of the natural daily variability from high to low demand times of the day, seasonal variability from wet to dry periods of the year and resulting rainfall infiltration, ongoing water use efficiency and conservation efforts, the COVID pandemic, and increases from new growth and

development within the City's service area and adjacent Sphere of Influence. Figures 2-3 and 2-4 present historical effluent flows to the Rialto Channel and resulting seasonal variability.

Figure 2-3: 1-Year Historical Effluent Flows to the Rialto Channel

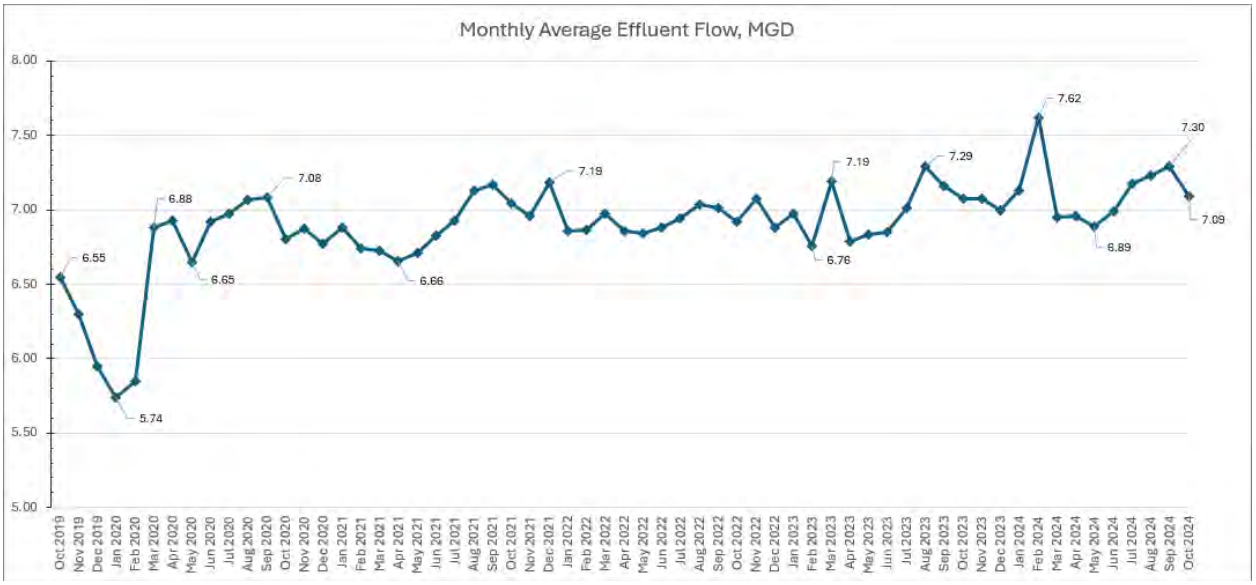
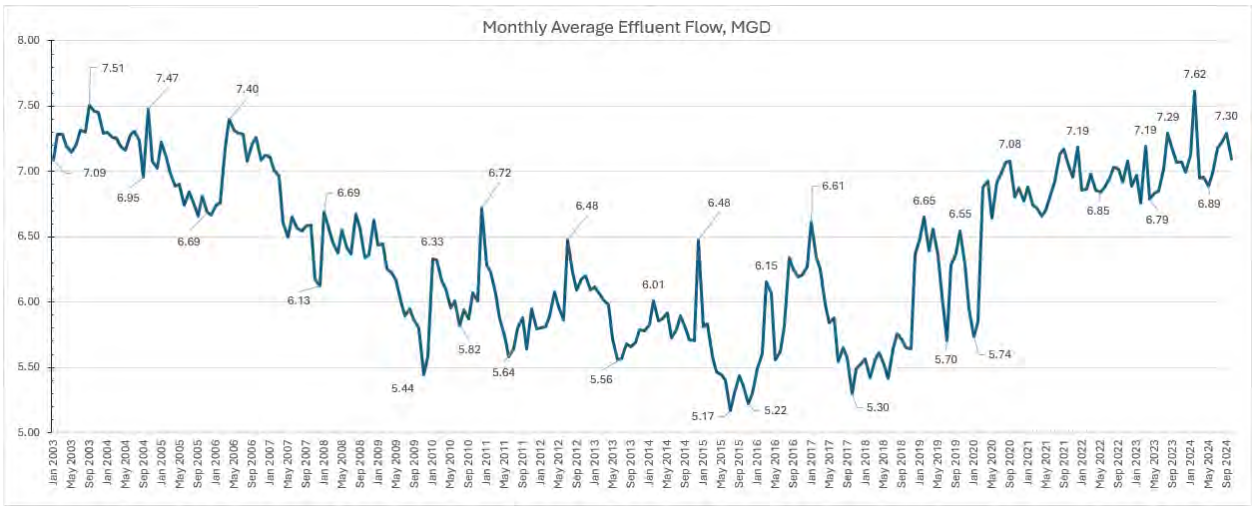


Figure 2-4: 20-Year Historical Effluent Flows to the Rialto Channel



2.4.4 Other Related Planning Efforts (Not a Part of the RHNC)

Local biological agencies including the San Bernardino Valley Municipal Water District (SBVMWD) have drafted a Habitat Conservation Plan (HCP) for the Upper Santa Ana River (SAR) watershed.[1] The HCP is a comprehensive program that would provide a framework to protect, enhance, and restore the habitat for Covered Species defined in the HCP while streamlining permitting for Covered Activities.

[1] *Upper Santa Ana River Habitat Conservation Plan, Stakeholder Draft*, San Bernardino Valley Municipal Water District, October 2020.

Currently, the WWTP discharges 100 percent of its treated effluent flows (average flow 7 mgd; minimum flow 6 mgd; maximum flow 8 mgd)[2] into the concrete-lined Rialto Channel via a 36-inch diameter effluent pipeline. Existing effluent discharge exceeds the 7 cfs or 3.8 mgd flow the City has previously agreed to provide into Rialto Channel as part of prior agreements coordinated with other agencies for the benefit of the Santa Ana River.

The City has recently agreed in concept to sell Inland Empire Utilities Agency (IEUA) 7 mgd of effluent in the first phase and up to 10 mgd in the future, subject to future CEQA analysis and potentially Resource Agency permits. The recycled water interconnect project would include a pump station located north of the RHNC site and within the WWTP property and an interconnection pipeline from the pump station easterly along the northern perimeter of the RHNC site to Rialto Channel. From Rialto Channel, the pipeline would turn north towards Santa Ana Avenue and ultimately to IEUA's Regional Water Recycling Plant No. 4 located at 12811 6th Street in Rancho Cucamonga. The City/IEUA project will be subject to its own environmental review including assessment of potential impacts to biological resources associated with effluent flow changes into the Rialto Channel and Santa Ana River associated with the reclaimed water project.

2.5 PROPOSED PROJECT

RHNC would provide the citizens of Rialto and the region with an approximately 13-acre outdoor public natural space including a 10-acre lake consisting of two connected lakes that would hold approximately 41 acre-feet of water, one mile of pedestrian perimeter trails, passive recreation, environmental education programming, and public outreach (Figure 2-3, Grading Plan). The filling of the lakes for the RHNC would be accomplished by temporarily diverting approximately 10 percent of the treated effluent from the City's WWTP and temporarily storing the water in the lakes to provide passive outdoor and educational experiences and wetland/terrestrial wildlife habitat. While the lakes are being filled, the remaining 90 percent of treated effluent would continue to be discharged into the Rialto Channel. The temporary reduction in effluent flow from the WWTP will be managed to ensure that effluent discharged to the Rialto Channel remains above the historical minimum discharge flows described in revised Section 2.4.3 and managed to be within daily and seasonal historical variability. During this time, the effluent flow into Rialto Channel would temporarily be reduced by approximately ten percent. This slight reduction in flow is within the daily and seasonal effluent flow variation generated by the WWTP and would remain at 6.57 MGD or above (7.3 MGD existing – 0.73 MGD = 6.57 MGD). Once the lake becomes filled, a steady-state condition will be obtained and the amount of effluent into the lake will equal the amount of effluent out from the lake and back into Rialto Channel.

The existing pit would be reengineered to create two lakes separated by a pedestrian path running north-south but connected by duel 24-inch diameter pipes. As shown in Figure 2-4, Liner Installation Plan, a synthetic polyethylene (PE) plastic liner would be installed on the entire bottoms and sides of the lakes. The PE liner would be buried beneath a layer of clay layer installed in the six-foot deep lake perimeter areas and in the manufactured wetlands area in the north side of the larger east lake. The smaller, 3-acre west lake would have a depth of approximately 13 feet. The larger, 7-acre lake would have a depth of 48 feet and would also include a maintenance access ramp to the bottom of the lake when emptied and a shallow marsh wetland area of 3 to 4 acres. For safety purposes, a shallow three-foot-deep and 13-foot-wide bench would be constructed along the edge of the lake (Figure 2-5, Cross Section at Wetlands). Once the lake is created, the discharges to the Rialto Channel would be the same as existing conditions that are occurring today. In essence, the lakes would function as a reclaimed water temporary storage facility using approximately 10 percent the treated effluent prior to its return into the Rialto Channel.

The inlet to the lake from the WWTP would divert from the existing 36-inch effluent pipeline at the northeast corner of the RHNC site. Delivery pipelines ranging from 18 to 30 inches in diameter would deliver reclaimed, treated

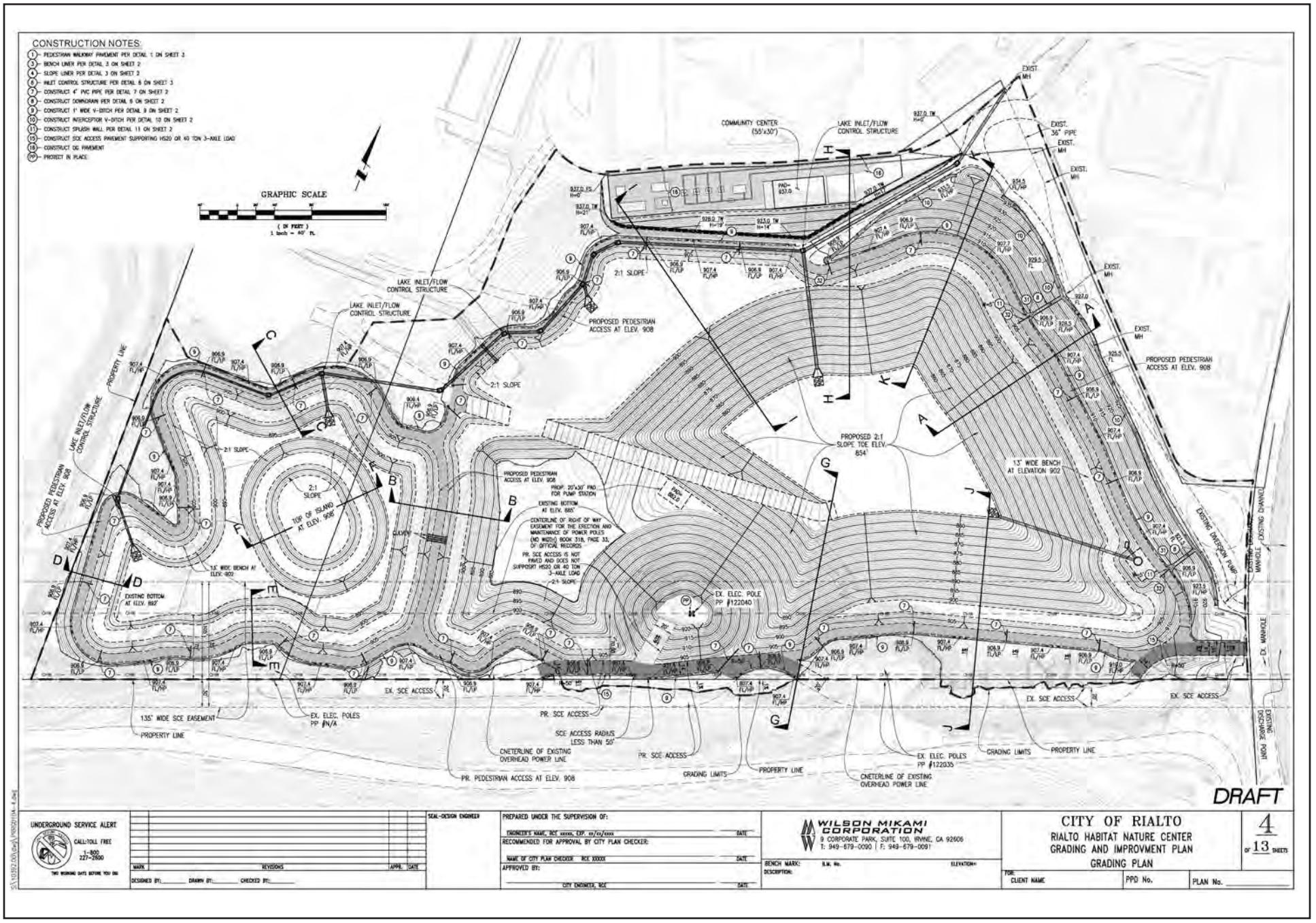
[2] *Rialto Recycled Water Interconnection Preliminary Design Report, Draft Report*, Inland Empire Utilities Agency, page 2-2, June 26, 2023.

effluent into the lake via gravity flow. The pipeline alignment follows the northern and western perimeter of the lake extending approximately 1,200 feet westerly from the diversion junction at the northeast corner of the RHNC property. Inlet control structures and lateral pipelines would deliver the effluent to the bottom of the lake at four locations. The first location would be at the north side of the larger eastern lake and down to the bottom and deepest point of the lake. The second location would be further to the west also on the north side of the larger lake and down to the shallow wetlands area. The third location would be further to the west on the north side of the smaller lake and down to the bottom and deepest point of the smaller lake. The fourth location would be further to the west and south on the west side of the smaller lake and down to the bottom and deepest point of the smaller lake. The outgoing water from the lake would be pumped from the bottom of the larger, deeper lake and discharged back into Rialto Channel at the same location as the WWTP's existing discharge point and near the existing diversion pump in the southeastern corner of the RHNC site.

Drainage for the RHNC site would be accomplished by a network of v-ditches located on the outside of the perimeter trails that encircle the lakes and on the east side of the site approximately 15 to 20 feet above the perimeter trails. The v-ditches would convey off site stormwater flowing onto the site and on-site flow into the lake via down drains located around the lake.

In addition, and as described previously, the proposed Project would include development of an 11-space parking area on an approximately 0.15-acre paved parking which would provide adequate parking and a pedestrian pathway connection along the channel's utility road to the RHNC site (Figure 2-6, Parking Grading and Improvement Plan). Development of the parking area would require site preparation, earthwork, and paving. Development of the pedestrian pathway between the parking area and the lake along the existing utility road would require minimal improvements including brush clearing, signage, loose rock removal and tread improvement for drainage. The path of travel between the lake and the parking area would be approximately 1,300 feet (0.25 mile) along the Rialto Channel utility road. Access into the RHNC site would be accommodated by a gate located in the southeast corner of the site near the Rialto Channel utility road.

FIGURE 2-5: GRADING PLAN

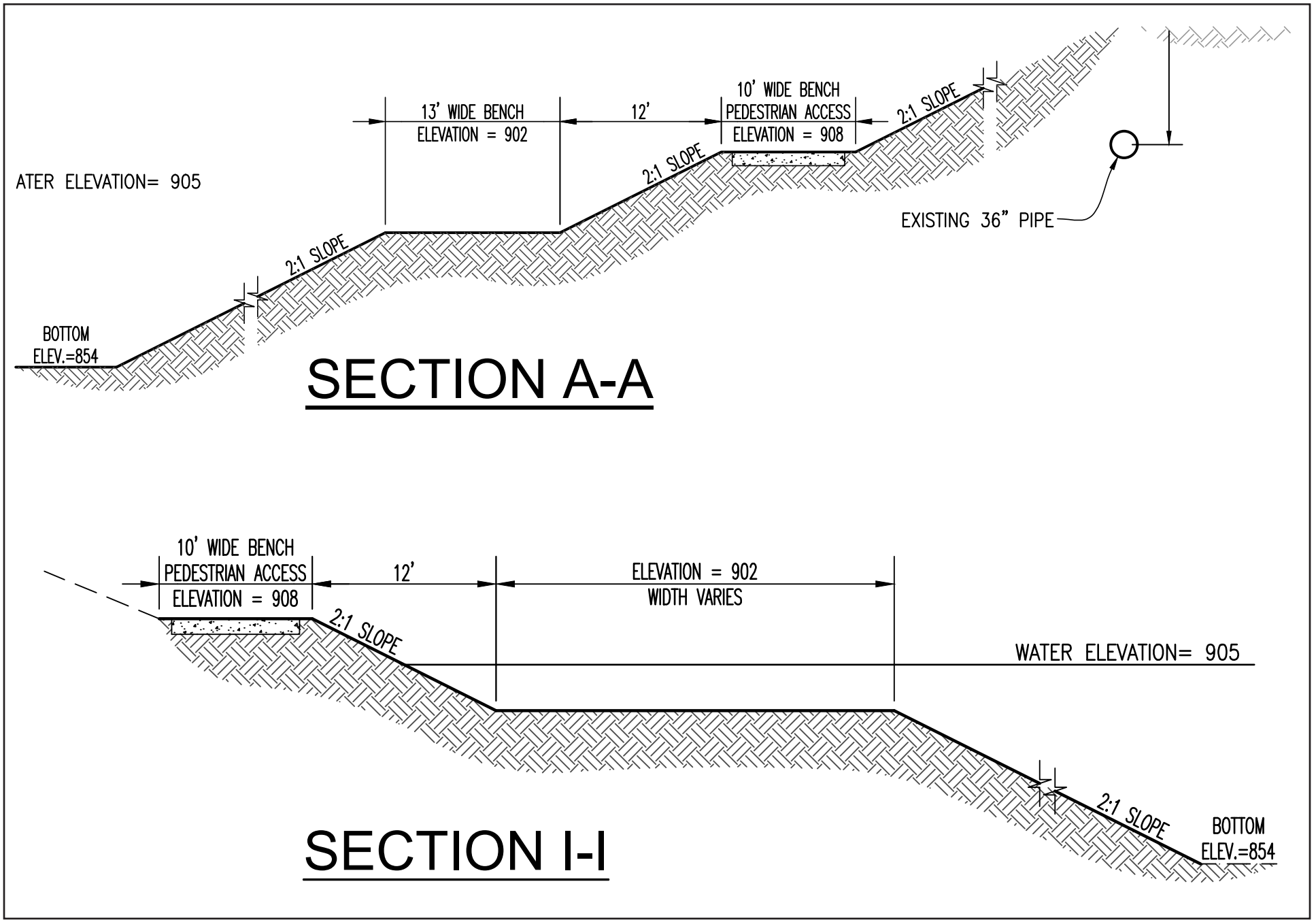


SOURCE: UTILITIES DIVISION 2023

FIGURE 2-6: LINER INSTALLATION PLAN

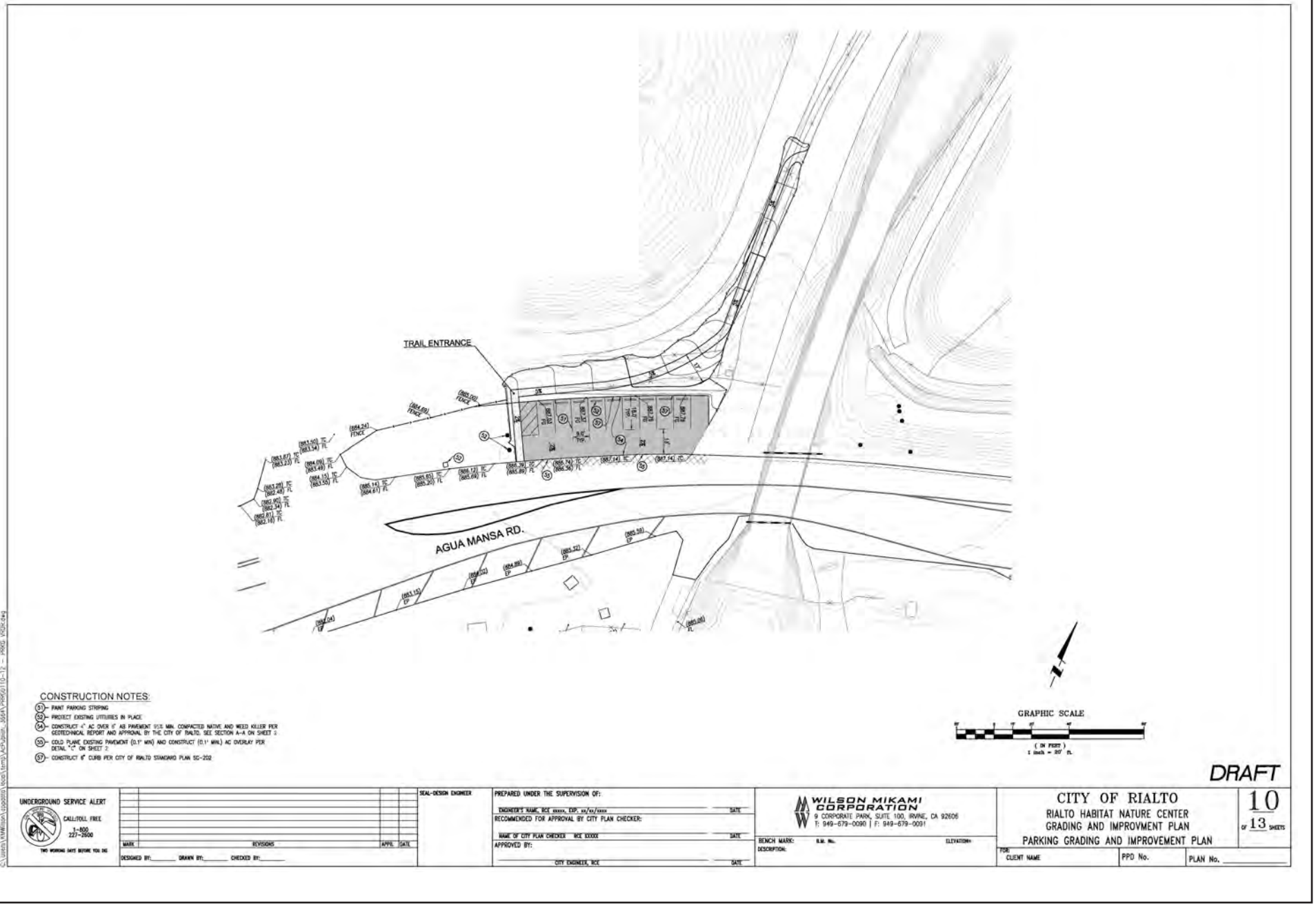
SOURCE: UTILITIES DIVISION 2023

FIGURE 2-7: CROSS SECTIONS AT WETLANDS



SOURCE: UTILITIES DIVISION 2023

FIGURE 2-8: PARKING GRADING AND IMPROVEMENT PLAN



SOURCE: UTILITIES DIVISION 2023

2.6 CONSTRUCTION

Construction of the proposed lake, parking, and pedestrian pathway is anticipated to take place over 18 months. Construction of the lake would consist of site preparation, grading, underground utility construction, and landscaping. Site preparation would consist of vegetation removal and removal of any onsite trash and debris. Grading for the Project would consist of any removals of unsuitable soils to be used for non-compaction required locations. Excavation for the lake would begin at the eastern most portion of the lake and would consist of a maximum 30 feet cut and minor fills to achieve lowest appropriate depths. In addition, grading of the eastern portion of the lake would construct two to one (2:1) slope embankments built up to the west for the proposed wetlands area and include a west to east access ramp to the bottom. Excavation of the western most portion of the lake would consist of a maximum 15 feet cut and fills to achieve appropriate depth and to construct 2:1 slopes embankments with bench surrounding proposed island in the middle. Grading would also include construction of a proposed pedestrian access (trail) which partitions the lake with 2:1 slope embankments and a culvert connecting the flow between the east and west lakes. Ultimately, grading of the lake site would generally be balanced onsite and would consist of 65,996 cubic yards (cy) total cut material and 65,934 cy total fill material. Although there is an approximate 62 cy of net cut, soils would balance onsite due to anticipated shrinkage. Simultaneous to grading, construction of underground utilities would take place which includes underground drainage, pipelines, pump station, restroom and dry utilities. Once grading and underground utilities are complete, finish grading would commence to construct the trails, slopes, and landscape areas. The lake and its embankments would be lined with a geomembrane to retain lake water and erosion control and landscaping would be planted around the lake (Figure 2-7 Conceptual Landscape Site Plan). Once final construction activities have completed, 10 percent of the existing flows into the Rialto Channel would commence to fill the lake to a full capacity at an elevation of 905 amsl.

Construction of the parking area would consist of site preparation, grading, and paving. Site preparation would consist of minor clearing of non-native weeds and grass, and removal of any onsite trash and debris. Grading would consist of minor cuts, approximately less than 1-foot and proper compact to an asphalt concrete (AC) paved parking area with driveway. The existing pathway connecting users to RHNC would require minor site preparation consisting of brush clearing and tread improvement for drainage and loose rock removal.

2.7 PROJECT OPERATION AND MAINTENANCE

As designed, the proposed Project would result in the discharge of approximately 90 percent of existing effluent flows into the Rialto Channel with the remaining approximately 10 percent of effluent flows temporarily diverted and stored in the lakes. Ultimately, the lake water would be pumped back into Rialto Channel resulting in the same are nearly the same quantity of flow into the Rialto Channel.

FIGURE 2-9: CONCEPTUAL LANDSCAPE SITE PLAN

SOURCE: UTILITIES DIVISION 2023

Rialto Habitat Nature Center

Operation of RHNC would generally occur Monday through Sunday during daylight hours (dawn to dusk). Daily securing of the site and monthly hardscape maintenance would be provided by the City's Facilities and Maintenance Department. In addition, if necessary, maintenance of kiosks, restrooms and other land-based amenities would consist of inspection and monitoring on a daily basis. Daily trash removal, routine cleaning, and grounds clean up, and monthly landscaping would be provided by the City's Community Services Department. Maintenance of the lake would consist of monthly inspections and if necessary, removal of settled solids, algae, invasive plants or contaminants by vacuum truck.

Rialto Habitat Nature Center Amenities

Local residents and other guests would access the lake for recreational use and educational programs. The RHNC amenities would include 11 paved parking spaces and bus access on Agua Mansa Road as described previously.

The 1 mile of pedestrian perimeter trails would include the following amenities for guests:

1. Resting Areas: The Project would include casual seating (boulders, stumps etc.) to allow for a quick stop along a path, as well as benches or similar seating to allow for longer duration resting or observation.
2. Observation Areas: The design includes areas to connect people to nature without trampling or disturbing the habitat. Themed informational signage would be provided throughout for guest guidance and enhanced experience. Signage with consistent icons, and symbology would begin at the site entrance and continue throughout all the Project areas.
3. Waste Management: Wildlife-proof waste collection stations would be placed at key locations (park entrance, gathering spaces, observation locations) for users to dispose of trash in bins and minimize trash ending up on the ground.
4. Irrigation: The Project would use treated dry-weather flow water and stormwater for planting irrigation. Supplemental irrigation would likely be required during the anticipated two-year plant and habitat establishment period.
5. Habitat Features: Habitat structures features would primarily consist of small, protected spaces made of natural materials (rock) to create habitat spaces for small native mammals, reptiles, birds, and native bees. Habitat structures would be designed and located within the riparian, transitional, and upland zones to encourage and promote native fauna occupying the site.
6. Hardscape Design: ADA compliant pedestrian access would be incorporated into the Project design. Of the 11 paved on-site parking spaces, appropriate ADA parking spaces would be provided. The 1 mile of pedestrian trail would be comprised of decomposed granite with a binder to prevent wind erosion.

2.8 REQUIRED PERMITS AND PROJECT APPROVALS

Construction of the Project may be funded through the Drinking Water State Revolving Fund (DWSRF) Program, within the Division of Financial Assistance, State Water Resources Control Board (SWRCB), which uses federal funds to provide low interest loans to eligible recipients drinking water infrastructure projects. The Project may also be funded through the Water Infrastructure Finance and Innovation Act (WIFIA) program. The WIFIA program is a federal credit program administered by EPA for eligible water and wastewater infrastructure projects including projects eligible for SRF funding, drought prevention projects, energy efficiency upgrades at water and wastewater treatment facilities, alternative water supply projects, and acquisition of property integral to a project or for environmental mitigation. Therefore, the Project is subject to federal environmental regulations, including the

Federal Endangered Species Act (Section 7), the National Historic Preservation Act (Section 106), and the General Conformity Rule for the Clean Air Act, among others. The Project may also be funded by other state, and local grant funding, other low interest loans and the City of Rialto Wastewater Reserve Funds. The project would be required to comply with the City's NPDES General Construction Permit and a South Coast Air Quality Management District Permit to Construct and Permit to Operate.

Consequently, the environmental document prepared for the Project must comply with both state and federal environmental project review process. The SWRCB has developed its own "NEPA-like" state environmental review process for SRF projects referred to as CEQA Plus. CEQA Plus utilizes the environmental documents developed under the CEQA as well as documents prepared for compliance with specified federal environmental laws and regulations referred to as federal cross-cutters. The CEQA Plus process complies with required elements from the EPA as outlined in the federal code of regulations [40 C.F.R. section 35.3140(b)] and refers to the CEQA document and supporting technical studies as well as supplemental information provided for compliance with the applicable federal cross cutters authorities.

3.0 ENVIRONMENTAL CHECKLIST FORM

1. Case Number

Not applicable

2. Project Title

Rialto Habitat Nature Center

3. Related Files

Not applicable

4. Lead Agency Name and Address

City of Rialto
150 South Palm Avenue
Rialto, CA 92376

5. Contact Person

John Rossi, Director of Utilities
Utilities Division
(909) 820-2525 Ext. 8056
abrown@rialtoca.gov

6. Project Applicant

City of Rialto Utilities Division
150 South Palm Avenue
Rialto, CA 92376

7. Project Location

The Project would be located on City-owned property that is part of the Rialto Water Treatment Plant located at 501 E. Santa Ana Avenue, City of Rialto, San Bernardino County. Parking for the proposed Rialto Habitat Nature Center would be located 0.25 miles to the south on Agua Mansa Road and accessed via a path along the existing Rialto Channel utility road (See Section 2.3, Project Location).

(Latitude: 34° 2'53.74"N / Longitude: 117°21'24.17"W)

8. General Plan Designations

General Industrial (GI) – General Plan (GP)
Public - Agua Mansa Industrial Corridor Specific Plan (AMICSP)

9. Zoning

Agua Mansa Industrial Corridor Specific Plan - GP

General Manufacturing (M-2) – AMICSP

10. Description of Project

Section 2.0, Project Description, illustrates the description of the Project in further detail.

11. Surrounding Land Uses and Setting

	GENERAL PLAN LAND USE	AMICSP LAND USE	AMICSP ZONING
PROJECT SITE	**General Industrial (GI)**	**Public**	**General Manufacturing (M-2)**
NORTH			
EAST			
SOUTH			
WEST			

12. Other agencies whose approval is required (e.g., permits, finance approval, or participation agreement):

California Regional Water Quality Control Board, Santa Ana Region

- Modification to Waste Discharge Requirements Order R8-2014-0010 (National Pollutant Discharge Elimination System permit No. CA0105295).
- Storm Water Pollution Prevention Plan General Construction Permit.

City of Rialto discretionary actions:

- Approval of the approval of the Initial Study and adoption of a Mitigated Negative Declaration.
- Approval of findings regarding the adequacy of the environmental analysis contained in the Initial Study.
- Authorize expenditure of funds to construct the RHNC, parking area, and pedestrian path between RHNC and the parking area.

City of Colton discretionary actions:

- Approval of encroachment permit for Agua Mansa Road parking area

County of San Bernardino discretionary actions:

- Approval of encroachment permit for pedestrian path along Rialto Channel utility road.

Have California Native American tribes traditionally and culturally affiliated with the Project area requested consultation pursuant to Public Resources Code 21080.3.1? If so, is there a plan for consultation that includes, for example, the determination of significant impacts to tribal cultural resources, procedures regarding confidentiality, etc.?

The AB-52 consultation process was initiated on July 27, 2023, by sending letters to the San Manuel Band of Mission Indians, Gabrieleño Tongva Nation, Gabrieleño-Tongva Nation, Gabrieleño-Tongva, Gabrieleño Band of Mission Indians, and Morongo Band of Mission Indians. Two responses were received during the consultation request window ending August 26, 2023. One response was from the San Manuel Band of Mission Indians requesting a copy of the completed report. The other response was from the Gabrieleno Band of Mission Indians - Kizh Nation that provided information regarding potential tribal cultural resources in the area and a request that the information be mentioned in the environmental document and included as a confidential appendix.

See Section 3.18, Tribal Cultural Resources, for a detailed discussion of potential impacts to tribal cultural resources.

Note: *Conducting consultation early in the CEQA process allows tribal governments, lead agencies, and project proponents to discuss the level of environmental review, identify and address potential adverse impacts to tribal cultural resources, and reduce the potential for delay and conflict in the environmental review process. (See Public Resources Code section 21083.3.2.) Information may also be available from the California Native American Heritage Commission's Sacred Lands File per Public Resources Code section 5097.96 and the California Historical Resources*

Information System administered by the California Office of Historic Preservation. Please also note that Public Resources Code section 21082.3(c) contains provisions specific to confidentiality.

13. Other Environmental Reviews Incorporated by Reference in this Review:

- Appendix A: Air Quality and Greenhouse Gas Assessment
- Appendix B: Biological Resource Assessment
- Appendix C: Cultural Resources Assessment
- Appendix D: Geotechnical Exploration and Review of Grading and Improvement Plan

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The environmental factors checked below would be potentially affected by this Project, involving at least one impact that is "Less than Significant with Mitigation Incorporated" as indicated by the checklist on the following pages.

☐ Aesthetics	☐ Greenhouse Gas Emissions	☐ Public Services
☐ Agriculture & Forest Resources	☐ Hazards and Hazardous Materials	☐ Recreation
☐ Air Quality	☐ Hydrology / Water Quality	☐ Transportation
☒ Biological Resources	☐ Land Use / Planning	☐ Tribal Cultural Resources
☒ Cultural Resources	☐ Mineral Resources	☐ Utilities / Service Systems
☐ Energy	☐ Noise	☐ Mandatory Findings of Significance
☒ Geology / Soils	☐ Population / Housing	☐ None

ENVIRONMENTAL DETERMINATION (TO BE COMPLETED BT THE LEAD AGENCY)

On the basis of this Initial Study, the City of Rialto Environmental Review Committee finds:

☐ The City of Rialto finds that the proposed Project COULD NOT have a significant effect on the environment, and a *NEGATIVE DEC*LARATION will be prepared.

☒ The City of Rialto finds that although the proposed 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.

☐ The City of Rialto finds that the proposed Project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ The City of Rialto finds that the proposed 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.

☐ The City of Rialto finds that although the proposed 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 proposed Project, nothing further is required.

Signature_____ Date_____

Printed Name_____ Title_____

Agency_____

3.1 AESTHETICS

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
I. Aesthetics. Except as provided in Public Resources Code section 21099 (where aesthetic impacts shall not be considered significant for qualifying residential, mixed-use residential, and employment centers), would the project:				
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☒	☐
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☒
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 points.) If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	☐	☐	☒	☐
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☒	☐

3.1.1 ENVIRONMENTAL SETTING

The RHNC site is comprised of vacant City-owned land, the public parking area is an unimproved portion of San Bernardino County right-of-way on the north frontage of Aqua Mansa Road, and the connecting pathway between the RHNC site and the parking area is an existing utility or service road on the west side of Rialto Channel owned by the San Bernardino County Flood Control District. The majority of the Project site to be developed is the RHNC site, an unused dry pit formerly used to receive partially treated effluent from the waste water treatment plant (WWTP) to the north. The Project site is located on the southern portion of the WWTP property and is bordered by the existing WWTP facilities to the north, So Cal Edison power poles and easement adjacent to the RHNC site to the south with Agua Mansa Landfill further to the south, the Rialto Channel to the east, and undeveloped industrial-zoned property to the west. Most structures in the area are one or two stories in height consisting of office and industrial buildings and other industrial structures. The visual character of the Project area and the surrounding area is dominated by old industrial development and newer industrial development typical within the Agua Mansa Industrial Corridor Specific Plan, along with scattering of undeveloped, vacant properties. The City of Rialto 2010 General Plan (City GP) identified several significant resources that can be seen from numerous vantage points in the City including the San Gabriel Mountains, San Bernardino Mountains, Box Springs Mountains, La Loma Hills, Jurupa Hills.

3.1.2 DISCUSSION

a) Have a substantial adverse effect on a scenic vista?

Less Than Significant Impact. The proposed Project site is currently vacant and located in an area surrounded by existing industrial uses to the north, west, and south, and vacant land to the east. As indicated previously the San Gabriel Mountains, San Bernardino Mountains, Box Springs Mountains, La Loma Hills, and Jurupa Hills are defined as scenic resources in the City's General Plan. In addition, views of the higher elevations of the Cities of Riverside and Moreno Valley are considered scenic resources. According to Goal 2-14 of the City GP, all projects shall protect such scenic vistas and resources by ensuring that building heights are consistent with the scale of surrounding, existing development. These scenic vistas are visible from the Project site and area, but the Project proposes no large, high buildings or structures and therefore would not obstruct views of such scenic resources. Grading- and construction-related activities have the potential to temporarily modify the existing visual character and views of the Project site and area. These effects on visual character would be temporary in nature, would be confined to the Project area, and would not have a substantial effect on a scenic vista. Following construction, views of the proposed RHNC site and public parking area would change from vacant to developed land. The landscaping surrounding the RHNC site and ancillary structures, buildings, and related features would be visible including the asphalt paved public parking lot on Agua Mansa Road. However, views of the RHNC site would be considered an improvement in comparison to the existing vacated, empty pit. The Project would have a **less than significant impact** directly, indirectly, or cumulatively on scenic vistas. No mitigation is required.

b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

No Impact. The City's GP does not identify or designate any potential or existing scenic routes in the vicinity of the Project area. In addition, there are no designated state scenic highways nearby, adjacent to, or visible from the Project area (Caltrans, 2023). As a result, the Project would not substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway. Therefore, the Project would have **no impact** directly, indirectly, or cumulatively on scenic resources. No mitigation is required.

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 points.) If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?

Less Than Significant Impact. The Project area is in an urbanized area designated General Industrial per the City's GP and is zoned General Manufacturing (M-2) within the Agua Mansa Industrial Corridor Specific Plan (AMICSP). During Project grading and construction, views of the Project site would be modified as a result of the temporary presence of grading and construction equipment and activities. However, the appearance of construction equipment and associated activities would be temporary and not considered to be significant. Once construction activities are complete, the site would change from vacant land to development associated with the RHNC, parking area, and pedestrian path between them.

Views of the RHNC site would consist of the two lakes separated by a pedestrian path running north-south between them and pedestrian paths surrounding the entire perimeter of the lakes. All aboveground utilities associated with the Project, would be screened by the surrounding landscaping and not be visible to motorists, pedestrians, and bicyclists from public viewpoints. Views of the existing vacant dry pit site would change to an approximately 13-acre outdoor public recreational space including a 10-acre lake, one mile of pedestrian perimeter trails, and native landscape. Development of the Project would contrast with the predominantly industrial development in the areas but would not conflict with applicable regulations regarding scenic quality. Instead, however, the RHNC would be

considered an improvement in comparison to the existing vacated, empty pit and an improvement in comparison to the surrounding visual character of area. Therefore, the Project would result in a **less than significant impact** directly, indirectly, or cumulatively to the scenic quality of the site and surroundings. No mitigation is required.

d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

Less Than Significant Impact. Grading- and construction-related activities would occur during daylight hours from 7:00 a.m. through 6:00 p.m. and would not require nighttime lighting. Grading and construction equipment are unlikely to have reflective surfaces and would not be a substantial source of glare in the area. The Project would not be constructed with materials that would create substantial glare; however, the lake would be filled with water which would naturally create a source of day-time glare from certain overhead viewpoints. Although the Project would create a new source of glare, this glare would not be visible from off-site public areas. The Project would not result in a new source of substantial light or glare that would adversely affect day or nighttime views in the area. Therefore, the Project would result in a **less than significant impact** directly, indirectly, or cumulatively related to light or glare effects on views. No mitigation is required.

3.2 AGRICULTURE AND FOREST RESOURCES

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
II. Agriculture and Forest Resources. In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997, as updated) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:				
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?	☐	☐	☐	☒
b) Conflict with existing zoning for agricultural use or a Williamson Act contract?	☐	☐	☐	☒
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))?	☐	☐	☐	☒
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
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?

3.2.1 ENVIRONMENTAL SETTING

Farmlands are mapped by the State of California Department of Conservation (DOC) under the Farmland Mapping and Monitoring Program (FMMP). Under the FMMP, land is delineated into the following eight categories: Prime Farmland, Farmland of Statewide Importance, Unique Farmland, Farmland of Local Importance, Grazing Land, Urban or Built-Up Land, Other Land, and Water. The Project area is defined as Urban and Built-Up Land and surrounded Other Land according to the DOC therefore is not designated as Important Farmland. The RHNC site is currently an unused dry pit. The parking area is unimproved edge of roadway (Agua Mansa Road) and the pedestrian path between the RHNC, and the parking area is an existing utility or service road (Rialto Channel). The Project area is surrounded by vacant land and industrial uses such as crushing operations, pallet storage, and an auto yard.

3.2.2 DISCUSSION

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. The Project area is not considered Prime Farmland, Unique Farmland, or Farmland of Statewide Importance according to the FMMP. Implementation of the Project would not convert farmland to non-agricultural uses. The Project would have **no impact** directly, indirectly, or cumulatively to Prime, Unique, or Importance Farmland. No mitigation is required.

b) Conflict with existing zoning for agricultural use or a Williamson Act contract?

No Impact. The Project area is not subject to Williamson Act contract. Therefore, implementation of the Project would not conflict with existing zoning for agricultural use or a Williamson Act contract. Therefore, the Project would have **no impact** directly, indirectly, or cumulatively on Williamson Act Preserves, Contracts, or agricultural zoning. No mitigation is required.

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 existing zoning within the Project area is not for forest land, timberland, or Timberland Production. The Project would include construction of a lake and surrounding recreational trials on vacant land and would not cause rezoning of forest land. Therefore, the Project would have **no impact** directly, indirectly, or cumulatively from the loss of forest land or conversion of forest land to non-forest use. No mitigation is required.

d) Result in the loss of forest land or conversion of forest land to non-forest use?

No Impact. The Project area is not considered forest land and is a vacant unused dry pit. Implementation of the Project would require the grading activities such as cut and fills to balance the site. Furthermore, there is no forest land within the City. Therefore, the Project would have **no impact** directly, indirectly, or cumulatively from the loss of forest land or conversion of forest land to non-forest use. No mitigation is required.

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. No forest or agricultural resources are located within or adjacent to the Project area. As discussed above in items a) through d), the Project would not involve changes in the existing environment which, because of their

location or nature, could result in conversion of forest land or agricultural land. Therefore, the Project would have **no impact** directly, indirectly, or cumulatively on Farmland or forest use. No mitigation is required.

3.3 AIR QUALITY

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
III. Air Quality.				
Where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied on to make the following determinations.				
Are significance criteria established by the applicable air district available to rely on for significance determinations? Would the project:				
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 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?	☐	☐	☒	☐

3.3.1 ENVIRONMENTAL SETTING

The analysis in this section is based on the Air Quality and Greenhouse Gas Assessment (AQ/GHG Analysis) prepared by Urban Crossroads, Inc. dated July 27, 2023, which is provided in its entirety as Appendix A of this IS/MND.

3.3.2 DISCUSSION

a) Conflict with or obstruct implementation of the applicable air quality plan?

Less Than Significant Impact. The Project Site is located within the South Coast Air Basin (SCAB) jurisdiction of the South Coast Air Quality Management District (SCAQMD). The SCAB, a 6,745-square mile subregion of the SCAQMD, is bounded by the Pacific Ocean to the west and the San Gabriel, San Bernardino, and San Jacinto Mountains to the north and east. Additionally, the SCAB includes portions of Los Angeles, Riverside, and San Bernardino Counties, and all of Orange County. (Urban Crossroads, 2023).

SCAQMD has adopted an Air Quality Management Plan (AQMP) to meet the State and federal ambient air quality standards. AQMPs are regularly updated to reduce emissions, accommodate growth, and to minimize any negative fiscal impacts of air pollution control on the economy more effectively. The 2022 AQMP was recently adopted by the SCAQMD in December 2022. As analyzed in the AQ/GHG Analysis, the proposed Project's consistency with the AQMP was determined using the process as defined in Chapter 12, Section 12.2 and Section 12.3 of the SCAQMD's CEQA Air Quality Handbook (1993). The Handbook identifies three consistency criterion as discussed below:

Consistency Criterion No. 1: The proposed Project will not result in an increase in the frequency or severity of existing air quality violations or cause or contribute to new violations or delay the timely attainment of air quality standards or the interim emissions reductions specified in the AQMP.

As determined in the AQ/GHG Analysis, violations under this criterion refer to the California Ambient Air Quality Standards (CAAQS) and National Ambient Air Quality Standards (NAAQS). CAAQS and NAAQS violations would occur if regional or localized significance thresholds are exceeded. As evaluated within this section and Response b), the Project's regional and localized construction and operational-source emissions would not exceed applicable regional significance thresholds and therefore the Project meets Consistency Criterion No. 1.

Consistency Criterion No. 2: The Project will not exceed the assumptions in the AQMP based on the years of Project build-out phase.

The 2022 AQMP demonstrates that the applicable ambient air quality standards can be achieved within the timeframes required under federal law. Growth projections from local general plans adopted by cities in the district are provided to the SCAG, which develops regional growth forecasts, which are then used to develop future air quality forecasts for the AQMP. Development consistent with the growth projections in the City GP is considered to be consistent with the AQMP.

The proposed Project is consistent with the City GP land use designation of GI and designation of Public in the AMICSP, and does not require a General Plan or Specific Plan amendment. For these reasons, the Project is determined to be consistent with the second criterion.

Since the proposed Project would not be in violation of either Consistency Criteria, the Project's potential impacts are considered to be **less than significant impact** directly, indirectly, or cumulatively to the implementation of the AQMP. No mitigation is required.

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. The Project would generate air pollution from construction activities and long-term operations. As described in the AQ/GHG Analysis, air pollutants have adverse effects to human health including, respiratory illness and carcinogenic effects. Based on available modeling, it is not feasible to correlate regional criteria pollutant emissions from development projects of the scale of the proposed Project to adverse health effects on a SCAB-wide level. However, the potential for the Project to result in substantial adverse health effects from toxic air contaminant emissions is addressed in Response 3.3 (c).

The following analysis is based on the applicable significance thresholds established by the SCAQMD for regional criteria pollutant emissions. This analysis assumes that the proposed Project would comply with applicable mandatory regional air quality standards, including: SCAQMD Rule 402, "Nuisance;" SCAQMD Rule 403, "Fugitive Dust;" SCAQMD Rule 1113, "Architectural Coatings;" SCAQMD Rule 1186.1, "Less-Polluting Street Sweepers," and Title 13, Chapter 10, Section 2485, Division 3 of the California Code of Regulations "Airborne Toxic Control Measure."

Regional Construction Emissions

For purposes of the construction emissions analysis, construction was expected to occur in July of 2024. The California Emissions Estimator Model (CalEEMod) accounts for the implementation and enforcement of California's progressively more restrictive regulatory requirements for construction equipment and the ongoing replacement of older construction fleet equipment with newer, less- polluting equipment. Construction activities that occur in the near future would be expected to generate more air pollutant emissions than if the same activities would occur further into the future. Thus, in the event that the Project's construction period occurs later than expected by this analysis, Project-related construction emissions would not exceed the values presented herein. (Urban Crossroads)

The Project's construction characteristics and construction equipment fleet assumptions used in the analysis were previously described in Section 2.0, Project Description.

The calculated maximum daily emissions associated with Project construction are presented in Table AQ-1, Construction Emissions Summary. Detailed construction model outputs are presented in the Project's AQ/GHG Analysis. As shown, the Project's daily construction emissions of volatile organic compounds (VOCs), nitrogen oxides (NO_X) carbon monoxide (CO), sulfur oxides (SO_X), and particulate matter (PM_{10} and $PM_{2.5}$) would not exceed SCAQMD regional criteria thresholds. If a project does not exceed the SCAQMD regional thresholds, then SCAQMD considers that project's air pollutant emissions to be cumulatively not considerable. Because Project construction emissions would not exceed the SCAQMD regional criteria significance thresholds, construction of the Project would not result in a cumulatively considerable net increase of any criteria pollutant, including any pollutants for which the SCAB does not attain applicable federal or State ambient air quality standards.

TABLE AQ-1: REGIONAL CONSTRUCTION EMISSIONS SUMMARY

Year	Emissions (lbs/day)					
	VOC	**NO_X**	**CO**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**
Summer						
2023	5.00	47.11	39.61	0.05	8.42	5.07
2024	6.38	54.87	56.09	0.10	5.93	3.45
Winter						
2023	6.70	58.95	56.55	0.10	8.42	5.07
2024	6.37	54.92	54.85	0.10	5.93	3.45
2025	0.88	7.53	10.86	0.01	0.54	0.37
Maximum Daily Emissions	**6.70**	**58.95**	**56.55**	**0.10**	**8.42**	**5.07**
SCAQMD Regional Threshold	75	100	550	150	150	55
Threshold Exceeded?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**

Source: Air Quality and Greenhouse Gas Assessment (Appendix A)

Regional Operational Emissions

Operation of the Project is expected to generate air pollutant emissions from the operation of motor vehicles (including trucks) associated with employee and visitor trips, operation of on-site equipment, on-site maintenance activities, and the consumption of energy resources. The calculated operational-source emissions are summarized on Table AQ-2, and detailed construction model outputs are presented in the Project's AQ/GHG Analysis.

As summarized in Table AQ-2, Project-related operational emissions of VOCs, NO_X, CO, SO_X, PM_{10} and $PM_{2.5}$ would not exceed SCAQMD regional criteria thresholds. The Project would not emit substantial concentrations of these pollutants during long-term operation and would not contribute to an existing or projected air quality violation. The Project's long-term emissions of VOCs, NO_X, CO, SO_X, PM_{10} and $PM_{2.5}$ would be less than significant.

TABLE AQ-2: TOTAL PROJECT REGIONAL OPERATIONAL EMISSIONS

Source	Emissions (lbs/day)					
	VOC	**NO_X**	**CO**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**
Summer						

Mobile	0.12	0.14	1.32	0.00	0.11	0.02
Area	0.30	0.00	0.00	0.00	0.00	0.00
Total Maximum Daily Emissions	**0.42**	**0.14**	**1.32**	**0.00**	**0.11**	**0.02**
SCAQMD Regional Threshold	55	55	550	150	150	55
Threshold Exceeded?	**No**	**No**	**No**	**No**	**No**	**No**
Winter						
Mobile	0.11	0.15	1.08	0.00	0.11	0.02
Area	0.30	0.00	0.00	0.00	0.00	0.00
Total Maximum Daily Emissions	**0.41**	**0.15**	**1.08**	**0.00**	**0.11**	**0.02**
SCAQMD Regional Threshold	55	55	550	150	150	55
Threshold Exceeded?	**No**	**No**	**No**	**No**	**No**	**No**

Source: Air Quality and Greenhouse Gas Assessment (Appendix A)

In summary, short-term construction and long-term operations of the Project would not exceed applicable regional thresholds of significance established by SCAQMD. Therefore, the proposed Project would not cause a cumulatively considerable net increase of any criteria pollutant for which the Project region is non-attainment resulting in a **less than significant impact** directly, indirectly, or cumulatively. No mitigation is required.

c) Expose sensitive receptors to substantial pollutant concentrations?

Less Than Significant Impact. The SCAQMD's *Final Localized Significance Threshold Methodology* (SCAQMD 2008) recommends the evaluation of localized NO_2, CO, PM_{10}, and $PM_{2.5}$ construction-related impacts to sensitive receptors in the immediate vicinity of a project site. Such an evaluation is referred to as a localized significance threshold (LST) analysis. SCAQMD has developed LSTs that 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 standards, and thus would not cause or contribute to localized air quality impacts. LSTs are developed based on the ambient concentrations of NO_x, CO, PM_{10}, and $PM_{2.5}$ pollutants for each of the 38 source receptor areas (SRAs) in the Basin. The proposed Project is located within SRA 34, Central San Bernardino Valley Area.

The SCAQMD recommends that the nearest sensitive receptor be considered when determining the Project's potential to cause an individual or cumulatively significant localized impact. The nearest land use where an individual could remain for 24 hours to the Project site has been used to determine localized construction and operational air quality impacts for emissions of PM_{10} and $PM_{2.5}$ (since PM_{10} and $PM_{2.5}$ thresholds are based on a 24-hour averaging time). The nearest sensitive receptor to the proposed Project is the existing residence at 323 Jurupa Ave, approximately 3,910 feet (1,192 meters) west of the Project site.

Localized Emissions Analysis

According to SCAQMD LST methodology, LSTs would apply to the operational phase of a proposed project, if the project includes stationary sources, or attracts mobile sources that may spend long periods queuing and idling at the site (e.g., transfer facilities and warehouse buildings). As described within this IS/MND, the proposed Project does not include such uses, and thus, due to the lack of significant stationary source emissions, no LST analysis is needed for operations.

Emissions associated to construction, specifically with peak demolition, site preparation and grading activities are considered for purposes of LSTs represent the maximum localized emissions that would occur. Any other

construction phases of development that overlap would result in less emissions and consequently lesser impacts. Table AQ-3 below presents the localized impacts at the sensitive receptor locations in the vicinity of the Project Site with highest exposure to Project construction activities. As detailed, localized construction emissions from Project construction would not exceed the applicable SCAQMD thresholds for any criteria pollutant. Detailed model outputs and receptor locations are presented in the Project's AQ/GHG Analysis (Appendix A).

TABLE AQ-3: PROJECT LOCALIZED SIGNIFICANCE SUMMARY OF CONSTRUCTION

On-Site Emissions	Emissions (lbs/day)			
	NO_X	CO	PM_{10}	$PM_{2.5}$
Site Preparation				
Maximum Daily Emissions	**47.02**	**37.99**	**8.19**	**5.01**
SCAQMD Localized Threshold	222	1,442	499	300
Threshold Exceeded?	**NO**	**NO**	**NO**	**NO**
Grading				
Maximum Daily Emissions	**40.94**	**32.67**	**4.63**	**2.78**
SCAQMD Localized Threshold	241	1,575	504	305
Threshold Exceeded?	**NO**	**NO**	**NO**	**NO**

Source: Air Quality and Greenhouse Gas Assessment (Appendix A)

Based on the information presented in Table AQ-3, the Project would not result in substantial localized pollutant concentrations during either construction or operation. Impacts would be less than significant.

CO "Hot Spot" Analysis

As discussed in the AQ/GHG Analysis, the Project would not result in potentially adverse CO concentrations or "hot spots." An adverse CO concentration, known as a "hot spot", would occur if an exceedance of the state one-hour standard of 20 parts per million (ppm) or the eight-hour standard of 9 ppm were to occur. To support this conclusion, measurements from busy intersections in Los Angeles were used for such determination. For example, 8.4 ppm 8-hr CO concentration measured at the Long Beach Boulevard and Imperial Highway intersection (highest CO generating intersection within the "hot spot" analysis), only 0.7 ppm was attributable to the traffic volumes and congestion at this intersection and the remaining 7.7 ppm were due to the ambient air measurements at the time the 2003 AQMP was prepared. The Project's trip generation is significantly less than the example, and therefore there is no potential for creation of a hot spot. As a result, a less than significant impact would occur.

In summary, the proposed Project would not expose sensitive receptors to substantial pollutant concentrations resulting in a **less than significant** directly, indirectly, and cumulatively. No mitigation is required.

d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

Less Than Significant Impact. Land uses associated with odor complaints include agricultural uses, wastewater treatment plants, food processing plants, chemical plants, composting operations, refineries, landfills, dairies, and fiberglass molding facilities. Although operation of the RHNC would not emit typical objectionable odors, it is possible that the dual lake complex would generate objectionable odors from occasional algae blooms during not summer months. It should be noted the existing General Plan land use designation for the RHNC site and zoning within the AMICSP permits the operation of the adjacent WWTP and related infrastructure and therefore it can be

assumed activities such as the proposed Project and the creation of a new source of objectionable odors from occasional algae blooms are permitted.

In addition, potential odor sources associated with the Project may result from construction equipment exhaust and the application of paving during construction activities and the temporary storage of typical solid waste (refuse) associated with the Project's (long-term operational) uses. Standard construction requirements would minimize odor impacts from construction. The construction odor emissions would be temporary, short-term, and intermittent in nature and would cease upon completion of the respective phase of construction and is thus considered less than significant. It is expected that Project-generated refuse would be stored in covered containers and removed at regular intervals in compliance with the City's solid waste regulations. The Project would also be required to comply with SCAQMD Rule 402 to prevent occurrences of public nuisances. Therefore, the Project would not cause objectionable odors affecting a substantial number of people per SCAQMD Rule 402, resulting in **less than significant impact** directly, indirectly, and cumulatively. No mitigation is required.

3.4 BIOLOGICAL RESOURCES

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
IV. Biological Resources. Would the project:				
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 the U.S. Fish and Wildlife Service?	☐	☒	☐	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by the California Department of Fish and Wildlife or the U.S. Fish and Wildlife Service?	☐	☐	☐	☒
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?	☐	☐	☐	☒
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?	☐	☒	☐	☐
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☒
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?	☐	☐	☐	☒

3.4.1 ENVIRONMENTAL SETTING

The analysis in this section is based on the Biological Resource Assessment (Biological Assessment) prepared by Carlson Strategic Land Solutions, Inc. (CSLS) dated December 2023, which is provided in its entirety as Appendix B of the IS/MND.

In addition, a field survey and jurisdictional delineation was performed on January 27, 2023, by CSLS to assess and map vegetation communities, plants, and wildlife, and to identify habitat areas that could be suitable for special status plant species or jurisdictional features.

3.4.2 DISCUSSION

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 the U.S. Fish and Wildlife Service?

Less Than Significant With Mitigation Incorporated. The Project site consists of primarily disturbed and developed areas associated with the City's WWTP property. The approximately 13-acre site, consisting of the proposed RHNC and associated amenities, is currently and undeveloped unused dry pit. The large pit area was formerly used as a receiving basin for partially treated discharge from the WWTP up to the early 1970's prior to implementation of federal Clean Water Act regulations that prohibited discharge of partially treated water onto the earth and water ways. The proposed parking location is disturbed right-of-way on the north frontage of Agua Mansa Road and the proposed pedestrian trail between the RHNC and parking area is disturbed and developed as a utility or service road for the Rialto Channel.

Vegetation Communities

According to the Biological Assessment, the field survey analyzed the Project site and a surrounding 300-foot buffer to identify the existing vegetation types of which consists primarily of developed, disturbed, and non-native vegetation communities. The native habitat observed on-site during the field survey was comprised of brittle bush scrub (Encelia farinose), disturbed brittle bush scrub, disturbed California buckwheat scrub (Eriogonum fasciculatum), and mulefat thicket (Baccharis salicifolia) vegetation communities.

Table Bio-1 list the approximate total acreages of vegetation communities that will be impacted by Project activities. It is anticipated that the entire Project site would be impacted with the implementation of the Project.

TABLE BIO-1: VEGETATION COMMUNITY IMPACTS

Vegetation Community	Existing Vegetation (acres)	*Impacts (acres)*	Avoided (acres)
Brittle Bush Scrub	3.85	2.23	1.62
Disturbed Brittle Bush Scrub	0.10	0.10	0.00
Disturbed California Buckwheat Scrub	0.12	0.12	0.00
Mulefat Thicket	0.12	0.12	0.00
Non-native Grasslands	0.45	0.35	0.10
Tamarisk Thicket	0.43	0.40	0.03
Ruderal	2.06	1.86	0.20
Disturbed	7.71	5.99	1.72
Developed	2.21	0.12	2.09
TOTAL	**17.05**	**11.29**	**5.76**

Direct impacts to the 8.72 acres of tamarisk thicket, non-native grasslands, ruderal, disturbed and developed communities onsite from Project implementation, are not significant because these areas consist of built environment and non-native vegetation communities. Further, the species found within these vegetation

communities include common plant species which are present in large numbers throughout the region and the removal is not considered significant.

Direct impacts to 2.57 acres of native vegetation communities (brittlebush scrub, disturbed brittlebush scrub, disturbed California buckwheat scrub, and mulefat thicket) from Project implementation is not considered significant because while native, the limited area does not contain any sensitive species, plants or wildlife, or represent sensitive habitats identified through CNDDB or CDFW sensitive plant communities. The species found within these communities includes common plant species which are present in large numbers throughout the region and the removal is not considered significant. Furthermore, the habitat to be associated with the creation of the two lakes include the creation of these vegetation communities on the slopes and shelf of the lakes. No indirect impacts to the surrounding 300-foot buffer area are anticipated.

As concluded in the Biological Assessment, no special status or sensitive plant species were identified to occur on-site, nor were they observed on-site. Therefore, impacts to candidate, sensitive, or special-status vegetation species would be considered less than significant.

Wildlife

During the field survey, the wildlife species observed included the American crow (Corvus brachyrhynchos), California towhee (*Melozone crissalis*), Bewick's wren (*Thryomanes bewickii*), American avocet (*Recurvirostra americana*), White crowned sparrow (*Zonotrichia leucophrys*), American bushtit (*Psaltriparus minimus*), Yellow-rumped warbler (*Setophaga coronata*), Western bluebird (*Sialia mexicana*), Cooper's Hawk *(Accipiter cooperii),* house finch (*Haemorhous mexicanus*), mourning dove (*Zenaida macroura*), song sparrow (*Melospiza melodia*), Anna's hummingbird (*Calypte anna*), turkey vulture (*Cathartes aura*), western fence lizard (*Sceloporus occidentalis*), cottontail rabbit (*Sylvilagus audubonii*), California ground squirrels (*Spermophilus beecheyi*), coyote (*Canis latrans*). As determined in the Biological Assessment, the Project site has nesting and foraging habitat for avian species due to the location, surrounding land uses, and the built nature of the Project site. In addition, the habitat found on-site was determined to not provide suitable habitat for sensitive wildlife species.

Although the Project site consists of unsuitable habitat for sensitive wildlife species, direct impacts during construction or long-term operations associated with vegetation removal may occur to all avian species covered under the Migratory Bird Treaty Act (MBTA) with the removal of potential nesting and foraging habitat. Therefore, a pre-construction survey is required prior to grading, site disturbances, or operational vegetation maintenance in compliance with the MBTA to ensure nesting birds are not disturbed during Project construction and operation. Implementation of **Mitigation Measure (MM) BIO-1** would reduce potential impacts to the nesting avian species to a less than significant level.

Effluent Flow into Rialto Channel

As indicated in the Project Description on page 2-6 and further clarified in response to CDFW comments, the proposed Project will have no effect on the effluent flow into Rialto Channel. Although the flow rate would be temporarily reduced during the time in which the lakes are filled, this reduction of effluent discharged to the Rialto Channel will be within the historical daily and seasonal variability as shown in previously referenced Figures 2-3 and 2-4. Based on current average flow of 7.3 MGD and a temporary reduction of 10 percent during filling, average flow into the channel would remain at 6.57 MGD during initial lake filling (7.3 MGD existing – 0.73 MGD = 6.57 MGD). For this reason, the flow reduction into Rialto Channel that would occur during filling of the lakes would not result in impacts to biological resources because the temporary change is within existing baseline conditions and normal fluctuations of the effluent flows. Once the lakes are filled, the quantity of flow in and out of the lakes would equalize and no change in flow would occur from the original baseline resulting in less than significant impacts to biological resources located downstream.

Critical Habitat

The United States Fish and Wildlife Service (USFWS) online service was reviewed and assessed for information regarding Threatened and Endangered Species Final Critical Habitat designation to determine if the Project site is within any species designated Critical Habitat. The Project site and surrounding buffer area are not located within any designated Critical Habitat overlay.

However, due to the proximity of the Project site to the Delhi Sands Flower-Loving Fly (DSF) Conservation Areas, a DSF assessment was performed on the RHNC lake site by Ken Osborne (Biological Assessment (Appendix B)), on February 15, 2023, and a subsequent survey was performed on March 2, 2023, on the parking area to determine the suitability for DSF to occur on-site. As concluded in the Biological Assessment, the entire Project site and parking area is on alluvial soils and therefore unsuitable for DSF. In addition, based on the proximity of DSF populations in the area, conditions on the entire Project site and areas surrounding west of the existing channel (which bounds the eastern edge of the WWTP facility) presents conditions unsuitable for DSF. As a result, implementation of the Project would have no impact related to the DSF, and no mitigation is required.

With implementation of **MM BIO-1** the Project would have a **less than significant impact** on a candidate, sensitive, or special status species directly, indirectly, and cumulatively.

Furthermore, implementation the RHNC would include creation of new coastal sage scrub and riparian habitats. The creation of the lakes and adjacent habitats provides superior habitat than the vegetation communities being impacted. Furthermore, Project implementation would provide superior nesting and foraging habitat for avian species.

Mitigation Measures

MM BIO-1: Nesting Birds: Regardless of the time of year, nesting bird surveys shall be performed by a qualified avian biologist no more than 3 days prior to vegetation removal or ground-disturbing activities for each phase of construction. Pre-construction surveys shall focus on both direct and indirect evidence of nesting, including nest locations and nesting behavior. The qualified avian biologist will make every effort to avoid potential nest predation as a result of survey and monitoring efforts. If active nests are found during the pre-construction nesting bird surveys, a qualified biologist shall establish an appropriate nest buffer to be marked on the ground. Nest buffers are species specific and shall be at least 300 feet for passerines and 500 feet for raptors. A smaller or larger buffer may be determined by the qualified biologist familiar with the nesting phenology of the nesting species and based on nest and buffer monitoring results. Construction activities may not occur inside the established buffers, which shall remain on site until a qualified biologist determines the young have fledged or the nest is no longer active. Active nests and adequacy of the established buffer distance shall be monitored daily by the qualified biologist until the qualified biologist has determined the young have fledged or the Project has been completed. The qualified biologist has the authority to stop work if nesting pairs exhibit signs of disturbance.

Burrowing Owl: Preconstruction burrowing owl surveys shall be conducted no less than 14 days prior to the start of Project-related activities and within 24 hours prior to ground disturbance, in accordance with the Staff Report on Burrowing Owl Mitigation (2012 or most recent version). Preconstruction surveys should be performed by a qualified biologist following the recommendations and guidelines provided in the Staff Report on Burrowing Owl Mitigation. If the preconstruction surveys confirm occupied burrowing owl habitat, Project activities shall be immediately halted. The qualified biologist shall coordinate with CDFW and prepare a Burrowing

Owl Plan that shall be submitted to CDFW and USFWS for review and approval prior to commencing Project activities.

b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by the California Department of Fish and Wildlife or the U.S. Fish and Wildlife Service?

No Impact. The Project vicinity includes the Rialto Channel, which is located on the eastern portion of the Project boundary. Rialto Channel would not be impacted as part of Project implementation. Furthermore, the channel is a concrete lined channel with no riparian habitat or other sensitive natural community. **No impact** directly, indirectly, or cumulatively to riparian habitats or other sensitive natural communities within the Rialto Channel would result from the proposed Project's implementation. No mitigation is required.

It should be noted that the City has the ability and capacity to choose not to divert any water into the proposed lakes post construction, for the purposes of regulating flows into Rialto Channel or effectively concluding the existence of the lakes. Reasons for temporarily or permanently stopping the diverting and storage of the water could be for maintenance of the lined and unlined portions of Rialto Channel, the cost of maintenance and repairs to the lakes, or overall operations of the lakes. The Rialto Habitat Nature Center Project is fully autonomous to the overall system, and should budget decline in the City, the City has the authorization to stop any diverting water into the lake and return to pre-project conditions.

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. The Project site does not contain State or federally protected wetlands. The proposed Project would have **no impact** directly, indirectly, or cumulatively to state or federally protected wetlands directly, indirectly, or cumulatively and no mitigation is required.

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?

Less Than Significant With Mitigation Incorporated. The Project site is comprised of vegetation which has the potential to support nesting and foraging habitat for migratory birds. Although implementation of the proposed Project would cause a loss of nesting and foraging habitat for migratory birds and raptors, the Project proposes to create two connected lakes and associated wetland/riparian habitats, which includes opportunities for nesting and foraging habitat post-construction. Therefore, impacts to foraging habitat would be temporary and less than significant impact would occur.

As discussed in Response 3.4 (a), the on-site vegetation would have the potential to support avian species nesting and foraging. Disturbing or destroying active nests is a violation of the MBTA (16 U.S.C. 703 et seq.) and the nests and eggs are protected under Fish and Wildlife Code Section 3503. As such, direct impacts to breeding birds (e.g. through nest removal or vegetation removal) or indirect impacts (e.g. by noise causing abandonment of the nest) is potentially significant. Compliance with the MBTA would reduce impacts to a less than significant level, as previously detailed in **MM BIO-1.**

With implementation of **MM BIO-1**, the Project would have no long-term effect on wildlife movement including migratory birds, thus the Project would have a **less than significant impact with mitigation incorporated** directly, indirectly, and cumulatively.

Mitigation Measures

MM BIO-1: As previously listed.

e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

No Impact. The City does not have any policies or ordinances protecting biological resources that are applicable to the Project site, such as a tree preservation ordinance. Therefore, **no impact** directly, indirectly, or cumulatively is anticipated and no mitigation is required.

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?

No Impact. The City or Rialto or the County of San Bernardino do not have an adopted Conservation Plan, Natural Community Conservation Plans, or other approved local, regional, or state habitat conservation plans. As discussed in the section, the Project is located near DSF observed occurrences, located 300 meters east, 350 meters east northeast, and within 0.9 km north northwest of the Project site, and DSF conservation occurs to the east and west of the Project site. However, it has been determined the Project site does not contain suitable habitat for the DSF, therefore, no impacts would occur to DSF conservation area since the Project site is not located within designated preserve or reserve area. Therefore, **no impact** directly, indirectly, or cumulatively is anticipated and no mitigation is required.

The local biological agencies including the San Bernardino Valley Municipal Water District (SBVMWD) have drafted a Habitat Conservation Plan (HCP) for the Upper Santa Ana River (SAR) watershed, which is a comprehensive program that would provide a framework to protect, enhance, and restore the habitat for Covered Species defined in the HCP while streamlining permitting for Covered Activities. This plan has not been approved by the Wildlife Agencies (USFWS and CDFW) at the time of the Biological Assessment. However, it is the intent of the Project to maintain the existing flows of the WWTP discharge into Rialto Channel. Following Project implementation, the discharge will meet and exceed the current 7 cfs requirement the City is obligated to outflow to Rialto Channel as part of prior agreements.

3.5 CULTURAL RESOURCES

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
V. Cultural Resources. Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5?	☐	☐	☐	☒
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?	☐	☒	☐	☐
c) Disturb any human remains, including those interred outside of dedicated cemeteries?	☐	☒	☐	☐

3.5.1 ENVIRONMENTAL SETTING

The analysis in this section is based on the Cultural Resources Assessment (CRA) (prepared by Duke CRM dated July 2023, which is included as Appendix C to the IS/MND.

As documented in the CRA, a records search for cultural resources (archaeological and historical) was performed on March 13, 2023, at the South Central Coastal Information Center (SCCIC), located at California State University, Fullerton. This included a review of all recorded historic and prehistoric cultural resources, as well as a review of known cultural resources surveys and excavation reports generated from projects located within ½ mile of the proposed Project. In addition, a review was conducted of the Built Environment Resources Directory (BERD), which includes the National Register of Historic Places (NRHP), California Register of Historical Resources (CRHR), California Historical Landmarks, and California Points of Historical Interest. The search identified 29 reports within the ½ mile search radius; four (4) of which cover all or a portion of the Project area. No cultural resources were identified during these studies within the Project area. The records search identified 29 cultural resources within the ½ mile search radius. One report from 1987 addressed the main body of the Project area for expansion of the WWTP. Two additional surveys covered the main body of the Project area. One survey covered the utility access road along Rialto Channel and another covered a proposed transmission line along Agua Mansa Road. As a review of these records identified 15 cultural resources within the ½ mile search radius. In addition, Duke CRM performed a pedestrian survey of the Project area was conducted on April 21, 2023, which did not result in the identification a historic or archaeological feature as the site was determined to be vacant with portions of dense vegetation.

3.5.2 DISCUSSION

a) Cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5?

No Impact. The only structures within the Project vicinity are the existing buildings and equipment at the adjacent WWTP facility to the north and the Rialto Channel to the east. As previously stated, the Project site is vacant and heavily disturbed due to the previous excavation of a pit and use as an effluent discharge location and subsequent abandonment as an effluent receiving location in the 1970s. As determined within the CRA, the 15 cultural resources identified within the ½ mile search radius of the Project site are not located within the Project area and none will be affected by the Project. The Project site contains no resources and would not affect resources and therefore development of the Project would not meet any of the criterion of eligibility for listing in the NRHP or CRHR, or affect

the significance of larger historic properties. As a result, the CRA concludes that no further cultural resources work is recommended. Therefore, there would be **no impact** directly, indirectly, or cumulatively to historical resources and no mitigation is required.

b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?

Less Than Significant Impact With Mitigation Incorporated. As stated in the CRA, analysis of the Project area was based on records search data, historical maps, aerial photographic research, field survey. The CRA concluded that due to the lack of cultural remains and the past history of soil disturbances, the Project area has low sensitivity at the surface for prehistoric resources and a low sensitivity for buried prehistoric and historic era resources.

Nevertheless, the possibility remains that unknown archaeological materials could be encountered during construction-related ground disturbing activities. This impact would be potentially significant.

Implementation of **Mitigation Measure MM CUL-1** would reduce potential impacts to archaeological resources discovered during project construction activities to a less than significant level because workers would be trained on identification of and proper handling of cultural resources. In addition, the measures would require the performance of professionally accepted and legally compliant procedures for the discovery of previously undocumented significant historical or archaeological resources. Therefore, with implementation of **MM CUL-1**, impacts to historic and archaeological resources would result in a **less than significant impact with mitigation incorporated** directly, indirectly, or cumulatively.

Mitigation Measures

MM CUL-1: Prior to grading activities and in consultation with the City, a qualified archaeologist shall develop a treatment plan. The treatment plan shall include protocols for the treatment of inadvertent discoveries of cultural or tribal resources during ground disturbances that would include evaluation of the resource(s) for CRHR-eligibility and further treatment to reduce impacts to the resource(s) through treatment that may include salvage excavation, laboratory analysis and processing, research, curation of the find in a local museum or repository, and preparation of a report summarizing the find(s). If the discovery is prehistoric in nature, local Native Americans shall be consulted.

If cultural resources or tribal cultural resources (such as structural features, unusual amounts of bone or shell, artifacts, or human remains) are encountered in the Project area during construction, the Project contractor shall stop work within 100 feet of the find(s) and the construction contractor shall immediately notify the project's City representative. The City representative in coordination with the Project contractor shall implement the evaluation and treatment protocols contained in the treatment plan.

c) Disturb any human remains, including those interred outside of dedicated cemeteries?

Less Than Significant Impact With Mitigation Incorporated. There are no known past cemeteries or burials within the Project area. However, because earthmoving activities associated with project construction would occur, there is potential to encounter buried human remains or unknown cemeteries in areas with little or no previous disturbance. This impact would be potentially significant.

Implementation of **Mitigation Measure MM CUL-2** would reduce potential impacts related to human remains to a less than significant level by requiring work to stop if suspected human remains are found, communication with the county coroner, and the proper identification and treatment of the remains consistent with the California Health and Safety Code and the California Native American Historical, Cultural, and Sacred Sites Act. Therefore, with

implementation of **MM CUL-2,** a **less than significant impact with mitigation incorporated** would occur to human remains directly, indirectly, or cumulatively.

Mitigation Measures

MM CUL-2: If human remains are encountered in the Project area during construction, the Project contractor shall stop work in accordance with State Health and Safety Code Section 7050.5. No further disturbance shall occur until the County Coroner has made a determination of origin and disposition pursuant to Public Resources Code Section 5097.98. The County Coroner must be notified of the find immediately. If the remains are determined to be prehistoric, the Coroner will notify the NAHC, which will determine and notify a Most Likely Descendant (MLD). With the permission of the City or authorized representative, the MLD may inspect the site of the discovery. The MLD shall complete the inspection within 48 hours of notification by the NAHC. The MLD may recommend scientific removal and nondestructive analysis of human remains and items associated with Native American burials. In addition, according to the California Health and Safety Code, a cemetery is place where six (6) or more human bodies are buried (Section 8100), and unauthorized disturbance of Native American cemeteries is a felony (Section 7052).

3.6 ENERGY

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
VI. Energy. 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?	☐	☐	☐	☒
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☐	☐	☐	☒

3.6.1 ENVIRONMENTAL SETTING

California is powered by a diverse mix of energy sources including petroleum products (gasoline, diesel, jet fuel), natural gas, and alternative energy. The proposed RHNC Project would result in the construction of 13-acre outdoor public recreational space including a 10-acre lake, one mile of pedestrian perimeter trails, public parking on Agua Mansa Road, and a pedestrian path between the RHNC site and the parking area along the Rialto Channel utility road. Consumption of energy from the proposed Project would occur during construction and operation and is discussed within this section.

3.6.2 DISCUSSION

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 proposed Project would use energy resources during construction and operation. Energy resources that would be potentially impacted by land use development projects result from energy demand for electricity, natural gas, vehicle and equipment fuels, and utility distribution. The proposed Project would comply with existing, applicable, City and State regulatory compliance measures related to air pollution and GHG emissions reduction, trip and trip length reduction, and water efficiency which all promote the efficient use of energy. The Project would also be constructed in accordance with all applicable City and State building codes that require use of energy efficient designs and materials resulting in the conservation energy. These existing regulatory compliance measures establish an inherent baseline of energy efficiencies common to all development projects in the City.

Construction Energy: Construction activities would require short-term and therefore limited energy consumption and are not expected to have an adverse impact on available energy supplies and infrastructure. Electricity demand during construction would be temporary, nominal, and would cease upon the completion of construction. Electricity would be supplied by a connection to the City's existing WWTP near the Project site, anticipated to be on the north border of the site. Natural gas typically is not consumed during construction, nor is anticipated for operation of the RHNC. While it is difficult to measure the energy used in the production of construction materials such as asphalt, and concrete, it is reasonable to assume that the production of such materials would employ all reasonable energy conservation practices in the interest of minimizing the cost of doing business. The proposed Project would have a

less than significant impact directly, indirectly, or cumulatively related to electricity, natural gas, and transportation energy supply and infrastructure capacity during construction. No mitigation is required.

Operation Energy: Energy would be consumed during Project operations related to water conveyance via proposed pumps, solid waste disposal, inbound and outbound vendor trips, and vehicle trips of employees and customers. The proposed Project would be required to comply with applicable federal, State, and local standards promoting energy efficiency including Title 24 building code standards. The proposed Project would not result in the inefficient, wasteful, or unnecessary consumption of building energy as nor structures are proposed. Additionally, there would not be any inefficient, wasteful, or unnecessary energy usage in comparison to similar development projects of this nature regarding construction-related fuel consumption. In addition, the proposed Project would result in a new outdoor passive use and environmental destination providing the opportunity to meet the demand for such space at a closer distance from residents in the vicinity. Therefore, implementation of the proposed Project would result in less than significant impacts on energy resources.

In summary, the proposed project would have a **less than significant impact** directly, indirectly, or cumulatively related to electricity, natural gas, and transportation energy supply and energy infrastructure capacity during operation. No mitigation is required.

b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

Less Than Significant Impact. As previously stated, the proposed Project would result in the construction of a lake with outdoor space, trails, and parking. Energy saving strategies would be implemented where feasible to reduce energy consumption during Project construction and operation of the RHNC as outlined in the California Green Building Standards Code to offset energy consumption and costs. CARB air pollution emission reduction strategies that reduce both construction and operation energy consumption including diesel anti-idling measures, light-duty vehicle technology, usage of alternative fuels such as biodiesel blends and ethanol, and heavy-duty vehicle design measures would reduce energy consumption. In addition, the Project would comply with all applicable General Plan policies and more specifically the goals within the *Sustainable Building Practices and Energy Conservation* section:

- **Goal 2-30:** Incorporate green building and other sustainable building practices into development projects.
- **Goal 2-31:** Conserve energy resources

The Project would comply with all applicable Municipal Code requirements specific to energy and water efficiency standards. Therefore, the Project would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency. As a result, the potential impacts are considered to be **less than significant** directly, indirectly, or cumulatively and no mitigation is required**.**

3.7 GEOLOGY AND SOILS

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
VII. Geology and Soils. Would the project:				
a) Directly or indirectly cause potential substantial				
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 California Geological Survey Special Publication 42.)	☐	☐	☒	☐
ii) Strong seismic ground shaking?	☐	☐	☒	☐
iii) Seismic-related ground failure, including liquefaction??	☐	☐	☒	☐
iv) Landslides?	☐	☐	☒	☐
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐
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 on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?	☐	☐	☒	☐
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994, as updated), creating substantial direct or indirect risks to life or property?	☐	☐	☒	☐
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	☒
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☒	☐	☐

3.7.1 ENVIRONMENTAL SETTING

A Geotechnical Exploration and Review of Grading and Improvement Plan (Geotechnical Exploration) was conducted by NMG Geotechnical, Inc. (NMG) dated January 16, 2023, to evaluate the existing conditions of the proposed Project

site, to identify geologic hazards, and to provide recommendations for Project development. Information from this report is utilized in the analysis below and the report is included as Appendix D to the IS/MND.

3.7.2 DISCUSSION

a.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?

Less Than Significant Impact. The Project site is in a seismically active zone typical of the Southern California area. Because the Project site is in a seismically active region of Southern California, occasional seismic ground shaking is likely to occur within the lifetime of the proposed Project. However, according to the California Department of Conservation, the California Geologic Survey, the Project site is not within an Alquist-Priolo Earthquake Fault Zone. The closest active fault is the San Jacinto Fault, located approximately 3.8 miles northeast of the site. The Project site is not crossed by an earthquake fault and is not affected by a state-designated Alquist-Priolo Earthquake Fault Zone. Thus, impacts would be **less than significant** directly, indirectly, or cumulatively. No mitigation is required.

a.ii) Strong seismic ground shaking?

Less Than Significant Impact. As mentioned previously, the Project site is located within a seismically active region of Southern California. The closest active fault is the San Jacinto Fault, located approximately 3.8 miles northeast of the site. Thus, strong seismic ground shaking has a high likelihood of occurring at the site. The amount of ground motion varies based on the distance to a fault, the magnitude of an earthquake, and local geology. Greater movement can be expected at sites located closer to an earthquake epicenter, sites consisting of poorly consolidated material such as alluvium, and sites subject to earthquakes of great magnitude.

As described, the proposed Project would construct a lake with outdoor trails and an associated paved parking lot of which all earthwork and grading construction activities preformed in the City are required to be in compliance with the California Building Code (CBC [California Code of Regulations, Title 24, Part 2]). Per the City's General Plan Seismic Hazards Policy 5-1.2, all construction is required to conform with the Uniform Building Code (UBC) and the CBC. These requirements are implemented through the City's Municipal Code, Chapter 11.12 Excavations and Fills, to provide for earthquake resistant earthwork practices and design. Compliance with the Municipal Code would ensure CBC earthquake safety practices and design are implemented at a project level based on factors including occupancy type, types of soils on-site, and probable strength of ground motion. Through compliance with the Municipal Code, the proposed Project would not expose people or structures to potentially substantial adverse effects, including the risk of loss, injury, or death involving strong seismic ground shaking more than other developments in Southern California.

The Geotechnical Report conducted a project-specific evaluation of the geotechnical issues and made findings regarding construction of the proposed Project. The Geotechnical identified the following main issues for the project:

- Stability of the perimeter slopes, especially during emptying and re-filling of the lake;
- Erodibility and potential soil piping of the sandy alluvium;
- Impact of lake development on existing slopes and adjacent properties, including existing electric transmission towers along the southern portion of the site;
- Presence of uncertified fills placed during prior grading/disposal at the site;
- Presence of the Agua Mansa Landfill rubble material along the southern boundary of the subject site; and
- The potential for strong seismic shaking.

Based on the evaluation and findings, construction of the proposed improvements was determined to be geotechnically feasible provided the geotechnical recommendations presented in Geotechnical Report are implemented during design, grading and construction of the Project. These recommendations have been

incorporated into the grading and improvement plans developed for the proposed Project and constitute a Project Design Feature (PDF). With implementation of the geotechnical recommendations that have been incorporated into the Project's grading and improvement plans (i.e., PDF), impacts would be **less than significant** directly, indirectly, or cumulatively related to seismic-related ground shaking, and no mitigation is required.

a.iii) Seismic-related ground failure, including liquefaction?

Less Than Significant Impact. Liquefaction refers to loose saturated sand or gravel deposits that lose their load supporting capability when subjected to intense shaking. Any buildings or structures on these sediments may float, sink, or tilt as if on a body of water. According to the County of San Bernardino General Plan (2009), *Geologic Hazard Overlay,* the Project site is located in an area outside a zone of "Suspected Liquefaction Susceptibility." In addition, the Geotechnical Exploration determined groundwater within the Project site is located at a depth in excess of 35 feet. As stated above in Response 3.7 (a.ii), through compliance with the Municipal Code and implementation of the geotechnical recommendations that have been incorporated into the Project's grading and improvement plans (i.e., PDF), the proposed Project would not expose people or structures to potentially substantial adverse effects, including the risk of loss, injury, or death involving seismic-related ground failure, including liquefaction more than other developments in Southern California. Impacts would result in a **less than significant impact** directly, indirectly, or cumulatively related to seismic-related ground failure, including liquefaction, and no mitigation is required.

a.iv) Landslides?

Less Than Significant Impact. Landslides are the downhill movement of masses of earth and rock and are often associated with earthquakes. Other factors such as slope, moisture content soil, composition of subsurface geology, heavy rains, and improper grading can influence the occurrence of landslides.

The Project site is considered to be generally flat around the pit. The Project's construction would involve excavation of the eastern portion of the lake to obtain two to one (2:1) slopes and minor cuts and fills to develop the western portion of the lake and trails throughout. Construction activities would include minor grading and compaction to obtain proper elevations for the parking lot to be paved. All areas in the Project site, including the slopes of the lake, would be properly conditioned and compacted as required in accordance with the geotechnical recommendations contained in the Geotechnical Report prepared for the Project (i.e., PDF). As a result of the Project's implementation of the geotechnical recommendations that have been incorporated into the grading plans to further stabilize on-site soil conditions, impacts would be **less than significant** directly, indirectly, or cumulatively and no mitigation is required.

b) Result in substantial soil erosion or the loss of topsoil?

Less Than Significant Impact.

Erosion and sediment control methods would be implemented as part of the Project's Storm Water Pollution Prevention Plan (SWPPP) that is a required for all construction activities including the proposed Project. With implementation of the grading and erosion control standards for which all development activity must comply with Chapter 11.12, *Excavations and Fills*, of the Municipal Code, and implementation of measures designed to minimize soil erosion would occur in accordance with the SWPPP. Compliance with State and federal requirements as well as with Chapters 12.60.110 and 11.12 of the City's Code would ensure that soil erosion or loss of topsoil would result in a **less than significant impact** directly, indirectly, or cumulatively and no mitigation is required.

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 on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?

Less Than Significant Impact. As mentioned previously, the Project site is located within a seismically active region of Southern California. As stated above in Response 3.7 (a.iii), impacts related to liquefaction would be less than

significant level with compliance with the CBC as implemented through the City's Municipal Code. As demonstrated in Response 3.7 (a.iv), the Project site would not be subject to earthquake-induced landslides. As stated in the Geotechnical Exploration, impacts from subsidence, lateral spreading, and liquefaction are considered low due to the dense nature of fill and native soil of the Project site. These recommendations have been incorporated into the grading and improvement plans developed for the proposed Project (i.e., PDF). With implementation of the geotechnical recommendations that have been incorporated into the Project's grading and improvement plans, potential impacts would result in a **less than significant impact** directly, indirectly, or cumulatively and no mitigation is required.

d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994, as updated), creating substantial direct or indirect risks to life or property?

Less Than Significant Impact. Expansive soils contain certain types of clay minerals that shrink or well as the moisture content changes; the shrinking or swelling can shift, crack, or break structures built on such soils. Arid or semiarid areas with seasonal changes of soil moisture experiences, such as southern California, have a higher potential of expansive soils than areas with higher rainfall and more constant soil moisture. As determined in the Geotechnical Exploration, the majority of the Project site consists of sand and gravel and some silt. The Project site soil is determined to have relatively high dry densities and low compressibility. In addition, near-surface soils, both fill and alluvium are predominantly non-expansive.

Compliance with the CBC as implemented through the Municipal Code would require that specific engineering design recommendations are incorporated into grading plans and building specifications as a condition of construction permit approval to ensure that Project structures would withstand the effects of related to ground movement from expansive soils. The geotechnical recommendations addressing expansive soils as presented in Geotechnical Report have been incorporated into the grading and improvement plans developed for the proposed Project and constitute a PDF. With implementation of the geotechnical recommendations that have been incorporated into the Project's grading and improvement plans, a **less than significant impact** directly, indirectly, or cumulatively would occur related to expansive soils and no mitigation is required.

e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?

No Impact. The Project does not propose the use of septic tanks or alternative wastewater disposal systems. As a result, **no impact** associated with the use of septic tanks would occur directly, indirectly, or cumulatively as part of the proposed Project's implementation and no mitigation is required.

f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Less Than Significant With Mitigation Incorporated. According to the United States Department of Agriculture (USDA) Web Soil Survey and the Geotechnical Report, the soils that underlie the Project site are described as quarries and pit soils which consist of undocumented fill, and sandy and gravelly alluvium soil deposits. Due to the type and quantity of soil to be cut from the western portion of the RHNC lake site, the likelihood of encountering paleontological resources is considered very low at near surface depths into such alluvium. However, there is the potential to uncover unknown paleontological resources during grading activities. **Mitigation Measure MM GEO-1** would ensure avoidance and minimization measures are implemented in the event inadvertent discoveries of paleontological resources are uncovered during construction including procedures to evaluate resources. Implementation of **MM GEO-1** would result in a **less than significant impact with mitigation incorporated** directly, indirectly, and cumulatively.

Mitigation Measures

MM GEO-1: If paleontological resources are encountered in the Project area during construction, work shall be suspended within 100 feet of the find (based on the apparent distribution of paleontological materials), and the construction contractor shall immediately notify the Project's City representative. The City shall contact a qualified paleontologist to evaluate the finds and the paleontologist shall: 1) implement avoidance and minimization measures if necessary; 2) identify the need for off-site lab evaluation requirements if necessary; and 3) define the steps needed for final disposition of the finds if necessary.

3.8 GREENHOUSE GAS EMISSIONS

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
VIII. Greenhouse Gas Emissions. Would the project:				
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 the emissions of greenhouse gases?	☐	☐	☒	☐

3.8.1 ENVIRONMENTAL SETTING

The analysis below is based on the Air Quality and Greenhouse Gas Assessment (AQ/GHG Analysis) prepared by Urban Crossroads, Inc. (Urban Crossroads) dated July 27, 2023, which is provided in its entirety as Appendix A of the IS/MND.

3.8.2 DISCUSSION

a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

Less Than Significant Impact.

Construction

Project construction would generate greenhouse gas (GHG) emissions from equipment exhaust, construction-related vehicular activity, and construction worker automobile trips. Construction GHG emissions would be temporary, short-term, and negligible when averaged over 30-years.

Operations

The proposed Project would include a pump for the lake, and possible lighting for security and safety of the perimeter trails. As a result, operational energy usage for the Project would result in the generation of GHG emissions. Existing State and federal regulations including the California Building Code regarding the energy efficiency of appliances (pump equipment) and lighting, would reduce the electricity demand from the proposed Project. The Project would also generate GHG emissions from mobile sources (trucks and passenger vehicles including busses). Truck and passenger vehicle emissions would be reduced by numerous regulations that affect both the cleanliness of fuels and the eventual tailpipe emissions.

Estimated GHG emissions from the proposed Project were estimated using previously the referenced CalEEMod. The estimated GHG emissions from the proposed Project are summarized below in Table GHG-1.

TABLE GHG-2: PROPOSED PROJECT GHG EMISSIONS

Source	Emissions (MT/yr)				
	CO_2	CH_4	N_2O	R	Total CO_2e

Annual construction-Related Emissions Amortized Over 30 Years	56.49	2.32E-03	5.71E-04	7.39E-03	56.72
Energy	27.85	0.00	0.00	0.05	29.33
Mobile	0.91	0.00	0.00	0.00	0.91
Water	15.65	0.00	0.00	0.00	15.75
Waste	0.09	0.01	0.00	0.00	0.32
Total CO_2e (All Sources)	**102.03**				

Source: Urban Crossroads (Appendix A)

The South Coast Air Quality Management District (SCAQMD) developed draft screening thresholds for local agencies including a screening threshold of 3,000 $MTCO_2e$/yr for residential/commercial projects.[1] Use of SCAQMD's draft recommendations has become a widely accepted practice by the City. For this reason, a 3,000 $MTCO_2e$/yr threshold has been used as a screening threshold for the proposed Project. As shown in Table GHG-1, the proposed Project would generate a total of approximately 102.03 $MTCO_2e$/yr. As a result, the sum of Project construction and operational GHG emissions would be below the 3,000 $MTCO_2e$ significance threshold. Therefore, the increase in GHG emissions resulting from implementation of the proposed Project would result in a **less than significant impact** directly, indirectly, or cumulatively. No mitigation is required.

b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gasses?

Less Than Significant Impact. The City of Rialto has prepared a Draft Climate Adaptation Plan. The Climate Adaption Plan provides general guidance and policies that would "… prepare the City and its residents for the expected impacts of climate change, as required by State law." projects.[2] The Climate Adaption Plan is not a GHG reduction plan.

The 2022 Scoping Plan for Achieving Carbon Neutrality (2022 Scoping Plan) lays out a path to achieve targets for carbon neutrality and reduce anthropogenic GHG emissions by 85 percent below 1990 levels no later than 2045, as directed by Assembly Bill 1279. The 2022 Scoping Plan relies on the deployment of clean technologies and fuels, further reductions in short-lived climate pollutants, support for sustainable development, increased action on natural and working lands to reduce emissions and sequester carbon, and the capture and storage of carbon. The proposed Project would comply with and would implement state and regional regulations and strategies that would minimize and control GHG emissions, and in this regard supports the 2022 Scoping Plan. The Project does not propose or require elements or operations that would obstruct or conflict with the 2022 Scoping Plan. In addition, the Project would not have the potential to generate direct or indirect GHG emissions that would result in a significant impact on the environment. Thus, a **less than significant impact** related to consistency with GHG emissions reduction plans, policies or regulations would occur. No mitigation is required.

[1] *Draft Guidance Document - Interim CEQA Greenhouse Gas (GHG) Significance Threshold*, SCAQMD, 2008.
[2] *City of Rialto, Climate Adaptation Plan*, City of Rialto, 2021.

3.9 HAZARDS AND HAZARDOUS MATERIALS

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
IX. Hazards and Hazardous Materials. Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☒	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and/or accident conditions involving the release of hazardous materials into the environment?	☐	☐	☒	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒
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?	☐	☐	☒	☐
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 or excessive noise for people residing or working in the project area?	☐	☐	☐	☒
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☒	☐
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires?	☐	☐	☐	☒

3.9.1 ENVIRONMENTAL SETTING

The RHNC site is in the southern portion of the existing WWTP property to the north, So Cal Edison power poles and easement to the south, the Rialto Channel to the east, and undeveloped industrial-zoned property to the west. According to the Geotechnical Exploration (Appendix D), aerial photographs and topographic maps depict the proposed Project site in a topographically low area historically used as sand and gravel quarries, and effluent ponds for the WWTP. The approximately 13-acre Project site is currently vacant and is covered by the former effluent pit

and is currently abandoned, unused. The Project site has an existing 36-inch drain pipe near the east side of the dry pit which discharges treated effluent flow into the Rialto Channel.

3.9.2 DISCUSSION

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. Construction of the Project would involve the routine transport and handling of hazardous substances such as diesel fuels, lubricants, and solvents. Handling and transport of these materials could result in the exposure of workers to hazardous materials. During Project construction, workers would be required to use, store, and transport hazardous materials in accordance with local, state, and federal regulations, including California Occupational Safety and Health Administration (Cal/OSHA) and California Department of Toxic Substances Control (DTSC) requirements and manufacturer's instructions.

Once operational, it is expected RHNC would require the need to store small quantities of hazardous materials used on the site typical of any outdoor use or park such as fuels and oils for equipment, solvents, adhesives, pesticides, and other materials. Consequently, Project operations would not be considered hazardous to the public at large. Certified Unified Program Agency (CUPA) with Hazardous Materials Division of the San Bernardino County Fire Department

The Project would be required to implement and comply with existing hazardous materials regulations including the San Bernardino County Certified Unified Program Agency's (CUPA) Hazardous Waste Inspection Program. The Project would not create significant hazards to the public or environment through the routine transport, use, and disposal of hazardous materials. Adherence to existing regulations governing the transport, use and storage of hazardous materials during Project construction and operations would result in a **less than significant impact** directly, indirectly, or cumulatively. No mitigation is required.

b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and/or accident conditions involving the release of hazardous materials into the environment?

Less Than Significant Impact. The Project site is located approximately one mile southeast from the closest residences and any potential spills would be unlikely to pose a significant hazard to the public. Furthermore, as discussed above in Response 3.9 (a), the Project would involve limited use of hazardous materials during construction and operations. Compliance with applicable Federal, State, and local laws and regulations pertaining to the transport, use, disposal, handling, and storage of hazardous materials would reduce risks from release of hazards to the environmental to an accepted level, resulting a **less than significant impact** directly, indirectly, or cumulatively. No mitigation is required.

c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

No Impact. The nearest school is the Crestmore Elementary School, located approximately 1.9 miles west from the Project site. There are no schools within 0.25-mile of the Project site. Therefore, there would be **no impact** directly, indirectly, or cumulatively and no mitigation is required.

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. The Hazardous Waste and Substances Sites List (Cortese List) is a planning document used by the State, local agencies, and developers to comply with the CEQA requirements in providing information about the location of hazardous materials release sites. Government Code Section 65962.5 requires the California

Environmental Protection Agency to develop an annually updated Cortese List. The Department of Toxic Substances Control (DTSC) is responsible for a portion of the information contained in the Cortese List. Other State and local government agencies are required to provide additional hazardous material release information for the Cortese List. DTSC's EnviroStor database provides DTSC's component of Cortese List data.

Review of EnviroStor database indicates that the Project site is not identified on the Cortese list or other State or county hazardous materials lists. In addition, there are no hazardous materials sites within 0.25-mile of the Project site. In addition, there are no hazardous materials sites within 0.25-mile of the Project site. Therefore, ground disturbance during Project construction and Project operations are not anticipated to create a significant hazard to the public or environment, resulting in a **less than significant impact** directly, indirectly, or cumulatively and no mitigation is required.

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 or excessive noise for people residing or working in the project area?

No Impact. The nearest airport is Flabob Airport, which is a public airport located approximately 5.15 miles from the Project site to the southwest. In addition, the San Bernardino International Airport is approximately 7.3 miles from the Project site to the northeast. There are no public airports within 2 miles of the Project site, and the Project site is not within an airport land use plans area. Therefore, **no impact** would occur directly, indirectly, or cumulatively. No mitigation is required.

f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

No Impact. As described in the City's General Plan, the City has the potential to be exposed to a multitude of hazards including wildfires, floods, windstorms, hazardous materials releases, civil disturbance, and earthquakes. However, the City's Standard Emergency Management System (SEMS) Multi-Hazard Functional Plan (MHFP) includes procedures for mitigating such events. The Project would not physically interfere with the MHFP, or any other emergency response plan. Vehicles traveling to the Project area would use the Project parking area on Agua Mansa Road. Similarly, during construction, workers and vendors would stage vehicles and equipment within the Project footprint, and they would not stage near or block any evacuation routes. Although construction adjacent to Agua Mansa Road may temporarily interfere with traffic or result in lane closures, the proposed Project would be required to maintain adequate emergency access to the site. It should be noted that construction of the Project would not require any street closures. The Project would have a **less than significant impact** directly, indirectly, and cumulatively on emergency response or evacuation plans. No mitigation is required.

g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires?

No Impact. The Project site is not in an area designated as having a high potential for wildland fires. The Project site is in a urbanized area of the City of Rialto developed with industrial structures and material storage that is void of nearby wildlands. According to the California Department of Forestry and Fire Protection (CalFire), the Project site is not within a fire hazard severity zone (FHSZ). The Project would not expose people or structure to a significant risk involving wildland fires. Thus, the Project would have **no impact** directly, indirectly, and cumulatively on wildland fires. No mitigation is required.

3.10 HYDROLOGY AND WATER QUALITY

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
X. Hydrology and Water Quality. Would the project:				
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?	☐	☐	☒	☐
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	☐	☐	☒	☐
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 which would:	☐	☐	☒	☐
i) Result in substantial on- or off-site erosion or siltation	☐	☐	☒	☐
ii) Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site;	☐	☐	☒	☐
iii) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or	☐	☐	☒	☐
iv) Impede or redirect flood flows?	☐	☐	☐	☒
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☐	☐	☒
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☐	☒	☐

3.10.1 ENVIRONMENTAL SETTING

As stated previously, the RHNC site is dominated by an abandon pit formerly used as the discharge location for partially treated effluent from the WWTP up to the early 1970s. A concrete drainage channel that drains the WWTP facilities to the north terminates into a rip-rap infiltrate pad located in the northern-central portion of the site. No

other drainage feature exists on the Project site. The concrete-lined Rialto Channel is located adjacent to the east of the Project site.

3.10.2 DISCUSSION

a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?

Less Than Significant Impact. Prior to start of Project construction, the City or Project contractor would be required to prepare and receive approval of a Storm Water Pollution Prevention Plan (SWPPP) from the Santa Ana Regional Water Quality Control Board (RWQCB) pursuant to the National Pollutant Discharge Elimination System (NPDES) regulations and the Santa Ana River Basin Water Quality Control Plan. The SWPPP would be included and implemented as part of the NPDES General Industrial Activities Storm Water Permit. The SWPPP would contain construction and operational best management practices (BMPs) that would restrict the discharge of sediment into the streets and local storm drains including the adjacent Rialto Channel, based on the required Project specific WQMP. The SWPPP must be obtained prior to the commencement of construction in order to ensure applicable BMPs are implemented. The SWPPP would remain on the Project site during construction and during project operations, so that the City and contractor are aware of the measures to be implemented. Adherence to the BMPs outlined in the mandatory SWPPP would ensure Project construction and operations do not violate any water quality standards or waste discharge requirements. Furthermore, the proposed Project would be subject to Section 12.60.260 of the Rialto Municipal Code, which requires projects to submit a WQMP for review and approval by the City.

Once constructed, the Project would divert and reclaim approximately 1 cfs of effluent from the WWTP into the lake complex and outlet the same or similar flow back into the existing discharge drainpipe into concrete-line Rialto Channel along the west of the property. This discharge will require a modification to the City's existing waste discharge requirements (WDR) permit that govern the WWTP's effluent discharge into the channel. The modification would be processed through the Santa Ana RWQCB that constitutes a Project Design Feature (PDF). With approval of the WDR permit modification (i.e., PDF) by the Santa Ana RWQCB, the minor change in the WWTP effluent discharge location necessary to accommodate outflow from the lake would be considered a less than significant impact.

According to the Geotechnical Exploration (Appendix D) completed for the Project site, groundwater has been as shallow as 870 feet, which is 7 feet below the bottom of the eastern lake. Explorations conducted in 2010 and 2021 showed groundwater levels at 836 and 841 feet msl, which is more than 35 feet below the bottom of the eastern lake. The proposed dual 10-acre lake complex would be created using a synthetic polyethylene (PE) liner partially buried under clay near the lake perimeters and the manufactured wetlands area in the north side of the larger, eastern lake. Although infiltration of the lake water into the groundwater below would not result in a violation of water quality standards because the incoming effluent from the WWTP is fully treated to tertiary levels considered acceptable for percolation into the groundwater, the synthetic PE liner would create an impermeable barrier between the lake water and the below groundwater. As a result, the groundwater table is would not be encountered during construction and operation of the lake would not result in percolation of lake water into the groundwater. at the site.

Through compliance with the Rialto Municipal Code and implementation of the BMPs contained in the construction and operation SWPPP and any modifications to the discharge measures contained in the modified WDR permit, the Project would not violate water quality standards or waste discharge requirements. As a result, a **less than significant impact** regarding violation of water quality standards and waste discharge requirements would occur directly, indirectly, and cumulatively. No mitigation is required.

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. The proposed Project would require connection to domestic water supplied by WVWD. Therefore, the Project would not include construction of a well that would otherwise result in a direct decrease in underlying groundwater supplies. The project site does not contain a groundwater recharge basin or other facilities that promote groundwater recharge and is therefore not considered an important location for groundwater recharge. However, the synthetic PE lined lake complex would create an impervious barrier and prohibit the incidental infiltration of stormwater runoff that currently flows into the previously excavated pit. Because the existing infiltration that occurs on the Project site is not considered to be important or significant, the loss of percolation into the subsurface soils compared to the existing conditions is not considered significant. As a result, the Project would not impede sustainable management of the groundwater basin resulting a **less than significant impact** directly, indirectly, or cumulatively to groundwater. No mitigation is required.

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 which would:

c.i) Result in substantial on- or off-site erosion or siltation?

Less Than Significant Impact. As discussed in Response 3.10 (a) above, the Project would comply with Federal NPDES regulations as implemented through a SWPPP. The SWPPP would contain construction and operational BMPs that would restrict the discharge of sediment into the streets and local storm drains. Adherence to the BMPs outlined in the mandatory SWPPP would ensure Project construction and operations would not violate any water quality standards or waste discharge requirements. Similar to existing conditions, storm water runoff from the southernly parking lot would be discharged off-site into local storm drains from Agua Mansa Road. Construction of the Project would be restricted to the Project site and the Project would not alter the course of any stream or river including the Santa Ana River that would lead to on-or off-site siltation or erosion. The Project would have a **less than significant impact** directly, indirectly, or cumulatively to existing drainage patterns. No mitigation is required.

c.ii) Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?

Less Than Significant Impact. As previously stated, Project implementation would not adversely affect the existing drainage patterns in the area as the site is predominately a previously excavated pit. As such, alteration of the on-site drainage pattern would be conducted in a manner consistent with all applicable standards related to the collection and treatment of stormwater compared to the Project site's existing condition. The Project would not increase the rate or amount of surface runoff in a manner which would result in flooding on-or-off-site. The Project would have a **less than significant impact** directly, indirectly, or cumulatively regarding surface runoff. No mitigation is required.

c.iii) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?

Less Than Significant Impact. Runoff from the developed site would be minimal because a majority of the Project consists of 10 acres of lake. Runoff from the adjacent off-site locations onto the proposed developed site would be conveyed to the lake utilizing a series of v-ditches along the outside of the perimeter trails and on the east side of the site above the perimeter trails and down pipes into the lake. Additionally, the public parking area would be designed to maintain existing flows along the Agua Mansa Road curbs and gutters. Because Project implementation would result in the same or less rate and amount of surface runoff as in the existing condition, the Project would not contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems. In

addition, with implementation of the SWPPP as discussed in this section, the Project would not create substantial amounts of additional sources of polluted runoff. The Project would have a **less than significant impact** directly, indirectly, or cumulatively regarding surface runoff. No mitigation is required.

c.iv) Impede or redirect flood flows?

No Impact. According to the Federal Emergency Management Agency (FEMA) National Flood Hazard Layer View (NFHLV) maps, the proposed RHNC site is within a designated flood hazard area. The parking lot is within a Zone X designation which has an annual probability of flooding of less than 0.2 percent and represents areas outside a 500-year flood plain. Properties located in Zone X are also not located within a 100-year flood plain. As stated in this section, the proposed drainage system would capture offsite and onsite stormwater flows convey through the site safely to the proposed lake complex. For these reasons**,** the Project would have **no impact** related to impeding or redirecting flood waters directly, indirectly, or cumulatively. No mitigation is required.

d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?

No Impact. The Project site is not within a 100-year flood hazard zone. Therefore, the Project would not have the potential to release pollutants due to 100-year flood inundation (FEMA, 2008). A tsunami is a sea wave, commonly referred to as a tidal wave, produced by a significant undersea disturbance such as tectonic displacement of a seafloor associated with large, shallow earthquakes. A seiche is an oscillation of a body of water in an enclosed or semi-enclosed basin, such as a reservoir, harbor, lake, or storage tank. The Project site is located approximately 45 miles northeast of the Pacific Ocean. Due to site distance, the Project would not be subject to tsunami-related inundation. With the exception of the relatively small water holding facilities on the WWTP, there are no large enclosed or semi-enclosed bodies of water in proximity to the Project site and therefore the Project would not be subject to seiche related inundation. **No impact** related to the potential for seiche or mudflow exists either directly, indirectly, or cumulatively. No mitigation is required.

e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

Less Than Significant Impact. As previously discussed in Response 3.10 (a) and (b), the Project would be required to comply with the Santa Ana RWQCB's Santa Ana River Basin Water Quality Control Plan by preparing and adhering to a SWPPP and WQMP. Implementation of the Project would not conflict with or obstruct the Santa Ana River Basin Water Quality Control Plan and impacts would be less than significant. As such, the Project's construction and operation would not conflict with any sustainable groundwater management plan. As a result, **a less than significant impact** directly, indirectly, or cumulatively is anticipated. No mitigation is required.

3.11 LAND USE AND PLANNING

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XI. Land Use and Planning. Would the project:				
a) Physically divide an established community?	☐	☐	☐	☒
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?	☐	☐	☐	☒

3.11.1 ENVIRONMENTAL SETTING

The majority of the Project site is located in the City of Rialto including the RHNC site and the connecting pedestrian pathway along the Rialto Channel utility road. A small portion of the Project is the public parking area on the north side of Agua Mansa Road which is located in the City of Colton and within San Bernardino County right-of-way. The RHNC site includes vacant land owned by the City, nearby roadways and the adjacent WWTP facility to the north and Rialto Channel to the east. The area is surrounded by industrial development and vacant land.

The RHNC site is designated General Industrial (GI) by the General Plan and the zoning is Agua Mansa Industrial Corridor Specific Plan (AMICSP). The AMICSP land use designation for the RHNC site is Public. The GP land use designation of GI allows for heavy industrial activities and permitted for manufacturing and processing, warehousing and distribution, chemical or petroleum products processing and refining, heavy equipment operations, and similar uses.

3.11.2 DISCUSSION

a) Physically divide an established community?

No Impact. The Project area is located within an area of the existing WWTP, industrial uses, and vacant land. The proposed Project is replacing the existing previously excavated pit with a lake, trails, native landscaping, and environmental education opportunities. The Agua Mansa Road parking lot would replace vacant land with 11 asphalt paved parking spaces for public use. The proposed Project introduces land uses permitted for development within the AMICSP Public designation. Therefore, the Project would not divide the established community. As a result, **no impact** would occur directly, indirectly, or cumulatively. No mitigation is required.

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 land use within the Project area would be consistent with the General Plan and AMICSP land use designations. The Project would result in a lake created by using existing recycled water from the adjacent WWTP. The previously excavated, existing pit would be reengineered to create two interconnected lakes and a shallow marsh wetland area by diverting and reclaiming a small portion of the WWTP's tertiary treated effluent. Lake water would be returned back into the concrete-lined Rialto Channel at the existing discharge location at the southeast portion of the east lake resulting in no change to existing flow conditions that are occurring today.

Therefore, the Project would not result in any changes to the existing land use that would conflict with the existing land use designations for the project area. As a result, **no impact** would occur directly, indirectly, or cumulatively. No mitigation is required.

3.12 MINERAL RESOURCES

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XII. Mineral Resources. Would the project:				
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?	☐	☐	☐	☒
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?	☐	☐	☐	☒

3.12.1 ENVIRONMENTAL SETTING

The California Surface Mining and Reclamation Act of 1975 (SMARA) requires that all cites address significant aggregate resources, classified by the State Geologist and designated by the State Mining and Geology Board, in their General Plans to promote conservation and protection of significant mineral deposits. The law provides for significant aggregate resources to be recognized and considered before land use decisions are made that may compromise the availability of these resources. The State Geologist classifies lands in California based on geological factors, without regard to existing land use and land ownership. Because available aggregate construction material is limited, four designations have been established for the classification of sand, gravel, and crushed rock resources:

- MRZ-1 Mineral Resource Zone: No significant mineral deposits are present or likely to be present.
- MRZ-2 Mineral Resource Zone: Significant mineral deposits are present or there is a high likelihood for their presence.
- MRZ-3 Mineral Resource Zone: The significance of mineral deposits cannot be determined.
- MRZ-4 Insufficient data to assign any other MRZ designation.

These mineral resource designations are intended to prevent incompatible land use development in areas determined to have significant mineral resource deposits. Permitted uses within a designated area of regional significance include mining, uses that support mining such as smelting and storage of materials, or uses that would not hinder future mining, such as grazing, agriculture, and low-intensity recreation.

3.12.2 DISCUSSION

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?

And;

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. Project Site is located within Mineral Resource Zone 2 (MRZ 2), which is a designation placed upon areas where geological data indicate that significant Plain Cement Concrete-Grade (PCC-Grade) aggregate resources are

present. (Rialto, 2010, Exhibit 2.7). In addition, the potential deposits on the Project site and surrounding area are classified as a sector containing regionally-significant resources (Rialto, 2010, Exhibit 2.6). However, the City's GP includes a land use designation for Open Space – Resources, which applies to areas necessary for the protection and preservation of unique areas for such purposes as managed production of aggregate resources. This designation would allow for mineral extraction and processing facilities per the SMARA classification, (i.e. MRZ-2). According to Exhibit 2.2, Land Use Policy Plan and Exhibit 2.5, Parks and Open Space Resources of the GP, Open Space – Resource designations are located predominately in the northern portions of the City. Therefore, the proposed Project site and surrounding area is not designated for mining operations. Lastly, the Project site historically was not used for mining operations and is located in an area that is either developed or planned to be developed with non-mining uses.

Thus, implementation of the proposed Project would not result in the loss of availability of a known mineral resource that would be of value to the region or the residents of the State of California. As a result, a **no impact** would occur directly, indirectly, or cumulatively. No mitigation is required.

3.13 NOISE

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XIII. Noise. Would the project:				
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 in other applicable local, state, or federal standards?	☐	☐	☒	☐
b) Generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐
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?	☐	☐	☐	☒

3.13.1 ENVIRONMENTAL SETTING

The area surrounding the RHNC site consists of vacant land, industrial uses, roadways, and the adjacent WWTP facilities. The General Plan designates the majority of the Project and surrounding areas as General Industrial, and the AMICSP designates the Project area as Public land uses and General Manufacturing (M-2) zoning. This GP land use designation is primarily for industrial uses, which allows for heavy industrial activities for manufacturing and processing, warehousing and distribution, chemical or petroleum products processing and refining, heavy equipment operations, and similar uses. These uses are not typically compatible with residential. (Rialto, 2010). Although the parking lot is located the City of Colton, the parking lot is within the San Bernardino County right-of-way and would remain a public space.

3.13.2 DISCUSSION

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 in other applicable local, state, or federal standards?

Less Than Significant Impact. Noise impacts can occur from short-term construction activities and long-term operations of a project. Short-term construction noise can occur from crew commutes and transport of equipment and materials to the Project site. Additional short-term construction noise, specific to the lake Project, would come from site preparation, grading, and paving of the parking lot. Typically, the most impactful noise impacts derive from the use of large construction equipment. Due to the nature of the proposed Project, operational noise of the lake consists of parking lot vehicle noise, landscaping equipment, and temporary use of pump equipment.

Construction

There are no sensitive receptors adjacent to the Project or within the vicinity, as industrial development and vacant property surrounds the Project site. Industrial uses including the adjacent WWTP to the north are non-sensitive uses. The WWTP would be the closest facility which has an office building at a distance of approximately 1,070 feet from the center of Project site where the majority of heavy equipment would be used for grading activities of the lake. This office or receptor within the WWTP is set behind large equipment and tanks with vehicle parking and loading areas, thus would experience lower noise levels due to the additional attenuation from distance and the shielding of intervening structures and operational activities.

According to the City of Rialto Municipal Code 9.50.070, disturbances from construction activity, noise associated with construction, erection, alteration, repair, addition, movement, demolition, or improvement to any building or structure are permitted only within the hours provided below:

October 1st through April 30th	
Monday—Friday	7:00 a.m. to 5:30 p.m.
Saturday	8:00 a.m. to 5:00 p.m.
Sunday / State holidays	No permissible hours
May 1st through September 30th	
Monday—Friday	6:00 a.m. to 7:00 p.m.
Saturday	8:00 a.m. to 5:00 p.m.
Sunday / State holidays	No permissible hours

Source: City of Rialto Municipal Code

While the City establishes limits to the hours during which construction activity may take place, the City of Rialto General Plan and Municipal Codes do not establish numeric maximum acceptable construction source noise levels at potentially affected receivers, which would allow for a quantified determination of what CEQA constitutes a substantial temporary or periodic noise increase. Therefore, a numerical construction threshold based on Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment Manual is used for analysis of daytime construction impacts. As such, the FTA considers a daytime exterior construction noise level of 80 dBA Leq as a reasonable threshold for noise sensitive residential land use with a nighttime exterior construction noise level of 70 dBA Leq.

Typical construction equipment noise levels obtained from the Federal Highway Administration (FHWA) Roadway Construction Noise Model User's Guide for the equipment to be used for the Project in the reference the larger noise level for front end loader and grader is referenced/used. The noise levels listed represent the A-weighted maximum sound level (L_{max}), measured at a distance of 50 feet from the construction equipment.

- Grader - 84 dBA
- Front End Loader - 80 dBA

While construction noise would vary, it is expected that noise levels during construction at the off-site receiver located significantly farther than 50 feet to the north would not exceed the FTAs 80 dBA L_{eq} threshold. These predicted noise levels would only occur when all construction equipment is operating simultaneously, a conservative assumption that would overestimate Project noise levels at the WWTP to the north. While construction-related short-term noise levels have the potential to be higher than existing ambient noise levels in the Project area under existing conditions, the noise impacts would no longer occur once Project construction is completed. Therefore, all nearby receiver locations would experience less than significant impacts due to Project construction noise levels.

Although the Project's construction noise, typical in nature, would increase ambient noise levels at the Project site, Project construction activities are required to comply with the allowed construction hours per the City's Municipal Code noise ordinance as previously stated. Therefore, noise levels from Project construction noise are within applicable standards, resulting in a **less than significant impact** directly, indirectly, or cumulatively. No mitigation is required.

Operation

Operational noise impacts from the proposed Project are regulated by Chapter 9.50, Noise Control, of the City's Municipal Code. As previously stated, the RHNC site is designated by the General Plan for General Industrial uses and designated by the AMICSP for Public uses. As discussed subsequently in section 3.17, Transportation, operation of the Project is anticipated to generate approximately less than 50 average daily trips, which represents an incremental increase to the existing roadway volumes. Since a doubling of traffic volumes is required to generate a perceptible 3 dBA CNEL noise increase, the off-site traffic volume increase attributable to the Project would not generate a perceptible noise level increase. While the Project would result in a small increase in regional and local traffic volumes, traffic generated by the operation of the proposed Project would not meaningfully influence traffic noise levels in surrounding off-site areas. Therefore, off-site traffic noise impacts would be less than significant.

Due to the nature of the proposed Project, operation of the lake, lake amenities, and parking area would not generate substantial noise level increases during the daytime or nighttime at the WWTP, the nearest non-sensitive receiver location. Project-related operational noise level increases would be below the operational noise level increase significance criteria resulting in a less than significant impact at all receiver locations. Therefore, noise levels from Project operational noise are within applicable standards, resulting in a less than significant impact directly, indirectly, or cumulatively and no mitigation is required.

In summary, the construction and operational noise levels associated with the proposed Project would comply with noise level standards at all nearby receiver locations, resulting in a **less than significant impact** directly, indirectly, or cumulatively. No mitigation is required.

b) Generation of excessive groundborne vibration or groundborne noise levels?

Less Than Significant Impact. The potential for ground-borne vibration impacts occurs during construction activities. Ground-borne noise and vibration from construction activity has the potential to be high when activities occur near a project boundary, however most construction activities are more central to a project site. Construction activity can result in varying degrees of ground vibration, depending on the equipment and methods employed. Operation of construction equipment causes ground vibrations that spread through the ground and diminish in strength with distance. Ground vibration levels measured in peak particle velocity (PPV) associated with various types of construction equipment are used to estimate the potential for building damage using vibration assessment methods defined by the Federal Transit Authority Vibration Standards (FTA) as shown in Table NOI-1.

TABLE NOI-1: VIBRATION SOURCE LEVELS FOR CONSTRUCTION EQUIPMENT

Equipment	PPV (in/sec) at 25 feet
Pile Driver (Impact), Typical	0.644
Pile Driver (Sonic), Typical	0.170
Vibratory Roller	0.210
Hoe Ram	0.089
Large Bulldozer	0.089
Caisson Drilling	0.089

Loaded Trucks	0.076
Jackhammer	0.035
Small Bulldozer	0.003

Source: Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual

PPV = peak particle velocity.

Construction

Although the City does not specify vibration level standards, the San Bernardino County Development Code Section 83.01.090[a] states that vibration shall be no greater than or equal to two-tenths inches per second PPV measured at or beyond the lot line. Therefore, to evaluate vibration impacts due to the operation and construction of the Project, a PPV vibration level standard of 0.2 inches per second (in/sec) is used. According to the FTA guidelines, a large bulldozer is 0.089 PPV at 25 feet which is representative of the heavy equipment used during construction.

Although there are no sensitive receivers within or near the vicinity of the Project site as previously discussed, the expected Project related vibration levels would be perceived at the adjacent receiver, the WWTP to the north. The closest facility on the WWTP would be approximately 1,070 feet from the center of Project site where the majority of heavy equipment would be used for grading activities of the lake. As a result, construction vibration levels at this distance are estimated to be below 0.01 PPV (in/sec) and would be below the 0.20 in/sec PPV threshold for vibration at the WWTP receiver location. Furthermore, vibration levels at the site of the closest receiver would be temporary and occur only during the times that heavy construction equipment is operating. Therefore, Project-related vibration impacts would be less than significant during the construction activities at the Project site.

Operation

Operational activities at the Project site would not include or require equipment, facilities, or activities that would result in perceptible ground-borne vibration. Maintenance of the RHNC would involve use of vehicles and light trucks to and from the Project site and the parking area on Agua Masa Road. However, the vehicles or heavy trucks would operate at the posted speed limits on smooth paved and gravel surfaces on the Project site and surrounding roadways resulting in minimal vibration and groundborne noise levels. Project operation would not generate excessive groundborne vibration or groundborne noise levels and impacts would be less than significant.

In summary, groundborne vibration and groundborne noise levels during Project construction and operations would result in a **less than significant impact** directly, indirectly, or cumulatively and no mitigation is required.

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?

No Impact. As stated in Response 3.9 (e), Flabob Airport is a public airport located approximately 5.2 miles to the southwest and the San Bernardino International Airport is 7.2 miles to the northeast from the Project site. The Project site is not located within any 60 CNEL contour line boundaries of the Flabob Airport or the San Bernardino International Airport. The Project site is not located in a high noise area of the Flabob Airport or the San Bernardino International Airport, or located within two miles from any other airport. The proposed Project would not expose employees to excessive aircraft noise and **no impact** would occur directly, indirectly, or cumulatively. No mitigation is required.

3.14 POPULATION AND HOUSING

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XIV. Population and Housing. Would the project:				
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)?	☐	☐	☐	☒
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

3.14.1 ENVIRONMENTAL SETTING

According to the U.S. Census Bureau, the City of Rialto's population totaled 104,394 in 2021 (U.S. Census Bureau 2021). Total housing units were not reported in 2021 for the City by the U.S Census Bureau; however, 26,134 households were reported in 2021. The Southern California Association of Governments (SCAG) Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) Adopted Growth Forecast projects an estimated population of 111,400 and 31,000 housing units by the year 2035. The Project area is surrounded by non-residential development comprised of vacant land and industrial businesses; therefore no housing is within the Project area.

3.14.2 DISCUSSION

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)?

No Impact. The Project is consistent with the underlying General Plan and AMICSP land use designations for the site. The proposed Project does not include the construction of new homes or businesses, nor does it extend roads or infrastructure that would lead to unplanned population growth. Therefore, the Project would not 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). Therefore, the proposed Project would have **no impact** on population growth directly, indirectly, or cumulatively. No mitigation is required.

b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?

No Impact. The entire Project site would be described as vacant unused property. The RHNC site is located on a portion of the WWTP property that is vacant and owned by the City. The parking area is vacant property along the north side of Agua Mansa Road within the San Bernardino County right-of-way. Consequently, there is no existing housing (or residents) on the Project site or within the Project site vicinity. As a result, the proposed Project would not displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere. **No impacts** would occur directly, indirectly, or cumulatively. No mitigation is required.

3.15 PUBLIC SERVICES

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XV. Public Services.				
Would the project:				
a) Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the 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:				
i) Fire Protection	☐	☐	☐	☒
ii) Police Protection	☐	☐	☐	☒
iii) Schools	☐	☐	☐	☒
iv) Parks?	☐	☐	☐	☒
v) Other public facilities?	☐	☐	☐	☒

3.15.1 ENVIRONMENTAL SETTING

Fire protection for the City is provided by the Rialto Fire Department (RFD). RFD consists of five fire stations staffed 24 hours per day by firefighters and one administrative office. One battalion chief, four engine companies, one truck company, and four paramedic ambulances are staffed each day. RFD also provides staffing for a Hazardous Materials unit, an Urban Search and Rescue unit, a Brush Engine, and an OES type VI engine. The nearest RFD station to the Project area is Fire Station #205, which is located at 1485 S. Willow Avenue, approximately 3.8 miles north from the Project area.

The City's police force is provided by the City of Rialto Police Department (CRPD), located at 128 N. Willow Avenue, approximately 3.9 miles north from the Project area. CRPD employs approximately 176 total sworn and non-sworn employees, and services a 28.5 square mile area. CRPD offers a variety of police services and assignments which include Patrol, K-9, School Resource Officer (SRO), Street Crime Attack Team (SCAT), Investigations, Traffic, Narcotics, Training/Backgrounds, Community Services, the Re-Entry Support Team, and is part of a Four-City Regional SWAT team (Inland Valley SWAT) and Air-Support Unit.

The Project is within the Colton Joint Unified School District. The closest school to the Project area is the Crestmore Elementary School, which is located approximately 2.5 miles west of the Project area.

As described in Section 3.16, Recreation, there are 143 total acres of recreational oriented areas within the City, which include neighborhood parks, community parks and facilities, and mini-parks of varying sizes to meet the needs of residents (Rialto, 2010). The nearest park to the Project is the Rialto Park and Little League field, approximately 2.1 miles to the north.

3.15.2 DISCUSSION

a) Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the 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:

a) i) Fire Protection

No Impact. RFD reviews all development plans to ensure future development conforms to all fire protection and prevention requirements, including, but not limited to requirements related to emergency access and fire flow for extinguishing on-site fires. The proposed Project would entail the development and operation of a passive-use lake with a perimeter trail and parking lot on Agua Mansa Road, which is surrounded by existing development that receive adequate RFD services. RHNC would be landscaped with native plants and equipped with minimal structures in the form of educational kiosks and a small community center and therefore would not introduce a substantive amount of fire prone materials. Due to the nature of the proposed Project, the Project would not generate increased demand for public services such as those related to fire protection, nor would the proposed Project generate the need for new or physically altered government facilities such as fire stations, the construction of which could cause significant environmental impacts. As a result, there would be **no impact** directly, indirectly, or cumulatively. No mitigation is required.

a.ii) Police Protection

No Impact. The proposed Project would entail the development and operation of a passive-use lake with a perimeter trail and parking lot on Agua Mansa Road, which is surrounded by existing development that receive adequate CRPD services. As discussed in Response 3.14 (a), the proposed Project would not induce a substantial unplanned population growth in the surrounding area, either directly or indirectly. RHNC would operate during the day only and by visitors and groups specifically intending to visit the site given the access restrictions created by the single entrance location and access requiring a quarter of a mile walk along the Rialto Channel utility road. Therefore, the proposed Project would not generate increased demand for public services such as those related to police protection, nor would the proposed Project generate the need for new or physically altered government facilities such as police stations, the construction of which could cause significant environmental impacts. As a result, there would be **no impact** directly, indirectly, or cumulatively. No mitigation is required.

a.iii) Schools

No Impact. As discussed in the Response 3.14 (a) above, the proposed Project would not induce a substantial unplanned population growth in the surrounding area, either directly or indirectly. The Project would not increase demand on schools resulting in the renovation of an existing school or construction of a new school that would result in an impact to the environment. As a result, there would be **no impact** directly, indirectly, or cumulatively. No mitigation is required.

a.iv) Parks

No Impact. As discussed in Section 2.0 Project Description, the City is proposing to construct RHNC within a previously excavated, vacant pit on the City's WWTP property. The approximately 10-acre passive use lake and surrounding area would provide public open space with approximately one mile of pedestrian perimeter trails, and provide opportunity for passive recreation, environmental education programming, and public outreach. In addition, RHNC would provide the City and surrounding area with new wetland and terrestrial wildlife habitat, and water quality benefits. As a result, the proposed Project would in fact benefit the general public as it would provide access to new recreational activities. The construction and operational impacts of the proposed Project are assessed in this

IS/MND, and all impacts have been determined to be less than significant or mitigated to less than significant. Consequently, n**o impact** from the construction and operation of the proposed Project would occur directly, indirectly, or cumulatively. No mitigation is required.

a.v) Other public facilities

No impact. Construction activities associated with the Proposed Project would be temporary in nature and would not increase the need for schools, parks, or other public facilities because the workers at the facility would likely be local. The Proposed Project would be constructed on an undeveloped and vacant site owned and operated by the City. Once in operation, the added employment opportunities the Project would create would be minimal and would be supplied by the City or by a third party. Operation of the Proposed Project would not increase the need for schools, parks, or other public facilities. N**o impact** would occur directly, indirectly, or cumulatively. No mitigation is required.

3.16 RECREATION

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XVI. Recreation. Would the project:				
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?	☐	☐	☐	☒
b) Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?	☐	☐	☐	☒

3.16.1 ENVIRONMENTAL SETTING

There are 143 total acres of recreational oriented space within the City, which includes neighborhood parks, community parks and facilities, and mini-parks of varying sizes to meet the needs of residents (Rialto, 2010). There are also a number of San Bernardino County and regional open space parks within the City's sphere of influence; County and regional facilities also provide recreation opportunities for Rialto residents. Demand for park and recreational facilities are generally the direct result of residential development. Accordingly, the proposed Project is recreational in nature.

3.16.2 DISCUSSION

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?

No Impact. The proposed Project, RHNC, would provide the citizens of Rialto and the region with an approximately 13-acre outdoor public recreational space including a 10-acre lake, one mile of pedestrian perimeter trails, passive recreation, environmental education programming, and public outreach with adequate parking. Therefore, the proposed Project would not induce population growth as discussed in Section 3.14, Population and Housing. The Project would add to the City's park and recreational space inventory and therefore would not increase use of existing neighborhood and regional parks or other recreational facilities. Therefore, the Project would not result in additional demand for such facilities that would otherwise result in substantial physical deterioration requiring new construction or expansion that would create an impact to the environment. There would be **no impact** directly, indirectly, or cumulatively and no mitigation is required.

b) Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?

No Impact. The Project includes the construction of a 13-acre passive use, outdoor public recreational space including a 10-acre lake, one mile of pedestrian perimeter trails, and adequate parking (11 paved parking spaces). Construction of the project could potentially have adverse physical effects on the environment, as discussed throughout this Initial Study. However, Project compliance with the standard design and construction measures and

the Mitigation Measures presented in this Initial Study would reduce impacts to less than significant. Given the size, nature, and intended use of the proposed Project, **no impact** would occur directly, indirectly, or cumulatively. No mitigation is required.

3.17 TRANSPORTATION

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XVII. Transportation. Would the project:				
a) Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities?	☐	☐	☒	☐
b) Conflict or be inconsistent with CEQA Guideline section 15064.3, subdivision (b)?	☐	☐	☒	☐
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☒	☐
d) Result in inadequate emergency access?	☐	☐	☐	☒

3.17.1 ENVIRONMENTAL SETTING

Lead agencies are required to use vehicle miles traveled (VMT) as the metric to evaluate project-related transportation impacts. The City has a draft VMT policy, but the policy has not been formerly adopted. The draft VMT policy follows the guidance provided by the San Bernardino County Transportation Authority (SBCTA) *Recommended Traffic Impact Analysis Guidelines for Vehicle Miles Traveled and Level of Service Assessment* (February 2020) and is generally consistent with the *Technical Advisory for Evaluating Transportation Impacts In CEQA*, published by the Governor's Office of Planning and Research (OPR), December 2018 (OPR Technical Advisory). The following analysis has been prepared consistent with the SBCTA guidance.

3.17.2 DISCUSSION

a) Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities?

Less Than Significant Impact. The City's General Plan Circulation Element (*City of Rialto General Plan, Making the Connections: The Circulation Chapter*) addresses the citywide circulation system including transit, roadway, bicycle, and pedestrian facilities. The Circulation Chapter is intended to guide the development of the City's circulation system in a manner that is compatible with the land use vision. The City will strive to meet diverse mobility needs and reduce VMT, which would reduce greenhouse gas emissions, address climate change, and mitigate roadway congestion.

Once constructed and operational, the type of traffic generated by the proposed Project would be limited to passenger vehicles, mid-size delivery and maintenance trucks, and busses and compatible with the type of existing traffic on Riverside Avenue, Santa Ana Avenue, and Agua Mansa Road and other roadways in the Project vicinity. Pedestrian and bicycle travel would occur on the short distance along Agua Mansa Road to the pedestrian path on Rialto Channel and then approximately one-quarter mile on the utility road and away from vehicular traffic. The proposed Project does not provide on-site vehicular circulation as vehicular access to the RHNC site would be limited to the public parking lot on the north side of Agua Mansa Road. The parking lot would be asphalt paved to match

existing roadway elevation along Agua Mansa Road, thereby providing non-curbed driveway. Vehicular access to the parking lot would be made from Agua Mansa Road traveling westbound from South Rancho Road.

Final design plans would be subject to review and approval by the City's Public Works Department and City Engineer as part of the City's standard development review process prior to the issuance of building permits to ensure such on-site design features are constructed. Therefore, impacts would be less than significant. In summary, the proposed Project would not introduce any new pedestrian or bicycle paths and roadways that would interfere with adopted plans, programs, ordinances, or policies regarding roadway facilities. Therefore, traffic conflicts with a program, plan, ordinance, or policy addressing the circulation system would not occur resulting in a **less than significant impact** directly, indirectly, or cumulatively. No mitigation is required.

b) Conflict or be inconsistent with CEQA Guideline section 15064.3, subdivision (b)?

Less Than Significant Impact. There are several types of screening that can screen projects from the need from a project-level, detailed VMT analysis. The following guidance developed by the San Bernardino County Transportation Authority (SBCTA) for the City was used to screen out the Project from detailed VMT analysis. Per the SBCTA Recommended Traffic Impact Analysis Guidelines for Vehicle Miles Traveled and Level of Service Assessment (February 2020), there are three steps of screening to screen projects from project-level VMT assessments. These are Step 1: Transit Priority Area (TPA) Screening, Step 2: Low VMT Area Screening, and Step 3: Project Type Screening. However, a project only needs to satisfy one of the three screening steps. The proposed Project is screened from further, detailed VMT analysis by the Project Type step.

Step 3: Project Type Screening: The SBCTA guidance lists several local oriented land use types that can be assumed to improve VMT because of their local serving nature and associated short trip distances. The list includes local parks as well as representative project types with a trip generation of 110 daily trips per day.

The proposed RHNC would provide the citizens of Rialto and the region with a park-like land use in the form of an approximately 13-acre outdoor public recreational space including a 10-acre passive use lake, one mile of pedestrian perimeter trails, passive recreation, environmental education programming, and public outreach. RHNC would be a unique outdoor passive use recreational land use that is expected to draw local and regional visitors. In addition, due to the nature of the RHNC access restrictions and day only operations, daily trips to and from the RHNC parking area are expected to be less than 110 per day. Therefore, Project Screening Step 3: Project Type Screening is satisfied and considered to be consistent with the SBCTA screening analysis and the Project is screened from further VMT analysis. As a result, the Project would not conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b). Impacts would be **less than significant** directly, indirectly, or cumulatively. No mitigation is required.

c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

Less Than Significant Impact. The types of traffic generated during operation of the Project (i.e., passenger vehicles, mid-sized delivery vehicles, and busses) would be compatible with the type of traffic observed along Riverside Avenue, Santa Ana Avenue, and Agua Mansa Road under existing conditions due to the surrounding industrial development and residential neighborhoods beyond the Riverside Avenue intersection to the west. If any component of Project construction would occur in the Agua Mansa Road public right-of-way, the Project would be required to adhere to the applicable construction control practices specified in Chapter 11.04, *Improvements*, within the City's Municipal Code, to minimize potential safety hazards. Within the Chapter, Section 11.04.070, further states, no person shall excavate, construct improvements, grade, or encroach within any public right-of-way of the City unless and until such person first obtains and keeps in force and effect a valid encroachment permit issued pursuant to the terms of this chapter. All contractors, subcontractors or other workers must operate within the street work zone safety rules and regulations as adopted by the City Council under Resolution Number 4938.

The City would review the Project development application materials as part of the City's standard development review process to ensure no hazardous transportation design features would be introduced within the City public right-of-way. Thus, construction and operation of the proposed Project would not create or substantially increase safety hazards due to a design feature or incompatible use. Therefore, the Project would have a **less than significant impact** from creation of traffic hazards directly, indirectly, and cumulatively. No mitigation is required.

d) Result in inadequate emergency access?

No Impact. Emergency access to the Project site would be made via the existing WWTP driveway at 501 E. Santa Ana Avenue. A secondary emergency access would be available via the approximately 20-foot-wide utility road on the west side of the Rialto Channel, the same location as the pedestrian path proposed to connect the RHNC lake site to the public parking area on the north side of Agua Mansa Road. The parking lot would be asphalt paved to match existing roadway elevation along Agua Mansa Road, thereby providing non-curbed driveway access. The proposed Project would be required to maintain adequate pathway and parking lot emergency access for emergency vehicles and responders during construction and long-term operation as required by the City of Rialto. The City would review the Project construction improvement plans as part of the City's standard development review process to ensure no hazardous transportation design features would be introduced through implementation of the Project. For these reasons, there would be **no impact** directly, indirectly, or cumulatively to emergency access. No mitigation is required.

3.18 TRIBAL CULTURAL RESOURCES

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XVIII. Tribal Cultural Resources.				
Has a California Native American Tribe requested consultation in accordance with Public Resources Code section 21080.3.1(b)?				
Would the project 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:				
a) 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)?	☐	☐	☐	☒
b) 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 Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe?	☐	☐	☐	☒

3.18.1 ENVIRONMENTAL SETTING

A Tribal Resources is defined in the Public Resources Code section 21074 and includes the following:

- Sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American Tribe that are either of the following: included or determined to be eligible for inclusion in the California Register of Historical Resources or included in a local register of historical resources as defined in subdivision (k) of Section 5020.1;
- 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 purpose of this paragraph, the lead agency shall consider the significance of the resources to a California American tribe;
- A cultural landscape that meets the criteria of subdivision (a) is a tribal cultural resource to the extent that the landscape is geographically defined in terms of the size and scope of the landscape;

- A historical resource described in Section 21084.1, a unique archaeological resource as defined in subdivision (g) of Section 21083.2, or a "non-unique archaeological resource" as defined in subdivision (h) of Section 21083.2 may also be a tribal resource if it conforms with the criteria of subdivision (a).

Under PRC section 21080.3.1 and 21082.3, the City must consult with tribes traditionally and culturally affiliated with the Project area that have requested formal notification and responded with a request for consultation. The parties must consult in good faith. Consultation is deemed concluded when the parties agree to measures to mitigate or avoid a significant effect on a tribal cultural resource when one is present or when a party concludes that mutual agreement cannot be reached. Mitigation measures agreed on during the consultation process must be recommended for inclusion in the environmental document.

3.18.2 DISCUSSION

a) 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)?

b) 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 Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe?

Less Than Significant Impact. The City is required to consult with interested California Native American tribes regarding the Project pursuant to Assembly Bill 52 (AB-52). As such, the AB-52 process was initiated on July 27, 2023, by sending letters to the San Manuel Band of Mission Indians, Gabrieleño Tongva Nation, Gabrieleño-Tongva Nation, Gabrieleño-Tongva, Gabrieleño Band of Mission Indians, and Morongo Band of Mission Indians. Two responses were received during the consultation request window ending August 26, 2023. One response was from the San Manuel Band of Mission Indians requesting a copy of the completed report. The other response was from the Gabrieleno Band of Mission Indians - Kizh Nation that provided information regarding potential tribal cultural resources in the area and a request that the information be mentioned in the environmental document and included as a confidential appendix. The City determined that formal avoidance or mitigation measures beyond those already incorporated into the Project were not warranted based on the information provided. While the Tribe expressed general concerns regarding the potential for unearthing previously undiscovered tribal cultural resources within their ancestral territory, no site-specific information or evidence was submitted to indicate that such resources are likely to be present at the Project site, which consists of a large percolation pit excavated in the 1950s.

The Cultural Resources Study (Duke CRM, 2023) prepared for the proposed Project included a request to the NAHC for a Sacred Lands File (SLF) search. The SLF search was negative for the presence of Native American cultural resources in the Project vicinity. Therefore, the Project would not affect SLF resources.

Considering no tribal resources have been identified within the Project site, and the chance of unearthing a tribal cultural resource is less than a cultural resources, impacts to tribal cultural resources would be **less than significant impact** directly, indirectly, or cumulatively. No mitigation is required.

Despite the lack of evidence that an impact to tribal cultural resources would occur, the City has agreed in concept to implement mitigation measures **MM TCR-1** and **TCR-2** requiring archaeological monitoring during initial grading and related ground disturbing activities. This addition is a result of consultation with the Gabrieleno Band of Mission Indians - Kizh Nation.

Mitigation Measures

MM TCR-1: Prior to commencement of ground-disturbing activities (site demolition, clearing, grubbing, grading, etc.), a Tribal Cultural Resources Mitigation and Monitoring Plan (TCR-MMP) shall be

prepared by the Project archaeologist and the City shall disseminate the TCR-MMP to the consulting Tribes. All parties shall review and be provided with an opportunity to comment upon the plan in a reasonable time period as determined by the City prior to commencement of ground-disturbing activities for the Project. If consensus among the Project archeologist, the City and Tribe(s) about monitoring and treatment methods cannot be reached, the City shall make the determination in its best judgement regarding the appropriate measures for inclusion in the TCR-MMP considering input and recommendations from the Project archaeologist and the consulting Tribes. Any non-responsive party shall be assumed to have agreed to the plans without comment. Any and all findings of discovered resources will be subject to the protocol detailed within the TCR-MMP. The TCR-MMP shall include, but not be limited to, the following provisions:

1) Prior to commencement of ground-disturbing activities, the City shall retain a certified archaeologist to perform as Project archaeologist for the Project and to implement the TCR-MMP.

2) The City shall invite the consulting Tribes to participate without reimbursement in monitoring on a rotating basis during all ground-disturbing activities. The Native American monitor(s) shall work in concert with the Project archaeological monitor to observe ground disturbances to fulfill the provisions of the TCR-MMP.

3) The Project archaeologist and the consulting tribal monitor(s) shall attend the pre-grading meeting with the contractors to explain and coordinate the requirements of the TCR-MMP.

4) In the event that tribal cultural resources (TCRs) are discovered, the Project archaeologist in consultation with the tribal monitor(s) shall have the authority to divert or temporarily halt ground disturbance operation in the area of discovery to allow for the evaluation of potentially significant TCRs. The Project archaeologist shall contact the City at the time of discovery. The Project archaeologist, in consultation with the tribal monitor(s) and City, shall determine the significance of the discovered resources. The City must concur with the evaluation before construction activities will be allowed to resume in the affected area. For significant TCRs, the TCR-MMP shall address culturally appropriate methods and treatment, including additional steps to mitigate impacts as determined by the City.

5) Before ground-disturbing activities are allowed to resume in the affected area, any TCRs that cannot be avoided and preserved in place shall be addressed through the methods and processes identified in the TCR-MMP. The Project archaeologist in consultation with the consulting tribal monitor(s) shall identify the methods for data recovery in the TCR-MMP.

6) All cultural material collected shall be subject to the culturally appropriate treatment and mitigation standards outlined in the TCR-MMP, which may include reburial on-site in an area that will be protected in perpetuity or relinquishment to the culturally affiliated consulting tribal government for culturally appropriate treatment.

7) A Phase 4 report documenting the field and analysis results and interpreting the artifact and research data within the research context shall be prepared by the Project archaeologist, in consultation with the consulting tribal monitor(s), and submitted to the satisfaction of the City prior to commencement of construction activities (i.e., post ground-disturbing activities). The report will include DPR Primary and Archaeological Site Forms.

8) Any historic archaeological material that is not Native American in origin (non-TCR and) shall be curated at an institution meeting the State and federal standards for curation.

MM TCR-2: 1) The City shall invite Native American Monitor(s) authorized to represent the consulting Tribe(s) on a rotating basis for all "ground-disturbing activities" in native soil and previously unexamined fill soils that occur within the proposed Project area. The monitor(s) shall be invited prior to the commencement of any "ground-disturbing activity" for the subject project (i.e., both on-site and any off-site locations that are included in the project description/definition and/or required in connection with the project, such as public improvement work). "Ground-disturbing activity" shall include, but is not limited to, all grading activities, archaeological investigations, demolition, pavement removal, subsurface testing of any kind, weed abatement, potholing, auguring, clearing, grubbing, tree removal, boring, grading, excavation, drilling, and trenching.

2) The Native American Monitor(s) shall complete daily monitoring activity logs that will provide descriptions of the relevant ground-disturbing activities, the type of construction activities performed, locations of ground-disturbing activities, soil types, TCR materials, and any other facts, conditions, materials, or discoveries of significance to the Tribe(s). Tribal monitoring activity logs will be provided to the Project archaeologist and City with any confidential information, as provided by law, not being subject to a Public Records Act Request.

3) On-site tribal monitoring for site preparation activities and for construction shall conclude upon the sooner of (1) when the consulting Tribe(s)' monitor(s) confirms through a written confirmation that all grading and ground-disturbing activities are no longer within archaeological and cultural resources soils or (2) a determination by the City and written notification to the Tribal monitor(s) that soil-disturbing construction activities within native soil and previously unexamined fill soils have concluded at the site.

3.19 UTILITIES AND SERVICE SYSTEMS

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XIX. Utilities and Service Systems. Would the project:				
a) Require or result in the relocation or construction of construction of new or expanded water, wastewater treatment or stormwater drainage, electric power, natural gas, or telecommunication facilities, the construction or relocation of which could cause significant environmental effects?	☐	☐	☒	☐
b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?	☐	☐	☒	☐
c) Result in a determination by the wastewater treatment provider that 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?	☐	☐	☒	☐
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?	☐	☐	☒	☐
e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	☐	☐	☐	☒

3.19.1 ENVIRONMENTAL SETTING

Water

The proposed Project is located within an area served by the West Valley Water District (WVWD) for domestic water. The WVWD services the northern and southern portions of the City, from Baseline Avenue to I-15, with a narrow extension in the south from Merrill Avenue south beyond Agua Mansa Road to the Santa Ana River. WVWD's primary source of water is water wells. These wells draw water from four water basins: Lytle Creek Surface Water Basin, Rialto Ground Water Basin, Bunkerhill Ground Water Basin, and Chino Hill Ground Water Basin.

Wastewater

Wastewater within the City of Rialto is treated at the City WWTP, which occupies the north portion of City-owned property shared with the Project site. The WWTP occupies approximately 25 acres and provides secondary and

tertiary treatment processes with a maximum treatment capacity of 11.7 million gallons per day (mgd). The City processes over 2 billion gallons of wastewater per year at the WWTP.

Stormwater

The proposed RHNC site is a previously excavated and abandoned pit; therefore no drainage facilities are present. Rialto Channel is located adjacent to the east of the RHNC site. Rialto Channel is a regional storm drain facility that starts approximately eight miles to the north of Santa Ana Avenue before emptying into the Santa Ana River approximately one mile south of the Santa Ana Avenue.

Electric Power

Southern California Edison provides electrical service to customers located within the Project area, and would provide electricity for the Project.

Natural Gas

Southern California Gas Company provides natural gas services to customers located within the Project area, and would provide gas for the Project. However, development of the RHNC Project would not create a demand natural gas.

Telecommunications

Development of the RHNC would not require installation of wireless internet service or phone serve.

3.19.2 DISCUSSION

a) Require or result in the relocation or construction of construction of new or expanded water, wastewater treatment or stormwater drainage, electric power, natural gas, or telecommunication facilities, the construction or relocation of which could cause significant environmental effects?

Water

Less Than Significant Impact. As noted previously, the proposed Project is located within an area served by the WVWD. The proposed Project would require connection to the existing domestic water located at the WWTP to the north. This connection would be made from the disturbed and developed area of the WWTP to the proposed RHNC community center building on the north side of the east lake and other areas along the lake perimeters. Impacts from such construction have been addressed in this IS/MND. As a result, a **less than significant impact** would occur directly, indirectly, or cumulatively. No mitigation is required.

Wastewater

Less Than Significant Impact. The proposed Project would construct a new lake, recreational trail, and other amenities on an existing vacant site. The Project would utilize a portion of the effluent flow generated by the plant to fill the proposed lake and once filled to maintain a constant flow into the lake. Once the lake is filled, the same or similar flow into the lake (approximately 1 cfs) would be discharged back into the concrete lined Rialto Channel at the existing effluent discharge point. The proposed community center would require connection to the City's wastewater system located at the WWTP to the north. This connection would be made from the disturbed and developed area of the WWTP to the proposed RHNC community center building on the north side of the east lake. Impacts from such construction have been addressed in this IS/MND. The quantity of wastewater generated at the community center would be insignificant and well within the capacity of the WWTP. As such, this Project would not require or result in the relocation or construction of new or expanded wastewater treatment facilities, the construction or relocation of which could cause significant environmental effects. As a result, a **less than significant impact** would occur directly, indirectly, or cumulatively. No mitigation is required.

Stormwater

Less Than Significant Impact. As discussed previously, the proposed drainage plan for the RHNC site would involve the installation v-ditches that would capture all offsite runoff onto the Project site and onsite flow during storm events. The captured storm flows would be conveyed into the lake via down pipes located at strategic locations round the lake perimeter. As a result, the Project design would ensure that storm water would be adequately managed within the Project footprint, and ultimately conveyed into the lake. The off-site parking location would generate and significant amount of stormwater from the installation of the proposed asphalt parking spaces and drive aisle. The proposed Project would not require expansion or development of new offsite stormwater facilities. As a result, a **less than significant impact** would occur directly, indirectly, or cumulatively. No mitigation is required.

Electric Power

Less Than Significant Impact. The proposed Project would construct a new lake with recreational amenities include a community center on the north side of the east lake. The proposed Project would require electricity to operate a small pump station for the RHNC lake and other supporting equipment. In addition, during construction some of the equipment used may be electric. Given that the Project would require connection to electricity during operation, the Project would connect into existing electricity from the adjacent WWTP to the north. This connection would be made from the disturbed and developed area of the WWTP to the proposed RHNC community center and the outlet pump located in the southeast portion of the east lake. Impacts from such construction have been addressed in this IS/MND. As a result, the Project would have no potential to require or result in the relocation or construction of new or expanded electric power facilities, the construction or relocation of which could cause significant environmental effects. A **less than significant impact** would occur directly, indirectly, or cumulatively. No mitigation is required.

Natural Gas

No Impact. Development of the RHNC Project would not create a demand for natural gas. Therefore, the Project would not result in a significant environmental effect related to the relocation or construction of new or expanded natural gas facilities. As a result, a **no impact** would occur directly, indirectly, or cumulatively. No mitigation is required.

Telecommunications

No Impact. Development of the RHNC Project would not require installation of wireless internet service or phone serve. Therefore, the project would not result in a significant environmental effect related to the relocation or construction of new or expanded telecommunication facilities. As a result, a **no impact** would occur directly, indirectly, or cumulatively. No mitigation is required.

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. The proposed Project would require minimal water to operate. The water for the proposed lake system would be supplied by effluent from the adjacent WWTP to the north. The proposed Project would require the use of water during grading activities to moisten the material for dust control and compaction. Once operational, the Project would require a minimal quantity of drinking water for the community center and irrigation water for native landscaping. Based on the limited and short term demand for potable water during construction and the minimal quantity of potable water anticipated to supply the community center and irrigation requirements of the Project, sufficient water supplies are available to serve the Project. As a result, a **less than significant impact** would occur directly, indirectly, or cumulatively. No mitigation is required.

c) Result in a determination by the wastewater treatment provider that 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 previously, the Project would utilize a portion of the effluent flow generated by the WWTP to fill the proposed lake and once filled to maintain a constant flow into the lake. Once the lake is filled, the same or similar flow into the lake (approximately 1 cfs) would be discharged back into the concrete lined Rialto Channel at the existing effluent discharge point. The proposed community center would require connection to the City's wastewater system located at the WWTP to the north. The quantity of wastewater generated at the community center would be insignificant and well within the capacity of the WWTP. Therefore, a **less than significant impact** would occur directly, indirectly, or cumulatively. No mitigation is required.

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 Project would result in a temporary increase in solid waste disposal needs associated with construction wastes, such as clearing of on-site debris prior to grading activities. Construction waste with no practical reuse or that cannot be salvaged or recycled would be disposed of at a local transfer station or solid waste facility. The closest active permitted regional landfill is the Mid- Valley Sanitary Landfill (61.2 million cubic yards remaining capacity) (CalRecycle 2023). Solid waste generated by the project would represent a small fraction of the daily permitted tonnage of this facility. Therefore, the Project's construction-related solid waste disposal needs would be sufficiently accommodated by existing landfills. Following construction, Project operation would generate minimal waste from visitor attendance and landscape maintenance. The proposed Project is not anticipated to exceed the capacity of the local solid waste infrastructure or impair the attainment of solid waste reduction goals. As a result, a **less than significant impact** would occur directly, indirectly, or cumulatively. No mitigation is required..

e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?

No Impact. The Project would comply with applicable local, State and federal regulations regarding solid waste, including those of the City, specifically, Municipal Code Section 18.108. This section of the municipal code provides policies and regulations regarding solid waste handling and recycling by both customers and collectors. As previously stated, waste generated by the Project would be minimal and comply with the City's programs to recycle such waste. The Project would not conflict with or impede implementation of such programs. As a result, a **no impact** would occur directly, indirectly, or cumulatively. No mitigation is required.

3.20 WILDFIRE

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XX. Wildfire. Is the project located in or near state responsibility areas or lands classified as high fire hazard severity zones? If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:				
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?	☐	☐	☒	☐
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?	☐	☐	☐	☒
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 ongoing impacts to the environment?	☐	☐	☐	☒
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?	☐	☐	☐	☒

3.20.1 ENVIRONMENTAL SETTING

Wildland fire hazards are of concern where development is adjacent to wildland areas, particularly in north Rialto. Fires starting in the foothill areas can easily spread south and consume urban development, especially if pushed by the Santa Ana winds that blow from the Cajon Pass. As discussed above in Section 3.9, Hazards and Hazardous Materials, the Project area is located within a Local Responsibility Area that is not within a fire hazard severity zone (FHSZ) (CALFIRE 2020).

3.20.2 DISCUSSION

a) Substantially impair an adopted emergency response plan or emergency evacuation plan?

Less Than Significant Impact. Construction associated with the proposed RHNC site would not occur in the street, therefore minimizing the potential to interfere with an emergency response or evacuation plan. However, there is a limited potential to interfere with an emergency response or evacuation plan during construction due to worker and

vendor vehicle trips to the site. The proposed Project is required to comply with the California Fire Code as adopted by the City of Rialto Municipal Code. In addition, evacuation routes are conducted by the City's Police and Fire Departments utilizing the California's Emergency Alert System (EAS) that utilizes public notices broadcast over the radio and television to inform the public. Therefore, the Project would not impair implementation of or physically interfere with an adopted emergency response plan or evacuation plan, because no permanent public street or lane closures are proposed. A **less than significant impact** related to emergency response plans or emergency evacuation plans would occur directly, indirectly, and cumulatively. No mitigation is required.

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. As previously stated, the proposed Project site is not located within, or adjacent to a state responsibility area, or lands classified as a very high FHSZ. The proposed RHNC site is characterized as heavily disturbed by past excavation of a pit, dirt stock piling and other grading activities. Similarly, the surrounding area is heavily disturbed from weed abatement and vehicle use. The site is characterized by non-native grasses and other weedy species. The potential for significant exposure of site occupants to pollutant concentrations from a wildfire would be minimal. The Project site itself is not anticipated to be exposed to wildfire, particularly once developed, because the site would be cleared and developed as a lake with recreational trail which would minimize potential wildfire risk. Although there is vacant property to the east, this property is east of the Rialto Channel and does not present a wildfire risk for the RHNC site. The surrounding areas to the north, south and west are developed and disturbed. Therefore, **no impacts** are identified or anticipated to occur. No mitigation measures are required.

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 ongoing impacts to the environment?

No Impact. As previously stated, the proposed Project site is not located within, or adjacent to a state responsibility area, or lands classified as very high FHSZ. The Proposed Project is currently surrounded by the WWTP to the north that would service the Lake (i.e. water, wastewater, power), the Rialto Channel to the east, existing infrastructure (i.e. power lines) to the south, and vacant highly disturbed land to the west. The Proposed Project does not require the installation or maintenance of any new or expanded wildfire infrastructure because the risk of wildfire is not anticipated. Therefore, **no impacts** are identified or anticipated to occur. No mitigation measures are required.

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. As previously stated, the proposed Project site is not located within, or adjacent to a state responsibility area, or lands classified as very high fire FHSZ. Topographically, the perimeter of the Project site is generally flat. The middle of the Project site consists of the previously excavated pit varying in depths and elevations due to prior grading and material stock piling. Overall relief on the Project site is approximately 30 feet, with elevations ranging from 900 feet above mean sea level (MSL) surrounding the site down to 870 feet above MSL near center of the site. There are no steep slopes within a one-quarter mile radius of the Project site. The Project Site has no known susceptibility to landslides. Construction of the RHNC lake and pedestrian paths would include grading and manipulation of onsite soils in conformance with project specific geotechnical and engineering specifications identified for the Project. As a result, the Project would not be exposed to downstream flooding or landslides as a result of runoff, post-fire slope instability, or drainage changes. Therefore, **no impacts** are identified or anticipated to occur. No mitigation measures are required.

3.21 MANDATORY FINDINGS OF SIGNIFICANCE

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XXI. Mandatory Findings of Significance.				
a) Does the project 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 an endangered, rare, or threatened species, or eliminate important examples of the major periods of California history or prehistory?	☐	☒	☐	☐
b) Does the project 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.)	☐	☒	☐	☐
c) Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☒	☐

3.21.1 ENVIRONMENTAL SETTING

The environmental analysis above indicates that the proposed Project has the potential to adversely affect Biological Resources, Cultural Resources, and Geology and Soils. Mitigation measures that have been identified in this document would be incorporated into the project to mitigate potentially significant adverse impacts to a less than significant level.

3.21.2 DISCUSSION

a) Does the project 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 an endangered, rare, or threatened species, or eliminate important examples of the major periods of California history or prehistory?

Less Than Significant Impact With Mitigation Incorporated. Potential impacts related to habitat of fish or wildlife species were discussed in the Biological Resources Section of this IS/MND, and were all found to result in a less than significant impact with mitigation directly, indirectly, and cumulatively. However, implementation of **Mitigation**

Measure MM BIO-1 was identified to mitigate potential impacts to nesting birds during Project construction. Potential impacts to cultural, archaeological, and paleontological resources related to major periods of California and the City's history or prehistory were discussed in the Cultural Resources, Tribal Cultural Resources, and Geology and Soils Sections of this IS/MND, resulting in a less than significant impact. However, implementation of **Mitigation Measures MM CUL-1** was identified to mitigate potential impacts to inadvertent discoveries of cultural or tribal resources during ground disturbances. Implementation of MM **CUL-2** was identified to mitigate potential impacts to inadvertent discoveries of human remains during ground disturbances. Implementation of MM **GEO-1** was identified to mitigate potential impacts to inadvertent discoveries of paleontological resources during ground disturbances. Accordingly, the Project would not 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 an endangered, rare, or threatened species, or eliminate important examples of the major periods of California history or prehistory. Impacts would be **less than significant with mitigation incorporated**.

b) Does the project 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.)

Less Than Significant Impact With Mitigation Incorporated. As presented in this document, potential Project-related impacts are either less than significant or would be less than significant with mitigation incorporated. There are no potential impacts attributable to the proposed Project that would intermingle with impacts from nearby projects and therefore implementation of the proposed Project would not result in impacts that are cumulatively considerable when evaluated with the impacts of other current projects, or the effects of probable future projects. Therefore, the proposed Project's contribution to any significant cumulative impacts would be less than cumulatively considerable. As discussed in Sections 3.1 through 3.20 of this IS/MND, mitigation would be required and incorporated as necessary. Similarly, all other development projects would be required to adhere to existing regulations and implement project-specific mitigation measures to reduce impacts to less than significant levels, which in combination would reduce potential for cumulative impacts. Therefore, impacts would be **less than significant with mitigation incorporated**.

c) Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?

Less Than Significant Impact. Effects on human beings were evaluated as part of the air quality, hazards and hazardous materials, hydrology and water quality, noise, population and housing, traffic, utilities, and wildfire sections of this IS/MND and found to be no impact or less than significant impact for each of the above sections. Therefore, potential direct and indirect impacts on human beings that result from the proposed Project would be **less than significant.** No mitigation is required.

4.0 COMPLIANCE WITH FEDERAL LAWS AND REGULATIONS

The City is seeking federal and state funding for the proposed Rialto Habitat Nature Center (Project) under, and projects seeking federal and state funding are subject to federal laws and regulations (e.g., federal *cross-cutters*). The SWRCB uses a Project's CEQA document along with federal cross-cutting documentation in place of a NEPA document; this document is termed a *CEQA-Plus* document. This chapter summarizes the federal environmental laws and regulations that apply to the Project and describes the Project's compliance with those laws and regulations. The federal regulations addressed in this section are based on guidance from the SWRCB for CEQA-Plus environmental review.

4.1 ENDANGERED SPECIES ACT (ESA), SECTION 7

The federal ESA (16 USC 1531 et seq.) and subsequent amendments establish legal requirements for the conservation of endangered and threatened species and the ecosystems upon which they depend. The ESA is administered by the United States Fish & Wildlife Service (USFWS) for terrestrial species, and by the National Marine Fisheries Service (NMFS) for marine species and anadromous fish. Under the ESA, the USFWS or NMFS may designate critical habitat for listed species. Section 7 of the ESA requires federal agencies to consult with USFWS or NMFS to ensure that their actions are not likely to jeopardize listed threatened or endangered species, or cause destruction or adverse modification of critical habitat. Section 10 of the ESA requires similar consultation for non-federal applicants.

As discussed in Section 3.4, Biological Resources, the Project site is within the existing WWTP boundary owned by the City and does not contain habitat for federally listed species. Although the closest designated Critical Habitat is located approximately 0.50 miles south of the Project site for the Santa Ana Sucker (*Catostomus santaanae*), the Project site and surrounding buffer area are not located within any designated Critical Habitat overlay. Therefore, the Project would not directly or indirectly affect federally listed species and no consultation with USFWS or NMFS is needed.

4.2 MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT, ESSENTIAL FISH HABITAT (EFH)

The Magnuson-Stevens Fishery Conservation and Management Act (MSA) (Public Law 104-267) passed in 1976 and was amended by the Sustainable Fisheries Act of 1996 (Public Law 104-297) and the Magnuson- Stevens Fishery Conservation and Management Reauthorization Act in 2007. The MSA, as amended, governs marine fisheries management in U.S. federal waters out to 200 nautical miles from shore and encourages "long-term biological and economic sustainability of our nation's marine fisheries." The goals of the MSA are to prevent overfishing, to rebuild overfished stocks, to increase long-term economic and social benefits, and to ensure a safe and sustainable supply of seafood. The act is in place to protect our natural resources, to maximize the possible use of these resources, and to make sure the use of marine resources is done in a safe manner. Amendments to the 1996 MSA require the identification of Essential Fish Habitat (EFH) for federally managed species and the implementation of measures to conserve and enhance this habitat. Any project requiring federal authorization is required to complete and submit an EFH Assessment with the application and either show that no significant impacts to the essential habitat of managed species are expected or identify mitigations to reduce those impacts. Under the MSA, Congress defined EFH as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity" (16 USC Section 1802(10)). The EFH provisions of the MSA offer resource managers a means to heighten consideration

of fish habitat in resource management. Pursuant to Section 305(b)(2), federal agencies shall consult with the NMFS regarding any action they authorize, fund, or undertake that might adversely affect EFH.

The proposed Project is adjacent to the Rialto Channel, a concrete lined storm drain channel and unlined channel, which conveys stormwater as well as treated effluent from the WWTP into the Santa Ana River approximately 0.60 mile to the south and downstream from the Project site. As a result of the Rialto Channel used to convey treated effluent, the channel functions as a perennial waterway south and downstream of the Project site. Although the Rialto Channel flows provide habitat for the federally threatened Santa Ana sucker, the Rialto Channel does not support a marine fishery. Therefore, implementation of the proposed Project would not affect marine fisheries or waters nor the substrates necessary for marine fisheries.

4.3 NATIONAL HISTORIC PRESERVATION ACT (NHPA), SECTION 106

Federal protection of resources is legislated by (a) the NHPA of 1966 as amended by 16 U.S. Code 470, (b) the Archaeological Resource Protection Act of 1979, and (c) the Advisory Council on Historical Preservation. These laws and organizations maintain processes for determination of the effects on historical properties eligible for listing in the National Register of Historic Places (NRHP). Federal and federally-sponsored programs and projects are reviewed pursuant to Section 106 of the NHPA. Section 106 of the NHPA requires federal agencies to consider the effects of proposed federal undertakings on historic properties. NHPA requires federal agencies to initiate consultation with the State Historic Preservation Officer as part of the Section 106 review process.

The Project site, or the area of potential effects (APE), is within a vacant portion of WWTP boundary owned by the City and within San Bernardino County right of way. The lake portion of the Project within the APE is and unused dry pit, heavily disturbed, and void of any structures and the southernly parking lot portion of the APE is a vacant piece of land void of any structures. Due to the nature of the Project, construction activities would be minimal as the most significant activity would be excavation of the lake which is proposed to balance onsite. In addition, construction and operation of the Project would be limited to areas of disturbed APE. As discussed in Section 3.5, Cultural Resources, the APE is determined to have a very low sensitivity for discovery of buried archaeological deposits. In addition, mitigation measure would be implemented to reduce the potential to damage unknown historic resources if uncovered during grading activities. Therefore, there are no historic properties within the APE and the Project would have No Effect on Historic Properties (NIC 2020).

4.4 CLEAN AIR ACT (CAA)

The proposed Project area is located in the City of Rialto, within the South Coast Air Basin (SCAB). Air quality within the Project area is regulated by the U.S. Environmental Protection Agency (EPA) and the California Air Resources board (CARB) at the federal and state levels, respectively, and locally by the South Coast Air Quality Management District (SCAQMD) which has jurisdiction of the SCAB. The proposed Project is within the Central San Bernardino Valley General Forecast Area (GFA) and the Air Monitoring Area (AMA) 34.

Federal General Conformity ensures that the actions taken by federal agencies do not interfere with a state's plans to attain and maintain national standards for air quality. Established under the federal Clean Air Act (CAA) (Section 176(c)(4)), the General Conformity rule plays an important role in helping states improve air quality in those areas that do not meet National Ambient Air Quality Standards (NAAQS). Under the General Conformity rule, federal agencies must work with state and local governments in a nonattainment or maintenance area to ensure that federal actions conform to the air quality plans established in the applicable state or Tribal implementation plan. The overall purpose of the General Conformity rule is to ensure that:

Federal activities do not cause or contribute to new violations of NAAQS;

actions do not worsen existing violations of the NAAQS; and
attainment of the NAAQS is not delayed.

As mentioned above, a General Conformity determination is required if federal activities cause or contribute to new violations of NAAQS. Due to the nature of operations of the lake, the proposed Project would result in equal air pollution emissions as it relates to the existing conditions. The Project site is an unused dry pit that is heavily disturbed due to human and vehicular disturbance. Although the lake would operate a pump to convey treated water into the Rialto Channel, emissions from operation of the pump would be nearly undetectable similar to the vehicular use within the dry pit. In addition, the parking lot would have similar impacts as the area is within the right of way along the heavily driven Agua Mansa Road. The Project would introduce a negligible amount of traffic in the area, therefore air emission impacts would be nearly undetectable. Consequently, the proposed Project would not cause or contribute to new violations of NAAQS due to the minimal size and nature of the Project.

Project construction would be temporary and construction activities would occur in phases to clear the site of vegetation and debris, excavate and grade the lake and parking lot site, landscaping of the lake, and paving of the parking lot site. As a result of construction activities not overlapping, construction pollutant emissions would also not overlap. Furthermore, because the lake site is already a dry pit, it is anticipated grading operations would be minimal in terms of duration and the amount of equipment needed to complete excavation. Similarly, impacts from construction of the parking lot would be minimal as the lot is 11 spaces and the site is currently graded. Therefore, operations of the Project would result in equal air pollution emissions from the existing site and a detailed General Conformity analysis pursuant to the CAA is not required.

4.5 COASTAL ZONE MANAGEMENT ACT

The Coastal Zone Management Act (CZMA) was passed by Congress to encourage coastal states to develop and implement a Coastal Zone Management Plan, or Program (CZMP). The intents of CZMPs are to protect natural resources, manage development in high hazard areas, give development priority to coastal dependent uses, provide public access for recreation, and coordinate state and federal actions. In 1978, the federal government certified the California Coastal Management Plan, the enforceable policies of which are found in Chapter 3 of the California Coastal Act of 1976, as amended.

The Project would be located in the City of Rialto, approximately 45 miles northeast of the Pacific coast. None of the Project's components would be located within the coastal zone, and the CZMA does not apply to the Project.

4.6 COASTAL BARRIERS RESOURCES ACT

The Coastal Barrier Resources Act of 1982 designated various undeveloped coastal barriers for inclusion in the Coastal Barrier Resources System (System). Areas so designated were made ineligible for direct or indirect federal financial assistance that might support development, including flood insurance, except for emergency life-saving activities. Exceptions for certain activities, such as fish and wildlife research, are provided, and National Wildlife Refuges and other, otherwise protected areas are excluded from the System. The System includes relatively undeveloped coastal barriers along the Atlantic and Gulf coasts, as well as the Great Lakes, Puerto Rico, and the Virgin Islands.

The proposed Project is not within the System, as it is in the State of California and the System encompasses areas within the Gulf Coast, Atlantic Ocean, and the Great Lakes but not the Pacific Coast. Therefore, the Coastal Barriers Resources Act does not apply to the Project.

4.7 FARMLAND PROTECTION POLICY ACT

The Farmland Protection Policy Act (FPPA) is intended to minimize the contribution of federal programs to the unnecessary and irreversible conversion of farmland to nonagricultural uses. It does not authorize the federal government to regulate the use of private land or lands not under federal jurisdiction, or in any way affect the rights of property owners. Under the FPPA, farmland includes Prime Farmland, Unique Farmland, and Land of Statewide or Local Importance. Farmland subject to FPPA requirements does not have to be currently used for cropland; however, it cannot be open water or urban built-up land.

The California Department of Conservation (DOC) identifies the Project site as Urban and Built-Up Land. Therefore, the Project would not convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance.

4.8 FLOODPLAIN MANAGEMENT – EXECUTIVE ORDER (EO) 11988

EO 13690, "The Federal Flood Risk Management Standard" (January 30, 2015) revises EO 11988, "Floodplain Management" (May 24, 1977), and directs federal agencies to take the appropriate actions to reduce risk to federal investments, specifically to "update their flood-risk reduction standards." The goal of this directive is to improve the resilience of communities and federal assets against the impacts of flooding and recognizes the risks and losses due to climate change and other threats.

The Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Maps (FIRMs) are used to determine if properties are located within Special Flood Hazard Areas. As explained in Section 3.10, "Hydrology and Water Quality," of this Initial Study, the Project area is within the reduced flood risk (Zone X) as designated by FEMA. In addition, the Project area is not located in a Special Flood Hazard Area, as identified on FIRM panel 06067C0177, dated June 16, 2015 (FEMA 2015). Furthermore, the Project would include reconstruction of an existing pump station and construction of a microwave tower and would not include any new residences. Therefore, the Project would not result in any additional exposure of people or structures to risk of flooding, and the Project would have no impact related to a 100-year flood hazard area or risk of flooding.

4.9 MIGRATORY BIRD TREATY ACT (MBTA)

The MBTA of 1918 (16 USC 703-711) prohibits take of any migratory bird, including eggs or active nests, except as permitted by regulation (e.g., licensed hunting of waterfowl or upland game species). Under the MBTA, "migratory bird" is broadly defined as "any species or family of birds that live, reproduce or migrate within or across international borders at some point during their annual life cycle" and thus applies to most native bird species.

As discussed in Section 3.4, Biological Resources, of this IS/MND, the RHNC area provides limited nesting and foraging habitat for special status wildlife due to the location and surrounding land uses and the built nature of the Project site. As determined in the Biological Resources Assessment (BRA), habitat found onsite does not provide suitable habitat for sensitive wildlife species. However, direct impacts associated with vegetation removal may occur to all avian species covered under the MBTA with the removal of potential nesting and foraging habitat. Under **Mitigation Measure BIO-1**, if Project construction is scheduled to occur during the typical breeding bird season (January 1 through August 15 for raptors and February 15 through August 31 for all other avian species), direct removal of vegetation and indirect short-term noise effects to birds that may forage or nest onsite or within the buffer area may occur. As stated in the BRA, to reduce potential impacts on nesting birds, if vegetation removal and/or construction activities were to occur during nesting bird season, a pre-construction nesting bird survey would be required within five (5) days of ground disturbances during typical nesting bird season to delineate any active nests found within the Study Area. Should an active nest be observed, a no-work buffer shall occur surrounding the active nest, until determined by the Project Biologist it has become inactive. As concluded in Section 3.4, Biological

Resources, implementation of the pre-construction nesting bird survey would prevent any direct or indirect impacts due to the removal of vegetation and construction-related noise on species covered under the MBTA. Therefore, the Project would not impact migratory birds.

4.10 PROTECTION OF WETLANDS – EXECUTIVE ORDER 11990

The purpose of EO 11990 (May 24, 1977) is to "minimize the destruction, loss or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands." To meet these objectives, EO 11990 requires federal agencies, in planning their actions, to consider alternatives to wetland sites and limit potential damage if an activity affecting a wetland cannot be avoided. EO 11990 applies to: Acquisition, management, and disposition of federal lands and facilities construction and improvement projects which are undertaken, financed, or assisted by federal agencies; and federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulation, and licensing activities.

The Project would be constructed and operated within the existing WWTP property owned by the City. The WWTP and its structures are not considered Waters of the U.S. or Waters of the State. As determined in the BRA and discussed in Section 3.4, Biological Resources, the Project site contains no wetlands nor any jurisdictional features. Furthermore, the Rialto Channel located adjacent to the Project site would not be impacted as part of Project implementation. Therefore, no impacts are expected to occur to protected wetlands.

4.11 WILD AND SCENIC RIVERS ACT

The Wild and Scenic Rivers Act (16 USC Section 1271 et seq.) establishes a National Wild and Scenic Rivers System (NWSRS) for the protection of rivers with important scenic, recreational, fish and wildlife, and other values. Rivers are classified as wild, scenic, or recreational. The Act designates specific rivers for inclusion in the System and prescribes the methods and standards by which additional rivers may be added.

Although the Project site is adjacent to the Rialto Channel, the nearest designated wild and scenic river in the National Wild and Scenic Rivers System is Deep Creek located more than 20 miles northeast of the City (NWSRS n.d.). Therefore, no portion of the Project is located within or near a designated wild and scenic river. As a result, the Project would not impact wild and scenic rivers.

4.12 SAFE DRINKING WATER ACT, SOURCE WATER PROTECTION

The Safe Drinking Water Act of 1974 (SDWA) was established to protect the quality of drinking water in the U.S. This law focuses on all waters actually or potentially designed for drinking use, whether from above ground or underground sources. The SDWA authorizes USEPA to establish minimum standards to protect tap water and requires all owners or operators of public water systems to comply with these primary (health-related) standards. Under the SDWA, the USEPA also establishes minimum standards for state programs to protect underground sources of drinking water from endangerment by underground injection of fluids.

The proposed Project is located in the City of Rialto within San Bernardino County, California. Designated sole source aquifers in California are located in Fresno County, Scotts Valley, and on the California/Mexico border, none of which would be in the vicinity of the proposed Project (USEPA 2022). Therefore, the SDWA as it pertains to underground water sources does not apply to the Project.

According to the City's General Plan (GP), nearly all of the City's water sources come from local surface water and groundwater supplies directly beneath Rialto. As stated in the City's GP, water is pumped from many wells that tap into the Lytle, Rialto, Bunkerhill, and North Riverside aquifers, and surface water is available from treated water coming from Lytle Creek in the San Bernardino Mountains and Lake Silverwood, a California State Water Project

facility. In addition, open space areas along Cajon Wash, Lytle Creek Wash, and the Santa Ana River allow for recharge of the groundwater basins.

The City is served by three water agencies: the City of Rialto Department of Public Works Water Division (RPWDWD), the West Valley Water District (WVWD), and the Fontana Water Company (FWC). The WVWD is responsible for supplying potable water to the existing WWTP site and surrounding area. The WVWD services the northern and southern portions of the City, from Baseline Avenue to I-15, with a narrow extension in the south from Merrill Avenue south beyond Agua Mansa Road to the Santa Ana River. WVWD's primary source of water is WVWD-owned water wells. These wells draw water from four water basins: Lytle Creek Surface Water Basin, Rialto Ground Water Basin, Bunkerhill Ground Water Basin, and Chino Hill Ground Water Basin.

Because construction of the proposed Project does not include heavy grading activities and operation of the proposed Project would be within the existing WWTP site boundary, no WVWD infrastructure supplying potable water to the site and surrounding area would be impacted. Therefore, the SDWA as it pertains to aboveground water sources does not apply to the Project.

4.13 ENVIRONMENTAL JUSTICE– EXECUTIVE ORDER 12898

In 1994, President Bill Clinton issued the EO 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," to focus federal attention on environmental and human health conditions in minority and low-income communities. EO 12898 promotes nondiscrimination in federal programs that substantially affect human health and the environment, and it provides information access and public participation relating to these matters. This order requires federal agencies (and state agencies receiving federal funds) to identify and address any disproportionately high or adverse human health or environmental effects of their programs, policies, and activities on minority and/or low-income populations. The Council on Environmental Quality (CEQ) oversees federal compliance with EO 12898. According to the CEQ environmental justice guidelines, minority populations should be identified if:

- A minority population percentage either exceeds 50 percent of the population of the affected area, or
- If the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis (e.g., a governing body's jurisdiction, neighborhood census tract, or other similar unit).

The City's 2021-2029 Housing Element Update (Housing Element) provides race/ethnicity information in the City based on the U.S. Census 2019 American Community Survey and income information based on 2013-2017 Department of Housing and Urban Development Comprehensive Housing Affordability Strategy. According to the updated Housing Element in the Rialto General Plan, approximately 41% of all Rialto households qualify as lower income. Because the Rialto Habitat Nature Center location is surrounded by Disadvantaged Communities (DAC) or Severely Disadvantaged Communities (SDAC) as identified by the California Department of Water Resources DAC Mapping Tool (https://gis.water.ca.gov/app/dacs/), these nearby underserved DAC and SDAC communities would benefit from the Project. The proposed Project presents an opportunity for the City to provide these surrounding underserved communities and all City and nearby residents with additional public open space, passive recreational areas, and environmental education programs.

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Potential adverse impacts of the Project are limited to short-term, construction-related nuisance effects. Once Project construction is completed, the Project would be beneficial to the environment, the City and its residents by creating an outdoor, passive recreational park with environmental education opportunities for Rialto residents and neighboring community residents in an abandoned pit located on the City-owned WWTP. Therefore, the Project does not involve any activity that is likely to be of interest to or could have a disproportionate impact upon minority or low-income populations.

4.14 FISH AND WILDLIFE CONSERVATION ACT

The Fish and Wildlife Conservation Act of 1980 (16 USC 2901 et seq.) encourages federal agencies to conserve and promote conservation of non-game fish and wildlife species and their habitats. In addition, the Fish and Wildlife Conservation Act (16 USC 661 et seq.) requires federal agencies undertaking projects affecting water resources to consult with the USFWS and the state agency responsible for fish and wildlife resources whenever the waters of any stream or other body of water are proposed or authorized to be impounded, diverted, the channel deepened, or the stream or other body of water will otherwise be controlled or modified for any purpose whatsoever, including navigation and drainages. The 1988 amendment (Public Law 100-653, Title VIII) to the Fish and Wildlife Conservation Act requires the Secretary of the Interior, through the USFWS, to "identify species, subspecies, and populations of all migratory nongame birds that, without additional conservation actions, are likely to become candidates for listing under the Endangered Species Act of 1973."

A determined in Section 3.4, Biological Resources, no special status wildlife species or evidence of their presence were observed or heard during the field survey conducted. Given the Project site's disturbed environment, proximity to the WWTP, and lack of suitable habitat for the sensitive species, there is no opportunity sensitive wildlife species to occur within the Project site. Furthermore, implementation of the Project would not affect or modify any stream or water body. Therefore, the Project would have no effect with compliance with this Act.

4.15 CLIMATE CHANGE

Increases in greenhouse gas (GHG) concentrations in the atmosphere have led to increased global average temperatures (climate change) through the intensification of the greenhouse effect, and associated changes in local, regional, and global average climatic conditions. These changes may translate into a variety of issues and concerns that may affect the project facilities, including but not limited to:

- increased frequency of droughts associated with changes to precipitation patterns,
- increased stormwater runoff associated with changes to precipitation patterns, and
- increased risk of flooding associated with changes to precipitation patterns.

Although uncertainty exists as to the precise levels of these impacts, there is consensus regarding the range, frequency, or intensity of these impacts that can be expected. The proposed Project could be subject to potential hazards that could be exacerbated by climate change, such as changes in the amount of wastewater, timing and amount of runoff, and the increased risk of flooding associated with changes to precipitation.

Increases in intense storm events could result increases in effluent related to stormwater runoff. However, as discussed in Section 3.9, "Hydrology and Water Quality," the City has ordinances to address stormwater runoff throughout the city that would reduce the extent and severity of climate change-related impacts related to stormwater. As determined in this section, the Project area is not within a 100-year floodplain, nor within a Special Flood Hazard Area. Therefore, the potential for climate change-related impacts from increased risk of flooding associated with changes to precipitation patterns to affect the project facilities is low.

Adaptation measures are measures taken in direct response to vulnerabilities to climate change. Although, the new RHNC would increase energy usage when compared to the Project site's existing unused pit condition, the new pump and required infrastructure systems designed to maintain lake water levels would be in accordance with the Titles 20 and 24 of the California Code of Regulations, which reduce demand for electrical energy. In addition, design of the proposed Project would construct a lake that has the capability of regulating flows into the Rialto Channel. Due to the nature of the lake and its capabilities of regulating flows, by nature the Project would provide adequate stormwater facilities in the event of storms.

Although the effects of climate change on the Project facilities is considered less than significant, the Project would include measures that would reduce the City's overall contribution to climate change including improved energy efficiency and reduced facility maintenance requirements.

5.0 ALTERNATIVES

This chapter includes a discussion of alternatives to the proposed project in compliance with State Water Resources Control Board CEQA-Plus requirements related to State Revolving Fund loans and per U.S. Environmental Protection Agency guidance for environmental information documents related to Special Appropriation Fund Grants. These alternatives are provided to meet the CEQA-Plus requirements and are not required for compliance with CEQA. The proposed Project is described in Chapter 2, "Project Description," and evaluated throughout this IS/MND and therefore is not discussed below.

5.1 ALTERNATIVE 1: NO PROJECT ALTERNATIVE

Under the No Project Alternative, the City would continue to own the existing unused dry pit at the existing location. No clearing or site preparation would occur at the existing pump station site. A new lake and parking lot would not be constructed and the site and would remain vacant. With this alternative, no construction-related impacts would occur and the proposed lake and parking lot would not be installed. Current WWTP effluent flow conditions into the Rialto Channel would continue, resulting in a lost opportunity to improve water quality that is associated with the Proposed Project. Mitigation would not be required under this alternative as potentially suitable nesting habitat for avian species would not be impacted.

The No Project Alternative would not achieve any of the project objectives, would result in greater long-term operational impacts, greater potential for service interruptions, and would result in increased operations and maintenance costs.

5.2 ALTERNATIVE 2: NO RECREATION ALTERNATIVE

Under Alternative 2, the City would develop a redesigned lake site with a greater capacity by maximizing the acreage of existing dry pit site. Under this alternative, the larger water holding capacity of the lake would increase the biological benefits from increase. This would reduce inspection and maintenance needs of the recreational trails as a result of eliminating the recreational use per the proposed Project's objective. With this alternative, associated parking may be eliminated as its objective to provide parking for recreational lake guests would cease. The recreational trail also provides a pathway around the lake for educational purposes and as a result, this alternative would also eliminate the proposed Project's educational objective.

This alternative would meet some of the project objectives; however, *would eliminate the benefits of the proposed public open space and passive recreation opportunities to the surrounding Disadvantaged Communities (DAC) and Severely Disadvantaged Communities (SDAC).* This alternative may also impact funding as a result of the elimination of the proposed Project's recreational and educational uses.

5.3 ALTERNATIVE 3: NEW LAKE LOCATION ALTERNATIVE

Under Alternative 3, the City would construct the new lake with adjacent parking west the existing proposed Project site. This site is approximately 4.5 acres on two parcels, although a smaller lake size, this alternative would include a adjacent parking lot for guests. Although minor, construction-related impacts for the pathway would also not occur with this alternative. However, impacts associated with the lake and parking lot would still occur under this alternative albeit to a smaller magnitude as the lake would be smaller. In addition, this alternative would require underground infrastructure improvements to make the existing connection into the Rialto Channel approximately three-tenths mile east under this alternative.

This alternative would meet all of the project objectives; however, this location is owned by EMWD of which may cause further approvals. In addition, construction-related impacts such as air quality impacts would be greater under this alternative compared to the proposed project because of the additional construction required due to the increase in distance to make the connection between the WWTP ant lake and then back to the Rialto Channel. This alternative would also decrease the effluent benefits as the lake capacity would be significantly reduced. Furthermore, under this alternative, this alternative site and the property between the existing proposed Project site is within a protected habitat for the Delhi Sands Fly, thereby could cause a potentially significant biological resource impact.

5.4 ALTERNATIVE 4: NO PARKING ALTERNATIVE

Under Alternative 4, the City would eliminate on-site parking for lake guests. The parking lot site is within the right of way of San Bernardino County in the City of Colton. The existing parking lot area would remain vacant and lake guests would have to use other nondescript off-site parking locations. Access into the lake would remain along the western trail along the Rialto Channel under this alternative.

This alternative would meet most of project objectives; however, it would have greater impacts related to emergency access and vehicular circulation as the lake would not have a designated location for a point of access to the lake site. In addition, this alternative would result in less impacts compared to the proposed project due to the elimination of some of the proposed Project's construction- and paving -related activities.

5.5 SUMMARY

In summary, the proposed Lake Rialto would achieve all of the Project Objectives and all potentially significant impacts would be reduced to less than significant with mitigation. Because all of the alternatives discussed above either do not meet all of the Project Objectives or result in greater environmental impacts compared to the proposed Project, the proposed Project as described in Chapter 2, "Project Description," was selected as the preferred alternative.

6.0 MITIGATION MONITORING REPORT PLAN

Mitigation Measures	Responsible Party	Monitoring Party	Implementation Timing	Compliance Verification		
				Initial	Date	Comments
BIOLOGICAL RESOURCES						
MM BIO-1: Nesting Birds: Regardless of the time of year, nesting bird surveys shall be performed by a qualified avian biologist no more than 3 days prior to vegetation removal or ground-disturbing activities for each phase of construction. Pre-construction surveys shall focus on both direct and indirect evidence of nesting, including nest locations and nesting behavior. The qualified avian biologist will make every effort to avoid potential nest predation as a result of survey and monitoring efforts. If active nests are found during the pre-construction nesting bird surveys, a qualified biologist shall establish an appropriate nest buffer to be marked on the ground. Nest buffers are species specific and shall be at least 300 feet for passerines and 500 feet for raptors. A smaller or larger buffer may be determined by the qualified biologist familiar with the nesting phenology of the nesting species and based on nest and buffer monitoring results. Construction activities may not occur inside the established buffers, which shall remain on site until a qualified biologist determines the young have fledged or the nest is no longer active. Active nests and adequacy of the established buffer distance shall be monitored daily by the qualified biologist until the qualified biologist has determined the young have fledged or the Project has been completed. The qualified biologist has the authority to stop work if nesting pairs exhibit signs of disturbance. Burrowing Owl: Preconstruction burrowing owl surveys shall be conducted no less than 14 days prior to the start of Project-related activities and within 24 hours prior to ground disturbance, in accordance with the Staff Report on Burrowing Owl Mitigation (2012 or most recent version). Preconstruction surveys should be performed by a qualified biologist following the recommendations and guidelines provided in the Staff Report on Burrowing Owl Mitigation. If the preconstruction surveys confirm occupied burrowing owl habitat, Project activities shall be immediately halted. The qualified biologist shall coordinate with CDFW and prepare a Burrowing Owl Plan that shall be submitted to CDFW and USFWS for review and approval prior to commencing Project activities.	City of Rialto; Project contractor; Project Biologist	City of Rialto Community Development Department (Planning and Building & Safety Divisions)	Prior to all grading and construction activities.			
CULTURAL RESOURCES						
MM CUL-1: Prior to grading activities and in consultation with the City, a qualified archaeologist shall develop a treatment plan. The treatment plan shall include protocols for the treatment of inadvertent discoveries of cultural or tribal resources during ground	City of Rialto; Project contractor; Project archaeologist.	City of Rialto Community Development Department (Planning and Building & Safety Divisions)	Prior and during all grading and construction activities.			

Mitigation Measures	Responsible Party	Monitoring Party	Implementation Timing	Compliance Verification		
				Initial	Date	Comments
disturbances that would include evaluation of the resource(s) for CRHR-eligibility and further treatment to reduce impacts to the resource(s) through treatment that may include salvage excavation, laboratory analysis and processing, research, curation of the find in a local museum or repository, and preparation of a report summarizing the find(s). If the discovery is prehistoric in nature, local Native Americans shall be consulted. If cultural resources or tribal cultural resources (such as structural features, unusual amounts of bone or shell, artifacts, or human remains) are encountered in the Project area during construction, the Project contractor shall stop work within 100 feet of the find(s) and the construction contractor shall immediately notify the project's City representative. The City representative in coordination with the Project contractor shall implement the evaluation and treatment protocols contained in the treatment plan.						
MM CUL-2: If human remains are encountered in the Project area during construction, the Project contractor shall stop work in accordance with State Health and Safety Code Section 7050.5. No further disturbance shall occur until the County Coroner has made a determination of origin and disposition pursuant to Public Resources Code Section 5097.98. The County Coroner must be notified of the find immediately. If the remains are determined to be prehistoric, the Coroner will notify the NAHC, which will determine and notify a Most Likely Descendant (MLD). With the permission of the City or authorized representative, the MLD may inspect the site of the discovery. The MLD shall complete the inspection within 48 hours of notification by the NAHC. The MLD may recommend scientific removal and nondestructive analysis of human remains and items associated with Native American burials. In addition, according to the California Health and Safety Code, a cemetery is place where six (6) or more human bodies are buried (Section 8100), and unauthorized disturbance of Native American cemeteries is a felony (Section 7052.	City of Rialto; Project contractor; Project archaeologist.	City of Rialto Community Development Department (Planning and Building & Safety Divisions)	Prior and during all grading and construction activities.			
GEOLOGY AND SOILS						
MM GEO-1: If paleontological resources are encountered in the Project area during construction, work shall be suspended within 100 feet of the find (based on the apparent distribution of paleontological materials), and the construction contractor shall immediately notify the Project's City representative. The City shall contact a qualified paleontologist to evaluate the finds and the paleontologist shall: 1) implement avoidance and minimization measures if necessary; 2) identify the need for off-site lab evaluation requirements if necessary; and 3) define the steps needed for final disposition of the finds if necessary.	City of Rialto; Project contractor; Project paleontologist.	City of Rialto Community Development Department (Planning and Building & Safety Divisions)	Prior and during all grading and construction activities.			
TRIBAL CULTURAL RESOURCES						

Mitigation Measures	Responsible Party	Monitoring Party	Implementation Timing	Compliance Verification		
				Initial	Date	Comments
MM TCR-1: Prior to commencement of ground-disturbing activities (site demolition, clearing, grubbing, grading, etc.), a Tribal Cultural Resources Mitigation and Monitoring Plan (TCR-MMP) shall be prepared by the Project archaeologist and the City shall disseminate the TCR-MMP to the consulting Tribes. All parties shall review and be provided with an opportunity to comment upon the plan in a reasonable time period as determined by the City prior to commencement of ground-disturbing activities for the Project. If consensus among the Project archeologist, the City and Tribe(s) about monitoring and treatment methods cannot be reached, the City shall make the determination in its best judgement regarding the appropriate measures for inclusion in the TCR-MMP considering input and recommendations from the Project archaeologist and the consulting Tribes. Any non-responsive party shall be assumed to have agreed to the plans without comment. Any and all findings of discovered resources will be subject to the protocol detailed within the TCR-MMP. The TCR-MMP shall include, but not be limited to, the following provisions: 1) Prior to commencement of ground-disturbing activities, the City shall retain a certified archaeologist to perform as Project archaeologist for the Project and to implement the TCR-MMP. 2) The City shall invite the consulting Tribes to participate without reimbursement in monitoring on a rotating basis during all ground-disturbing activities. The Native American monitor(s) shall work in concert with the Project archaeological monitor to observe ground disturbances to fulfill the provisions of the TCR-MMP. 3) The Project archaeologist and the consulting tribal monitor(s) shall attend the pre-grading meeting with the contractors to explain and coordinate the requirements of the TCR-MMP. 4) In the event that tribal cultural resources (TCRs) are discovered, the Project archaeologist in consultation with the tribal monitor(s) shall have the authority to divert or temporarily halt ground disturbance operation in the area of discovery to allow for the evaluation of potentially significant TCRs. The Project archaeologist shall contact the City at the time of discovery. The Project archaeologist, in consultation with the tribal monitor(s) and City, shall determine the significance of the discovered resources. The City must concur with the evaluation before construction activities will be allowed to resume in the affected area. For significant TCRs, the TCR-MMP shall address culturally	City of Rialto; Project contractor; Project archaeologist.	City of Rialto Community Development Department (Planning and Building & Safety Divisions)	Prior and during all grading and construction activities.			

Mitigation Measures	Responsible Party	Monitoring Party	Implementation Timing	Compliance Verification		
				Initial	Date	Comments
appropriate methods and treatment, including additional steps to mitigate impacts as determined by the City. 5) Before ground-disturbing activities are allowed to resume in the affected area, any TCRs that cannot be avoided and preserved in place shall be addressed through the methods and processes identified in the TCR-MMP. The Project archaeologist in consultation with the consulting tribal monitor(s) shall identify the methods for data recovery in the TCR-MMP. 6) All cultural material collected shall be subject to the culturally appropriate treatment and mitigation standards outlined in the TCR-MMP, which may include reburial on-site in an area that will be protected in perpetuity or relinquishment to the culturally affiliated consulting tribal government for culturally appropriate treatment. 7) A Phase 4 report documenting the field and analysis results and interpreting the artifact and research data within the research context shall be prepared by the Project archaeologist, in consultation with the consulting tribal monitor(s), and submitted to the satisfaction of the City prior to commencement of construction activities (i.e., post ground-disturbing activities). The report will include DPR Primary and Archaeological Site Forms. 8) Any historic archaeological material that is not Native American in origin (non-TCR and) shall be curated at an institution meeting the State and federal standards for curation.						
MM TCR-2: 1) The City shall invite Native American Monitor(s) authorized to represent the consulting Tribe(s) on a rotating basis for all "ground-disturbing activities" in native soil and previously unexamined fill soils that occur within the proposed Project area. The monitor(s) shall be invited prior to the commencement of any "ground-disturbing activity" for the subject project (i.e., both on-site and any off-site locations that are included in the project description/definition and/or required in connection with the project, such as public improvement work). "Ground-disturbing activity" shall include, but is not limited to, all grading activities, archaeological investigations, demolition, pavement removal, subsurface testing of any kind, weed abatement, potholing, auguring, clearing, grubbing, tree removal, boring, grading, excavation, drilling, and trenching. 2) The Native American Monitor(s) shall complete daily monitoring activity logs that will provide descriptions of the relevant ground-disturbing activities, the type of construction activities performed,	City of Rialto; Project contractor; Project archaeologist.	City of Rialto Community Development Department (Planning and Building & Safety Divisions)	Prior and during all grading and construction activities.			

Mitigation Measures	Responsible Party	Monitoring Party	Implementation Timing	Compliance Verification		
				Initial	Date	Comments
locations of ground-disturbing activities, soil types, TCR materials, and any other facts, conditions, materials, or discoveries of significance to the Tribe(s). Tribal monitoring activity logs will be provided to the Project archaeologist and City with any confidential information, as provided by law, not being subject to a Public Records Act Request. 3) On-site tribal monitoring for site preparation activities and for construction shall conclude upon the sooner of (1) when the consulting Tribe(s)' monitor(s) confirms through a written confirmation that all grading and ground-disturbing activities are no longer within archaeological and cultural resources soils or (2) a determination by the City and written notification to the Tribal monitor(s) that soil-disturbing construction activities within native soil and previously unexamined fill soils have concluded at the site.						

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7.0 REFERENCES

1.0 INTRODUCTION

No citations were used in this chapter.

2.0 PROJECT DESCRIPTION

No citations were used in this chapter.

3.0 ENVIRONMENTAL CHECKLIST

Air Quality and Greenhouse Gas Impact Assessment. Prepared by Urban Crossroads (UC 2023). Appendix A.

Biological Resource Assessment. Prepared by Carlson Strategic Land Solutions (CSLS 2023). Appendix B.

Calabasas Landfill. CalRecycle (2022). Available:
https://www2.calrecycle.ca.gov/SolidWaste/Site/Details/1041. Accessed February 17, 2022.

CalRecycle Solid Waste Information System Facility/Site Search. Available:
https://www2.calrecycle.ca.gov/SWFacilities/Directory/. Accessed February 17, 2022.

CalRecycle Jurisdiction Disposal and Alternative Daily Cover. Available:
https://www2.calrecycle.ca.gov/LGCentral/DisposalReporting/Destination/DisposalByFacility

California Fire Hazard Severity Zone Viewer. Cal FIRE (2022).
Available: https://egis.fire.ca.gov/FHSZ/. Accessed February 17, 2022.

California Important Farmland Finder. California Department of Conservation. Available:
https://maps.conservation.ca.gov/DLRP/CIFF/. Accessed February 17, 2022.

California State Scenic Highway System Map. Available:
https://www.arcgis.com/apps/webappviewer/index.html?id=2e921695c43643b1aaf7000dfcc19983]

City of Rialto. General Plan. December 2010.

City of Rialto. General Plan EIR. Available:
https://yourrialto.com/DocumentCenter/View/1494/2010-General-Plan. Accessed February 17, 2022.

City of Rialto. Official City Zoning Map. Updated July 8, 2013.

City of Rialto. Rialto Airport Specific Plan. November 18, 1997.

County of San Bernardino. Countywide Plan. November 27, 2020.

City of Rialto Municipal Code. Available:
https://library.municode.com/ca/rialto/codes/codeofordinances?nodeId=RIALTOCALIFORNIAMUCO.
Accessed February 17, 2022.

Cultural Resources Assessment. Prepared by Brian F. Smith and Associates, Inc. (BFSA 2023). Appendix C.

EnviroStor. Department of Toxic Substances Control.
Available: https://www.envirostor.dtsc.ca.gov/public/. Accessed February 17, 2022.

Estimated Solid Waste Generation Rates. CalRecycle.
Available: https://www2.calrecycle.ca.gov/WasteCharacterization/General/Rates.
Accessed February 17, 2022.

Fault Activity Map of California. California Department of Conservation.
Available: https://maps.conservation.ca.gov/cgs/fam/. Accessed February 17, 2022.

FEMA Flood Map Center.
Available:https://msc.fema.gov/portal/search?AddressQuery=16323%20shoemaker%20avenue%20Cerritos%20#searchresultsanchor. Accessed February 17, 2022.

Geotechnical Exploration. Prepared by NMG Geotechnical (NMG 2023). Appendix D.

Scholl Canyon Landfill. CalRecycle (2022).
Available: https://www2.calrecycle.ca.gov/SolidWaste/Site/Summary/1000. Accessed February 17, 2022.

4.0 COMPLIANCE WITH FEDERAL LAWS AND REGULATIONS

Federal Emergency Management Agency. 2015 (June 16). Flood Insurance Rate Map.
Available: https://msc.fema.gov/portal. Accessed November 2, 2022.

U.S. Bureau of Land Management, National Park Service, U.S. Fish and Wildlife Service, and U.S. Forest Service. 2020. National Wild and Scenic Rivers System.
Available: https://www.rivers.gov/rivers/deep-creek.php. Accessed January 10, 2023.

U.S. Census Bureau. 2021. 2021-2016 American Community Survey 5-Year. Demographic and Housing Estimates. City of Sacramento Rialto. Available:https://data.census.gov/all?g=040XX00US06_160XX00US0660466&d=ACS+5-Year+Estimates+Data+Profiles. Accessed February 17, 2022.

U.S. Environmental Protection Agency. 2021. Sole Source Aquifer.
Available: https://epa.maps.arcgis.com/apps/webappviewer/index.html?id=9ebb047ba3ec41ada1877155fe31356b. Accessed February 17, 2022.

5.0 ALTERNATIVES

No citations were used in this chapter.

8.0 REPORT PREPARERS

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Appendix A: Air Quality and Greenhouse Gas Assessment

Appendix B: Biological Resource Assessment

Appendix C: Cultural Resources Assessment

Appendix D: Geotechnical Exploration and Review of Grading and Improvement Plan

Appendix E: Responses to Public Comments

Appendix A: Air Quality and Greenhouse Gas Assessment

MEMORANDUM

URBAN | CROSSROADS

DATE: July 27, 2023
TO: Ray Hussey, Enplanners
FROM: Haseeb Qureshi
Ali Dadabhoy
JOB NO: 14941-03 AQ & GHG Assessment

LAKE RIALTO AIR QUALITY & GREENHOUSE GAS ASSESSMENT

Ray Hussey,

Urban Crossroads, Inc. is pleased to provide the following Air Quality & Greenhouse Gas Assessment for the Lake Rialto (**Project**), which would be located in the southern portion of the approximately 40-acre City-owned Rialto WWTP, located at 501 E. Santa Avenue in the City of Rialto. The lake site is generally located northwest of the Santa Ana River, and south of Interstate 10 between Riverside Avenue to the west and Pepper Avenue (extended) to the east. The lake site is bordered by the existing plant to the north, SoCal Edison power poles and easement to the south, the Rialto Channel to the east, and undeveloped industrial-zoned property to the west.

PROJECT OVERVIEW

It is our understanding that the Project is to consist of the development of an approximate 12.50-acre outdoor public recreational space, including a 10-acre lake with a parking lot comprised of 11 spaces. The proposed Project is anticipated to have an opening year of 2025. The preliminary site plan for the proposed Project is shown on Exhibit 1.

SUMMARY OF FINDINGS

Results of the assessment indicate that the Project would result in a less than significant with respect to air quality and greenhouse gases.

EXHIBIT 1: SITE PLAN

A
A
B
B
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2:1 SLOPE
2:1 SLOPE

PROJECT AIR QUALITY IMPACTS

AIR QUALITY SETTING

SOUTH COAST AIR BASIN (SCAB)

The Project site is located in the SCAB within the jurisdiction of South Coast Air Quality Management District (SCAQMD) (1). The SCAQMD was created by the 1977 Lewis-Presley Air Quality Management Act, which merged four county air pollution control bodies into one regional district. Under the Act, the SCAQMD is responsible for bringing air quality in areas under its jurisdiction into conformity with federal and state air quality standards. As previously stated, the Project site is located within the SCAB, a 6,745-square mile subregion of the SCAQMD, which includes portions of Los Angeles, Riverside, and San Bernardino Counties, and all of Orange County.

The SCAB is bounded by the Pacific Ocean to the west and the San Gabriel, San Bernardino, and San Jacinto Mountains to the north and east. The Los Angeles County portion of the Mojave Desert Air Basin is bounded by the San Gabriel Mountains to the south and west, the Los Angeles / Kern County border to the north, and the Los Angeles / San Bernardino County border to the east. The Riverside County portion of the Salton Sea Air Basin is bounded by the San Jacinto Mountains in the west and spans eastward up to the Palo Verde Valley.

Regional Climate

The regional climate has a substantial influence on air quality in the SCAB. In addition, the temperature, wind, humidity, precipitation, and amount of sunshine influence the air quality.

The annual average temperatures throughout the SCAB vary from the low to middle 60s degrees Fahrenheit (°F). Due to a decreased marine influence, the eastern portion of the SCAB shows greater variability in average annual minimum and maximum temperatures. January is the coldest month throughout the SCAB, with average minimum temperatures of 47°F in downtown Los Angeles and 36°F in San Bernardino. All portions of the SCAB have recorded maximum temperatures above 100°F.

Although the climate of the SCAB can be characterized as semi-arid, the air near the land surface is quite moist on most days because of the presence of a marine layer. This shallow layer of sea air is an important modifier of SCAB climate. Humidity restricts visibility in the SCAB, and the conversion of sulfur dioxide (SO_2) to sulfates (SO_4) is heightened in air with high relative humidity. The marine layer provides an environment for that conversion process, especially during the spring and summer months. The annual average relative humidity within the SCAB is 71 percent (%) along the coast and 59% inland. Since the ocean effect is dominant, periods of heavy early morning fog are frequent and low stratus clouds are a characteristic feature. These effects decrease with distance from the coast.

More than 90% of the SCAB's rainfall occurs from November through April. The annual average rainfall varies from approximately nine inches in Riverside to fourteen inches in downtown Los Angeles. Monthly and yearly rainfall totals are extremely variable. Summer rainfall usually consists of widely scattered thunderstorms near the coast and slightly heavier shower activity in the eastern portion of the SCAB with frequency being higher near the coast.

Due to its generally clear weather, about three-quarters of available sunshine is received in the SCAB. The remaining one-quarter is absorbed by clouds. The ultraviolet portion of this abundant radiation is a key factor in photochemical reactions. On the shortest day of the year there are approximately 10 hours of possible sunshine, and on the longest day of the year there are approximately 14½ hours of possible sunshine.

The importance of wind to air pollution is considerable. The direction and speed of the wind determines the horizontal dispersion and transport of the air pollutants. During the late autumn to early spring rainy season, the SCAB is subjected to wind flows associated with the traveling storms moving through the region from the northwest. This period also brings five to ten periods of strong, dry offshore winds, locally termed "Santa Anas" each year. During the dry season, which coincides with the months of maximum photochemical smog concentrations, the wind flow is bimodal, typified by a daytime onshore sea breeze and a nighttime offshore drainage wind. Summer wind flows are created by the pressure differences between the relatively cold ocean and the unevenly heated and cooled land surfaces that modify the general northwesterly wind circulation over southern California. Nighttime drainage begins with the radiational cooling of the mountain slopes. Heavy, cool air descends the slopes and flows through the mountain passes and canyons as it follows the lowering terrain toward the ocean. Another characteristic wind regime in the SCAB is the "Catalina Eddy," a low level cyclonic (counterclockwise) flow centered over Santa Catalina Island which results in an offshore flow to the southwest. On most spring and summer days, some indication of an eddy is apparent in coastal sections.

In the SCAB, there are two distinct temperature inversion structures that control vertical mixing of air pollution. During the summer, warm high-pressure descending (subsiding) air is undercut by a shallow layer of cool marine air. The boundary between these two layers of air is a persistent marine subsidence/inversion. This boundary prevents vertical mixing which effectively acts as an impervious lid to pollutants over the entire SCAB. The mixing height for the inversion structure is normally situated 1,000 to 1,500 feet above mean sea level.

A second inversion-type forms in conjunction with the drainage of cool air off the surrounding mountains at night followed by the seaward drift of this pool of cool air. The top of this layer forms a sharp boundary with the warmer air aloft and creates nocturnal radiation inversions. These inversions occur primarily in the winter when nights are longer and onshore flow is weakest. They are typically only a few hundred feet above mean sea level. These inversions effectively trap pollutants, such as nitrogen oxides (NO_X) and carbon monoxide (CO) from vehicles, as the pool of cool air drifts seaward. Winter is therefore a period of high levels of primary pollutants along the coastline.

Wind Patterns and Project Location

The distinctive climate of the Project area and the SCAB is determined by its terrain and geographical location. The SCAB is located in a coastal plain with connecting broad valleys and low hills, bounded by the Pacific Ocean in the southwest quadrant with high mountains forming the remainder of the perimeter.

Wind patterns across the south coastal region are characterized by westerly and southwesterly onshore winds during the day and easterly or northeasterly breezes at night. Winds are characteristically light although the speed is somewhat greater during the dry summer months than during the rainy winter season.

Criteria Pollutants

Both the U.S. Environmental Protection Agency (EPA) and the California Air Resources Board (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) (precursor emissions include NO_X and reactive organic gases (ROG), CO, particulate matter (PM), nitrogen dioxide (NO_2), 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 Riverside County portion of the SCAB is designated as a nonattainment area for the federal O_3 and $PM_{2.5}$ standards and is also a nonattainment area for the state standards for O_3, PM_{10}, and $PM_{2.5}$.

Toxic Air Contaminants (TAC) Trend

In 1984, as a result of public concern for exposure to airborne carcinogens, CARB adopted regulations to reduce the amount of TAC emissions resulting from mobile and area sources, such as cars, trucks, stationary products, and consumer products. According to the Ambient and Emission Trends of Toxic Air Contaminants in California journal article (2) which was prepared for CARB, results show that between 1990-2012, ambient concentration and emission trends for the seven TACs responsible for most of the known cancer risk associated with airborne exposure in California have declined significantly (between 1990 and 2012). The seven TACs studied include those that are derived from mobile sources: diesel particulate matter (DPM), benzene (C_6H_6), and 1,3-butadiene (C_4H_6); those that are derived from stationary sources: perchloroethylene (C_2Cl_4) and hexavalent chromium (Cr(VI)); and those derived from photochemical reactions of emitted VOCs: formaldehyde (CH_2O) and acetaldehyde (C_2H_4O)[1]. The decline in ambient concentration and emission trends of these TACs are a result of various regulations CARB has implemented to address cancer risk.

Some people are especially sensitive to air pollution and are given special consideration when evaluating air quality impacts from projects. These groups of people include children, the elderly, and individuals with pre-existing respiratory or cardiovascular illness. Structures that house these persons or places where they gather are defined as "sensitive receptors". These structures typically include uses such as residences, hotels, and hospitals where an individual can remain for 24 hours. Consistent with the LST Methodology, the nearest land use where an individual could remain for 24 hours to the Project site has been used to determine construction and operational air quality impacts for emissions of PM_{10} and $PM_{2.5}$, since PM_{10} and $PM_{2.5}$ thresholds are based on a 24-hour averaging time.

Receptors in the Project study area are described below. All distances are measured from the Project site boundary to the outdoor living areas (e.g., backyards) or at the building façade,

[1] It should be noted that ambient DPM concentrations are not measured directly. Rather, a surrogate method using the coefficient of haze (COH) and elemental carbon (EC) is used to estimate DPM concentrations.

whichever is closer to the Project site. Receptors in the Project study area are shown on Exhibit 2 under the Localized Construction Emissions section later in the report.

- Receptor R1 represents the existing residence at 323 Jurupa Ave, approximately 3,910 feet west of the Project site.
- Receptor R2 represents SC Fuels at 2829 Industrial Dr, approximately 1,351 feet west of the Project site.
- Receptor R3 represents E-Z Mix Inc at 3355 S Industrial Dr, approximately 2,822 feet southwest of the Project site.
- Receptor R4 represents Walmart ACC at 1600 Agua Manda Rd, approximately 1,562 feet southeast of the Project site.
- Receptor R5 represents Veolia Water North America at 501 E Santa Ana Ave, approximately 94 feet north of the Project site.

REGULATORY BACKGROUND

FEDERAL REGULATIONS

The EPA is responsible for setting and enforcing the national ambient air quality standards (NAAQS) for O_3, CO, NO_X, SO_2, PM_{10}, and lead (Pb) (3). The EPA has jurisdiction over emissions sources that are under the authority of the federal government including aircraft, locomotives, and emissions sources outside state waters (Outer Continental Shelf). The EPA also establishes emission standards for vehicles sold in states other than California. Automobiles sold in California must meet the stricter emission requirements of CARB.

The Federal Clean Air Act (CAA) was first enacted in 1955 and has been amended numerous times in subsequent years (1963, 1965, 1967, 1970, 1977, and 1990). The CAA establishes the federal air quality standards, the NAAQS, and specifies future dates for achieving compliance (4). The CAA also mandates that each state submit and implement state implementation plans (SIPs) for local areas not meeting these standards. These plans must include pollution control measures that demonstrate how the standards will be met.

The 1990 amendments to the CAA that identify specific emission reduction goals for areas not meeting the NAAQS require a demonstration of reasonable further progress toward attainment and incorporate additional sanctions for failure to attain or to meet interim milestones. The sections of the CAA most directly applicable to the development of the Project site include Title I (Non-Attainment Provisions) and Title II (Mobile Source Provisions) (5) (6). Title I provisions were established with the goal of attaining the NAAQS for the following criteria pollutants O_3, NO_2, SO_2, PM_{10}, CO, $PM_{2.5}$, and Pb. The NAAQS were amended in July 1997 to include an additional standard for O_3 and to adopt a NAAQS for $PM_{2.5}$.

Mobile source emissions are regulated in accordance with Title II provisions. These provisions require the use of cleaner burning gasoline and other cleaner burning fuels such as methanol and natural gas. Automobile manufacturers are also required to reduce tailpipe emissions of hydrocarbons and NO_X. NO_X is a collective term that includes all forms of NO_X which are emitted as byproducts of the combustion process.

CALIFORNIA REGULATIONS

CARB

The CARB, which became part of the California EPA (CalEPA) in 1991, is responsible for ensuring implementation of the California Clean Air Act (AB 2595), responding to the federal CAA, and for regulating emissions from consumer products and motor vehicles. AB 2595 mandates achievement of the maximum degree of emissions reductions possible from vehicular and other mobile sources in order to attain the state ambient air quality standards by the earliest practical date. The CARB established the California ambient air quality standards (CAAQS) for all pollutants for which the federal government has NAAQS and, in addition, establishes standards for SO_4, visibility, hydrogen sulfide (H_2S), and vinyl chloride (C_2H_3Cl). However, at this time, H_2S and C_2H_3Cl are not measured at any monitoring stations in the SCAB because they are not considered to be a regional air quality problem. Generally, the CAAQS are more stringent than the NAAQS (7) (8).

Local air quality management districts, such as the SCAQMD, regulate air emissions from stationary sources such as commercial and industrial facilities. All air pollution control districts have been formally designated as attainment or non-attainment for each CAAQS.

Serious non-attainment areas are required to prepare Air Quality Management Plans (AQMP) that include specified emission reduction strategies in an effort to meet clean air goals. These plans are required to include:

- Application of Best Available Retrofit Control Technology to existing sources;
- Developing control programs for area sources (e.g., architectural coatings and solvents) and indirect sources (e.g. motor vehicle use generated by residential and commercial development);
- A District permitting system designed to allow no net increase in emissions from any new or modified permitted sources of emissions;
- Implementing reasonably available transportation control measures and assuring a substantial reduction in growth rate of vehicle trips and miles traveled;
- Significant use of low emissions vehicles by fleet operators;
- Sufficient control strategies to achieve a 5% or more annual reduction in emissions or 15% or more in a period of three years for ROGs, NO_X, CO and PM_{10}. However, air basins may use alternative emission reduction strategy that achieves a reduction of less than 5% per year under certain circumstances.

AQMP

Currently, the NAAQS and CAAQS are exceeded in most parts of the SCAB. In response, the SCAQMD has adopted a series of AQMP to meet the state and federal ambient air quality standards (9). AQMPs are updated regularly in order to more effectively reduce emissions, accommodate growth, and to minimize any negative fiscal impacts of air pollution control on the economy.

APPLICABLE REGULATORY REQUIRMENTS

SCAQMD Rules that are currently applicable during construction activity for this Project include but are not limited to Rule 403 (Fugitive Dust) and Rule 1113 (Architectural Coatings) (10) (11).

SCAQMD Rule 403

This rule is intended to reduce the amount of particulate matter entrained in the ambient air as a result of anthropogenic (human-made) fugitive dust sources by requiring actions to prevent and reduce fugitive dust emissions. Rule 403 applies to any activity or human-made condition capable of generating fugitive dust and requires best available control measures to be applied to earth moving and grading activities. 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.

- 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.
- All onsite roads will be paved as soon as feasible or watered periodically or chemically stabilized.
- All material transported offsite will be either sufficiently watered or securely covered to prevent excessive amounts of dust.
- The area disturbed by clearing, grading, earthmoving, or excavation operations will be minimized at all times.
- 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.

SCAQMD Rule 1113

This rule serves to limit the volatile organic compound (VOC) content of architectural coatings used on projects in the SCAQMD. Any person who supplies, sells, offers for sale, or manufactures any architectural coating for use on projects in the SCAQMD must comply with the current VOC standards set in this rule.

METHODOLOGY

In May 2022, the California Air Pollution Control Officers Association (CAPCOA) in conjunction with other California air districts, including SCAQMD, released the latest version of the CalEEMod Version 2022.1. The purpose of this model is to calculate construction-source and operational-source criteria pollutant (VOCs, NO_X, SO_X, CO, PM_{10}, and $PM_{2.5}$) and GHG emissions from direct and indirect sources; and quantify applicable air quality and GHG reductions achieved from mitigation measures (12). Accordingly, the latest version of CalEEMod has been used for this Project to determine construction and operational air quality and greenhouse gas emissions.

Standards of Significance

The criteria used to determine the significance of potential Project-related air quality impacts are taken from the California Environmental Quality Act Guidelines (CEQA Guidelines) (14 CCR

§§15000, et seq.). Based on these thresholds, a project would result in a significant impact related to air quality if it would (13):

- **Threshold 1**: Conflict with or obstruct implementation of the applicable air quality plan.
- **Threshold 2**: 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.
- **Threshold 3**: Expose sensitive receptors to substantial pollutant concentrations.
- **Threshold 4**: Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

AIR QUALITY REGIONAL EMISSIONS THRESHOLDS

The SCAQMD has developed regional significance thresholds for criteria pollutants, as summarized at Table 1 (14). The SCAQMD's CEQA Air Quality Significance Thresholds (March 2023) indicate that any projects in the South Coast Air Basin (SCAB) with daily emissions that exceed any of the indicated thresholds should be considered as having an individually and cumulatively significant air quality impact.

TABLE 1: MAXIMUM DAILY REGIONAL EMISSIONS THRESHOLDS

Pollutant	Construction	Operations
NO_X	100 lbs/day	55 lbs/day
VOC	75 lbs/day	55 lbs/day
PM_{10}	150 lbs/day	150 lbs/day
$PM_{2.5}$	55 lbs/day	55 lbs/day
SO_X	150 lbs/day	150 lbs/day
CO	550 lbs/day	550 lbs/day

lbs/day – Pounds Per Day

AIR QUALITY LOCALIZED EMISSIONS THRESHOLDS

For this Project, the appropriate SRA for the LST analysis is the SCAQMD Central San Bernardino Valley monitoring station (SRA 34). LSTs apply to CO, NO_2, PM_{10}, and $PM_{2.5}$. The SCAQMD produced look-up tables for projects less than or equal to 5 acres in size. The SCAQMD's screening look-up tables are utilized in determining localized impacts. It should be noted that since the look-up tables identify thresholds at only 1 acre, 2 acres, and 5 acres, linear regression has been utilized to determine localized significance thresholds. Consistent with SCAQMD guidance, the thresholds presented in Table 2 were calculated by interpolating the threshold values for the Project's disturbed acreage.

The acres disturbed is based on the equipment list and days in the demolition, site preparation, and grading phase according to the anticipated maximum number of acres a given piece of equipment can pass over in an 8-hour workday. The equipment-specific grading rates are summarized in the CalEEMod user's guide, Appendix A: Calculation Details for CalEEMod (15). It

should be noted that the disturbed area per day is representative of a piece of equipment making multiple passes over the same land area. In other words, one Rubber Tired Dozer can make multiple passes over the same land area totaling 0.5 acres in a given 8-hour day. Appendix A of the CalEEMod User Manual only identifies equipment-specific grading rates for Crawler Tractors, Graders, Rubber Tired Dozers, and Scrapers; therefore, Tractors/Loaders/Backhoes equipment that was included in the demolition, site preparation and grading phase was replaced with Crawler Tractors. For analytical purposes, emissions associated with peak site demolition, preparation, and grading activities are considered for purposes of localized significance thresholds (LSTs) since this phase represents the maximum localized emissions that would occur. The Project's construction activities could disturb a maximum of approximately 3.5 acres per day for site preparation and 4 acres per day for grading activities. Any other construction phases of development would result in lesser emissions and consequently lesser impacts than what is disclosed herein. As such, Table 2 presents thresholds for localized construction and operational emissions.

TABLE 2: MAXIMUM DAILY LOCALIZED EMISSIONS THRESHOLDS

Source	Activity	Emissions (lbs/day)			
		VOC	NO_X	PM_{10}	$PM_{2.5}$
Construction	Site Preparation	225 lbs/day	1,442 lbs/day	499 lbs/day	300 lbs/day
	Grading	241 lbs/day	1,575 lbs/day	504 lbs/day	305 lbs/day

[1]Source of localized significance threshold (LSTs) is provided on page 15.

CONSTRUCTION ACTIVITIES

Construction activities associated with the Project would result in emissions of VOCs, NO_X, SO_X, CO, PM_{10}, and $PM_{2.5}$. Construction related emissions are expected from the following construction activities:

- Site Preparation
- Grading (Import/Export)
- Paving
- Trenching

GRADING ACTIVITIES

Dust is typically a major concern during grading activities. Because such emissions are not amenable to collection and discharge through a controlled source, they are called "fugitive emissions". Fugitive dust emissions rates vary as a function of many parameters (soil silt, soil moisture, wind speed, area disturbed, number of vehicles, depth of disturbance or excavation, etc.). CalEEMod was utilized to calculate fugitive dust emissions resulting from this phase of activity. Per client provided data, this analysis assumes that earthwork activities are expected to balance on site and no import or export of soils would be required. The CalEEMod default trip length of 20-miles will be used to analyze the emissions associated with export activities.

ON-ROAD TRIPS

Construction generates on-road vehicle emissions from vehicle usage for workers, vendors, and haul trucks commuting to and from the site. Worker and hauling trips are based on CalEEMod defaults. It should be noted that for vendor trips, specifically, CalEEMod only assigns vendor trips to the Building Construction phase. Vendor trips would likely occur during all phases of construction. As such, the CalEEMod defaults for vendor trips have been adjusted based on a ratio of the total vendor trips to the number of days of each subphase of activity.

CONSTRUCTION DURATION

For purposes of analysis, construction of the Project is expected to commence in July 2023 and would last through January 2025. The construction schedule utilized in the analysis represents a "worst-case" analysis scenario should construction occur any time after the respective dates since emission factors for construction decrease as time passes and the analysis year increases due to emission regulations becoming more stringent[2]. The duration of construction activity and associated equipment represents a reasonable approximation of the expected construction fleet as required per CEQA Guidelines (16).

CONSTRUCTION EQUIPMENT

CalEEMod default parameters for equipment has been used. Consistent with industry standards and typical construction practices, each piece of equipment will operate up to a total of eight (8) hours per day, or more than two-thirds of the period during which construction activities are allowed pursuant to the code.

REGIONAL CONSTRUCTION EMISSIONS SUMMARY

The estimated maximum daily construction emissions are summarized on Table 3, and as shown, the Project construction-source emissions would not exceed SCAQMD regional thresholds. Thus, the Project would result in a less than significant impact associated with construction activities. Detailed construction model outputs are presented in Attachment A.

TABLE 3: REGIONAL CONSTRUCTION EMISSIONS SUMMARY

Source	Emissions (lbs/day)					
	VOC	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Summer						
2023	5.00	47.11	39.61	0.05	8.42	5.07
2024	6.38	54.87	56.09	0.10	5.93	3.45

[2] As shown in the CalEEMod User's Guide Version 2022.1, Section 4.3 "Off-Road Equipment" as the analysis year increases, emission factors for the same equipment pieces decrease due to the natural turnover of older equipment being replaced by newer less polluting equipment and new regulatory requirements.

Source	Emissions (lbs/day)					
	VOC	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Winter						
2023	6.70	58.95	56.55	0.10	8.42	5.07
2024	6.37	54.92	54.85	0.10	5.93	3.45
2025	0.88	7.53	10.86	0.01	0.54	0.37
Maximum Daily Emissions	**6.70**	**58.95**	**56.55**	**0.10**	**8.42**	**5.07**
SCAQMD Regional Threshold	75	100	550	150	150	55
Threshold Exceeded?	NO	NO	NO	NO	NO	NO

[1]PM_{10} and $PM_{2.5}$ source emissions reflect 3x daily watering per SCAQMD Rule 403 for fugitive dust.

REGIONAL OPERATIONAL EMISSIONS

Operational activities associated with the Project would result in emissions of VOCs, NO_X, CO, SO_X, PM_{10}, and $PM_{2.5}$. Operational related emissions are expected from the following primary sources: area source emissions and mobile source emissions.

The estimated operation-source emissions from the Project are summarized on Table 4. Detailed operation model outputs are presented in Attachment A. As shown on Table 4, operational-source emissions would not exceed the applicable SCAQMD regional thresholds for emissions of any criteria pollutant.

TABLE 4: TOTAL PROJECT REGIONAL OPERATIONAL EMISSIONS

Source	Emissions (lbs/day)					
	VOC	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Summer						
Mobile Source	0.12	0.14	1.32	0.00	0.11	0.02
Area Source	0.30	0.00	0.00	0.00	0.00	0.00
Total Maximum Daily Emissions	**0.42**	**0.14**	**1.32**	**0.00**	**0.11**	**0.02**
SCAQMD Regional Threshold	55	55	550	150	150	55
Threshold Exceeded?	NO	NO	NO	NO	NO	NO
Winter						
Mobile Source	0.11	0.15	1.08	0.00	0.11	0.02
Area Source	0.30	0.00	0.00	0.00	0.00	0.00
Total Maximum Daily Emissions	**0.41**	**0.15**	**1.08**	**0.00**	**0.11**	**0.02**
SCAQMD Regional Threshold	55	55	550	150	150	55
Threshold Exceeded?	NO	NO	NO	NO	NO	NO

LOCALIZED CONSTRUCTION EMISSIONS

The analysis makes use of methodology included in the SCAQMD *Final Localized Significance Threshold Methodology* (LST Methodology) (17). The SCAQMD has established that impacts to air quality are significant if there is a potential to contribute or cause localized exceedances of the federal and/or state ambient air quality standards (NAAQS/CAAQS). Collectively, these are referred to as Localized Significance Thresholds (LSTs). The SCAQMD established LSTs in response to the SCAQMD Governing Board's Environmental Justice Initiative I-4[3]. LSTs represent the maximum emissions from a project that will not cause or contribute to an exceedance of the most stringent applicable federal or state ambient air quality standard at the sensitive receptor. The SCAQMD states that lead agencies can use the LSTs as another indicator of significance in its air quality impact analyses.

The SCAQMD recommends that the nearest sensitive receptor be considered when determining the Project's potential to cause an individual or cumulatively significant impact. The nearest land use where an individual could remain for 24 hours to the Project site has been used to determine localized construction and operational air quality impacts for emissions of PM_{10} and $PM_{2.5}$ (since PM_{10} and $PM_{2.5}$ thresholds are based on a 24-hour averaging time). The nearest receptor used for evaluation of localized impacts of PM_{10} and $PM_{2.5}$ is location R1, represented by the existing

[3] The purpose of SCAQMD's Environmental Justice program is to ensure that everyone has the right to equal protection from air pollution and fair access to the decision-making process that works to improve the quality of air within their communities. Further, the SCAQMD defines Environmental Justice as "...equitable environmental policymaking and enforcement to protect the health of all residents, regardless of age, culture, ethnicity, gender, race, socioeconomic status, or geographic location, from the health effects of air pollution."

residence at 323 Jurupa Ave, approximately 3,910 feet (1,192 meters) west of the Project site. Receptors in the Project study area shown on Exhibit 2.

As previously stated, and consistent with LST Methodology, the nearest industrial/commercial use to the Project site is used to determine construction and operational LST air impacts for emissions of NO_X and CO as the averaging periods for these pollutants are shorter (8 hours or less) and it is reasonable to assume that an individual could be present at these sites for periods of one to 8 hours. The nearest receptor used for evaluation of localized impacts of NO_X and CO is location R2, represented by Veolia Water North America located at 501 E Santa Ana Ave, approximately 94 feet (29 meters) north of the Project site.

EXHIBIT 2: SENSITIVE RECEPTOR LOCATIONS

Table 5 identifies the localized impacts at the nearest receptor location in the vicinity of the Project. Outputs from the model runs for construction LSTs are provided in Attachment A. For analytical purposes, emissions associated with peak demolition, site preparation and grading activities are considered for purposes of LSTs since these phases represent the maximum localized emissions that would occur. Any other construction phases of development that overlap would result in less emissions and consequently lesser impacts than what is disclosed herein. As shown in Table 5, emissions resulting from the Project construction will not exceed the numerical thresholds of significance established by the SCAQMD for any criteria pollutant. Thus, a less than significant impact would occur for localized Project-related construction-source emissions and no mitigation is required.

TABLE 5: PROJECT LOCALIZED CONSTRUCTION IMPACTS

On-Site Emissions	Emissions (lbs/day)			
	NO_X	CO	PM_{10}	$PM_{2.5}$
Site Preparation				
Maximum Daily Emissions	47.02	37.99	8.19	5.01
SCAQMD Localized Threshold	225	1,442	499	300
Threshold Exceeded?	NO	NO	NO	NO
Grading				
Maximum Daily Emissions	40.94	32.67	4.63	2.78
SCAQMD Localized Threshold	241	1,575	504	305
Threshold Exceeded?	NO	NO	NO	NO

LOCALIZED OPERATIONAL EMISSIONS

The proposed project is located on approximately 12.50 acres including a 10-acre lake with a parking lot comprised of 11 spaces. According to SCAQMD LST methodology, LSTs would apply to the operational phase of a proposed project, if the project includes stationary sources, or attracts mobile sources that may spend long periods queuing and idling at the site (e.g., transfer facilities and warehouse buildings). The proposed project does not include such uses, and thus, due to the lack of significant stationary source emissions, no LST analysis is needed for operations.

AIR QUALITY IMPACTS – CONSISTENCY WITH THRESHOLD NO. 1

Would the Project conflict with or obstruct implementation of the applicable air quality plan?

The Project site is located within the SCAB, which is characterized by relatively poor air quality. The SCAQMD has jurisdiction over an approximately 10,743 square-mile area consisting of the four-county Basin and the Los Angeles County and Riverside County portions of what use to be referred to as the Southeast Desert Air Basin. In these areas, the SCAQMD is principally responsible for air pollution control, and works directly with the Southern California Association of Governments (SCAG), county transportation commissions, local governments, as well as state

and federal agencies to reduce emissions from stationary, mobile, and indirect sources to meet state and federal ambient air quality standards.

Currently, these state and federal air quality standards are exceeded in most parts of the SCAB. In response, the SCAQMD has adopted a series of AQMPs to meet the state and federal ambient air quality standards. AQMPs are updated regularly in order to more effectively reduce emissions, accommodate growth, and to minimize any negative fiscal impacts of air pollution control on the economy.

In December 2022, the SCAQMD released the Final 2022 AQMP (2022 AQMP). The 2022 AQMP continues to evaluate current integrated strategies and control measures to meet the CAAQS, as well as explore new and innovative methods to reach its goals. Some of these approaches include utilizing incentive programs, recognizing existing co-benefit programs from other sectors, and developing a strategy with fair-share reductions at the federal, state, and local levels (18). Similar to the 2016 AQMP, the 2022 AQMP incorporates scientific and technological information and planning assumptions, including the 2020-2045 RTP/SCS, a planning document that supports the integration of land use and transportation to help the region meet the federal CAA requirements (19). The Project's consistency with the AQMP will be determined using the 2022 AQMP as discussed below.

Criteria for determining consistency with the AQMP are defined in Chapter 12, Section 12.2 and Section 12.3 of the 1993 CEQA Handbook (20). These indicators are discussed below.

The proposed Project will not result in an increase in the frequency or severity of existing air quality violations or cause or contribute to new violations or delay the timely attainment of air quality standards or the interim emissions reductions specified in the AQMP.

The violations that under this criterion refer to are the CAAQS and NAAQS. CAAQS and NAAQS violations would occur if regional or localized significance thresholds were exceeded.

CAAQS and NAAQS violations would occur if regional or localized significance thresholds were exceeded. As evaluated, the Project's regional and localized construction and operational-source emissions would not exceed applicable regional significance thresholds. As such, a less than significant impact is expected.

On the basis of the preceding discussion, the Project is determined to be consistent with the first criterion.

The Project will not exceed the assumptions in the AQMP based on the years of Project build-out phase.

The 2022 AQMP demonstrates that the applicable ambient air quality standards can be achieved within the timeframes required under federal law. Growth projections from local general plans adopted by cities in the district are provided to the SCAG, which develops regional growth forecasts, which are then used to develop future air quality forecasts for the AQMP. Development consistent with the growth projections in City of Rialto General Plan is considered to be consistent with the AQMP.

Peak day emissions generated by construction activities are largely independent of land use assignments, but rather are a function of development scope and maximum area of disturbance. Irrespective of the site's land use designation, development of the site to its maximum potential

would likely occur, with disturbance of the entire site occurring during construction activities. As such, when considering that no emissions thresholds will be exceeded, a less than significant impact would result.

The City of Rialto General Plan designates the Project site for "General Industrial" uses with a Specific Plan Overlay. The Project is within the "Agua Mansa Specific Plan" which designates the Project as "public recreational/educational". The Agua Mansa Specific Plan permits sewage treatment plants and related infrastructure and activities in the Public Facilities land use designation (21).

The proposed Project includes the development of a 12.5-acre outdoor public recreational space, including a 10-acre lake and a parking lot, which is consistent with the "public recreational/educational" use. As previously stated, the Project is consistent with the current land use and zoning designation. As such, the proposed Project would not conflict with the goals and objectives of the AQMP. Furthermore, the Project, as evaluated herein would not exceed the regional or localized air quality significance thresholds.

On the basis of the preceding discussion, the Project is determined to be consistent with the AQMP and a less than significant impact is expected.

AIR QUALITY IMPACTS – CONSISTENCY WITH THRESHOLD NO. 2

Would the Project 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?

The CAAQS designate the Project site as nonattainment for O_3, PM_{10}, and $PM_{2.5}$ while the NAAQS designates the Project site as nonattainment for O_3 and $PM_{2.5}$.

The SCAQMD has published a report on how to address cumulative impacts from air pollution: White Paper on Potential Control Strategies to Address Cumulative Impacts from Air Pollution (22). In this report the SCAQMD clearly states (Page D-3):

> *"…the SCAQMD uses the same significance thresholds for project specific and cumulative impacts for all environmental topics analyzed in an Environmental Assessment or EIR. The only case where the significance thresholds for project specific and cumulative impacts differ is the Hazard Index (HI) significance threshold for TAC emissions. The project specific (project increment) significance threshold is HI > 1.0 while the cumulative (facility-wide) is HI > 3.0. It should be noted that the HI is only one of three TAC emission significance thresholds considered (when applicable) in a CEQA analysis. The other two are the maximum individual cancer risk (MICR) and the cancer burden, both of which use the same significance thresholds (MICR of 10 in 1 million and cancer burden of 0.5) for project specific and cumulative impacts.*
>
> *Projects that exceed the project-specific significance thresholds are considered by the SCAQMD to be cumulatively considerable. This is the reason project-specific and cumulative significance thresholds are the same. Conversely, projects that do not exceed the project-specific thresholds are generally not considered to be cumulatively significant."*

Therefore, this analysis assumes that individual projects that do not generate operational or construction emissions that exceed the SCAQMD's recommended daily thresholds for project-

specific impacts would also not cause a cumulatively considerable increase in emissions for those pollutants for which SCAB is in nonattainment, and, therefore, would not be considered to have a significant, adverse air quality impact. Alternatively, individual project-related construction and operational emissions that exceed SCAQMD thresholds for project-specific impacts would be considered cumulatively considerable.

Construction Impacts

The Project-specific evaluation of emissions presented in the preceding analysis demonstrates that proposed Project construction-source air pollutant emissions would not result in exceedances of regional thresholds. Therefore, proposed Project construction-source emissions would be considered less than significant on a project-specific and cumulative basis.

Operational Impacts

The Project-specific evaluation of emissions presented in the preceding analysis demonstrates that proposed Project operational-source air pollutant emissions would not result in exceedances of regional thresholds. Therefore, the proposed Project operational-source emissions would be considered less than significant on a project-specific and cumulative basis.

AIR QUALITY IMPACTS – CONSISTENCY WITH THRESHOLD NO. 3

Would the expose sensitive receptors to substantial pollutant concentrations?

The potential impact of Project-generated air pollutant emissions at sensitive receptors has also been considered. Results of the LST analysis indicate that the Project will not exceed the SCAQMD localized significance thresholds during construction. Therefore, sensitive receptors would not be exposed to substantial pollutant concentrations during Project construction.

Additionally, the Project will not exceed the SCAQMD localized significance thresholds during operational activity. Therefore, sensitive receptors would not be exposed to substantial pollutant concentrations as the result of Project operations.

CO "HOT SPOT" ANALYSIS

As discussed below, the Project would not result in potentially adverse CO concentrations or "hot spots." Further, detailed modeling of Project-specific CO "hot spots" is not needed to reach this conclusion. An adverse CO concentration, known as a "hot spot", would occur if an exceedance of the state one-hour standard of 20 parts per million (ppm) or the eight-hour standard of 9 ppm were to occur.

It has long been recognized that CO hotspots are caused by vehicular emissions, primarily when idling at congested intersections. In response, vehicle emissions standards have become increasingly stringent in the last twenty years. Currently, the allowable CO emissions standard in California is a maximum of 3.4 grams/mile for passenger cars (there are requirements for certain vehicles that are more stringent). With the turnover of older vehicles, introduction of cleaner fuels, and implementation of increasingly sophisticated and efficient emissions control technologies, CO concentration in the SCAB is now designated as attainment. To establish a more accurate record of baseline CO concentrations affecting the SCAB, a CO "hot spot" analysis was conducted in 2003 for four busy intersections in Los Angeles at the peak morning and afternoon

time periods[4]. This "hot spot" analysis did not predict any exceedance of the 1-hour (20.0 ppm) or 8-hour (9.0 ppm) CO standards, as shown on Table 6.

TABLE 6: CO MODEL RESULTS

Intersection Location	CO Concentrations (ppm)		
	Morning 1-hour	Afternoon 1-hour	8-hour
Wilshire Boulevard/Veteran Avenue	4.6	3.5	3.7
Sunset Boulevard/Highland Avenue	4	4.5	3.5
La Cienega Boulevard/Century Boulevard	3.7	3.1	5.2
Long Beach Boulevard/Imperial Highway	3	3.1	8.4

Notes: Federal 1-hour standard is 35 ppm and the deferral 8-hour standard is 9.0 ppm.

Based on the SCAQMD's 2003 AQMP and the 1992 Federal Attainment Plan for Carbon Monoxide (1992 CO Plan), peak carbon monoxide concentrations in the SCAB were a result of unusual meteorological and topographical conditions and not a result of traffic volumes and congestion at a particular intersection. As evidence of this, for example, 8.4 ppm 8-hr CO concentration measured at the Long Beach Blvd. and Imperial Hwy. intersection (highest CO generating intersection within the "hot spot" analysis), only 0.7 ppm was attributable to the traffic volumes and congestion at this intersection; the remaining 7.7 ppm were due to the ambient air measurements at the time the 2003 AQMP was prepared (23). In contrast, an adverse CO concentration, known as a "hot spot", would occur if an exceedance of the state one-hour standard of 20 parts per million (ppm) or the eight-hour standard of 9 ppm were to occur.

Similar considerations are also employed by other Air Districts when evaluating potential CO concentration impacts. More specifically, the Bay Area Air Quality Management District (BAAQMD) concludes that under existing and future vehicle emission rates, a given project would have to increase traffic volumes at a single intersection by more than 44,000 vehicles per hour (vph)—or 24,000 vph where vertical and/or horizontal air does not mix—in order to generate a significant CO impact (24). Traffic volumes generating the CO concentrations for the "hot spot" analysis is shown on Table 7. The busiest intersection evaluated was at Wilshire Boulevard and Veteran Avenue, which had AM/PM traffic volumes of 8,062 vph and 7,719 vph respectively (25). The 2003 AQMP estimated that the 1-hour concentration for this intersection was 4.6 ppm; this indicates that, should the hourly traffic volume increase four times to 32,248 vehicles per hour, CO concentrations (4.6 ppm x 4 = 18.4 ppm) would still not likely exceed the most stringent 1-hour CO standard (20.0 ppm).

[4] The CO "hot spot" analysis conducted in 2003 is the most current study used for CO "hot spot" analysis in the SCAB.

TABLE 7: CO MODEL RESULTS

Intersection Location	Peak Traffic Volumes (vph)				
	Eastbound (AM/PM)	Westbound (AM/PM)	Southbound (AM/PM)	Northbound (AM/PM)	Total (AM/PM)
Wilshire Boulevard/Veteran Avenue	4,954/2,069	1,830/3,317	721/1,400	560/933	8,062/7,719
Sunset Boulevard/Highland Avenue	1,417/1,764	1,342/1,540	2,304/1,832	1,551/2,238	6,614/5,374
La Cienega Boulevard/Century Boulevard	2,540/2,243	1,890/2,728	1,384/2,029	821/1,674	6,634/8,674
Long Beach Boulevard/Imperial Highway	1,217/2,020	1,760/1,400	479/944	756/1,150	4,212/5,514

AIR QUALITY IMPACTS – CONSISTENCY WITH THRESHOLD NO. 4

Would the Project result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

The potential for the Project to generate objectionable odors has also been considered. Land uses generally associated with odor complaints include:

- Agricultural uses (livestock and farming)
- Wastewater treatment plants
- Food processing plants
- Chemical plants
- Composting operations
- Refineries
- Landfills
- Dairies
- Fiberglass molding facilities

The Project does not contain land uses typically associated with emitting objectionable odors. Potential odor sources associated with the proposed Project may result from construction equipment exhaust and the application of asphalt and architectural coatings during construction activities and the temporary storage of typical solid waste (refuse) associated with the proposed Project's (long-term operational) uses. Standard construction requirements would minimize odor impacts from construction. The construction odor emissions would be temporary, short-term, and intermittent in nature and would cease upon completion of the respective phase of construction and is thus considered less than significant. It is expected that Project-generated refuse would be stored in covered containers and removed at regular intervals in compliance with the solid waste regulations. The proposed Project would also be required to comply with SCAQMD Rule 402 to prevent occurrences of public nuisances. Therefore, odors associated with the proposed Project construction and operations would be less than significant and no mitigation is required (26).

PROJECT GHG ANALYSIS

CLIMATE CHANGE SETTING

Global climate change (GCC) is the change in average meteorological conditions on the earth with respect to temperature, precipitation, and storms. The majority of scientists believe that the climate shift taking place since the Industrial Revolution is occurring at a quicker rate and magnitude than in the past. Scientific evidence suggests that GCC is the result of increased concentrations of GHGs in the earth's atmosphere, including carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and fluorinated gases. The majority of scientists believe that this increased rate of climate change is the result of GHGs resulting from human activity and industrialization over the past 200 years.

An individual project like the proposed Project evaluated in this memo cannot generate enough GHG emissions to affect a discernible change in global climate. However, the proposed Project may participate in the potential for GCC by its incremental contribution of GHGs combined with the cumulative increase of all other sources of GHGs, which when taken together constitute potential influences on GCC. Because these changes may have serious environmental consequences, this memo will evaluate the potential for the proposed Project to have a significant effect upon the environment as a result of its potential contribution to the greenhouse effect.

GCC refers to the change in average meteorological conditions on the earth with respect to temperature, wind patterns, precipitation and storms. Global temperatures are regulated by naturally occurring atmospheric gases such as water vapor, CO_2, N_2O, CH_4, hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). These particular gases are important due to their residence time (duration they stay) in the atmosphere, which ranges from 10 years to more than 100 years. These gases allow solar radiation into the earth's atmosphere, but prevent radiative heat from escaping, thus warming the earth's atmosphere. GCC can occur naturally as it has in the past with the previous ice ages.

Gases that trap heat in the atmosphere are often referred to as GHGs. GHGs are released into the atmosphere by both natural and anthropogenic activity. Without the natural GHG effect, the earth's average temperature would be approximately 61 degrees Fahrenheit (°F) cooler than it is currently. The cumulative accumulation of these gases in the earth's atmosphere is considered to be the cause for the observed increase in the earth's temperature.

For the purposes of this analysis, emissions of CO_2, CH_4, and N_2O were evaluated because these gases are the primary contributors to GCC from development projects. Although there are other substances such as fluorinated gases that also contribute to GCC, these fluorinated gases were not evaluated as their sources are not well-defined and do not contain accepted emissions factors or methodology to accurately calculate these gases.

REGULATORY SETTING

Executive Order S-3-05

Former California Governor Arnold Schwarzenegger announced on June 1, 2005, through Executive Order S-3-05, the following reduction targets for GHG emissions:

- By 2010, reduce GHG emissions to 2000 levels.

- By 2020, reduce GHG emissions to 1990 levels.
- By 2050, reduce GHG emissions to 80% below 1990 levels.

The 2050 reduction goal represents what some scientists believe is necessary to reach levels that will stabilize the climate. The 2020 goal was established to be a mid-term target. Because this is an executive order, the goals are not legally enforceable for local governments or the private sector.

Assembly Bill (AB) 32

The California State Legislature enacted AB 32, which requires that GHGs emitted in California be reduced to 1990 levels by the year 2020. "GHGs" as defined under AB 32 include CO_2, CH_4, N_2O, hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). Since AB 32 was enacted, a seventh chemical, nitrogen trifluoride, has also been added to the list of GHGs. CARB is the state agency charged with monitoring and regulating sources of GHGs. Pursuant to AB 32, CARB adopted regulations to achieve the maximum technologically feasible and cost-effective GHG emission reductions. AB 32 states the following:

"Global warming poses a serious threat to the economic well-being, public health, natural resources, and the environment of California. The potential adverse impacts of global warming include the exacerbation of air quality problems, a reduction in the quality and supply of water to the state from the Sierra snowpack, a rise in sea levels resulting in the displacement of thousands of coastal businesses and residences, damage to marine ecosystems and the natural environment, and an increase in the incidences of infectious diseases, asthma, and other human health-related problems."

CARB approved the 1990 GHG emissions level of 427 million metric ton of CO_2 equivalent per year ($MMTCO_2e$) on December 6, 2007 (27). Therefore, emissions generated in California in 2020 are required to be equal to or less than 427 $MMTCO_2e$. Emissions in 2020 in a "business as usual" (BAU) scenario were estimated to be 596 $MMTCO_2e$, which do not account for reductions from AB 32 regulations (28). At that level, a 28.4% reduction was required to achieve the 427 $MMTCO_2e$ 1990 inventory. In October 2010, CARB prepared an updated BAU 2020 forecast to account for the recession and slower forecasted growth. The forecasted inventory without the benefits of adopted regulation is now estimated at 545 $MMTCO_2e$. Therefore, under the updated forecast, a 21.7% reduction from BAU is required to achieve 1990 levels (29).

Progress in Achieving AB 32 Targets and Remaining Reductions Required

The State has made steady progress in implementing AB 32 and achieving targets included in Executive Order S-3-05. The progress is shown in updated emission inventories prepared by CARB for 2000 through 2012 (30). The State has achieved the Executive Order S-3-05 target for 2010 of reducing GHG emissions to 2000 levels. As shown below, the 2010 emission inventory achieved this target.

- 1990: 427 $MMTCO_2e$ (AB 32 2020 target)
- 2000: 463 $MMTCO_2e$ (an average 8% reduction needed to achieve 1990 base)
- 2010: 450 $MMTCO_2e$ (an average 5% reduction needed to achieve 1990 base)

CARB has also made substantial progress in achieving its goal of achieving 1990 emissions levels by 2020. As described earlier in this section, CARB revised the 2020 BAU inventory forecast to account for new lower growth projections, which resulted in a new lower reduction from BAU to achieve the 1990 base. The previous reduction from 2020 BAU needed to achieve 1990 levels was 28.4% and the latest reduction from 2020 BAU is 21.7%.

- 2020: 545 $MMTCO_2e$ BAU (an average 21.7% reduction from BAU needed to achieve 1990 base)

Senate Bill (SB) 32

On September 8, 2016, Governor Jerry Brown signed the SB 32 and its companion bill, AB 197. SB 32 requires the state to reduce statewide GHG emissions to 40% below 1990 levels by 2030, a reduction target that was first introduced in Executive Order B-30-15. The new legislation builds upon the AB 32 goal of 1990 levels by 2020 and provides an intermediate goal to achieving S-3-05, which sets a statewide GHG reduction target of 80% below 1990 levels by 2050. AB 197 creates a legislative committee to oversee regulators to ensure that CARB not only responds to the Governor, but also the Legislature (31).

AB 197

A condition of approval for SB 32 was the passage of AB 197. AB 197 requires that CARB consider the social costs of GHG emissions and prioritize direct reductions in GHG emissions at mobile sources and large stationary sources. AB 197 also gives the California legislature more oversight over CARB through the addition of two legislatively appointed members to the CARB Board and the establishment a legislative committee to make recommendations about CARB programs to the legislature.

Executive Order B-55-18 and SB 100

Executive Order B-55-18 and SB 100. SB 100 and Executive Order B-55-18 were signed by Governor Brown on September 10, 2018. Under the existing RPS, 25% of retail sales are required to be from renewable sources by December 31, 2016, 33% by December 31, 2020, 40% by December 31, 2024, 45% by December 31, 2027, and 50% by December 31, 2030. SB 100 raises California's RPS requirement to 50% renewable resources target by December 31, 2026, and to achieve a 60% target by December 31, 2030. SB 100 also requires that retail sellers and local publicly owned electric utilities procure a minimum quantity of electricity products from eligible renewable energy resources so that the total kilowatt hours of those products sold to their retail end-use customers achieve 44% of retail sales by December 31, 2024, 52% by December 31, 2027, and 60% by December 31, 2030. In addition to targets under AB 32 and SB 32, Executive Order B-55-18 establishes a carbon neutrality goal for the state of California by 2045; and sets a goal to maintain net negative emissions thereafter. The Executive Order directs the California Natural Resources Agency (CNRA), California Environmental Protection Agency (CalEPA), the Department of Food and Agriculture (CDFA), and CARB to include sequestration targets in the Natural and Working Lands Climate Change Implementation Plan consistent with the carbon neutrality goal.

Title 24 California Code of Regulations (CCR)

California Code of Regulations (CCR) Title 24 Part 6: The California Energy Code was first adopted in 1978 in response to a legislative mandate to reduce California's energy consumption.

The standards are updated periodically to allow consideration and possible incorporation of new energy efficient technologies and methods. CCR, Title 24, Part 11: California Green Building Standards Code (CALGreen) is a comprehensive and uniform regulatory code for all residential, industrial, commercial, and school buildings that went in effect on August 1, 2009, and is administered by the California Building Standards Commission.

CALGreen is updated on a regular basis, with the most recent approved update consisting of the 2022 California Green Building Code Standards that was effective on January 1, 2023[5]. As construction of the Project is anticipated to be completed in 2025, the Project would be required to comply with the Title 24 standards in place at that time.

SCAQMD

SCAQMD is the agency responsible for air quality planning and regulation in the SCAB. The SCAQMD addresses the impacts to climate change of projects subject to SCAQMD permit as a lead agency if they are the only agency having discretionary approval for the project and acts as a responsible agency when a land use agency must also approve discretionary permits for the project. The SCAQMD acts as an expert commenting agency for impacts to air quality. This expertise carries over to GHG emissions, so the agency helps local land use agencies through the development of models and emission thresholds that can be used to address GHG emissions.

In 2008, SCAQMD formed a Working Group to identify GHG emissions thresholds for land use projects that could be used by local lead agencies in the SCAB. The Working Group developed several different options that are contained in the SCAQMD Draft Guidance Document – Interim CEQA GHG Significance Threshold, that could be applied by lead agencies. The working group has not provided additional guidance since release of the interim guidance in 2008. The SCAQMD Board has not approved the thresholds; however, the Guidance Document provides substantial evidence supporting the approaches to significance of GHG emissions that can be considered by the lead agency in adopting its own threshold. The current interim thresholds consist of the following tiered approach:

- Tier 1 consists of evaluating whether or not the project qualifies for any applicable exemption under CEQA.
- Tier 2 consists of determining whether the project is consistent with a GHG reduction plan. If a project is consistent with a qualifying local GHG reduction plan, it does not have significant GHG emissions.
- Tier 3 consists of screening values, which the lead agency can choose, but must be consistent with all projects within its jurisdiction. A project's construction emissions are averaged over 30 years and are added to the project's operational emissions. If a project's emissions are below one of the following screening thresholds, then the project is less than significant:
    - Residential and commercial land use: 3,000 metric ton of CO_2 equivalent ($MTCO_2e/yr$)

[5] The 2022 California Green Building Standard Code will be published July 1, 2022.

  - Industrial land use: 10,000 $MTCO_2e/yr$
  - Based on land use type: residential: 3,500 $MTCO_2e/yr$; commercial: 1,400 $MTCO_2e/yr$; or mixed use: 3,000 $MTCO_2e/yr$
- Tier 4 has the following options:
  - Option 1: Reduce Business-as-Usual (BAU) emissions by a certain percentage; this percentage is currently undefined.
  - Option 2: Early implementation of applicable AB 32 Scoping Plan measures
  - Option 3: 2020 target for service populations (SP), which includes residents and employees: 4.8 $MTCO_2e$ per SP per year for projects and 6.6 $MTCO_2e$ per SP per year for plans;
  - Option 3, 2035 target: 3.0 $MTCO_2e$ per SP per year for projects and 4.1 $MTCO_2e$ per SP per year for plans
- Tier 5 involves mitigation offsets to achieve target significance threshold.

The SCAQMD's interim thresholds used the Executive Order S-3-05-year 2050 goal as the basis for the Tier 3 screening level. Achieving the Executive Order's objective would contribute to worldwide efforts to cap CO_2 concentrations at 450 ppm, thus stabilizing global climate.

SCAQMD only has authority over GHG emissions from development projects that include air quality permits. At this time, it is unknown if the project would include stationary sources of emissions subject to SCAQMD permits. Notwithstanding, if the Project requires a stationary permit, it would be subject to the applicable SCAQMD regulations.

SCAQMD Regulation XXVII, adopted in 2009 includes the following rules:

- Rule 2700 defines terms and post global warming potentials.
- Rule 2701, Southern California (SoCal) Climate Solutions Exchange, establishes a voluntary program to encourage, quantify, and certify voluntary, high quality certified GHG emission reductions in the SCAQMD.
- Rule 2702, GHG Reduction Program created a program to produce GHG emission reductions within the SCAQMD. The SCAQMD will fund projects through contracts in response to requests for proposals or purchase reductions from other parties.

SCAQMD is the agency responsible for air quality planning and regulation in the SCAB. The SCAQMD addresses the impacts to climate change of projects subject to SCAQMD permit as a lead agency if they are the only agency having discretionary approval for the project and acts as a responsible agency when a land use agency must also approve discretionary permits for the project. The SCAQMD acts as an expert commenting agency for impacts to air quality. This expertise carries over to GHG emissions, so the agency helps local land use agencies through the development of models and emission thresholds that can be used to address GHG emissions.

City of Rialto Climate Adaptation Plan (Plan)

This Plan lays the groundwork to help prepare the City and its residents for the expected impacts of climate change, as required by State law. This Plan builds on the City's existing General Plan

Safety Element and Local Hazard Mitigation Plan to evaluate Rialto's vulnerabilities and capabilities and propose policy around four climate-related hazards: air pollution, extreme heat, wildfire, and flooding. These hazards were selected because they currently threaten the health and safety of Rialto residents and are the most likely to get worse as a result of climate change. This Plan pays particular attention to addressing the needs of those most vulnerable in the community. Specifically, the recommendations provided in this Plan focus on the communities that are already disproportionately exposed to these hazards and are the least able to respond to climate change due to their physiological conditions or socio- economic factors (32).

GHG IMPACTS

Standards of Significance

According to the CEQA Guidelines Appendix G thresholds, to determine whether impacts from GHG emissions are significant. Would the project:

- **Threshold 1**: Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment?
- **Threshold 2**: Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHGs?

The evaluation of an impact under CEQA requires measuring data from a project against both existing conditions and a "threshold of significance." For establishing significance thresholds, the Office of Planning and Research's amendments to the CEQA Guidelines Section 15064.7(c) state "[w]hen adopting thresholds of significance, a lead agency may consider thresholds of significance previously adopted or recommended by other public agencies, or recommended by experts, provided the decision of the lead agency to adopt such thresholds is supported by substantial evidence."

Discussion on Establishment of Significance Thresholds

Based on the foregoing guidance, the City of Rialto has elected to rely on compliance with a local air district threshold in the determination of significance of Project-related GHG emissions. Specifically, the City has selected the interim 3,000 $MTCO_2e$ per year threshold recommended by SCAQMD staff for residential and commercial sector projects against which to compare Project-related GHG emissions.

The 3,000 $MTCO_2e$ per year threshold is based on a 90 percent emission "capture" rate methodology. Prior to its use by the SCAQMD, the 90 percent emissions capture approach was one of the options suggested by the California Air Pollution Control Officers Association (CAPCOA) in their CEQA & Climate Change white paper (2008). A 90 percent emission capture rate means that unmitigated GHG emissions from the top 90 percent of all GHG-producing projects within a geographic area – the SCAB in this instance – would be subject to a detailed analysis of potential environmental impacts from GHG emissions, while the bottom 10 percent of all GHG-producing projects would be excluded from detailed analysis. A GHG significance threshold based on a 90 percent emission capture rate is appropriate to address the long-term adverse impacts associated with global climate change because medium and large projects will be required to implement measures to reduce GHG emissions, while small projects, which are generally infill development projects that are not the focus of the State's GHG reduction targets, are allowed to

proceed. Further, a 90 percent emission capture rate sets the emission threshold low enough to capture a substantial proportion of future development projects and demonstrate that cumulative emissions reductions are being achieved while setting the emission threshold high enough to exclude small projects that will, in aggregate, contribute approximate 1 percent of projected statewide GHG emissions in the Year 2050 (33).

In setting the threshold at 3,000 $MTCO_2e$ per year, SCAQMD researched a database of projects kept by the Governor's Office of Planning and Research (OPR). That database contained 798 projects, 87 of which were removed because they were very large projects and/or outliers that would skew emissions values too high, leaving 711 as the sample population to use in determining the 90th percentile capture rate. The SCAQMD analysis of the 711 projects within the sample population combined commercial, residential, and mixed-use projects. It should be noted that the sample of projects included warehouses and other light industrial land uses but did not include industrial processes (i.e., oil refineries, heavy manufacturing, electric generating stations, mining operations, etc.). Emissions from each of these projects were calculated by SCAQMD to provide a consistent method of emissions calculations across the sample population and from projects within the sample population. In calculating the emissions, the SCAQMD analysis determined that the 90th percentile ranged between 2,983 to 3,143 $MTCO_2e$ per year. The SCAQMD set their significance threshold at the low-end value of the range when rounded to the nearest hundred tons of emissions (i.e., 3,000 $MTCO_2e$ per year) to define small projects that are considered less than significant and do not need to provide further analysis.

The City understands that the 3,000 $MTCO_2e$ per year threshold for residential/commercial uses was proposed by SCAQMD a decade ago and was adopted as an interim policy; however, no permanent, superseding policy or threshold has since been adopted. The 3,000 $MTCO_2e$ per year threshold was developed and recommended by SCAQMD, an expert agency, based on substantial evidence as provided in the Draft Guidance Document – Interim CEQA Greenhouse Gas Significance Threshold (2008) document and subsequent Working Group meetings (latest of which occurred in 2010). SCAQMD has not withdrawn its support of the interim threshold and all documentation supporting the interim threshold remains on the SCAQMD website on a page that provides guidance to CEQA practitioners for air quality analysis (and where all SCAQMD significance thresholds for regional and local criteria pollutants and toxic air contaminants also are listed). Further, as stated by SCAQMD, this threshold "uses the Executive Order S-3-05 goal [80 percent below 1990 levels by 2050] as the basis for deriving the screening level" and, thus, remains valid for use in 2022 (33). Lastly, this threshold has been used for hundreds, if not thousands of GHG analyses performed for projects located within the SCAQMD jurisdiction.

Thus, for purposes of analysis in this analysis, if Project-related GHG emissions do not exceed the 3,000 $MTCO_2e$ per year threshold, then Project-related GHG emissions would clearly have a less-than-significant impact pursuant to Threshold GHG-1. On the other hand, if Project-related GHG emissions exceed 3,000 $MTCO_2e$ per year, the Project would be considered a substantial source of GHG emissions.

GHG IMPACTS – CONSISTENCY WITH THRESHOLD NO. 1

Would the Project have the potential to generate direct or indirect GHG emissions that would result in a significant impact on the environment?

PROJECT GHG EMISSIONS

The estimated GHG emissions for the Project land use are summarized on Table 8. The estimated GHG emissions include emissions from Carbon Dioxide (CO_2), Methane (CH_4), Nitrous Oxide (N_2O), and Refrigerants (R). As shown on Table 8, the Project would generate a total of approximately 102.03 $MTCO_2e$/yr. Detailed operation model outputs for the proposed Project are presented in Attachment A.

TABLE 8: TOTAL PROJECT GHG EMISSIONS

Source	Emission (lbs/day)				
	CO_2	CH_4	N_2O	R	Total CO_2e
Annual construction-related emissions amortized over 30 years	56.49	2.32E-03	5.71E-04	7.39E-03	56.72
Mobile Source	27.85	0.00	0.00	0.05	28.33
Energy Source	0.91	0.00	0.00	0.00	0.91
Water	15.65	0.00	0.00	0.00	15.75
Waste	0.09	0.01	0.00	0.00	0.32
Total CO_2e (All Sources)	**102.03**				

A numerical threshold for determining the significance of GHG emissions in the SCAB has not been established by the SCAQMD for Projects where it is not the lead agency. As an interim threshold based on guidance provided in the CAPCOA *CEQA and Climate Change* handbook, the City has opted to use a non-zero threshold approach based on Approach 2 of the handbook. Threshold 2.5 (Unit-Based Thresholds Based on Market Capture) establishes a numerical threshold based on capture of approximately 90% of emissions from future development. The latest threshold developed by SCAQMD using this method is 3,000 $MTCO_2e$/yr for all projects (34).

The Project would result in approximately 102.03 $MTCO_2e$/yr; the proposed Project would not exceed the SCAQMD's numeric threshold of 3,000 $MTCO_2e$/yr. Thus, the Project would result in a less than significant impact with respect to GHG emissions.

GHG IMPACTS – CONSISTENCY WITH THRESHOLD NO. 2

Would the Project have the potential to conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of GHGs?

Pursuant to 15604.4 of the CEQA Guidelines, a lead agency may rely on qualitative analysis or performance-based standards to determine the significance of impacts from GHG emissions (35).

The 2022 Scoping Plan for Achieving Carbon Neutrality (2022 Scoping Plan) lays out a path to achieve targets for carbon neutrality and reduce anthropogenic greenhouse gas (GHG) emissions

by 85 percent below 1990 levels no later than 2045, as directed by Assembly Bill 1279. The actions and outcomes in the plan will achieve significant reductions in fossil fuel combustion by deploying clean technologies and fuels, further reductions in short-lived climate pollutants, support for sustainable development, increased action on natural and working lands to reduce emissions and sequester carbon, and the capture and storage of carbon (36).

Finally, the Project is consistent with the general plan land use designation, density, building intensity, and applicable policies specified for the Project area in SCAG's Sustainable Community Strategy/Regional Transportation Plan, which pursuant to SB 375 calls for the integration of transportation, land-use and housing policies to plan for achievement of the GHG-emissions target for the region. Thus, a less than significant impact related to GHG emissions from Project construction and operation would occur and no mitigation is required.

CONSISTENCY WITH THE CITY'S CAP

The City of Rialto has prepared a Draft Climate Adaption Plan (37). The Climate Adaption Plan provides general guidance and policies that would "prepare the City and its residents for the expected impacts of climate change, as required by State law" (Climate Adaptation Plan, Introduction, n.p.).

The Project would comply with and would implement state and regional regulations and strategies that would minimize and control GHG emissions, and in this regard supports the City's Climate Adaptation Plan. The Project does not propose or require elements or operations that would obstruct or conflict with the Climate Adaptation Plan. Moreover, the analysis presented here substantiates that the Project would not have the potential to generate direct or indirect GHG emissions that would result in a significant impact on the environment.

CONCLUSION

Results of the assessment indicate that the Project is not anticipated to result in a significant impact during construction or operational activities associated with air quality and greenhouse gases.

REFERENCES

1. **South Coast Air Quality Management District.** Southern California Air Basins. [Online] https://www.arb.ca.gov/msprog/onroad/porttruck/maps/scabc7map.pdf.

2. **Ralph Propper, Patrick Wong, Son Bui, Jeff Austin, William Vance, Alvaro Alvarado, Bart Croes, and Dongmin Luo.** Ambient and Emission Trends of Toxic Air Contaminants in California. *American Chemical Society: Environmental Science & Technology.* 2015.

3. **United States Environmental Protection Agency.** National Ambient Air Quality Standards (NAAQS). [Online] 1990. https://www.epa.gov/environmental-topics/air-topics.

4. **Environmental Protection Agency.** Air Pollution and the Clean Air Act. [Online] http://www.epa.gov/air/caa/.

5. **1990 Clean Air Act Amendment Summary: Title I. [Online] https://www.epa.gov/clean-air-act-overview/1990-clean-air-act-amendment-summary-title-i.**

6. **United States Environmental Protection Agency. 1990 Clean Air Act Amendment Summary: Title II. [Online] https://www.epa.gov/clean-air-act-overview/1990-clean-air-act-amendment-summary-title-ii.**

7. **Air Resources Board. California Ambient Air Quality Standards (CAAQS). [Online] 2009. [Cited: April 16, 2018.] http://www.arb.ca.gov/research/aaqs/caaqs/caaqs.htm.**

8. **Environmental Protection Agency. National Ambient Air Quality Standards (NAAQS). [Online] 1990. https://www.epa.gov/environmental-topics/air-topics.**

9. **Southern California Association of Governments. 2016-2040 Regional Transportation Plan/Sustainable Communities Strategy. [Online] April 2016. http://scagrtpscs.net/Documents/2016/final/f2016RTPSCS.pdf.**

10. **South Coast Air Quality Management District. RULE 403. FUGITIVE DUST. [Online] https://www.aqmd.gov/docs/default-source/rule-book/rule-iv/rule-403.pdf?sfvrsn=4.**

11. **—. RULE 1113. Architectural Coatings. [Online] http://www.aqmd.gov/docs/default-source/rule-book/reg-xi/r1113.pdf.**

12. **California Air Pollution Control Officers Association (CAPCOA). California Emissions Estimator Model (CalEEMod). [Online] May 2022. www.caleemod.com.**

13. **State of California. *2020 CEQA California Environmental Quality Act.* 2020.**

14. **South Coast Air Quality Management District (SCAQMD). SCAQMD Air Quality Significance Thresholds. [Online] 2023. https://www.aqmd.gov/docs/default-source/ceqa/handbook/south-coast-aqmd-air-quality-significance-thresholds.pdf.**

15. **California Air Pollution Control Officers Association (CAPCOA). Appendix A: Calculation Details for CalEEMod. *CalEEMod.* [Online] http://www.aqmd.gov/docs/default-source/caleemod/02_appendix-a2016-3-2.pdf?sfvrsn=6.**

16. **State of California. *2020 CEQA California Environmental Quality Act.* 2020.**

17. South Coast Air Quality Management District. *Localized Significance Thresholds Methodology.* s.l. : South Coast Air Quality Managment District, 2003.

18. —. Final 2016 Air Quality Management Plan (AQMP). [Online] March 2017. http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2016-air-quality-management-plan/final-2016-aqmp/final2016aqmp.pdf?sfvrsn=11.

19. Southern California Association of Governments. 2020-2045 Regional Transportation Plan/Sustainable Communities Strategy. [Online] September 2020. https://scag.ca.gov/sites/main/files/file-attachments/0903fconnectsocal-plan_0.pdf?1606001176.

20. South Coast Air Quality Management District. *CEQA Air Quality Handbook (1993).* 1993.

21. City of Rialto. Agua Mansa Specific Plan. [Online] 1986. chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.yourrialto.com/DocumentCenter/View/563/Agua-Mansa-Specific-Plan.

22. Goss, Tracy A and Kroeger, Amy. White Paper on Potential Control Strategies to Address Cumulative Impacts from Air Pollution. [Online] South Coast Air Quality Management District, 2003. http://www.aqmd.gov/rules/ciwg/final_white_paper.pdf.

23. South Coast Air Quality Management District. 2003 Air Quality Management Plan. [Online] 2003. https://www.aqmd.gov/home/air-quality/clean-air-plans/air-quality-mgt-plan/2003-aqmp.

24. Bay Area Air Quality Management District. [Online] http://www.baaqmd.gov/.

25. South Coast Air Quality Management District. 2003 Air Quality Management Plan. [Online] 2003. https://www.aqmd.gov/home/air-quality/clean-air-plans/air-quality-mgt-plan/2003-aqmp.

26. —. RULE 402 NUISANCE. [Online] http://www.aqmd.gov/docs/default-source/rule-book/rule-iv/rule-402.pdf.

27. California Air Resources Board. GHG 1990 Emissions Level & 2020 Limit. *California Air Resources Board.* [Online] https://ww2.arb.ca.gov/ghg-2020-limit.

28. —. *Climate Change Draft Scoping Plan.* 2008.

29. —. STATUS OF SCOPING PLAN RECOMMENDED MEASURES. [Online] [Cited: September 19, 2019.] https://ww3.arb.ca.gov/cc/scopingplan/status_of_scoping_plan_measures.pdf.

30. —. *First Update to the Climate Change Scoping Plan.* 2014.

31. California Legislative Information. Senate Bill No. 32. [Online] September 8, 2016. https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201520160SB32.

32. City of Rialto. Climate Adaptation Plan. [Online] 2021. https://www.yourrialto.com/DocumentCenter/View/2248/Final-Rialto-Climate-Adaptation-Plan.

33. South Coast Air Quality Management District. *Interim CEQA GHG Significnace Threshold for Stationary Sources, Rules and Plans.* Diamond Bar : s.n., 2008.

34. —. Interim CEQA GHG Threshold for Stationary Sources, Rules and Plans. [Online] December 5, 2008. http://www.aqmd.gov/docs/default-source/ceqa/handbook/greenhouse-gases-(ghg)-ceqa-significance-thresholds/ghgboardsynopsis.pdf.

35. Association of Environmental Professionals. *2018 CEQA California Environmental Quality Act.* 2018.

36. California Air Resources Board. 2022 Scopuing Plan Documents. [Online] https://ww2.arb.ca.gov/our-work/programs/ab-32-climate-change-scoping-plan/2022-scoping-plan-documents.

37. Dudek. *City of Rialto Climate Adaption Plan.* Rialto : s.n., 2021.

ATTACHMENT A
CALEEMOD PROPOSED EMISSIONS MODEL OUTPUTS

14941-Lake Rialto Detailed Report

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Data Field	Value
Project Name	14941-Lake Rialto
Construction Start Date	7/3/2023
Operational Year	2025
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	2.20
Precipitation (days)	14.2
Location	34.051329, -117.361129
County	San Bernardino-South Coast
City	Rialto
Air District	South Coast AQMD
Air Basin	South Coast
TAZ	5343
EDFZ	10
Electric Utility	Southern California Edison
Gas Utility	Southern California Gas
App Version	2022.1.1.13

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description

City Park	12.0	Acre	12.0	0.00	522,721	522,721	—	—
Parking Lot	11.0	Space	0.15	0.00	0.00	—	—	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

No measures selected

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	7.58	6.38	54.9	56.1	0.10	2.53	5.89	8.42	2.33	2.74	5.07	—	11,378	11,378	0.46	0.12	3.45	11,427
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	7.96	6.70	58.9	56.6	0.10	2.72	5.89	8.42	2.50	2.74	5.07	—	11,324	11,324	0.47	0.12	0.10	11,370
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	5.08	4.27	36.9	37.1	0.07	1.67	2.30	3.96	1.53	0.77	2.31	—	7,598	7,598	0.31	0.08	1.01	7,630
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.93	0.78	6.73	6.77	0.01	0.30	0.42	0.72	0.28	0.14	0.42	—	1,258	1,258	0.05	0.01	0.17	1,263

2.2. Construction Emissions by Year, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2023	5.94	5.00	47.1	39.6	0.05	2.53	5.89	8.42	2.33	2.74	5.07	—	5,787	5,787	0.23	0.05	1.10	5,810
2024	7.58	6.38	54.9	56.1	0.10	2.48	3.45	5.93	2.28	1.16	3.45	—	11,378	11,378	0.46	0.12	3.45	11,427
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2023	7.96	6.70	58.9	56.6	0.10	2.72	5.89	8.42	2.50	2.74	5.07	—	11,324	11,324	0.47	0.12	0.10	11,370
2024	7.57	6.37	54.9	54.9	0.10	2.48	3.45	5.93	2.28	1.16	3.45	—	11,306	11,306	0.46	0.12	0.09	11,352
2025	1.02	0.88	7.53	10.9	0.01	0.35	0.20	0.54	0.32	0.05	0.37	—	1,705	1,705	0.07	0.02	0.02	1,713
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2023	2.12	1.79	16.2	14.7	0.02	0.80	1.40	2.20	0.73	0.58	1.32	—	2,634	2,634	0.11	0.03	0.33	2,645
2024	5.08	4.27	36.9	37.1	0.07	1.67	2.30	3.96	1.53	0.77	2.31	—	7,598	7,598	0.31	0.08	1.01	7,630
2025	< 0.005	< 0.005	0.01	0.02	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	3.34	3.34	< 0.005	< 0.005	< 0.005	3.36
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2023	0.39	0.33	2.95	2.68	< 0.005	0.15	0.26	0.40	0.13	0.11	0.24	—	436	436	0.02	< 0.005	0.05	438
2024	0.93	0.78	6.73	6.77	0.01	0.30	0.42	0.72	0.28	0.14	0.42	—	1,258	1,258	0.05	0.01	0.17	1,263
2025	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.55	0.55	< 0.005	< 0.005	< 0.005	0.56

2.4. Operations Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.13	0.42	0.14	1.32	< 0.005	< 0.005	0.11	0.11	< 0.005	0.02	0.02	0.56	439	439	0.08	0.02	1.27	447

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.12	0.41	0.15	1.08	< 0.005	< 0.005	0.11	0.11	< 0.005	0.02	0.02	0.56	417	418	0.08	0.02	0.03	424
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.06	0.36	0.08	0.59	< 0.005	< 0.005	0.06	0.06	< 0.005	0.01	0.01	0.56	268	269	0.07	0.01	0.29	274
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.01	0.06	0.01	0.11	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	0.09	44.4	44.5	0.01	< 0.005	0.05	45.3

2.5. Operations Emissions by Sector, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.13	0.12	0.14	1.32	< 0.005	< 0.005	0.11	0.11	< 0.005	0.02	0.02	—	338	338	0.01	0.01	1.27	344
Area	0.00	0.30	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Energy	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	5.47	5.47	< 0.005	< 0.005	—	5.50
Water	—	—	—	—	—	—	—	—	—	—	—	0.00	94.6	94.6	0.01	< 0.005	—	95.1
Waste	—	—	—	—	—	—	—	—	—	—	—	0.56	0.00	0.56	0.06	0.00	—	1.95
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00
Total	0.13	0.42	0.14	1.32	< 0.005	< 0.005	0.11	0.11	< 0.005	0.02	0.02	0.56	439	439	0.08	0.02	1.27	447
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.12	0.11	0.15	1.08	< 0.005	< 0.005	0.11	0.11	< 0.005	0.02	0.02	—	317	317	0.01	0.02	0.03	322
Area	—	0.30	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Energy	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	5.47	5.47	< 0.005	< 0.005	—	5.50
Water	—	—	—	—	—	—	—	—	—	—	—	0.00	94.6	94.6	0.01	< 0.005	—	95.1
Waste	—	—	—	—	—	—	—	—	—	—	—	0.56	0.00	0.56	0.06	0.00	—	1.95
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00
Total	0.12	0.41	0.15	1.08	< 0.005	< 0.005	0.11	0.11	< 0.005	0.02	0.02	0.56	417	418	0.08	0.02	0.03	424
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.06	0.06	0.08	0.59	< 0.005	< 0.005	0.06	0.06	< 0.005	0.01	0.01	—	168	168	0.01	0.01	0.29	171
Area	0.00	0.30	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Energy	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	5.47	5.47	< 0.005	< 0.005	—	5.50
Water	—	—	—	—	—	—	—	—	—	—	—	0.00	94.6	94.6	0.01	< 0.005	—	95.1
Waste	—	—	—	—	—	—	—	—	—	—	—	0.56	0.00	0.56	0.06	0.00	—	1.95
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00
Total	0.06	0.36	0.08	0.59	< 0.005	< 0.005	0.06	0.06	< 0.005	0.01	0.01	0.56	268	269	0.07	0.01	0.29	274
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.01	0.01	0.01	0.11	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	27.9	27.9	< 0.005	< 0.005	0.05	28.3
Area	0.00	0.05	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Energy	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.91	0.91	< 0.005	< 0.005	—	0.91
Water	—	—	—	—	—	—	—	—	—	—	—	0.00	15.7	15.7	< 0.005	< 0.005	—	15.7
Waste	—	—	—	—	—	—	—	—	—	—	—	0.09	0.00	0.09	0.01	0.00	—	0.32
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00
Total	0.01	0.06	0.01	0.11	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	0.09	44.4	44.5	0.01	< 0.005	0.05	45.3

3. Construction Emissions Details

3.1. Site Preparation (2023) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	5.83	4.90	47.0	38.0	0.05	2.53	—	2.53	2.33	—	2.33	—	5,530	5,530	0.22	0.04	—	5,549
Dust From Material Movement	—	—	—	—	—	—	5.66	5.66	—	2.69	2.69	—	—	—	—	—	—	—
Onsite truck	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	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	5.83	4.90	47.0	38.0	0.05	2.53	—	2.53	2.33	—	2.33	—	5,530	5,530	0.22	0.04	—	5,549
Dust From Material Movement	—	—	—	—	—	—	5.66	5.66	—	2.69	2.69	—	—	—	—	—	—	—
Onsite truck	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	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.85	0.71	6.83	5.52	0.01	0.37	—	0.37	0.34	—	0.34	—	803	803	0.03	0.01	—	806
Dust From Material Movement	—	—	—	—	—	—	0.82	0.82	—	0.39	0.39	—	—	—	—	—	—	—
Onsite truck	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.15	0.13	1.25	1.01	< 0.005	0.07	—	0.07	0.06	—	0.06	—	133	133	0.01	< 0.005	—	133
Dust From Material Movement	—	—	—	—	—	—	0.15	0.15	—	0.07	0.07	—	—	—	—	—	—	—
Onsite truck	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	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.11	0.10	0.09	1.62	0.00	0.00	0.23	0.23	0.00	0.05	0.05	—	257	257	0.01	0.01	1.10	261
Vendor	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	0.00
Hauling	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	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.10	0.09	0.11	1.22	0.00	0.00	0.23	0.23	0.00	0.05	0.05	—	236	236	0.01	0.01	0.03	238
Vendor	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	0.00
Hauling	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	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.02	0.19	0.00	0.00	0.03	0.03	0.00	0.01	0.01	—	34.7	34.7	< 0.005	< 0.005	0.07	35.2
Vendor	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	0.00
Hauling	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.03	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	5.74	5.74	< 0.005	< 0.005	0.01	5.82
Vendor	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	0.00
Hauling	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	0.00

3.3. Grading (2023) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	5.00	4.20	40.9	32.7	0.06	1.96	—	1.96	1.80	—	1.80	—	6,715	6,715	0.27	0.05	—	6,738
Dust From Material Movement	—	—	—	—	—	—	2.67	2.67	—	0.98	0.98	—	—	—	—	—	—	—
Onsite truck	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	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.79	0.67	6.49	5.18	0.01	0.31	—	0.31	0.29	—	0.29	—	1,064	1,064	0.04	0.01	—	1,068
Dust From Material Movement	—	—	—	—	—	—	0.42	0.42	—	0.16	0.16	—	—	—	—	—	—	—
Onsite truck	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.14	0.12	1.18	0.95	< 0.005	0.06	—	0.06	0.05	—	0.05	—	176	176	0.01	< 0.005	—	177

Dust From Material Movement	—	—	—	—	—	—	0.08	0.08	—	0.03	0.03	—	—	—	—	—	—	—
Onsite truck	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	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.11	0.10	0.12	1.39	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	269	269	0.01	0.01	0.03	273
Vendor	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	0.00
Hauling	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	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.02	0.23	0.00	0.00	0.04	0.04	0.00	0.01	0.01	—	43.3	43.3	< 0.005	< 0.005	0.09	43.9
Vendor	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	0.00
Hauling	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	7.17	7.17	< 0.005	< 0.005	0.01	7.27
Vendor	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	0.00
Hauling	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	0.00

3.5. Grading (2024) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	4.69	3.94	37.6	31.4	0.06	1.77	—	1.77	1.63	—	1.63	—	6,715	6,715	0.27	0.05	—	6,738
Dust From Material Movement	—	—	—	—	—	—	2.67	2.67	—	0.98	0.98	—	—	—	—	—	—	—
Onsite truck	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	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	4.69	3.94	37.6	31.4	0.06	1.77	—	1.77	1.63	—	1.63	—	6,715	6,715	0.27	0.05	—	6,738
Dust From Material Movement	—	—	—	—	—	—	2.67	2.67	—	0.98	0.98	—	—	—	—	—	—	—
Onsite truck	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	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.11	2.61	24.9	20.8	0.04	1.18	—	1.18	1.08	—	1.08	—	4,455	4,455	0.18	0.04	—	4,470
Dust From Material Movement	—	—	—	—	—	—	1.77	1.77	—	0.65	0.65	—	—	—	—	—	—	—
Onsite truck	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.57	0.48	4.55	3.80	0.01	0.21	—	0.21	0.20	—	0.20	—	738	738	0.03	0.01	—	740

Dust From Material Movement	—	—	—	—	—	—	0.32	0.32	—	0.12	0.12	—	—	—	—	—	—	—
Onsite truck	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	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.11	0.10	0.10	1.69	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	288	288	0.01	0.01	1.15	292
Vendor	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	0.00
Hauling	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	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.11	0.10	0.11	1.28	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	264	264	0.01	0.01	0.03	267
Vendor	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	0.00
Hauling	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	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.06	0.08	0.89	0.00	0.00	0.17	0.17	0.00	0.04	0.04	—	178	178	0.01	0.01	0.33	180
Vendor	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	0.00
Hauling	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.16	0.00	0.00	0.03	0.03	0.00	0.01	0.01	—	29.4	29.4	< 0.005	< 0.005	0.05	29.8
Vendor	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	0.00
Hauling	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	0.00

3.7. Paving (2024) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.01	0.85	7.81	10.0	0.01	0.39	—	0.39	0.36	—	0.36	—	1,512	1,512	0.06	0.01	—	1,517
Paving	—	0.02	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	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	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.05	0.04	0.41	0.53	< 0.005	0.02	—	0.02	0.02	—	0.02	—	79.9	79.9	< 0.005	< 0.005	—	80.1
Paving	—	< 0.005	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.08	0.10	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	13.2	13.2	< 0.005	< 0.005	—	13.3
Paving	—	< 0.005	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	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	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08	0.07	0.09	0.96	0.00	0.00	0.20	0.20	0.00	0.05	0.05	—	198	198	0.01	0.01	0.02	200
Vendor	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	0.00
Hauling	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	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.05	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	10.6	10.6	< 0.005	< 0.005	0.02	10.8
Vendor	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	0.00
Hauling	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.76	1.76	< 0.005	< 0.005	< 0.005	1.78
Vendor	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	0.00
Hauling	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	0.00

3.9. Paving (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.95	0.80	7.45	9.98	0.01	0.35	—	0.35	0.32	—	0.32	—	1,511	1,511	0.06	0.01	—	1,517
Paving	—	0.02	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Onsite truck	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	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.01	0.02	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	2.96	2.96	< 0.005	< 0.005	—	2.97
Paving	—	< 0.005	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.49	0.49	< 0.005	< 0.005	—	0.49
Paving	—	< 0.005	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	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	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.06	0.07	0.88	0.00	0.00	0.20	0.20	0.00	0.05	0.05	—	194	194	0.01	0.01	0.02	196
Vendor	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	0.00
Hauling	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	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.38	0.38	< 0.005	< 0.005	< 0.005	0.39
Vendor	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	0.00
Hauling	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.06	0.06	< 0.005	< 0.005	< 0.005	0.06

Vendor	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	0.00
Hauling	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	0.00

3.11. Trenching (2023) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	2.63	2.19	17.6	19.7	0.04	0.76	—	0.76	0.70	—	0.70	—	3,801	3,801	0.15	0.03	—	3,814
Onsite truck	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	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.42	0.35	2.80	3.12	0.01	0.12	—	0.12	0.11	—	0.11	—	602	602	0.02	< 0.005	—	605
Onsite truck	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.08	0.06	0.51	0.57	< 0.005	0.02	—	0.02	0.02	—	0.02	—	99.7	99.7	< 0.005	< 0.005	—	100
Onsite truck	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	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.23	0.21	0.25	2.78	0.00	0.00	0.52	0.52	0.00	0.12	0.12	—	538	538	0.03	0.02	0.07	545
Vendor	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	0.00
Hauling	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	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04	0.03	0.04	0.47	0.00	0.00	0.08	0.08	0.00	0.02	0.02	—	86.6	86.6	< 0.005	< 0.005	0.17	87.8
Vendor	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	0.00
Hauling	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.09	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	14.3	14.3	< 0.005	< 0.005	0.03	14.5
Vendor	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	0.00
Hauling	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	0.00

3.13. Trenching (2024) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	2.55	2.13	17.0	19.7	0.04	0.71	—	0.71	0.65	—	0.65	—	3,799	3,799	0.15	0.03	—	3,812
Onsite truck	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	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	2.55	2.13	17.0	19.7	0.04	0.71	—	0.71	0.65	—	0.65	—	3,799	3,799	0.15	0.03	—	3,812
Onsite truck	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	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.69	1.41	11.3	13.0	0.03	0.47	—	0.47	0.43	—	0.43	—	2,520	2,520	0.10	0.02	—	2,529
Onsite truck	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.31	0.26	2.06	2.38	< 0.005	0.09	—	0.09	0.08	—	0.08	—	417	417	0.02	< 0.005	—	419
Onsite truck	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	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.23	0.21	0.19	3.38	0.00	0.00	0.52	0.52	0.00	0.12	0.12	—	576	576	0.02	0.02	2.30	585
Vendor	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	0.00
Hauling	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	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.22	0.20	0.23	2.56	0.00	0.00	0.52	0.52	0.00	0.12	0.12	—	528	528	0.03	0.02	0.06	534
Vendor	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	0.00
Hauling	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	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.14	0.13	0.15	1.78	0.00	0.00	0.34	0.34	0.00	0.08	0.08	—	355	355	0.02	0.01	0.66	360
Vendor	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	0.00

Hauling	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.02	0.03	0.33	0.00	0.00	0.06	0.06	0.00	0.01	0.01	—	58.8	58.8	< 0.005	< 0.005	0.11	59.6
Vendor	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	0.00
Hauling	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	0.00

4. Operations Emissions Details

4.1. Mobile Emissions by Land Use

4.1.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	0.13	0.12	0.14	1.32	< 0.005	< 0.005	0.11	0.11	< 0.005	0.02	0.02	—	338	338	0.01	0.01	1.27	344
Parking Lot	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	0.00
Total	0.13	0.12	0.14	1.32	< 0.005	< 0.005	0.11	0.11	< 0.005	0.02	0.02	—	338	338	0.01	0.01	1.27	344
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	0.12	0.11	0.15	1.08	< 0.005	< 0.005	0.11	0.11	< 0.005	0.02	0.02	—	317	317	0.01	0.02	0.03	322
Parking Lot	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	0.00
Total	0.12	0.11	0.15	1.08	< 0.005	< 0.005	0.11	0.11	< 0.005	0.02	0.02	—	317	317	0.01	0.02	0.03	322
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	0.01	0.01	0.01	0.11	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	27.9	27.9	< 0.005	< 0.005	0.05	28.3

Parking Lot	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	0.00
Total	0.01	0.01	0.01	0.11	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	27.9	27.9	< 0.005	< 0.005	0.05	28.3

4.2. Energy

4.2.1. Electricity Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	—	5.47	5.47	< 0.005	< 0.005	—	5.50
Total	—	—	—	—	—	—	—	—	—	—	—	—	5.47	5.47	< 0.005	< 0.005	—	5.50
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	—	5.47	5.47	< 0.005	< 0.005	—	5.50
Total	—	—	—	—	—	—	—	—	—	—	—	—	5.47	5.47	< 0.005	< 0.005	—	5.50
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	—	0.91	0.91	< 0.005	< 0.005	—	0.91
Total	—	—	—	—	—	—	—	—	—	—	—	—	0.91	0.91	< 0.005	< 0.005	—	0.91

4.2.3. Natural Gas Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	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
Parking Lot	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
Total	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
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	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
Parking Lot	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
Total	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
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	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
Parking Lot	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
Total	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

4.3. Area Emissions by Source

4.3.2. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	—	0.30	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	< 0.005	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	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
Total	0.00	0.30	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	—	0.30	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	< 0.005	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	0.30	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	—	0.05	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	< 0.005	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	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
Total	0.00	0.05	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00

4.4. Water Emissions by Land Use

4.4.2. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	—	—	—	—	—	—	—	—	—	—	—	0.00	94.6	94.6	0.01	< 0.005	—	95.1
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	0.00	94.6	94.6	0.01	< 0.005	—	95.1
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	—	—	—	—	—	—	—	—	—	—	—	0.00	94.6	94.6	0.01	< 0.005	—	95.1
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	0.00	94.6	94.6	0.01	< 0.005	—	95.1
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	—	—	—	—	—	—	—	—	—	—	—	0.00	15.7	15.7	< 0.005	< 0.005	—	15.7
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	0.00	15.7	15.7	< 0.005	< 0.005	—	15.7

4.5. Waste Emissions by Land Use

4.5.2. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	—	—	—	—	—	—	—	—	—	—	—	0.56	0.00	0.56	0.06	0.00	—	1.95
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	0.56	0.00	0.56	0.06	0.00	—	1.95
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	—	—	—	—	—	—	—	—	—	—	—	0.56	0.00	0.56	0.06	0.00	—	1.95
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	0.56	0.00	0.56	0.06	0.00	—	1.95
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	—	—	—	—	—	—	—	—	—	—	—	0.09	0.00	0.09	0.01	0.00	—	0.32
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	0.09	0.00	0.09	0.01	0.00	—	0.32

4.6. Refrigerant Emissions by Land Use

4.6.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00

Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00

4.7. Offroad Emissions By Equipment Type

4.7.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.8. Stationary Emissions By Equipment Type

4.8.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.9. User Defined Emissions By Equipment Type

4.9.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase	Phase Description
Site Preparation	Site Preparation	7/31/2023	10/11/2023	5.00	53.0	—
Grading	Grading	10/12/2023	12/4/2024	5.00	300	—
Paving	Paving	12/5/2024	1/1/2025	5.00	20.0	—
Underground Utility Construction	Trenching	10/12/2023	12/4/2024	5.00	300	—

5.2. Off-Road Equipment

5.2.1. Unmitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Site Preparation	Rubber Tired Dozers	Diesel	Average	3.00	8.00	367	0.40
Site Preparation	Crawler Tractors	Diesel	Average	4.00	8.00	87.0	0.43

Grading	Excavators	Diesel	Average	2.00	8.00	36.0	0.38
Grading	Graders	Diesel	Average	1.00	8.00	148	0.41
Grading	Rubber Tired Dozers	Diesel	Average	1.00	8.00	367	0.40
Grading	Scrapers	Diesel	Average	2.00	8.00	423	0.48
Grading	Crawler Tractors	Diesel	Average	2.00	8.00	87.0	0.43
Paving	Pavers	Diesel	Average	2.00	8.00	81.0	0.42
Paving	Paving Equipment	Diesel	Average	2.00	8.00	89.0	0.36
Paving	Rollers	Diesel	Average	2.00	8.00	36.0	0.38
Underground Utility Construction	Excavators	Diesel	Average	1.00	8.00	36.0	0.38
Underground Utility Construction	Skid Steer Loaders	Diesel	Average	1.00	8.00	71.0	0.37
Underground Utility Construction	Tractors/Loaders/Backhoes	Diesel	Average	2.00	8.00	84.0	0.37
Underground Utility Construction	Forklifts	Diesel	Average	1.00	8.00	82.0	0.20
Underground Utility Construction	Plate Compactors	Diesel	Average	2.00	8.00	8.00	0.43
Underground Utility Construction	Pumps	Diesel	Average	2.00	8.00	11.0	0.74
Underground Utility Construction	Air Compressors	Diesel	Average	1.00	8.00	37.0	0.48
Underground Utility Construction	Off-Highway Trucks	Diesel	Average	1.00	8.00	376	0.38
Underground Utility Construction	Generator Sets	Diesel	Average	2.00	8.00	14.0	0.74
Underground Utility Construction	Concrete/Industrial Saws	Diesel	Average	1.00	8.00	33.0	0.73
Underground Utility Construction	Pavers	Diesel	Average	1.00	8.00	81.0	0.42
Underground Utility Construction	Sweepers/Scrubbers	Diesel	Average	1.00	8.00	36.0	0.46

5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Site Preparation	—	—	—	—
Site Preparation	Worker	17.5	18.5	LDA,LDT1,LDT2
Site Preparation	Vendor	—	10.2	HHDT,MHDT
Site Preparation	Hauling	0.00	20.0	HHDT
Site Preparation	Onsite truck	—	—	HHDT
Grading	—	—	—	—
Grading	Worker	20.0	18.5	LDA,LDT1,LDT2
Grading	Vendor	—	10.2	HHDT,MHDT
Grading	Hauling	0.00	20.0	HHDT
Grading	Onsite truck	—	—	HHDT
Paving	—	—	—	—
Paving	Worker	15.0	18.5	LDA,LDT1,LDT2
Paving	Vendor	—	10.2	HHDT,MHDT
Paving	Hauling	0.00	20.0	HHDT
Paving	Onsite truck	—	—	HHDT
Underground Utility Construction	—	—	—	—
Underground Utility Construction	Worker	40.0	18.5	LDA,LDT1,LDT2
Underground Utility Construction	Vendor	—	10.2	HHDT,MHDT
Underground Utility Construction	Hauling	0.00	20.0	HHDT
Underground Utility Construction	Onsite truck	—	—	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Non-applicable. No control strategies activated by user.

5.5. Architectural Coatings

Phase Name	Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (cy)	Material Exported (cy)	Acres Graded (acres)	Material Demolished (sq. ft.)	Acres Paved (acres)
Site Preparation	—	—	186	0.00	—
Grading	—	—	1,200	0.00	—
Paving	0.00	0.00	0.00	0.00	0.15

5.6.2. Construction Earthmoving Control Strategies

Control Strategies Applied	Frequency (per day)	PM10 Reduction	PM2.5 Reduction
Water Exposed Area	3	74%	74%

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt
City Park	0.00	0%
Parking Lot	0.15	100%

5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

Year	kWh per Year	CO2	CH4	N2O
2023	0.00	349	0.03	< 0.005
2024	0.00	349	0.03	< 0.005
2025	0.00	349	0.03	< 0.005

5.9. Operational Mobile Sources

5.9.1. Unmitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
City Park	9.36	23.5	26.3	5,037	142	358	399	76,562
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

5.10. Operational Area Sources

5.10.1. Hearths

5.10.1.1. Unmitigated

5.10.2. Architectural Coatings

Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
0	0.00	0.00	0.00	392

5.10.3. Landscape Equipment

Season	Unit	Value
Snow Days	day/yr	0.00
Summer Days	day/yr	250

5.11. Operational Energy Consumption

5.11.1. Unmitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
City Park	0.00	349	0.0330	0.0040	0.00
Parking Lot	5,724	349	0.0330	0.0040	0.00

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
City Park	0.00	18,654,311
Parking Lot	0.00	0.00

5.13. Operational Waste Generation

5.13.1. Unmitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
City Park	1.03	—
Parking Lot	0.00	—

5.14. Operational Refrigeration and Air Conditioning Equipment

5.14.1. Unmitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced

City Park	Other commercial A/C and heat pumps	User Defined	750	< 0.005	4.00	4.00	18.0
City Park	Stand-alone retail refrigerators and freezers	R-134a	1,430	0.04	1.00	0.00	1.00

5.15. Operational Off-Road Equipment

5.15.1. Unmitigated

Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor

5.16. Stationary Sources

5.16.1. Emergency Generators and Fire Pumps

Equipment Type	Fuel Type	Number per Day	Hours per Day	Hours per Year	Horsepower	Load Factor

5.16.2. Process Boilers

Equipment Type	Fuel Type	Number	Boiler Rating (MMBtu/hr)	Daily Heat Input (MMBtu/day)	Annual Heat Input (MMBtu/yr)

5.17. User Defined

Equipment Type	Fuel Type
—	—

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.2. Sequestration

5.18.2.1. Unmitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

Climate Hazard	Result for Project Location	Unit
Temperature and Extreme Heat	27.3	annual days of extreme heat
Extreme Precipitation	2.45	annual days with precipitation above 20 mm
Sea Level Rise	0.00	meters of inundation depth
Wildfire	0.00	annual hectares burned

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about ¾ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider different increments of sea level rise coupled with extreme storm events. Users may select from four model simulations to view the range in potential inundation depth for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 50 meters (m) by 50 m, or about 164 feet (ft) by 164 ft.

Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

6.2. Initial Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	3	0	0	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	1	0	0	N/A
Wildfire	1	0	0	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	0	0	0	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

6.3. Adjusted Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	3	1	1	3
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	1	1	1	2
Wildfire	1	1	1	2
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A

Air Quality Degradation	1	1	1	2

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Exposure Indicators	—
AQ-Ozone	97.6
AQ-PM	89.4
AQ-DPM	55.0
Drinking Water	96.5
Lead Risk Housing	45.8
Pesticides	0.00
Toxic Releases	66.0
Traffic	84.2
Effect Indicators	—
CleanUp Sites	96.0
Groundwater	98.5
Haz Waste Facilities/Generators	99.1
Impaired Water Bodies	12.5
Solid Waste	99.7

Sensitive Population	—
Asthma	78.5
Cardio-vascular	84.3
Low Birth Weights	75.6
Socioeconomic Factor Indicators	—
Education	85.9
Housing	28.2
Linguistic	69.8
Poverty	60.8
Unemployment	25.2

7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Economic	—
Above Poverty	21.01886308
Employed	36.37880149
Median HI	37.44385987
Education	—
Bachelor's or higher	18.61927371
High school enrollment	100
Preschool enrollment	54.67727448
Transportation	—
Auto Access	81.29090209
Active commuting	4.234569485
Social	—
2-parent households	37.46952393

Voting	27.79417426
Neighborhood	—
Alcohol availability	61.83754652
Park access	2.194276915
Retail density	20.45425382
Supermarket access	46.58026434
Tree canopy	6.582830746
Housing	—
Homeownership	77.71076607
Housing habitability	73.74566919
Low-inc homeowner severe housing cost burden	47.09354549
Low-inc renter severe housing cost burden	94.37957141
Uncrowded housing	14.98780957
Health Outcomes	—
Insured adults	9.367380983
Arthritis	38.0
Asthma ER Admissions	36.9
High Blood Pressure	68.0
Cancer (excluding skin)	68.9
Asthma	9.8
Coronary Heart Disease	43.7
Chronic Obstructive Pulmonary Disease	12.3
Diagnosed Diabetes	36.9
Life Expectancy at Birth	24.4
Cognitively Disabled	36.6
Physically Disabled	57.4
Heart Attack ER Admissions	36.4

Mental Health Not Good	13.8
Chronic Kidney Disease	45.1
Obesity	23.4
Pedestrian Injuries	80.3
Physical Health Not Good	19.5
Stroke	39.4
Health Risk Behaviors	—
Binge Drinking	36.9
Current Smoker	15.0
No Leisure Time for Physical Activity	31.5
Climate Change Exposures	—
Wildfire Risk	30.9
SLR Inundation Area	0.0
Children	48.8
Elderly	81.3
English Speaking	30.9
Foreign-born	66.5
Outdoor Workers	10.7
Climate Change Adaptive Capacity	—
Impervious Surface Cover	80.4
Traffic Density	83.0
Traffic Access	23.0
Other Indices	—
Hardship	81.5
Other Decision Support	—
2016 Voting	48.5

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	96.0
Healthy Places Index Score for Project Location (b)	25.0
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	Yes
Project Located in a Low-Income Community (Assembly Bill 1550)	Yes
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.
b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

7.4. Health & Equity Measures

No Health & Equity Measures selected.

7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

8. User Changes to Default Data

Screen	Justification
Land Use	Parking acreage taken from client provided site plan
Construction: Construction Phases	Construction information take from Project description Working days was assumed based on CalEEMod defaults and Project Description.
Construction: Off-Road Equipment	Equipment list for trenching uses similar Project size equipment. Water Truck modeled as Off-Highway Trucks
Operations: Refrigerants	Beginning 1 January 2025, all new air conditioning equipment may not use refrigerants with a GWP of 750 or greater.

Appendix B: Biological Resource Assessment

Biological Resource Assessment for the Rialto Habitat Nature Center Project

Prepared for:

Enplanners
P.O. Box 960
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Prepared by:

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December 2023

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Appendix A Representative Photographs of Community Classification

Appendix B Plant Species Recorded During the Field Surveys

Appendix C Special Status Plant Species Potential Occurrence Determination

Appendix D Special Status Wildlife Species Potential Occurrence Determination

Appendix E Delhi Sand Flower-Loving Fly Assessment

ACRONYMS, ABBREVIATIONS, AND GLOSSARY OF TERMS

BLM	United States Bureau of Land Management
BMPs	Best Management Practices
CAGN	coastal California gnatcatcher
CDF	California Department of Forestry and Fire Protection
CDFW	California Department of Fish and Wildlife
CESA	California Endangered Species Act
CEQA	California Environmental Quality Act
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
Corps	United States Army Corps of Engineers
CRPR	California Rare Plant Rank
CSLS	Carlson Strategic Land Solutions
CWA	Clean Water Act
FESA	Federal Endangered Species Act
FGC	California Fish and Game Code
FM	Facilities Management
GIS	Geographic Information System
GPS	Global Positioning System
HCP	Habitat Conservation Plan
MBTA	Migratory Bird Treaty Act
MCVII	The Manual of California Vegetation
MMRP	Mitigation, Monitoring, and Reporting Program
MSL	mean sea level
NEPA	National Environmental Protection Act
NHD	National Hydrography Dataset
NPDES	National Pollutant Discharge Elimination System
NPPA	Native Plant Protection Act
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
OHWM	Ordinary High-Water Mark
Project	Rialto Habitat Nature Center Project
RWQCB	Regional Water Quality Control Board

SAA	Section 1600 Streambed Alteration Agreement
SAR	Santa Ana River
SBVMWD	San Bernardino Valley Municipal Water District
SWPPP	Storm Water Pollution Prevention Plan
U.S.	United States
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WQC	Section 401 Water Quality Certification
WWTP	Waste Water Treatment Plant

1.0 Introduction

Carlson Strategic Land Solutions (CSLS) prepared this Biological Resource Assessment for Enplanners and the City of Rialto (City) for the Rialto Habitat Nature Center Project (Project) in the City of Rialto. The Biological Resource Assessment for the approximately 14-acre Rialto Habitat Nature Center site, the surrounding 300-feet, the 0.15-acre parking lot on Agua Mansa Road, and approximately 1,300-foot long pedestrian path between the parking lot and the Rialto Habitat Nature Center along an existing service road on the west side of a lined portion of Rialto Channel, collectively known as the "Study Area," incorporates the findings from a biological field survey and jurisdictional delineation conducted on January 27, 2023. A Delhi Sands Flower-loving Fly site visit was assessed on February 15, 2023.

1.1 Purpose and Approach

This report provides a summary of the conditions present during the January 27, 2023 field survey, which includes an assessment of the potential presence of sensitive biological resources, an analysis of the potential impacts to those resources due to Project implementation and proposed mitigation. A Delhi Sands Flower-loving Fly site visit was assessed on February 15, 2023. This assessment describes the current biological resources present within the Study Area including habitat communities, jurisdictional waters, and the potential occurrence of listed and special status plant and wildlife species. The potential biological significance of site construction and development in view of federal, state, and local laws and regulations are also identified in this report. The report also recommends, as appropriate, Best Management Practices (BMPs) and avoidance and minimization measures to reduce or avoid potential impacts. While general biological resources are discussed, the focus of this assessment is on those resources considered to be sensitive. This assessment was prepared based upon results of a literature review and field survey.

1.2 Project Terms

The following terms will be used throughout this document and are defined as follows:

- Project site: the approximately Rialto Habitat Nature Center site (14 acres) and proposed parking and pedestrian path.
- Study Area: the area evaluated during the field survey, including the approximately 14-acre Rialto Habitat Nature Center site and an approximate 300-foot buffer area surrounding the Project site.
- Project Vicinity: intended to be a general term to describe the broader area surrounding the Study Area.

1.3 Project Location

The Study Area is located in the City of Rialto on the southern 14 acres of the approximately 40-acre City-owned Rialto Water Treatment Plant, located at 501 East

Santa Ana Avenue, City of Rialto, San Bernardino County (Figures 1 and 2). The Project site is generally located northwest of the Santa Ana River, and south of Interstate 10 between South Riverside Avenue to the west and South Pepper Avenue (extended) to the east. The Study Area is located within the United States Geological Survey (USGS) 7.5-Minute Topographic Map *San Bernardino South* Quadrangle.
Access to the Project site is through the Rialto Water Treatment Plant located at 501 East Santa Ana Avenue.

1.4 Existing Conditions and Project History

The Project site consists of large, disturbed areas associated with the City's Wastewater Treatment Plant (WWTP) property. The approximately 14-acre Project site of the location for the proposed Rialto Habitat Nature Center is currently vacant and is predominantly covered by an abandoned, unused pit. An existing 36-inch drain pipe on the east side of the pit discharges treated effluent flow from the treatment plant directly into the Rialto Channel. The pit was formerly used as a receiving basin for partially treated discharge from the WWTP up to the early 1970's prior to implementation of federal Clean Water Act regulations that prohibited discharge of partially treated water onto the earth and water ways. The proposed parking location and pedestrian trail is disturbed. The parking area is 0.15 acres of land fronting the north side of Agua Mansa Road west of the bridge that crosses Rialto Channel and the pedestrian trail is used as the Rialto Channel access road.

Local biological agencies lead by the San Bernardino Valley Municipal Water District (SBVMWD) have issued a Draft Habitat Conservation Plan (Draft HCP) for the Upper Santa Ana River (SAR) watershed, which is a comprehensive program that would provide a framework to protect, enhance, and restore the habitat for Covered Species defined in the Draft HCP while streamlining permitting for Covered Activities.

Currently, the WWTP discharges 100 percent of its treated effluent flows (6.2 mgd or 9.6 cfs on average) into the concrete-lined Rialto Channel via a 36-inch diameter pipe.

2.0 Project Description

The City is proposing to construct the Project on an approximately 14-acre site consisting of the Habitat Nature Center, a public parking lot on Agua Mansa Road, and a pedestrian trail along the existing Rialto Channel service road to the Habitat Nature Center Project site. The Project proposes to be created by intercepting fully treated (primary, secondary, and tertiary) effluent from the WWTP that is currently discharged into the Rialto Channel and routing the effluent flow into an existing pit in the southern portion of the treatment plant property resulting in new wetland and terrestrial wildlife habitat, recreation, and water quality benefits. The Project proposes to create two lakes as shown on Figure 3.

Due to safety concerns preventing parking within the WWTP property, the City considered various parking locations for the Rialto Habitat Nature Center Project. The City determined parking would be located on the north side of Agua Mansa Road, east of 687 West Agua Mansa Road, and directly west of the Agua Mansa Road crossing of the Rialto Channel (Figure 2). The proposed parking is an approximately 0.15-acre vacant site, identified as APN 805-36-185. The parking is located approximately three-tenths of a mile to the south of the Rialto Habitat Nature Center site and is located in the City of Colton and within the San Bernardino County right-of-way. The path of travel between the lake and the parking area would be approximately 1,600 feet (0.3 mile).

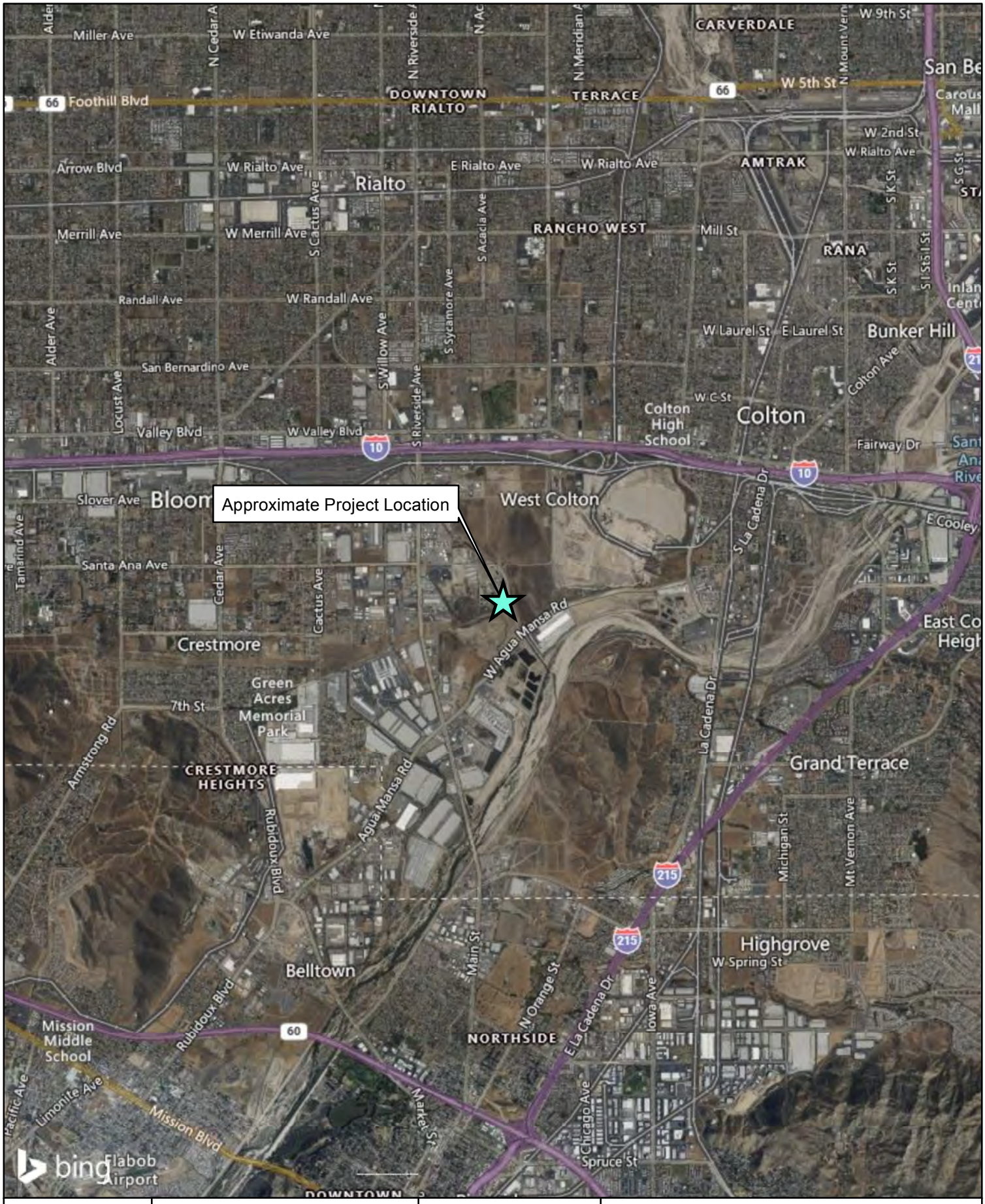
2.1.1 Project Design Details

The Project proposes to create two lakes separated by a pedestrian path running north-south. The lakes would be connected by duel 24-inch diameter pipes. A plastic liner would be installed on the bottom and sides of the lakes, and clay would be installed in the lake perimeter shallow areas and in the wetland area. The smaller, 3-acre west lake would have a depth of approximately 13 feet. The larger, 7-acre lake would have a depth of 48 feet and would include a maintenance access ramp to the bottom of the lake when emptied and a shallow marsh wetland area of 3 to 4 acres. For safety purposes, a shallow three-foot-deep and 13-foot-wide bench would be constructed along the perimeter edges of the lakes. The lake would receive fully treated and cleaned effluent once it has passed through the bio-filtration step, providing water temperature and nutrient management benefits. Once the Rialto Habitat Nature Center is created, it would connect to the existing discharge pipe that the discharges effluent flow to the Rialto Channel. The new connection back into the discharge pipe would occur on the Project site not within the Rialto Channel. The outfall structure within Rialto Channel would remain the same. In essence, the lake would temporarily use approximately 10 percent the treated effluent prior to its return into the Rialto Channel.

In addition, and as described previously, the proposed Project would include development of an 11-space parking lot, which would provide adequate parking and a pedestrian pathway connection to the Project site. A pedestrian pathway between the parking lot and Rialto Habitat Nature Center would occur on the existing utility road along the west side of Rialto Channel.

2.1.2 Recreation Plan

The Project proposes to create recreational facilities within the City by providing active and passive recreational opportunities in the form of a trail around the two lakes. Active recreation opportunities include hiking trails and passive recreation opportunities include vista and wildlife viewing locations with signage. No lighting is planned on the trail system around the lakes. The slopes are proposed at 2:1.



GIS Prepared By:
Carlson SLS

Created: April 19, 2023

0 1,250 2,500 5,000 7,500 Feet

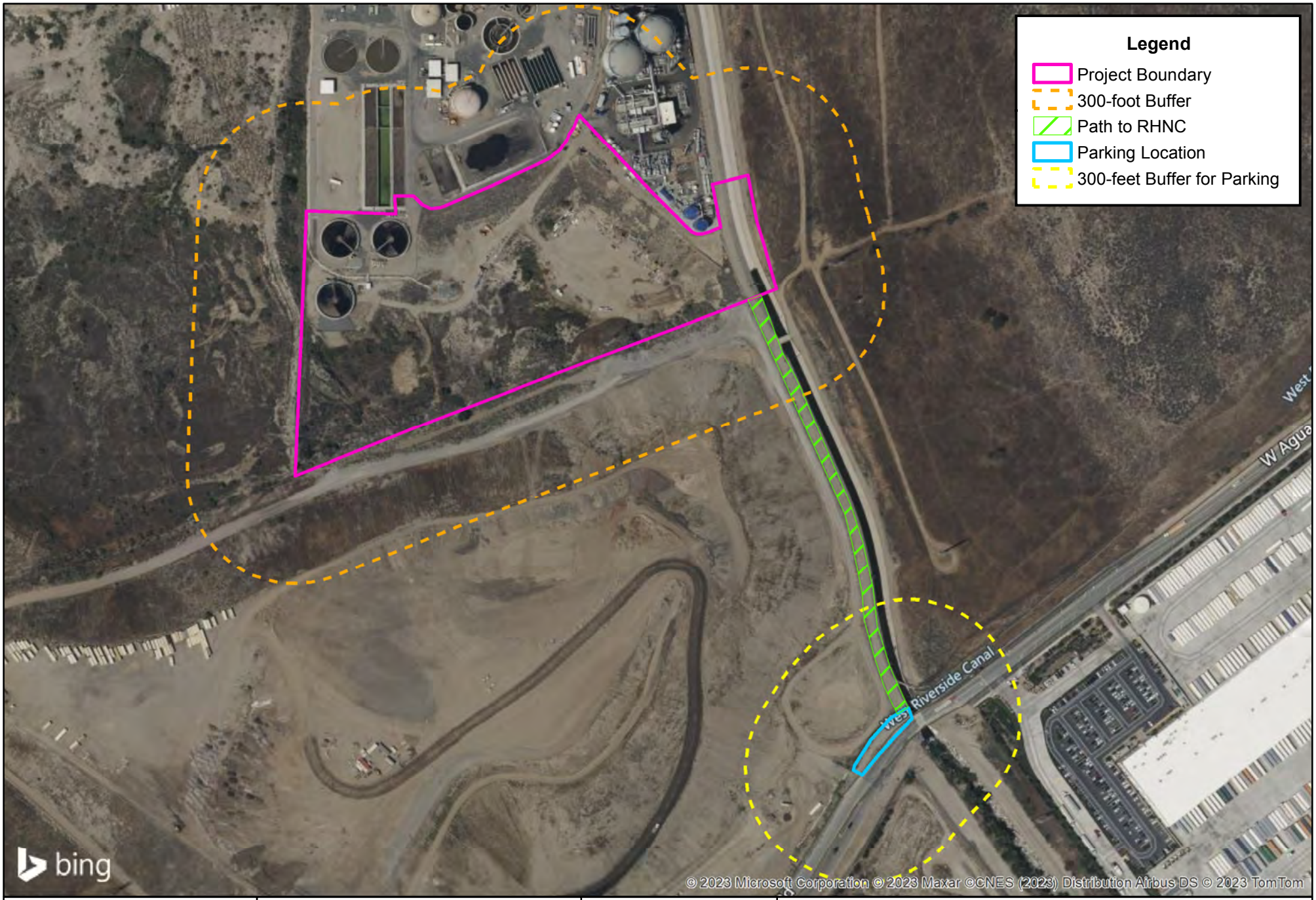
1 inch = 5,000 feet

Data Source: Bing Maps

Rialto Habitat Nature Center Project

Regional Location Map

FIGURE 1



GIS Prepared By:
Carlson SLS

Created: January 23, 2023

0 87.5 175 350 525 700 Feet

1 inch = 350 feet

Data Sources: Bing Maps

Rialto Habitat Nature Center Project

Project Location Map

FIGURE 2

CONSTRUCTION NOTES:

1. PEDESTRIAN WALKWAY PAVEMENT PER DETAIL 1 ON SHEET 3
2. DISCHARGE STRUCTURE PER DETAIL 2 ON SHEET 3
3. BENCH LINER PER DETAIL 3 ON SHEET 2
4. SLOPE LINER PER DETAIL 3 ON SHEET 2
5. OUTLET WATER CONTROL VALVE AND LAKE DRAIN PER DETAIL 5 ON SHEET 3
6. INLET CONTROL STRUCTURE PER DETAIL 6 ON SHEET 3
7. CONSTRUCT 4" PVC PIPE PER DETAIL 7 ON SHEET 2
8. CONSTRUCT DOWNDRAIN PER DETAIL 8 ON SHEET 2
9. CONSTRUCT 1' WIDE V-DITCH PER DETAIL 9 ON SHEET 2
10. CONSTRUCT INTERCEPTOR V-DITCH PER DETIAL 10 ON SHEET 2
11. CONSTRUCT SPLASH WALL PER DETAIL 11 ON SHEET 2
31. 12" CMP RISER PER DETAIL 31 ON SHEET 2
32. 12" PVC SCHEDULE 40 SD DRAIN LINE PER CITY STD. PLAN

GRAPHIC SCALE

10' 0 5' 10' 20' 40'

(IN FEET)
1 inch = 10' ft.

Figure 3

DRAFT

NO.	DATE	REVISIONS

DESIGNED BY:
DRAFTED BY:
CHECKED BY:
DATE:

WILSON MIKAMI CORPORATION
9 CORPORATE PARK, SUITE 100, IRVINE, CA 92606
T: 949-679-0090 | F: 949-679-0091

LAKE RIALTO
GRADING PLAN
GRADING AND IMPROVEMENT PLAN

PROJECT NO. 10392.00
SHEET 4 OF 10

S:\10392.00\dwg\PRRG0101-9.dwg

2.1.3 Construction

Construction of the proposed lakes, parking, and pedestrian pathway is anticipated to take place over 18 months. Construction of the lakes would consist of site preparation, grading, underground utility construction, and landscaping. Site preparation would consist of vegetation removal and removal of any onsite trash and debris. Grading for the Project would consist of any removals of unsuitable soils to be used for non-compaction required locations. Excavation for the lakes would begin at the eastern most portion of the lake. In addition, grading of the eastern portion of the lake would construct two to one (2:1) slope embankments built up to the west for the proposed wetlands area and include a west to east access ramp to the bottom. Excavation of the western most portion of the lake would consist of a maximum 15 feet cut and fills to achieve appropriate depth and to construct 2:1 slopes embankments with bench surrounding proposed island in the middle. Grading would also include construction of a proposed pedestrian access (trail) which partitions the lake with 2:1 slope embankments and a culvert connecting the flow between the east and west lakes. Once grading and underground utilities are complete, finish grading would commence to construct the trails, slopes, and landscape areas. The lake and its embankments would be lined with a geomembrane to retain lake water and erosion control and landscaping would be planted around the lake. Once final construction activities have completed, 10 percent of the existing flows into the Rialto Channel would commence to fill the lake to a full capacity at an elevation of 905 above mean sea level (MSL).

Construction of the parking lot would consist of site preparation, grading, and paving. Site preparation would consist of minor clearing of non-native weeds and grass, and removal of any onsite trash and debris. Grading would consist of minor cuts and proper compact to an asphalt concrete (AC) paved parking lot with driveway. The existing pathway connecting users to Rialto Habitat Nature Center would require minor site preparation consisting of brush clearing and tread improvement for drainage and loose rock removal.

2.1.4 Project Operation and Maintenance

Although the Waste Water Treatment Plant has no contractual responsibility to deliver effluent flows into the Rialto Channel, it is required to protect the downstream habitat of two listed species in accordance with the California Endangered Species Act (CESA) and the federal Endangered Species Acts (FESA). The City is working with San Bernardino Valley Municipal Water District to assist in the coordination of the flows to support the habitat of the two listed species (Santa Ana Sucker and Arroyo Chub) within the downstream natural bottom portion of Rialto Channel and the Santa Ana River. As a result, the WWTP currently discharges a minimum of 7 cubic feet per second (cfs) of

treated water into the channel to maintain suitable habitat for these species within the downstream natural bottom portion of Rialto Channel and the Santa Ana River.

As designed, the proposed Project would continue the direct delivery of approximately 90 percent of existing effluent flows into the Rialto Channel to maintain the CESA and FESA minimum requirement. The remaining 10 percent of effluent flows would be temporarily diverted into the lake to maintain the lake's full capacity and ultimately conveyed through the same existing outlet into the Rialto Channel. It should be noted that the City has the ability and capacity to choose not to divert any water into the lakes post construction effectively concluding the existence of the lakes. Reasons for not diverting the water could be cost of maintenance and repairs to the lakes or overall operations of the lakes. The Rialto Habitat Nature Center Project is fully autonomous to the overall system, and should budget decline in the City, the City has the authorization to stop any diverting water into the lake and return to pre-project conditions.

2.1.4.1 Rialto Habitat Nature Center

Operation of Rialto Habitat Nature Center would generally occur Monday through Sunday during daylight hours (dawn to dusk). Daily securing of the site and monthly hardscape maintenance would be provided by the City's Facilities and Maintenance Department. In addition, if necessary, maintenance of kiosks, restrooms and other land-based amenities would consist of inspection and monitoring on a daily basis. Daily trash removal, routine cleaning, and grounds clean up, and monthly landscaping would be provided by the City's Community Services Department. Maintenance of the lake would consist of monthly inspections and if necessary, removal of settled solids, algae, invasive plants or contaminants by vacuum truck.

2.1.4.2 Rialto Habitat Nature Center Amenities

Residents and other guests would access the lake for recreational use and educational programs. The Rialto Habitat Nature Center amenities would include parking and bus access on Agua Mansa Road. In addition, the 1 mile of pedestrian perimeter trails would include the following amenities for guests:

1. Resting Areas: The Project would include casual seating (boulders, stumps etc.) to allow for a quick stop along a path, as well as benches or similar seating to allow for longer duration resting or observation.
2. Observation Areas: The design includes areas to connect people to nature without trampling or disturbing the habitat. Themed informational signage would be provided throughout for guest guidance and enhanced experience.

Signage with consistent icons, and symbology would begin at the site entrance and continue throughout all the Project areas.

3. Waste Management: Wildlife-proof waste collection stations would be placed at key locations (park entrance, gathering spaces, observation locations) for users to dispose of trash in bins and minimize trash ending up on the ground.
4. Irrigation: The Project would use treated dry-weather flow water and stormwater for planting irrigation. Supplemental irrigation would likely be required during the anticipated two-year plant and habitat establishment period.
5. Habitat Features: Habitat structures features would primarily consist of small, protected spaces made of natural materials (rock) to create habitat spaces for small native mammals, reptiles, birds, and native bees. Habitat structures would be designed and located within the riparian, transitional, and upland zones to encourage and promote native fauna occupying the site.
6. Hardscape Design: ADA compliant pedestrian access would be incorporated into the Project design. Of the 11 paved on-site parking spaces, appropriate ADA parking spaces would be provided. The 1 mile of pedestrian trail would be comprised of decomposed granite with a binder to prevent wind erosion.

3.0 Regulatory Context

The following is a list of the key local, state, and federal laws and regulations that apply to protecting plant communities, plants, wildlife, and water quality from project impacts relevant to the Project.

3.1 Federal Laws and Regulations

3.1.1 Federal Endangered Species Act (FESA)

The Federal Endangered Species Act (FESA) of 1973 defines an endangered species as "any species which is in danger of extinction throughout all or a significant portion of its range." A threatened species is defined as "any species which is likely to become an Endangered species within the foreseeable future throughout all or a significant portion of its range." Under provisions of Section 9(a)(1)(B) of the FESA, unless properly permitted, it is unlawful to "take" any listed species. "Take" is defined in Section 3(18) of FESA: "...harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." Further, the US Fish and Wildlife Service (USFWS), through regulation, has interpreted the terms "harm" and "harass" to include certain types of habitat modification as forms of "take." These interpretations, however, are generally considered and applied on a case-by-case basis and often vary from species to species. In a case where a property owner seeks permission from a federal agency for an action which could affect a federally listed plant or animal species, the

property owner and agency are required to consult with USFWS pursuant to Section 7 of the Endangered Species Act (ESA) if there is a federal nexus, or pursuant to Section 10 of the ESA. Section 9(a)(2)(b) of the FESA addresses the protections afforded to listed plants. All references to federally-protected species in this biological assessment include the most current published status or candidate category to which each species has been assigned by USFWS.

3.1.2 Migratory Bird Treaty Act (MBTA)

The Migratory Bird Treaty Act (MBTA) protects individuals as well as any part, nest, or eggs of any bird listed as migratory. In practice, Federal permits issued for activities that potentially impact migratory birds typically have conditions that require pre-disturbance surveys for nesting birds. In the event nesting is observed, a buffer area with a specified radius must be established, within which no disturbance or intrusion is allowed until the young have fledged and left the nest, or it has been determined that the nest has failed. If not otherwise specified in the permit, the size of the buffer area varies with species and local circumstances (e.g., presence of busy roads, intervening topography, etc.), and is based on the professional judgment of a monitoring biologist. A list of migratory bird species protected under the MBTA is published by USFWS.

3.1.3 Federal Clean Water Act (CWA)

The Clean Water Act (CWA), Section 401 provides guidance for the restoration and maintenance of the chemical, physical, and biological integrity of the nation's waters. Section 401 requires a project operator to obtain a federal license or permit that allows activities resulting in a discharge to waters of the United States to obtain state certification, thereby ensuring that the discharge will comply with provisions of the CWA. The Regional Water Quality Control Board administers the certification program in California. Section 404 establishes a permit program administered by the United States Army Corps of Engineers (Corps) that regulates the discharge of dredged or fill material into waters of the United States, including wetlands. The Corps implementing regulations are found at 33 CFR 320 and 330. Guidelines for implementation are referred to as the Section 404(b)(1) Guidelines, which were developed by the United States Environmental Protection Agency in conjunction with Corps (40 CFR 230). The guidelines allow the discharge of dredged or fill material into the aquatic system only if there is no practicable alternative that would have less adverse impacts.

3.1.4 Wetlands and Other Waters of the United States

Aquatic resources, including riparian areas, wetlands, and certain aquatic vegetation communities, are considered sensitive biological resources and fall under the jurisdiction of several regulatory agencies. The Corps exerts jurisdiction over waters of the United States, including all waters that are subject to the ebb and flow of the tide; wetlands and other waters such as lakes, rivers, streams (including intermittent or ephemeral streams), mudflats, sandflats, sloughs, prairie potholes, vernal pools, wet meadows, playa lakes, or natural ponds; and tributaries of the above features. The extent of waters of the United States is generally defined as the portion that falls within the limits of the Ordinary High-Water Mark (OHWM). The OHWM is defined as the "line

on the shore established by the fluctuation of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas."

The definition of waters of the United States has undergone several iterations, including a much more streamlined definition which was published and formally adopted in April 2020. However, in August 2021, the April 2020 Navigable Waters definition was challenged in the case Pascua Yaqui Tribe v. U.S. Environmental Protection Agency. In light of this case and subsequent order from US District Court for the District of Arizona, the U.S. Environmental Protection Agency (EPA) and Corps have halted implementation of the Navigable Waters Protection Rule from 2020 and are interpreting "waters of the United States" consistent with the pre-2015 regulatory regime. Then in March 2023 following a Supreme Court decision, the rule was once again changed and finalized to codify the pre-2015 definition with some revisions to the definition wetlands. On August 29, 2023 the EPA and Corps issued a final rule to amend the prior definition of Waters of the United States. The final rule conforms with the definition of Waters of the United Stated to the US Supreme Court's May 25, 2023 decision in the case Sackett v. Environmental Protection Agency. As a result of the case, key aspects of the regulatory text have been amended to conform to the Court's decision, which revised the definitions of Waters of the United Stated and became effective on September 8, 2023.

The September 2023 ruling codified the term (a) waters of the United States to mean:

1. Waters which are:
    i. Currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
    ii. The territorial seas; or
    iii. Interstate waters;
2. Impoundments of waters otherwise defined as waters of the United States under this definition, other than impoundments of waters identified under paragraph (a)(5) of this section;
3. Tributaries of waters identified in paragraph (a)(1) or (2) of this section that are relatively permanent, standing or continuously flowing bodies of water;
4. Wetlands adjacent to the following waters:
    i. Waters identified in paragraph (a)(1) of this section; or
    ii. Relatively permanent, standing or continuously flowing bodies of water identified in paragraph (a)(2) or (a)(3) of this section and with a continuous surface connection to those waters;

   iii. Waters identified in paragraph (a)(2) or (3) of this section when the wetlands either alone or in combination with similarly situated waters in the region, significantly affect the chemical, physical, or biological integrity of waters identified in paragraph (a)(1) of this section;
5. Intrastate lakes and ponds not identified in paragraphs (a)(1) through (4) of this section that are relatively permanent, standing or continuously flowing bodies of water with a continuous surface connection to the waters identified in paragraph (a)(1) or (a)(3) of this section.
6. Intrastate lakes and ponds, streams, or wetlands not identified in paragraphs (a)(1) through (4) of this section:
   i. That are relatively permanent, standing or continuously flowing bodies of water with a continuous surface connection to the waters identified in paragraph (a)(1) or (a)(3)(i) of this section; or
   ii. That either alone or in combination with similarly situated waters in the region, significantly affect the chemical, physical, or biological integrity of waters identified in paragraph (a)(1) of this section.

Wetlands, including swamps, bogs, seasonal wetlands, seeps, marshes, and similar areas, are defined by Corps as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (33 CFR 328.3[a]; 40 CFR 230.3[t]). Indicators of three wetland parameters (i.e., hydric soils, hydrophytic vegetation, and wetlands hydrology), as determined by field investigation, must be present and, as outlined within the September 2023 ruling, have adjacency with relative permanent, standing or continuously flowing bodies of water with continuous connection to Waters of the US. Wetlands must meet the parameters as outlined above classified as a wetland by Corps. It is important to note that the RWQCB definition of wetland was redefined, and the new definition went into effect May 28, 2020. The definition of a wetland is as follows: An area is wetland if, under normal circumstances, (1) the area has continuous or recurrent saturation of the upper substrate caused by groundwater, or shallow surface water, or both; (2) the duration of such saturation is sufficient to cause anaerobic conditions in the upper substrate; and (3) the area's vegetation is dominated by hydrophytes, or the area lacks vegetation. This RWQCB modified three-parameter definition is similar to the federal definition in that it identifies three wetland characteristics that determine the presence of a wetland: wetland hydrology, hydric soils, and hydrophytic vegetation. Unlike the federal definition, however, the RWQCB wetland definition allows for the presence of hydric substrates as a criterion for wetland identification (not just wetland soils) and wetland hydrology for an area devoid of vegetation (less than 5% cover) to be considered a wetland.

Examples of waters that would be considered wetlands by the RWQCB definition, but not by the federal wetland definition, are non-vegetated wetlands, or wetlands characterized by exposed bare substrates like mudflats and playas, as long as they meet the three-parameters as described in the RWQCB definition. It is important to note that while the Corps may not designate a feature as a wetland, that feature could be considered a special aquatic site or other water of the U.S. by the Corps and potentially subject to Corps' jurisdiction.

3.2 California State Laws and Regulations

3.2.1 California Endangered Species Act (CESA)

The California Endangered Species Act (CESA) establishes the policy of the state to conserve, protect, restore, and enhance threatened or endangered species and their habitats. The CESA mandates that state agencies should not approve projects that would jeopardize the continued existence of threatened or endangered species if reasonable and prudent alternatives are available that would avoid jeopardy. There are no state agency consultation procedures under the CESA. For projects that would affect a listed species under both the CESA and the FESA, compliance with the FESA would satisfy the CESA if California Department of Fish and Wildlife (CDFW) determines that the federal incidental take authorization is "consistent" with the CESA under California Fish and Game Code (FGC) Section 2080.1. For projects that would result in take of a species listed under the CESA only, the project operator would have to apply for a take permit under Section 2081(b).

3.2.2 California Fish and Game Code Section 1600-1616

Section 1602 of the California Fish and Game Code requires notifying CDFW prior to any project activity that might (1) substantially divert or obstruct the natural flow of any river, stream, or lake; (2) substantially change or use any material from the bed, channel, or bank of any river, stream, or lake; or (3) deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake. If, after this notification, the CDFW determines that the activity may substantially adversely affect fish and wildlife resources, a Lake or Streambed Alteration Agreement will need to be obtained. CDFW may then place conditions in the Section 1602 Streambed Alteration Agreement to avoid, minimize, and mitigate any potentially significant adverse impacts within CDFW jurisdictional limits.

3.2.3 California Fully Protected Species

California fully protected species are described in Sections 3511, 4700, 5050, and 5515 of the California Fish and Game Code. These statutes prohibit take or possession of fully protected species. CDFW is unable to authorize incidental take of fully protected species when activities are proposed in areas inhabited by those species.

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3.2.5 Protection of Birds

Section 3503.5 of the California Fish and Game Code states that it is "unlawful to take, possess, or destroy any birds in the order Falconiformes or Strigiformes (birds of prey) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto." Activities that result in the abandonment of an active bird of prey nest may also be considered in violation of this code. In addition, California Fish and Game Code, Section 3511 prohibits the taking of any bird listed as fully protected, and California Fish and Game Code, Section 3515 states that is it unlawful to take any non-game migratory bird protected under the MBTA.

3.2.6 Porter-Cologne Water Quality Act – California Code, Division 7

The RWQCB also has jurisdiction over waters deemed "isolated" or not subject to Section 404 jurisdiction under the Solid Waste Agency of Northern Cook County v. Corps decision. Dredging, filling, or excavation of isolated waters constitutes a discharge of waste to waters of the state and prospective dischargers are required to obtain authorization through an Order of Waste Discharge or waiver thereof from the RWQCB and comply with other requirements of Porter-Cologne Act.

Under Section 401 of the CWA, the local RWQCB (for this Project, the Santa Ana RWQCB) must certify that actions receiving authorization under Section 404 of the CWA also meet state water quality standards. The RWQCB requires projects to avoid impacts to wetlands if feasible and requires that projects do not result in a net loss of wetland acreage or a net loss of wetland function and values. Compensatory mitigation for impacts to wetlands and/or waters of the state is required.

3.2.7 California Native Plant Protection Act

The California Native Plant Protection Act (California Fish and Game Code §§ 1900–1913) requires all State agencies to use their authority to carry out programs to conserve Endangered and Rare native plants. The California Native Plant Protection Act gives the CDFW the power to designate native plants as "Endangered" or "Rare" and prohibits the take of such plants with certain exceptions.

3.2.8 Sensitive Plant Communities

Sensitive plant communities include those habitat types considered sensitive by resource agencies, namely CDFW, due to their scarcity and/or their ability to support State and Federally-listed Endangered, Threatened, and Rare vascular plants, as well as several sensitive bird and reptile species. CDFW maintains a natural plant community list, the List of California Terrestrial Natural Communities. Sensitive natural communities (also referred to by CDFW as 'rare', 'special-status', or 'special concern') are identified on the list by an asterisk and are considered high priority vegetation types (CDFW 2003; CDFW 2000).

3.2.9 California Native Plant Society

The California Native Plant Society (CNPS) is a private plant conservation organization dedicated to the monitoring and protection of sensitive species in California. CNPS has compiled an inventory comprised of the information focusing on geographic distribution and qualitative characterization of Rare, Threatened, or Endangered vascular plant species of California. The list serves as the candidate list for Threatened and Endangered by CDFW. CNPS has developed five categories of rarity, of which Ranks 1A, 1B, and 2 are particularly considered sensitive.

Sensitive species that occur or potentially could occur within the Study Area are based on one or more of the following: (1) the direct observation of the species within the Study Area during any field surveys; (2) a record reported in the CNDDB; and (3) the Study Area is within known distribution of a species and contains appropriate habitat.

3.2.10 Native Plant Protection Act (NPPA)

California's Native Plant Protection Act (NPPA) requires all state agencies to use their authority to carry out programs to conserve endangered and rare native plants (FGC Sections 1900-1913). Provisions of the NPPA prohibit the taking of listed plants from the wild and require notification of CDFW at least 10 days in advance of any change in land use. This allows CDFW to salvage listed plant species that would otherwise be destroyed. The project operator is required to conduct botanical inventories and consult with CDFW during project planning to comply with the provisions of this act and sections of CEQA that apply to rare or endangered plants.

3.3 Regulatory Permits

This report is prepared pursuant to and in support of California Environmental Quality Act (CEQA), and any applicable regulatory permit applications, including the California Department of Fish and Wildlife (CDFW) Streambed Alteration Agreement (SAA), Regional Water Quality Control Board (RWQCB) Section 401 Water Quality Certification (WQC), United States Army Corps of Engineers (Corps) Section 404 permit, and United States Fish and Wildlife Service Section 7 Biological Opinion.

4.0 Survey and Methods

Preparation for this biological assessment began with a review of relevant available literature and review of historical biological documentation for the Study Area. This effort was followed by onsite field surveys to assess the existing habitat, map any onsite sensitive plant communities and jurisdictional waters, and determine whether special status plant and wildlife species occur or potentially occur within the Study Area.

4.1 Literature Review

The assessment began with a review of relevant available literature on the biological resources within the Study Area and Project Vicinity.

4.1.1 Sensitive Plant Communities

Sensitive plant communities (sensitive habitats) are of limited distribution statewide or within a county or region and are often vulnerable to environmental effects of projects. Sensitive habitats are often threatened with local extirpation and are therefore considered valuable biological resources. Plant communities are considered "sensitive" by the California Native Plant Society (CNPS) and CDFW if they meet any of the criteria listed below.

- The habitat is recognized and considered sensitive by CDFW, USFWS, and/or special interest groups such as CNPS.
- The habitat is under the jurisdiction of the Corps pursuant to Section 404 of the CWA.
- The habitat is under the jurisdiction of the CDFW pursuant to Sections 1600 through 1612 of the California Fish and Game Code.
- The habitat is known or believed to be of high priority for inventory in the California Natural Diversity Database (CNDDB).
- The habitat is considered regionally rare.
- The habitat has undergone a large-scale reduction due to increased encroachment and development.
- The habitat supports special status plant and/or wildlife species (defined below).
- The habitat functions as an important corridor for wildlife movement.

4.1.2 Critical Habitat

Under the ESA, the federal government is required to designate "critical habitat" for any species it lists under the ESA. Federal agencies are prohibited from authorizing, funding or carrying out actions that "destroy or adversely modify" critical habitats. Section 3 of the ESA defines critical habitat as:

- The specific areas within the geographic area occupied by a species, at the time it is listed in accordance with the ESA, on which are found those physical or biological features essential to the conservation of the species and that may require special management considerations or protection.

- The specific areas outside the geographic area occupied by a species at the time it is listed, upon a determination that such areas are essential for the conservation of the species.

"Conservation" means the use of all methods and procedures that are necessary to bring an endangered or a threatened species to the point at which listing under the ESA is no longer necessary. Critical habitat receives protection under Section 7(a)(2) of the ESA through the prohibition against destruction or adverse modification of critical habitat with regard to actions carried out, funded, or authorized by a federal agency. Section 7(a)(2) also requires conferences on federal actions that are likely to result in the destruction or adverse modification of proposed critical habitat.

The USFWS's online service for information regarding Threatened and Endangered Species Final Critical Habitat designation within California was reviewed to determine if the Study Area is within any species' designated Critical Habitat (USFWS 2022a). The USFWS regulatory mapping process for the designation of critical habitat is broad-based mapping exercise of areas that may or may not include constituent elements of the critical habitat designation. Due to this approach in mapping, large areas are designated as critical habitat regardless of the existing habitat, and as a result may include developed areas, such as buildings, roads, hardscape, and other such facilities, as well as natural habitats.

The constituent elements of the critical habitat designation consider the physical and biological features needed for life processes and successful reproduction of the listed species, including:

- Space for individual and population growth for normal behavior;
- Habitat cover or shelter;
- Food, water, or other nutritional or physiological requirements;
- Sites for breeding and rearing offspring; and
- Habitat that is protected from disturbance or is representative of the historical geographic and ecological distribution of a species.

4.1.3 Special Status Plants and Wildlife

Species of plants and animals are afforded "special status" by federal agencies, state agencies, and/or non-governmental organizations because of their recognized rarity, potential vulnerability to extinction, and local importance. These species typically have a limited geographic range and/or limited habitat and are referred to collectively as "special status" species. Plant and wildlife species are considered "special status" species if they meet any of the following criteria.

- Taxa with official status under ESA, CESA, and/or the NPPA.
- Taxa proposed for listing under ESA and/or CESA.
- Taxa designated a species of special concern by CDFW.
- Taxa designated a state fully protected species by CDFW.
- Taxa identified as sensitive, unique or rare, by the USFWS, CDFW, the United States Forest Service (USFS), the United States Bureau of Land Management (BLM), and/or the California Department of Forestry and Fire Protection (CDF).
- Plants that meet the definition of rare or endangered under CEQA §15380(b) and (d). Species that may meet the definition of rare or endangered include the following:
    - Species considered by CNPS and CDFW to be "rare, threatened or endangered in California" (California Rare Plant Rank [CRPR] 1A, 1B and 2) (CNPS 2023). A majority of the CRPR 3 and CRPR 4 plant species generally do not qualify for protection under CESA and NPPA.

    - Species that may warrant consideration on the basis of local significance or recent biological information.
    - Some species included on the CNDDB Special Plants, Bryophytes, and Lichens List (CDFW 2023g).
- Considered a locally significant species, that is, a species that is not rare from a statewide perspective but is rare or uncommon in a local context such as within a county or region (CEQA §15125 (c)) or is so designated in local or regional plans, policies, or ordinances (CEQA Guidelines, Appendix G). Examples include a species at the outer limits of its known range or a species occurring on an uncommon soil type.

Available literature and databases were reviewed regarding sensitive habitats and special status plant and wildlife species. Special status plant and wildlife species that have the potential to occur within the immediate region of the Study Area were identified. Several agencies, including the USFWS, CDFW, and CNPS publish lists of particular taxa (species and subspecies) and the associated level of protection or concern associated with each. Reviewed and consulted literature and databases focused on the Study Area, and included the following sources listed below:

- The CNDDB, a CDFW species account database that inventories status and locations of rare plants and wildlife in California, was used to identify any sensitive plant communities and special status plants and wildlife that may exist within a two-mile radius of the Project site. A CNDDB search was performed by assessing a two-mile radius around the Study Area (CDFW 2023f). CNDDB records are generally used as a starting point when determining what special status species, if any, may occur in a particular area. However, these records may be old, lack data not yet entered, and do not represent all the special status species that could be in that particular area.
- A map of USFWS critical habitat to determine species with critical habitat mapped in the general vicinity of the Project (Figure 4) (USFWS 2023a).
- Online CNPS Inventory of Rare and Endangered Plants of California (CNPS 2023). A search for the USGS 7.5-Minute Topographic Map *San Bernardino South* and the surrounding eight quadrangles (*San Bernardino North, Harrison Mountain, Redlands, Sunnymead, Riverside East, Riverside West, Fontana, and Devore*) provided information regarding the distribution and habitats of special status vascular plants in the Project Vicinity.
- Pertinent maps, scientific literature, websites, and regional flora and fauna field guides.

The literature review was used as a resource to better understand the biological resources potentially occurring within the Study Area. Although the inventory list of special status plant and wildlife species was not exhaustive of all species that might occur on the property, it provides a wide range of species that are representative of the wildland habitats in the area. Species occurrence and distribution information is based

on documented occurrences where surveys have taken place for individual projects; therefore, a lack of documented occurrence does not necessarily indicate that a given species is absent from the Study Area.

4.2 Biological Survey

4.2.1 General Biological Survey

Plant species were identified using plant field and taxonomical guides, such as The Jepson Manual: Vascular Plants of California, second edition (Baldwin et al. 2012). Vegetation communities were characterized utilizing vegetation alliances in accordance with The Manual of California Vegetation, Second Edition (MCVII) (Sawyer et al. 2009). Where necessary, deviations were made on best professional judgment when areas did not fit into a specific habitat description provided by MCVII. Plant communities were mapped in the field directly onto a 200-scale (1" = 200') aerial photograph and a Trimble R1 GNSS Receiver paired with the ARC Geographical Information System (ARCGIS) Collector Application was utilized during the survey. All plant species encountered during the field survey were identified and recorded in field notes. Information regarding the presence of suitable habitat and soils to support the species, known records or occurrence within the area, and known distribution and elevation range obtained from the relevant literature was used to determine presence or absence of sensitive species.

The biologist paid special attention to those habitat areas that had the potential to provide suitable habitat for special status plant and wildlife species. Aerial photographs and maps were used to assist in the delineation of plant community boundaries. Following field mapping, the plant communities were digitized, and the vegetation map was created.

General wildlife surveys were conducted on foot and with binoculars within the Study Area. All wildlife species encountered visually or audibly during the field survey were identified and recorded in field notes. Biologists also recorded signs of wildlife species including animal tracks, burrows, nests, scat, and remains. Binoculars were used to aid in the identification of observed wildlife. Wildlife field guides and photographs were used to assist with identification of wildlife species during the field survey, as necessary. Photographs were taken to document existing conditions within the Study Area (Appendix A).

4.2.2 Regional Connectivity/Wildlife Movement

Wildlife corridors link together areas of suitable habitat that are otherwise separated by rugged terrain, changes in vegetation, or human disturbance. The fragmentation of open space areas by urbanization creates isolated "islands" of wildlife habitat. In the absence of habitat linkages that allow movement to adjoining open space areas, various studies have concluded that some wildlife species, especially the larger and more mobile mammals, would not likely persist over time in fragmented or isolated habitat

areas because they prohibit the infusion of new individuals and genetic information (MacArthur and Wilson 1967, Soule 1987, Harris and Gallager 1989). Corridors effectively act as links between different populations of a species. A group of smaller populations (termed "demes") linked together via a system of corridors is termed a "meta-population." The long-term health of each deme within the meta-population is dependent upon its size and the frequency of interchange of individuals (immigration versus emigration). The smaller the deme, the more important immigration becomes, because prolonged inbreeding with the same individuals can reduce genetic variability. Immigrant individuals that move into the deme from adjoining demes mate with individuals and supply that deme with new genes and gene combinations that increases overall genetic diversity. An increase in a population's genetic variability is generally associated with an increase in a population's health.

Corridors mitigate the effects of habitat fragmentation by:

- Allowing animals to move between remaining habitats, which allows depleted populations to be replenished and promotes genetic diversity.
- Providing escape routes from fire, predators, and human disturbances, thus reducing the risk that catastrophic events (such as fires or disease) will result in population or local species extinction.
- Serving as travel routes for individual animals as they move within their home ranges in search of food, water, mates, and other needs (Fahrig and Merriam 1985, Simberloff and Cox 1987, Harris and Gallagher 1989).

Wildlife movement activities usually fall into one of three movement categories:

- Dispersal (e.g., juvenile animals from natal areas, individuals extending range distributions).
- Seasonal migration.
- Movements related to home range activities (foraging for food or water, defending territories, searching for mates, breeding areas, or cover).

A number of terms have been used in various wildlife movement studies, such as "wildlife corridor," "travel route," "habitat linkage," and "wildlife crossing" to refer to areas in which wildlife moves from one area to another. To clarify the meaning of these terms and facilitate the discussion on wildlife movement in this study, these terms are defined as follows:

- Travel route: a landscape feature (such as a ridge line, drainage, canyon, or riparian strip) within a larger natural habitat area that is used frequently by animals to facilitate movement and provide access to necessary resources (e.g., water, food, cover, den sites). The travel route is generally preferred because it provides the least amount of topographic resistance in moving from one area to

another; it contains adequate food, water, and/or cover while moving between habitat areas; and provides a relatively direct link between target habitat areas.

- Wildlife corridor: a piece of habitat, usually linear in nature, that connects two or more habitat patches that would otherwise be fragmented or isolated from one another. Wildlife corridors are usually bounded by urban land areas or other areas unsuitable for wildlife. The corridor generally contains suitable cover, food, and/or water to support species and facilitate movement while in the corridor. Larger, landscape-level corridors (often referred to as "habitat or landscape linkages") can provide both transitory and resident habitat for a variety of species.

- Wildlife crossing: a small, narrow area, relatively short in length and generally constricted in nature, that allows wildlife to pass under or through an obstacle or barrier that otherwise hinders or prevents movement. Crossings are typically manmade and include culverts, underpasses, drainage pipes, and tunnels to provide access across or under roads, highways, pipelines, or other physical obstacles. These are often "choke points" along a movement corridor.

4.3 Delhi Sands Flower-loving Fly Assessment

Due to the Proximity of Delhi Sands Flower-Loving Fly (DSF) Conservation Areas, a DSF habitat assessment was performed on the Project site. Prior to a site visit, soil maps covering the Project site were reviewed, along with aerial imagery to gain an understanding of historical land use regimens. Photographs were taken of the site, along with field notes on vegetation and soil conditions. The site is then rated based on its potential to support DSF based on the following scale of 1 to 5, with 5 being the best quality and most suitable habitat:

1. Developed areas, non-Delhi sands soils with high clay, silt, and/or gravel content. Delhi sands extensively and deeply covered by dumping of exotic soils, rubble, trash, manure, or organic debris. *Unsuitable*.
2. Delhi sands are present, but the soil characteristics include a predominance of exotic soils such as alluvial materials, or predominance of other foreign contamination as gravels, manure, or organic debris. Severe and frequent disturbance (such as a maintenance yard or high use roadbed). *Very Low Quality*.
3. Moderately contaminated Delhi sands. Delhi sands with moderate to high disturbance (such as annual disking). Sufficient Delhi Sands are present to prevent soil compaction (related to contamination by foreign soils). Some sandy soils exposed on the surface due to fossorial animal activity. *Low Quality.*
4. Abundant clean Delhi Sands with little or no foreign soils (such as alluvial material) present. Moderate abundance of exposed sands on the soil surface. Low vegetative cover. Evidence of moderate degree of fossorial animal activity by vertebrates and invertebrates. May represent high quality habitat with mild or superficial disturbance. *Moderate Quality.*

5. Sand dune habitat with clean Delhi Sands. High abundance of exposed sands on the soil surface. Low vegetative cover. Evidence (soil surface often gives under foot) of high degree of fossorial animal activity by vertebrates and invertebrates. Sand associated plant and arthropod species may be abundant and vegetation species composition is often indicative of low disturbance. *High Quality.*

It should be noted that habitat qualities often vary spatially within a site and may range in quality of suitability for DSF habitat. Furthermore, overall habitat quality is affected by the overall habitat area on a site, such that very small areas diminish the overall habitat value of a site. Habitat conditions rated from Very Low Quality up to High Quality, are formally considered as representing suitable conditions for the DSF.

4.4 Jurisdictional Waters

The following sources were reviewed to determine the potential presence or absence of jurisdictional streams/drainages, wetlands, and their location within the watersheds associated with the Study Area, and other features that might contribute to federal or state jurisdictional authority located within watersheds associated with the Study Area:

- National Wetlands Inventory (NWI) maps (USFWS 2023c). The NWI database indicates potential wetland areas based on changes in vegetation patterns as observed from satellite imagery. This database is used as a preliminary indicator of wetland habitats because the satellite data are not precise.
- Title 33 Code of Federal Register (CFR): Navigation and Navigable Waters Part 328
- USGS National Hydrography Dataset (NHD). Provides the locations of "blue-line" streams as mapped on 7.5-Minute Topographic Map coverage.
- Aerial Imagery (Google Earth©) (Google 2023).
- USGS 7.5-Minute Topographic Maps.
- Natural Resource Conservation Service (NRCS) Soil Survey.

All depressions and drainages were evaluated for the presence of jurisdictional waters and wetlands according to the Corps, RWQCB, and CDFW delineation guidelines, including connectivity or lack of connectivity to Traditional Navigable Waters. Dominant vegetation within and adjacent to the jurisdictional features within the Study Area was identified and recorded.

The Corps and the RWQCB have jurisdiction over Waters of the United States. Jurisdictional non-wetland features for the Waters of the United States are typically determined through the observation of an Ordinary High Water Mark (OHWM), which is defined as the "line on the shore established by the fluctuation of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the

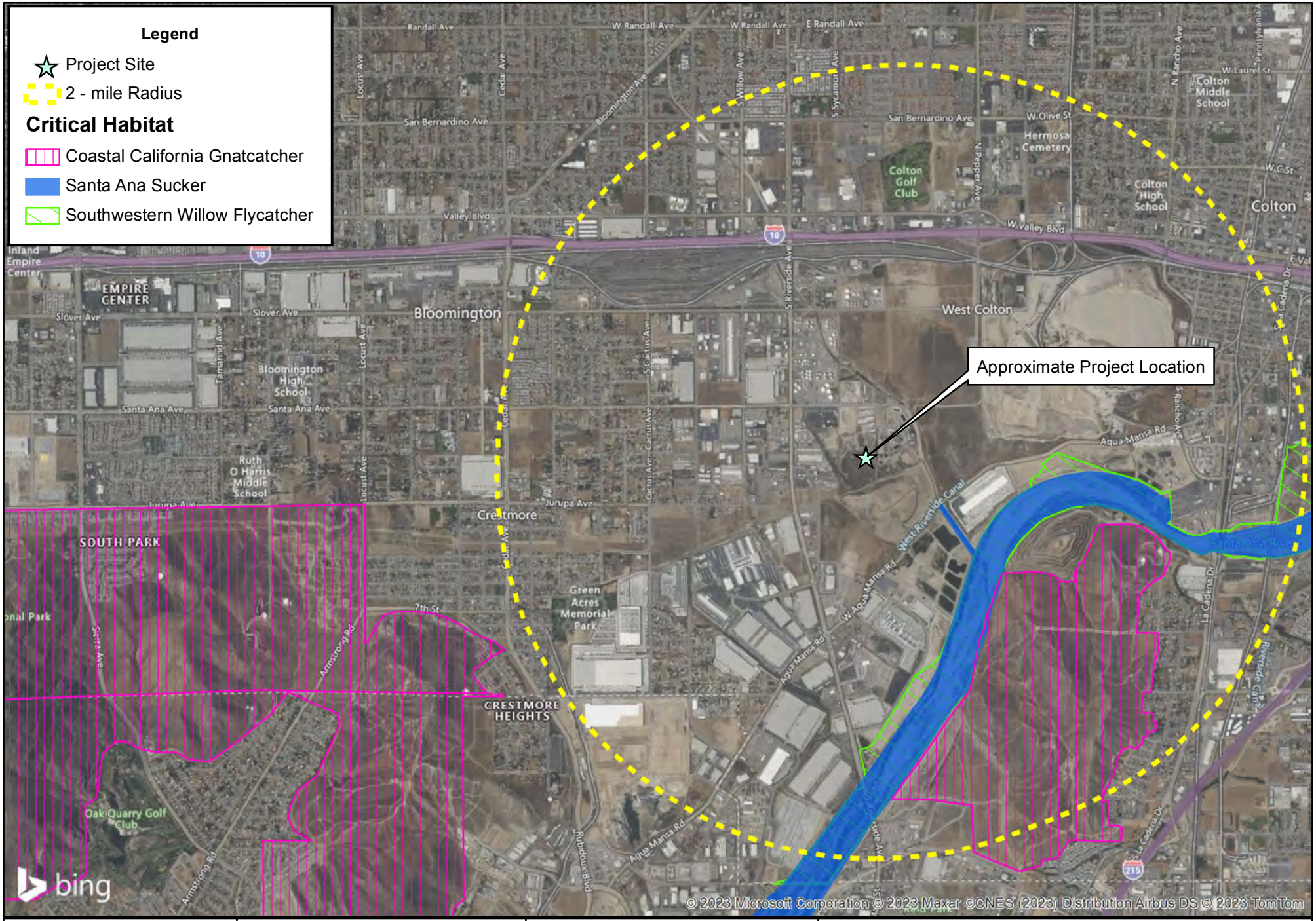
surrounding areas." Projects with impacts to Waters of the United States are regulated under Sections 401 and 404 of the Clean Water Act.

To determine the presence of a jurisdictional wetland for the Waters of the United States, three indicators are required: (1) hydrophytic vegetation, (2) hydric soils, and (3) wetland hydrology. The methodology published in the *United States Army Corps of Engineers 1987 Wetland Delineation Manual* and the *Arid West Supplement* sets the standards for meeting each of the three indicators, which normally require more than 50 percent cover of dominant plant species typical of a wetland, soils exhibiting characteristics of saturation, and hydrological indicators be present.

CDFW has jurisdiction over water of the Department's interest (California Fish and Game Code §§1600 et seq.; California Code of Regulations, Title 14, §720), referred to as Waters of the State. Section 1602 of the California Fish and Game Code (FGC) applies to all rivers, streams, lakes and streambeds. CDFW defines a stream as "a body of water that flows perennially or episodically and that is defined by the area in which water currently flows, or has flowed, over a given course during the historic hydrologic course regime, and where the width of its course can reasonably be identified by physical or biological indicators" (Brady and Vyverberg 2013). Likewise, CDFW regulates jurisdictional areas of riparian habitat only to the extent that those areas are part of a stream, river, or lake as defined above. Waters of the State pertaining to Porter-Cologne in relation to RWQCB jurisdiction are defined by California Water Code Section 13050(e) as any surface or ground water within the boundaries of the state.

Prior to the field investigation, CSLS biologist reviewed historical aerial imagery and topography for the Study Area to determine the potential for perennial, intermittent, or ephemeral drainages and associated riparian resources. Generally, indicators of jurisdictional drainages on an aerial photo include vegetation and/or incised lines indicating the path of flowing water. Following the desktop research, CSLS biologists conducted an onsite field investigation. Based on the collective results of the desktop investigation and the field surveys, any observed jurisdictional features were mapped using the following parameters:

- The limits of the Corps' jurisdiction extend to the OHWM. OHWM indicators include: the observation of benches, break in bank slope, particle size distribution, sediment deposits, drift, litter, and/or change in plant community.
- The RWQCB shares the Corps' jurisdictional methodology, and the Regional Board's May 2020 wetland definition.
- CDFW's jurisdiction applies to all perennial, intermittent, and ephemeral rivers, streams, and lakes in the state. CDFW's authority also includes riparian habitat (including wetlands) supported by a river, stream, or lake regardless of the presence or absence of hydric soils and saturated soil conditions. Generally, CDFW jurisdiction is mapped to the top of bank of the stream or the extent of streambed dependent vegetation.



GIS Prepared By:
Carlson SLS

Created: April 5, 2023

0 875 1,750 3,500 5,250 7,000 Feet
1 inch = 3,500 feet

Data Source: Bing Map

Rialto Habitat Nature Center Project

Critical Habitat

FIGURE 4

5.0 Results

A field survey and jurisdictional delineation was performed on January 27, 2023, by CSLS biologist Brianna Bernard to assess and map vegetation communities, plants, and wildlife, and to identify habitat areas that could be suitable for special status plant species or jurisdictional features. A Delhi Sands Flower-loving Fly site visit was assessed on February 15, 2023.

5.1 Vegetation Communities

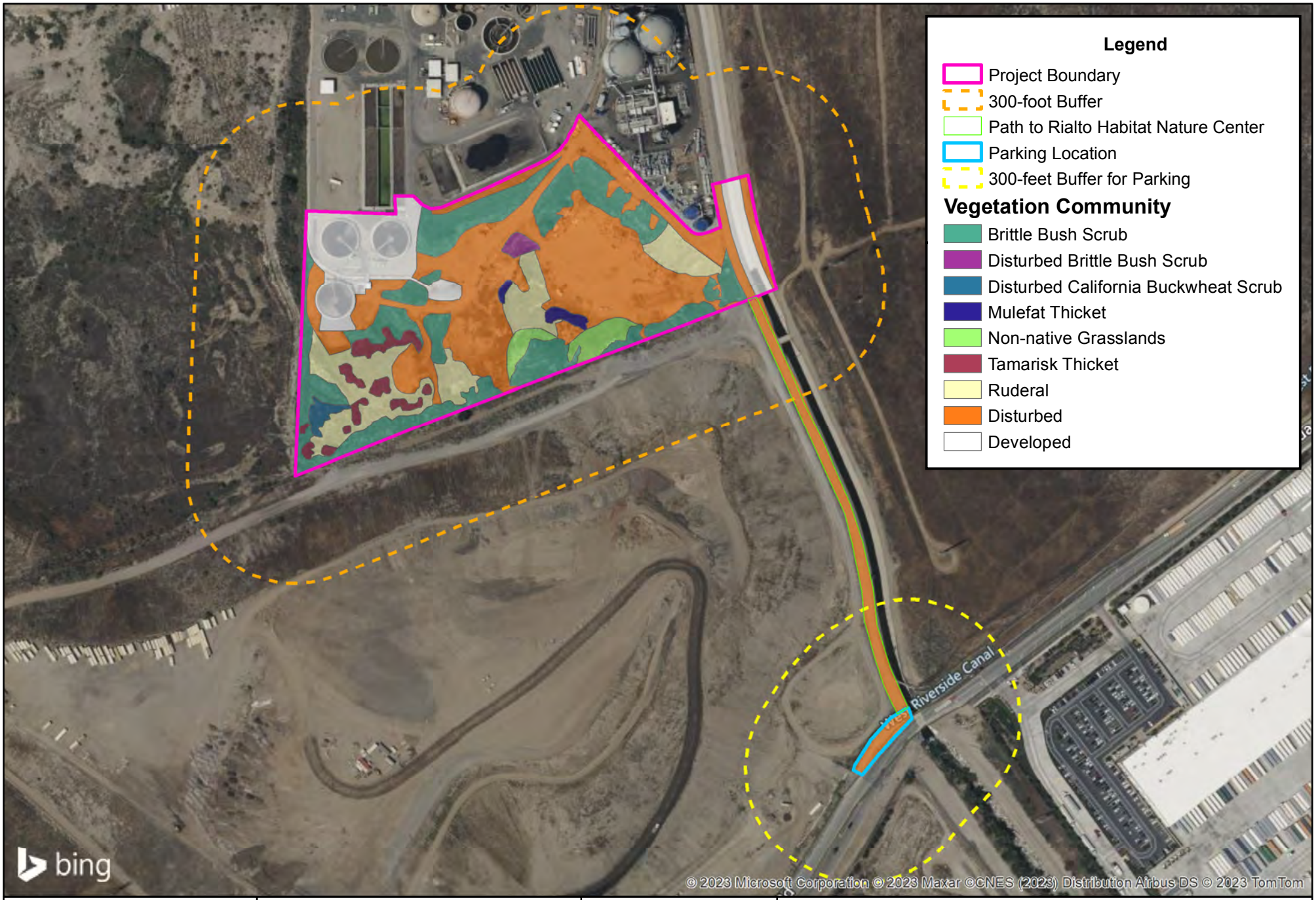
The vegetation communities and habitat conditions were inspected to confirm presence and habitat quality of the vegetation found onsite. Vegetation mapping and acreages for each vegetation community is based on the observations of the field survey, which are listed below in Table 1 and graphically depicted on Figure 5. Representative photographs of the vegetation communities can be found in Appendix A. A complete list of species observed onsite can be found in Appendix B.

The deviations from MCVII alliance categories include ruderal, ornamental, disturbed and developed communities. The deviations were made due to the lack of alliances for these communities within MCVII. The field survey analyzed the Project site and a surrounding 300-foot buffer around the Project site to determine the existing vegetation types. As shown on Figure 5, the surrounding 300-foot buffer consists primarily of developed, disturbed, and non-native grasslands vegetation communities.

Table 1. Vegetation Community Observed Onsite

Vegetation Community	Acreage within the Project site (acres)
Brittle Bush Scrub	3.85
Disturbed Brittle Bush Scrub	0.10
Disturbed California Buckwheat Scrub	0.12
Mulefat Thicket	0.12
Non-native Grasslands	0.45
Tamarisk Thicket	0.43
Ruderal	2.06
Disturbed	7.71
Developed	2.21
TOTAL	17.05

The general description of the habitat observed during the field survey are described below.



GIS Prepared By:
Carlson SLS

Created: January 23, 2023

0 87.5 175 350 525 700 Feet

1 inch = 350 feet

Data Sources: Bing Maps

Rialto Habitat Nature Center Project

Vegetation Community Map

FIGURE 5

5.1.1 Brittle Bush Scrub

The brittle bush scrub is also known as *Encelia farinosa* Shrubland Alliance is composed primarily of brittle bush (*Encelia farinosa*). Additional species within the scrub includes California buckwheat (*Eriogonum fasciculatum*), California sage scrub (*Artemisia californica*), scattered with coyote brush, star thistle (*Centaurea solstitialis*), and summer mustard (*Hirschfeldia incana*).

5.1.2 Disturbed Brittle Bush Scrub

The disturbed brittle bush scrub and is composed of species as outlines in the brittle bush scrub community in a disturbed state with less vegetation cover and animal trails.

5.1.3 Disturbed California Buckwheat Scrub

The disturbed California buckwheat scrub is as known as *Eriogonum fasciculatum* Shrubland Alliance and is composed of California buckwheat with scattered California brittlebush. It is in a disturbed state with less vegetation cover and animal trails.

5.1.4 Mulefat Thicket

The mulefat thicket is also known as *Baccharis salicifolia* Shrubland Alliance and is composed of mulefat (*Baccharis salicifolia*), California buckwheat and California sage scrub. Ruderal and non-native species occur within this community.

5.1.5 Non-Native Grasslands

The non-native grassland habitat is dominated by slender oat (*Avena barbata*). Other grass and forb species within this community includes red stemmed filaree (*Erodium cicutarium*), red brome (Bromus madritensis subsp. rubens), and summer mustard (*Hirschfeldia incana*).

5.1.6 Tamarisk Thickets

This alliance consists entirely of tamarisk species (*Tamarix ramosissima*).

5.1.7 Ruderal

The Project site contains portions of the ruderal vegetation community. The vegetation within this area is comprised of predominantly of summer mustard (*Hirschfeldia incana*). Other species include tocalote (*Centaurea melitensis*), and red brome (*Bromus rubens*).

5.1.8 Disturbed

The Project site consists primarily of disturbed habitat. The disturbed habitat area is associated with water treatment plant activities, staging areas, maintenance road adjacent to the Rialto Channel, dirt roads, and pedestrian paths/trails.

5.1.9 Developed

The developed areas are not vegetated and consist of water treatment plant infrastructure, asphalt roads, and concrete.

5.1.10 300-foot Buffer Area

While a majority of the 300-foot buffer is developed with the Rialto Water Treatment Plant to the north, various industrial uses occur to the west, and the Rialto channel occurs to the east. Open space occurs to the south of the Project site.

5.2 Special-Status Vegetation Types

A CNDDB search within the San Bernardino South USGS topographic quadrangle identified three special-status vegetation communities designated by CDFW. The special status vegetation communities include Riversidian Alluvial Fan Sage Scrub, Southern Riparian Scrub, and Southern Cottonwood Willow Riparian Scrub. The Project site does not contain any of the listed special-status vegetation types.

5.3 Plants

Sensitive plants include those listed, or candidates for listing, by the USFWS and CDFW; and species considered sensitive by the CNPS (particularly Lists 1A, 1B, and 2). Several sensitive plant species were reported in the vicinity of the Study Area based on the CNDDB and within the San Bernardino South quadrangle search. A total of six sensitive plant species occurs within the USGS 7.5' San Bernardino South quadrangle and had a CNDDB occurrence. A brief description of the species is included below. A complete list of special status plant species within the potential to occur on the Project site were analyzed based on distribution, habitat requirements, and existing site conditions (Appendix C). All plant species observed within the Project site during the field survey is listed in Appendix B.

Marsh Sandwort (*Arenaria paludicola*)
Status: Federally Endangered, State Endangered, California Rare Plant Rank 1B.1
Distribution: Los Angeles, San Bernardino, Santa Cruz, San Francisco, and San Luis Obispo Counties.
Habitat(s): Habitats supporting sandy openings and marshes and swamps (freshwater or brackish). Known from 3 to 170 meters (9 to 558 feet) MSL. Blooms May through August.
Status onsite: None. The Project site lacks suitable habitat and soils. Not observed during field visit.

Salt Marsh bird's-beak (*Chloropyron maritium ssp. maritimum)*
Status: Federally Endangered, State Threatened, California Rare Plant Rank 1B.2
Distribution: Los Angeles, Orange, Santa Barbara, San Bernardino, San Diego, Ventura, and San Luis Obispo.
Habitat(s): Habitats supporting coastal dunes and marshes and swamps (coastal salt). Known from 0 to 30 meters (0 to 985 feet) MSL. Blooms May through November.
Status onsite: None. The site lacks suitable habitat and soils. Not observed during field visit.

Santa Ana Whollystar (*Eriastrum densifolium ssp. sanctorum)*
Status: Federally Endangered, State Endangered, California Rare Plant Rank 1B.21
Distribution: Orange, Riverside, and San Bernardino Counties.
Habitat(s): Found in sandy soils of floodplains and terraced fluvial deposits of the Santa Ana River and larger tributaries. Known from 120 to 625 meters (400 to 4,100 feet) MSL. Blooms April through September.
Status onsite: None. The site lacks suitable soils. Not observed during the field survey.

Mesa Horkelia (*Horkelia cuneata var. puberula*)
Status: California Rare Plant Rank 1B.1
Distribution: Los Angeles, Orange, Riverside, San Bernardino, San Diego, San Luis Obispo, Santa Barbara, and Ventura Counties.
Habitat(s): Occurs within chaparral (maritime, cismontane woodland and coastal scrub. Known from 70 to 810 meters (230 to 2660 feet) MSL. Blooms February through July (September).
Status onsite: None. The site lacks suitable soils. Not observed during the field survey.

Parish's bush-mallow (*Malacothamnus parishii*)
Status: California Rare Plant Rank 1A
Distribution: San Bernardino County.
Habitat(s): Found within chaparral and coastal scrub habitats. Known from 305 to 455 meters (1,000 to 1,495 feet) MSL. Blooms June through July.
Status onsite: None. While the site contains minimal chaparral habitat, the site lacks suitable soils. Not observed during the field survey.

Pringle's monardella (*Monardella pringlei*)
Status: California Rare Plant Rank 1A
Distribution: Riverside and San Bernardino Counties.
Habitat(s): Habitats supporting sandy coastal scrub. Known from 300 to 400 meters (985 to 1,310 feet) MSL. Blooms May through June.
Status onsite: None. The site lacks suitable habitats. Not observed during the field survey.

As determined through the field survey conducted, no special status plant species were observed within the Project site and there is no potential for special status plant species to occur on the Project site because the majority of the Project site is developed as a parking lot and disturbed. The undeveloped areas lack suitable habitats and soils to support the special status plant species.

5.4 Critical Habitat

The USFWS's online service for information regarding Threatened and Endangered Species Final Critical Habitat designation within California was reviewed to determine if the Project site is within any species designated Critical Habitat. The Project site and surrounding buffer area are not located within any designated Critical Habitat overlay.

The closest designated Critical Habitat is located approximately 0.50 miles south of the Project site for the Santa Ana Sucker (*Catostomus santaanae*) (Figure 4). The Project site does not contain habitat for the Santa Ana Sucker and the species does not occur onsite.

5.5 Wildlife

Special status wildlife species with the potential to occur within the Study Area were analyzed based on the species identified in USGS 7.5' San Bernardino South quadrangle, distribution, habitat requirements, and existing site conditions (Appendix D). No special status wildlife was identified or observed within the Project site during the field survey. The following special status species are identified to occur within the San Bernardino South quadrangle and noted as an occurrence within the 2-mile CNDDB search: California glossy snake (*Arizona elegan occidentalis*), orange-throated whiptail (*Aspidoscelis hyperythra*), coastal whiptail (*Aspidoscelis tigris stejnegeri*), burrowing owl (*Athene cunicularia*), Santa Ana sucker, western yellow-bellied cuckoo (*Coccyzus americanus occidentalis*), San Diego banded gecko (*Coleonyx variegatus abbotti*), western mastiff bat (*Eumops perotis californicus*), arroyo chub (*Gila orcuttii*), western yellow bat (*Lasiurus xanthinus*), San Diego black-tailed jackrabbit (*Lepus californicus bennettii*), pocketed free-tailed bat (*Nyctinomops femorosaccus*), steelhead – southern California DPS (*Oncorhynchus mykiss irideus pop. 10*), Los Angles pocket mouse (*Perognathus longimembris brevinasus),* coastal California gnatcatcher (*Polioptila californica californica*), Delhi Sands flower-loving fly, and least Bell's vireo (*Vireo bellii pusillus*). A brief description of those species and their habitat is included below. A complete list of the special status species identified within the quadrangle can be found in Appendix D.

California Glossy Snake
Status: Species of Special Concern
Habitat(s): This species is found in a variety of habitats, primarily arid scrub areas with sparse vegetation including chaparral and grasslands areas.
Status onsite: None. No suitable habitat is found within the Project site. Not observed during the field survey.

Orange-throated Whiptail
Status: Species of Special Concern
Habitat(s): The species is generally found in semi-arid brushy areas typically with loose soil and rocks, including washes, stream sides, rocky hillsides, and coastal chaparral. Habitat types include low elevational chaparral, non-native grassland, (Riversidean) coastal sage scrub, juniper woodland and oak woodland. Associations include alluvial fan scrub and riparian areas. Friable soil appears to be a necessary requirement for excavating burrows and hiding eggs.
Status onsite: None. No suitable habitat is found within the Project site. Not observed during the field survey.

Coastal Whiptail
Status: Species of Special Concern
Habitat(s): This species is found in a variety of habitats, primarily hot and dry open areas with sparse vegetation including chaparral, woodland, and riparian areas. This subspecies is found in coastal southern California, north into Ventura County, and south into Baja California. Additional important habitat characteristics include shrub cover with accumulated leaf litter, and an abundance of invertebrate prey, particularly termites.
Status onsite: None. No suitable habitat is found within the Project site. Not observed during the field survey.

Burrowing Owl
Status: Species of Special Concern
Habitat(s): Burrowing owls are a year-round resident of California including habitats of open, dry grassland, and desert. They are generally restricted to mostly flat, open country with suitable nest sites. They use rodent or other burrows for roosting and nesting cover and acquire their burrows from either abandonment or eviction. Burrowing owls typically hunt from a perch.
Status onsite: None. During the field survey, the biologist paid special attention to any mammal burrows suitable for burrowing owl. It is determined the Project site does not contain any suitable sized burrows for the species. Not observed during the field survey.

Santa Ana Sucker
Status: Federally threatened
Habitat(s): Santa Ana suckers rely on perennial flows with suitable water quality and substrate to support breeding, feeding and sheltering. Over different life history stages, suckers depend on a variety of coarse substrate types, such as gravel, cobble, or mixtures of gravel or cobble with sand, and a variety of riverine features, like shallow riffles and deeper runs and pools.
Status onsite: None. No suitable habitat is found within the Project site. Not observed during the field survey.

Western Yellow-bellied Cuckoo
Status: Federally threatened and State endangered
Habitat(s): This species is an uncommon to rare summer resident of valley foothill and desert riparian habitats in scattered locations in California. Formerly much more common and widespread throughout lowland California. Roosts and nests in densely foliaged, deciduous trees and shrubs in extensive thickets, particularly willows.
Status onsite: None. The site lacks suitable habitat. Not observed during the field survey.

San Diego Banded Gecko
Status: Species of Special Concern
Habitat(s): The species ranges through most of Southern California north into the extreme southern part of Nevada and the southwestern tip of Utah, across northwest,

southwest, and southeast Arizona into the bootheel of New Mexico, and south down the western edge of the state of Sonora, Mexico and down the entire length of Baja California. The species occurs in rocky areas in coastal sage and chaparral.
Status onsite: None. The site lacks suitable habitat. Not observed during the field survey.

Western Mastiff Bat
Status: Species of Special Concern
Habitat(s): Western mastiff bats are found in a variety of habitats, such as semi-arid to arid habitats, including conifer and deciduous woodlands, coastal scrub, annual and perennial grasslands, palm oases, chaparral, desert scrub, and urban, but the species' distribution may be geomorphically determined, occurring primarily where there are significant rock features offering suitable roosting habitat. A cliff dwelling species, where maternity colonies of 30 to several hundred roost generally under exfoliating rock slabs and rock crevices along cliffs. Western mastiff bats can also be found in similar crevices in large boulders and buildings. When roosting in rock crevices they require a sizable drop from their roost in order to achieve flight. Western mastiff bats prefer deep crevices that are at least 15 or 20 feet above the ground. Foraging is concentrated around bodies of water but also includes coastal sage scrub, chaparral, and grassland habitats.
Status onsite: None. The site lacks suitable habitat. Not observed during the field survey.

Arroyo Chub
Status: Species of Special Concern
Habitat(s): Arroyo chub are adapted to survive in cool to warm (10 – 24°C) streams that fluctuate between large winter storm flows, and low summer flows, and the low dissolved oxygen and wide temperature fluctuations associated with this flow regime. They are most common in slow flowing or backwater areas with sand or mud substrate but may also inhabit areas with velocities in excess of 80 cm/s over coarse substrate.
Status onsite: None. The site lacks suitable habitat. Not observed during the field survey.

Western Yellow Bat
Status: Species of Special Concern
Habitat(s): Roost in trees, hanging from the underside of a leaf. Commonly found in the southwestern U.S. roosting in the skirt of dead fronds in both native and non- native palm trees and have also been documented roosting in cottonwood trees.
Status onsite: None. The site lacks suitable habitat. Not observed during the field survey.

San Diego black-tailed jackrabbit
Status: None
Habitat(s): The black-tailed jackrabbit is a habitat generalist occurring in open areas or semi-open country, typically in grasslands, agricultural fields or sparse coastal scrub. It primarily is found in arid regions supporting short grass habitats. Jackrabbits typically are not found in high grass or dense brush where it is difficult for them to locomote, and the openness of open scrub habitat probably is preferred over dense chaparral. They

have also been found in annual grassland, Riversidean sage scrub, alluvial fan sage scrub, Great Basin sagebrush, chaparral, disturbed habitat, southern willow scrub and juniper woodland. They are not found in high mountain forests. It prefers valley bottoms or intermontane valleys.

Status onsite: Low. While the site has minimal suitable habitat, the Project site is a Waste Water Treatment Plant that is fenced a majority of the site. Not observed during the field survey.

Pocketed Free-tailed Bat

Status: Species of Special Concern

Habitat(s): This bat species prefers rocky desert areas with high cliffs or rock outcrops. Rock crevices in cliffs are preferred as roosting sites, since the bat must drop from the roost to gain flight speed. Typically reproduces in rock crevices, caverns, or buildings. Ranges from southern California to New Mexico.

Status onsite: None. The site lacks suitable habitat. Not observed during the field survey.

Steelhead – Southern California DPS

Status: Federally Endangered State Candidate Endangered

Habitat(s): Historically, this species populated all coastal streams of southern California with permanent flows, as either resident or anadromous forms, or both. Today, the species occurs mostly within intermittent streams. The DPS includes all naturally spawned anadromous Coastal Rainbow trout populations downstream of natural and human-made barriers in streams from the Santa Maria River (San Luis Obispo County) to the Tijuana River on the U.S.-Mexico border. They are most abundant in the four largest watersheds in the northern portion of their range: the Santa Maria, Santa Ynez, Ventura, and Santa Clara rivers.

Status onsite: None. The site lacks suitable habitat. Not observed during the field survey.

Los Angles Pocket Mouse

Status: Species of Special Concern

Habitat(s): Prefers sandy soil for burrowing. Also known to occur on gravel washes and in rocky soils. Associated with coastal scrub.

Status onsite: None. The site lacks suitable habitat. Not observed during the field survey.

Coastal California gnatcatcher (*Polioptila californica californica*)

Status: Federally threatened, Species of Special Concern

Habitat(s): A non-migratory, permanent resident of coastal sage scrub habitat, which is a broad category of vegetation that includes the following plant communities: Ventura coastal sage scrub, Diegan coastal sage scrub, maritime succulent scrub, Riversidean sage scrub, Riversidean alluvial fan sage scrub, southern coastal bluff scrub, and coastal sage-chaparral scrub. They also use chaparral, grassland and riparian habitats next to coastal sage scrub, but these habitats are used dispersal and foraging. They avoid nesting on steep slopes.

Status onsite: Low. The Project site has disturbed California buckwheat scrub but consists of brittlebush scrub and disturbed habitats. While there is suitable habitat, it is a small patch and not sustainable for a pair. Not observed during the field survey.

Delhi Sands Flower-loving fly
Status: Federally Endangered
Habitat(s): The Delhi Sands flower-loving fly is dependent on Delhi sands and Delhi sand dunes with less than 50% vegetation cover. Typical vegetation includes California buckwheat, California croton (*Croton californicus*), and telegraph weed (*Heterotheca grandiflora*).
Status onsite: None. A DSF habitat assessment was performed on February 15, 2023 and March 2, 2023 by Ken Osborne of Osborne Biological Consulting. Based on that assessment, it was determined the Project site is not suitable for the species. The site lacks suitable habitat. Not observed during the field surveys or habitat assessment.

Least Bell's Vireo (*Vireo bellii pusillus*)
Status: federally endangered, state endangered
Habitat(s): This species primarily occupies riverine riparian habitats that typically feature dense cover within 1-2 m of the ground and a dense, stratified canopy. Typically, it is associated with southern willow scrub, cottonwood-willow forest, mule fat scrub, sycamore alluvial woodland, coast live oak riparian forest, arroyo willow riparian forest, or mesquite in desert localities. It uses habitat which is limited to the immediate vicinity of water courses.
Status onsite: None. No suitable habitat occurs onsite. Not observed during the field survey.

Summary of Sensitive Wildlife Species
No special status wildlife species or evidence of their presence were observed or heard during the field survey. Given the Project site's disturbed environment, proximity to the Water Treatment Plant, and lack of suitable habitat for the sensitive species, there is no opportunity sensitive wildlife species to occur within the Project site.

5.5.1 Wildlife Species Observed or Detected

Wildlife activity was moderate, and the species observed are typical urbanized species. The animal species or signs thereof observed during the CSLS surveys are listed below:

Birds:

- American crow (*Corvus brachyrhynchos*)
- California towhee (*Melozone crissalis*)
- Bewick's wren (*Thryomanes bewickii*)
- American avocet (*Recurvirostra americana*)
- White crowned sparrow (*Zonotrichia leucophrys*)
- American bushtit (*Psaltriparus minimus*)
- Yellow-rumped warbler (*Setophaga coronata*)

- Western bluebird (*Sialia mexicana*)
- Cooper's Hawk *(Accipiter cooperii)*
- house finch (*Haemorhous mexicanus*)
- mourning dove (*Zenaida macroura*)
- song sparrow (*Melospiza melodia*)
- Anna's hummingbird (*Calypte anna*)
- turkey vulture (*Cathartes aura*)

Reptiles:

- western fence lizard (*Sceloporus occidentalis*)

Mammals:

- cottontail rabbit (*Sylvilagus audubonii*)
- California ground squirrels (*Spermophilus beecheyi*)
- coyote (*Canis latrans*)

5.6 Regional Connectivity/Wildlife Movement

The Project site does not support regional wildlife movement. The Project site consists of primarily brittlebush scrub and disturbed vegetation communities, within the Rialto Water Treatment Plant, which is located to the north of the Project site. This further constrains potential regional wildlife movement through the Project site.

Although regional movement through this area is likely limited, there is some potential for smaller or "local" movement through the Study Area for more urbanized species. Movement on a smaller scale could occur within the site for species that are less restricted in movement pathway requirements or are adapted to commercial/urban areas [e.g., squirrels, coyotes, and avian species in general).

Bird species may fly over the Project site to utilize the site for foraging, although this is expected to be limited due to the high level of human activity in the region. In summary, the site may support live-in and movement habitat for species on a local scale. Due to development surrounding the site, the site likely provides little to no function to facilitate movement for wildlife species on a regional scale.

5.7 Delhi Sands Flower-Loving Fly Assessment

Due to the location of the Project site adjacent to Delhi Sands flower-loving fly conservation areas, a habitat assessment for this species was conducted by Ken Osborne on February 15, 2023 (Appendix E). A subsequent survey was performed on March 2, 2023 on the Parking Alternative areas to determine the suitability for the DSF to occur onsite. The Delhi Sands flower-loving fly is a Federally Endangered species which is dependent on Delhi sands and Delhi sand dunes with less than 50% vegetation cover. Typical vegetation includes California buckwheat (*Eriogonum fasciculatum*), California croton (*Croton californicus*), and telegraph weed (*Heterotheca grandiflora*).

The entire Project site is on alluvial soils therefore the Project site is determined to be Unsuitable for DSF. The nearest extant DSF population appears immediately east and northeast of the water treatment facility on the eastern side of the existing channel. DSF have been observed (Osborne pers. obs.) 300 meters east, 350 meters east northeast, and within 0.9 km north northwest of the Project area. However, based on the proximity of DSF populations in the area, conditions on the entire Project site and surroundings west of the existing channel (which bounds the eastern edge of the Rialto water treatment facility) presents conditions Unsuitable for DSF.

Furthermore, the proposed parking lot location is determined to be Unsuitable for DSF due to lack of Delhi sand soil type.

5.8 Jurisdictional Areas

5.8.1 Summary of Jurisdictional Waters

The Rialto Channel runs west to east on the eastern portion of the Project site. The channel is concrete.

5.8.2 Waters of the United States

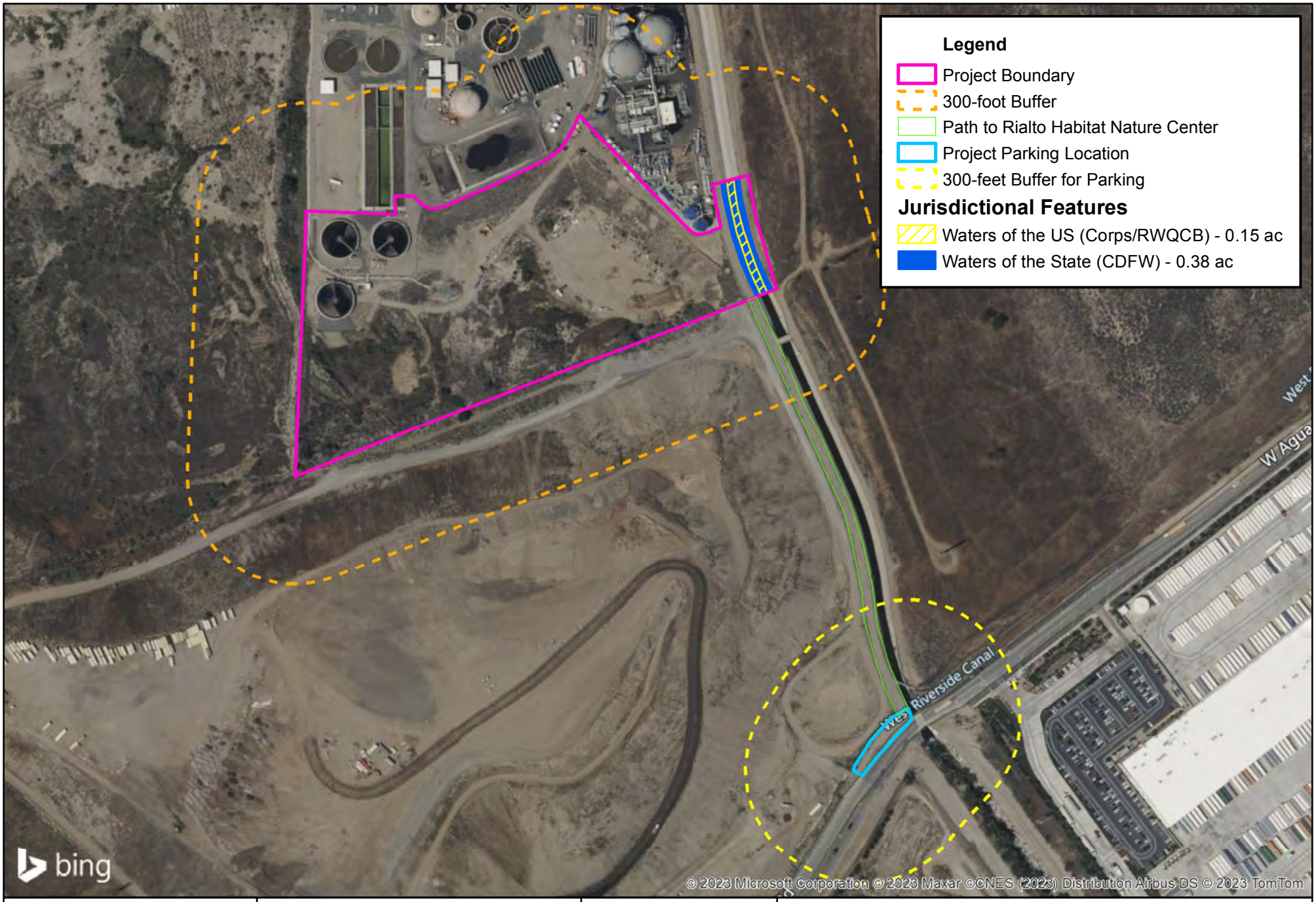
This section relies on the term "Waters of the United States" as it applies to the jurisdictional limits under the authority of the Army Corps of Engineers under the Clean Water Act and applies to the jurisdiction of the Regional Water Quality Control Board under the Porter-Cologne Water Quality Act. Based on the methodology described in Section 4.3, both literature/data base review and a field delineation were conducted to determine the presence of Waters of the United States.

A total of 0.15 acres as shown on Figure 6. The Rialto Channel is concrete within the Project boundary and has relatively permanent water due to the discharge of flows from the Waste Water Treatment Plant.

5.8.3 Waters of the State

The Study Area includes Waters of the State that meet CDFW characteristics in accordance with FGC Section 1600 (Brady and Vyverberg 2013). The only Waters of the State jurisdictional feature located within the Study Area is the concrete lined Rialto Channel due to the presence of biological and physical characteristics of a stream subject to the Jurisdiction of CDFW under FGC §1600 et seq.

A total of 0.38 acres as shown on Figure 6. The Rialto Channel is concrete within the Project boundary.



GIS Prepared By:
Carlson SLS

Created: January 23, 2023

0 87.5 175 350 525 700 Feet

1 inch = 350 feet

Data Sources: Bing Maps

Rialto Habitat Nature Center Project

Jurisdictional Waters Map

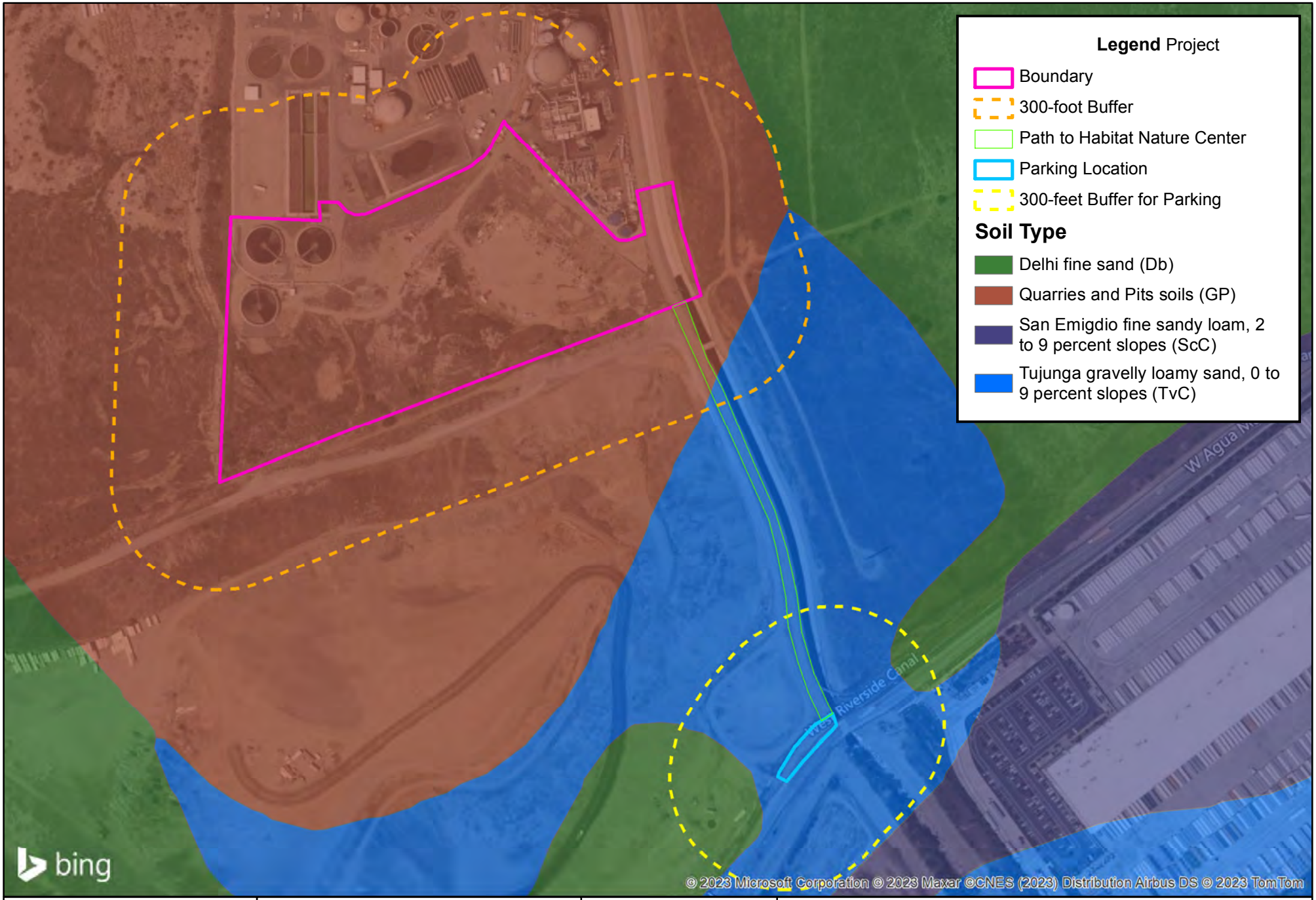
FIGURE 6

5.9 Soils Mapping

The United States Department of Agriculture Natural Resources Conservation Service lists three soil types (series) for the Study Area (Figure 7). Please see below for the following soil type, which was used to determine the possibility for sensitive wildlife and plant species. No unique soil types exist on the Project site.

The following soil types are mapped within the Study Area and shown on Figure 7:

- Quarries and Pits Soils (GP)
- Tujunga gravelly loamy sand, 0 to 9 percent slopes (TvC)



GIS Prepared By:
Carlson SLS

Created: January 23, 2023

0 87.5 175 350 525 700 Feet

1 inch = 350 feet

Data Sources: Bing Maps

Rialto Habitat Nature Center Project

Soil Map

FIGURE 7

6.0 Threshold of Significance

Appendix G of the CEQA Guidelines is used by public agencies in determining whether a project may have a significant impact on biological resources. Under Appendix G, a project may have a significant impact on biological resources if it would:

Threshold BIO-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 CDFW or USFWS.

Threshold BIO-B Have a substantial adverse effect on any riparian habitat or other sensitive plant community identified in local or regional plans, policies, regulations, or by the CDFW or USFWS.

Threshold BIO-C Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the CWA (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.

Threshold BIO-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 areas.

Threshold BIO-E Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.

Threshold BIO-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.

For the purposes of this impact analysis the following definitions apply:

- "Substantial adverse effect" means loss or harm of a magnitude which, based on current scientific data and knowledge would: (1) substantially reduce population numbers of a listed, candidate, sensitive, rare, or otherwise special status species; (2) substantially reduce the distribution of a sensitive plant community/habitat type; or (3) eliminate or substantially impair the functions and values of a biological resource (e.g., streams, wetlands, or woodlands) in a geographical area defined by interrelated biological components and systems. In the case of this analysis, the prescribed geographical area is considered to be the region that includes the USGS topographic quadrangle for the site. For some species,

the geographic area may extend to the vicinity of the site based on known distributions of the species.

- "Conflict" means contradiction of a magnitude, which based on foreseeable circumstances, would preclude or prevent substantial compliance.

- "Rare" means: (1) that the species exists in such small numbers throughout all, or a significant portion of, its range that it may become endangered if its environment worsens; or (2) the species is likely to become endangered within the foreseeable future throughout all or a significant portion of its range and may be considered "threatened" as that term is used in the FESA.

7.0 Significance Determination and Proposed Mitigation

7.1 Regulatory Setting

Sensitive species are provided protection by either Federal or State resource management agencies, or both, under provisions of the FESA and CESA.

There are a number of performance criteria and standard conditions that must be met as part of any review and approval of the proposed Project. These include compliance with all of the terms, provisions, and requirements with applicable laws that relate to Federal, State, and local regulating agencies related to potential impacts to sensitive plant and wildlife species, wetlands, riparian habitats, and blue lined stream courses. Impacts are sometimes locally important but not significant because, although they would result in an adverse alteration of existing local conditions, they would not substantially diminish or result in the permanent loss of an important resource on a population-wide or region-wide basis.

7.2 Project Related Impacts

For the purpose of this assessment, Project-related impacts consist of direct and indirect impacts. Direct impacts are considered to be those that involve the loss, modification or disturbance of natural habitats (i.e., vegetation or plant communities), which in turn, directly affect plant and wildlife species dependent on that habitat. Direct impacts also include the destruction of individual plants or wildlife, which is typically the case in species of no to low mobility (i.e., plants, amphibians, reptiles, and small mammals). The collective loss of individuals in these manners may also directly affect regional population numbers of a species or result in the physical isolation of populations thereby reducing genetic diversity and, hence, population stability.

Indirect impacts are considered to be those that involve the effects of increases in ambient levels of sensory stimuli (e.g., noise, light), unnatural predators (e.g., domestic

cats and other non-native animals), and competitors (e.g., exotic plants, non-native animals). Indirect impacts may be associated with the construction and/or operation of a project; therefore, these impacts may be both short-term and long-term in their duration. These impacts are commonly referred to as "edge effects" and may result in changes in the behavioral patterns of wildlife and reduced wildlife diversity and abundance in habitats adjacent to project sites.

The determination of impacts in this analysis is based on the proposed Project development plan and the biological values of the habitat and/or sensitivity of plant and wildlife species to be affected. Any recommended mitigation measures to address impacts are discussed below, along with compliance of existing regulations.

7.2.1 Impacts to Vegetation Communities

Direct impacts resulting from Project implementation consist of any ground-disturbing activities (i.e., vegetation removal, grading, paving, structures, landscaping, fuel modification zone, etc.). These areas would be permanently affected by the construction of the Project. Calculations are based on the currently proposed development design in conjunction with the vegetation map from the field survey and aerial imagery. The proposed development plan can be found on Figure 3.

Indirect temporary impacts to plant communities include the effects of fugitive dust created by grading activities, vehicle construction traffic, or offsite discharge of surface water runoff with its associated erosion and sedimentation. Grading-related dust could settle on plant surfaces and indirectly inhibit metabolic processes such as photosynthesis and respiration. Grading-related erosion, runoff, sedimentation, soil compaction, and alteration of drainage patterns may affect plants by altering site conditions so that the location in which they are growing becomes unfavorable. Another example of indirect impacts includes the introduction and spread of invasive, exotic plants which could result in permanent indirect impacts to adjacent native plant communities.

Figure 8 and Table 2 describe and list the approximate total acreages of vegetation communities that will be impacted by Project activities within the Project boundary. It is anticipated that the entire Project site would be impacted with the implementation of the Project.

Table 2. Vegetation Community Impacts

Vegetation Community	Existing Vegetation (acres)	*Impacts (acres)*	Avoided (acres)
Brittle Bush Scrub	3.85	2.23	1.62
Disturbed Brittle Bush Scrub	0.10	0.10	0.00
Disturbed California Buckwheat Scrub	0.12	0.12	0.00
Mulefat Thicket	0.12	0.12	0.00

Non-native Grasslands	0.45	0.35	0.10
Tamarisk Thicket	0.43	0.40	0.03
Ruderal	2.06	1.86	0.20
Disturbed	7.71	5.99	1.72
Developed	2.21	0.12	2.09
TOTAL	17.05	11.29	5.76

Direct impacts to the 8.72 acres of tamarisk thicket, non-native grasslands, ruderal, disturbed and developed communities onsite from Project implementation, are not significant because these areas consist of built environment and non-native vegetation communities. Further, the species found within these vegetation communities include common plant species which are present in large numbers throughout the region and the removal is not considered significant.

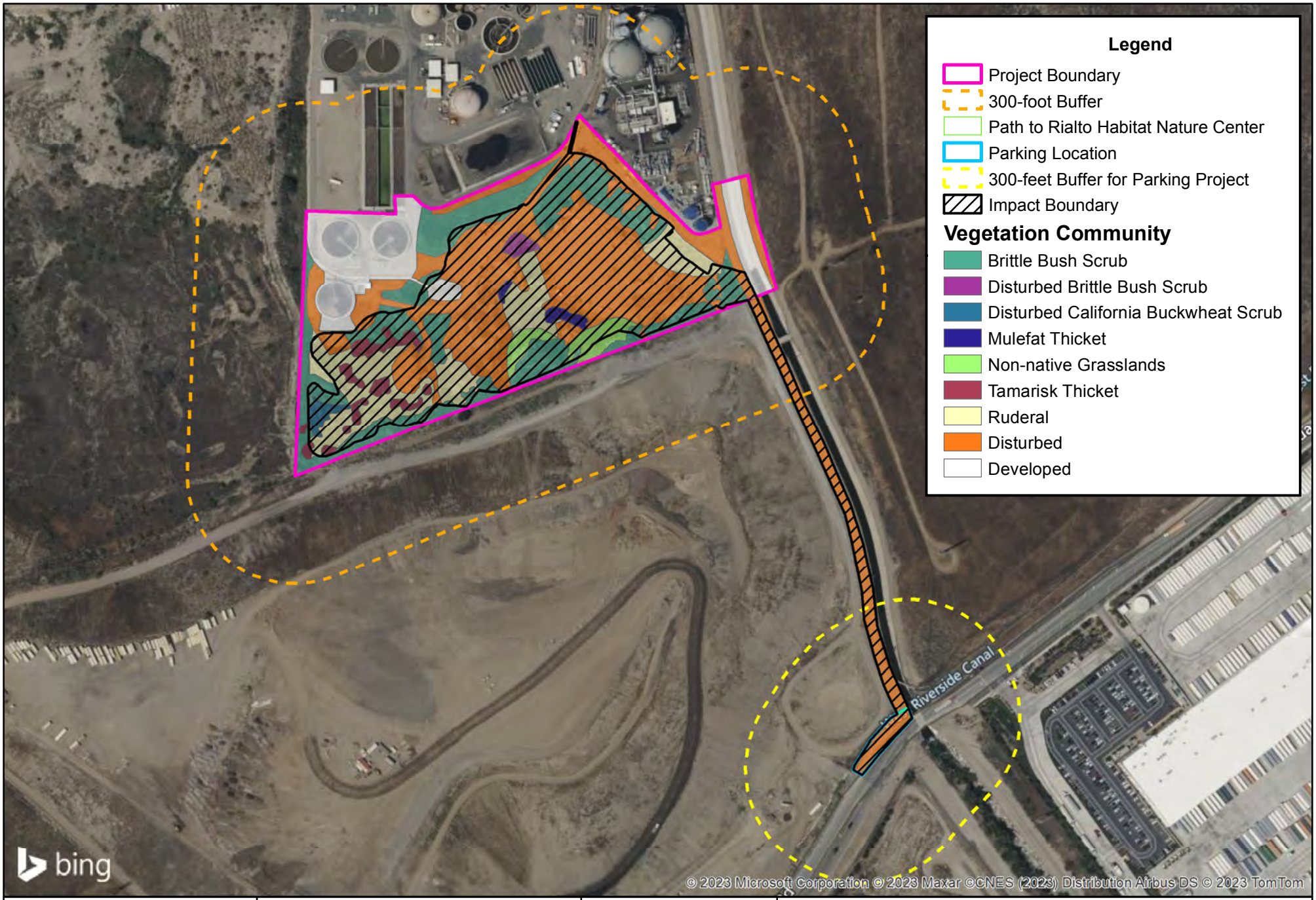
Direct impacts to 2.57 acres of native vegetation communities (brittlebush scrub, disturbed brittlebush scrub, disturbed California buckwheat scrub, and mulefat thicket) from Project implementation is not considered significant because while native, the limited area does not contain any sensitive species, plants or wildlife, or represent sensitive habitats identified through CNDDB or CDFW sensitive plant communities. The species found within these communities includes common plant species which are present in large numbers throughout the region and the removal is not considered significant. Furthermore, the habitat to be associated with the creation of the two lakes include the creation of these vegetation communities on the slopes and shelf of the lakes. No indirect impacts to the surrounding 300-foot buffer area are anticipated.

7.2.2 Impacts to Jurisdictional Features

Any direct impact to the jurisdictional waters would require authorization from the Resource Agencies (Corps, CDFW, and RWQCB) before any impacts could commence.

The only jurisdictional resource found onsite is the Rialto Channel. The channel is concrete within the Project boundary. No jurisdictional impacts would occur with Project implementation as the outfall area is not anticipated to change. Therefore, no mitigation is required. Furthermore, the Project creates new wetland and riparian habitat with the creation of the two lakes and various planting zones.

It should be noted that the City has the ability and capacity to choose not to divert any water into the lakes post construction, effectively concluding the existence of the lakes. Reasons for not diverting the water could be cost of maintenance and repairs to the lakes or overall operations of the lakes. The Rialto Habitat Nature Center Project is fully autonomous to the overall system, and should budget decline in the City, the City has the authorization to stop any diverting water into the lake and return to pre-project conditions.



GIS Prepared By:
Carlson SLS

Created: April 16, 2023

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1 inch = 350 feet

Data Sources: Bing Maps

Rialto Habitat Nature Center Project

Vegetation Impact Map

FIGURE 8

7.3 Threshold BIO - A

Would the Project have a substantial adverse effect, either directly or through habitat modifications, on any species identified as 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.

7.3.1 Sensitive Plant Species

No special status plant species exist within the Project site. No suitable habitat for the plant species is found within the Project site, and no observations of sensitive species have been made; therefore, no impact would occur.

7.3.2 Sensitive Wildlife Species

The Project site has nesting and foraging habitat for avian species and special status wildlife identified below due to the location and surrounding land uses and the built nature of the Project site during construction and operations. The existing habitat found onsite does not provide suitable habitat for sensitive wildlife species.

Direct impacts associated with vegetation removal, as a result of construction and long-term operations in the form of vegetation maintenance, may occur to all avian species covered under the Migratory Bird Treaty Act (MBTA) with the removal of potential nesting and foraging habitat. Under Mitigation Measure BIO-1, if Project construction or operational maintenance is scheduled to occur during the typical breeding bird season (January 1 through August 15 for raptors and February 15 through August 31 for all other avian species), direct removal of vegetation and indirect short-term noise effects to birds that may forage or nest onsite or within the buffer area may occur. In order to reduce direct and indirect impacts on nesting birds, if vegetation removal and/or construction activities were to occur during nesting bird season, a pre-construction nesting bird survey would be required within five (5) days of ground disturbances during typical nesting bird season to delineate any active nests found within the Study Area. Should an active nest be observed, a no-work buffer shall occur surrounding the active nest, until determined by the Project Biologist it has become inactive. The implementation of the pre-construction nesting bird survey would prevent any direct or indirect impacts due to the removal of vegetation and construction-related noise on species covered under the MBTA.

The Migratory Bird Treaty Act protects nesting activities of both native and non-native bird species. Under the Act it is unlawful to harm, harass, or take a nest. Furthermore, pre-construction and pre-operational vegetation maintenance nesting bird surveys as outlined within Mitigation Measure BIO – 1 would ensure protection against direct impacts associated with vegetation removal and maintenance or indirect impacts associated with construction or operational maintenance related noise impacts for avian species covered under the MBTA during the typical nesting bird season.

Implementation of MM BIO-1 would reduce potential impacts to special status wildlife species to less than significant.

> MM BIO – 1: If grading or site disturbance or operational vegetation maintenance is to occur between January 1 through August 15 for raptors and February 15 through August 31 for all other avian species, a nesting bird survey shall be conducted within all suitable habitat, onsite and within 300-feet surrounding the site (as feasible), by a qualified biologist within no more than 5 days of scheduled vegetation removal or start of ground disturbing activities, to determine the presence of nests or nesting birds. If active nests are identified, the biologist shall establish buffers around the vegetation (500 feet for raptors and sensitive species, 200 feet for non-raptors/non-sensitive species). All work within these buffers shall be halted until the nesting effort is finished (i.e. the juveniles are surviving independent from the nest). The onsite biologist shall review and verify compliance with the no-work buffers and verify the nesting effort has finished. Work can resume when no other active nests are found onsite or within the surrounding buffer area. Alternatively, a qualified biologist may determine that construction can be permitted within the buffer areas of an active nest with preparation and implementation of a monitoring plan to prevent any impacts while the nest continues to be active (eggs, chicks, etc.). Upon completion of the survey and any follow-up construction avoidance management, a report shall be prepared documenting mitigation monitoring compliance. If ground disturbances have not commenced within 5 days of a negative survey or if construction activities have stopped for 5 days or longer, the nesting survey must be repeated to confirm the absence of nesting birds.

Furthermore, following Project implementation the lakes would include coastal sage scrub and riparian habitats. The creation of the lakes and adjacent habitats provides superior habitat than the vegetation communities being impacted. Furthermore, Project implementation would provide superior nesting and foraging habitat for avian species.

With the implementation of MM BIO-1 potential adverse impacts to nesting birds and special status wildlife species are reduced to a less than significant level during both the construction phase and operational maintenance phase.

7.3.3 Critical Habitat

The Study Area does not contain a designated Critical Habitat overlay. The closest designated Critical Habitat is located approximately 0.50 miles south for the Santa Ana Sucker. No designated Critical Habitat is located onsite; therefore, there are no potential impacts to designated Critical Habitat due to Project implementation. Furthermore, no suitable habitat occurs onsite for the Santa Ana Sucker.

7.4 Threshold BIO- B

Would the Project 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 contains the Rialto Channel, which is located on the eastern portion of the Project site. The Channel is not impacted as part of Project implementation. Therefore, no impacts are expected to occur to Waters of the State and no mitigation is required.

It should be noted that the City has the ability and capacity to choose not to divert any water into the lakes post construction, effectively concluding the existence of the lakes. Reasons for not diverting the water could be cost of maintenance and repairs to the lakes or overall operations of the lakes. The Rialto Habitat Nature Center Project is fully autonomous to the overall system, and should budget decline in the City, the City has the authorization to stop any diverting water into the lake and return to pre-project conditions.

7.5 Threshold BIO - C

Would the project 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.

The Project site contains the Rialto Channel, which is located on the eastern portion of the Project site. The Channel is not impacted as part of Project implementation. Therefore, no impacts are expected to occur to Waters of the State and no mitigation is required.

It should be noted that the City has the ability and capacity to choose not to divert any water into the lakes post construction, effectively concluding the existence of the lakes. Reasons for not diverting the water could be cost of maintenance and repairs to the lakes or overall operations of the lakes. The Rialto Habitat Nature Center Project is fully autonomous to the overall system, and should budget decline in the City, the City has the authorization to stop any diverting water into the lake and return to pre-project conditions.

7.6 Threshold BIO - D

Would the project 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?

Less than Significant with Mitigation Incorporated.

7.6.1 Wildlife Movement

The site supports potential live-in and movement habitat for species on a local scale (i.e., some limited live-in and marginal movement habitat for reptile, bird, and mammal species), however, the site provides little to no function to facilitate wildlife movement on a regional scale due to the primary developed nature surrounding the Project site. Movement on a local scale likely occurs with species adapted to urban environments due to the surrounding development and disturbances in the vicinity of the site. Although implementation of the Project would result in disturbances to local wildlife movement within the site, those species adapted to urban areas would be expected to persist on-site following construction within the newly created lakes.

Furthermore, following Project implementation the lakes would include coastal sage scrub and riparian habitats. The creation of the lakes and adjacent habitats provides superior habitat than the vegetation communities being impacted and more potential live-in and movement habitat for species.

As such, impacts would be less than significant, and no mitigation measures would be required.

7.6.2 Migratory Birds and Raptors

The Study Area supports potential nesting and foraging habitat for migratory birds. While the loss of foraging/nesting habitat as a result of the proposed Project implementation would cause a significant loss of foraging/nesting habitat for migratory birds and raptors, the Project proposes to create two lakes and associated wetland/riparian habitats and opportunities for nesting and foraging habitat. Therefore, impacts to foraging habitat would be less than significant and no mitigation measures are required with the implementation of the Project.

The site supports songbird nests due to the presence of a shrubs and tamarisk thickets current and will support vegetation in both coastal sage scrub and riparian habitat post-construction. Nesting activity typically occurs from January 1 through August 15 for raptors and February 15 through August 31 for all other avian species. Disturbing or destroying active nests is a violation of the MBTA (16 U.S.C. 703 et seq.). In addition, nests and eggs are protected under Fish and Wildlife Code Section 3503. As such, direct impacts to breeding birds (e.g. through nest removal) or indirect impacts (e.g. by noise causing abandonment of the nest) is potentially significant. Compliance with the MBTA during construction and operational vegetation maintenance would reduce impacts to a less than significant level, as detailed in MM BIO-1.

7.7 Threshold BIO - E

Would the project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

No Impact.

The Project is not subject to any local policies, such as a tree preservation ordinance, that protect biological resources. Therefore, no impacts would occur, and no mitigation is necessary.

7.8 Threshold BIO - F

Would the project 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.

The City or Rialto nor the County of San Bernardino do not have an adopted Conservation Plan, Natural Community Conservation Plans, or other approved local, regional, or state habitat conservation plans. The Project is located near DSF observed occurrences, located 300 meters east, 350 meters east northeast, and within 0.9 km north northwest of the Project site. Furthermore, DSF conservation occurs to the east and west of the Project site. The Project site does not contain suitable habitat for the DSF, therefore, no impacts would occur to DSF conservation area since the Project site is not located within designated preserve or reserve area. Therefore, no mitigation is necessary.

The local biological agencies including the San Bernardino Valley Municipal Water District (SBVMWD) have drafted a Habitat Conservation Plan (HCP) for the Upper Santa Ana River (SAR) watershed, which is a comprehensive program that would provide a framework to protect, enhance, and restore the habitat for Covered Species defined in the HCP while streamlining permitting for Covered Activities. This plan has not been approved by the Wildlife Agencies (USFWS and CDFW) at the time of this Assessment. However, it is the intent of the Project to maintain the existing flows of the WWTP discharge into Rialto Channel. Following Project implementation the discharge will meet and exceed the 7 cfs requirement proposed as part of the SAR HCP.

8.0 Cumulative Impacts

The loss of biological resources on the Study Area must be considered in the context of the other development in the area. The Project's direct impact analysis identified nesting birds that when combined with impacts from other reasonably past, present, and future projects, could result in a cumulative biological impact. Direct impacts may occur to nesting birds should construction activities and vegetation removal take place during the typical nesting season. However, adherence and implementation of MM BIO - 1 will ensure impacts to nesting and breeding avian species and their habitats are minimized thus reducing the Project's contribution to cumulative impacts to less than significant. Furthermore, following Project implementation, the lakes would include coastal sage scrub and riparian habitats. The creation of the lakes and adjacent habitats

provides superior habitat than the vegetation communities being impacted and more potential nesting and foraging habitat for species.

Development surrounding the Project site is essentially build-out, therefore there is a lesser potential to impact foraging habitat for song birds and raptors than loss of nesting habitat. The proposed Project constitutes the reuse of an existing developed area and creates lakes and riparian habitat to further enhance the area and provide additional nesting and foraging habitat to avian species. It is not anticipated that additional development would occur in the Project area due to the built-out nature thus conserving the DSF Conservation area and with the implementation of the Project provide additional habitat for avian species. Since the proposed Project is the reconstructed of habitat in a developed area, the proposed Project would not contribute to a cumulative impact, resulting in a less than significant cumulative impact.

9.0 Literature Cited

Amphibiaweb. 2023. Species Accounts. Retrieved from: http://amphibiaweb.org/search/index.html

AOU (The American Ornithologists' Union). 1998. Check-List of North American Birds. 7th Edition. American Ornithologists' Union, Washington, D.C. 829 pp.

Baldwin, B. G., D. H. Goldman, D. J. Keil, R. Patterson, T. J. Rosatti, and D. H. Wilken, editors. 2012. The Jepson Manual: Vascular Plants of California, second edition. University California Press, Berkeley.

Bowers, N., R. Bowers, and K. Kaufman. 2004. Mammals of North America. Houghton Mifflin Company, New York.

Brady, Roland H. III, Kris Vyverberg. 2013. Methods to Describe and Delineate Episodic Stream Processes on Arid Landscapes for Permitting Utility-Scale Solar Power Plants. California Energy Commission. Publication Number: CEC-500-2014-013.

Calflora. 2023. Calflora website - search for plants. Retrieved from: http://www.calflora.org/species/index.html.

CaliforniaHerps.com. 2023. California Herps. A Guide to the Reptiles and Amphibians of California. Retrieved from: http://www.californiaherps.com/.

Cal-IPC (California Invasive Plant Council). 2006. California Invasive Plant Inventory. Cal-IPC Publication 2006-02. California Invasive Plant Council: Berkeley, CA. Retrieved from: http://www.cal-ipc.org/ip/inventory/index.php.

CDFW (California Department of Fish and Wildlife). 2023. Natural Communities List. Biographic Data Branch. The Vegetation Classification and Mapping Program. https://www.wildlife.ca.gov/Data/VegCAMP/Natural-Communities.

CDFW (California Department of Fish and Wildlife). 2023a. California Endangered Species Act (CESA). Retrieved from: https://www.wildlife.ca.gov/Conservation/CESA.

CDFW (California Department of Fish and Wildlife). 2023b. California Environmental Quality Act (CEQA). Retrieved from: https://www.wildlife.ca.gov/Conservation/CEQA.

CDFW (California Department of Fish and Wildlife). 2023c. Fish and Game Code Section 1600-1616. Retrieved from: https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=3784.

CDFW (California Department of Fish and Wildlife). 2023d. Lake and Streambed Alteration Program. Retrieved from: https://www.wildlife.ca.gov/Conservation/LSA.

CDFW (California Department of Fish and Wildlife). 2023e. Life History Accounts and Range Maps – California Wildlife Habitat Relationship System. Retrieved from: https://www.wildlife.ca.gov/Data/CWHR/Life-History-and-Range.

CDFW (California Department of Fish and Wildlife). 2023f. RareFind, California Department of Fish and Wildlife, California Natural Diversity Database (CNDDB). State of California, The Natural Resources Agency, Department of Fish and Wildlife, Biogeographic Data Branch, California Natural Diversity Database, Sacramento, CA.

CDFW (California Department of Fish and Wildlife), Natural Diversity Database. February 2023g. Special Vascular Plants, Bryophytes, and Lichens List. Quarterly publication. 140 pp.

CDFW (California Department of Fish and Wildlife), Natural Diversity Database. February 2023h. Special Animals List. Periodic publication. 67 pp. Retried from: https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=109406.

CDFW (California Department of Fish and Wildlife). 2023i. State and Federally Listed Endangered, Threatened, and Rare Plants of California. State of California, The Resources Agency, Department of Fish and Wildlife, Resource Management and Planning Division, Biogeographic Data Branch, California Natural Diversity Database, Sacramento, CA.

Clark, W.S. and B.K. Wheeler. 2001. A Field Guide to Hawks of North America, Second Edition. Houghton Mifflin Company, Boston and New York.

California Native Plant Society, Rare Plant Program. 2023. Inventory of Rare and Endangered Plants of California (online edition, v8-03 0.39). Website http://www.rareplants.cnps.org [accessed 12 March 2018].

Corps (United States Army Corps of Engineers). 2008. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0), ed. J. S. Wakeley, R. W. Lichvar, and C. V. Noble. ERDC/EL TR-08-28. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

Eder, Tamara. 2005. Mammals of California. Lone Pine Publishing International Inc, Auburn, WA.

Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual, Technical Report Y-87-1, U.S. Army Engineer Waterways Experimental Station, Vicksburg, Mississippi.

EPA (United States Environmental Protection Agency). 2011. Laws and Regulations. Summary of the Endangered Species Act. Retrieved from: http://www.epa.gov/lawsregs/laws/esa.html

Fahrig, L., and G. Merriam. 1985. Habitat patch connectivity and population survival. Ecology 66:1762-1768.

Federal Interagency Committee for Wetland Delineation. 1989. Federal Manual for Identifying and Delineating Jurisdictional Wetlands. U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, and USDA Soil Conservation Service, Washington, DC Cooperative technical publication.

Fish and Game Commission. 2023. California Law. California Fish and Game Code. Retrieved from: http://leginfo.legislature.ca.gov/faces/codesTOCSelected.xhtml?tocCode=FGC&tocTitle=+Fish+and+Game+Code+-+FGC

Google. 2023. GoogleEarth© website.

Government Printing Office. 1991. Federal Register, 1989 "Federal Manual for Identifying Jurisdictional Wetlands; Proposed Revisions." August 14, 1991, Vol. 56, No. 157, pp 40446-40480.

Harris, L.D. and Gallagher, P.B. 1989. New initiatives for wildlife conservation: The need for movement corridors. In defense of wildlife: Preserving communities and corridors. pp. 11-34. Edited by G. Mackintosh. Defenders of Wildlife, Washington, DC.

Holland, R.F. 1986. Preliminary Descriptions of the Terrestrial Natural Communities of California. State of California, The Resources Agency, Nongame Heritage Program, California Department of Fish & Game, Sacramento, Calif. 156 pp.

Jennings, M.R. and M.P. Hayes. 1994. Amphibian and Reptile Species of Special Concern in California. Submitted to the California Department of Fish and Game Inland Fisheries Division. Rancho Cordova, CA.

National Geographic Society. Edited by Jonathan Alderfer. 2006. Complete Birds of North America. National Geographic Society. Washington D.C.

NatureServe. 2023. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available http://explorer.natureserve.org.

NRCS (Natural Resource Conservation Service). 2023. Web Soil Survey. U.S. Department of Agriculture Natural Resources Conservation Service. Retrieved from: http://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx

Sibley, David Allen. 2000. National Audubon Society, The Sibley Guide to Birds. Alfred A. Knopf, New York.

Simberloff, D., and J. Cox. 1987. Consequences and costs of conservation corridors. Conservation Biology. 1:63-71.

Soule, Michael E. 1987. Viable populations for conservation. Cambridge University Press. Cambridge Cambridgeshire and New York.

SWRCB (State Water Resources Control Board). 2011. Porter-Cologne Water Quality Control Act with Additions and Amendments Effective April 2017. Compiled by the Office of Chief Counsel.
Retrieved from:
http://www.swrcb.ca.gov/laws_regulations/docs/portercologne.pdf

USDA (United States Department of Agriculture) Natural Resources Conservation Service. 1995. Hydric Soils of California.

USFWS (United States Fish and Wildlife Service). 2023a. FWS Critical Habitat for Threatened and Endangered Species. Retrieved from https://www.fws.gov/endangered/.

USFWS (United States Fish and Wildlife Service). 2023b. Migratory Birds & Habitat Programs. Migratory Bird Treaty Act. Retrieved from: https://www.fws.gov/birds/policies-and-regulations.php.

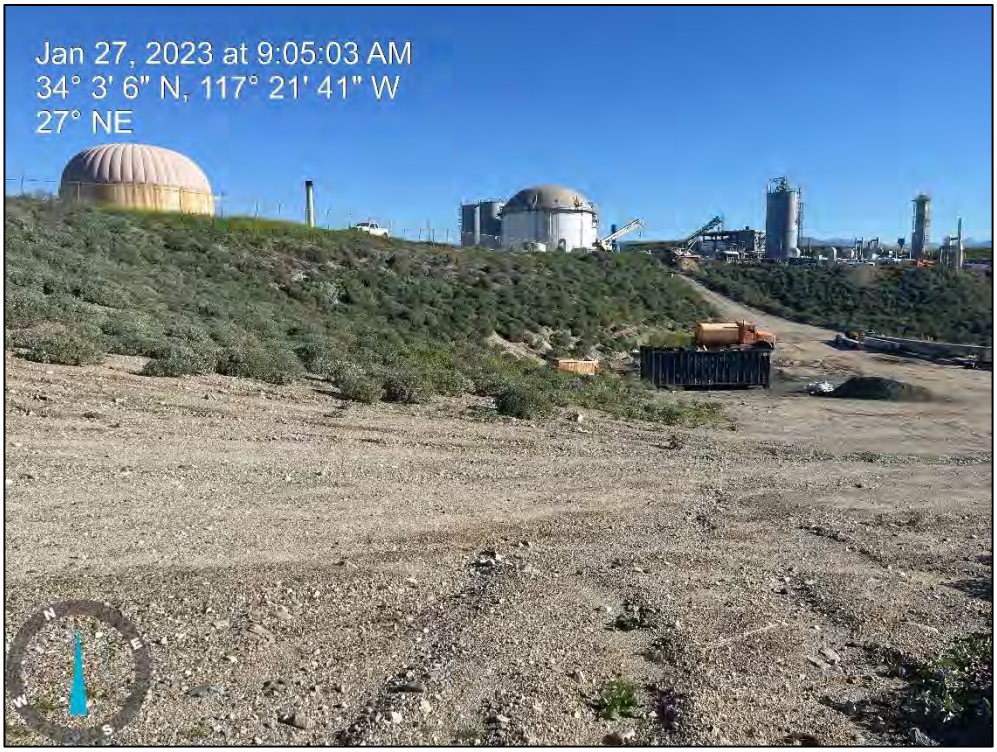
USFWS (United States Fish and Wildlife Service). 2023c. National Wetlands Inventory. Wetlands Mapper. Retrieved from: http://www.fws.gov/wetlands/Data/mapper.html.

WTI (Wetland Training Institute, Inc.). 1999. Field Guide for Wetland Delineation: 1987 Corps of Engineers Manual. Glenwood, NM WTI 99-1. 143 pp.

WTI (Wetland Training Institute, Inc.). 2003. Wetland Delineation Lecture Notes and Field Guide for Wetland Delineation based on the Corps of Engineers 1987 Manual. WTI, New Mexico.

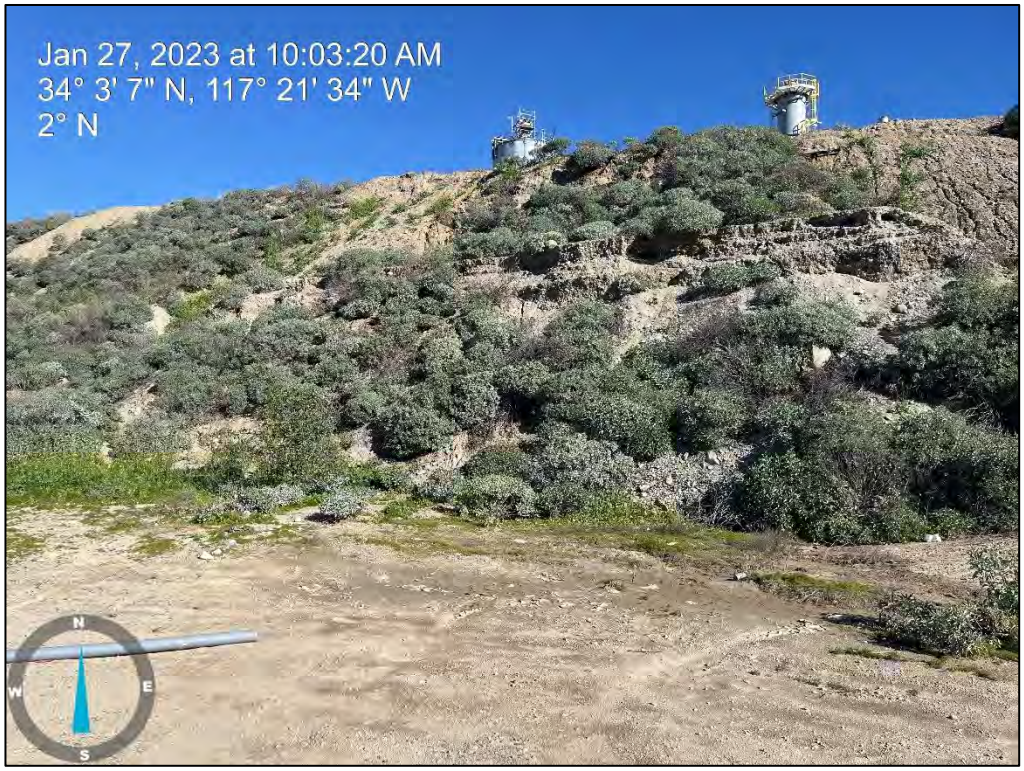
APPENDIX A

Representative Photographs of Community Classification

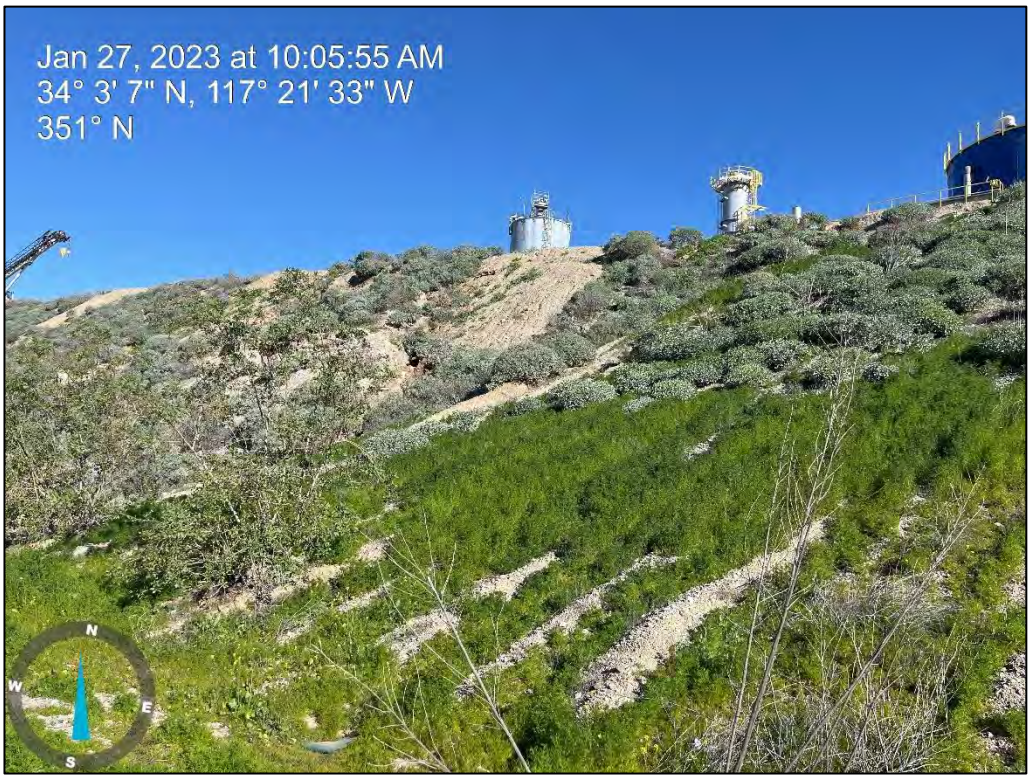


Looking north on the Project site with Encelia slopes and disturbed habitat.

Much of the Project site is disturbed habitat.



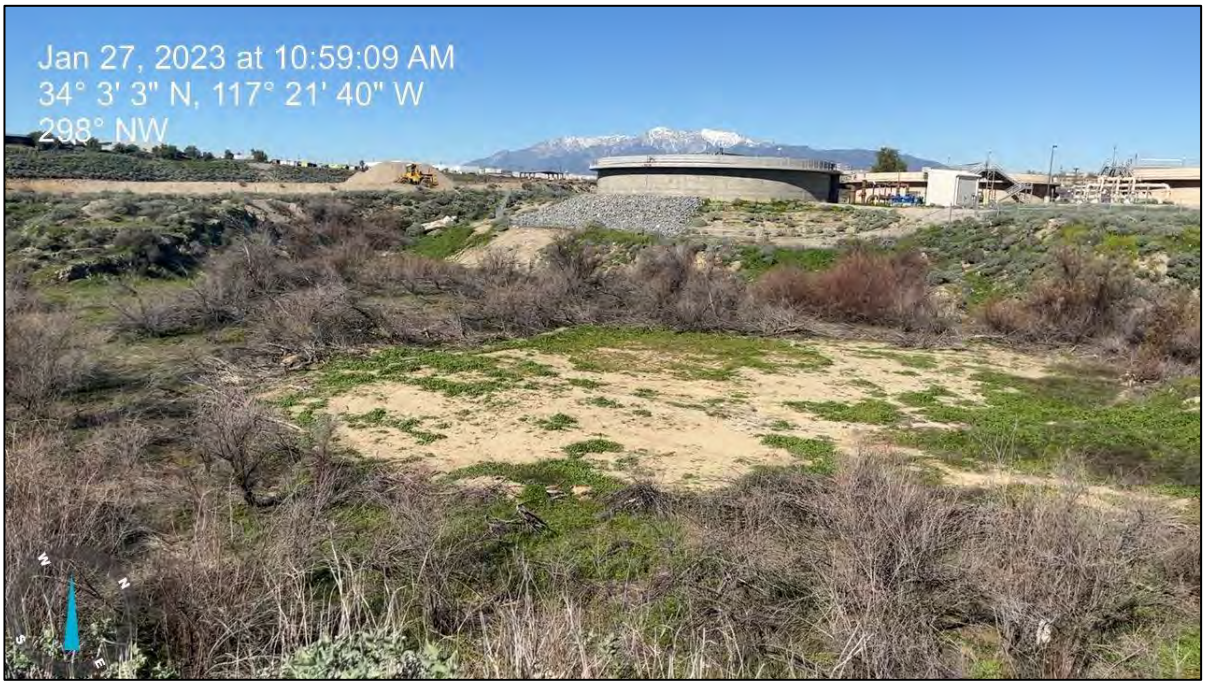
Many of the slopes on the Project site consist of brittle bush scrub.



Several slopes included non-native grasslands.

Looking south over the Project site.

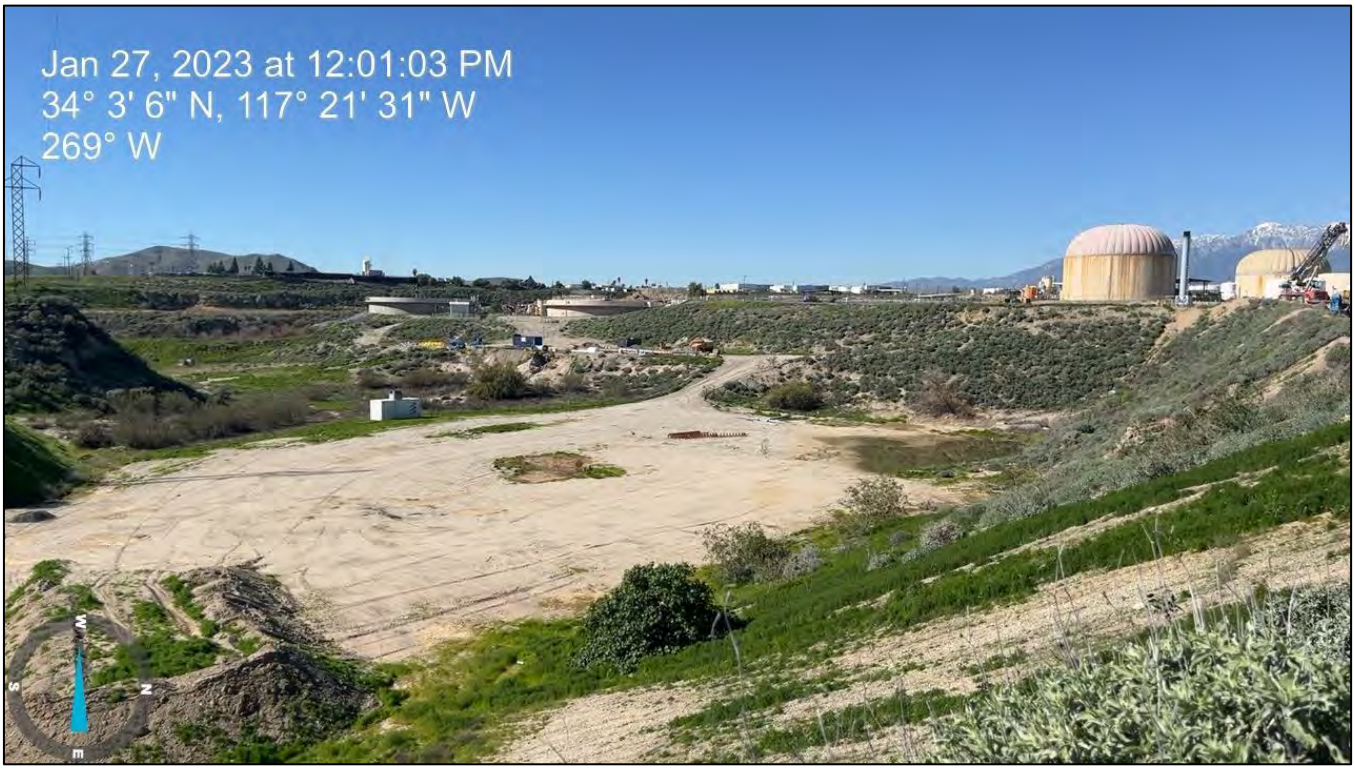
Looking northeast across the Project site with ruderal habitat and brittle bush scrub slope



Areas of tamarisk stands.

The Project site included scattered slopes of California sage scrub.

Looking east over the Project site.



Looking west over the Project site.

The proposed parking location consists of disturbed habitat.

Proposed trail path that would lead to the Rialto Habitat Nature Center Project.

APPENDIX B

Plant Species Recorded During Field Surveys

Appendix B contains the list of vascular plant taxa recorded during the 2023 biological survey conducted within the Study Area. Plant nomenclature and taxonomic order is based on *The Jepson Manual: Vascular Plants of California, s*econd Edition (Baldwin *et al.* 2012).

Plant Species Observed during the Field Survey

EUDICOTS

VASCULAR SPECIES

ASTERACEAE–Sunflower Family

Artemisia californica–California sagebrush

Baccharis pilularis–coyote brush

Baccharis salicifolia–mulefat

Centaurea melitensis–Maltese star-thistle*

Centaurea solstitialis–yellow star-thistle*

Encelia farinosa–brittle bush

Oncosiphon piluliferum–stinknet*

BRASSICACEAE–Mustard Family

Hirschfeldia incana–shortpod mustard*

GERANIACEAE–Geranium Family

Erodium cicutarium–redstem stork's bill*

LAMIACEAE–Mint Family

Salvia apiana–white sage

POLYGONACEAE–Buckwheat Family

Eriogonum fasciculatum var. fasciculatum–California buckwheat

TAMARICACEAE–Tamarisk Family

Tamarix ramosissima–tamarisk*

MONOCOTS

VASCULAR SPECIES

POACEAE–Grass Family

Avena barbata–slender oat*

Bromus diandrus–ripgut brome*

Bromus madritensis ssp. rubens–red brome*

APPENDIX C

Special Status Plant Species Potential Occurrence Determination

APPENDIX C

Special Status Plant Species Potential Occurrence Determination

This table summarizes conclusions from analysis and field surveys regarding the potential occurrence of special status plant species within the Project site for the USGS 7.5-Minute Topographic Map San Bernardino South and the surrounding two-mile radius. During the field surveys, the potential for special status plant species to occur within the Project site was assessed based on the following criteria:

- Present: observed on the site during the field surveys, or recorded on-site by other qualified biologists.

- Known to Occur: observed on site in the recent past, but not observed during the most recent biological survey.

- High potential to occur: observed in similar habitat in the region by a qualified biologist or habitat on the site is a type often utilized by the species, and the site is within the known distribution and elevation range of the species.

- Moderate potential to occur: reported sightings in surrounding region, or the site is within the known distribution and elevation range of the species, and habitat on the site is a type occasionally used by the species.

- Low potential to occur: the site is within the known distribution and elevation range of the species, but habitat on the site is rarely used by the species or for which there are no known recorded occurrences of the species within or adjacent to the site.

- None: a focused study failed to detect the species or no suitable habitat is present.

- Unknown: the species' distributional/elevation range and habitat are poorly known.

Even with field surveys, biologists assessed the probability of occurrence rather than make a definitive conclusion about species presence or absence. Failure to detect the presence of the species is not definitive and may be due to variable effects associated with fire, rainfall patterns, and/or season.

Special Status Plants: Potential to Occur within the Study Area

Scientific Name	Common Name	Status	General Habitat Description	Potential For Occurrence within the Study Area
Arenaria paludicola	marsh sandwort	FE, SE CRPR:1B.1	Habitats supporting sandy openings and marshes and swamps (freshwater or brackish). Known from 3 to 170 meters (9 to 558 feet) MSL. Bloom Period: May through August.	None. No suitable habitat is found within the Study Area. Not observed during field survey.
Astragalus hornii var. hornii	Horn's milk-vetch	CRPR: 1B.1	Habitats supporting Meadows and seeps, Playas along alkaline and lake margins. Known from 60 to 850 meters (195 to 2,790 feet) MSL. Bloom period May through October.	None. No suitable habitat is found within the Study Area. Not observed during field survey.
Carex comosa	Bristly Sedge	CRPR: 2B.1	Habitats supporting Coastal prairie, Marshes and swamps (lake margins), Valley and foothill grassland. Known from 0 to 625 meters (0 to 2,050 feet) MSL. Bloom period May through September.	None. No suitable habitat is found within the Study Area. Not observed during field survey.
Centromadia pungens ssp. laevis	smooth tarplant	CRPR:1B.1	Alkaline areas in chenopod scrub, meadows and seeps, ditches, playas, riparian woodland, and valley and foothill grassland. Known from below 480 meters (1,600 feet) MSL. Blooming Period: April through September.	None. No suitable habitat is found within the Study Area. Not observed during field survey.
Chloropyron maritimum ssp. maritimum	salt marsh bird's-beak	FE, SE CRPR: 1.B2	Habitats supporting coastal dunes and marshes and swamps (coastal salt). Known from 0 to 30 meters (0 to 985 feet) MSL. Blooming Period: May through November.	None. No suitable habitat is found within the Study Area. Not observed during field survey.
Chorizanthe parryi var. parryi	Parry's spineflower	CRPR:1B.1	Found in sandy or rocky openings. Habitat includes chaparral, cismontane woodland, coastal scrub, and valley and foothill grasslands. Known from 275 to 1,220 meters (900 to 4,000 feet) MSL. Blooming period: April through June.	None. No suitable habitat is found within the Study Area. Not observed during field survey.
Cuscuta obtusiflora var. glandulosa	Peruvian Dodder	CRPR: 2B.2	Habitats supporting Marshes and swamps (freshwater). Known from 15 to 280 meters (50 to 920 feet) MSL. Bloom Period: July through October.	None. No suitable habitat is found within the Study Area. Not observed during field survey.
Dodecahema leptoceras	Slender-horned spineflower	CRPR: 1B.1	Habitats supporting sandy soils within Chaparral, Cismontane woodland, Coastal scrub (alluvial fans). Known from 200 to 760 meters (655 to 2,495 feet) MSL. Bloom period: April to June.	None. No suitable habitat is found within the Study Area. Not observed during field survey.

Scientific Name	Common Name	Status	General Habitat Description	Potential For Occurrence within the Study Area
Eriastrum densifolium ssp. sanctorum	Santa Ana Wolllystar	CRPR: 1B.1	Habitats supporting Chaparral, Coastal scrub (alluvial fans). Known from 91 to 610 meters (300 to 2,000 feet) MSL. Bloom period: April to September.	None. No suitable habitat is found within the Study Area. Not observed during field survey.
Galium californicum ssp. primum	Meadow Bedstraw	CRPR: 1B.2	Habitats supporting Chaparral, Lower montane coniferous forest. Known 1,350 to 1,700 meters (4,430 to 5,580 feet) MSL. Bloom period: May through July.	None. No suitable habitat is found within the Study Area. Not observed during field survey.
Helianthus nuttallii ssp. parishii	Los Angeles Sunflower	CRPR: 1A	Habitats supporting marshes and swamps (freshwater). Known from 10 to 1,525 meters (35 to 5,005 feet) MSL. Bloom period: August through October.	None. No suitable habitat is found within the Study Area. Not observed during field survey.
Horkelia cuneata var. puberula	Mesa horkelia	CRPR: 1B.1	Habitats supporting Chaparral (maritime), Cismontane woodland, Coastal scrub. Known from 70 to 810 meters (230 to 2,660 feet) MSL. Bloom period: February through July.	None. No suitable habitat is found within the Study Area. Not observed during field survey.
Lycium parishii	Parish's desert-thorn	CRPR: 2B.3	Habitats supporting Coastal scrub, Sonoran desert scrub. Known rom 135 to 1,000 meters (445 to 3,280 feet) MSL. Bloom period: March through April.	None. No suitable habitat is found within the Study Area. Not observed during field survey.
Malacothamnus parishii	Parish bush-mallow	CRPR: 1A	Habitats supporting Chaparral, Coastal scrub. Known from 305 to 455 meters (1,000 to 1,495 feet) MSL. Bloom period: June through July.	None. No suitable habitat is found within the Study Area. Not observed during field survey.
Monardella pringlei	Pringle's monardella	CRPR: 1A	Habitats supporting Coastal scrub (sandy). Known from 300 to 400 meters (985 to 1,310 feet) MSL. Bloom period: May through June.	None. No suitable habitat is found within the Study Area. Not observed during field survey.
Nasturtium gambelii	Gambel's water cress	CRPR: 1B.1	Habitats supporting Marshes and swamps (brackish, freshwater). Known from 5 to 330 meters (15 to 1,085 feet) MSL. Bloom period: April through October.	None. No suitable habitat is found within the Study Area. Not observed during field survey.
Ribes divaricatum var. parishii	Parish's gooseberry	CRPR: 1A	Habitats supporting Riparian woodland. Known from 65 to 300 meters (215 to 985 feet) MSL. Bloom period: February through April.	None. No suitable habitat is found within the Study Area. Not observed during field survey.
Senecio aphanactis	Chaparral ragwort	CRPR: 2B.2	Habitats supporting Chaparral, Cismontane woodland, Coastal scrub. Known from 15 to 800 meters (50 to 2,625 feet) MSL. Bloom period: Jan through April.	None. No suitable habitat is found within the Study Area. Not observed during field survey.

Scientific Name	Common Name	Status	General Habitat Description	Potential For Occurrence within the Study Area
Sidalcea neomexicana	salt spring checkerbloom	CRPR: 2B.2	Habitats supporting Chaparral, Coastal scrub, Lower montane coniferous forest, Mojavean desert scrub, Playas. Known from 15 to 1,530 meters (50 to 5,020 feet) MSL. Bloom period: March through June.	None. No suitable habitat is found within the Study Area. Not observed during field survey.
Sphenopholis obtusata	prairie wedge grass	CRPR: 2B.2	Habitats supporting Cismontane woodland, Meadows and seeps. Known from 300 to 2,000 meters (985 to 6,560 feet) MSL. Bloom period: April to July.	None. No suitable habitat is found within the Study Area. Not observed during field survey.
Symphyotrichum defoliatum	San Bernardino aster	CRPR: 1B.1	Habitats supporting Cismontane woodland, Coastal scrub, Lower montane coniferous forest, Marshes and swamps, Meadows and seeps, Valley and foothill grassland (vernally mesic). Known from 2 to 2,040 meters (5 to 6,695 feet) MSL. Bloom period: July through November.	None. No suitable habitat is found within the Study Area. Not observed during field survey.

Legend

Federal Endangered Species Act (ESA) Listing Codes: federal listing is pursuant to the Federal Endangered Species Act of 1973, as amended (ESA).
FE = federally listed as endangered: any species, subspecies, or variety of plant or animal that is in danger of extinction throughout all or a significant portion of their range.
FT = federally listed as threatened: any species, subspecies, or variety of plant or animal that is considered likely to become endangered throughout all or a significant portion of its range within the foreseeable future.

California Endangered Species Act (CESA) Listing Codes: state listing is pursuant to § 1904 (Native Plant Protection Act of 1977) and §2074.2 and §2075.5 (California Endangered Species Act of 1984) of the Fish and Game Code, relating to listing of Endangered, Threatened and Rare species of plants and animals.
SE = state listed as endangered: any species, subspecies, or variety of plant or animal that are in serious danger of becoming extinct throughout all, or a significant portion, of their range.
ST = state listed as threatened: any species, subspecies, or variety of plant or animal that, although not presently threatened with extinction, is likely to become an endangered species in the foreseeable future.

California Rare Plant Ranks (Formerly known as CRPR Lists): the CRPR is a statewide, non-profit organization that maintains, with CDFG, an Inventory of Rare and Endangered Plants of California. In the spring of 2011, CRPR and CDFG officially changed the name "CRPR List" or "CRPR Ranks" to "California Rare Plant Rank" (or CPRP). This was done to reduce confusion over the fact that CRPR and CDFG jointly manage the Rare Plant Status Review Groups and the rank assignments are the product of a collaborative effort and not solely a CRPR assignment.

CRPR: 1B - California Rare Plant Rank 1B (formerly List 1B): Plants Rare, Threatened, or Endangered in California and Elsewhere. All of the plants constituting California Rare Plant Rank 1B meet the definitions of Sec. 1901, Chapter 10 (Native Plant Protection Act) or Sections 2062 and 2067 (California Endangered Species Act) of the California Department of Fish and Game Code, and are eligible for state listing. It is mandatory that they be fully considered during preparation of environmental documents relating to CEQA.

CRPR: 2 - California Rare Plant Rank 2 (formerly List 2): Plants Rare, Threatened, or Endangered in California, But More Common Elsewhere. All of the plants constituting California Rare Plant Rank 2 meet the definitions of Sec. 1901, Chapter 10 (Native Plant Protection Act) or Sections 2062 and 2067 (California Endangered Species Act) of the California Department of Fish and Game Code, and are eligible for state listing. It is mandatory that they be fully considered during preparation of environmental documents relating to CEQA.

CRPR: 4 - California Rare Plant Rank 4 (formerly List 4): Plants of Limited Distribution - A Watch List. Very few of the plants constituting California Rare Plant Rank 4 meet the definitions of Sec. 1901, Chapter 10 (Native Plant Protection Act) or Secs. 2062 and 2067 (California Endangered Species Act) of the California Department of Fish and Game Code, and few, if any, are eligible for state listing. Nevertheless, many of them are significant locally, and CRPR and CDFG strongly recommend that California Rare Plant Rank 4 plants be evaluated for consideration during preparation of environmental documents relating to CEQA.

California Native Plant Society (CRPR) Threat Ranks: The CRPR Threat Rank is an extension added onto the California Rare Plant Rank (CRPR) and designates the level of endangerment by a 1 to 3 ranking with 1 being the most endangered and 3 being the least endangered. A Threat Rank is present for all California Rare Plant Rank 1B's, 2's, 4's, and the majority of California Rare Plant Rank 3's. California Rare Plant Rank 4 plants are seldom assigned a Threat Rank of 0.1, as they generally have large enough populations to not have significant threats to their continued existence in California; however, certain conditions exist to make the plant a species of concern and hence be assigned a California Rare Plant Rank. In addition, all California Rare Plant Rank 1A (presumed extinct in California), and some California Rare Plant Rank 3 (need more information) plants, which lack threat information, do not have a Threat Rank extension.

0.1 = seriously endangered in California (over 80% of occurrences threatened / high degree and immediacy of threat)
0.2 = fairly endangered in California (20-80% occurrences threatened / moderate degree and immediacy of threat)

Sources:

- Calflora website - search for plants (Calflora 2023).
- CRPR Inventory of Rare and Endangered Plants (CRPR 2023).
- The Status of Rare, Threatened, and Endangered Plants and Animals of California, 2000–2004 (CDFW 2023).
- The Jepson Manual: *Vascular Plants of California,* second edition (Baldwin *et al.* 2012).
- RareFind, CDFW, California Natural Diversity Database (CNDDB) (CDFW 2023f).
- State and Federally Listed Endangered, Threatened, and Rare Plants of California (CDFW 2023i).

APPENDIX D

Special Status Wildlife Potential Occurrence Determination

APPENDIX D

Special Status Wildlife Potential Occurrence Determination

This table summarizes conclusions from analysis and field surveys regarding the potential occurrence of special status wildlife species within the Project site for the USGS 7.5-Minute Topographic Map San Bernardino South and the surrounding two-mile radius. During the field surveys, the potential for special status wildlife species to occur within the Project Site was assessed based on the following criteria:

- Present: observed on the site during the field surveys, or previously recorded on-site by other qualified biologists.

- Known to Occur: observed on site in the recent past, but not observed during the most recent biological survey.

- High potential to occur: observed in similar habitat in the region by a qualified biologist or habitat on the site is a type often utilized by the species, and the site is within the known distribution and elevation range of the species.

- Moderate potential to occur: reported sightings in surrounding region, or the site is within the known distribution and elevation range of the species, and habitat on the site is a type occasionally used by the species.

- Low potential to occur: the site is within the known distribution and elevation range of the species, but habitat on the site is rarely used by the species or for which there are no known recorded occurrences of the species within or adjacent to the site.

- None: a focused study failed to detect the species or no suitable habitat is present.

- Unknown: the species' distributional/elevation range and habitat are poorly known.

Even with field surveys, biologists assessed probability of occurrence rather than make definitive conclusions about species presence or absence. Failure to detect the species is not definitive and may be due to variable effects associated with migration, weather, fire, and/or time of day and year.

Special Status Wildlife: Potential to Occur within the Study Area

Scientific Name	Common Name	Status	General Habitat Description	Potential For Occurrence
Agelaius tricolor	Tricolor blackbird	ST, SSC, BLMS, BBC	Tricolor blackbird colonies require nearby water, a suitable nesting substrate, and open-range foraging habitat composed of grassland, woodland, or agricultural cropland.	None. No suitable habitat is found within the Project site. Not observed during field survey.
Aimophila ruficeps canescens	southern California rufous-crowned sparrow	WL	They are found on grass-covered hillsides, coastal sage scrub, and chaparral and often occur near the edges of the denser scrub and chaparral associations. Preference is shown for tracts of California sagebrush. Optimal habitat consists of sparse, low brush or grass, hilly slopes preferably interspersed with boulders and outcrops. The species may occur on steep grassy slopes without shrubs if rock outcrops are present. It is a very secretive species.	None. No suitable habitat is found within the Project site. Not observed during the field surveys.
Anniella stebbinsi	Southern California legless lizard	SSC	Coastal sand dunes and a variety of interior habitats, including sandy washes and alluvial fans.	None. No suitable habitat is found within the Project site. Not observed during field survey.
Arizona elegans occidentalis	California glossy snake	SSC	This species is found in a variety of habitats, primarily arid scrub areas with sparse vegetation including chaparral and grasslands areas.	None. No suitable habitat is found within the Project site. Not observed during field survey.
Aspidoscelis hyperythra	orange-throated whiptail	SSC, FSS	The species is generally found in semi-arid brushy areas typically with loose soil and rocks, including washes, stream sides, rocky hillsides, and coastal chaparral. Habitat types include low elevation chaparral, non-native grassland, (Riversidian) coastal sage scrub, juniper woodland and oak woodland.	None. No suitable habitat is found within the Project site. Not observed during field survey.

Scientific Name	Common Name	Status	General Habitat Description	Potential For Occurrence
			Associations include alluvial fan scrub and riparian areas. Friable soil appears to be a necessary requirement for excavating burrows and hiding eggs.	
Artemisiospiza belli	Bell's sage sparrow	WL	Chaparral and coastal sage scrub along the coastal lowlands, inland valleys and in the lower foothills of local mountains.	None. No suitable habitat is found within the Project site. Not observed during the field surveys.
Aspidoscelis tigris stejnegeri	coastal whiptail	SSC	This species is found in a variety of habitats, primarily hot and dry open areas with sparse vegetation including chaparral, woodland, and riparian areas. This subspecies is found in coastal southern California, north into Ventura County, and south into Baja California. Additional important habitat characteristics include Important habitat components include shrub cover with accumulated leaf litter, and an abundance of invertebrate prey, particularly termites.	Low. The site contains minimal suitable habitat within the disturbed areas. Not observed during field survey.
Athene cunicularia hypugaea	burrowing owl	SSC, BLMS, BCC	Burrowing owls are a year-round resident of California including habitats of open, dry grassland, and desert. They are generally restricted to mostly flat, open country with suitable nest sites. They use rodent or other burrows for roosting and nesting cover and acquire their burrows from either abandonment or eviction. Burrowing owls typically hunt from a perch.	None. A habitat assessment was performed, and no suitable habitat is found within the Project site. Not observed during field survey.
Bombus crotchii	Crotch bumble bee	SCE	The crotch bumble bee inhabits open grassland and scrub habitats. This species occurs primarily in California, including the Mediterranean region, Pacific Coast, Western Desert, Great Valley, and adjacent foothills	None. No suitable nectar sources were observed onsite. No suitable habitat is found within the Project site. Not observed during field survey.

Scientific Name	Common Name	Status	General Habitat Description	Potential For Occurrence
			through most of southwestern California.	
Buteo swainsoni	Swainson's hawk	ST, BLMS, BBC	This hawk prefers open grasslands and desert-like habitats. It is common to see this hawk perched on a fence post in a prairie or open range. The Swainson's Hawk also inhabits agricultural areas, and is known to follow farmer's tractors in search of insect or rodent prey.	None. No suitable habitat is found within the Project site. Not observed during the field survey.
Catostomus santaanae	Santa Ana Sucker	FT	Santa Ana suckers rely on perennial flows with suitable water quality and substrate to support breeding, feeding and sheltering. Over different life history stages, suckers depend on a variety of coarse substrate types, such as gravel, cobble, or mixtures of gravel or cobble with sand, and a variety of riverine features, like shallow riffles and deeper runs and pools.	None. No suitable habitat is found within the Project site. Not observed during the field survey.
Chaetodipus fallax fallax	northwestern San Diego pocket mouse	SSC	This species is a common resident of sandy herbaceous areas, often on sandy substrates (rocks or coarse gravel) in southwestern California. In San Diego County the species occurs mainly in arid coastal and desert border areas. Habitats include coastal scrub, chamise-redshank chaparral, mixed chaparral, sagebrush, desert wash, desert scrub, desert succulent shrub, pinyon-juniper, and annual grassland.	None. No suitable habitat is found within the Project site. Not observed during field survey.
Coccyzus americanus occidentalis	western yellow-billed cuckoo	FT, SE, BLMS, FSS, BCC	This species is an uncommon to rare summer resident of valley foothill and desert riparian habitats in scattered locations in California. Formerly much more common and widespread throughout lowland California. Roosts and nests in densely foliaged,	None. No suitable habitat is found within the Project site. Not observed during field survey.

Scientific Name	Common Name	Status	General Habitat Description	Potential For Occurrence
			deciduous trees and shrubs in extensive thickets, particularly willows.	
Coleonyx variegatus abbotti	San Diego Banded Gecko	SSC	The species ranges through most of Southern California north into the extreme southern part of Nevada and the southwestern tip of Utah, across northwest, southwest, and southeast Arizona into the bootheel of New Mexico, and south down the western edge of the state of Sonora, Mexico and down the entire length of Baja California. The species occurs in rocky areas in coastal sage and chaparral.	None. No suitable habitat is found within the Project site. Not observed during field survey.
Crotalus ruber	red-diamond rattlesnake	SSC, FSS	It can be found from the desert, through dense chaparral in the foothills (it avoids the mountains above around 4,000 feet), to warm inland mesas and valleys, all the way to the cool ocean shore. It is most commonly associated with heavy brush with large rocks or boulders. Dense chaparral in the foothills, cactus or boulder associated coastal sage scrub, oak and pine woodlands, and desert slope scrub associations are known to carry populations of the northern red-diamond rattlesnake, however, chamise and red shank associations may offer better structural habitat for refuges and food resources for this species than other habitats. They need rodent burrows, cracks in rocks or surface cover objects.	None. No suitable habitat is found within the Project site. Not observed during field survey.
Dipodomys merriami parvus	San Bernardino kangaroo rat	FE, SSC	Typically found in Riversidean alluvial fan sage scrub and sandy loam soils, alluvial fans and floodplains, and along washes with nearby	None. No suitable habitat is found within the Project site. Not observed during field survey.

Scientific Name	Common Name	Status	General Habitat Description	Potential For Occurrence
			sage scrub.	
Dipodomys stephensi	Stephen's kangaroo rat	FE, ST	This species prefers large areas of disturbed or patchy annual and perennial grasslands and open coastal sage scrub. Preferred perennials plant species include buckwheat and chamise and preferred annual plant species include brome grass. The nearest known populations are in Rancho Guejito and at the Naval Weapons Station in Fallbrook.	None. No suitable habitat is found within the Project site. Not observed during field survey.
Eumops perotis californicus	Western mastiff bat	SSC	Western mastiff bats are found in a variety of habitats, such as semi-arid to arid habitats, including conifer and deciduous woodlands, coastal scrub, annual and perennial grasslands, palm oases, chaparral, desert scrub, and urban, but the species' distribution may be geomorphically determined, occurring primarily where there are significant rock features offering suitable roosting habitat. A cliff dwelling species, where maternity colonies of 30 to several hundred roost generally under exfoliating rock slabs and rock crevices along cliffs. Western mastiff bats can also be found in similar crevices in large boulders and buildings. When roosting in rock crevices they require a sizable drop from their roost in order to achieve flight. Western mastiff bats prefer deep crevices that are at least 15 or 20 feet above the ground. Foraging is concentrated around bodies of water but also includes coastal sage scrub, chaparral, and grassland habitats.	None. The site lacks suitable roosting habitat for the species. Not observed during the field survey.
Euphydryas editha quino	quino checkerspot	FE	Quino checkerspot butterfly habitat is characterized by patchy shrub or small tree	None. The site lacks suitable habitat for the species. Not observed during the

Scientific Name	Common Name	Status	General Habitat Description	Potential For Occurrence
	butterfly		landscapes with openings of several meters between large plants, or a landscape of open swales alternating with dense patches of shrubs; such habitats are often collectively termed "scrublands." Quino will frequently perch on vegetation or other substrates to mate or bask, and they require open areas to facilitate movement. Optimal habitat appears to contain little or no invasive exotic vegetation. Sustained drought conditions can lead to extirpation of local populations, and broad scale climate anomalies may lead to phenological incompatibility between Quino checkerspot butterfly and their host plants.	field survey.
Gila orcuttii	Arroyo chub	SSC	Arroyo chub are adapted to survive in cool to warm (10 – 24°C) streams that fluctuate between large winter storm flows, and low summer flows, and the low dissolved oxygen and wide temperature fluctuations associated with this flow regime. They are most common in slow flowing or backwater areas with sand or mud substrate but may also inhabit areas with velocities in excess of 80 cm/s over coarse substrate.	None. The site lacks suitable habitat. Not observed during the field survey.
Lasiurus xanthinus	western yellow bat	SSC	Roost in trees, hanging from the underside of a leaf. Commonly found in the southwestern U.S. roosting in the skirt of dead fronds in both native and non- native palm trees and have also been documented roosting in cottonwood trees.	None. The site lacks suitable habitat. Not observed during the field survey.

Scientific Name	Common Name	Status	General Habitat Description	Potential For Occurrence
Laterallus jamaicensis coturniculus	California black rail	ST, BLMS, BBC, Fully Protected	Black Rails nest in marshes and wet meadows across North America, including riparian marshes, coastal prairies, saltmarshes, and impounded wetlands. All of the habitats have stable shallow water. Nests are primarily made of southern cattail or spikerush and are elevated above the mud substrate in clumps of vegetation. Black rails have also been known to nest on top of a mat of dead vegetation from the previous years' growth.	None. No suitable habitat is found within the Project site. Not observed during field survey.
Lepus californicus bennettii	San Diego black-tailed jackrabbit	SSC	The black-tailed jackrabbit is a habitat generalist occurring in open areas or semi-open country, typically in grasslands, agricultural fields or sparse coastal scrub. It primarily is found in arid regions supporting short grass habitats. Jackrabbits typically are not found in high grass or dense brush where it is difficult for them to locomote, and the openness of open scrub habitat probably is preferred over dense chaparral. They have also been found in annual grassland, Riversidean sage scrub, alluvial fan sage scrub, Great Basin sagebrush, chaparral, disturbed habitat, southern willow scrub and juniper woodland. They are not found in high mountain forests. It prefers valley bottoms or intermontane valleys.	None. No suitable habitat is found within the Project site. Not observed during field survey.
Nyctinomops femorosaccus	pocketed free-tailed bat	SSC	This bat species prefers rocky desert areas with high cliffs or rock outcrops. Rock crevices in cliffs are preferred as roosting sites, since the bat must drop from the roost to gain flight speed. Typically reproduces in rock crevices, caverns, or buildings. Ranges from southern	None. No suitable habitat is found within the Project site. Not observed during field survey.

Scientific Name	Common Name	Status	General Habitat Description	Potential For Occurrence
			California to New Mexico.	
Oncorhynchus mykiss irideus pop. 10	Steelhead-Southern California DPS	FE, State Candidate Endangered	Historically, this species populated all coastal streams of southern California with permanent flows, as either resident or anadromous forms, or both. Today, the species occurs mostly within intermittent streams. The DPS includes all naturally spawned anadromous Coastal Rainbow trout populations downstream of natural and human-made barriers in streams from the Santa Maria River (San Luis Obispo County) to the Tijuana River on the U.S.-Mexico border. They are most abundant in the four largest watersheds in the northern portion of their range: the Santa Maria, Santa Ynez, Ventura, and Santa Clara rivers.	None. The site lacks suitable habitat. Not observed during the field survey.
Onychomys torridus ramona	Southern grasshopper mouse	SSC	Common in arid desert habitats of the Mojave Desert and southern Central Valley of California. Alkali desert scrub and desert scrub habitats are preferred, with somewhat lower densities expected in other desert habitats, including succulent shrub, wash, and riparian areas. Also occurs in coastal scrub, mixed chaparral, sagebrush, low sage, and bitterbrush habitats. Uncommon in valley foothill and montane riparian, and in a variety of other habitats.	None. The site lacks suitable habitat for the species. Not observed during the field survey.
Perognathus longimembris brevinasus	Los Angeles pocket mouse	SSC	Prefers sandy soil for burrowing. Also known to occur on gravel washes and in rocky soils. Associated with coastal scrub.	None. No suitable habitat is found within the Project site. Not observed during field survey.
Phrynosoma blainvillii	coast horned lizard	SSC, BLMS	Occurs in a variety of vegetation types including coastal sage scrub, chaparral,	None. No suitable habitat is found within the Project site. Not observed

Scientific Name	Common Name	Status	General Habitat Description	Potential For Occurrence
			annual grassland, oak woodland and riparian woodlands.	during field survey.
Polioptila californica californica	coastal California gnatcatcher	FT, SSC	A non-migratory, permanent resident of coastal sage scrub habitat, which is a broad category of vegetation that includes the following plant communities: Ventura coastal sage scrub, Diegan coastal sage scrub, maritime succulent scrub, Riversidean sage scrub, Riversidean alluvial fan sage scrub, southern coastal bluff scrub, and coastal sage-chaparral scrub. They also use chaparral, grassland and riparian habitats next to coastal sage scrub, but these habitats are used dispersal and foraging. They avoid nesting on steep slopes.	None. No suitable habitat is found within the Project site. Not observed during field survey.
Rhaphiomidas terminates abdominalis	Delhi Sands flower-loving fly	FE	The Delhi Sands flower-loving fly is dependent on Delhi sands and Delhi sand dunes with less than 50% vegetation cover. Typical vegetation includes California buckwheat, California croton (*Croton californicus*), and telegraph weed (*Heterotheca grandiflora*).	None. A DSF habitat assessment was performed on February 15, 2023 and March 2, 2023 by Ken Osborne of Osborne Biological Consulting. Based on that assessment, it was determined the Project site is not suitable for the species. The site lacks suitable habitat. Not observed during the field surveys or habitat assessment.
Spea hammondii	western spadefoot	SSC, BLMS	May be found in coastal sage scrub, open chaparral, pine-oak woodlands and grassland habitats, but is most common in grasslands with vernal pools or mixed grassland/coastal sage scrub areas. Within these habitats, they require rain pools/vernal pools in which to reproduce and that persist with more than	None. No suitable habitat is found within the Project site. Not observed during field survey.

Scientific Name	Common Name	Status	General Habitat Description	Potential For Occurrence
			three weeks of standing water in which to metamorphose successfully. They can also breed in slow-moving streams (e.g., areas flooded by intermittent streams). Water breeding sites must lack fish, bullfrogs, and crayfish in order for to successfully reproduce and metamorphose. They estivates in sandy, gravelly soil in upland habitats adjacent to potential breeding sites in burrows approximating 1 meter in depth.	
Taxidea taxus	American badger	SSC	Badgers prefer to live in dry, open grasslands, fields, and pastures. They are found from high alpine meadows to sea level	None. No suitable habitat is found within the Project site. Not observed during field survey.
Vireo bellii pusillus	least Bell's vireo	FE, SE	Least Bell's vireos primarily occupy riverine riparian habitats that typically feature dense cover within 1-2 m of the ground and a dense, stratified canopy. Typically, it is associated with southern willow scrub, cottonwood-willow forest, mule fat scrub, sycamore alluvial woodland, coast live oak riparian forest, arroyo willow riparian forest, or mesquite in desert localities. It uses habitat which is limited to the immediate vicinity of water courses. 2,000 feet elevation in the interior.	None. No suitable habitat is found within the Project site. Not observed during field survey.

Legend
Federal Endangered Species Act (ESA) Listing Codes: federal listing is pursuant to the Federal Endangered Species Act (ESA) of 1973, as amended. The official federal listing of Endangered and Threatened Animals is published in the Federal Register, 50 CFR 17.11. FE = federally listed as endangered: any species, subspecies, or variety of plant or animal that is in danger of extinction throughout all or a significant portion of their range. FT = federally listed as threatened: any species, subspecies, or variety of plant or animal that is considered likely to become endangered throughout all or a significant portion of its range within the foreseeable future. FC = federal candidate for listing.

FPT = federally proposed threatened.

California Endangered Species Act (CESA) Listing Codes: state listing is pursuant to §2074.2 and §2075.5 (California Endangered Species Act of 1984) of the Fish and Game Code, relating to listing of Endangered, Threatened and Rare species of plants and animals. The official California listing of Endangered and Threatened animals is contained in the California Code of Regulations, Title 14, and Section 670.5.
SE = state listed as endangered: any species, subspecies, or variety of plant or animal that are in serious danger of becoming extinct throughout all, or a significant portion, of their range.
ST = state listed as threatened: any species, subspecies, or variety of plant or animal that, although not presently threatened with extinction, is likely to become an endangered species in the foreseeable future.
SCT = state candidate for listing as threatened.
SCE = state candidate for listing as endangered.

California Department of Fish and Wildlife (CDFW):
SSC = species of special concern: status applies to animals which 1) are declining at a rate that could result in listing, or 2) historically occurred in low numbers and known threats to their persistence currently exist. The CDFW has designated certain vertebrate species as "species of special concern" because declining population levels, limited ranges, and/or continuing threats have made them vulnerable to extinction.
Fully protected = animal species may not be taken or possessed at any time and no licenses or permits may be issued for their take except for collecting these species for necessary scientific research and relocation of the bird species for the protection of livestock.
WL = watch list: these birds have been designated as "Taxa to Watch" in the *California Bird Species of Special Concern report* (Shuford and Gardali 2008). The report defines "Taxa to Watch" as those that are not on the current special concern list that (1) formerly were on the 1978 (Remsen 1978) or 1992 (CDFG 1992) special concern lists and are not currently listed as state threatened and endangered; (2) have been removed (delisted) from either the state or federal threatened and endangered lists (and remain on neither), or (3) are currently designated as "fully protected" in California.

United States Fish and Wildlife Service (USFWS):
BCC = USFWS bird of conservation concern: listed in the USFWS'S 2008 *Birds of Conservation Concern* report. The report identifies species, subspecies, and populations of all migratory non-game birds that, without additional conservation actions, are likely to become candidates for listing under the ESA. While all of the bird species included in the report are priorities for conservation action, the list makes no finding with regard to whether they warrant consideration for ESA listing.

United States Forest Service (USFS):
FSS = Forest Service sensitive: those plant and animal species identified by a Regional Forester that are not listed or proposed for listing under the ESA and for which population viability is a concern, as evidenced by: (a) significant current or predicted downward trends in population numbers or density or (b) significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution."

United States Bureau of Land Management (BLM):
BLMS = BLM sensitive: those plant and animal species on BLM administered lands and that are (1) under status review by the USFWS/NMFS; or (2) whose numbers are declining so rapidly that federal listing my become necessary, or (3) with typically small and widely dispersed populations; or (4) those inhabiting ecological refugia or other specialized or unique habitats. BLM policy is to provide the same level of protection as USFWS candidate species.

California Department of Forestry and Fire Protection (CDF):
CDF: S = CDF sensitive: species is a California Department of Forestry and Fire Protection sensitive species. The Board of Forestry classifies as sensitive species those species that warrant special protection during timber operations.

Sources:

- A Guide to the Reptiles and Amphibians of California (CaliforniaHerps.com 2023).
- *A Field Guide to Hawks of North America, Second Edition* (Clark and Wheeler 2001).
- *Atlas of Breeding Birds, Orange County, California* (Gallagher 1997).
- Amphibian and Reptile Species of Special Concern in California (Jennings and Hayes 1994).
- *A Field Guide to Mammals of North America North of Mexico. Fourth Edition* (Reid 2006).
- *A Natural History of California* (Schoenherr 1992).
- *A Field Guide to Western Reptiles and Amphibians*, *Third Edition* (Stebbins 2003).
- Amphibian species accounts (Amphibiaweb 2023).
- *California Bird Species of Special Concern*: *A ranked assessment of species, subspecies, and distinct populations of birds of immediate conservation concern in California* (Shuford and Gardali 2008).
- Check-List of North American Birds, 7th edition (American Ornithologists' Union [AOU] 1998).
- *Complete Birds of North America* (National Geographic Society 2006).
- *Field Guide to the Birds of North America*, 4th Ed (National Geographic Society 2003).
- Fifty-first supplement to the AOU Check-List of North American Birds (Chesser et. al. 2010).
- Life History Accounts and Range Maps (CDFW 2023e).
- *Life on the Edge: A Guide to California's Endangered Natural Resources. Wildlife* (Thelander et al. 1994).
- *Mammals of North America* (Bowers et al. 2004).
- *Mammals of California* (Eder 2005).
- *Mammals of North America* (Kays and Wilson 2002).
- Mammalian Species of Special Concern in California (Williams 1986).
- *Mammal Species of the World* (Wilson and Reeder 2005).
- NatureServe Explorer (NatureServe 2023).
- *National Audubon Society, the Sibley Guide to Birds* (Sibley 2000).
- RareFind, CDFW, California Natural Diversity Database (CNDDB) (CDFW 2023).
- *Reference Atlas to the Birds of North America* (National Geographic Society 2003).
- *Shorebirds of North America. The Photographic Guide* (Paulson 2005).
- Special Animals List (CDFW 2023h).
- Standard Common and Current Scientific Names (Center for North American Herpetology website [CNAH] website 2023).
- *The Smithsonian Book of North American Mammals* (Wilson and Ruff 1999).
- Terrestrial Mammal Species of Special Concern in California (Bolster 1998).

APPENDIX E

Delhi Sand Flower-Loving Fly Assessment

Ken H. Osborne
Osborne Biological Consulting
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March 7, 2023

Attn: Ms. Brianna Bernard
Project Manager/Biologist
Carlson Strategic Land Solutions
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San Juan Capistrano, CA 92675

RE: Habitat assessment for Delhi Sands Flower-loving Fly on 12.7-acres of the Rialto Wastewater Treatment Plant, Rialto Lake project and associated alternative parking areas, Rialto, CA.

To Whom It May Concern:

On behalf of the Rialto Wastewater Treatment Plant, Carlson Strategic Land Solutions has requested my assessment of habitat conditions and potential for the federally endangered Delhi Sands Flower-loving Fly (DSF, *Rhaphiomidas terminatus abdominalis*) on a 12.7-acre site at the southern end of the Rialto Water Treatment Facility, Rialto, CA. This assessment includes three alternative parking areas associated with the project. For the purpose of this habitat assessment, I have evaluated site conditions for DSF suitability in terms of site characteristics on the basis of a detailed grading system I have developed in recent years.

Summary Conclusions: Though the 12.7-acre project site is within close proximity to known DSF populations, the entire site is situated on alluvial soil substrates and is therefore unsuitable for DSF. Site conditions for the three alternative parking areas are as follows: Agua Mansa Road location (alternative #3) and east end of Santa Ana Avenue (alternative #1) sites are unsuitable for DSF due to lack of Delhi sand soils. The alternative parking location on the Southern California Edison easement at Industrial Drive (alternative #2) represents high quality DSF habitat with high potential for DSF presence.

Qualifications: Although I possess USFWS 10(a) permitting to survey for the federally endangered Delhi Sands Flower-loving Fly, such permitting is generally awarded to biologists only on the basis of a biologist's experience with and/or ability to identify adult DSF, such permitting not awarded on the basis of any real understanding of DSF biology, ecology, or habitat requirements. Traditionally, USFWS considered any land (within the known range of DSF) to have been mapped with Delhi Sands soils (Woodruff 1980) as subject to formal survey for the DSF. Thus, my additional qualifications in this regard include BS, MS, degrees in entomology, 55 years general entomological experience, over thirty-five years' experience with research and discoveries in *Rhaphiomidas* life history, biology, and ecology, such that I am now a leading expert in this narrow field of study.

Natural History of the Delhi Sands Flower-loving Fly: Delhi Sands Flower-loving fly belongs to a genus of flies (*Rhaphiomidas*) commonly known as flower loving flies. There are more than 30

species of these flies, distributed across the southwestern United States and northern Mexico. These flies are huge by the standards set by most flies – with size among the species ranging from approximately 1.5 centimeters up to 3, and even 4 centimeters, usually gray, tan, rust or yellow in color. All species of *Rhaphiomidas* are associated with rather arid, sandy habitats, with most species living on dune systems of inland desert valleys, rivers, deltas, and beach strands. A few species are found in sandy washes, alluvial benches and remnant glacial moraines. Many species of these flies often hover before flowers in the manner of hummingbirds, using a long, thin, tubular proboscis (mouth-part), with which the flies probe for nectar – hence a traditional name "giant flower-loving flies". Smaller flies of the family Apioceridae, once considered very closely related to *Rhaphiomidas* were formerly called "flower-loving flies".

The DSF is only known to occur in association with Delhi sand deposits, presumably occupied the once extensive dune system of the upper Santa Ana River Valley, including portions of what is now the City of Colton, west through portions of the City of Ontario, and south to the Santa Ana River. Today, DSF exists on only a few disjunct sites (USFWS 1997) within a radius of about eight miles in southwestern San Bernardino and northwestern Riverside Counties (Colton, Rialto, Fontana, and Ontario). More than 95 percent of known DSF habitat was considered eliminated by development, agriculture and other land management practices by 1993 (Smith 1993, USFWS 1996 *in* Kingsley 1996), however, this proportion is now nearer 98 to 99% due to these ongoing processes. Many of the last remaining fragments of DSF habitat are currently under pressure by land management efforts such as heavy disking, irrigation, manure dumping, and gravel dumping. There is presently an estimated 1,200 acres of habitat that can support this species (USFWS 1997), but this estimate likely includes lands needing extensive habitat restoration.

Adult DSF flight period is typically August and September, when individual adults emerge, reproduce and die. The adult life span of an individual DSF lasts for a few days and adults do not live beyond the flight period (Kiyani 1995). Adult DSF are highly mobile, agile fliers. Male DSF are frequently seen flying low through habitat, using apparently random, circuitous paths around and between shrubs in search of females. Such "cruising" behavior often covers areas on the scale of 1000 square meters in the time span of a minute. Alternatively, male DSF are often seen flying about an open patch of ground (ca 100 square meters) such as along a dirt path or dune blow-out area. Here, males may repetitively land and rest on one or another object (such as small dried plants) in the area, and such rests are interrupted by periods of patrolling flight (apparently territorial) about the spot. When alarmed, these insects tend to fly rapidly in more or less a straight line – often covering distances of 100 meters in less than 6 seconds. Adult DSF are known to nectar at flowers of California buckwheat and California croton.

DSF, like other *Rhaphiomidas* species, appears to have an annual life cycle (because of the annual flight). However, it has been widely believed that the underground larval/pupal stage may persist for additional years, depending upon various environmental factors such as annual rainfall, food availability and weather conditions during the flight season (many desert *Rhaphiomidas* species do not appear after a drought year and often, substantial flights occur only sporadically over the years). The biology of *Rhaphiomidas trochilus* is likely informative of *Rhaphiomidas* species in general and DSF in particular. Based on observations of captive *R. trochilus* larvae (Osborne and Ballmer 2014) it is reasonable to conclude that they are mobile opportunistic predators of soft-bodied, sand-inhabiting insects. Larvae from Sand Ridge, Kern County, CA were maintained in captivity for several months, during which they burrowed actively through sand maintained with slight moisture

content (similar to the damp sand where they were found). They fed on larvae of a scarab beetle (Scarabaeidae) and an unidentified beefly (Diptera: Bombyliidae), which were also recovered from Sand Ridge, and larvae of paper wasps (*Polistes* sp.) which were removed from their nests and buried in the sand. Captive larvae grew and molted after feeding; but, when not fed for extended periods of time, they molted again – losing weight and size in the process. Some larvae were observed to repeat the growth and "shrinkage" cycle multiple times. One larva survived about 17 months in captivity; because it was captured nine months after the most recent flight season, it was at least two years old at time of death. This larva molted four times while undergoing five cycles of growth and shrinkage driven by variable food availability. Its final dry weight was slightly smaller than the typical dry weight of an adult male *R. trochilus*. The ability of *R. trochilus* larvae to molt down during times of scarce food resources could allow an extended and indeterminate larval growth period, but with maturation and appearance of adults always during summer months. This may also explain the common observations that populations of various *Rhaphiomidas* species apparently exhibit little or no adult emergence in some years (especially years of below normal precipitation).

The brief adult life span and active mate-locating behavior of DSF males (typical of all *Rhaphiomidas* species) suggests that relatively high population density and/or nearly synchronous adult emergence may be crucial to survival of populations. Protracted *Rhaphiomidas* larval biology and staggered (across years) adult emergence must enhance population momentum and cross generational gene flow, and the requirement of abundant and diverse insect prey on which larvae develop – all explain why DSF populations appear as long-term entities (persisting for decades) associated with ecologically intact dune habitats.

DSF Habitat Characteristics: DSF is typically found in areas of unconsolidated sandy soils (Delhi series) supporting an open community of native and exotic plant species. Dominant plants are typically California buckwheat (*Eriogonum fasciculatum*), California croton (*Croton californicus*), telegraph weed (*Heterotheca grandiflora*), annual bur ragweed (*Ambrosia acanthicarpa*) and deerweed (*Acmespon scoparius*) but many exotic species often dominate on DSF habitat as well. DSF have been found in habitats that do not support these dominant plant species, and plant species composition is not directly relevant to larval development (due to predatory biology of DSF larvae). Thus, the implication that DSF are reliant on some of these plant species – an idea often repeated in literature and biological reporting – is false. Adult DSF are anecdotally believed to nectar at flowers of California buckwheat and California croton, though such a habitat is rare at best and not yet documented. Many other plant species are common, including Thurber's eriogonum (*Eriogonum thurberi*), autumn vinegar weed (*Lessingia glandulifera*), and sapphire eriastrum (*Eriastrum sapphirinum*). Nonnative plant species also occur in DSF habitat (and incidentally, virtually everywhere). DSF habitat also commonly supports other associated insects such as flies and wasps considered as indicator species – *Apiocera convergens, Apiocera chrysolasia, Ligyra gozophylax*, *Campsomeris tolteca*, *Trielis alcione*, and *Nemomydas pantherinus*. Over 350 insect species have been found on one DSF site, and DSF habitat is typically marked by high abundance and diversity of predatory and parasitic insect groups including many highly specialized families of flies, wasps, bees, beetles, and antlions. The Delhi Sands community is one of California's unique natural communities containing an array of native plants and animals, some of which are found nowhere else. One plant species, Pringle's monardella, (*Monardella pringlei*) is already presumed extinct, as no living individuals have been observed in

many years. Several species of insects and some vertebrates, which inhabit the Delhi Sands dunes system, are as endangered as the DSF, but no one has yet petitioned to have them officially declared Endangered. These include the convergent flower-loving fly *Apiocera convergens*, a newly discovered species of Jerusalem cricket, (*Stenopelmatus* sp.), a new species of camel cricket (*Ceuthophilus* sp.) and an endemic subspecies of butterfly *Apodemia mormo nigrescens* (Emmel and Emmel 1998). The other apiocerid fly (*Apiocera chrysolasia*), although known from approximately six general localities, is only common within the Delhi sands.

Methods: On February 15, 2023, I visited the primary project site in order to investigate habitat suitability for the DSF. During a subsequent visit on March 2, 2023, I visited three alternative parking areas associated with the project (Alternative #1 located on the eastern end of Santa Ana Avenue, Alternative #2 on an Southern California Edison easement at Industrial Drive, and Alternative #3 located on Agua Mansa Road at the crossing with the Rialto Channel). I have reviewed soil maps covering the project site, prepared by the California Department of Agriculture (Woodruff 1980, https://websoilsurvey.sc.egov.usda.gov). Satellite imagery covering the site, dating from 1994 to 2020 (Google Earth) was reviewed in order to gain an understanding of land use regimens in recent years. Other reports of habitat evaluations and DSF surveys in the vicinity of the project site have been reviewed. Photographs were taken of the site along with field notes on vegetation and soil conditions. I examined the project site to rate its potential to support DSF, the rating based on the following scale of 1 to 5, with 5 being the best quality and most suitable habitat in my judgment:

1. Developed areas, non-Delhi sands soils with high clay, silt, and/or gravel content. Delhi sands extensively and deeply covered by dumping of exotic soils, rubble, trash, manure, or organic debris. *Unsuitable.*

2. Delhi sands are present but the soil characteristics include a predominance of exotic soils such as alluvial materials, or predominance of other foreign contamination as gravels, manure, or organic debris. Severe and frequent disturbance (such as a maintenance yard or high use roadbed). *Very Low Quality.*

3. Moderately contaminated Delhi sands. Delhi sands with moderate to high disturbance (such as annual disking). Sufficient Delhi Sands are present to prevent soil compaction (related to contamination by foreign soils). Some sandy soils exposed on the surface due to fossorial animal activity. *Low Quality.*

4. Abundant clean Delhi Sands with little or no foreign soils (such as alluvial material) present. Moderate abundance of exposed sands on the soil surface. Low vegetative cover. Evidence of moderate degree of fossorial animal activity by vertebrates and invertebrates. May represent high quality habitat with mild or superficial disturbance. *Moderate Quality*

5. Sand dune habitat with clean Delhi Sands. High abundance of exposed sands on the soil surface. Low vegetative cover. Evidence (soil surface often gives under foot) of high degree of fossorial animal activity by vertebrates and invertebrates. Sand associated plant and arthropod species may be abundant and vegetation species composition is often indicative of low disturbance. *High Quality*

It should be noted that habitat qualities often vary spatially within a site so that conditions on a site fall within a range of qualities. Further, overall habitat quality is affected by the overall habitat area on a site, such that very small areas diminish the overall habitat value of a site. Habitat conditions rated from *Very Low Quality* up to *High Quality*, are formally considered as representing *Suitable* conditions for the DSF. Use of this habitat rating system is somewhat subjective and best undertaken by a biologist who has extensive experience with *Rhaphiomidas* species. It must be noted that these ratings do not infer or imply actual occupancy by DSF, only relative potential to harbor the species, and relative conservation value of the land should DSF be found.

Results: The entire site is situated on an area of quarry pits associated with an alluvial wash (the quarried materials were evidently sand and gravel). My field investigation confirms interbedded alluvial course gravely sands (all with presence of abundant larger cobble) as indicated by previous soils mapping (Woodruff 1980, https://websoilsurvey.sc.egov.usda.gov, Figure 1). Plant species characteristic of Delhi sands do not occur on the site. Although Delhi sands are located as close as 50 meters east of the study site (a large dune system known to support the DSF), Delhi sands do not occur on the study site itself. The Delhi sands east of the site are separated from the site by an existing channel.

Vegetation on the slopes surrounding the basins consists primarily of *Encelia farinosa*-dominated coastal sage scrub. Basin floors support ruderal exotic annual vegetation with the basin margins often with *Bacharis salisifolia* and *Tamarisk*.

All three of the alternative parking areas are located in areas previously mapped with Delhi Sand soils (Woodruff 1980, https://websoilsurvey.sc.egov.usda.gov). The locations at the eastern end of Santa Ana Avenue and on Agua Mansa Road have had the native soils stripped away and/or buried with gravel pavements. The alternative parking site on the Southern California Edison easement off of Industrial Drive has intact Delhi Sand soils, supports vegetation associated with Delhi sands, is adjacent to other extensive areas with Delhi sands, and most significantly, is in a context with several adjacent lands known to support the DSF.

Discussion and Conclusions: The entire 12.7-acre site is on alluvial soils presenting habitat conditions *Unsuitable* for DSF. The nearest extant DSF population appears immediately east and northeast of the water treatment facility on the eastern side of the existing channel. DSF have been observed (Osborne pers. obs.) 300 meters east, 350 meters east northeast, and within 0.9 km north northwest of the project area. Nevertheless, on the basis of my experience, and in spite of the near proximity of DSF populations in the area, conditions on the entire project site and surroundings west of the existing channel (which bounds the eastern edge of the Rialto water treatment facility) presents conditions *Unsuitable* for DSF.

With respect to the alternative parking areas, site conditions on the Agua Mansa Road location (alternative #3) and east end of Santa Ana Avenue (alternative #1) sites are *Unsuitable* for DSF due to lack of Delhi sand soils. The alternative parking location on the Southern California Edison easement at Industrial Drive (Alternative #2) represents *High Quality* DSF habitat with high potential for DSF presence. This Alternative #2 site would be subject to a two-year protocol survey for DSF in order to make a presence/absence determination acceptable to the USFWS (1996) and even with a negative survey result, this site may nevertheless be considered to be of conservation value (USFWS 1997) for DSF ecological purposes given its adjacent proximity to other areas held in conservation for the DSF.

References:

Cazier, M. A. 1985. A revision of the North American flies belonging to the genus *Rhaphiomidas* (Diptera:Apioceridae). Bulletin of the American Museum of Natural History 182(2):181-263.

Emmel, J. F., and T. C. Emmel. 1998. Two New Geographically Restricted Subspecies of *Apodemia mormo* (Lepidoptera: Riodinidae) from the Vicinity of San Bernardino, California *in* Systematics of Western North American Butterflies. Emmel, T. C., Editor. Mariposa Press, Gainsville, Florida. (67): 795-800.

Hickman, J.C. (ed.). 1993. The Jepson manual: Higher plants of California. University of California Press. Berkeley, California.

Knecht, A.A. 1971. Soil survey of western Riverside area, California. U.S. Department of Agriculture, Soil Conservation Service.

Kingsley, Kenneth J. 1996. Behavior of the Delhi Sands Flower-Loving Fly (Diptera: Mydidae), a Little Known Endangered Species. Ann. Entomol. Soc. Am. 89(6): 883-891.

Kiyani Environmental Consultants. 1995. Principal Investigator's Annual Report, Delhi Sands Flower-loving fly (*Rhaphiomidas terminatus abdominalis*) Studies at Colton, California. Prepared for San Bernardino County and U.S. Fish and Wildlife Service, Carlsbad, CA. 25+ pp.

Munz, P.A. 1974. A flora of southern California. University of California Press, Berkeley, California.

Osborne, K. H. 2003. *Delhi Sands Flower-loving fly Habitat Assessment for the Hermosa Cemetery, Colton.* Prepared for Inland Memorial Cremations and Burial. Submitted to the U.S. Fish and Wildlife Service, CA.

Osborne, K. H., G. R. Ballmer, and T. McGill. 2003. *DSF Habitat Assessment for the Proposed Mary Vagle Conservation Area.* Prepared for the City of Fontana. Submitted to the U.S. Fish and Wildlife Service, CA.

Osborne, K. H. and G. R. Ballmer. 2014. A Petition to the United States Department of the Interior, Fish and Wildlife Service, for emergency action to list an endangered species pursuant to the conditions and regulations of the Federal Endangered Species Act: For the San Joaquin Valley Giant Flower-loving Fly (*Rhaphiomidas trochilus*). Submitted June, 2014.

Rogers, R. and M. Mattoni. 1993. Observations on the natural history and conservation biology of the giant flower-loving flies, *Rhaphiomidas* (Diptera:Apioceridae). Dipterologial Research 4(1-2):21-34.

University of California, Davis, Agriculture and Natural Resources, California Soil Resource Lab, https://casoilresource.lawr.ucdavis.edu/gmap/

U.S. Fish and Wildlife Service. 1993. Endangered and Threatened Wildlife and Plants: Determination of Endangered Status for the Delhi Sands Flower-loving Fly. U.S. Department of Interior. Federal Register, 58 (183): 49881-49887.

U.S. Fish and Wildlife Service. 1996. Delhi Sands Flower-loving Fly Draft Presence/Absence Survey Guidelines. December 30.

U.S. Fish and Wildlife Service. 1997. Delhi sands Flower-loving Fly (*Rhaphiomidas terminatus abdominalis*) Recovery Plan. U.S. Fish and Wildlife Service, Portland, OR.

Woodruff, G. A. 1980. Soil survey of San Bernardino County, southwestern part, California. U.S. Department of Agriculture, Soil Conservation Service.

Respectfully submitted,

Ken H. Osborne

Figure 1. Soils map with satellite image of the 12.7-acre area (highlighted and outlined blue): HaC = Hanford course sandy loam, TvC = Tujunga gravelly loamy sand, TuB = Tujunga loamy sand.

Figure 2. Photograph (February 15, 2023) of gravely sandy alluvial soils exposed in slope on the northern portion of the site (pen at center for scale).

Figure 3. Photograph (February 15, 2023) of *Encelia farinosa*-dominated coastal sage scrub on gravely, sandy alluvial soils, on the northern portion of the site. View looks northeast from a central location on the site. Note cobble and gravel in alluvial soils of foreground.

Figure 4. Photograph (February 15, 2023) of exposed slopes on the eastern edge of the site. Undisturbed bedding of alluvial soils is evident on the upper portion of this slope exposure, with cobble, gravel in the talus slope below. Mature *Encelia* and *Artemisia* shrubs indicate the slope is long undisturbed.

Figure 5. Photograph (February 15, 2023) of one of the basin floors on the western portion of the site. While vegetation on the floor of the basin is dominated by ruderal - exotic annual forbs such as *Oncosiphon piluliferum*, *Hirschfeldia incana*, and *Amsinkia menziesii*, the margins of the basin support extensive stands of Tamarisk.

Figure 6. Photograph (March 7, 2023) of the parking Alternative site #1 on the north side of Santa Ana Avenue at the eastern terminus of Santa Ana Avenue. View looks north. This site has a well compacted gravel base pavement. Natural Delhi sands dunes (with DSF) exist on the lands in the background.

Figure 7. Photograph (March 7, 2023) of the parking Alternative site #2 on the Southern California Edison easement along the east side of Industrial Drive. Lands managed for DSF are located beyond the fence-line (center) and extend nearly to the Angeles Block building in the background.

Figure 8. Photograph (March 7, 2023) of the parking Alternative site #3 on the south side of Agua Mansa Road (view looking east toward the Rialto Channel crossing (background). Roadside conditions are with a well compacted gravel base.

Appendix C: Cultural Resources Assessment

Cultural Resources Assessment
Lake Rialto Project
City of Rialto, San Bernardino County, California
APN's 025-814-114, 025-814-115, 025-815-124, 025-815-125, 026-006-162, 026-006-163, 026-006-123, 026-006-124, 026-006-109, 026-007-108, 026-007-109 & 025-815-113

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DUKE CRM Project Number: C-0422

July 2023

Fieldwork Performed April 21, 2023

Township 1 South, Range 5 West, Section 25, USGS 7.5' *San Bernardino South, Calif.*
Keywords: ~13.96 acres, Negative Impacts

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Abbreviations

APN .....Assessor's Parcel Number
B.A.....Bachelor of Arts
BERD .....Built Environment Resources Database
BP .....Before Present
CEQA .....California Environmental Quality Act
City .....City of Rialto
Client.....enplanners
CRHR .....California Register of Historical Resources
cy.....cubic yards
DUKE CRM.....Duke Cultural Resources Management, LLC
m.....meters
M.A.....Master of Arts
MLD.....most likely descendent
NAHC .....Native American Heritage Commission
NHPA .....National Historic Preservation Act
NRHP.....National Register of Historic Places
PCT .....Paleocoastal Tradition
Project.....Lake Rialto Project
Qa .....Quaternary alluvial
Qao.....older Quaternary alluvial
RPA.....Registered Professional Archaeologist
SCCIC.....South Central Coastal Information Center
SWRCB.....State Water Resources Control Board
WPLT .....Western Pluvial Lakes Tradition

MANAGEMENT SUMMARY

Duke Cultural Resources Management, LLC (DUKE C R M) is under contract to the enplanners, incorporated (CLIENT), to provide cultural resources services for the Lake Rialto Project (Project) located within the City of Rialto, County of San Bernardino, California.

The purpose of this report is to comply with the California Environmental Quality Act (CEQA) with regards to cultural resources. The City of Rialto (City) is the lead agency for CEQA. Federal and federally-sponsored programs and projects are reviewed pursuant to Section 106 of the NHPA. Section 106 of the NHPA requires federal agencies to consider the effects of proposed federal undertakings on historic properties. NHPA requires federal agencies to initiate consultation with the State Historic Preservation Officer as part of the Section 106 review process. The State Water Resources Control Board (SWRCB) is responsible for Section 106 compliance. The approximately 13.96-acre Project area is comprised of the proposed park, a parking area and the connecting access.

DUKE CRM conducted a records search for cultural resources (archaeological and historical) on March 13, 2023 at the South Central Coastal Information Center (SCCIC), located at California State University, Fullerton. This included a review of all recorded historic and prehistoric cultural resources, as well as a review of known cultural resources surveys and excavation reports generated from projects located within ½ mile of the proposed Project. In addition, a review was conducted of the Built Environment Resources Directory (BERD), which includes the National Register of Historic Places (NRHP), California Register of Historical Resources (CRHR), California Historical Landmarks, and California Points of Historical Interest.

A cultural resource records search was conducted by DUKE CRM Archaeologist Morgan Beigle on March 13, 2023. The search identified 29 reports within the ½ mile search radius; four (4) of which cover all or a portion of the Project area. No cultural resources were identified during these studies within the Project area. The records search identified 15 cultural resources within the ½ mile search radius; none of which were located within the Project area.

DUKE CRM archaeologist Alexandria Bulato conducted a survey of the Project area on April 21, 2023. Survey was conducted using parallel transects spaced no greater than 15 meters apart. Portions of the survey area were omitted due to dense vegetation and steep terrain. Survey was negative for archaeological resources. An encased section of the West Riverside Canal crosses beneath the access road directly north of the proposed parking area. The resource was not visible on the surface within the Project area and will not be impacted by the Project.

From analysis of the Project area based on records search data, historical maps, aerial photographic research, field survey and the lack of cultural remains and the past history of soil disturbances, it is concluded that the Project area has low sensitivity at the surface for prehistoric resources and a low sensitivity for buried prehistoric and historic era resources. The exception is the encased section of the circa 1938 West Riverside Canal. Given these data, a finding of No Historical Resources Impacted for the purposes of CEQA is warranted.

If human remains are encountered, State Health and Safety Code Section 7050.5 states that no further disturbance shall occur until the County Coroner has made a determination of origin and disposition pursuant to Public Resources Code Section 5097.98. The County Coroner must be notified of the find immediately. If the remains are determined to be prehistoric, the Coroner will notify the NAHC, which will determine and notify a Most Likely Descendant (MLD). With the permission of the landowner or his/her authorized representative, the MLD may inspect the site of the discovery. The MLD shall complete the inspection within 48 hours of notification by the NAHC. The MLD may recommend scientific removal and nondestructive analysis of human remains and items associated with Native American burials. In addition, according to the California Health and Safety Code, a cemetery is place where six (6) or more human bodies are buried (Section 8100), and unauthorized disturbance of Native American cemeteries is a felony (Section 7052).

If the proposed Project changes additional efforts may be necessary.

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INTRODUCTION

Duke Cultural Resources Management, LLC (DUKE CRM) is under contract to the enplanners, incorporated (CLIENT), to provide cultural resources services for the Lake Rialto Project (Project) located within the City of Rialto (City), County of San Bernardino, California. The purpose of this report is to document compliance with the California Environmental Quality Act (CEQA) with regards to cultural resources.

Project Description and Area of Potential Effects

The Project is located within the City of Rialto (Assessor's Parcel Number (APN) 025-814-114, 025-814-115, 025-815-124, 025-815-125, 026-006-162 and 026-006-163 within the main body of the Project area, APNs 025-815-113, 026-006-123, 026-006-124, 026-007-108 and 026-007-109 within the access road, and APN 026-006-109 within the parking area) in San Bernardino County, California (Figure 1). The project is illustrated on the 1980 *San Bernardino, Calif.* USGS 7.5-minute quadrangle in Township 1 South, Range 5 West, Section 25 (Figure 2). The boundary of the Project area incorporates the area of both direct and indirect effects that includes the construction zone, temporary staging and permanent parking areas and access route (Figure 3).

Lake Rialto would be located on an approximately 12-acre site in the southern portion of the approximately 40-acre City-owned Rialto Water Treatment Plant, located at 501 E. Santa Ana Avenue, City of Rialto, San Bernardino County. Parking for the proposed lake would be located 0.30 miles to the south on Agua Mansa Road. The lake site is generally located northwest of the Santa Ana River, and south of Interstate 10 between South Riverside Avenue to the west and South Pepper Avenue (extended) to the east. The lake site is bordered by the existing plant to the north, So Cal Edison power poles and easement to the south, the Rialto Channel to the east, and undeveloped industrial-zoned property to the west.

Lake Rialto would provide the citizens of Rialto and the region with an approximately 12-acre outdoor public recreational space including the proposed lake park, one (1) mile of pedestrian perimeter trails, passive recreation, environmental education programming, and public outreach. Lake Rialto would be created using recycled water from the City's Wastewater Treatment Plant and would also provide wetland and terrestrial wildlife habitat, and water quality improvements.

The existing dry pit would be reengineered to create two (2) lakes separated by a pedestrian path running north-south but connected by duel 24-inch pipes. A plastic liner would be installed on the bottom and deeper sides of the lakes, and a clay liner would be installed in the shallower areas and in the wetland area. The smaller, 3-acre west lake would have a depth of approximately 13 feet. The larger, 7-acre lake would have a depth of 48 feet and would also include an access ramp to the bottom of the lake and a shallow marsh wetland area of 3 to 4 acres. For safety purposes, a shallow three (3)-foot-deep and 13-foot-wide bench would be constructed along the edge of Lake Rialto. The lake would receive cleaned effluent once it has passed through bio-filtration, providing water temperature and nutrient management benefits. Once Lake Rialto is created the discharges to the Rialto Channel would be consistent with the existing conditions that are occurring today.

In addition, and as described previously, the proposed Project would include development of an 11-space parking lot on an approximately 0.15-acre paved parking lot (PA-#3), which would provide adequate parking and a pedestrian pathway connection to the Lake Rialto Project site. Development of the PA-#3 parking lot would require site preparation, earthwork, and paving. Development of a pedestrian pathway between the parking lot and Lake Rialto on the existing utility road would require minimal improvements including brush clearing, signage, loose rock removal and tread improvement for drainage. The path of travel between the lake and the parking area would be approximately 1600 feet (0.3 miles)and encompass approximately 0.9 acres.

Construction of the proposed lake, parking, and pedestrian pathway is anticipated to take place over 18 months from July 2023 to January 2025. Construction of the lake would consist of site preparation, grading, underground utility construction, and landscaping. Site preparation would consist of minor clearing of non-native weeds and grass, and removal of any onsite trash and debris.

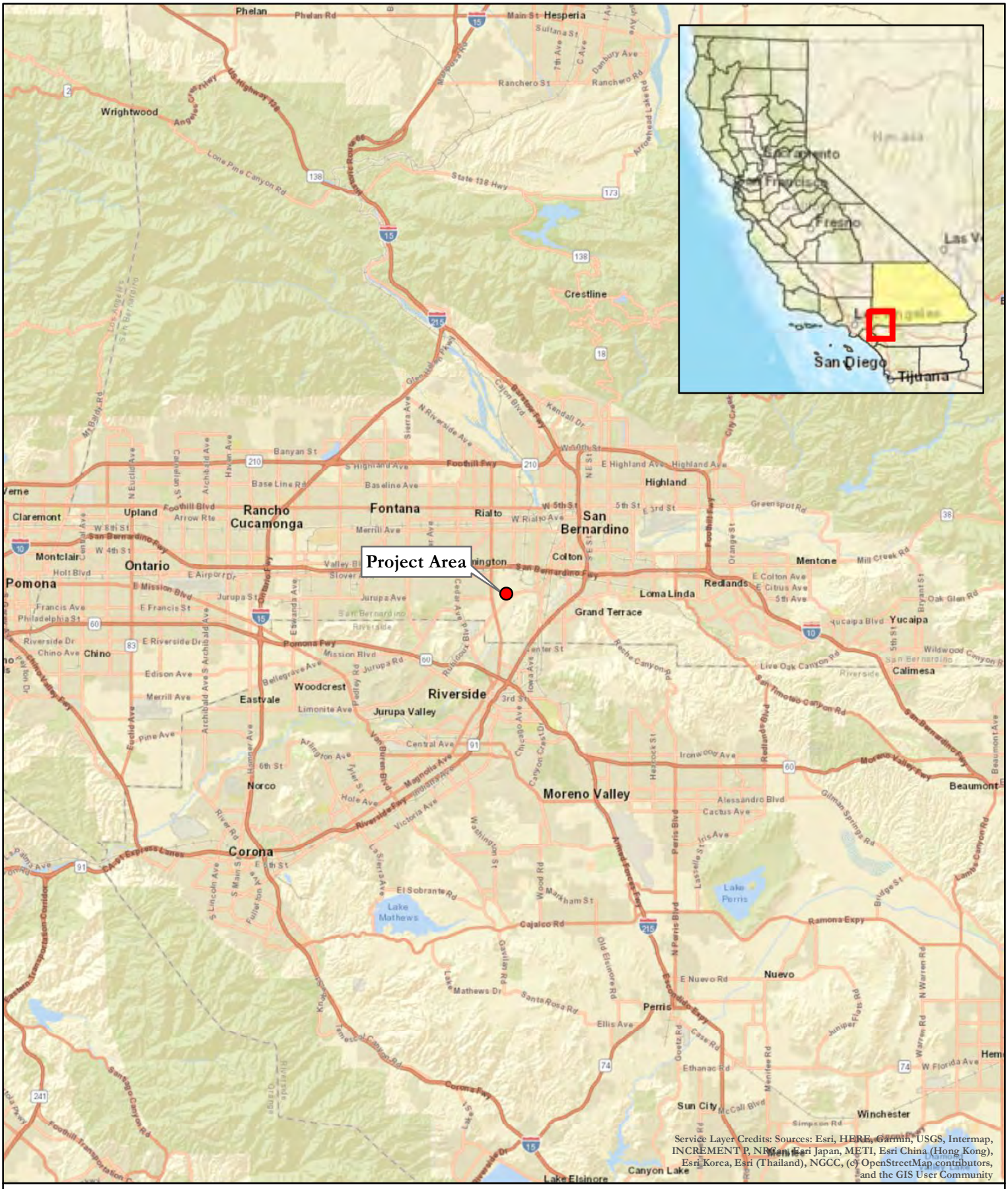

Figure 1. Project Vicinity
Lake Rialto, C-0422

DUKE CRM

Project Area

0 6 12 Miles N

1 inch = 6 miles 1:360,000

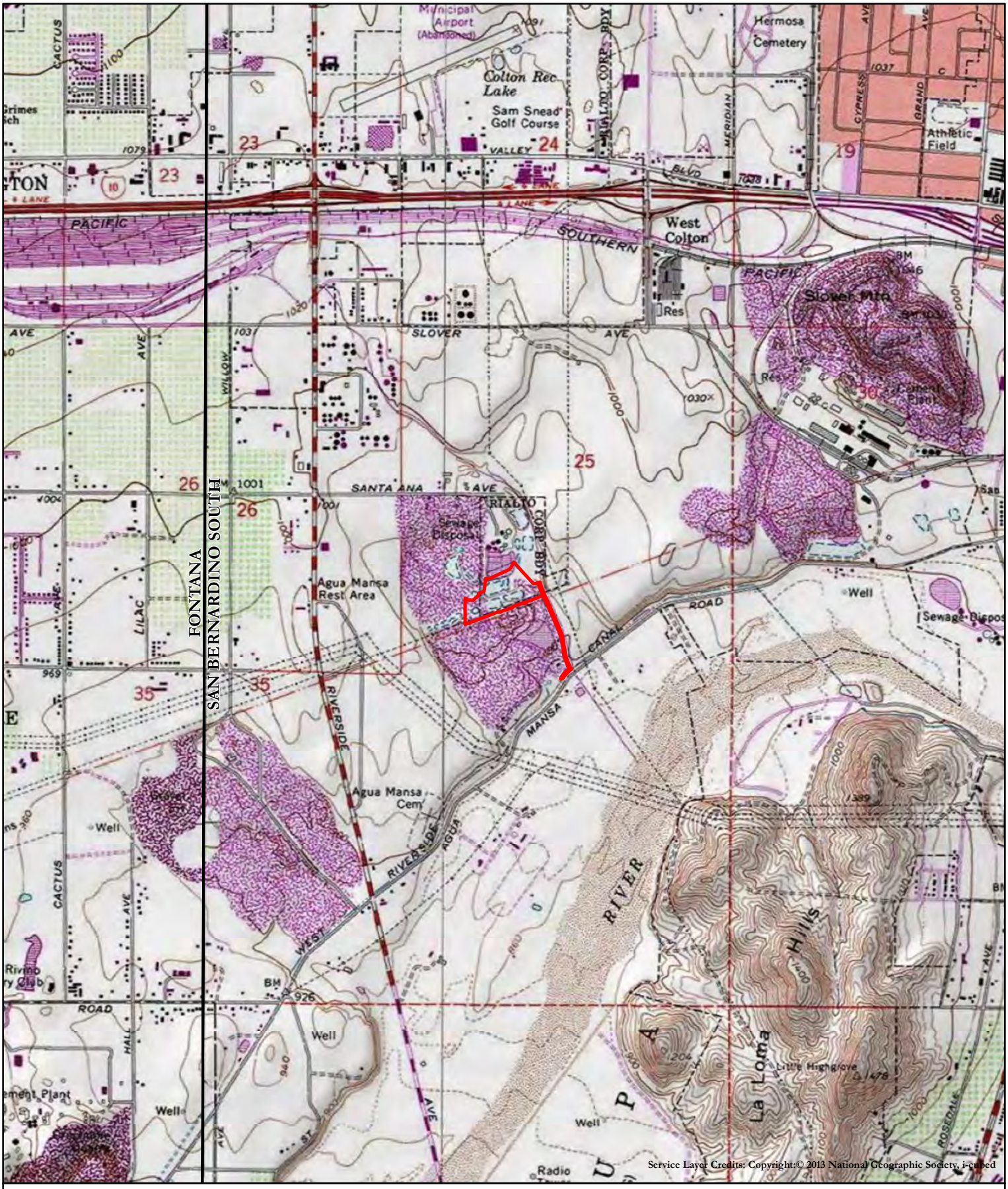

Figure 2. Project Location
Lake Rialto, C-0422

DUKE CRM

San Bernardino South, Calif USGS 7.5-minute quadrangle
T1S, R5W, Section 25 & 36
Date of Map: 1954 / Photorevised: 1980
Project Area
USGS 7.5' Quads

0 0.25 0.5 Miles
0 0.25 0.5 Kilometers
N
1 inch = 2,000 feet 1:24,000

Figure 3. Project Aerial Photo
Lake Rialto, C-0422

DUKE CRM

Project Area

0 300 600 Feet

1 inch =600 feet

N

1:7,200

Grading for the Project would consist of any removals of unsuitable soils to be used for non-compaction required locations. Excavation for the lake would begin at the eastern most portion of the lake and would consist of a maximum 30 feet cut and minor fills to achieve lowest appropriate depths. In addition, grading of the eastern portion of the lake would construct two to one (2:1) slope embankments built up to the west for the proposed wetlands area and include a west to east access ramp to the bottom. Excavation of the western most portion of the lake would consist of a maximum 15 feet cut and fills to achieve appropriate depth and to construct 2:1 slopes embankments with bench surrounding proposed island in the middle.

Grading would also include construction of a proposed pedestrian access (trail) which partitions Lake Rialto with 2:1 slope embankments and a culvert connecting the flow between the east and west lakes. Ultimately, grading of the lake site would consist of 65,996 cubic yards (cy) total cut material and 65,934 cy total fill material. Although there is an approximate 62 cy of net cut, soils would balance onsite due to anticipated shrinkage. Simultaneous to grading, construction of underground utilities would take place which includes underground drainage, pipelines, pump station, restroom and dry utilities. Once grading and underground utilities are complete, finish grading would commence to construct the trails, slopes, and landscape areas. Then the lake and its embankments would be lined with a geomembrane to retain lake water and erosion control and landscaping would be planted around the lake.

Construction of the parking lot (PA-#3) and pedestrian pathway would consist of site preparation, grading, and paving. Site preparation would consist of minor clearing of non-native weeds and grass, and removal of any onsite trash and debris. Grading would consist of minor cuts, approximately less than 1-foot and proper compact to an asphalt concrete paved parking lot with driveway. Phasing of the existing pathway connecting users to Lake Rialto would require site preparation consisting of brush clearing and tread improvement for drainage and loose rock removal.

Regulatory Context

Partial funding and permitting of the Project is through the Clean Water and Drinking Water State Revolving Fund Program, within the Division of Financial Assistance, State Water Resources Control Board (SWRCB), which uses federal funds to reduce interest costs on funds used for clean water projects. The Project may also be funded through the Water Infrastructure Finance and Innovation Act program. The City is the CEQA Lead Agency.

Federal and federally-sponsored programs and projects are reviewed pursuant to Section 106 of the NHPA. Section 106 of the NHPA requires federal agencies to consider the effects of proposed federal undertakings on historic properties. NHPA requires federal agencies to initiate consultation with the State Historic Preservation Officer as part of the Section 106 review process. The SWRCB is responsible for Section 106 compliance.

CEQA

CEQA Guidelines define a *historical resource* as a resource listed in or determined eligible for listing in the California Register of Historical Resources (CRHR). This includes cultural resources that have been determined for a local register or through a local historic resources survey. A resource may be considered potentially eligible for listing in the CRHR if it meets any of the four (4) criteria listed below:

1. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.
2. Is associated with the lives of persons important in our past.
3. Embodies the distinctive characteristics of a type, period, region, or method of construction; represents the work of an important creative individual; or possesses high artistic values.
4. Has yielded or may be likely to yield information important in prehistory or history.

Furthermore, CEQA necessitates that the lead agency considers whether the project will significantly affect unique archaeological resources that are ineligible for listing in the CRHR and to avoid these unique archaeological resources when possible or mitigate any effects to less than significant levels (Public Resources

Code 21083.2). As stated by CEQA, a *unique archaeological resource* means an archaeological artifact, object, or site which clearly demonstrates with a high probability that it meets, without merely adding to the current body of knowledge, any of the following criteria:

1. Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information.
2. Has a special and particular quality such as being the oldest of its type or the best available example of its type.
3. Is directly associated with a scientifically recognized important prehistoric or historic event or person.

Existing federal, state, and local regulations require the identification of historic properties and cultural resources during the planning stage of new projects.

Research Design

The primary purpose of this report is to identify cultural resources that may be eligible for the CRHR and to determine what affects/impacts proposed Project will have on those historical resources. This research design and resulting methodology is developed to interpret these resources in the context of the cultural traditions present. This includes those represented by Native American, Hispanic, Anglo-American and other cultural traditions.

At the theoretical level, archaeological investigations are based on partial and fragmented remnants of material items from past cultures and are viewed from a Cultural Materialism perspective. The premise of Cultural Materialism links materials, as represented by those items in the archaeological record, to the patterned action of human behavior within specific environments (culture) (Harris 1968:659). We consider Cultural Materialism a basic premise encompassing all other assumptions.

The formulation of research questions pertaining to survey-level investigations are typically based on information specific to the project area under investigation and reflective of previously gathered data. Within the prehistoric research realm, typical regimes within a cultural ecology model would focus on probability models positing a relationship between functional site types and resource location. These correlations would, naturally, be highly dependent on the time periods represented. Thus, the identification of complexes relating to specific time periods and the establishment of prehistoric context would be paramount.

Historic Period research would similarly focus on defining how the occupants of the region utilized this seemingly inhospitable environment. Identified Historic Period resources would be traced through documentation to an individual or group if possible. A survey-level recording of site constituents would be correlated with socio-economic, ethnic and religious identities of the registered occupants to formulate further research questions applicable to evaluation studies.

The Project is subject to the CEQA which requires that lead agencies, in this case the City, consider impacts to historical resources and adverse effects to historic properties that are potentially eligible for the CRHR.

Basic research questions include:

1. Are cultural resources located in the Project?
    a. Are the conditions conducive to cultural resources within the Project?
    b. What is the sensitivity of the Project location for cultural resources?
    c. What is the level of prior disturbance to the property?
    d. Are there cultural resources that may be impacted/adversely affected by the Project?
    e. What is the potential for buried cultural resources?
2. Should any cultural resources be considered potential *historical resources* for the purposes of CEQA? Are they significant resources according to CEQA and the CRHR criteria, and do they possess integrity?
3. What impacts will the proposed Project have on any potential *historical resources*?

4. What treatment, avoidance and/or mitigation measures can be implemented to decrease the level of impact to potential *historical resources?*

SETTING

Natural Setting

California is divided into 11 geomorphic provinces, each naturally defined by unique geologic and geomorphic characteristics. The Project is located in the northeastern portion of the Peninsular Ranges geomorphic province. The Peninsular Ranges province is distinguished by northwest trending mountain ranges and valleys following faults branching from the San Andreas Fault. The Peninsular Ranges are bound to the east by the Colorado Desert and extend north to the San Bernardino – Riverside county line (Norris and Webb 1976), west into the submarine continental shelf, and south to the California state line.

The Project area consists of an approximately 12-acre area within the 40-acre City-owned Rialto Water Treatment Plant in the City of Rialto, plus a parking area and access, in western San Bernardino County (see Figure 2). The Project area is an artificial basin associated within the existing 40 acre wastewater treatment plant that occupied the Project area a. The Project is approximately 880 to 900 ft above mean sea level. Treated water flows approximately 0.6 miles south-southeast where it empties into the Santa Ana River.

The Project area is geologically and geographically characterized by Quaternary alluvial (*Qa*) sands with minor components of older surficial sediments (*Qao*) (Morton 1978). The USDA (2023) classifies soil in the Project area as exclusively Quarry and Pit soils comprised of sands derived from *Qa* sediments. Vegetation, where it exists within the Project area, is made up of a combination of native and exotic plants.

Cultural Setting

Prehistoric Traditions

Two (2) primary regional schemas are commonly cited in the archaeological literature for western San Bernardino County where the Project is located. These schemas or syntheses generalize the presence or absence of certain artifact types into explanatory frameworks of temporal chronologies and/or subsistence practices. Schemas are necessary given that many archaeological sites lack material amenable to absolute dating (e.g., ^{14}C carbon for radiometric dating). Therefore, researchers need to cross-date sites by comparison to either coastal or desert chronologies with established chronological sequences backed by absolute dates. In western San Bernardino County, it is thought to be the meeting ground of both coastal and inland desert schemas and neither exclusively explains prehistoric finds.

The first schema, advanced by Wallace (1955), defines four (4) cultural horizons for the southern California coastal province, each with characteristic local variations:

I. Early Man (~9000–8500 Before Present [BP]) is a hunting culture based on almost exclusive evidence of chipped-stone hunting materials: dart points, scrapers, choppers, and bifaces.
II. Milling Stone (8500–4000 BP) reflects a change to a more sedentary, plant-collecting lifestyle as evidenced by the introduction and dominance of milling stone artifacts and a decrease in well-made projectile points.
III. Intermediate (4000–1500 BP) is characterized by a larger dependency on hunting, use of the dart and atlatl, and the shift from using the mano/metate to mortar/pestle. However, knowledge of this horizon suffers from lack of knowledge about what occurred during this time, not a lack of inhabitants along the southern California coast.
IV. Late Prehistoric (1500~200 BP) contains a more nuanced artifact assemblage indicative of a more complex lifestyle and an increase of population. This horizon is characterized by an increase in bow and arrow use, steatite containers, pottery, circular fishhooks, perforated stones, asphaltum, diversified bone tools, ample shell ornaments, and elaborate mortuary customs.

Warren and Crabtree (1986) employ an ecological approach to the deserts of southern California, defining five (5) traditions in prehistory:

I. Lake Mojave (12000–7000 BP)
II. Pinto (7000–4000 BP)
III. Gypsum (4000–1500 BP)
IV. Saratoga Springs (1500–800 BP)
V. Shoshonean (800~200 BP)

Warren and Crabtree (1986) viewed cultural continuity and change in terms of various significant environmental shifts, defining the cultural ecological approach for archaeological research of the California deserts. The authors viewed changes in settlement pattern and subsistence as cultural adaptations to a changing environment, beginning with the gradual environmental warming in the late Pleistocene, the desiccation of the desert lakes during the early Holocene, the short return to pluvial conditions during the middle Holocene, and the general warming and drying trend, with periodic reversals that continue to this day. The work by Warren and Crabtree (1986) is built upon, in part, by that of Warren (1980) in which he argued for a chronology based on projectile points as period markers backed by radiocarbon assays providing absolute dates.

The two (2) schema contrast in important ways. The units employed by Warren are "traditions," and in contrast to Wallace (1955), traditions may be spatially restricted but display temporal continuity. For Wallace, "horizons" or "periods," are extensive through space but restricted in time. More recent schemata have been attempted to reconcile these differences. Koerper and Drover (1983) synthesized chronologies for coastal southern California and employed Wallace's (1955) horizon terminology but use radiometric data to sequence stylistic changes observed in the artifact assemblages, which they interpreted as material indication of cultural change through time. Regardless of the overall schema to best explain the prehistory of western San Bernardino County, the region can be understood within broad chronological frameworks and as the meeting ground of the coastal and desert subsistence patterns.

Early Holocene (11,600 – 7,600 BP)

Traditional models of the prehistory of California hypothesize that its first inhabitants were the big game hunting Paleoindians who lived at the close of the last ice-age (~11,000 years BP). As the environment warmed and dried, large Ice Age fauna died out, requiring adaption by groups to survive. The western Great Basin and deserts of southern California were characterized by large pluvial (rainfall-fed) lakes, streams, marshes, and grasslands. The human response to this environment is known as the Western Pluvial Lakes Tradition (WPLT) (Moratto 1984). The WPLT is generally identified by an advanced flaked-stone industry of foliate knives/points, Silver Lake and Lake Mojave points, lanceolate bifaces, and long-stemmed points. Other flaked-stone tools include crescents, scrapers, choppers, scraper-planes, hammer stones, cores, drills, and gravers. People of this period hunted diverse populations of smaller animals and collected a wide number of plants from diverse eco-zones. Importantly, this period lacks widespread evidence of milling stones, and, therefore, hard seed processing was likely not widely practiced. Sites are generally found along the shores of former pluvial lakes, marshes, and streams (Moratto 1984). The desert manifestation of the WPLT is the Lake Mojave Complex, while along the coast the WPLT is seen in the San Dieguito Complex.

The Paleocoastal Tradition (PCT) has many similarities to the WPLT, but it reflects a coastal adaptation (Davis et al. 1969). PCT sites are located along bays and estuaries. Subsistence patterns indicate the consumption of mollusks, sea mammals, sea birds, and fish in addition to land plants and animals. The argument for a PCT has gained momentum. This is based on research that has been conducted along the California coast and the adjacent Channel Islands (Byrd and Raab 2007). A recent study dates habitation on San Miguel Island back to ~11,300 BP (Daisy Cave), while a site on San Clemente (Eel Point) shows that a PCT was entrenched at Eel Point in the early Holocene, with the hunting of seals, sea lions, and dolphins, as well as the gathering of shellfish (Byrd and Raab 2007).

Middle Holocene (7,600 – 3,650 BP)

The middle Holocene is a time of change and transition. As conditions continued to warm, pluvial lakes and streams in the desert disappeared. This resulted in a shift in subsistence strategies, namely a shift to the

gathering of plant seeds, grasses, and shellfish along the coast as the primary dietary staple. Fishing and the hunting of smaller animals played a less important role in day-to-day activity. This shift in subsistence-strategies is what Wallace named the Millingstone Horizon (Wallace 1955) and this name has continued among archaeologists working on the coastal province of southern California. Large habitations are seen in the inland areas and considerable variability is seen along coastal occupation of southern California. Occupation revolved around seasonal and semi-sedentary movements in coastal Orange and San Diego counties. Trade networks are postulated by researchers that have dated *Olivella* sp. grooved rectangle shell beads as far north as central Oregon dating to 4900-3500 BP (Byrd and Raab 2007). Characteristics of the middle Holocene sites include ground stone artifacts (manos and metates) used for processing plant material and shellfish, flexed and extended burial beneath rock or milling stone cairns, flaked core or cobble tools, dart points, cogstones, and discoidals.

Late Holocene (3,650 – 233 BP)

During the late Holocene there was a migration of Takic speakers from the Great Basin and San Joaquin Valley into southern California (Sutton 2009, 2010). Characteristics of the late Holocene include the introduction of the bow and arrow, stone mortar, and pestle, use of ceramics, and a change in mortuary behavior from inhumations to cremations in southern California. This was also a period of climatic fluctuation. Paleoenvironmental data show that periods of drought alternated with cooler and moister periods (Vellanoweth and Grenda 2002; Byrd and Raab 2007; Jones et al. 2004). This resulted in dynamic regional cultural patterns with considerable local variation. Byrd and Raab (2007) suggest that foragers in southern California over-exploited high-ranked food, such as shellfish, fish, marine and land mammals, and plant remains. This led to resource depression, causing people to forage more costly resources, such as acorns, which were more abundant but required increased acquisition and processing times.

Local Prehistory

Local regional archaeological research presents a rich background to compare potential findings in the Project area. Various themes of research present themselves and these reflect broader trends in hunter-gatherer archaeological research. These themes are as follows: chronology, site formation processes, site structure and function, mobility, settlement strategy and patterns, economy, subsistence, and cultural organization (including but not limited to organization of gendered behavior and ritual/religion).

Approximately 30 miles to the southeast of the Project, the Eastside Reservoir Study presents a regional approach to examining questions of Native American settlement. Numerous sites were present within the Eastside Reservoir study area and spanning occupation from the Middle Holocene (7,500 BP) to the Late Prehistoric period (Onken 2001). The Late Prehistoric period sites within this study area present a uniform pattern of dependency upon water resource availability for settlement location while during previous periods water availability does not appear to be such a determinant factor in site location (Goldberg 2001:602-604).

Ethnographic Traditions

The Project is located within the ethnographic territory of the Luiseño Indians. The Luiseño are Takic speakers and are believed descended from Late Prehistoric populations of the region. Takic is part of the larger Uto-Aztecan language stock which migrated west from the Great Basin (Bean and Smith 1978, Shipley 1978).

Luiseño

The Luiseño share many similar cultural traits with surrounding tribes. The Luiseño lived in sedentary and independent village groups, each with specific subsistence territories encompassing hunting, food gathering, and fishing areas. Villages were usually located in valley basins, along creeks and streams adjacent to mountain ranges where water was available and where the villages would be protected from environmental conditions and potential enemies. Most inland populations had access to fishing and food gathering sites on the coast (Bean and Shipek 1978).

Luiseño economic and subsistence practices centered upon the seasonal gathering of acorns and seeds; the hunting of deer and small mammals such as rabbits, wood rats, ground squirrels, and birds. Coastal foods

included sea mammals, fish, and shellfish. Tool technologies were organized around food collection, storage, and preparation strategies, which was reflected in the type, size, and quantity of food items gathered. Stone (lithic) tools included two (2) types: ground stone and flaked stone tools. Ground stone equipment included: mortars, pestles, manos and metate grinding slicks, made from granite, schist, and gneiss. Flaked tools included: bifaces, projectile points, scrapers, and gravers, fabricated from siliceous rock such as chert and jasper, microcrystalline chalcedony, obsidian, fine grain ingenious rocks such as basalt rhyolite, and andesite, and hard silica such as quarts and quartzite. Utilitarian tools were constructed from wood, animal bones, skins, and/or woven from flora materials depending on need. Hunting activities were conducted both on an individual basis and/or organized into group activities, depending on seasonal factors and the game hunted. Acorns provided as much 50 percent of the Luiseño diet (White 1963). They provided a reliable and abundant food source that was high in calories and could be easily stored for future use. Acorn collection was a central tenant in the lives of the Luiseños and dominated their economic and social structure (Basgall 1987, Johnson and Earle 1987).

Villages were organized around an inherited chief who exerted sole control over the economy, religious rituals, and territorial matters within the village (Bean and Shipek 1978:555). The chief at times would consult with a council of elders and shamans on matters of religious practices and on environmental conditions affecting village life. Large villages may have had a complex behavioral and political structure due to their territorial size and economic control, while the smaller villages' political complexity was limited by their territorial size (Strong 1929; Bean and Shipek 1978:555).

Historic Traditions

The historic era in California is generally divided into three (3) periods: the Spanish or Mission Period (1769 to 1821), the Mexican or Rancho Period (1821 to 1848), and the American Period (1848 to present).

The Spanish Period (1769-1821) is represented by European exploration of the region; establishment of the San Diego Presidio and missions at San Gabriel and San Luis Rey; and the introduction of livestock, agricultural goods, and European architecture and construction techniques. Early exploration of the San Bernardino County area began in 1772 when Lieutenant Pedro Fages (then Military Governor of San Diego) crossed through the region.

The Mexican Period (1821-1848) began with Mexican independence from Spain and continued until the end of the Mexican-American War. The Secularization Act resulted in the transfer, through land grants (called ranchos) of large mission tracts to politically prominent individuals. At that time, cattle ranching was a more substantial business than agricultural activities, and trade in hides and tallow increased during the early portion of this period. Until the Gold Rush of 1849, livestock and horticulture dominated California's economy.

No known settlements occurred in the area until 1838 when *Rancho Jurupa* was granted to Juan Bandini. Within a few years Bandini divided *Rancho Jurupa* into two (2) properties. He sold approximately 25,000 acres to Able Stearns, his son-in-law, which continued to operate as *Rancho Jurupa*. About 1889 a six (6) square mile portion of the rancho was purchased by the Fuller family who established the Pioneer Ranch.

The American Period (1848-present) began with the Treaty of Guadalupe Hidalgo, and in 1850, California was accepted into the Union of the United States primarily due to the population increase created by the Gold Rush of 1849. The cattle industry reached its greatest prosperity during the first years of the American Period. Mexican Period land grants had created large pastoral estates in California, and demand for beef during the Gold Rush led to a cattle boom that lasted from 1849–1855. However, beginning about 1855, the demand for beef began to decline due to imports of sheep from New Mexico and cattle from the Mississippi and Missouri Valleys. When the beef market collapsed, many California ranchers lost their ranchos through foreclosure. A series of disastrous floods in 1861–1862, followed by two (2) years of extreme drought, which continued to some extent until 1876, altered ranching forever in the southern California area.

History of the Project area: City of Rialto

The following history of Rialto is quoted from the California Historian online resource accessed in March 2023.

> In 1887 a railroad connector line was built between San Bernardino and Pasadena by the Santa Fe Railroad, passing through Rialto. The first school was built in the fall of 1888. The Rialto School District was formed in 1891. The staff consisted of two (2) teachers and a principal with separate play areas for boys and girls. In 1893 there were half a dozen business and 35 homes. A fire in the 1920s swept through and destroyed many of the buildings in the downtown area. Today the city is situated between Interstate 10 and State Route 210. … Foothill Boulevard was repaired in 1913 and became U.S. Route 66, a section of the U. S. highway system which runs through the city. In 1914 Los Angeles' Pacific Electric Railway completed its San Bernardino Line through the City of Rialto. In the 1900s the growing of oranges was the largest industry in the city with over 10,000 orange trees.

METHODS

Personnel

DUKE CRM archaeologist Morgan Beigle, Master of Arts (M.A.), Registered Professional Archaeologist (RPA) conducted a records search for cultural resources (archaeological and historical) at the South Central Coastal Information Center (SCCIC), located at California State University, Fullerton. This included a review of all recorded historic and prehistoric cultural resources, as well as a review of known cultural resources surveys and excavation reports generated from projects located within ½ mile of the proposed Project. In addition, a review was conducted of the Built Environment Resources Directory (BERD), which includes the National Register of Historic Places (NRHP), the CRHR, California Historical Landmarks, and California Points of Historical Interest.

The field survey was conducted by Alexandria Bulato using parallel pedestrian transects spaced no greater than 15 meter intervals. All work was conducted under the direct supervision of Brian Glenn, M.A., RPA and Curt Duke, M.A., RPA (Appendix A). Mr. Glenn is the Principal Investigator/Archaeologist assigned to the Project for DUKE C R M and is the primary author of the report. Mr. Glenn meets the professional qualifications of the Secretary of the Interior for prehistoric and historical archaeology who has worked in all phases of archaeology (archival research, field survey, testing and data recovery excavation, laboratory analysis, construction monitoring). Mr. Duke oversaw all work and provided peer review of this report (Appendix A).

Records Search

The SCCIC is the regional office of the California Historical Resources Information System housing records for San Bernardino County. The records search includes a review of all recorded historic and prehistoric archaeological sites within a specified search radius of the Project area, as well as a review of known cultural resource survey and excavation reports. In addition, a review was conducted of the Built Environment Resources Directory (BERD), which includes the NRHP, CRHR, California Historical Landmarks, and California Points of Historical Interest. The following online resources were reviewed:

- Historic aerial photos and maps
- http://mil.library.ucsb.edu/ap_indexes/FrameFinder/,
- http://www.davidrumsey.com/rumsey_collection.kmz,
- www.historicaerials.com,
- https://oac.cdlib.org/
- https://www.loc.gov/collections/sanborn-maps
- https://livingatlas.arcgis.com/topoexplorer/index.html
- National Register of Historic Places (http://www.gelib.com/historic-places-inventory.htm)
- Soil mapping data (https://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/survey/)

Mr. Glenn examined the on-line BERD maintained by the State Historic Preservation Office. The BERD includes the NRHP/CRHR, California Historical Landmarks, and California Points of Historical Interest. The internal archives at DUKE CRM were also inspected for relevant background information.

Native American Outreach

The City will be conducting Native American outreach at a later date, once the Project details have been finalized; AB 52 consultation is the purview of the CEQA lead agency. DUKE CRM will supply the City with the results of the Native American Heritage Commission (NAHC) Sacred Lands File review and a list of tribes with interest in the region as a supplement to the AB 52 list maintained by the City (Appendix B).

Field Survey

The goal of the pedestrian survey was to identify all cultural resources within the Project area. Prior to survey the crew and Native American monitor reviewed safety protocols. Pedestrian survey transects were spaced no greater than 15 meters (m) apart. A Spectra GPS, and field map were used to locate the Project boundary, and to record the location of identified cultural resources. Sites and built-environment resources, if present, would be documented on State of California Department of Parks and Recreation 523 series forms with photographs taken on an iPhone X smartphone.

RESULTS

Records Search

A cultural resource records search was conducted by Ms. Beigle of DUKE CRM at the SCCIC on March 13, 2023 (Table 1). The records search encompassed the entirety of the Project area and a ½ mile radius (Appendix C). The search identified 29 cultural reports within the ½ mile search radius. One (1) report addresses the main body of the Project area (SB-01750, Romani 1987). The report was prepared for possible expansion of the wastewater treatment plant. Two (2) additional surveys (SB-00508, SB-00509) cross the main body of the Project area. One (1) survey (SB-02887) crosses the access road. No resources were identified as a result of these investigations within the Project area. Report SB-01287 covers a proposed transmission line paralleling portions of Agua Manza Road directly adjacent to the access road and parking area.

Table 1: Cultural resource reports (½ mile search radius of the Project area) on file with various Agencies

Year	Author	Affiliation	Title
2000	Love, Bruce	CRM Tech	Ontario to Colton Pipeline, San Bernardino County, CA. 26PP
1978	Chavez, David	URS Company	Final: Cultural Resources Evaluation for the Naval Petroleum Reserve No. 1 (Elk Hills) to Rialto Crude Oil Pipeline
1978	Chavez, David	URS Company	Final: Cultural Resources Evaluation for the Rialto Crude Oil Tank Farm to the Four Corners Pipeline, Kern County, California
1978	Chavez, David	URS Company	Cultural Resources Evaluation of the Rialto Tank Farm Location and Associated Pipeline and Pump Station Locations, San Bernardino, California
1978	Chavez, David	URS Company	Cultural Resources Evaluation of the Four Corners Pipeline Interconnect Facilities, San Bernardino and Riverside Counties, California
1989	Hatheway, Roger G., and Karen Swope	Hatheway & Associates	Archaeological and Historical Survey Report for the Proposed Angelus Block Property
1992	Seymour, Gregory R., and David P. Doak	Thomas G. Olsen Associates	The Santa Ana Regional Interceptor Project SAWPA-SARI Reaches IV D & E: A Cultural Resource Survey of an 18-Mile Right of Way from Mira Loma to Colton, Riverside and San Bernardino Counties, CA
1987	Romani, Gwendolyn R.	Greenwood & Associates	Cultural Resources Investigation: Proposed Expansion of the City of Rialto Wastewater Treatment Plant
1988	Peter, Kevin J., James Rudolph, Tony Morgan, Jean Hudson, and Craig F. Woodman	URS Consultants	Archaeological Test Investigation and Evaluation of SBR-1576, San Bernardino County, California

Year	Author	Affiliation	Title
2000	Love, Bruce	CRM Tech	Ontario to Colton Pipeline, San Bernardino County, CA. 26PP
1982	Lerch, Michael K.	San Bernardino County Museum Associates	Cultural Resources Assessment of the Sana Ana Regional Interceptor, Reaches IV-D and IV-E, San Bernardino and Riverside Counties, California
1990	Harmsworth Associates and CH2M Hill	Harmsworth Associates	Supplemental Draft Environmental Impact Report: Expansion of the Rialto Wastewater Treatment Plant [Cultural Resources Section]
1996	Schmidt, James J.	Greenwood & Associates	Cultural Resources Investigations: CA-SBR-1576, City of Colton, New Substation and Transmission Facilities. 23PP
1992	McKenna, Jeanette A.	McKenna et al.	Cultural Resources Investigations and Historic Research for the Expanded Santa Watershed Project Authority Site 1 Project Area, Agua Mansa, San Bernardino County, CA
1993	McKenna, Jeanette A.	McKenna et al.	Cultural Resources Investigations and Historic Research for the Santa Ana Watershed Project Authority Site 1 Project Area and Associated Soil Testing Areas, Agua Mansa, San Bernardino County, CA
1990	McKenna, Jeanette A.	McKenna et al.	Report Addendum: A Phase I Archaeological Survey of the Proposed Sana Ana Watershed Project Authority (SAWPA) Pipeline Right-of-Way, San Bernardino to Colton, San Bernardino, California
1991	Harley, Bruce	San Bernardino County Museum Association Quarterly 39 (1):1-59	The Agua Mansa Story, A Collection of Papers Compiled on the Occasion of the 150th Anniversary of the Settlement of Agua Mansa
1973	Wilke, Philip J., and Stephen Hammond	Archaeological Research Unit, UCR	La Loma – Mira Loma Transmission Line: Expected Impact on Archaeological Values
1977	Greenwood, Roberta S.	Greenwood & Associates	Archaeological Resources Survey: West Coast – Mid Continent Pipeline Project, Long Beach to Colorado River
1978	Greenwood & Associates	Greenwood & Associates	Archaeological Resources Survey: West-Coast – Mid-Continent Pipeline Project, Long Beach to Colorado River, the Agua Mansa Alternate Pipeline Route
1990	McKenna, Jeanette A.	McKenna et al.	A Phase I Archaeological Survey and Historical Background Investigation of the Proposed Santa Ana River Watershed Project Authority, Site 1 Agua Mansa, San Bernardino County, California
1990	McKenna, Jeanette A.	McKenna et al.	Update Report: Archaeological Monitoring at the SAWPA RIX Site, Site 1, Colton (Agua Mansa), San Bernardino County, California
1990	McKenna, Jeanette A.	McKenna et al.	Supplemental, Archaeological Monitoring at the RIX Project Site (SAWPA), Agua Mansa, San Bernardino County
1991	McKenna, Jeanette A.	McKenna et al.	RIX Project Area Archaeological Monitoring
1991	McKenna, Jeanette A.	McKenna et al.	Continued Archaeological Monitoring at the RIX Project Site
1991	McKenna, Jeanette A.	McKenna et al.	RIX Project Area Archaeological Monitoring

The records search identified 15 cultural resources within the ½ mile search radius (Table 2). No previously identified cultural resources are located within the Project area and none will be affected by the Project. The majority of the historic-era resources are related to use of the surrounding area during ranch and farming activities spanning the Spanish, Mexican and American history of the area.

Table 2: Previously Identified Cultural Resources within ½ mile of the Project area

Resource No.	Resource Type	Description	Distance & Direction
P36-001572	Prehistoric	Charcoal pits	0.07 miles, northwest
P36-001576	Prehistoric	Habitation site with lithic scatters	0.14 miles, east
P36-001578, P36-004233	Prehistoric	Lithic and ceramics scatter	0.49 miles, south-southwest
P36-004952 P36-020804	Historic	Adobe structure and historic debris scatter	0.39 miles, southwest
P36-006007	Prehistoric	Ceramic sherd scatter	.080 miles, east
P36-006084	Historic	Glass, ceramics, can scatter	0.35 miles, southeast
P36-006940	Historic	Irrigation system	0.49 miles, southwest
P36-007172	Historic	Riverside Lower Canal	0.5 miles, south

Resource No.	Resource Type	Description	Distance & Direction
P36-001572	Prehistoric	Charcoal pits	0.07 miles, northwest
P36-021603	Historic	Historic storage tanks	0.38 miles, northwest
P36-025601	Historic	Residential structure	0.17 miles, east
P36-025602	Historic	Residential structure	0.13 miles, east
P36-031378	Historic	Manuel Soarea Property, Agua Mansa	0.35 miles, east
P36-031676	Historic	Glass isolate	0.45 miles, south
P36-031677	Historic	Historic barn and horse rehabilitation pond	0.43 miles, south
P36-031715	Historic	Agua Mansa Ditch	0.14 miles, southeast

Prehistoric resources within the ½ mile records search radius were limited to lithics and ceramics scatters. The large habitation site, P-36-001576, is located within dune deposits has been heavily impacted through illicit collecting.

Background Research

Maps of the Project were examined for details that would aid in reconstructing the history of the Project area. This included historical USGS maps, as well as aerial imagery on file with the University of California, Santa Barbara and online (Framefinder 2023; HistoricalAerial.com 2023).

The 1896 USGS *San Bernardino, Calif.* 15' map illustrates the unmodified area now occupied by the treatment plant. A basic road system surrounds the location with Riverside Road present to the south. The City of Colton and San Bernardino are well established to the northeast. By 1938, as reflected on the 1938 aerial and the 1943 *Colton, Calif.* 7.5' topo, the area to the west of the Project area has a well-established grid of roads encompassing agricultural fields. Dirt roads cut through and around the Project area connecting with the improved Riverside Road to the south. The Project area remains otherwise undeveloped with the exception of the West Riverside Canal and Agua Manza Road. By 1959, the treatment plant is in place and the Project area contains retention ponds. The ponds continue to be used until 1985, after which they are seen as empty ponds with vegetation. The abandoned configuration remains until after 2005 when the Project area is reconfigured, and trailers parked in the northern portion. The Project area remains undeveloped at present.

Field Survey

The Phase I archaeological field survey/cultural resources assessment of the Project area was conducted by DUKE CRM archaeologist Alexandria Bulato, B.A. on April 21, 2023 (Figure 4). Pedestrian transects were no greater than 15 m apart and 100% of the Project area was intensively surveyed. The main body of the Project area consists of a large basin. Vegetation within the main body of the Project area included a combination of native and exotic plants (Figure 5). Soils consisted of gray-brown coarse alluvial sand (Figure 6). The area is currently used for treatment plant storage and contains construction debris. No cultural resources were identified within the main body of the Project area as a result of survey. Historical maps and aerial imagery from 1938 through 1980 show the West Riverside Canal crossing the access road within a pipe directly north of the parking area. No indications of the canal were visible on the surface within the Project area.

Figure 4. Rialto Lake Project area overview looking northwest.

Site Sensitivity Summary

Prehistoric cultural resources have been identified within the ½ mile records search radius. However, previous disturbance of the Project area reduce the probability of encountering intact resources. Historical maps and imagery indicate slow development of the area surrounding the Project area throughout the late 19th and first half of the 20th centuries. A basic road system that includes Agua Manza Road. Agricultural use of the area dominated the landscape. A pipe-encased segment of the West Riverside Canal crosses the Project area beneath the access road directly north of the proposed parking area but will not be impacted by the Project. The Project has a low sensitivity for cultural resources.

FINDINGS AND RECOMMENDATIONS

The current study identified 15 cultural resources within ½ mile of the Project area, none of which were within the Project area. A pipe-encased section of the West Riverside Canal crosses beneath the Project area access road directly north of the proposed parking area but will not be impacted by the Project. Background research and pedestrian survey did not identify additional cultural materials but did indicate a high degree of disturbance related to previous use of the area by the adjacent wastewater treatment plant. Given these data, a finding of No Historical Resources Impacted for the purposes of CEQA is warranted. Given these data, no further cultural resources work is recommended.

Inadvertent Archaeological Finds

Given the current findings, archaeological monitoring is not recommended during ground disturbance related to implementation within the Project area. If intact and potentially significant subsurface deposits are encountered during earth moving, it is recommended these cultural resources undergo evaluation excavation to determine CRHR-eligibility. To reduce impacts to historical resources, data recovery or other treatments of eligible deposits may be required.

In consultation with the City, a qualified archaeologist shall develop a treatment plan prior to earth moving related to Project implementation. The treatment plan shall include protocols for the treatment of inadvertent finds during ground disturbance that would include evaluation of the resource for CRHR-eligibility and

Figure 5. Vegetation within the Project area looking south.

Figure 6. Project area soils

further treatment to reduce impacts through treatment that may include salvage excavation, laboratory analysis and processing, research, curation of the find in a local museum or repository, and preparation of a report summarizing the find. If the discovery is prehistoric in nature, local Native Americans shall be consulted.

If human remains are encountered, State Health and Safety Code Section 7050.5 states that no further disturbance shall occur until the County Coroner has made a determination of origin and disposition pursuant to Public Resources Code Section 5097.98. The County Coroner must be notified of the find immediately. If the remains are determined to be prehistoric, the Coroner will notify the NAHC, which will determine and notify a Most Likely Descendant (MLD). With the permission of the landowner or his/her authorized representative, the MLD may inspect the site of the discovery. The MLD shall complete the inspection within 48 hours of notification by the NAHC. The MLD may recommend scientific removal and nondestructive analysis of human remains and items associated with Native American burials. In addition, according to the California Health and Safety Code, a cemetery is place where six (6) or more human bodies are buried (Section 8100), and unauthorized disturbance of Native American cemeteries is a felony (Section 7052).

If the proposed Project changes additional efforts may be necessary.

REFERENCES

Basgall, Mark E.
1987 Resource Intensification Among Hunter-Gathers: Acorn Economies in Prehistoric Southern California. *Research in Economics Anthropology* 9:21-52.

Bean, Lowell J., and Florence C. Shipek
1978 Luiseño. In *California*, edited by Robert F. Heizer, pp.550-563. Handbook of North American Indians, Vol. 8, William C Sturtevant, general editor, Smithsonian Institution, Washington, DC.

Bean, Lowell J., and Charles R. Smith
1978 Gabrielino. In *California*, edited by Robert F. Heizer, pp.538-549. Handbook of North American Indians, Vol. 8, William C Sturtevant, general editor, Smithsonian Institution, Washington, DC.

Byrd, Brian F., and L. Mark Raab
2007 Prehistory of the Southern Bight: Models for a New Millennium. In *California Prehistory: Colonization, Culture, and Complexity*, edited by Terry L. Jones and Kathryn A. Klar, pp. 215-227. AltaMira Press, New York.

Davis, E.L., C.W. Brott, and D.L. Weide
1969 The Western Lithic Co-Tradition. *San Diego Museum Papers* Vol. 6, San Diego Museum of Man, San Diego.

FrameFinder
2023 Various black and white aerial photographs. Electronic documents, http://mil.library.ucsb.edu/ap_indexes/FrameFinder/, accessed April 28, 2023.

Goldberg, Susan (editor)
2001 *Metropolitan Water District of Southern California, Eastside Reservoir Project, Final Report of Archaeological Investigations, Volume I: Project Overview and Summary of Archaeological Investigations.* Applied EarthWorks, Inc. Submitted to the Metropolitan Water District of Southern California. Copies available from the Eastern Information Center, Riverside.

Harris, Marvin
1968 *The Fall of Anthropological Theory: A History of Theories of Culture*. AltaMira Press, London.

HistoricAerials.com
2023 Various black and white aerial photographs. Electronic documents, https://www.historicaerials.com/viewer, accessed April 28, 2023.

Johnson, Allen W., and Timothy Earle
1987 *The Evolution of Human Societies: From Foraging Group to Agrarian State*. Stanford University Press, Stanford.

Jones, Terry L., Gary M. Brown, L. Mark Raab, Janet L. McVickar, W. Geoffrey Spaulding, Douglas M. Kennett, Andrew York, and Phillip L. Walker
2004 Environmental Imperatives Reconsidered: Demographic Crises in Western North America During the Medieval Climatic Anomaly. In *Prehistoric California: Archaeology and the Myth of Paradise*, edited by L. Mark Raab and Terry L. Jones, pp. 12-32. University of Utah Press, Salt Lake City.

Koerper, H. C., and C. E. Drover
1983 Chronology Building for Coastal Orange County: The Case from CA-ORA-119A. *Pacific Coast Archaeological Society Quarterly* 19(2):1–34.

Moratto, Michael J.
1984 *California Archaeology*. Academic Press, Inc., Orlando.

Morton, D.M.
1978 Geologic map of the San Bernardino South quadrangle, San Bernardino and Riverside Counties, California, U.S. Geological Survey.

Norris, Robert M., and Robert W. Webb
1976 *Geology of California*. John Wiley & Sons, New York.

Onken, Jill A.
2001 Chronosequencing. In *Metropolitan Water District of Southern California Eastside Reservoir Project: Final Report of Archaeological Investigations*. Applied EarthWorks, Inc. Submitted to the Metropolitan Water District of Southern California. Copies available from the Eastern Information Center, Riverside.

Shipley, William F.
1978 Native Languages of California. In *California*, edited by Robert F. Heizer, pp.80-90. Handbook of North American Indians, Vol. 8, William C. Sturtevant, general editor, Smithsonian Institution, Washington, DC.

Strong, William Duncan
1929 Aboriginal Society in Southern California. *University of California Publications in American Archaeology and Ethnology* 26:1-358.

Sutton, Mark
2009 People and Language: Defining the Takic Expansion into Southern California. *Pacific Coast Archaeological Society Quarterly* 41(2&3):31–93.

2010 A Reevaluation of Early Northern Uto-Aztecan Prehistory in Alta California. *California Archaeology*, 2(1):3-30.

United States Department of Agriculture (USDA)
2023 USDA Web Soil Survey. https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx Accessed April 28, 2023.

Vellanoweth, Rene L. and Donn R. Grenda
2002 Paradise or Purgatory: Environments, Past and Present. In *Islanders and Mainlanders: Prehistoric Context for the Southern California Bight*, edited by Jeffrey H. Altschul and Donn R. Grenda, pp. 67-84. SRI Press, Tucson.

Wallace, William
1955 A Suggested Chronology for Southern California Coastal Archaeology. *Southwestern Journal of Anthropology* 2:214-230.

Warren, Claude N.
1980 Chapter II: Cultural Chronology of the Mojave Desert. In *A Cultural Resources Overview for the Amargosa-Mojave Basin Planning Units*, edited by C. N. Warren, M. Knack, and E. von Till Warren. U.S. Bureau of Land Management, Cultural Resources Publications, Anthropology/History, Riverside, California.

Warren, Claude N., and Robert H. Crabtree
1986 Prehistory of the Southwestern Area. In *Great Basin*, edited by Warren L. D'Azevedo, pp. 183-193. Handbook of North American Indians, Vol. 11, William C. Sturtevant, general editor, Smithsonian Institution, Washington, DC.

White, Raymond C.
1963 Luiseño Social Organization. *University of California Publications in American Archaeology and Ethnology* 48:91–194.

Appendix A
Resumes

DUKE CRM
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Brian Glenn

Principal Investigator/Archaeologist

Professional Experience: 30 Years

Expertise

Cultural Resources Management
California Prehistory
Section106 & CEQA Compliance
Native American Consultation
Database (Collections) Management

Education

UCLA , M.A. Anthropology, 1991
UC, Santa Barbara, B.A., Anthropology, 1986
UC, Santa Barbara, B.A., Geography, 1986
San Diego Mesa College, Certificate, GIS, 2010

Professional Registrations

RPA, No. 989903

Professional Memberships

Society for California Archaeology
Society for American Archaeology
San Diego County Archaeological Society President, 1999

Summary of Qualifications

Mr. Glenn has worked on hundreds of cultural resources management projects over his 30 year career. This includes projects throughout California in compliance with Section 106 of the National Historic Preservation Act (NHPA) and California Environmental Quality Act (CEQA). He is listed on the RPA and meets the Secretary of Interior Standards for Principal Investigator. His recent experience includes cultural resources surveys and studies for clients such as the Los Angeles Department of Water and Power, Metropolitan Transit Authority, and La Plaza Foundation. His responsibilities have included the preparation of technical reports (assessment, evaluation, and mitigation), cultural resources management plans and EIS/EIR sections, as well as archaeological monitoring. He has training and significant experience in lithic, faunal, typological and spatial analyses, as well as obsidian source and hydration studies. He has identified, evaluated, and investigated historic era resources from a 1792 Spanish gun emplacement on Ballast Point overlook San Diego Bay to late 19th to mid-20th century household and commercial deposits. Mr. Glenn received B.A. degrees in Geography and Anthropology from UC, Santa Barbara and an M.A. in Archaeology from UCLA. During his graduate work at UCLA, he was acting coordinator of the SCCIC (CHRIS).

Selected Project Experience

Middle Mile Broadband Network Survey and Extended Phase I Ventura County, CA

Mr. Glenn managed multiple teams and reported on the survey of 123 miles and extended phase I subsurface testing at locations along seven Ventura County highways in anticipation of project construction for GPA Consulting and Caltrans.

FEMA / City of Indian Wells, CA Whitewater River East & West Drop Structure Project

Mr. Glenn managed survey and below surface testing at four locations along the Whitewater River in compliance with Section 106 of the National Historic Preservation Act and California Environmental Quality Act in anticipation of FEMA repair project construction. Completed a combined survey and BST report for FEMA and the City of Indian Wells.

Pacific Coast Highway (PCH) Pavement Rehabilitation Project, City of Malibu & County of Los Angeles, CA

Mr. Glenn managed and reported on the survey of 16 miles and extended phase I subsurface testing at locations along six locations along PCH for GPA Consulting and Caltrans.

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Alexandria M. Bulato

Archaeologist

Expertise

Cultural Resources Management
Pacific Coastal Archaeology
California Prehistory
Laboratory Analysis

Education

CSUSB, B.A., Anthropology, 2016
CSUSB, Certificate, Archaeology, 2016
USDA Forest Service, Applied Archaeology Field School, 2015

Professional Experience

Archaeologist/Laboratory Technician, DUKE CRM, 2016 - present
Archaeological Field Technician, Statistical Research, Inc., 2016
Research Intern, Anthropology Department, CSUSB, 2016 - 2018
Supplemental Instruction Leader, CSUSB, 2015 - 2016

Selected Project Experience

Ocean Place Project, Seal Beach, 2018 - present
Diamond Valley Estates Project, Hemet, 2017 - present
US-101 California St. Off-Ramp Relocation Project, Ventura, 2017 - present
6th Street Seismic Retrofit Project, Los Angeles, 2017 - present
Gold Flora Farms, Desert Hot Springs, 2017 - 2019
Murrieta Hospitality Commons Project, Murrieta, 2017
SR-110 Improvement Project, Los Angeles, 2017
Dolores Lake Park Project, Newberry Springs, 2017
Vanderham Monitoring Project, Jurupa Valley, 2017
Rialto USD CNG & Transportation Yard Phase I, Rialto, 2017
Canyon Springs High School Athletic Complex Project, Moreno Valley, 2017
Fullerton JUHSD CNG Fueling Infrastructure Improvements, La Habra, 2017
La Mirada Creek Park Project, La Mirada, 2017
Soto Street Widening Project, Los Angeles, 2017
Vila Borba Specific Plan, Chino Hills, 2016 - present
CSUSB Channel Islands Research & Data Recovery Project, 2016 - present
Spruce Goose Hangar Project Data Recovery, Los Angeles, 2016

Appendix B

Native American Heritage Commission Sacred Lands File Search

NATIVE AMERICAN HERITAGE COMMISSION

CHAIRPERSON
Laura Miranda
Luiseño

VICE CHAIRPERSON
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Kumeyaay

COMMISSIONER
[Vacant]

COMMISSIONER
[**Vacant**]

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

October 19, 2022

Brian Glenn
Duke CRM

Via Email to: BrianGlenn@DukeCRM.com

Re: Rialto Lake (C-0422) Project, San Bernardino County

Dear Mr. Glenn:

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: Cameron.vela@nahc.ca.gov.

Sincerely,

Cameron Vela

Cameron Vela
Cultural Resources Analyst

Attachment

Native American Heritage Commission
Native American Contact List
San Bernardino County
10/19/2022

Agua Caliente Band of Cahuilla Indians
Reid Milanovich, Chairperson
5401 Dinah Shore Drive — Cahuilla
Palm Springs, CA, 92264
Phone: (760) 699 - 6800
Fax: (760) 699-6919
laviles@aguacaliente.net

Agua Caliente Band of Cahuilla Indians
Patricia Garcia-Plotkin, Director
5401 Dinah Shore Drive — Cahuilla
Palm Springs, CA, 92264
Phone: (760) 699 - 6907
Fax: (760) 699-6924
ACBCI-THPO@aguacaliente.net

Augustine Band of Cahuilla Mission Indians
Amanda Vance, Chairperson
84-001 Avenue 54 — Cahuilla
Coachella, CA, 92236
Phone: (760) 398 - 4722
Fax: (760) 369-7161
hhaines@augustinetribe.com

Cabazon Band of Mission Indians
Doug Welmas, Chairperson
84-245 Indio Springs Parkway — Cahuilla
Indio, CA, 92203
Phone: (760) 342 - 2593
Fax: (760) 347-7880
jstapp@cabazonindians-nsn.gov

Cahuilla Band of Indians
Daniel Salgado, Chairperson
52701 U.S. Highway 371 — Cahuilla
Anza, CA, 92539
Phone: (951) 763 - 5549
Fax: (951) 763-2808
Chairman@cahuilla.net

Gabrieleno Band of Mission Indians - Kizh Nation
Andrew Salas, Chairperson
P.O. Box 393 — Gabrieleno
Covina, CA, 91723
Phone: (626) 926 - 4131
admin@gabrielenoindians.org

Gabrieleno/Tongva San Gabriel Band of Mission Indians
Anthony Morales, Chairperson
P.O. Box 693 — Gabrieleno
San Gabriel, CA, 91778
Phone: (626) 483 - 3564
Fax: (626) 286-1262
GTTribalcouncil@aol.com

Gabrielino /Tongva Nation
Sandonne Goad, Chairperson
106 1/2 Judge John Aiso St., #231 — Gabrielino
Los Angeles, CA, 90012
Phone: (951) 807 - 0479
sgoad@gabrielino-tongva.com

Gabrielino Tongva Indians of California Tribal Council
Christina Conley, Tribal Consultant and Administrator
P.O. Box 941078 — Gabrielino
Simi Valley, CA, 93094
Phone: (626) 407 - 8761
christina.marsden@alumni.usc.edu

Gabrielino Tongva Indians of California Tribal Council
Robert Dorame, Chairperson
P.O. Box 490 — Gabrielino
Bellflower, CA, 90707
Phone: (562) 761 - 6417
Fax: (562) 761-6417
gtongva@gmail.com

Gabrielino-Tongva Tribe
Charles Alvarez,
23454 Vanowen Street — Gabrielino
West Hills, CA, 91307
Phone: (310) 403 - 6048
roadkingcharles@aol.com

Los Coyotes Band of Cahuilla and Cupeño Indians
Ray Chapparosa, Chairperson
P.O. Box 189 — Cahuilla
Warner Springs, CA, 92086-0189
Phone: (760) 782 - 0711
Fax: (760) 782-0712

This list is current only as of the date of this document. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resource Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources assessment for the proposed Rialto Lake (C-0422) Project, San Bernardino County.

Native American Heritage Commission
Native American Contact List
San Bernardino County
10/19/2022

Morongo Band of Mission Indians
Ann Brierty, THPO
12700 Pumarra Road — Cahuilla
Banning, CA, 92220 — Serrano
Phone: (951) 755 - 5259
Fax: (951) 572-6004
abrierty@morongo-nsn.gov

Morongo Band of Mission Indians
Robert Martin, Chairperson
12700 Pumarra Road — Cahuilla
Banning, CA, 92220 — Serrano
Phone: (951) 755 - 5110
Fax: (951) 755-5177
abrierty@morongo-nsn.gov

Pala Band of Mission Indians
Shasta Gaughen, Tribal Historic Preservation Officer
PMB 50, 35008 Pala Temecula Rd. — Cupeno, Luiseno
Pala, CA, 92059
Phone: (760) 891 - 3515
Fax: (760) 742-3189
sgaughen@palatribe.com

Pechanga Band of Indians
Mark Macarro, Chairperson
P.O. Box 1477 — Luiseno
Temecula, CA, 92593
Phone: (951) 770 - 6000
Fax: (951) 695-1778
epreston@pechanga-nsn.gov

Pechanga Band of Indians
Paul Macarro, Cultural Resources Coordinator
P.O. Box 1477 — Luiseno
Temecula, CA, 92593
Phone: (951) 770 - 6306
Fax: (951) 506-9491
pmacarro@pechanga-nsn.gov

Quechan Tribe of the Fort Yuma Reservation
Manfred Scott, Acting Chairman
Kw'ts'an Cultural Committee
P.O. Box 1899 — Quechan
Yuma, AZ, 85366
Phone: (928) 750 - 2516
scottmanfred@yahoo.com

Quechan Tribe of the Fort Yuma Reservation
Jill McCormick, Historic Preservation Officer
P.O. Box 1899 — Quechan
Yuma, AZ, 85366
Phone: (760) 572 - 2423
historicpreservation@quechantribe.com

Ramona Band of Cahuilla
Joseph Hamilton, Chairperson
P.O. Box 391670 — Cahuilla
Anza, CA, 92539
Phone: (951) 763 - 4105
Fax: (951) 763-4325
admin@ramona-nsn.gov

Ramona Band of Cahuilla
John Gomez, Environmental Coordinator
P. O. Box 391670 — Cahuilla
Anza, CA, 92539
Phone: (951) 763 - 4105
Fax: (951) 763-4325
jgomez@ramona-nsn.gov

Rincon Band of Luiseno Indians
Bo Mazzetti, Chairperson
One Government Center Lane — Luiseno
Valley Center, CA, 92082
Phone: (760) 749 - 1051
Fax: (760) 749-5144
bomazzetti@aol.com

Rincon Band of Luiseno Indians
Cheryl Madrigal, Tribal Historic Preservation Officer
One Government Center Lane — Luiseno
Valley Center, CA, 92082
Phone: (760) 297 - 2635
crd@rincon-nsn.gov

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This list is only applicable for contacting local Native Americans with regard to cultural resources assessment for the proposed Rialto Lake (C-0422) Project, San Bernardino County.

Native American Heritage Commission
Native American Contact List
San Bernardino County
10/19/2022

San Manuel Band of Mission Indians
Jessica Mauck, Director of Cultural Resources
26569 Community Center Drive — Serrano
Highland, CA, 92346
Phone: (909) 864 - 8933
Jessica.Mauck@sanmanuel-nsn.gov

Santa Rosa Band of Cahuilla Indians
Lovina Redner, Tribal Chair
P.O. Box 391820 — Cahuilla
Anza, CA, 92539
Phone: (951) 659 - 2700
Fax: (951) 659-2228
lsaul@santarosa-nsn.gov

Serrano Nation of Mission Indians
Mark Cochrane, Co-Chairperson
P. O. Box 343 — Serrano
Patton, CA, 92369
Phone: (909) 528 - 9032
serranonation1@gmail.com

Serrano Nation of Mission Indians
Wayne Walker, Co-Chairperson
P. O. Box 343 — Serrano
Patton, CA, 92369
Phone: (253) 370 - 0167
serranonation1@gmail.com

Soboba Band of Luiseno Indians
Joseph Ontiveros, Cultural Resource Department
P.O. BOX 487 — Cahuilla
San Jacinto, CA, 92581 — Luiseno
Phone: (951) 663 - 5279
Fax: (951) 654-4198
jontiveros@soboba-nsn.gov

Soboba Band of Luiseno Indians
Isaiah Vivanco, Chairperson
P. O. Box 487 — Cahuilla
San Jacinto, CA, 92581 — Luiseno
Phone: (951) 654 - 5544
Fax: (951) 654-4198
ivivanco@soboba-nsn.gov

Torres-Martinez Desert Cahuilla Indians
Cultural Committee,
P.O. Box 1160 — Cahuilla
Thermal, CA, 92274
Phone: (760) 397 - 0300
Fax: (760) 397-8146
Cultural-Committee@torresmartinez-nsn.gov

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Appendix C

Records Search

Confidential Appendix:
Not for Public Review

ReportNum	OtherIDs	Authors	CitYear	CitTitle	CitPublisher	CitPages	CitMaps	ReportType	InventorySize	InventoryNotes	Resources	ResourceCount	HasInformals	Counties	Maps
SB-00145	NADB-R - 1060145; Voided - 73-3.2	WILKE, PHILIP J. and STEPHEN HAMMOND	1973	LA LOMA - MIRA LOMA TRANSMISSION LINE: EXPECTED IMPACT ON ARCHAEOLOGICAL VALUES	ARCHAEOLOGICAL RESEARCH UNIT, UCR					[NADB Keywords: PREHISTORIC; ARCHAEOLOGICAL SURVEY REPORT; ROCK ART SITES; PICTOGRAPHS; FOOD PROCESSING SITES; OPEN HABITATION SITES; INTERMONTANE VALLEY; JURUPA MOUNTAINS; LA LOMA - MIRA LOMA; CA-RIV-615; CA-RIV-616; CA-RIV-617; CA-RIV-618; CA-RIV-502; CA-RIV-594; CA-RIV-619; CA-RIV-620; CA-RIV-127; CA-RIV-621; CA-RIV-622; CA-RIV-623; CA-RIV-624; CA-RIV-625]	36-000144, 36-000714, 36-000715, 36-000716, 36-000794, 36-001573, 36-001574	7	No	San Bernardino	Fontana, San Bernardino South
SB-00180	NADB-R - 1060180; Voided - 73-9.1	SAN BERNARDINO COUNTY MUSEUM ASSOCIATION	1973	RIALTO CHANNEL - ZONE 2, ARCHAEOLOGIC EVALUATION	SAN BERNARDINO COUNTY MUSEUM ASSOCIATION					[NADB Keywords: PREHISTORIC; ARCHAEOLOGICAL RECONNAISSANCE REPORT; INTERMONTANE VALLEY; SANTA ANA RIVER; SAN BERNARDINO VALLEY; NO RESOURCES]		0	No	San Bernardino	San Bernardino South
SB-00508	NADB-R - 1060508; Voided - 77-6.4A	GREENWOOD, ROBERTA S.	1977	ARCHAEOLOGICAL RESOURCES SURVEY: WEST COAST - MID CONTINENT PIPELINE PROJECT, LONG BEACH TO COLORADO RIVER	GREENWOOD AND ASSOCIATES	75		Archaeological, Architectural/Historical, Field study		[NADB Keywords: PREHISTORIC; HISTORIC; ARCHAEOLOGICAL SURVEY REPORT; VILLAGES; OPEN HABITATION SITES; BURIAL; LITHIC SCATTER; FOOD PROCESSING SITES; BEDROCK MORTARS; ROCK ART; CEMETERY; TRAILS; SHELL MIDDENS; PETROGLYPHS; BEDROCK SLICKS; POTTERY; GROUND STONE; SCHOOL BUILDING; FLAKED LITHICS; FLAKED GLASS; INTERMONTANE VALLEY; SANTA ANA RIVER; COASTAL PLAINS; CA-LAN-390; CA-LAN-389; CA-LAN-697; CA-LAN-852; CA-LAN-853; CA-LAN-854; CA-RIV-179; CA-RIV-163; CA-RIV-149; CA-RIV-1173; CA-RIV-343; CA-RIV-1185; CHERT; STEATITE; QUARTZITE; BASALT; SCHIST; GRANITE; CHALCEDONY]	36-000715, 36-000716, 36-001573, 36-001576, 36-001632	5	No	San Bernardino	Fontana, Redlands, San Bernardino South
SB-00509	NADB-R - 1060509; Voided - 77-6.4B	GREENWOOD AND ASSOCIATES	1978	ARCHAEOLOGICAL RESOURCES SURVEY: WEST-COAST - MID-CONTINENT PIPELINE PROJECT, LONG BEACH TO COLORADO RIVER, THE AGUA MANSA ALTERNATE PIPELINE ROUTE	GREENWOOD AND ASSOCIATES	12		Archaeological, Architectural/Historical, Field study		[NADB Keywords: PREHISTORIC; HISTORIC; ARCHAEOLOGICAL SURVEY REPORT; INTERMONTANE VALLEY; SANTA ANA RIVER; NO RESOURCES]		0	No	San Bernardino	San Bernardino South
SB-00711	NADB-R - 1060711; Voided - 78-12.2A	CHAVEZ, DAVID	1978	CULTURAL RESOURCES EVALUATION OF THE RIALTO TANK FARM LOCATION AND ASSOCIATED PIPELINE AND PUMP STATION LOCATIONS, SAN BERNARDINO COUNTY, CALIFORNIA						[NADB Keywords: PREHISTORIC; HISTORIC; ARCHAEOLOGICAL RECONNAISSANCE REPORT; CEMETERY; INTERMONTANE VALLEY; SAN BERNARDINO VALLEY]	36-001578	1	No	San Bernardino	San Bernardino South
SB-00712	NADB-R - 1060712; Voided - 78-12.2B	CHAVEZ, DAVID	1978	CULTURAL RESOURCES EVALUATION OF THE FOUR CORNERS PIPELINE INTERCONNECT FACILITIES, SAN BERNARDINO AND RIVERSIDE COUNTIES, CALIFORNIA						[NADB Keywords: PREHISTORIC; HISTORIC; ARCHAEOLOGICAL RECONNAISSANCE REPORT; CEMETERY; INTERMONTANE VALLEY; SANTA ANA RIVER]	36-001578	1	No	San Bernardino	San Bernardino South
SB-00713	NADB-R - 1060713; Voided - 78-12.2C	CHAVEZ, DAVID	1978	FINAL: CULTURAL RESOURCES EVALUATION FOR THE NAVAL PETROLEUM RESERVE NO. 1 (ELK HILLS) TO RIALTO CRUDE OIL PIPELINE	URS COMPANY					[NADB Keywords: PREHISTORIC; HISTORIC; ARCHAEOLOGICAL RECONNAISSANCE REPORT; VILLAGE; LITHIC SCATTERS; OPEN HABITATION SITES; FOOD PROCESSING SITES; CEMETERY; ROADS; RAILROAD SITE; FLAKED LITHCS; GROUND STONE; SCHIST; QUARTZ MONZONITE; MOJAVE DESERT; TRANSVERSE RANGES; SAN GABRIEL MOUNTAINS; INTERMONTANE VALLEY; SAN BERNARDINO VALLEY; CA-LAN-676; CA-KER-115; PSBR-5-H]	36-000116, 36-000425, 36-001578, 36-002419, 36-003430, 36-004411	6	No	San Bernardino	Cajon, Devore, Mescal Creek, Phelan, San Bernardino North, San Bernardino South, Telegraph Peak
SB-00714	NADB-R - 1060714; Voided - 78-12.2D	CHAVEZ, DAVID	1978	FINAL: CULTURAL RESOURCES EVALUATION FOR THE RIALTO CRUDE OIL TANK FARM TO THE FOUR CORNERS PIPELINE, KERN COUNTY, CALIFORNIA	URS COMPANY					[NADB Keywords: PREHISTORIC; HISTORIC; ARCHAEOLOGICAL RECONNAISSANCE REPORT; FOOD PROCESSING SITES; ADOBE FOUNDATION; BEDROCK MORTARS; BEDROCK SLICKS; ROCKSHELTER; CEMETERY; INTERMONTANE VALLEY; SAN BERNARDINO VALLEY; SANTA ANA RIVER; CA-RIV-497]	36-000314, 36-001578	2	No	San Bernardino	San Bernardino South
SB-01287	NADB-R - 1061287; Voided - 82-7.3	LERCH, MICHAEL K.	1982	CULTURAL RESOURCES ASSESSMENT OF THE SANTA ANA REGIONAL INTERCEPTOR, REACHES IV-D AND IV-E, SAN BERNARDINO AND RIVERSIDE COUNTIES, CALIFORNIA	SAN BERNARDINO COUNTY MUSEUM ASSOCIATION	23		Field study		[NADB Keywords: PREHISTORIC; HISTORIC; ARCHAEOLOGICAL RECONNAISSANCE REPORT; CHAPEL SITE; SCHOOL SITE; INTERMONTANE VALLEY; PRADO BASIN; SANTA ANA RIVER]	36-001575, 36-004952	2	No	San Bernardino	Corona North, Prado Dam, San Bernardino South
SB-01750	NADB-R - 1061750; Voided - 87-12.2	ROMANI, GWENDOLYN R.	1987	CULTURAL RESOURCE INVESTIGATION: PROPOSED EXPANSION OF THE CITY OF RIALTO WASTEWATER TREATMENT PLANT	GREENWOOD & ASSOCIATES					[NADB Keywords: PREHISTORIC; HISTORIC; ARCHAEOLOGICAL RECONNAISSANCE REPORT; INTERMONTANE VALLEY; SAN BERNARDINO VALLEY; SANTA ANA RIVER; NO RESOURCES]		0	No	San Bernardino	San Bernardino South
SB-01828	NADB-R - 1061828; Voided - 88-9.3	PETER, KEVIN J., JAMES RUDOLPH, TONY MORGAN, JEAN HUDSON, and CRAIG F. WOODMAN	1988	ARCHAEOLOGICAL TEST INVESTIGATION AND EVALUATION OF SBR-1576, SAN BERNARDINO COUNTY, CALIFORNIA	URS CONSULTANTS, INC.					[NADB Keywords: PREHISTORIC; ARCHAEOLOGICAL TESTING; FLAKED LITHICS; GROUND STONE; SCHIST; GRANITE; QUARTZITE; BASALT; CHERT; FELSITE; OBSIDIAN; RHYOLITE; SANDSTONE; METAL HARDWARE; CERAMICS; GLASS BOTTLES; INTERMONTANE VALLEY; SAN BERNARDINO VALLEY; SANTA ANA RIVER]	36-001576	1	No	San Bernardino	San Bernardino South
SB-01951	NADB-R - 1061951; Voided - 89-10.8	HATHEWAY, ROGER G. and KAREN SWOPE	1989	ARCHAEOLOGICAL AND HISTORICAL SURVEY REPORT FOR THE PROPOSED ANGELUS BLOCK PROPERTY	HATHEWAY & ASSOCIATES					[NADB Keywords: PREHISTORIC; HISTORIC; ARCHAEOLOGICAL RECONNAISSANCE REPORT; CULTURAL HISTORY; CEMETERY; CANAL; IRRIGATION DITCHES; ADOBE QUARRY; INTERMONTANE VALLEY; SAN BERNARDINO VALLEY; P1074-35-H; P1074-124-H; 19TH-20TH CENTURIES AD]	36-001578, 36-004952	2	No	San Bernardino	San Bernardino South
SB-02030	NADB-R - 1062030; Voided - 89-6.13	KIELUSIAK, CAROL	1989	CULTURAL RESOURCES ASSESSMENT - SARI, REACHES IV D & E	San San Bernardino County Museum Association	14		Archaeological, Other research		[NADB Keywords: PREHISTORIC; HISTORIC; ARCHAEOLOGICAL RECONNAISSANCE REPORT; INTERMONTAINE VALLEY; SAN BERNARDINO VALLEY; SANTA ANA RIVER; CA-RIV-3493; PSBR-1-H; PSBR-25-H; P872-27-H; P872-28-H; P872-51-H; P872-24-H; P872-49-H; P872-26-H; P872-25-H; P1074-35-H; P1074-104-H; P1074-107-H; P1074-106-H; P1074-88-H; P1074-84-H; P1074-89-H; P1074-90-H; P1074-101-H; P1074-114-H]	36-001575, 36-004952, 36-005241, 36-005274, 36-006007, 36-006069	6	No	San Bernardino	Corona North, Prado Dam, San Bernardino South
SB-02117	NADB-R - 1062117; Voided - 90-7.3	HARMSWORTH ASSOCIATES and CH2M HILL	1990	SUPPLEMENTAL DRAFT ENVIRONMENTAL IMPACT REPORT: EXPANSION OF THE RIALTO WASTEWATER TREATMENT PLANT [CULTURAL RESOURCE SECTIONS]	HARMSWORTH ASSOCIATES					[NADB Keywords: PREHISTORIC; HISTORIC; ARCHAEOLOGICAL RECONNAISSANCE REPORT; INTERMONTAINE VALLEY; SAN BERNARDINO VALLEY; SANTA ANA RIVER; RESOURCES UNKNOWN]		0	No	San Bernardino	San Bernardino South
SB-02155	NADB-R - 1062155; Voided - 90-8.12	MCKENNA, JEANETTE A.	1990	A PHASE I ARCHAEOLOGICAL SURVEY AND HISTORICAL BACKGROUND INVESTIGATION OF THE PROPOSED SANTA ANA RIVER WATERSHED PROJECT AUTHORITY, SITE 1, AGUA MANSA, SAN BERNARDINO COUNTY, CALIFORNIA	MCKENNA ET AL.					[NADB Keywords: PREHISTORIC; HISTORIC; INTERMONTAINE VALLEY; SANTA ANA RIVER; SAN BERNARDINO VALLEY; NO RESOURCES]		0	No	San Bernardino	San Bernardino South
SB-02156	NADB-R - 1062156; Voided - 90-9.2	MCKENNA, JEANETTE A.	1990	REPORT ADDENDUM: A PHASE I ARCHAEOLOGICAL SURVEY OF THE PROPOSED SANTA ANA WATERSHED PROJECT AUTHORITY (SAWPA) PIPELINE RIGHT-OF-WAY, SAN BERNARDINO TO COLTON, SAN BERNARDINO, CALIFORNIA	MCKENNA ET AL.					[NADB Keywords: PREHISTORIC; HISTORIC; ARCHAEOLOGICAL RECONNAISSANCE REPORT; INTERMONTAINE VALLEY; SAN BERNARDINO VALLEY; SANTA ANA RIVER; NO RESOURCES]		0	No	San Bernardino	San Bernardino South
SB-02214	NADB-R - 1062214; Voided - 90-11.10	MCKENNA, JEANETTE A.	1990	UPDATE REPORT: ARCHAEOLOGICAL MONITORING AT THE SAWPA RIX SITE, SITE 1, COLTON (AGUA MANSA), SAN BERNARDINO COUNTY, CALIFORNIA	MCKENNA ET AL.	3		Archaeological, Monitoring		[NADB Keywords: PREHISTORIC; HISTORIC; ARCHAEOLOGICAL MONITORING REPORT; INTERMONTAINE VALLEY; SAN BERNARDINO VALLEY; SANTA ANA RIVER; NO RESOURCES]		0	No	San Bernardino	San Bernardino South
SB-02215	NADB-R - 1062215; Voided - 90-12.6	MCKENNA, JEANETTE A.	1990	SUPPLEMENTAL, ARCHAEOLOGICAL MONITORING AT THE RIX PROJECT SITE (SAWPA), AGUA MANSA, SAN BERNARDINO COUNTY	MCKENNA ET AL.					[NADB Keywords: PREHISTORIC; HISTORIC; ARCHAEOLOGICAL MONITORING REPORT; INTERMONTAINE VALLEY; SAN BERNARDINO VALLEY; SANTA ANA RIVER; NO RESOURCES]		0	No	San Bernardino	San Bernardino South
SB-02251	NADB-R - 1062251; Voided - 91-1.12	MCKENNA, JEANETTE A.	1991	RIX PROJECT AREA ARCHAEOLOGICAL MONITORING	MCKENNA ET AL					[NADB Keywords: PREHISTORIC; HISTORIC; ARCHAEOLOGICAL MONITORING REPORT; INTERMONTANE VALLEY; SAN BERNARDINO VALLEY; SANTA ANA RIVER; NO RESOURCES]		0	No	San Bernardino	San Bernardino South
SB-02252	NADB-R - 1062252	MCKENNA, JEANETTE A.	1991	CONTINUED ARCHAEOLOGICAL MONITORING AT THE RIX PROJECT SITE	MCKENNA ET AT.					[NADB Keywords: PREHISTORIC; HISTORIC; ARCHAEOLOGICAL MONITORING REPORT; INTERMONTANE VALLEY; SAN BERNARDINO VALLEY; SANTA ANA RIVER; NO RESOURCES]		0	No	San Bernardino	San Bernardino South
SB-02389	NADB-R - 1062389; Voided - 91-1.16	MCKENNA, JEANETTE A.	1991	RIX PROJECT AREA ARCHAEOLOGICAL MONITORING	MCKENNA ET AL.					[NADB Keywords: PREHISTORIC; HISTORIC; ARCHAEOLOGICAL MONITORING REPORT; INTERMONTANE VALLEY; SAN BERNARDINO VALLEY; SANTA ANA RIVER; NO RESOURCES]		0	No	San Bernardino	San Bernardino South
SB-02752	NADB-R - 1062752	SEYMOUR, GREGORY R. and DAVID P. DOAK	1992	THE SANTA ANA REGIONAL INTERCEPTOR PROJECT SAWPA-SARI REACHES IV D & E: A CULTURAL RESOURCE SURVEY OF A 18-MILE RIGHT OF WAY FROM MIRA LOMA TO COLTON, RIVERSIDE AND SAN BERNARDINO COUNTIES, CA	THOMAS G. OLSEN ASSOCIATES					[NADB Keywords: ARCHAEOLOGICAL RECONNAISSANCE REPORT; ROAD; CEMETERY; CHAPEL; CANAL; FLAKED LITHICS; GROUNDSTONE; CPHI-87; P1074-101H; P1074-104H; P1074-117H; P1074-33H; CHL-121; SANTA ANA RIVER; C14; 2790 +/- 80BP]	36-000001, 36-001575, 36-001576, 36-001578, 36-002623, 36-004952, 36-006007, 36-006069, 36-006858, 36-006859, 36-006860	11	No	San Bernardino	
SB-02785	NADB-R - 1062785	MCKENNA, JEANETTE A.	1992	CULTURAL RESOURCES INVESTIGATIONS AND HISTORIC RESEARCH FOR THE EXPANDED SANTA WATERSHED PROJECT AUTHORITY SITE 1 PROJECT AREA, AGUA MANSA, SAN BERNARDINO COUNTY, CA	MCKENNA ET AL				87 ACRES	[NADB Keywords: ARCHAEOLOGICAL TESTING; SANTA ANA RIVER; SAN BERNARDINO VALLEY; NO RESOURCES]		0	No	San Bernardino	San Bernardino South
SB-02786	NADB-R - 1062786	MCKENNA, JEANNETTE A.	1993	CULTURAL RESOURCES INVESTIGATIONS AND HISTORIC RESEARCH FOR THE SANTA ANA WATERSHED PROJECT AUTHORITY SITE 1 PROJECT AREA AND ASSOCIATED SOIL TESTING AREAS, AGUA MANSA, SAN BERNARDINO COUNTY, CA	MCKENNA ET AL				157 ACRES	[NADB Keywords: ARCHAEOLOGICAL TESTING; SAN BERNARDINO VALLEY; SANTA ANA RIVER; NO RESOURCES]		0	No	San Bernardino	San Bernardino South
SB-02884	NADB-R - 1062884	MCKENNA, JEANETTE A.	1993	A DETERMINATION OF ELIGIBILITY STUDY: CA-SBR-6859H - THE WEST RIVERSIDE CANAL, SAN BERNARDINO AND RIVERSIDE COUNTIES, CALIFORNIA	MCKENNA ET AL.				APPROX. 2 MILES	[NADB Keywords: ARCHAEOLOGICAL SITE EVALUATION REPORT; WATER TRANSPORTATION SITE; CANAL; SAN BERNARDINO VALLEY; INTERMONTANE VALLEY; HISTORIC; 1887 A.D.]	36-006859	1	No	San Bernardino	Fontana, San Bernardino South

ReportNum	OtherIDs	Authors	CitYear	CitTitle	CitPublisher	CitPages	CitMaps	ReportType	InventorySize	InventoryNotes	Resources	ResourceCount	HasInformals	Counties	Maps
SB-02887	NADB-R - 1062887	SCHMIDT, JAMES J.	1994	CULTURAL RESOURCE INVESTIGATION: CITY OF COLTON NEW SUBSTATION AND TRANSMISSION FACILITIES	GREENWOOD AND ASSOCIATES				6.5 MILES	[NADB Keywords: ARCHAEOLOGICAL RECONNAISSANCE REPORT; INDUSTRIAL SITE; STANDING STRUCTURES; HABITATION SITE; FLAKED LITHICS; FOUNDATIONS; FLAKED TOOLS; FLAKES; GROUND STONE; FAUNAL REMAINS; ORNAMENTS; CORES; HAMMERSTONES; QUARTZITE; GRANITE; SCHIST; BASALT; CHERT; OBSIDIAN; BONE; INTERMONTAINE VALLEY; SAN BERNARDINO VALLEY; PREHISTORIC; HISTORIC]	36-001576, 36-007976	2	No	San Bernardino	San Bernardino South
SB-02944	NADB-R - 1062944	HARLEY, BRUCE	1991	THE AGUA MANSA STORY, A COLLECTION OF PAPERS COMPILED ON THE OCCASION OF THE 150TH ANNIVERSARY OF THE SETTLEMENT OF AGUA MANSA	SAN BERNARDINO COUNTY MUSEUM ASSOCIATION QUARTERLY 39 (1):1-59				1 ACRE	[NADB Keywords: CULTURAL HISTORY; SAN BERNARDINO VALLEY; INTERMONTANE VALLEY; SANTA ANA RIVER; CHL-121; HISTORIC]	36-001578	1	No	San Bernardino	San Bernardino South
SB-03214	NADB-R - 1063214	SCHMIDT, JAMES J.	1996	CULTURAL RESOURCES INVESTIGATIONS: CA-SBR-1576, CITY OF COLTON, NEW SUBSTATION AND TRANSMISSION FACILITIES. 23PP	GREENWOOD & ASSOCIATES				4 MILES X 50 M	[NADB Keywords: ARCHAEOLOGICAL TESTING REPORT; SAN BERNARDINO VALLEY; INTERMONTANE VALLEY; NO RESOURCES]	36-001576	1	No	San Bernardino	San Bernardino South
SB-03586	NADB-R - 1063586	LOVE, BRUCE	2000	ONTARIO TO COLTON PIPELINE, SAN BERNARDINO COUNTY, CA. 26PP	CRM TECH				16 MILES + 9 ACRES	[NADB Keywords: ARCHAEOLOGICAL RECONNAISSANCE REPORT; HISTORIC; CANAL; SAN BERNARDINO VALLEY; SAN GABRIEL VALLEY; INTERMONTANE VALLEY]	36-006859	1	No	San Bernardino	Fontana, Guasti, Ontario, San Bernardino South

Lake Rialto C-0422
San Bernardino County
DUKE CRM
San Bernardino South, Calif. USGS 7.5-minute quadrangle
T1S, R5W, Sections 25, 26 & 36
Project Area
1/4 Mile Radius
USGS 7.5' Quadrangles
1/2 Mile Radius
0
2,000
4,000
1 inch = 2,000 feet
1:24,000
N

OCCIC Reports 9/24 in blender

*= includes Project area

— : NMDB 1063586

— : 1060713, 0714, 0711, 0712, 1957*

— : 2030* 2752

1750*

: 1828

— : 1287* 1217

— : 2887*

4 : 2884

— 0150

: 3214

: 2785

: 2786

: 2156

: 2944

— : 0145

— : 0508, 0509*

: 2155, 2214, 2215, 2251, 2252, 2889

Lake Riato C-0422
San Bernardino County
DUKE CRM
San Bernardino South, Calif. USGS 7.5 minute quadrangle
T1S, R5W, Sections 23, 26 & 35
Project Area
USGS 7.5' Quadrangles
1/4 Mile Radius
1/2 Mile Radius
0
2,000
4,000
Feet
1 inch = 2,000 feet
1:24,000
N

ECCIC Resources 9/26 M bender

- : 1064445

- : 1067255

: 21604

: 21603

X : 36-020804

- : 1065934

- : 1067255

X : 1004

- : 1066084

- : 1576

- : 26051

: 31375

- : 31715

X : 31676

- : 318316777

Lake Rialto C-0422

San Bernardino County

DUKE CRM

San Bernardino South, Calif. USGS 7.5 minute quadrangle
T1S, R5W, Sections 25, 26 & 36

Project Area
USGS 7.5' Quadrangles
1/4 Mile Radius
1/2 Mile Radius

0 2,000 4,000 Feet

1 inch = 2,000 feet 1:24,000

N

OCCIC Resources 9/24 in bender
- : 1064584
- : 13627
— : 10643665, 10646331
- : 10644233, 1578
- : 10644630
- : 10635866
- : 10645608
- : 10645616
— : 10645859, 10644940
10645616
X : 4952
- : 7172

Lake Rialto C-0422
San Bernardino County
DUKE CRM
Project Area
1/4 Mile Radius
1/2 Mile Radius
0
3,000
6,000
Feet
1 inch = 2,000 feet
1:24,000
N

SCCIC Resources 9/26 in binder

■ : 256.00 grade

▨ : 10675556

— : 6940

SBr 1572

Santa Ana Street

SAN BERNARDINO COUNTY MUSEUM

Archaeological Site Survey Record

See SBr 1572/H - p1

1. Site CSDM-57 2. Map SE 1/4 Section 4 3. County San Bernardino
4. Twp. 1 South Range 4 West NW 1/4 of SW 1/4 of Sec. 25
5. Location Alignments - East of Riverside Avenue, South of Santa Ana
6. On Colonial Cession
7. Previous designations for site Santa Ana Street Gravel Pit
8. Owner --- 9. Address
10. Previous owners, dates --- 768040N
11. Present tenant --- See 11/4 4 5 5 E - 4 1/2 mi. N
12. Attitude toward excavation ---
13. Description of site Charcoal pits five to eight feet below present surface exposed in gravel pit operations
14. Area ---
15. Depth ---
16. Height ---
17. Vegetation --- 18. Nearest water
19. Soil of site sand 20. Surrounding soil type sand
21. Previous excavation ---
22. Cultivation --- 23. Erosion wind
24. Buildings, roads, etc. gravel pit active operation
25. Possibility of destruction pit destroyed ---
26. House pits ---
27. Other features ---
28. Burials ---
29. Artifacts none noted

30. Remarks

31. Published references
32. Other Museum reference 33. Date in file
34. Date 1952 35. Recorded by Carroll H. Smith 36. Checked

ARCHAEOLOGICAL SITE RECORD

PAGE: 1 OF 4 PERMANENT TRINOMIAL: CA-SBR-1575
DATE OF ORIGINAL RECORD: 1938 TEMPORARY NUMBER:
DATE OF THIS FORM: 4/06/94 AGENCY DESIGNATION: SBCM-40
1. COUNTY: San Bernardino
2. USGS QUAD: San Bern. So. 7.5' 1967 REVISED: 1980
3. UTM COORDINATES: ZONE 11 467520 m Easting; 3767800 m Northing (X)
4. TOWNSHIP 1S RANGE 5W
NW 1/4 NW 1/4 SE 1/4 SE 1/4 of Section 25 BASE MER. SBM
5. MAP COORDINATES: 336 mm S 90 mm E
6. ELEVATION: 980 ft

7. LOCATION: From east bound Interstate 10 exit at Riverside Avenue proceed south to Agua Mansa Road. Turn left and proceed east for approximately one mile, the site is located on the north side of the road at the top of the adjacent terrace.

8. PREHISTORIC X HISTORIC PROTOHISTORIC

9. SITE DESCRIPTION: Site is a large prehistoric habitation location evidenced by varying surface concentrations of artifacts in blowouts within a stabilized dune field. The site was originally recorded in 1938 by Dr. Gerald Smith. It was subjected to testing efforts in 1988 and has suffered repeated episodes of amateur artifact collection (Peter et al. 1988).

10. AREA: not determined m (length) x m (width); m^2 (X)
Method:

11. DEPTH: Unknown METHOD: NA

12. FEATURES: None noted.

13. ARTIFACTS: Artifacts encountered during this examination of the site included numerous groundstone implements of granite and schist. Cores, hammerstones, and debitage of quartzite, basalt, and chert, as well as a single obsidian flake. While previously recorded on this site [Peter et al. 1988], no historical artifacts were noted in the course of the current investigation.

14. NON-ARTIFACTUAL CONSTITUENTS: Fragments of burned and unburned bone

15. DATE OF ORIGINAL RECORD: 1938

16. RECORDED BY: June Schmidt and James J. Schmidt

17. AFFILIATION: Greenwood and Associates, 725 Jacon Way, Pacific Palisades, CA 90272, (310) 454-3091

ARCHAEOLOGICAL SITE RECORD

PAGE: 3 OF 4 PERMANENT TRINOMIAL: CA-SBR-1576
DATE OF ORIGINAL RECORD: 1938 TEMPORARY NUMBER:
DATE OF THIS FORM: 4/08/94 AGENCY DESIGNATION: SBCM-40

18. HUMAN REMAINS: None observed. Gerald Smith reported the presence of human teeth in 1938.

19. SITE INTEGRITY: Site has been subject to natural erosional processes which have been accelerated in some areas by mechanical activities (vehicular traffic, grading, pipeline installation, transmission line installation). The adjacent tailings pile (X)

20. NEAREST WATER: Santa Ana River, 1/4 mile south.

21. VEGETATION COMMUNITY (SITE VICINITY): Remnant Coastal Sage Scrub.

22. VEGETATION COMMUNITY (ON SITE): Same.

23. SITE SOIL: Light brown sand.

24. SURROUNDING SOIL: Same as 23.

25. GEOLOGY: Aeolian sand.

26. LANDFORM: Stabilized dune.

27. SLOPE: Variable in degree and direction. 28. EXPOSURE: Open to sheltered.

29. LANDOWNERS(S), (TENANTS), ADDRESS: CalMat, 695 Rancho Ave., Colton, CA 92324.

30. REMARKS: Only that portion of CA-SBR-1576 lying within the proposed transmission line corridor was examined during this investigation. An examination of loci previously recorded (X)

31. REFERENCES: Archaeological Test Investigation and Evaluation of SBR-1576. Kevin S. Peter et al.; 1988. URS Consultants, Inc. Prepared for CalMat, P.O. Box 947, Colton, California. (X)

32. NAME OF PROJECT: Cultural Resource Investigation: City of Colton New Substation and Transmission Facilities.

33. TYPE OF INVESTIGATION: Intensive surface reconnaissance.

35. SITE ACCESSION NO.: N/A CURATED AT: N/A

36. PHOTOS: Overviews TAKEN BY: James Schmidt

37. PHOTO ACCESSION NO. N/A ON FILE AT: Greenwood and Associates

ARCHAEOLOGICAL SITE LOCATION MAP

PAGE: 3 OF 4 PERMANENT TRINOMIAL: CA-SBR-1576

DATE OF ORIGINAL RECORD: 1930 TEMPORARY NUMBER:

DATE OF THIS FORM: 4/06/94 AGENCY DESIGNATION: SBCM-66

U.S.G.S. 7.5' QUADRANGLE: San Bernardino South

ARCHAEOLOGICAL SITE RECORD - CONTINUATION

PAGE 4 OF 4 PERMANENT TRINOMIAL: CA-SBR-1916
DATE OF ORIGINAL RECORD: 1938 TEMPORARY NUMBER:
DATE OF THIS FORM: 4/06/94 AGENCY DESIGNATION: SBCM-40

CONTINUATION

ITEM NO.

3 Note that all map coordinates refer only to a point within the current project corridor.

10 Overall site boundaries were not reestablished in the course of this investigation but have been variously described as 3000 ft in diameter (Smith 1938) and as 790 m (E-W) x 175 m (N-S: Peter and Easter 1988).

19 is encroaching and may in fact cover portions of the site. Site has also been subject to testing in the form of backhoe trenching and repeated collection of artifacts (Peter et al. 1988).

30 by Peter et al. in the vicinity of the current project corridor revealed significantly more cultural material than was noted by the earlier investigation (Peter et al 1988).

31 California Vegetation. V.L. Holland and David J. Keil; 1989. El Corral Publications, Biological Sciences Department. California Polytechnic State University, San Luis Obispo, California.

Cultural Resource Investigation: City of Colton New Substation and Transmission Facilities. James J. Schmidt; 1994. Greenwood and Associates. Prepared for ENSR Consulting and Engineering, Camarillo, California.

SBCM-48

CA-SBR-1576

01/89
L. Ross

#0 WESTERN PORTION OF SITE, LOOKING SW FROM SADDLE MOUNTAIN TRAILING PIKE

#1 EASTERN PORTION OF SITE, LOOKING SE FROM SADDLE MOUNTAIN TRAILING PIKE

#2 BLOW-OUT DUNE ON EASTERN PORTION OF SITE, LOOKING S

#3 CONTACT ZONE OF SITE AND TRAILING PIKE, LOOKING W FROM EASTERN PORTION OF SITE

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
ARCHEOLOGICAL SITE RECORD

Permanent Trinomial: SBr-1576 Supplement: X

Other Designations: SBCM-47

1. County: San Bernardino

2. USGS Quad: San Bernardino South (7.5') 1967 Photorevised 1980

3. UTM Coordinates: Zone 11 / A: 468020 m Easting / 3767970 Northing (X)
Jurupa Land Grant

4. Township 1S Range 5W NA 1/4 of NA 1/4 of NA 1/4 of NA 1/4 of Section NA Base (Mer.) SBM ( )

5. Map Coordinates: NA mmE NA mmN (from NW corner of map) 6. Elevation 305-789 amsl

7. Location: SBr-1576 is dispersed among several blowouts and dunal ridges located on two terraces overlooking the floodplain of the Santa Ana River. The terraces are 0.5 miles north of the river. The site deposits extend across the southern edge of both the upper (eastern) and lower (western) terraces. 99% of the cultural remains now present at the site are within the devegetate blowouts. Access to the site is restricted by CalMat, the landowner. (X)

8. Prehistoric: X Historic Protohistoric 9. Site Description: SBr-1576 consists of several spatially distinct scatters of prehistoric cultural remains primarily restricted to 12 blowouts dispersed across the two terraces. The assemblages within the blowouts consist predominantly of flakes, fragments of manos and metates, FCR, and unmodified cobbles. The density of cultural remains varies among the blowouts, but is is generally low (see 8 of 8). The site (X)

10. Area 790 (E-W) m (length) x 175 (N-S) m (width) 108,580 m^2 (X)
Method of Determination: Surface survey and mapping (compass, tape, and pacing); hand (X)

11. Depth: ca. 20 cm Method of Determination: A total of 76 backhoe trenches were (X)

12. Features: A charcoal stain was noted in the edge of a blowout on the upper terrace. The stain consisted of carbon-rich sands, but lacked any associated artifacts or cobbles. Testing near this stain yielded negative results. Although the stain dated to 2790 ± 80 RCYBP, the (X)

13. Artifacts: See page 5/8 and 6/8 - tables listing identified artifacts on surface; page 4/8 lists artifacts recovered subsurface. ( )

14. Non-Artifactual Constituents and Faunal Remains: Several hundred unmodified cobbles are present within the blowouts. Since the natural deposits at the site consists of eolian sands, the (X)

15. Date Recorded: 7/16/88 16. Recorded by: K.J. Perez, P. Eggers. (X)

17. Affiliation and Address: URS Consultants, Inc. 1421 Chapala St. Santa Barbara, CA 93101 ( )

State of California - The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
ARCHEOLOGICAL SITE RECORD

Permanent Trinomial: SBr-1576 / 7/88 (NRHP / CR)

Other Designations:

18. Human Remains: None observed; but G. Smith reported collecting four human teeth ( )

19. Site Disturbances: The site has been adversely affected by ORV activities, collection, and natural post-depositional processes (deflation, erosion). ORV activities accentuated and engendered deflation and intermixing of temporally and functionally distinct artifact (X)

20. Nearest Water (type, distance and direction): Santa Ana River, 0.5 km, south ( )

21. Vegetation Community (site vicinity): Disturbed coastal sage scrub [Plants List ( )] ( )

22. Vegetation Community (on site): Same ( )

23. Site Soil: Loose, eolian sand with weak to no soil development. ( )

24. Surrounding Soil: Same ( )

25. Geology: The site is located on the southern edge of the Sand Hills, a Quaternary sand (X)

26. Landform: Sand dune field. ( )

27. Slope: Variable from 1.5 - 9.7% ( ) 28. Exposure: Open ( )

29. Landowner(s) (and/or tenant) and Address: CalMat, 695 Rancho Ave., Colton, CA 92324 ( )

30. Remarks: A small portion of an assemblage collected by Gerald Smith is at the San Bernardino County Museum. Other collected artifacts are held by amateur collectors. ( )

31. References: Archaeological Test Investigation and Evaluation of SBr-1576. K.J. Peter, J. Hudson, T. Morgan, J. Rudolph, and C. Woodman. 1988. URS Consultants, Inc., Santa Barbara. ( )

32. Name of Project: Archaeological Test Investigation and Evaluation of SBr-1576 ( )

33. Type of Investigation: Surface survey, site mapping, controlled surface collection, subsurface testing. ( )

34. Site Accession Number: SBr-1576 Curated At: San Bernardino County Museum ( )

35. Photos: 35 mm color slides, CM1: 1-35 and CM2: 1-14 ( )

5 B: 468060m. Easting/3767830 m. Northing; C: 467370 m. Easting/3767610 m. Northing; D: 467260 m. Easting/3767760 m. Northing; E: 467600 m. Easting/3768010 m. Northing; see site location map for placement of UTM points.

8 presently consists of only a surface scatter; no demonstrably subsurface cultural deposits were identified, despite extensive testing. Based on the data collected in July 1988 and that provided by previous investigators and collectors of the site, SBr-1576 apparently represented the residues of a Late Prehistoric habitation site intermixed with remains from multiple, shorter-duration use episodes dating from as early as the Late Millingstone Horizon. However, the site has been adversely affected by amateur collectors and heavily disturbed by ORV activities. Minimal amounts of historic artifacts (glass and ceramic fragments) were found scattered across both terraces. The paucity and attributes of the historic assemblage suggest limited historic use of the area.

10 on the surface distribution of artifacts. The overall area of the site includes considerable area between blowouts that contains no artifacts. The 12 blowouts encompass approximately 51,000 m^2.

11 excavated throughout the upper and lower terraces. Three trenches on the upper terrace and two trenches on the lower terraces yielded cultural remains. From a total of 45.2 m^3 of screened matrix, a total of 16 prehistoric artifacts and 1 historic artifact were recovered from surface to 20 cm below surface. See page 4/8.

12 lack of associated artifacts strongly suggests that it had a natural origin.

14 unmodified cobbles apparently were deposited by humans. Approximately 300-400 FCR were noted within the 12 blowouts. Approximately 4 pieces of bone (unidentifiable to species or genus) and 7 pieces of marine shell were observed.

16 J. Johannesmeyer, and M. Elston.

19 assemblages. Collection by amateurs and professionals has removed at least 2,000 artifacts from the site. These artifacts have no provenience information. Overall, the site now lacks integrity.

21 dune field.

TABLE 15
VERTICAL DISTRIBUTION OF ARTIFACTS IN BACKHOE TRENCHES

	UPPER TERRACE									LOWER TERRACE						
	TRENCH 12			TRENCH 16			TRENCH 18			TRENCH 21			TRENCH 22			
LEVEL	CHIPPED STONE	BONE	MODERN DEBRIS	CHIPPED STONE	BONE	MODERN DEBRIS	CHIPPED STONE	BONE	MODERN DEBRIS	CHIPPED STONE	BONE	MODERN DEBRIS	CHIPPED STONE	BONE	MODERN DEBRIS	TOTAL
0 - 40cm	3	0	0	1a	0	1	6	1	10	6	0	0	7	1	4b	36
40 - 80cm	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2
80 - 120cm	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
120 - 160cm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160 - 200cm	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.	0	0	0	N.E.	N.E.	N.E.	0

a= possibly historic ceramic
b= beer bottle glass; not collected
N.E.= not excavated

TABLE 3
PREHISTORIC LITHIC ARTIFACTS IDENTIFIED ON THE SURFACE OF THE UPPER TERRACE

MATERIAL TYPE	ARTIFACT CLASS										
	PRIMARY FLAKE	SECONDARY FLAKE	TERTIARY FLAKE	SHATTER/ FLAKE FRAG	UTILIZED FLAKE	CORE	BIFACE	CHOPPER	HAND	METATE	TOTAL
FELSITE	1	4									5
BASALT	7	12	1			1					21
CHERT		11	18	1			2				32
GRANITE									2		2
OBSIDIAN			1								1
QUARTZITE	6	31	24			5					66
RHYOLITE	13	95	36	1							145
SANDSTONE									1		1
SCHIST								1	1	6	8
UNKNOWN			10					1			11
TOTAL	27	153	90	2		6	2	2	4	6	290

TABLE 5
PREHISTORIC LITHIC ARTIFACTS IDENTIFIED ON THE SURFACE OF THE LOWER TERRACE

MATERIAL TYPE	ARTIFACT CLASS										
	PRIMARY FLAKE	SECONDARY FLAKE	TERTIARY FLAKE	SHATTER/ FLAKE FRAG	UTILIZED FLAKE	CORE	BIFACE	CHOPPER	MANO	METATE	TOTAL
FELSITE											
BASALT		43			2						45
CHERT		10	12								22
GRANITE									6	1	7
OBSIDIAN					1						1
QUARTZITE	5	37	7		1	2					52
RHYOLITE	2	13	1			2					18
SANDSTONE									1		1
SCHIST	1								13	13	26
UNKNOWN	4	2									6
TOTAL	12	105	20		4	4			17	14	178

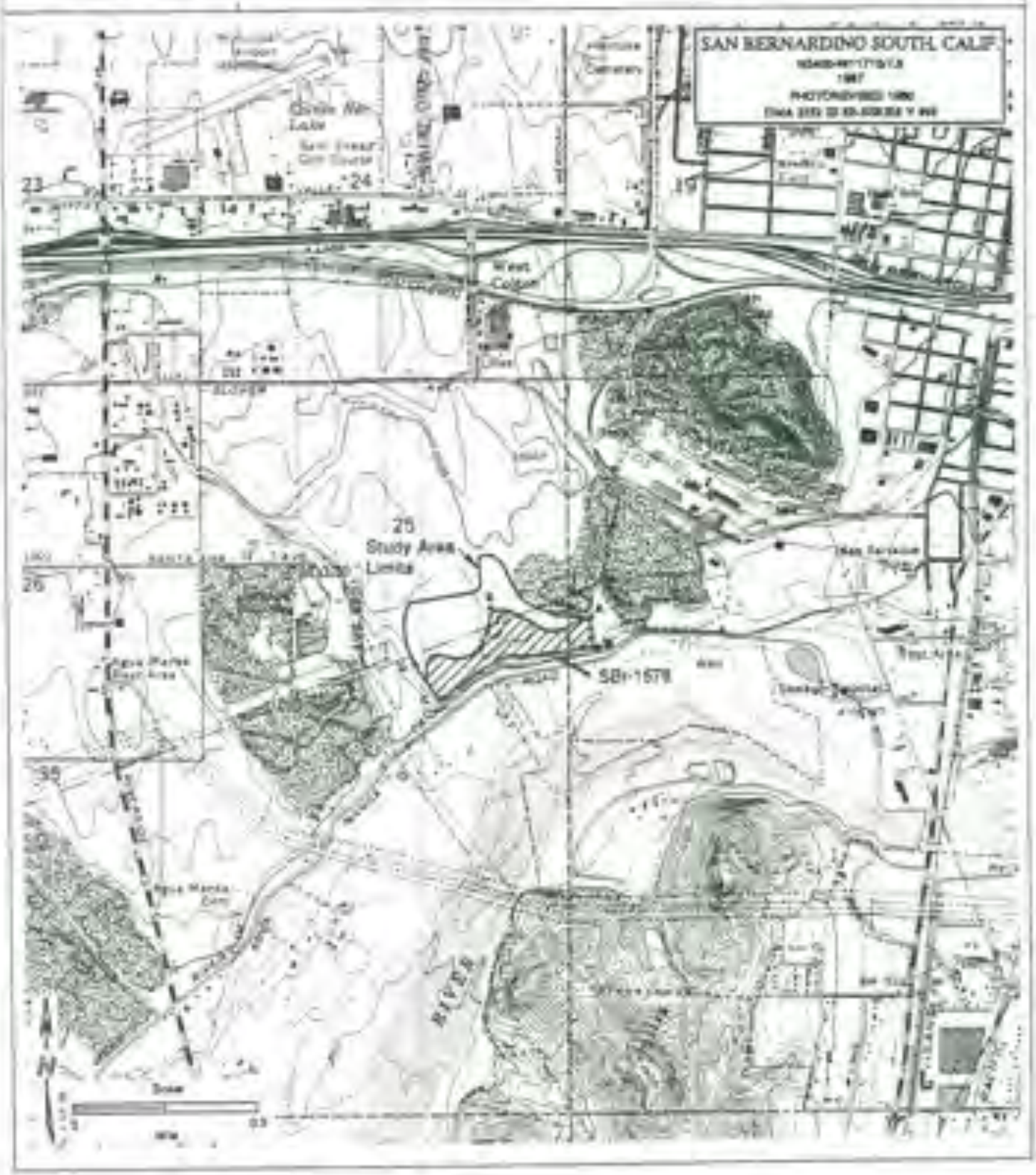
State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

ARCHEOLOGICAL SITE LOCATION MAP

Page 7 of 8

Permanent Trinomial: SBr-1576 7 / 88
(Mo. / Yr.)

Other Designations:



OHP 422 G (Rev. 4/88)

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

ARCHEOLOGICAL SITE MAP

Page 8 of 8

Permanent Trinomial: SBr-1576 7 / 86 (Mo. / Yr.)

Other Designations:

DPR 422 F (Rev. 4/85)

SAN BERNARDINO COUNTY MUSEUM SBCM No. 40

Smithsonian No. SBr. 1576

Site Name Colton Slover Mountain County

USGS Quad Maps San Bernardino South 15' 7½'

___ of ___ of ___ of ___ of ___ of all Section 25

Twp. 1S, Rng. 5W, SB Base Meridian, Ele.

Distance along bearing from

UTM grid numbers or lat. and long.

Site description, artifacts, etc. on sand dunes N. of Santa Ana River, W. of Slover

Recorded by G. A. Smith Date 1938/1962

Address Informant

Remarks

14-11893-921 Rev. 3/78

Archaeological Site Survey Record

1. Date [illegible] 2. Map [illegible] 3. Country [illegible]
Twp. [illegible] Range [illegible] Lot [illegible] Sec. [illegible]
5. Location [illegible]
[illegible] 6. Ca Contour elevation [illegible]
7. Previous designations for site [illegible]
8. Owner [illegible] 9. Address [illegible]
10. Previous owners, dates [illegible]
11. Present owners [illegible]
12. Attitude toward excavation [illegible]
13. Description of site [illegible]

14. Area [illegible] 15. Depth [illegible] 16. Relief [illegible]
17. Vegetation [illegible] 18. Nearest water [illegible]
19. Soil of site [illegible] 20. Surrounding soil type [illegible]
21. Previous excavation [illegible]
22. Cultivation [illegible] 23. Erosion [illegible]
24. Buildings, ruins, etc. [illegible]
25. Possibility of destruction [illegible]
26. House rite [illegible]
27. Other features [illegible]
28. Burials [illegible]
29. Artifacts [illegible]
CHARACTERISTICS

30. Remarks [illegible]
31. Published references [illegible]
32. UCRA Accession No. [illegible] 33. Sketch map [illegible]
34. Date 12-21-1935 Recorded by [illegible] 35. Photos
1959

Colton

SBr 1576

San Bernardino County Museum

Archaeological Site Survey Record

1. Site [illegible] 2. Nearest Community South Colton County San Bernardino
4. Twp. 1S Range 5W [illegible] ¼ of SE ¼ of SW ¼ Sec. 15
5. Location SE corner quarter north of Santa Ana River, east of Slover Mountain.
Intersection is north 1/2 of Section 15 6. Ca Contour Elevation 900-1000'
7. Previous designations for site Colton, Slover Mountain Land Corner
8. Owner [illegible] 9. Address [illegible]
10. Previous owner, Date [illegible] 11. [illegible]
11. Present tenant [illegible] 11. [illegible]
12. Attitude toward excavation [illegible] 11. [illegible]
13. Description of site Land after prehistoric use again overlooking river
14. Area 300' by 300'
15. Depth 0
16. Height [illegible]
17. Vegetation Cleared in part 18. Nearest water Santa Ana River
19. Soil of site/lot [illegible] 20. Surrounding soil type land
21. Previous excavation None
22. Cultivation Grain in part 23. Erosion Extensive wind
24. Buildings, roads, etc. In district part (Agua Mansa after 1860)
25. Possibility of destruction Calif Portland Cement Co encroaching on dumping waste
26. Source data area
27. Other features None
28. Burials human teeth found
29. Artifacts Metals, bones, shell beads, Chemehuevi points, shell, obsidian, pottery, charcoal
30. Remarks Chemehuevi in close-knit in open camps near Agua Mansa
31. Published reference See report # 77-64
32. Other known depository [illegible] 33. Catalog no. No
34. Date 1932 35. Recorded by Gerald A. Smith 36. Photos Yes
Not found in folder

UTM A 468080 E 3768060 N
B 468120 E 3767930 N
C 467960 E 3767790 N
D 467870 E 3767580 N

ajf
1/10/84

Archaeological Survey - Site Record.

Site Clover Mountain Topog. Sheet San Bernardino No. of Site 41

Township 1 south Range 5 west Section 25

Owner ? New miles 6 from Colton

General surroundings Rolling sand dunes west of the Clover Mountain on bench above the Santa Ana River.

Type of Site Permanent campsite? Area of Site 50 acres

Elevation 1000 Nearest water ½ mile river

Houses Burials None

Remarks Material scattered and appears to conflict to a degree.

Metates, manos, chisels, projectile point, perforators, hammer stones, scrapers, choppers.

Visited 1935 Reported By Gerald J. Smith

Silver Mountain San Bernardino Quad. Site No. (40)

1 – S 5 – W 25 SE. ¼

2½ Cotton

Rolling Sand dunes west of Silver mountain in dunes on bench above Santa Ana River

Campsite permanent 50 acres

½ mile – River

—

—

Material scattered and appears to conflict to a degree. Some give the appearance of great age. Scraper-planes projectile points scraper-choppers metates perforaters manos Numerous stone chippings

Elevation 1000 feet

Feb, 1, 1949

Gerald A. Smith

ROBERT VERHOEVEN
11963 BRYANT ST
YUCAIPA CAL.
797-2110

MATERIAL FROM SBR-1576 (SBCM-40)
SAN BERNARDINO S 7.5

1939 Colton
Slover Mountain No.40

Very interesting place because of the old and the new culture represented there. Very confusing and difficult to work out. Old arrowpoints, new Shoshone points, and pottery in the Yuma cemetery.

Colton - Slover Mountain Dunes No. 40

Bernardino Valley
ano ? Old ?

Located on dunes overlooking Santa Ana River West of Slover Mt. In pockets scoped out by wind action ---Interesting

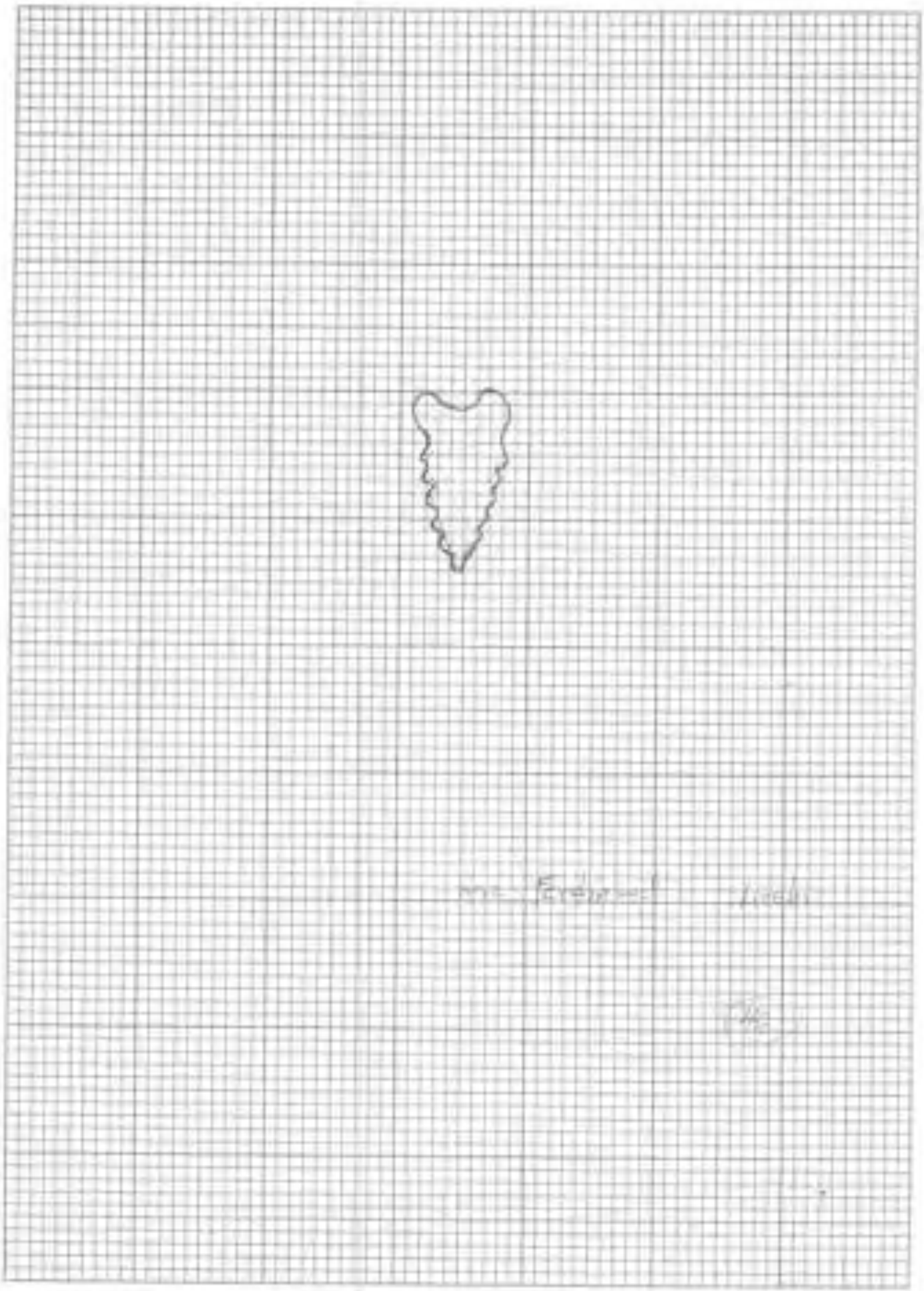
tes
s
Dart points
hono points
l
pers
pers
ral Dunes

Bloomington IV (40)

cation:
Turn to the left out of Colton west of the lover Mt. On the bluffs just above the Agua Mansa oad over-looking the river. In the sand dunes.

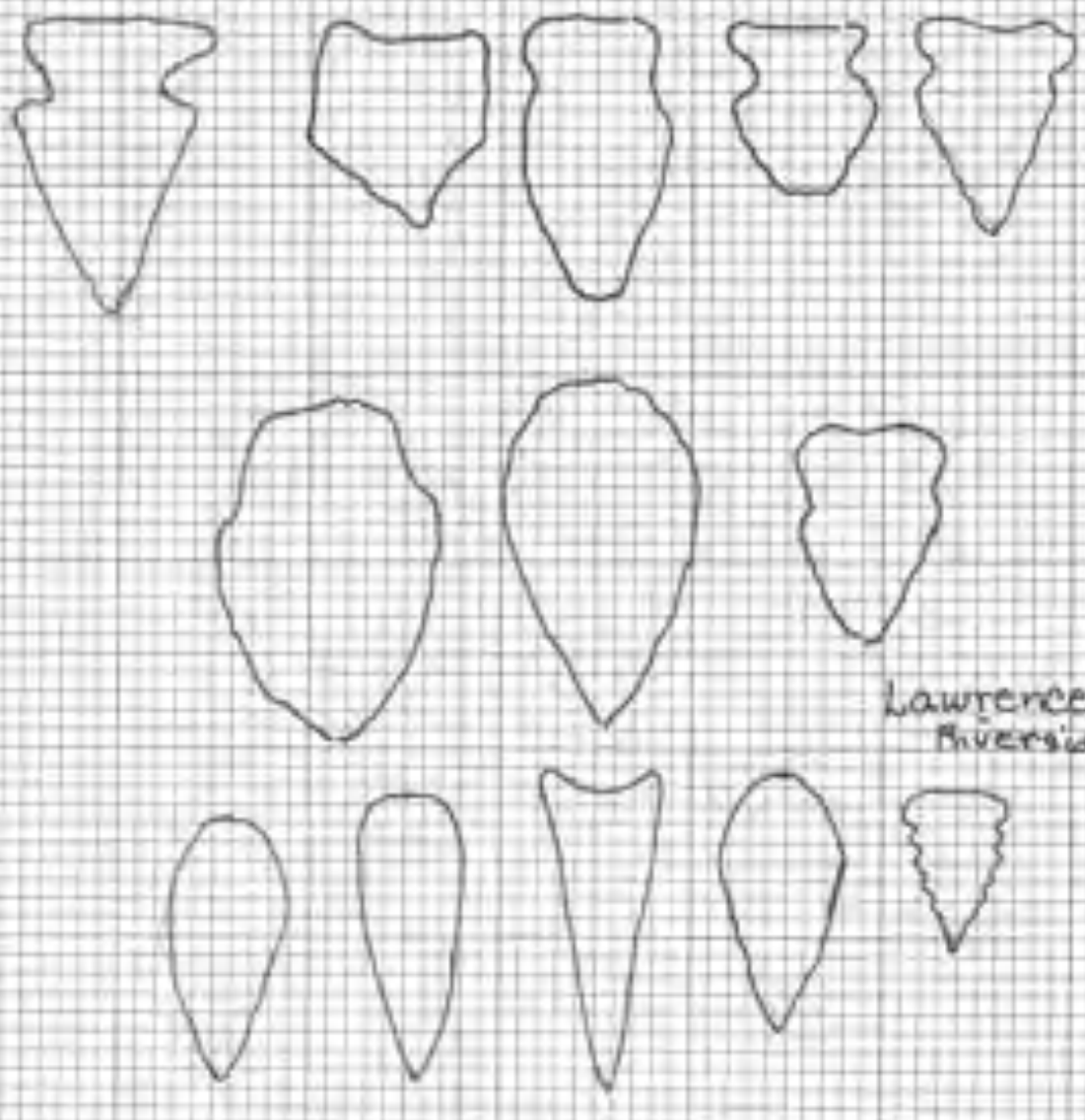
ings Found:
Metates---mano stones-----chipping
Old type &? points
Also reported new type points

Must investigate...



Colton

Slover Mountain



Lawrence Brown
Riverside, Cal.

Slover Mt. ARCHEOLOGICAL SURVEY OF SOUTHERN CALIFORNIA

SITE SB-40 LAT. ALT.
LONG. QUAD. SECTION T R B&M

TYPE: artifact area[1] house[2] burial[3] cremation[4] shell midden[5] midden[6] workshop[7] fire[8] mourning cer.[9] effigy[10] trail[11] maze[12] bedrock mortars[13] do. metates[14] pictographs[15] petroglyphs[16] village site[17] quarry[18] other[19]

Area of site: Deep deposit[1] shallow[2] surf. only[3] overburden?[4]

Water source: spring[1] stream[2] lake[3] tank[4] lagoon[5] Location:

Location of site: beach[1] terrace[2] bluff[3] shore[4] mesa[5] cave[6] rock shelter[7] dune[8] alluv fan[9] [10]

Access to site: Dist. from road:

Condition: wind eroded[1] water eroded[2] cultivated[3] overgrown[4] construction[5] pitted[6]

Owner: gov't[1] private[2] Permission?

Artifacts: pottery[1] bone[2] shell[3] asphaltum[4] pigment[5] vegetal[6] European[7] food remains[8] other[9]

Chipped Stone: points[1] knives[2] scrapers[3] drills[4] ornaments[5] other:[6]

Ground: metates[1] manos[2] mortars[3] pestles[4] bowls[5] other:[6] ground?[7] polished?[8]

Loc of coll: LA[1] SB[2] SD[3] SW[4] KH[5] AV[6] SH[7] PS[8] other[9] Photos:[10] Report[11]

Date: Recorded by: Excavation?

LOCATION OF COLLECTION

x 979.4
cop 2
Hood,W.G.
Tales of discovery on the pacific slope.

40 - Colton - Agua Mansa - AW 63

1	Metate		
2	"		
3	Mano		
4	"		
5	"		
6	"		
7	"		
8	"		
9	"		
10	"		
11	"		
12	"		
13	"		
14	"		
15	"		
16	"		
17	"		
18	"		
19	"		
20	"		
21	"		
22	"		
23	"		
24	"		
25	"		
26	Metate		
27	Mano		
28	"		
29	"		
30	"		
31	"		
32	"		
33	"		

64 40-Cotton-Agua Mansa-AN

34	Mano	Broken
35		"
36		"
37	"	"
38	"	"
39	"	"
40	"	"
41	"	"
42	"	"
43	"	"
44	"	"
45	"	"
46	"	"
47	"	"
48	"	"
49	"	"
50	Pestle	Small, crude
51	Hammerstone	
52	"	
53	Metate	
54	"	Broken
55	"	
56	"	Broken
57	Mano	Large, broken

Hist. Site

Paul Bergman
853 W. D St.
Ontario

4 points total

½ miles

6 lots

Site

SBCM 40

SITE ANALYSIS SBr-1576

Fill out completely for ALL sites - previously recorded sites plus those newly discovered.

1. Site function Camp site

a. Ceramics ? List types present. Estimate the % of each present.
None seen. "Pottery" reported by Smith.

b. Lithics. Types and materials present. % of each.
Schist, mill. stones - 40 %; Felsite, flakes & Cores - 12 %; Rhyolite - 8
Granitic " " 20 %; Quartzite, flakes & Scrapers - 9 %

c. Structures and/or other features. Describe, measure, and sketch.
None seen

d. Other features or artifacts:

(1) bone ? None seen

(2) charcoal ? None seen

(3) midden ? Shell reported by Smith

(4) historic artifacts ? Sun-colored glass, purple; Clay pipe reported by Smith

e. Environmental variables:

(1) vegetation ? buckwheat, mustard, grasses - disturbed

(2) geology ? Dune sand over alluvium

(3) morphological features ? Sandy depressions on small rolling hills on top of bluff running east-west

(4) ecozone ? Grasses/chaparral

(5) natural resources present or related ?
Wash just south of bluff

f. FUNCTION, based on above factors:
Camp or camps, temporary or seasonal. Depressions may have served as shelters.

2. Cultural Affiliation:
Indicate which of above diagnostics used to determine this -
Smith described points as "Shoshonean."

3. Chronological placement: Unknown at this time; mixed
Indicate which temporal indicators used -
Presence of both dart points and late types suggested by Smith.

4. Present condition of the site ? Some surface collection; no excavation. Dunes semi-stabilized.

5. Detailed proposal for mitigation, including estimate of time, costs, and manpower required.
Attached

SBCM-40 SITE RECORD SUPPLEMENT

SBCM-40 was partially field rechecked on July 25, 1975. Field inspection of the site was limited to the southeastern portion of the dune area. Essentially, five blow-outs were examined in an area ca. 250x150m. Among the cultural remains noted were worked, unworked and utilized flakes of basalt (50+), quartzite (30+), granite (21), quartz (17), and chalcedony (5+); 11 basaltic cores, 6 quartzite cores, 4 granitic cores; biface fragments of basalt (4), quartzite (3), and one of chalcedony; a polished basalt scraper plane; 12 basalt and 10 granite manos, 3 bifacial granite manos; and metate fragments of basalt (10), schist (6), and granite (3). A large mammal astragulus bone and 5-6 fragments of small mammal bone were found. Also observed was a large chunk of charcoal deflating from a bank of one of the blow-outs. Several fragments of blue and purple historic glass were discovered.

An encroaching modern dump hill threatens the site from the north and northeast.

Matthew C. Hall

Archaeological Research Unit
University of California, Riverside

August 15, 1975

SBC-1576

Archaeology

Both historic and pre-historic Indian village sites exist on California Portland Cement Company lands near Colton, California. Some of these sites have been destroyed by cement plant or agricultural operations and others are still undisturbed. The sites are officially recognized by the San Bernardino County Museum and are so designated on their register of historical sites, the cement plant site number being SBCM 40 (See map No. 1).

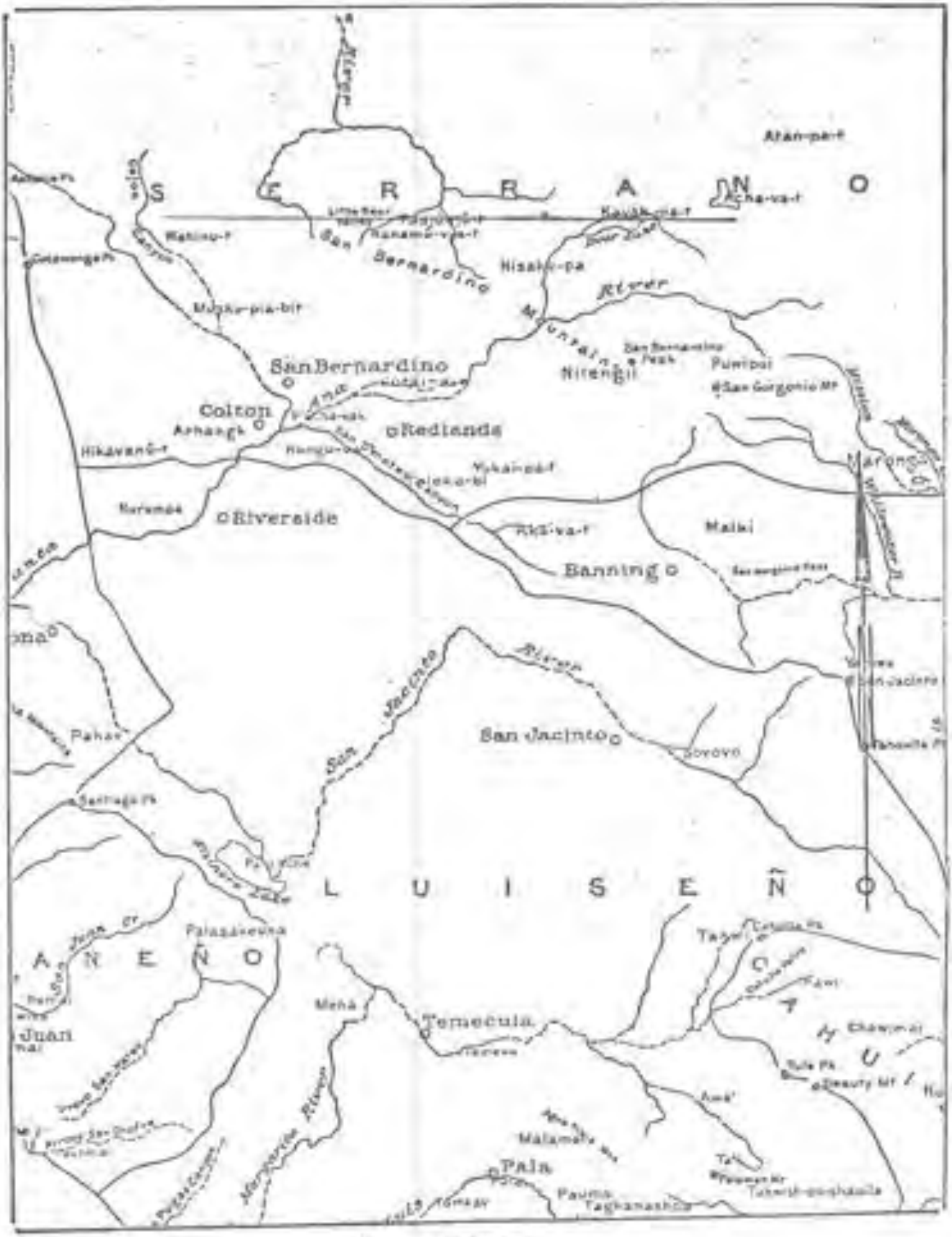
The presence of atlatl (old style spear points that required a casting device similar to the Australian aborigines Woomera) found at the site indicates man's presence prior to the invention and use of the bow and arrow. This is believed by Dr. Gerald Smith to be at least 3,000 years old and could be much older. What Indian tribes lived here at that time is not known but they were displaced by invading Shoshoni possibly 1,500 to 2,000 years ago. These Indians emigrated from the Great Basin of Nevada and Utah settling the California desert west of the Sierra Nevadas and crossed the Sierra Madres and San Bernardino Mountains to the coast and settled the better part of what is now Los Angeles and Orange Counties (See Map No. 2). The Shoshoni were split into about twelve tribes that were recognized by Kroeber, with individual tribal populations varying from a few hundred to over two thousand. The tribal group claiming ownership of the cement plant lands were the Serranos. Of all the Shoshoni tribes probably least is known about this tribe due to their retiring and non-aggressive nature. Apparently they avoided the early church communes at San Gabriel by retreating to their mountain fastnesses in the San Bernardino Mountains. Later they became converted and were allowed to remain in the valley. Here they built an Asstencia (mission outpost), dug a 30 mile ditch to carry irrigation water to their

fields. With the murder of three cowboys near Flores Ranch Summit Valley, in 1866, probably by desert raiders (Mojaves, Chemehuevis, or ?) posses were formed in San Bernardino and the Serranos were massacred in the mountains in May 1866. Of an estimated population of 1,500 probably over 1,000 were killed. Remnants were gathered and placed on the San Manuel reservation in 1876.

Kroeber lists the village of ARHAVIK as the Serrano village located southwest of Mt. Slover and north of the Santa Ana. This village was probably not a permanent year-round settlement, but was inhabited when snow lay deep on the mountains. Apparently the site lay along the river bluffs and extended north for at least a thousand feet. The site is located on quiescent sand dunes and any large stones found were carried in by man rather than stream action. Personal search of the area has shown many broken metates (mortars) manos (grinding stones), atlatl and arrow points, sea shells, hammer stones, charm crystals, pendants, pottery sherds, steatite fragments. Many of the metates are broken in keeping with the custom of destroying (killing) the mortar upon the death of the owner. Metates were generally made from a green schist slab with a slight depression ground in. Occasionally they were made from a slab of granite, in no case were they made from locally available limestone. The Serrano of the Mojave-Tehachapi area did use crystalline limestone of that area for manufacture of metates. One large bowl metate made of granite has been found, this was approximately 18 inches in diameter with sidewalls about 2 inches thick. Kroeber states that their houses were of the pit type with floors about two feet deep, covered with brush and earth overlying a conical log framework. This was verified by personal recollections of David Alvarado at Agua Mansa cemetery

in 1956 who stated that a few Indians still camped on the bluffs in his childhood, and described their shelters.

Lying as this village does, astride the trail from the coast up the Santa Ana, thence up through the Cajon to the Mojave River to the Mojave Sink and then to the Colorado, it is natural that trade items not of Serrano manufacture would be found. The steatite found is believed to originate from the Catalina Island quarries, the shells are obviously from the coast. The occasional chip of obsidian found had to come from far out on the desert as it does not occur locally. It should be noted that their favorite schist for their metates is not local, it most closely resembles Peluna schist which is found on the north west slopes of the San Gabriel Mountains.


S E R R A N O
San Bernardino
San Bernardino River
Santa Ana River
Mountains
San Bernardino Peak
Redlands
Riverside
Banning
Malki
San Jacinto
San Jacinto River
L U I S E Ñ O
A N E Ñ O
Temecula
Pala
Palomar Mt.
Mesa Grande
Santa Margarita River

MAP NO. 3

BIBLIOGRAPHY

1. A. L. Kroeber, Handbook of the Indians of California, Calif. Book Co. Ltd., 1923

2. Dr. Gerald Smith, Agua Manaa, San Bernardino County Museum, Vol. VIII No. 4, Summer 1961.

3. P. J. Johnston, The Serrano Indians of Southern California, Malki Museum Press, Banning, California, 1965.

4. Smith & Simpson, The Basket Makers of San Bernardino County, San Bernardino County Museum.

5. Smith & Turner, Indian Rock Art of Southern California, San Bernardino County Museum, 1975.

Portion of the USGS 7.5'
San Bernardino South (1967/1973)
Quadrangle showing site location

See sketch map attached

UTGM Coordinates defining perimeter, Zone 11

E	N
467350	3767625
467420	3767480
467610	3767779
467810	3767800
467910	3767820
468060	3767870
468100	3767930
468050	3768010
468000	3767990
467900	3767910
467780	3767910
467540	3767910
467290	3767800
467250	3767700

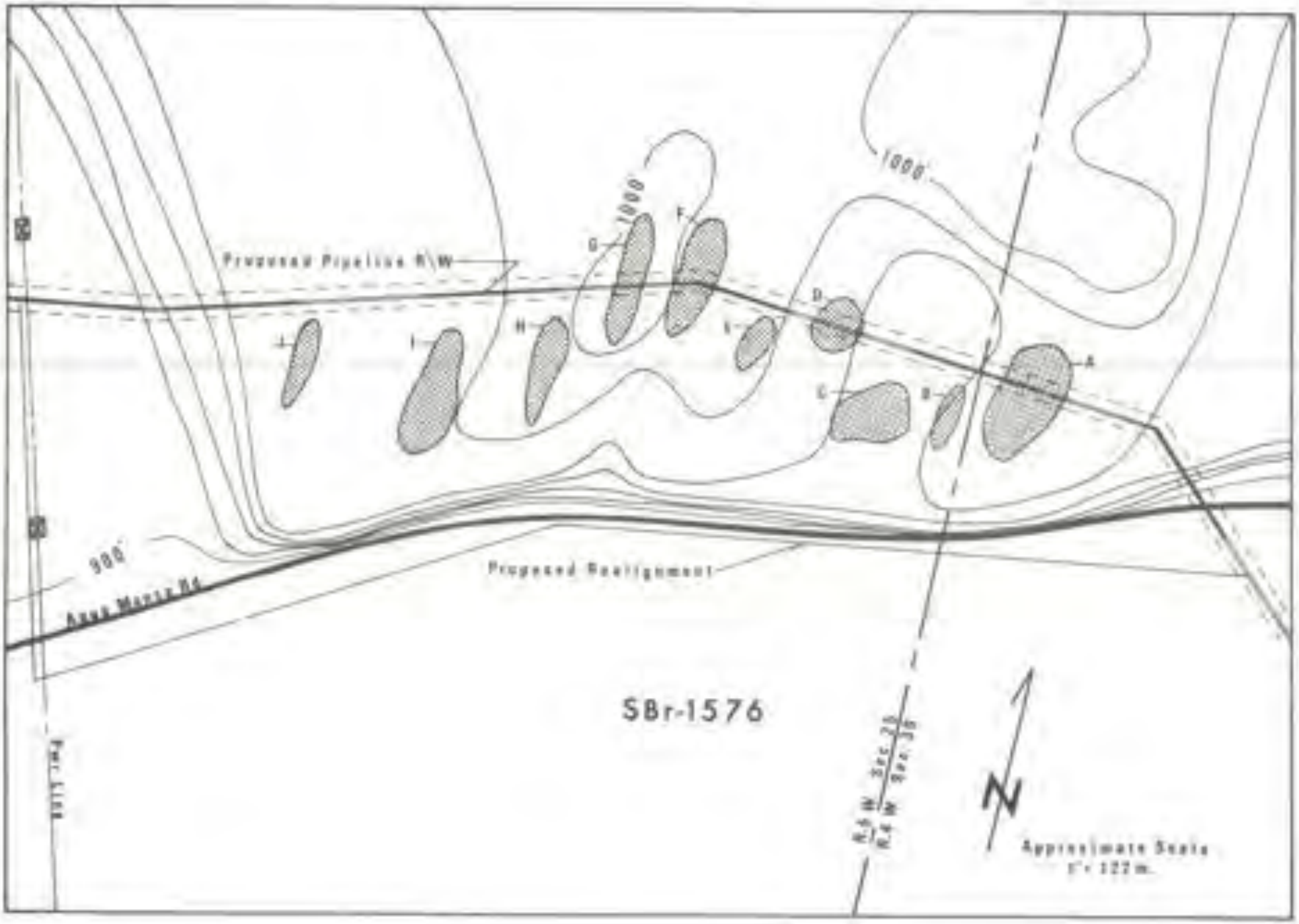

Proposed Pipeline R\W
1000'
1000'
A
B
C
D
E
F
G
H
I
J
K
900'
Agua Mansa Rd.
Proposed Realignment
SBr-1576
Approximate Scale
1" = 122 m.

Figure 1

LOCATION OF SBr-1576 AND STUDY AREA

Figure 6

SURFACE DISTRIBUTION OF CULTURAL MATERIALS

Glover Mtn
Mapped, edited, and published by the Geological Survey
Control by USCGS and USC&GS
Topography by photogrammetric methods from aerial photographs taken 1952 and planetable surveys 1936–38. Field checked 1954
Revised from aerial photographs taken 1968. Field checked 1969
Polyconic projection. 1927 North American datum
10,000 foot grid based on California coordinate system, zones 5 and 6
1000 meter Universal Transverse Mercator grid ticks,
zone 11, shown in blue
Red tint indicates areas in which only landmark buildings are shown
Areas covered by dashed light-blue pattern
are subject to periodical inundation

WF No. 1

[illegible]
[illegible]
[illegible]
[illegible]

[illegible]
[illegible]
[illegible]
3/13/87 ORIGINALS IN SECU-40 FILE

AND MANAGEMENT DEPARTMENT

15 North Arrowhead Avenue • San Bernardino, CA 92415-0180 • (314) 387-4031

COUNTY OF SAN BERNARDINO
ENVIRONMENTAL
PUBLIC WORKS AGENCY

JOHN N. JAQUESS
Land Management Director

OFFICE OF PLANNING
Sharon W. Hightower
County Planning Officer
OFFICE OF SURVEYOR
Claude D. Tomlinson, L.S.
County Surveyor
OFFICE OF BUILDING AND SAFETY
Larry L. Schaefgen, P.E.
County Building Official

SBCM-45

December 16, 1988

Larry L. Warner, Plant Manager
CalMat Co., Cement Division
P. O. Box 967
Colton, CA 92324

Subject: Archaeological Test Investigation and Evaluation of SBr-1576

Dear Mr. Warner,

Pursuant to the discussion held during our meeting of October 11, 1988 and as a result of my receipt of a copy your November 29, 1988 letter to Dr. Carol Rector of the San Bernardino County Museum confirming that the archaeological collection from the URS investigation at SBR-1576 has been curated, this letter documents our finding that concerns raised initially in February of 1987 have been satisfactorily addressed.

As you recall, the matter was first brought to our attention by the County Museum staff, who became aware of potential impacts to archaeological site SBr-1576 because materials collected from the site over the years by a CalMat employee, Mr. Verhoven, were shown to museum staff members, apparently in an effort to stimulate some action regarding CalMat operations relative to the site location. We then had meetings and telephone conferences with you and other CalMat officials, with the result that URS Consultants were contracted determine the areal and subsurface extent of the site, to evaluate its significance, and to assess the potential for operations currently permitted under any of CalMat's reclamation plans to affect the site.

As a result of the investigations conducted by URS and documented in their report of September 30, 1988, it was concluded that:

> SBr-1576 can be characterized as a thoroughly mixed and depleted resource that lacks temporal control. In light of its current condition, SBr-1576 is not considered eligible for listing on the National Register of Historic Places and is not considered an important resource as defined by CEQA, Appendix K.

Based on our review of the URS report, we concur that the site now lacks integrity and thus does not warrant further consideration at this time. We also find that the currently approved CalMat reclamation plans will not cause any impact to important archaeological resources, and that no further archaeological investigation is necessary at this time. However, we will consider the potential impact of any future discretionary

actions (such as amendments to any reclamation plan) on archaeological resources. The status of site SBr-157A would be reevaluated in that instance, relative to any proposal and the existing conditions at the time.

We take this opportunity to commend CalMat for its responsible handling of this matter. Through your efforts and willing cooperation we now know a great deal about the nature of the prehistoric and early historic activities that took place on CalMat's property. Furthermore, CalMat's donation to the Museum of the archaeological collection resulting from the URS investigation preserves that information for the benefit of future interested citizens and researchers. As noted in the final recommendations of the URS report, this benefit would be considerably enhanced by the addition to the museum collection of the materials collected by both Mr. Verhoven and Dr. Gerald Smith. We would encourage CalMat to work with Mr. Verhaven in this regard, and we are taking separate steps to determine if any materials collected by Dr. Smith that are not currently in the museum can be located.

Thank you for your patience in seeing the archaeological work through to its completion at a time when I know you had many other more pressing concerns to deal with. Feel free to contact me or Joe Belland at (714) 287-4196 should you have any questions regarding the archaeological study or other aspects of your reclamation plans.

Sincerely,

OFFICE OF PLANNING

Michael K. Lerch

MICHAEL K. LERCH, SENIOR PLANNER
ENVIRONMENTAL ANALYSIS TEAM

cc: Sharon Hightower
Joe Belland
Lester Rose
Bill Tilden

SBR 1578

Agua Mansa (1074)

Formerly P36-001578

San Bernardino County Museum

Archaeological Site Survey Record

1. Site SBCM - 113 2. Map(s) San Bernardino 7.5' 3. Country San Bernardino
4. Twp. 1 S Range 5 W SW ¼ of NE ¼ of Sec. 36
5. Location Central western boundary of Agua Mansa Cemetery
6. On Contour/Elevation 900'
7. Previous designations for site Agua Mansa Cemetery
8. Owner -- 9. Address --
10. Previous owners, dates -- 466460 E
11. Present tenant -- 3766575 N
12. Attitude toward excavation: Friendly
13. Description of site Camp site on dune north of Santa Ana River
14. Area 100' E/W 50' N/S
15. Depth none
16. Height --
17. Vegetation -- 18. Nearest water Santa Ana River
19. Soil of site Sand 20. Surrounding soil type Sand
21. Previous excavation Gold hunting pot holes, Cemetery Burials
22. Cultivation Extensive in past 23. Erosion High wind
24. Buildings, roads, etc. Cemetery Fence N&S
25. Possibility of destruction All within cemetery
26. Bonus site none
27. Other features none
28. Burials Question to 1960 pothole wreck
29. Artifacts pottery and 1 point

30. Remarks Scattering of artifacts in the area

31. Published references
32. Other Sources Reference 33. Quad map --
34. Date 1984 35. Recorded by W.A. Smith 36. Points --

Riverside, California
August 14th, 1931.

Mr. George W. Beattie
East Highlands, California

Dear Sir:

The undersigned, Rialto Land Company, a corporation, consents to the designation by the State Department of Natural Resources the location of a point in Lot 37 of Semiol Donation, San Bernardino County, on which is located the ruins of the Agua Mansa Church.

RIVING LAND COMPANY

by _____
Vice President

by _____
Secretary

RIVERSIDE

APPLICATION FOR
REGISTRATION OF HISTORICAL POINT OF INTEREST

NAME OF HISTORICAL POINT: AGUA MANSA - THE DESERTED VILLAGE.

LOCATION: Two and one-half miles southwest of Colton.

NAMES OF OWNERS:

In 1938 the cemetery was deeded to a board of trustees.

Frank C. Peters, West Congress and Third Streets, Colton, California, and Ramon F. Belardo, Box 69, West Congress Street, Colton, California, are the present active trustees.

The Church site belongs to Rivino Land Company.

Address, Fuller & Bell, agents, 301-302 Rotunda International, Riverside, California.

The road through Agua Mansa is a county road, under Board of Supervisors.

Address, Courthouse, San Bernardino, California.

HISTORY AND DESCRIPTION

The home of a group of New Mexican colonists, who, in 1843, upon the invitation of Don Juan Bandini, owner of the Jurupa Rancho, moved upon a part of it known thereafter as the Bandini Donation. They were granted parts of this Donation as their individual property on the understanding that they aid in repelling Indian raids on his stock on Jurupa.

The location was seemingly ideal. The Santa Ana River flowed through it and the soil was rich. The settlers had their plots of land in the river bottom, and adobe homes, gardens, orchards, vineyards and fields made it a most attractive region. The community was named Agua Mansa - Gentle Water - because of a limpid stream that flowed from an adjacent cienega.

The community was prosperous until 1862, when a great flood swept suddenly down the Santa Ana, carrying away the village of adobe buildings, and covering the fields with river sand and gravel. The village was rebuilt on higher ground, but never regained its former prosperity.

The decline in importance of the live stock industry, the purchase of portions of the land and water rights by the company developing Riverside, the long years of litigation to which the earlier settlers were subjected by various interested parties - all these acted to render Agua Mansa a mere memory. Today the surviving descendants of the Agua Mansa pioneers are

scattered. The old community church is now only a mound of adobe marked by a bell of the Camino Real Association. In the west end of the old cemetery - the oldest in the county - rest the remains of the original settlers and their children, but their graves cannot be identified, since a grass fire destroyed their wooden markers, and no maps or written records were kept. A portion of the cemetery is still used for interments, as descendants of the old families dying wish to be laid by their forebears.

Through Agua Mansa runs one of the few stretches still in use of the road opened about 1806 by missionaries of San Gabriel to connect their mission with the San Bernardino Rancho, and known later as the San Bernardino - Sonora Road.

REFERENCES TO BOOKS, RECORDS AND OTHER AUTHORITIES SUSTAINING THESE FACTS

The story of Agua Mansa and other New Mexican settlements on the portion of Jurupa Rancho known as the Rancho Domation may be read in an unprinted manuscript by George William Beattie.

Much of the material has been gathered from unprinted sources - court records of lawsuits, interviews with pioneers, etc. Important parts have been taken from notes by Judge Benjamin Hayes in the Bancroft Library, and from his Pioneer Notes, edited and published by Marjorie Tisdale Wolcott in 1929. Other printed works drawn on are Reminiscences of a Ranger, by Major Horace Bell, and Luther A. Ingersoll's Century Annals of San Bernardino County.

FROM NOTE BOOK OF HENRY CHAPMAN FORD:

"SAN SALVADOR - Chapel at Agua Mansa (June, 1888). . . . The building had adobe walls set upon heavy timber sleepers with stone foundations and upright wooden posts at the corners.

The dimensions were 56 ft. in length by 22 ft. 6 inches in width. The roof was covered by shakes instead of tiles. The dormitories consisted of a two roomed adobe at the right and connected with the chapel. The walls of the chapel are ruined and but little is left to mark the dimensions. A bell was cast at this place in 1868, under the direction of a Sonoranian, and was hung on a bar supported by two posts in the front of the chapel, but was afterwards suspended from a strong branch of a cottonwood where it still hangs, although the tree is dead. . . The bell was dedicated to Santa Guadalupe, and bears

the following inscription in very rude letters:

S.S.D.A.1862 N.S.De GUADALUPE.

In 1862 a great flood occurred in the Valley, washing away many of the houses . . . .

Two rude white marble posts quarried in a hill near Colton, not far from the settlement, were set up in front of the chapel to mark the limits of the water, and are still standing."

ARE PICTURES ATTACHED? Yes.

IS STATEMENT OF OWNER ATTACHED? Yes.

SIGNED George W. Beattie
GEORGE W. BEATTIE.

TOWN East Highlands, Calif.,

COUNTY San Bernardino,

DATED July 26, 1934.

[illegible] [illegible]:

[illegible] [illegible] [illegible] [

DIVISION OF BEACHES & PARKS
DISTRICT 6

HISTORICAL LANDMARKS

Date April 23, 1959

Name of Landmark AGUA MANSA (we do not think that this means Deserted Village)

Registration Number 121 County San Bernardino

Location Appror 3 miles sowest of Colton on Agua Manse Avenue near Riverside Street.

Type of Plaque None

Condition of Plaque

Condition of Plaque Base

Condition of Surroundings

Wording on Plaque

Location of Highway Directional Markers None, This is an old cemetery that is still being used, the entire area is fenced with a 5' cyclone fence and the gates are

Remarks locked. A Mr. Alvarado is the custodian and lives in Colton, but we were unable to locate him. We could not find anythingof value to photograph, perhaps there may be something of interest in the old section of the cemetery but we are inclined to think that this area is not of historical interest

Photos Taken by: Date Year

Submitted by: W. J. Carson, Park Superviser, Lake Elsinore State Park

NAME AGUA CALIENTE - THE INDIAN VILLAGE

COUNTY SAN BERNARDINO

APPROVAL COMMITTEE

Aubrey Drury

Edward F. Dufficy

Paul J. Wood

Walter V. Hutchings

Harry Carr

Lynn A. Wright

Herbert Bolton

Robert Glover

Orra E. Monnette

SPARE PARK COMMISSION

DIRECTOR, DEPARTMENT NATURAL RESOURCES

REGISTERED LANDMARK NUMBER 121

DATE May 15 - 1933.

SURVEY
of
California Registered Historical Landmarks

Name AGUA MANSA Number 181

County San Bernardino

Location Agua Mansa Cemetery, 270 East Agua Manso Road, Colton.

Type of Plaque THIS PLAQUE PLACED BY JURUPA PARLOR NO. 296 NATIVE DAUGHTERS OF THE GOLDEN WEST, JUNE 11, 1951.

Condition of Plaque Excellent

Condition of Base Excellent

Condition of Surroundings Excellent

Wording on Plaque AGUA MANSA CEMETERY

THIS HISTORIC SITE MARKS THE RESTING PLACE OF THE PIONEERS OF THE AGUA MANSA AREA WHICH WAS STARTED ABOUT 1840. THE PRESERVATION OF THIS CEMETERY BEGAN IN 1951.

Are there Highway Directional Signs? Yes

If no, Where? One southbound Riverside Avenue; sign needed for northbound.

Remarks:

Private planned on San Bernardino County Museum property.

Submitted by: Jim Ambuehle Date 7/12/79

We, the Board of Supervisors of San Bernardino County, as Trustees of the County Road running through Agua Mansa, hereby consent to the registering and numbering by the State Department of Natural Resources of Agua Mansa, as a spot of historic interest. Said County Road is one of the few stretches now in use of the road from San Gabriel to the Branch Mission at old San Bernardino that was built by the Mission Fathers about 1810, and later known as the San Bernardino-Sonora Road.

Chairman, Board of Supervisors

Clerk of the Board of Supervisors
of San Bernardino County

By [illegible], Deputy

DEPARTMENT OF PARKS AND RECREATION

HISTORIC RESOURCES INVENTORY

No. _____

1. Common Name: AGUA MANSA (CEMETERY) & RUINS OLD SAN SALVADOR CHURCH
   Situated on a bluff, on the north side of Agua Mansa Road, about 1/2 of a
2. Location: mile east of Riverside Avenue.

4. Date of Inventory: July, 1974

5. Status: Occupied X Unoccupied ____ Preservation Work in Progress ____

6. Accessible to Public: Yes, Restricted ____ Yes, Unrestricted X No, Not Accessible to Public ____

7. Owner of Property: Name: County of San Bernardino Address: Civic Bldg: 157 West 5th. Street
   City: San Bernardino State: California Zip: 92401 Phone: (714) 383-1903

8. Approximate Acreage: _____ or Approximate Lot Size: _____

9. Representation in existing historic or prehistoric survey (see instructions): Yes X No ____ Unknown ____
   Name of Survey: California History Plan Inventory

10. Depository for Records: Name _____
    Address _____ City _____ State _____ Unknown ____

11. Representation on current National Landmark Registry programs: Yes X No ____ Unknown ____
    Which Program: California State Historical Landmark # 121

12. Description (multiple choice): Altered ___ Unaltered ___ /Condition: Excellent ___ Good ___ Fair ___
    Deteriorated X Ruins X Unexposed (archeological site) ___

13. Briefly describe the present and original physical appearance of site or structure and note any major alterations:
    Though much destroyed by vandals, efforts to preserve and protect the site
    have been successful. Originally, the site was a community. Today, only the
    cemetery and an outline of the old church remain. The village community was
    washed away in the flood of 1862.

14. Date of Historical Importance: None ___ Local X State X National ___ Describe briefly the circumstances
    for architectural exceptionals: Flood 1862 destroyed community

15. Source of historical importance: None Several - See Quarterly - Vol. XXI, No. 1&2, Fall-1973
    Local ___ State X National ___ Unknown ___ None ___

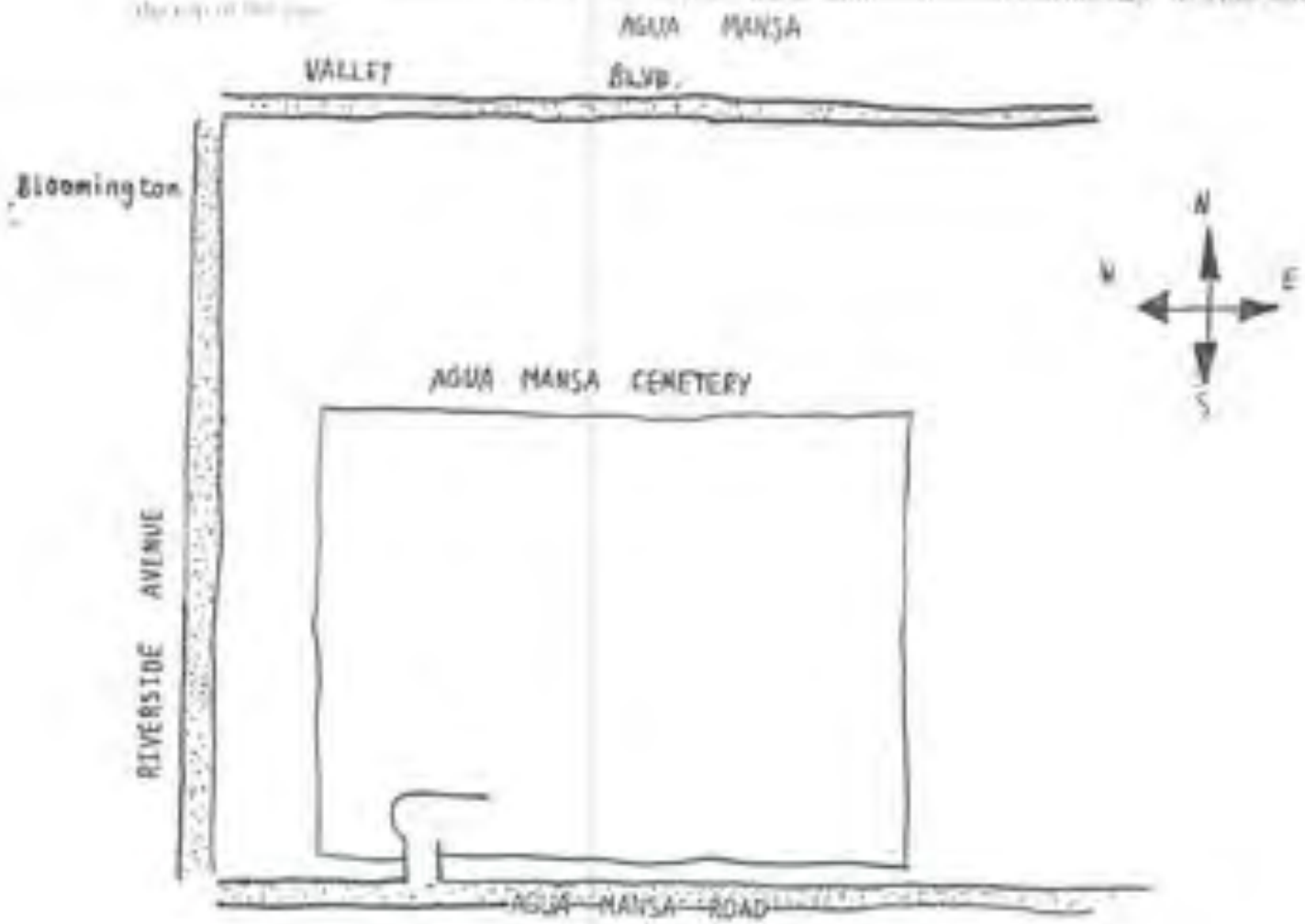
16. Statement of Significance: The ruins of Agua Mansa represent the oldest preserved
    cemetery of the County. New Mexican colonists settled on the land which was
    part of the Rancho Jurupa Rancho. The 1862 flood destroyed the adobe structures
    in the area. Only the cemetery and the church, situated on high ground, survived
    the flood waters. Cemetery contains graves - sometimes by the hundreds -
    unidentified.

17. Bibliography (cite sources): See: "Four Centuries of San Bernardino", 1961 Quarterly
    of the Historical Society of Southern California, 1968: The Story of San Bernardino County, 1853-1953
    by Kirsopp; "Agua Mansa Road"

Recommended for historical designation: Yes X No ____ (see instructions)

24. Sketch map

In the space below draw a sketch map showing the location of the property. Label streets and roads and show the distance from the property to the nearest intersection. Indicate north on the map or the site plan.



30. Form prepared by: Name Dr. G. Smith-T. Sucr Address 1900 Pellgrin
City Bloomington Phone 877-2272 Organization San Bernardino County Museum

THE FOLLOWING (31-36) ARE FOR STRUCTURES ONLY.

31. Date of Construction: _____ Factual___ Estimated___ Uncertain___
Architect _____ Unknown___ Builder _____ Unknown___

32. Briefly describe use of structure (past and present) _____

33. Briefly describe overall structural features of the structure _____

34. Is structure on original site? Yes_____ No_____ Unknown_____

35. Describe alterations and dates if known (Structural & Cosmetic) _____
Secure___ Fair___ Poor___ Unknown___

36. Area of structural presence: Width _____ Length _____

VI. HISTORICAL BACKGROUND: AGUA MANSA CEMETERY

By: Karen Swope

Presumably, the cemetery was established at approximately the same time as the church. Church records and later recorders (Hamlin 1973, Genealogical Society of Riverside 1976) provide various lists of names of those interred and dates of death. The cemetery was used not only for the burial of residents of San Salvador, but "...for the people of the area stretching from present Colton to Chino" (Haenze) 1960: np).

Archaeological investigations have revealed the presence of a footpath connecting the church with the cemetery. This was probably the route taken for funeral processions. The path runs up the slope above the church and onto the flat near the adobe "quarry" site, about ten meters east of the northeast corner of the cemetery.

In May, 1951, a local chapter of the Daughters of the American Colonists recorded all legible names on grave markers in the cemetery (Genealogical Society of Riverside 1976: 20). At that time, there were many unmarked and several vandalized graves, although interment was still taking place (Hamlin 1973: 83-115).

The Friends for the Preservation of Agua Mansa Cemetery was formed in 1956 for the purpose of protecting the site from vandalism (Haenzel 1968: np). The property was resurveyed, in order to establish the boundaries of the cemetery, and funds were raised to erect a chain link fence around the property. The area where the fence stands today was graded and leveled (Wood: 66-71).

A surveyor's plat map dated 1954, shows a dirt road from the power lines south to the northeast corner of the cemetery. This road no longer exists, but was probably used for access prior to the construction of a new bridge over the canal at the southeast entrance of the cemetery. This road was no longer in use in 1967.

In 1961, the Friends for the Preservation of the Agua Mansa Cemetery, having run out of funds, turned over care of the cemetery to the County of San Bernardino. The property was heavily impacted by vandalism, etc., during the mid-1960s, and was formally abandoned as a place of future interment, by order of the San Bernardino County Board of Supervisors in 1967. The cemetery and church site were acquired by the San Bernardino County Museum Association at this time.

Finally, as a result of the fact that the cemetery boundaries were resurveyed in 1955, and that grading for the fence did not reveal any subsurface remains, it can be stated with relative certainty that no graves exist outside of the present fenced area.

1576
RIVER
SANTA ANA
Highgrove

Set
El. 937.20
CEMETERY
AGUA
AGUA MANSA
880
880
CO

visioning route. Hipolito Espinosa and Lorenzo Trujillo, two of the leaders of the first New Mexican emigrant party, had crossed the trail earlier as mule drivers and herdsmen for the Rowland-Workman Party. The New Mexican colonists crossed this trail to get to California.

Finally, Agua Mansa reveals the strength, stability, and durability of the New Mexican-Genízaro pioneers who came to serve as a buffer between Californios and Indios by protecting the farmers' stock and property from Indian attack in exchange for land upon which they could settle, farm, and build their pueblos. The Genízaro origins of the New Mexican settlers is particularly important. Genízaro was the term used in New Mexico to refer to hispanicized Indian people. They were indigenous people who, through capture and enslavement by other groups, had no firm tribal self-identity and who could not be returned to their own people. In New Mexico Genízaros were given special grants which allowed them to settle in their own villages with their own placitas. The grants given to Genízaros, known as settlement grants, were a combination of land tenure forms. "Individual heads of families were given strips of land which usually touched the source of water at one end and the placita area at the other. In addition, the community was given a common grazing grant known as an ejido. This method of land distribution... reinforced the power held by the heads of the families while at the same time it also encouraged a strong cooperative community feeling among the various families in the settlement."1 These New Mexican/Genízaro communities, the first farming communities in the area, proved the agricultural fertility of the region as their productive farms and gardens dotted the gentle slops of the river-bottom area they settled.

The Spanish speaking communities consisting of La Politana, La Placita de los Trujillo, and Agua Mansa, and collectively called San Salvador, date from 1843, when Juan Bandini and the Lugo family made it known they would provide land to settlers willing to settle the area around Cajón Pass and protect their cattle and property from attack by Indians, thieves, and marauders. Juan Bandini owned the Jurupa Grant, the Lugo family owned the San Bernardino Grant. Arriving at an agreement with the Lugos, a group of seventeen families led by Espinosa and Trujillo left Abiquiu in 1843 and established the settlement of La Politana on the Northwest side of the Santa Ana River. A falling out with the Lugos resulted in negotiations

and an agreement with Juan Bandini and in the establishment of another settlement, La Placita de los Trujillos, on the Bandini Grant on the Southeast side of the Santa Ana River. The sister settlement of Agua Mansa on the Northwest side of the river, was founded in 1845, as more settlers from New Mexico came to the area.

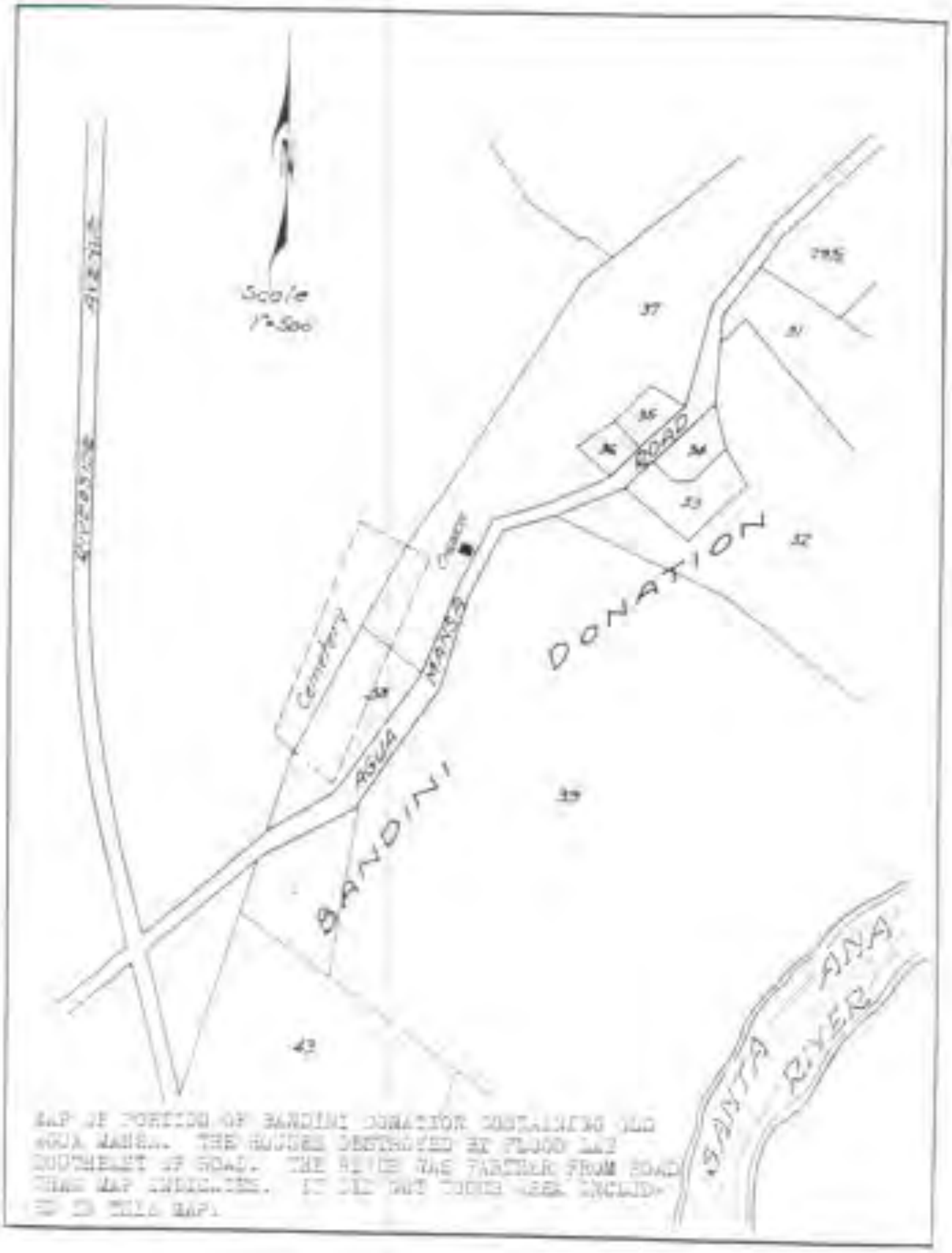
The Spanish speaking communities, which in the 1850s numbered between two and three hundred people, grew and prospered as small farming communities. Most of the residents were from New Mexico and brought with them their particular traditions of communal land tenure, of agriculture, sheepherding, Catholicism, and strong family ties. Settling the area as buffers, they rooted themselves deeply in the region, and despite the Mexican-American War and the ensuing conflict as Anglos emigrated to the area, they helped the new Anglo settlers. After Americanization La Placita became known as "Spanish town. The most inclusive term for the Spanish speaking settlements along the river bottom between Colton and Riverside was San Salvador, which was the name of the Parish church, the school district, and the voting precinct. As the fabric of the area changed with Americanization, the descendants of the original settlers melded into the larger population - into both the Mexicano/Chicano barrio established in South Colton in the 1890s, and through intermarriage, into the Anglo community.

The original church, a small temporary chapel, was being replaced in 1852 as the entire community joined the effort to construct an adobe church. Led by Lorenzo Trujillo, the community labored for five months to build their permanent church. When it was almost ready, with only the shingle roof remaining to be finished, heavy rains crumbled the walls. The building collapsed on December 5, 1852. Not to be deterred, the community assembled in a town meeting to decide the course of action for constructing a new church. They decided to build on the Agua Mansa side of the river where there was firmer ground. The Placita Church, they discovered, collapsed because the site was underlaid with numerous small springs which created a weak foundation for the building. Once again the collective labor of the community built the church on its present location. Finally completed in 1852, the new adobe church was dedicated by by Father Petithomme, of the Sacred Hearts of Jesus, as the Church of San Salvador. The church continued to serve the community until 1892, when it was abandoned because its walls became unsafe. Although a new

Roman Catholic Church was built in Colton, the Spanish speaking organized to persuade the Archdiocese to re-build the Church of San Salvador in South Colton. In 1913 the new Church of San Salvador was constructed in South Colton on seventh street. Since then, a new, modern church has replaced the one built in 1913. It is still the Church of San Salvador, the priest is spanish-speaking, and it still serves the Chicano community in South Colton. In fact, the Church of San Salvador is a central religious, social, and political center in South Colton.

The Cemetery at Agua Mansa, established at the same time as the Church, holds the remains of the original settlers, their families, and many of their descendants. It was the only cemetery in the Colton area until the latter part of the nineteenth century so many of the Anglo pioneers are also buried there. Since the Church and Cemetery lay in ruins for about fifty years, the non-marble gravestones, including those that revealed particularly interesting aspects of burial customs, are gone. However, in 1954 a community group led by one of the descendants of the original settlers, spearheaded a movement to construct a replica of the Church and to restore the Cemetery. The County of San Bernardino bought the property, reconstructed the Church, along with donations from private citizens, and restored the Cemetery. It is now owned by the County and operated as a County Historical Site.

The Church and Cemetery at Agua Mansa should be designated as a State Historical Site. The New Mexican-Genizaro roots of the Spanish-speaking communities, their establishment as farming communities, their state as buffer zones, and their survival as small, self-contained agrarian settlements are significant aspects of Chicano and California nineteenth century history which must be preserved and recognized state-wide.



MAP OF PORTION OF SANDINI DONATION CONTAINING OLD AGUA MANSA. THE BUILDING DESTROYED BY FLOOD LAY SOUTHEAST OF ROAD. THE RIVER WAS FARTHER FROM ROAD THAN MAP INDICATES. IT DID NOT CROSS LOT INCLUDED IN D TITLE MAP.

MAP SHOWING LOCATIONS OF SEE MEXICAN SETTLEMENTS IN THE SAN BERNARDINO VALLEY

ARTIST'S SKETCH OF AGUA MANSA CHURCH AND PRIEST'S HOUSE, PREPARED FOR LUTHER A. INGERSOLL FROM DESCRIPTIONS BY PIONEERS AND PUBLISHED, 1904, IN CENTURY ANNALS OF SAN BERNARDINO COUNTY.

SOUTH OF ADOVA MARSH CHURCH AND THE PRIEST'S HOUSE IN 1888, AS SKETCHED BY HENRY TWO POSTS IN FRONT WERE PLACED TO MARK THE WIDTH OF THE FLOOD IN 1862.

THE CHAIRMAN FOUND "THE BEST IN THE SHOW WAS CAPT HENRY BUTLER'S IN 1886." THE CHAIRMAN FOUND "THE BEST IN THE SHOW WAS CAPT HENRY BUTLER'S IN 1886."

THE MOUND OF EARTH IN THE FOREGROUND IS ALL THAT REMAINS (1942) OF WHAT WAS ONCE THE CHURCH IN AGUA MANSA. THE ROAD IN FRONT OF THE MOUND IS ONE OF THE FEW STRETCHES OF THE OLD SAN BERNARDINO - CORONA ROAD STILL IN USE.

TOMBSTONE OF FRANCISCO M. ALVARADO, SON OF THE LAST MAYORDOMO WHO SERVED MISSION SAN GABRIEL ON THE SAN BERNARDINO RANCHO. HE SPENT HIS LAST DAYS IN AGUA MANSA, AND HIS KNOWLEDGE OF EARLY VALLEY HISTORY PROVED VERY VALUABLE IN LATER YEARS.

ENTRANCE TO THE OLDEST CEMETERY STILL IN USE IN SAN BERNARDINO COUNTY. THE PIONEER SETTLERS REST IN THE VACANT PORTION NEAR THE GATE, THEIR GRAVES UNMARKED. GRASS FIRES HAVE DESTROYED THEIR WOODEN HEAD BOARDS.

Agua Mansa Site, Dedicated to "Our Lady of Guadalupe"
MISSION INN, RIVERSIDE, CALIFORNIA

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

HISTORIC RESOURCES INVENTORY

Ser. No. 3324-1

HABS ___ HAER ___ NR 3 SHL ___ Loc ___

UTM: A ___ B ___

C ___ D ___

IDENTIFICATION

1. Common name: Agua Mansa Cemetery
2. Historic name: Agua Mansa Cemetery and Church
3. Street or rural address: 270 E. Agua Mansa Road

City Colton Zip ___ County San Bernardino

4. Parcel number: ___
5. Present Owner: San Bernardino County Address: ___

City San Bernardino Zip ___ Ownership is: Public X Private ___

6. Present Use: County Historical Site Original use: Cemetery and Church

DESCRIPTION

7a. Architectural style: The church is early Spanish mission style.

7b. Briefly describe the present physical description of the site or structure and describe any major alterations from its original condition:

The original adobe church was abandoned in the 1890s. The new church, a replica of the original, was constructed in the 1950s. The cemetery, in front of the church, is in its original location.

Attach Photo(s) Here

8. Construction date: Estimated ___ Factual 1851
9. Architect ___
10. Builder The People of San Salvador
11. Approx. property size (in feet) Frontage ___ Depth ___ or approx. acreage ___
12. Date(s) of enclosed photograph(s) Jan. 1980

DPR 523 (Rev. 4/81)

13. Condition: Excellent ___ Good X Fair ___ Deteriorated ___ No longer in existence ___

14. Alterations: ___

15. Surroundings: (Check more than one if necessary) Open land X Scattered buildings ___ Densely built up ___
Residential ___ Industrial ___ Commercial ___ Other: ___

16. Threats to site: None known X Private development ___ Zoning ___ Vandalism ___
Public Works project ___ Other: ___

17. Is the structure: On its original site? Yes Moved? ___ Unknown? ___

18. Related features: ___

SIGNIFICANCE

19. Briefly state historical and/or architectural importance (include dates, events, and persons associated with the site)

The Church and cemetery at Agua Manca bring together several very important strands of nineteenth century Chicano history. First, the establishment of the Spanish speaking communities in the rich, river-bottom area around Colton in the early 1840's reveals the reality of the hostile relations between Californios and Indios during the Spanish/Mexican periods. Indian people actively resisted the efforts of Spanish/Mexican governments, of the Catholic Church, and of rancheros to settle their land in the inland region around the present San Bernardino County. In short, it points out important contradictions in Chicano history.

Second, the development of New Mexican settlements in Southern California attest to the commercial and cultural interchange between the two Mexican provinces. The settlers came from Abiquiu, Nuevo México, the rendevous point for the Old Spanish Trail. This trail, so precipitous, barren, narrow and rugged that no wagon could traverse its full length, was discovered, charted, and travelled by Spanish/Mexican traders and trappers as part of the commercial and pro-

(continued on attached sheet)

20. Main theme of the historic resource: (If more than one is checked, number in order of importance.)

Architecture ___ Arts & Leisure ___
Economic/Industrial ___ Exploration/Settlement X
Government ___ Military ___
Religion 1 Social/Education 2

21. Sources (List books, documents, surveys, personal interviews and their dates)

Archives in Colton City Library; Joyce Carter Vicary, Defending Eden New Mexican Pioneers in Southern California 1830-1890 (Riverside: U.C. Riverside & Riverside Museum Press, 1977). Robert Finger and Susan Phillips, "Colton," unpublished

(cont'd below)

22. Date form prepared Jan. 1980
By (name) A. Castaneda & J. Pitti
Organization Ch/Latino Cult. Resources Survey
Address 1587 Woodland Avenue, #8
City Palo Alto, CA Zip 94303
Phone (415) 326-7038

Locational sketch map (draw and label site and surrounding streets, roads, and prominent landmarks):

#21 (cont'd) seminar paper in possession of Carlos Cortes, Dept. of History, U.C. Riverside.

SAN BERNARDINO COUNTY MUSEUM
2024 ORANGE TREE LANE
REDLANDS, CA. 92373

HISTORIC SITE SURVEY RECORD

PSE-004952

(1074)

SITE NO. SBr-4952-H

COUNTY San Bernardino

SITE NAME Agua Mansa Chapel

1. USGS QUAD. San Bernardino South (7½') San Bernardino (15)

2. UTM GRID ZONE 11 ; 466640 mE 3766820 mN OK

3. Twp. 1S Range 5W ; SW ¼ of SE ¼ of NE ¼ of SW ¼ of NW ¼ of Sec. 36 (projected) OK

4. Location On the northwest side of Agua Mansa Road, approximately 4/10 mile northeast of Riverside Avenue. Site is on the northwest bank of the Santa Ana River, between the road and an irrigation canal.

5. Area 30 m (E-W) x 30 m (N-S) 6. Contour 880'

7. Owner San Bernardino County Museum Address 2024 Orange Tree Lane Redlands, CA 92373

8. Temporal Period: Circa 1853-1890s Period Mexican Rancho-Early American

9. Activity: Mining ___ Railroad ___ Military ___ Homesteading ___ Exploration/ Traveling ___ Settlement xx Ranching ___ Other xx Explain location of chapel for San Salvador parish and the community of La Placita/Agua Mansa

10. Site Type: Town ___ Camp ___ Homestead ___ Road ___ Trail ___ Mine ___ Railroad ___ Grave Yard ___ Trash Dump ___ Military ___ Other Remains of adobe chapel which measured 50' long x 22' wide (Vickery 1977:73).

11. Previous Site Designation, Published References SBCM-113, La Capilla de San Salvador, Agua Mansa Church. See Defending Eden, by Joyce Carter Vickery, 1977, Riverside Museum Press.

12. Features: Structure xx Dugout ___ Fire Hearth ___ Cairn ___ Rock Alignment ___ Trash Dump ___ Irrigation ___ Trail ___ Road ___ Corral ___ Burial ___ Well ___ Spring ___ R&R Grade (berm) ___ Tram (road/way) ___ Tailings ___ Other ___ Explain Adobe remains of leveled structure-foundations of wall and portions of clay floor have been found, plus various artifacts

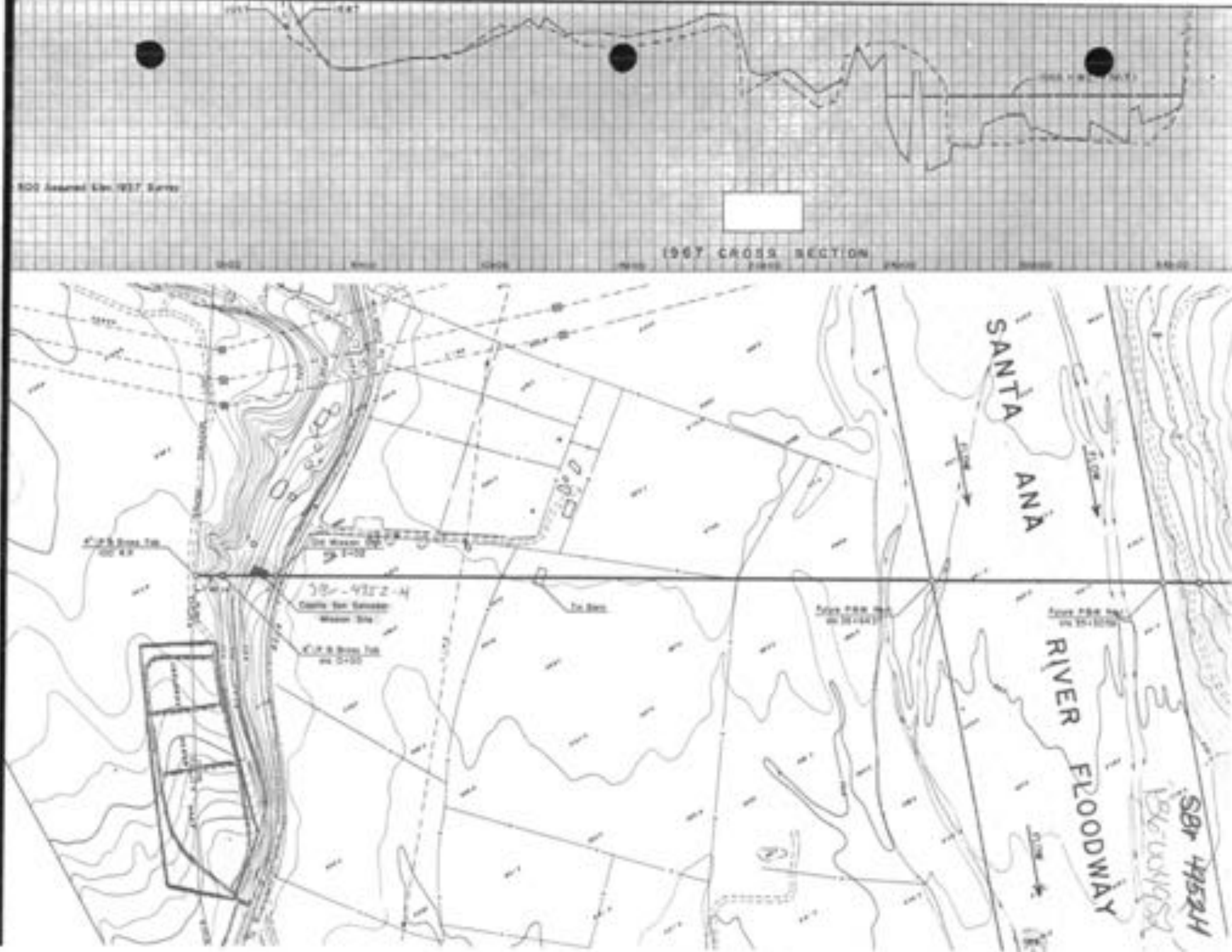
13. Artifacts: Wood (size/type) xx Glass (color) xx Metal (type) xx Bone xx Ceramic (color) xx Adobe (condition) xx Nails (size/type) xx Cans (size/ type) ? Ordnance ___ Other ___ Explain Wood beams, window and bottle glass, various colors; metal can lids, spigot, hinges, etc.; butchered bone from domestic animals (pigs,beef); Chinese ceramics; adobe blocks and melt.

14. Disturbance: Animal ___ Burning ___ Vandalism ___ ORV ___ Other xx Explain Weather has melted adobe walls, now covered with dirt & weeds.

15. Present Condition: Good ___ Fair xx Poor ___ Explain There still seems to be a fair amount of subsurface detail intact-excavations in progress by UCR field class (P. Wilke) Spring of 1978, 1980, 1982, report in preparation.

16. Sketch Map on file at UCR 17. Photos on file at UCR

18. Recorder M. K. Lerch 19. Date 3/28/82


1967 CROSS SECTION
SANTA ANA
RIVER FLOODWAY

SB-4952-H
4952-H
1576
1577
1578
1444
RIVER
SANTA ANA
J U R U P A
La Loma Hills
SAN BERNARDINO CO.
RIVERSIDE CO
JURUPA
Highgrove

Project 89-10.8
P86-004952
CA-SBR-4953H

VIII. RESULTS OF INVESTIGATIONS

The field survey of the project area was completed as of October 4, 1989. The results of the field study are as follows:

1.) No prehistoric resources were recorded during the field survey.

2.) The following project area historic resources were noted:

a.) Three irrigation canals. These are of concrete construction, and are almost certainly related to the agricultural development of the property, and the development of the citrus industry. Two of these canals bisect the central portion of the property. The third is located in the northeastern eastern portion of the property beneath the transmission lines. A date of construction has not been established at the present time, but they do represent component of a major irrigation network. It is, however, unlikely that these canals are associated with the Chinese occupation of the old Agua Mansa Church in the early twentieth century, and that they probably date to the 1930s or early 1940s. See Appendix B for photographs, and Appendix C for preliminary site records.

b.) An historic canal on the west side of Agua Mansa. This canal has already been recorded as historic, and is designated as the West Riverside Canal. This canal is discussed in greater detail in section VII of this report, and further documentation is contained in Appendix A, as provided by the San Bernardino County Archaeological Information Center.

c.) The Agua Mansa Cemetery and Church sites. These two historic sites are outside of the project area boundaries, but they are both immediately adjacent to it. They have both been previously recorded as significant sites, and are owned by the County of San Bernardino. Additional information regarding these sites is contained in Appendix A of this report, and background histories of Agua Mansa and the Agua Mansa Cemetery are contained in sections V and VI of this report.

d.) Quarry and mixing area for adobe used in the construction of the Agua Mansa Church. This site is located on the top of the bluff and to the northeast of the cemetery. It is not known at the present time if this site is within your project area. This site is discussed in section V of this report, and an updated site sketch map is included as Appendix D.

Based upon the results of the field investigation, it would appear that there are no "fatal flaws" in the planning process with regards to cultural resources at this point in time, although it is suggested here that some mitigations measures may be required prior to the implementation of development plans.

Kern-ext 89-10-3
136-0049582
CA-SDM-4952H

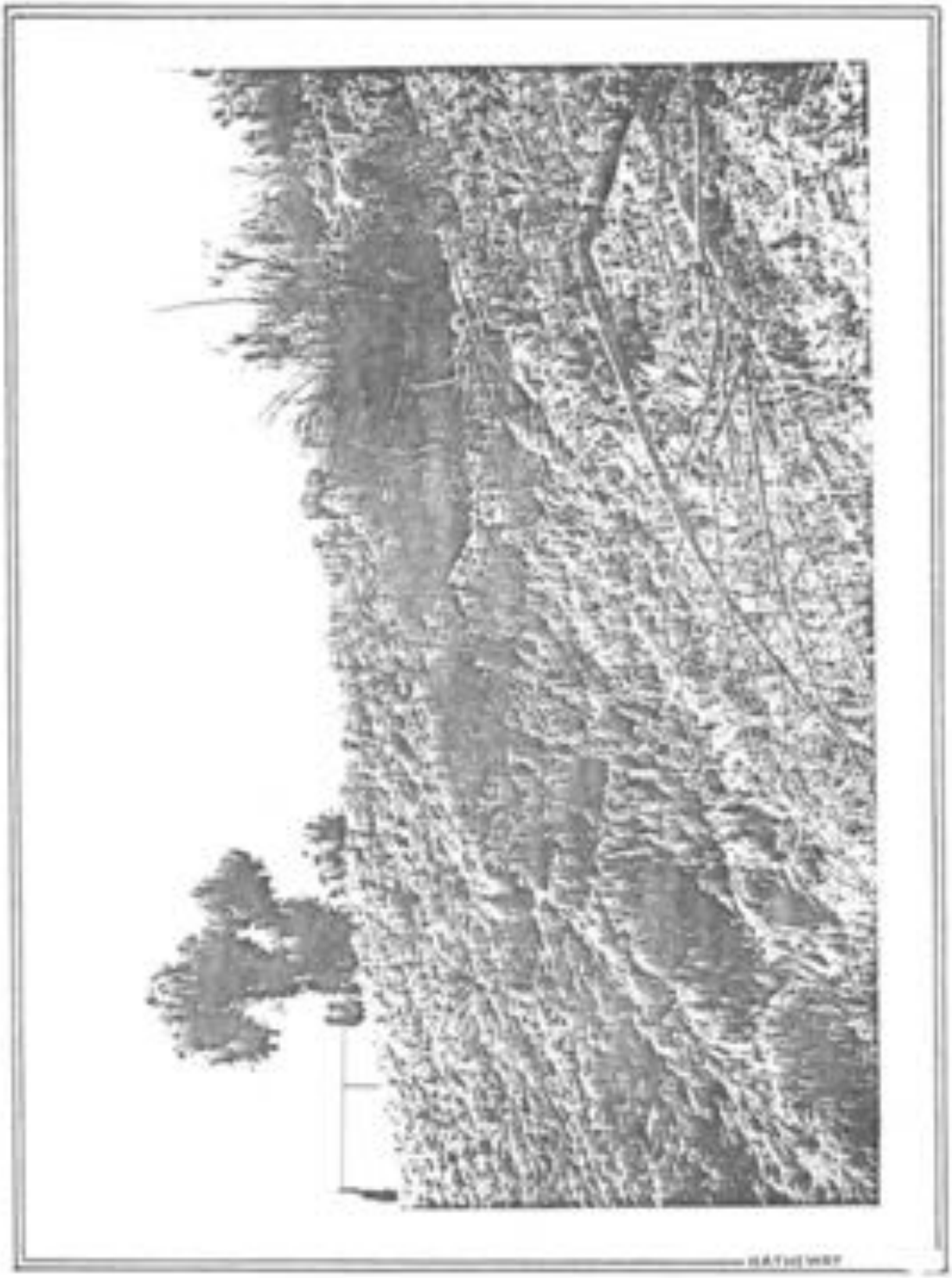
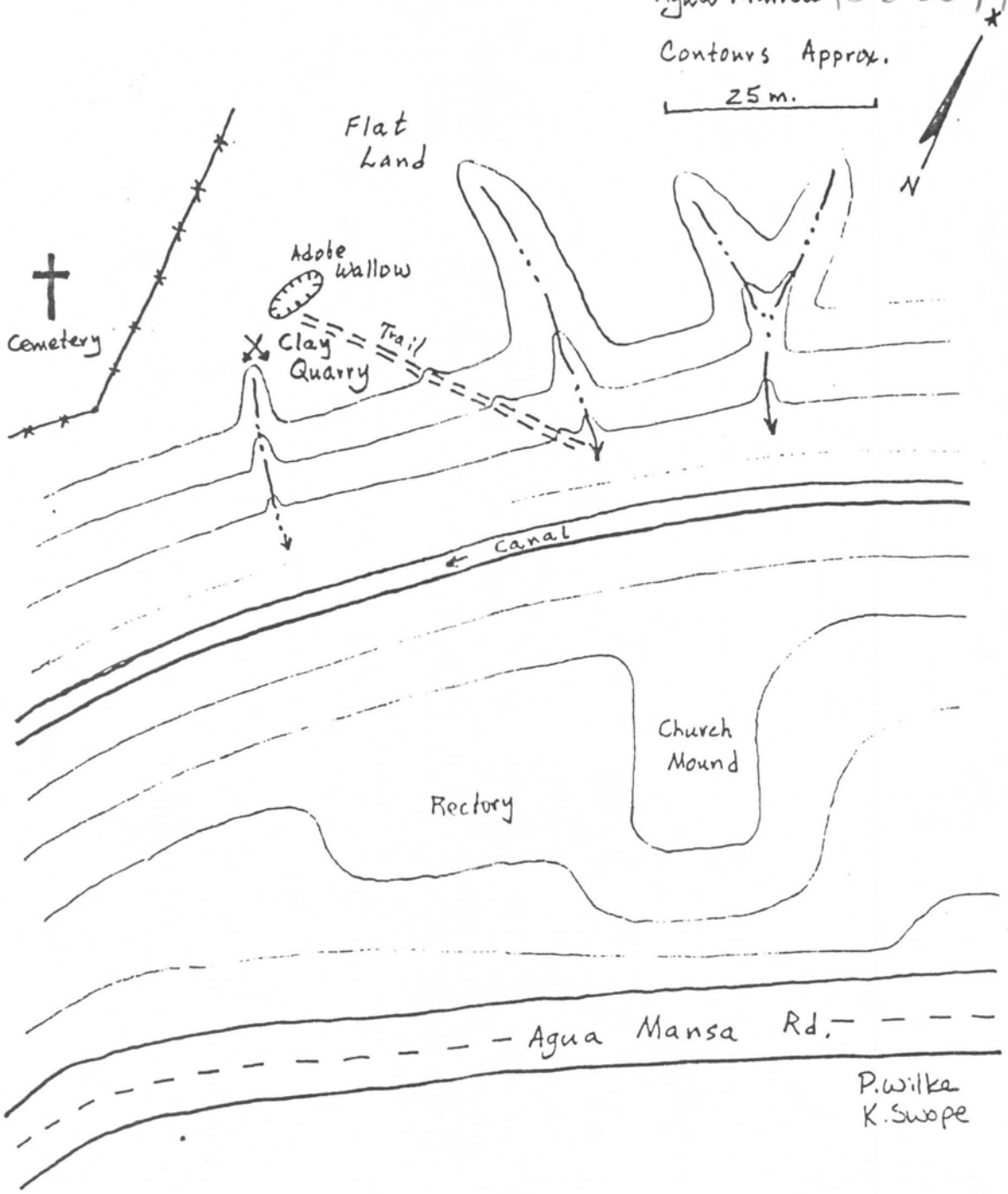


PHOTO 6: CHURCH ADOBE "QUARRY" SITE

REPORT 89-10.8

CA-SBR-4952H

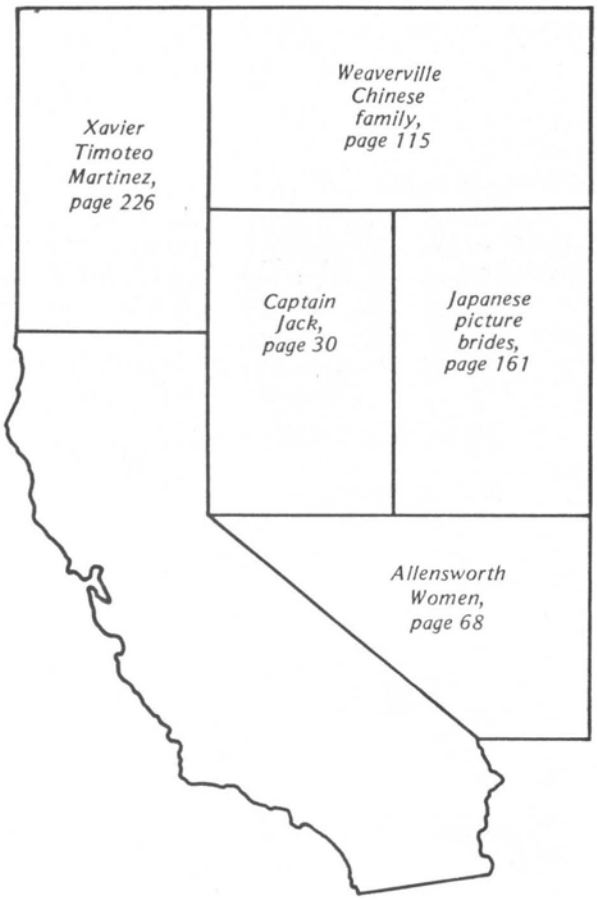
Agua Mansa P36004952



P. Wilka
K. Swope

Set
V-87 1X2 Hub
El 957.20
CEMETERY
AGUA MANSA
AGUA
950
900
850
850

P36-004952



FIVE VIEWS

George Deukmejian
Governor

Gordon Van Vleck
Secretary for Resources

Henry R. Agonia
Director, Dept. of Parks & Recreation

Kathryn Gualtieri
State Historic Preservation Officer

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

Office of Historic Preservation P.O. Box 942896, Sacramento, CA 94296-0001

December 1988

18670049S3

Xavier Timoteo Martinez, page 226

A History of MEXICAN AMERICANS in California

Jose Pitti, Ph.D.
Professor of History and Ethnic Studies
California State University, Sacramento

Antonia Castaneda, Ph.D. Candidate
Stanford University

Carlos Cortes, Ph.D.
Professor of History
University of California, Riverside

1980

Historical Listing

1. **"A History of Our Struggle" Mural,** Los Angeles County
2. **A. Pereira General Store,** Calaveras County
3. **Agua Mansa Cemetery and Church,** San Bernardino County
4. **Aguirre Hotel Site,** San Francisco
* 5. **Anjac Fashion Building,** Los Angeles County
* 6. **Asociacion de Charros Camperos del Valle,** Alameda County
7. **BART Mural,** San Francisco
8. **Broderick/Washington City,** Yolo County
9. **Camarillo Home and Rancho,** Ventura County
* 10. **Casa Blanca School,** Riverside County

11. **Casa de Tableta,** San Mateo County
12. **Central Station,** Los Angeles County
13. **Centro Cultural de la Mision,** San Francisco
* 14. **Cerro Gordo,** Inyo County
15. **Cesar Chavez Family Home,** Kern County
16. **Chavez Ravine,** Los Angeles County
* 17. **Chicano Park, Logan Heights,** San Diego County
18. **Children's Mural,** Los Angeles County
19. **Chili Bar,** El Dorado County
20. **Chualar Railroad Crossing,** Monterey County

* 21. **Cottage Hotel Site,** Ventura County
* 22. **Cuyama District Ranger Station,** Ventura County
23. **Death Valley Junction,** Inyo County
24. **Death Valley Railroad Construction Camp,** Inyo County
25. **Depot,** Butte County
26. **Diaz Lake,** Inyo County
* 27. **Dodson's Rooming House Site,** Sacramento County
28. **Dona Santos,** San Joaquin County
29. **Drytown,** Amador County
30. **Duran's Showboat Bar,** Los Angeles County

*** Sites included in this report**

PSC-4952
SBC-4952-H

Dig at church ruin uncovers artifacts left by Chinese

Chinese farmers probably raised crops in the vicinity of the old Agua Mansa Church after it was abandoned by its Spanish-speaking congregation and replaced by a new church in south Colton.

This is indicated by the finding during a current archeological dig of fragments of Chinese pottery, Chinese fruit jars and bones that had been cut by cleaver.

Philip J. Wilke, head of the UCR Archeological Research Unit and supervisor of the dig, says he suspects that Chinese vegetable gardens were situated on nearby riverbottom land after the church building was abandoned.

The abandonment of the church is believed to be have occurred in 1893, when the it was replaced by a new one in south Colton. The date is based on the findings of the Rev. John Sierra of Banning, who is studying the history of the Catholic churches of the area.

Chinese in the 19th century and early in the 20th were not allowed to own land in the United States, but they operated "China gardens" on leased land, primarily producing vegetables. One such farm was near Riverside's Fairmount Park. Another, operated by a man remembered as Little Joe, was in Rubidoux north of Mission Boulevard. Another, operated by Yee Lung Ching, called Big Charlie, was south of Mission Boulevard. When the Riverside sewage disposal area was located on the west side of the river, before its transriver pipeline was

Out of the County's Past

Tom Patterson

destroyed by the 1938 flood, Virgil Chung grew vegetables there, using the sewer effluent for irrigation.

All these operations were carried on in the early 1900s. Big Charlie and Little Joe gardened on land leased from the Riverside Land & Irrigating Co., a major development firm of early Riverside and West Riverside (now Rubidoux).

In Riverside and many other cities of the United States and Canada, Chinese vegetable peddlers with horse-drawn wagons were traditional. One such peddler in Riverside was Little Joe (probably a different Little Joe), father of George Wong of Riverside Chinatown fame.

The Agua Mansa Church dig is an exercise of a class being taught at two-year intervals by Wilke for the UCR anthropology department. Karen Swope is teaching assistant for the project.

Early phases of the dig unearthed the foundations of the church sanctuary, disclosing a small room, probably a baptistry, attached to the east wall. No Chinese artifacts were found there.

Two years ago, the dig was in the first part of the rectory, attached to the west wall of the church. It disclosed "a few" Chinese artifacts, to which little significance was attached. The current dig is bringing out more fragments, leading Wilke to remark: "It seems to us that Chinese were in the building while it was in ruins."

Presumably, Chinese vegetable farming there was on leased land, as in the later operations nearer Riverside.

The twin villages of La Placita, on the east bank of river, and Agua Mansa (Gentle Water) on the west bank, were founded in 1844 and 1845, respectively, by settlers from New Mexico. They were given the land in exchange for their help in fighting marauding Indians from Utah. The Church of San Salvador was built in 1852 in Agua Mansa to serve both communities and has been informally called the Old Agua Mansa Church.

The great flood of 1862 damaged the community. For that reason, and because of pressure from subsequent surrounding Anglo settlements, the twin communities never fully recovered.

The church bell, which had been cast on the church grounds in 1866, was moved to the new Church of the Holy Rosary on Congress Street in south Colton. That church was destroyed by fire in 1917. As part of the fund-raising effort for a new church, the

Philip Wilke,

bell was sold [illegible] Mission Inn in Riv[illegible] still exists). Th[illegible] church at a new [illegible] K Street, Colton, [illegible] September 1918 [illegible] earlier name o[illegible] (Holy Savior).

The appeara[illegible] Mansa Church ha[illegible] later generations [illegible] drawing appeari[illegible] "Ingersoll's Centu[illegible] Bernardino Coun[illegible] recent years, a [illegible] that drawing has [illegible]

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called the Old Agua
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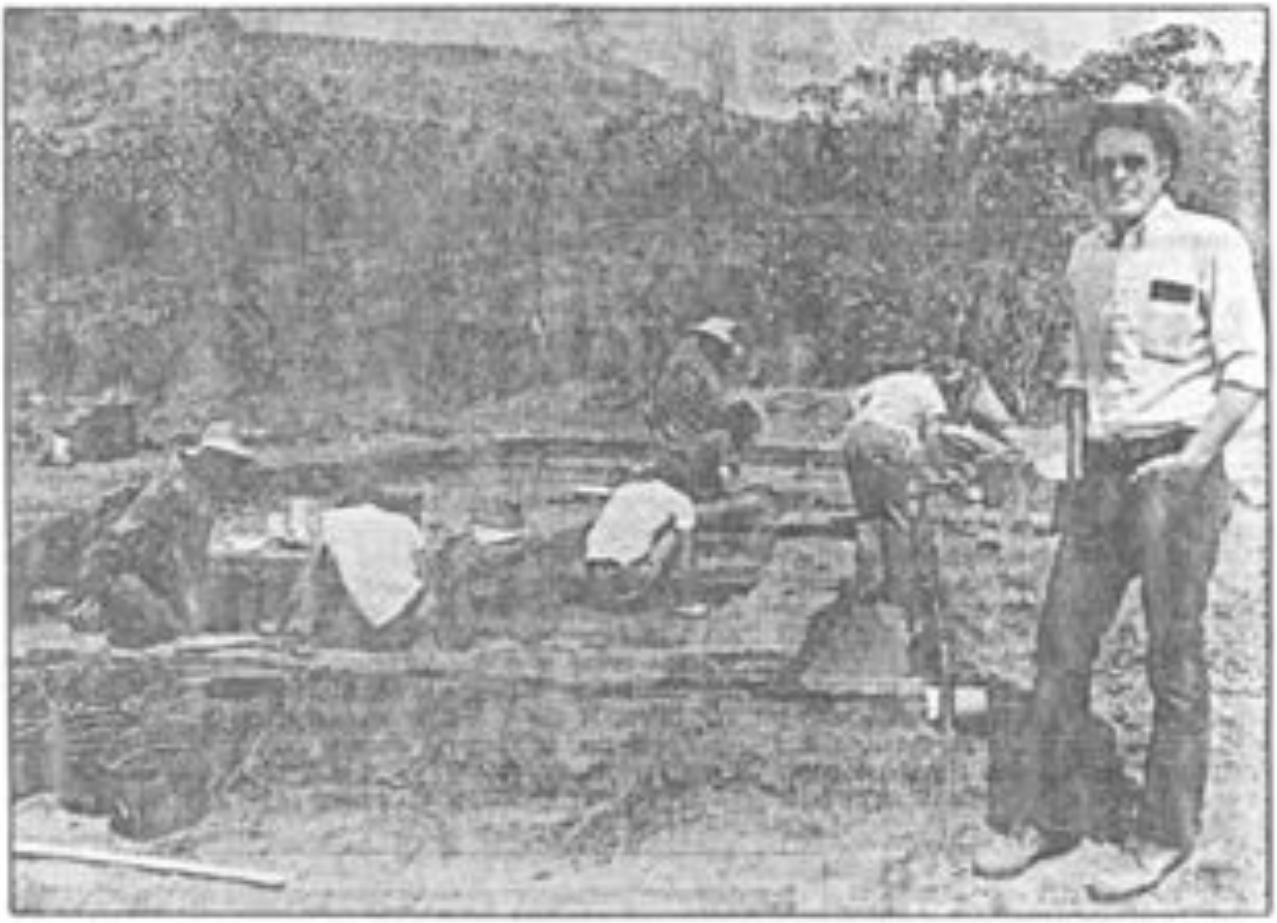
s part of the fund-rais-
for a new church, the



TOM PATTERSON/The Press Enterprise

Philip Wilke, right, of the UCR archeological unit, supervises the Agua Mansa church dig.

bell was sold for $500 to the Mission Inn in Riverside (where it still exists). The replacement church at a new location on West K Street, Colton, was dedicated in September 1918 and given the earlier name of San Salvador (Holy Savior).

The appearance of the Agua Mansa Church has been known to later generations chiefly from a drawing appearing in the 1940 "Ingersoll's Century Annals of San Bernardino County, California." In recent years, a replica based on that drawing has been built on the grounds of the nearby Agua Mansa Cemetery by the San Bernardino County Museum Association.

Archeological and other findings have disclosed minor differences between the drawing and the actual building, including windows and the baptistry addition, not shown in the Ingersoll book drawing.

The first dig at the Agua Mansa site was done by the San Bernardino County Flood Control District in the course of a study of the magnitude of the 1862 flood.

Eyewitnesses wrote that the flood reached the church steps. The steps were located and computations made, which disclosed that the flow exceeded 300,000 cubic feet per second, more than three times the greatest subsequent flow. On this disclosure, vast new flood-control measures have been found necessary. The chief danger is to Orange County, where the river channel has been narrowed by levees and where buildings have been constructed on the flood plain.

CA-SBr-6007-H

ISOLATED ARCHAEOLOGICAL OCCURRENCE

1. Map San Bernardino South 7.5 (1957/73)2. County San Bernardino

3. Twp. 1S Range 5W ; NW ¼ of NW ¼ of SW ¼ of SE ¼ of Sec. 35

4. Location Situated on top of a river terrace, approximately 50 M west of SBr-1576. Bearings: S 60° E to ridge top (1389'), S 10° E to Quarry Peak (1704'). UTMC 11/467208E - 3767560 N. 5. Contour elevation 900'

6. Owner 7. Address N of Agua Mansa Road and canal

8. Present tenant

9. Present land use

10. Description of occurrence Seven sherds of Tizon Brown ware fragments, historic faunal remains (sheep and cattle) with saw cuts, historic glass

11. Area 12. Dimensions

13. Vegetation Russian thistle, sunflower, grasses

14. Nearest water Santa Ana River 15. Distance 1/8 mi. south

16. Soil Light brown sand

17. Previous alteration/disturbance/intrusion A concrete canal runs along the south side and a bulldozer cut runs through the center

18. Possibility of destruction Disturbed and/or destroyed

19. Explanation or Interpretation This deposit may represent all that remains of an historic trash dump although there is no stratigraphic profile evident to illustrate a continuous intensive or intrusive deposit

20. Remarks/suggestions

21. Accession No. No collection 22. Sketch map No

23. Date Sept. 6, 1978 24. Photos No

25. Recorded by John Romani, Alan Corbin

26. Project or report Greenwood & Assoc. for William Gray (SCHIP)

P36006940

10 III

ARCHAEOLOGICAL SITE RECORD

PAGE: 1 OF 6 PERMANENT TRINOMIAL: CA-SBR-6940H
DATE OF ORIGINAL RECORD: N/A TEMPORARY NUMBER: SBS-W #6
DATE OF THIS FORM: 12/18/90 AGENCY DESIGNATION: P1074-124H
1. COUNTY: Riverside San Bernardino
2. USGS QUAD: San Bern. So. 7.5' 1967 REVISED: 1980
3. UTM COORDINATES: ZONE 11 466260m Easting; 3766500 m Northing
4. TOWNSHIP 1S RANGE 5W. not sectioned
BASE MER. SBM
5. MAP COORDINATES: 391 mm S 37 mm E
6. ELEVATION: 900 ft.

7. LOCATION: From interstate 10, take the Riverside Avenue exit and proceed south to Agua Mansa Road. Site is located 20 meters northeast of the intersection of Riverside Avenue and Agua Mansa Road.

8. PREHISTORIC HISTORIC X PROTOHISTORIC

9. SITE DESCRIPTION: Irrigation system comprised of an east/west running concrete/mortar lined canal (Feature A: West Riverside Canal); isolated cement standpipes to the west (Feature B); a north/south running cement lined flume with cement standpipes (Feature C), and a concentration of standpipe fragments, barbed wire, wooden beams and associated trash (Feature D).

10. AREA: unknown m (length) x m (width): N/A m^2
Method:

11. DEPTH: surface METHOD: N/A

12. FEATURES: Cement standpipes have flow regulators. Standpipes vary in diameter (45, 36, and 23 cm.) and construction techniques. The standpipes and flume of Feature C run north and upslope to (X)

13. ARTIFACTS: None

14. NON-ARTIFACTUAL CONSTITUENTS: None observed.

15. DATE OF ORIGINAL RECORD: N/A DATE OF THIS FORM: 12/18/90

16. RECORDED BY: James J. Schmidt, Kathy VanderVeen, James Kenney, and Lisa LeCount

17. AFFILIATION: Greenwood and Associates, 725 Jacon Way,
725 Jacon Way, Pacific Palisades, CA 90272
(213) 454-3091

P36006940

ARCHAEOLOGICAL SITE RECORD

PAGE:2 OF 6 PERMANENT TRINOMIAL: SBr-6940H
DATE OF ORIGINAL RECORD: N/A TEMPORARY NUMBER: SBS-W #6
DATE OF THIS FORM: 12/18/90 AGENCY DESIGNATION: P1074-124H

18. HUMAN REMAINS: None observed.

19. SITE INTEGRITY: Good. Well preserved, extensive irrigation system.

20. NEAREST WATER:

21. VEGETATION COMMUNITY (SITE VICINITY): Ruderal.

22. VEGETATION COMMUNITY (ON SITE): Same.

REFERENCES FOR ABOVE: N/A

23. SITE SOIL: Coarse brown sand.

24. SURROUNDING SOIL: Same as 23

25. GEOLOGY: Granite gravels.

26. LANDFORM: Riverine terrace.

27. SLOPE: 0-5 degrees south 28. EXPOSURE: Open

29. LANDOWNERS(S), (TENANTS), ADDRESS: Unknown.

30. REMARKS:

32. REFERENCES:

33. NAME OF PROJECT: Metropolitan Water District Inland Feeder Project Cultural Resource Investigation.

34. TYPE OF INVESTIGATION: Preliminary surface reconnaissance

35. SITE ACCESSION NO.: CURATED AT:

36. PHOTOS: Overviews, B & W prints. TAKEN BY: James Schmidt

37. PHOTO ACCESSION NO. N/A ON FILE AT: Greenwood and Associates

P36-006940

ARCHAEOLOGICAL SITE LOCATION MAP

PAGE:3 OF 6
DATE OF ORIGINAL RECORD:
DATE OF THIS FORM: 12/18/90
U.S.G.S. 7.5' QUADRANGLE: San Bernardino South

PERMANENT TRINOMIAL: 36-006940
TEMPORARY NUMBER: SBS-W #6
AGENCY DESIGNATION: P1074-124H

P36-006940

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

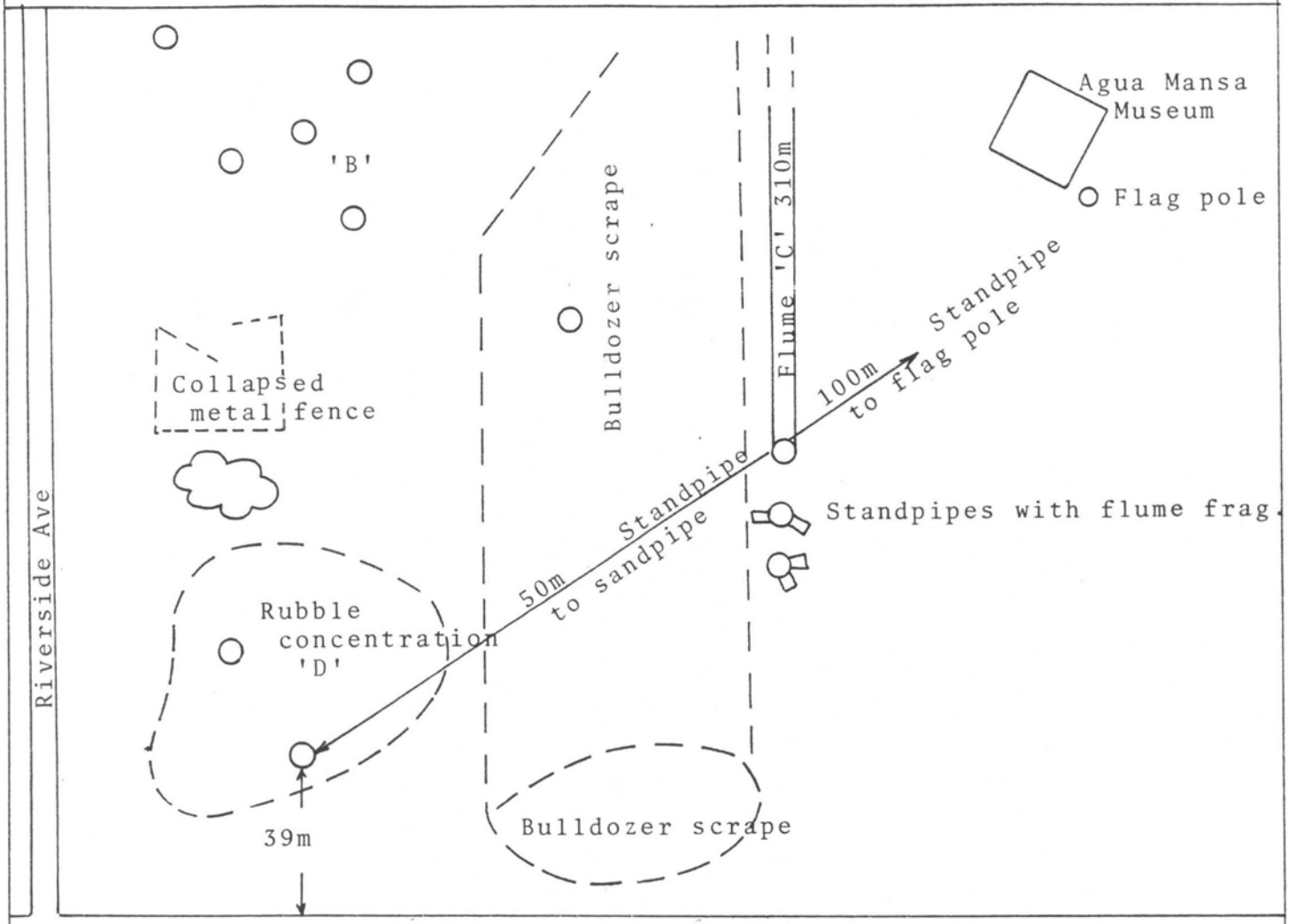
ARCHEOLOGICAL SITE MAP

Page 4 of 6 .

Permanent Trinomial: SBR-6940H / 12 (mo.) 90 (yr.)

Temporary Number: SBS-W #6

Agency Designation: P1074-124H



Legend

○ Cement standpipes

N

Area of impact
Letters correspond to site description

Not to scale

DPR 422F (Rev. 8/82)

P36-006940

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

ARCHEOLOGICAL SITE RECORD
Continuation Sheet

Page 5 of 6 .

Permanent Trinomial: SBR-6940H / 12 (mo.) 90 (yr.)

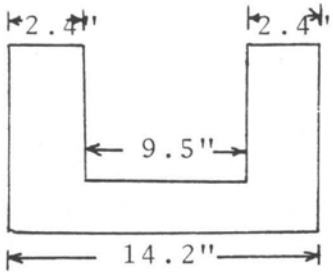
Temporary Number: SBS - W#6

Agency Designation:

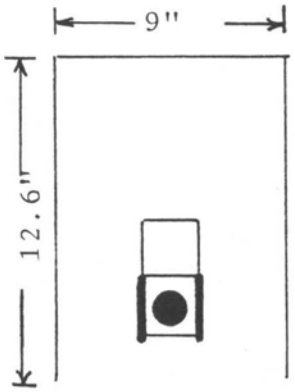
Item No.	Continuation

Feature "C"

1. Flume



2. Standpipe



Water outlet with sliding door

Not to scale

P36-006940

ARCHAEOLOGICAL SITE RECORD - CONTINUATION

PAGE: 6 OF 6 PERMANENT TRINOMIAL: SBR-6940H

DATE OF ORIGINAL RECORD: TEMPORARY NUMBER: SBS-W #6

DATE OF THIS FORM: 12/18/90 AGENCY DESIGNATION:

CONTINUATION

ITEM NO.

(12.) an extensive network of standpipes. The poorly preserved, cement lined flume runs 310 meters northwest to the top of a ridge to a gate (composed of a large threaded screw) which controls water flowing into the flume. The flume contains flow regulators identical to those found on the standpipes (see profiles).

The east/west canal (Feature A) is well preserved. This cement lined canal parallels Agua Mansa Road.

Standpipes: The smallest are those associated with the flume. They appear to be poorly shaped, possibly formed in place.

Larger standpipes were manufactured to a standardized size and form.

State of California -- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

HISTORIC RESOURCES INVENTORY

Ser. No. ____

HABS ____ HAER ____ Loc ____ SHL No ____ NR Status ____

UTM: A ____ C ____

B ____ D ____

IDENTIFICATION

1. Common name: Agricultural Irrigation Canals
2. Historic name: ____
3. Street or rural address: North of Agua Mansa Road--West of Riverside Ave

   City N/A Zip N/A County San Bernardino
4. Parcel number: N/A
5. Present Owner: CalMat Address: N/A

   City N/A Zip N/A Ownership is: Public ____ Private X
6. Present Use: Vacant Land Original use: Citrus Grove

DESCRIPTION

7a. Architectural style: N/A

7b. Briefly describe the present physical appearance of the site or structure and describe any major alterations from its original condition:

Three irrigation canals are located within the proposed project area. Canal #1 extends from the southwest corner of the property, near the northwest corner of the cemetery, to a point in the north central portion of the project area. Canal #2 extends from the approximate middle of the project area to a point beneath the power lines in the northeast portion of the property. Canal #3 is located beneath the power lines in the central portion of the eastern boundary of the project area. The canals are of open-box concrete construction, measuring approximately 15 inches in width by 8 inches in depth. A portion of canal #2 is built of brick (distribution station), and portions of the canal have been laid with metal pipe.

Attach Photo Envelope Here

PLEASE SEE ATTACHED PHOTOS

8. Construction date: Estimated 1940 Factual ____
9. Architect None
10. Builder Unknown
11. Approx. property size (in feet) Frontage ____ Depth ____ or approx. acreage 90
12. Date(s) of enclosed photograph(s) October 1989

P36 000490
<538-6940 H

13. Condition: Excellent ___ Good ___ Fair ___ Deteriorated X ___ No longer in existence ___

14. Alterations: Deterioration of system

15. Surroundings: (Check more than one if necessary) Open land X Scattered buildings ___ Densely built up ___
Residential ___ Industrial ___ Commercial ___ Other: Agua Mansa Cemetery

16. Threats to site: None known ___ Private development X ___ Zoning ___ Vandalism ___
Public Works project ___ Other: ___

17. Is the structure: On its original site? X ___ Moved? ___ Unknown? ___

18. Related features: Three canals and distribution system

SIGNIFICANCE

19. Briefly state historical and/or architectural importance (include dates, events, and persons associated with the site.)

The canals are clearly associated with the agricultural development of the property, and most probably with the development of the citrus industry. A date of construction has not yet been determined, but they were likely constructed during the period extending from the mid-1930s to the mid-1940s. Earlier use of this property for irrigation purposes has been noted as having been associated with the post-1900 use of the Agua Mansa Church site by Chinese laborers. It is unlikely that these canals are associated with this period of development as they represent a relatively substantial capital investment. They are, however, a part of a once large irrigation network, and would appear to have the potential to yield information regarding the development of such systems.

20. Main theme of the historic resource: (If more than one is checked, number in order of importance.)
Architecture ___ Arts & Leisure ___
Economic/Industrial X Exploration/Settlement ___
Government ___ Military ___
Religion ___ Social/Education ___

21. Sources (List books, documents, surveys, personal interviews and their dates).

See Bibliography of this report.

22. Date form prepared October 1989
By (name) Roger G. Hatheway
Organization Hatheway & Associates
Address: 23301-A La Glorieta
City Mission Viejo Zip 92691
Phone: (714) 458-1245

Locational sketch map (draw and label site and surrounding streets, roads, and prominent landmarks):

NORTH

SEE ATTACHED MAPS

SANTA ANA AVE
Agua Mansa Rest Area
Agua Mansa Cem
Well
Sewage Disposal
Cement Plant
San Salvador
RIVERSIDE
SAN BERNARDINO CO
RIVERSIDE CO
SANTA ANA RIVER
SOUTHERN PACIFIC

SSE-6940
P36006940

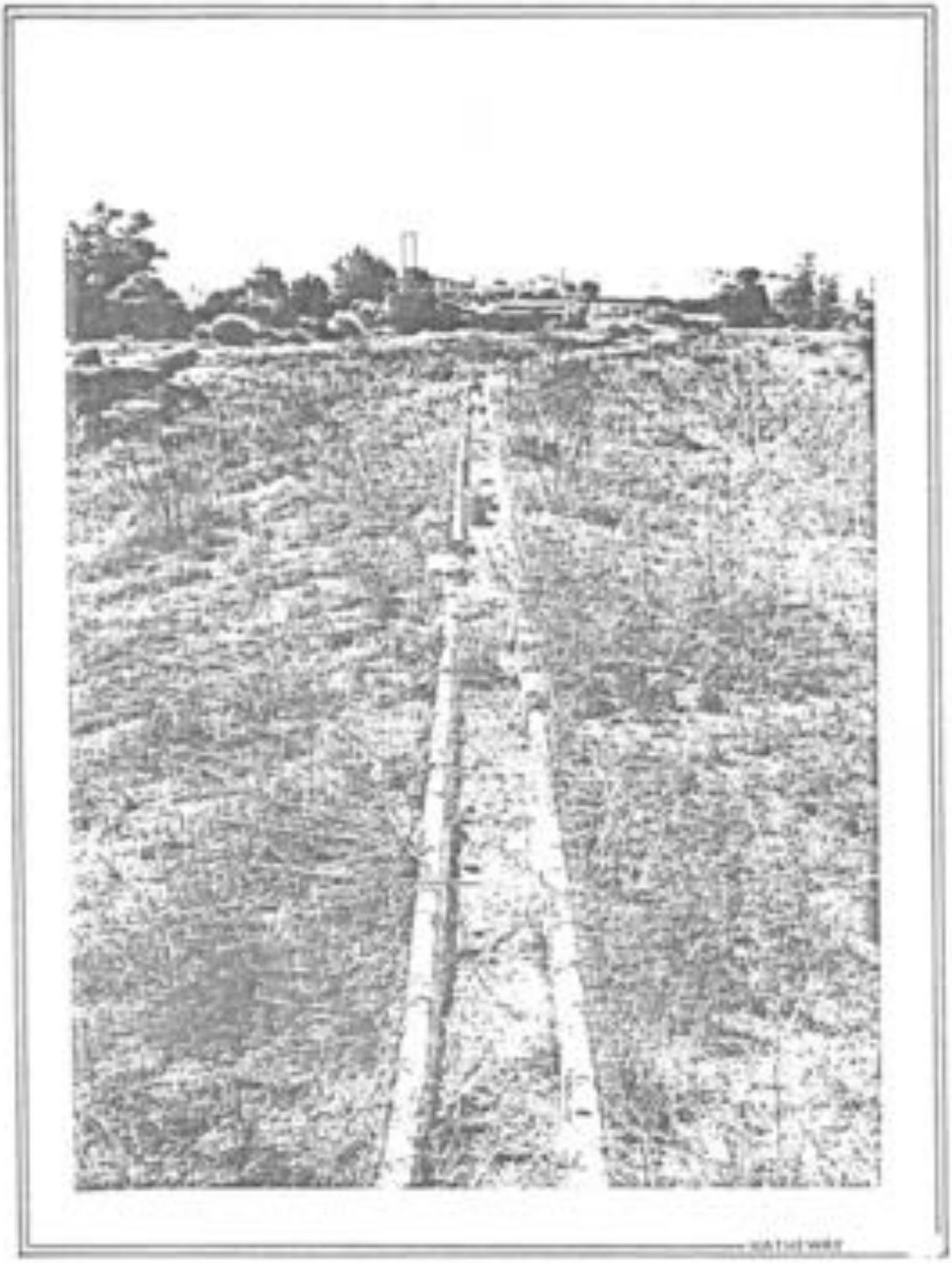


PHOTO 1: PROJECT AREA IRRIGATION CANAL #1

SRC-69401
P36006940

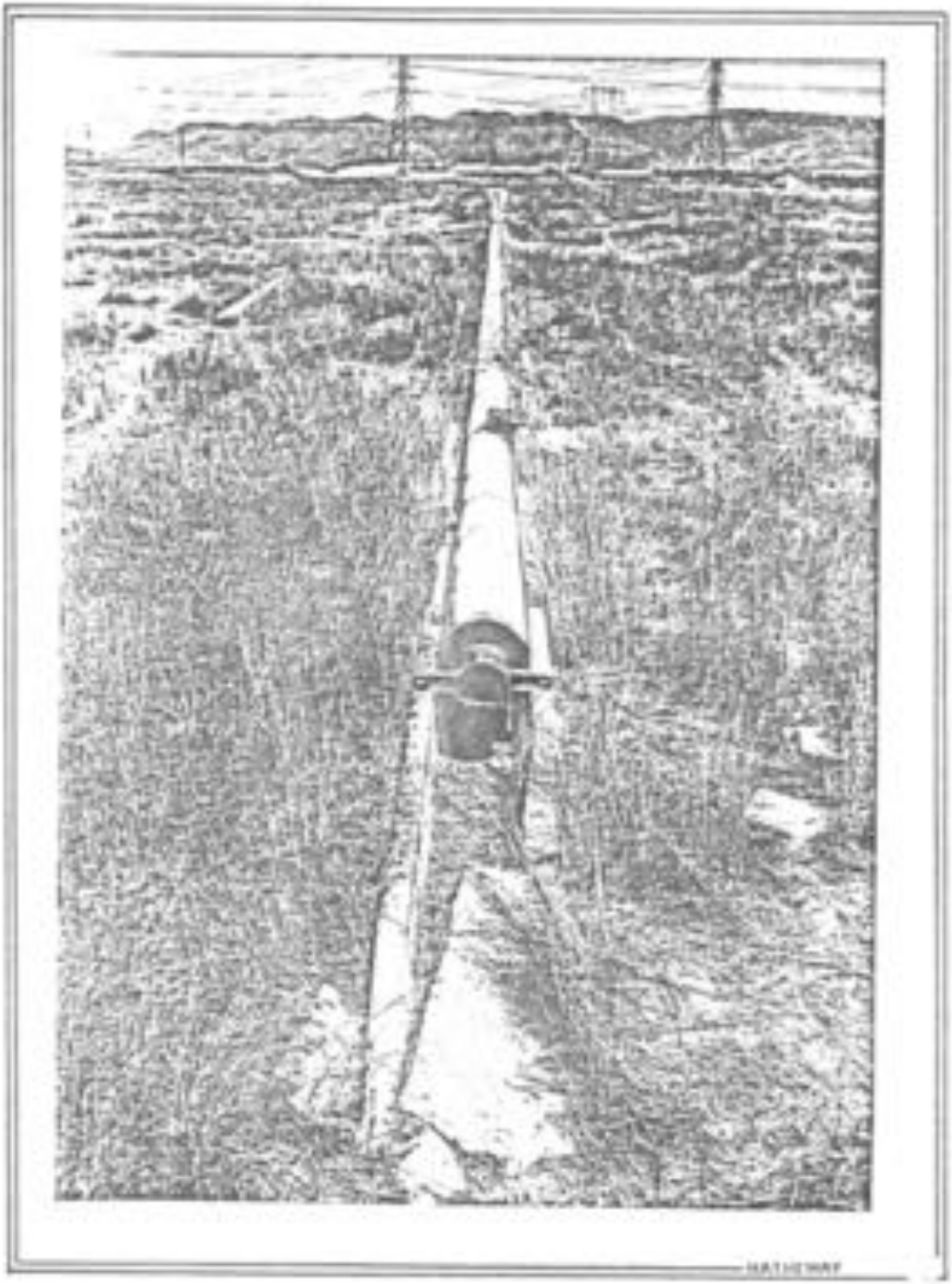


PHOTO 2: PROJECT AREA IRRIGATION CANAL #2

PB6-006904
SSC-6940A

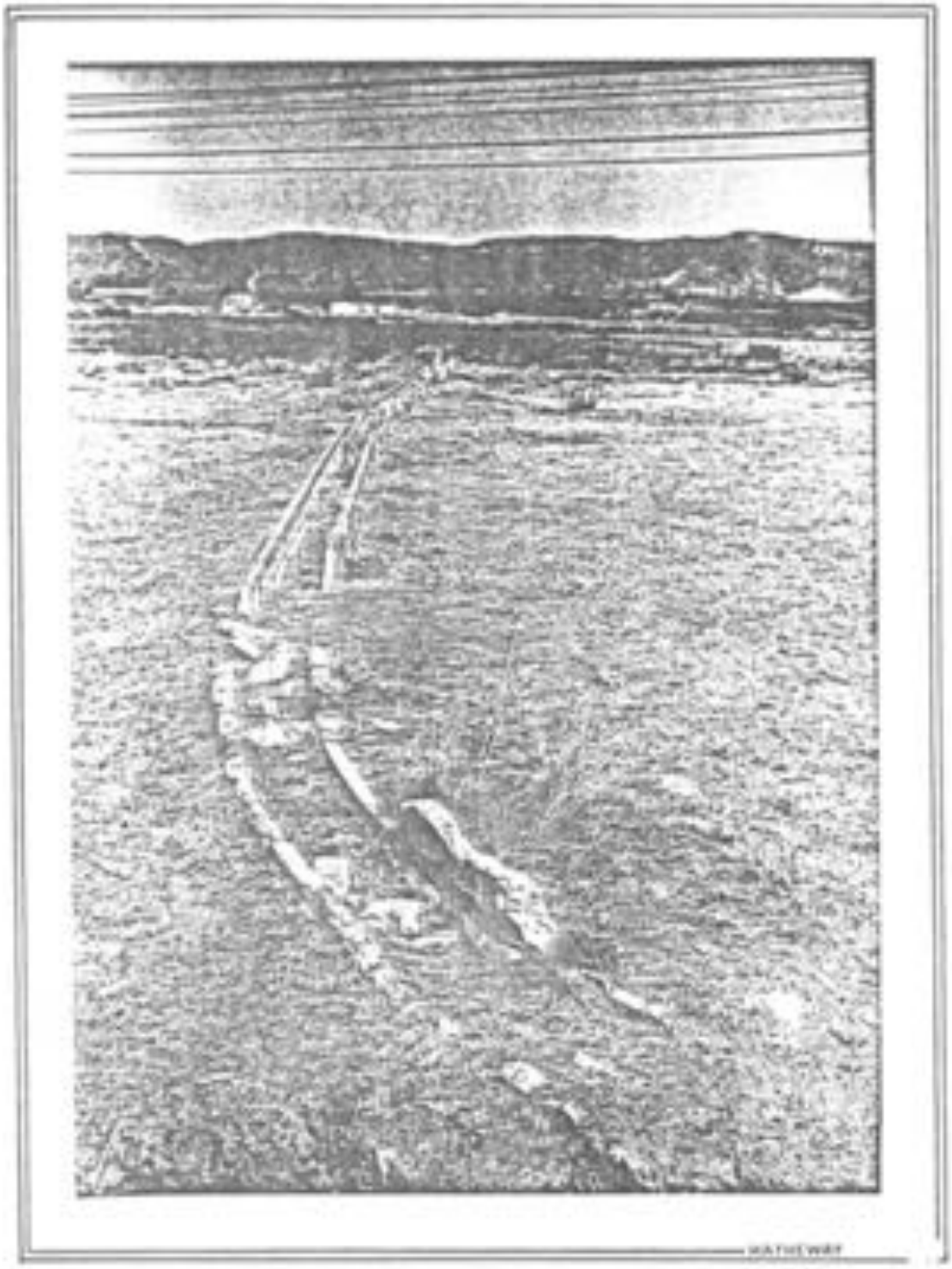


PHOTO 3: PROJECT AREA IRRIGATION CANAL #5

P36-006940

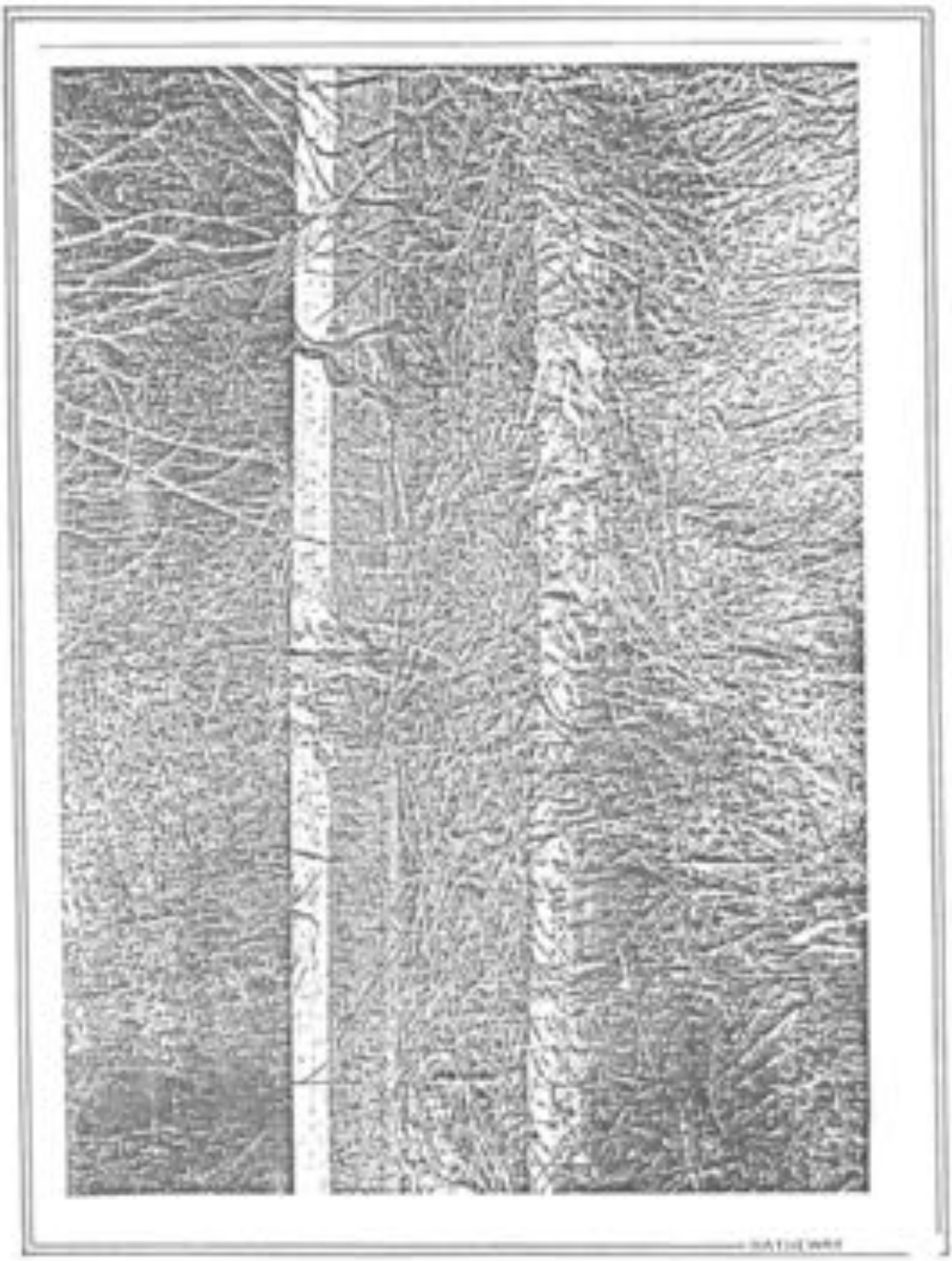


PHOTO 4: PROJECT AREA CANAL--DETAIL OF CONSTRUCTION

Report 89-18.B
P36-006940
CRR-6490H

VIII. RESULTS OF INVESTIGATIONS

The field survey of the project area was completed as of October 4, 1989. The results of the field study are as follows:

1.) No prehistoric resources were recorded during the field survey.

2.) The following project area historic resources were noted:

a.) Three irrigation canals. These are of concrete construction, and are almost certainly related to the agricultural development of the property, and the development of the citrus industry. Two of these canals bisect the central portion of the property. The third is located in the northeastern eastern portion of the property beneath the transmission lines. A date of construction has not been established at the present time, but they do represent component of a major irrigation network. It is, however, unlikely that these canals are associated with the Chinese occupation of the old Agua Mansa Church in the early twentieth century, and that they probably date to the 1930s or early 1940s. See Appendix B for photographs, and Appendix C for preliminary site records.

b.) An historic canal on the west side of Agua Mansa. This canal has already been recorded as historic, and is designated as the West Riverside Canal. This canal is discussed in greater detail in section VII of this report, and further documentation is contained in Appendix A, as provided by the San Bernardino County Archaeological Information Center.

c.) The Agua Mansa Cemetery and Church sites. These two historic sites are outside of the project area boundaries, but they are both immediately adjacent to it. They have both been previously recorded as significant sites, and are owned by the County of San Bernardino. Additional information regarding these sites is contained in Appendix A of this report, and background histories of Agua Mansa and the Agua Mansa Cemetery are contained in sections V and Vi of this report.

d.) Quarry and mixing area for adobe used in the construction of the Agua Mansa Church. This site is located on the top of the bluff and to the northeast of the cemetery. It is not known at the present time if this site is within your project area. This site is discussed in section V of this report, and an updated site sketch map is included as Appendix D.

Based upon the results of the field investigation, it would appear that there are no "fatal flaws" in the planning process with regards to cultural resources at this point in time, although it is suggested here that some mitigations measures may be required prior to the implementation of development plans.

P36-007172

ARCHAEOLOGICAL SITE RECORD

PAGE: 1 OF 8

PERMANENT TRINOMIAL: CA-SBr-7172H/CA-RIV-4771-H
OTHER DESIGNATIONS: P1074-115H/P1074-116H/MPA-48/
Riverside Lower Canal
Riverside Press #7772

1. COUNTY: Riverside/San Bernardino
2. USGS QUADRANGLES: San Bernardino, South 7.5 minute (1967;Photorevised-1980); Riverside West, 7.5 minute (1967;Photorevised-1980); Riverside East, 7.5 minute (1967;Photorevised-1980); Corona North, 7.5 minute (1967;Photorevised-1980; Corona South, 7.5 minute (1967;Photorevised-1980).

3. UTM COORDINATES: Zone 11: 466010m-3767200m EASTING/NORTHING (northern terminus); 451610m-3747410m EASTING/NORTHING (southern terminus).

4. TOWNSHIP: 2S; RANGE: 4W; SECTIONS: Unsectioned portions of Rancho Jurupa; TOWNSHIP: 1S; RANGES: 4W/5W; SECTIONS: Unsectioned portions of Rancho Jurupa; TOWNSHIP: 2S; RANGE: 5W; SECTIONS: 33, 34; TOWNSHIP: 3S; RANGE 5W; SECTIONS: 4, 5, 7, 8, 10, 15; TOWNSHIP: 3S; RANGE: 6W; SECTIONS: Unsectioned portions of Rancho El Sobrante de San Jacinto. BASE MERIDIAN: San Bernardino.

5. MAP COORDINATES: 214mm NORTH 109mm EAST [northern terminus] (SW corner).
35mm SOUTH 91mm WEST [southern terminus] (NE corner).

6. ELEVATION: 670 feet (northern terminus); 720 feet (southern terminus).

7. LOCATION: The northern terminus of the Riverside Lower Canal is located along the base of the La Loma Hills on the south side of the Santa Ana River. The canal travels approximately 17.8 miles northeast-southwest to its southern terminus at Temescal Canyon, east of Magnolia Avenue in Home Gardens. The Upper and Lower canals joined at Hughes Alley approximately 5.2 miles northeast of the Temescal Canyon terminus.

8. PREHISTORIC ____ ; HISTORIC X ; PROTOHISTORIC ____ ; ETHNOGRAPHIC ____

9. SITE DESCRIPTION: Construction of an Upper and Lower Canal systems occurred from 1870 to 1877. The headworks for the canal was located on the south side of the Santa Ana River, about a half a mile downstream from the present Atchison, Topeka and Santa Fe railroad bridge, near the base of the La Loma Hills. The canal passed through La Placita, High Grove and Riverside, Arlington Heights and Home Gardens. The section of the canal in La Loma Hills, from the Santa Ana River to Spring Street was abandoned around 1894 where remnants still remain. Portions of the Lower Canal were used (and are still used) as a flood control channel after its abandonment as an irrigation canal in 1913.

10. AREA: 28,455 meters in length (93,900 feet = 17.8 miles).
METHOD OF DETERMINATION: Historic maps; research

11. DEPTH OF DEPOSIT: The open canal was approximately 91 cm. (3 feet) to 122 cm. (4 feet) below ground surface. Underground pipes, conduits and other related features exist along its route. METHOD OF DETERMINATION: Historical research.

12. FEATURES: Earthen and cement-lined canal with headgates; levees; flume remains; canal intakes; gate controls; intakes; siphons and conduits.

13. ARTIFACTS: See feature description.
14. NON-ARTIFACTUAL CONSTITUENTS AND FAUNAL REMAINS: None observed.
15. DATE RECORDED: 6-11-92 16. RECORDED BY: Robert Wlodarski

P36-001176

ARCHAEOLOGICAL SITE RECORD

PAGE: 2 OF 8

PERMANENT TRINOMIAL: CA-SBr-7173H/CA-RIV-4791-H
OTHER DESIGNATIONS: P1074-113H/P1074-116H/MFA-4H/
Riverside Lower Canal

17. AFFILIATION: Historical, Environmental, Archaeological, Research, Team, 5316 Las Virgenes Road, Calabasas, California 91302-1089, (818) 880-6330

18. HUMAN REMAINS: None observed

19. INTEGRITY OF SITE/SITE DISTURBANCES: Poor to Good. Although portions of the canal route have been abandoned, other parts exist as either structural remains (La Loma Hills); partially buried or covered sections; or, as an open canal now used for flood control purposes (Jefferson Street to Temescal Canyon.)

20. NEAREST WATER: Type: Temescal Canyon at the southern terminus and the Santa Ana River at the northern terminus.

21. VEGETATION COMMUNITY (site vicinity): Non-native plants/agricultural crops.
22. VEGETATION COMMUNITY (on-site): Non-native plants/agricultural crops.

23. SITE SOIL: Alluvial fan and terrace deposits; alluvial adobe; gray clay; marly earth; and heavy red mesa soil.
24. SURROUNDING SOIL: Alluvial fan and terrace deposits and gravels.

25. GEOLOGY: Recent alluvium/Pleistocene Non-marine Sedimentary Deposits/Mesozoic Granitic Rocks.

26. LANDFORM: Santa Ana river; floodplain; alluvial fan and terrace.

27. SLOPE: Less than 10 percent. 28. EXPOSURE: Total.

29. LANDOWNER/TENANT (Address): City of Riverside Public Utilities Department, 3900 Main Street, Riverside, California 92522.

30. REMARKS: The construction of the Upper and Lower Riverside canals allowed Riverside to grow and flourish. Without water, there was nothing but dry, arid, undeveloped land which could not sustain a large settlement. The canal system still appears to possess integrity of location, design, setting, workmanship, feeling and association that have made a significant contribution to local and regional history.

31. REFERENCES: San Bernardino and Riverside 15 min. USGS (1901 editions); Scott (1976) Development of Water Facilities in the Santa Ana River Basin, California; Tom Patterson, "Cracking the case of the egg-shaped cross section [The Press Enterprise, Sunday, October 27, 1991]; [n.d.] Map of the Upper and Lower Riverside Canals [City of Riverside Public Utilities Department-Ken Anderson].

32. NAME OF PROJECT: An Archaeological Survey Report (ASR) Documenting the Effects of Widening Interstate 215 (I-215) From the Route 60/I-215 Interchange in Moreno Valley, Riverside County, to Orange Show Road in the City of San Bernardino, San Bernardino County, California.

33. TYPE OF INVESTIGATION: Phase I Archaeological Study.
34. SITE ACCESSION NUMBER: None. CURATED AT: None.
35. PHOTOGRAPHS: None TAKEN BY: N/A

P50L0112

LOCATION OF THE
FUNNELING LOWER CANAL

State of California - The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

ARCHAEOLOGICAL SITE RECORD
Continuation Sheet

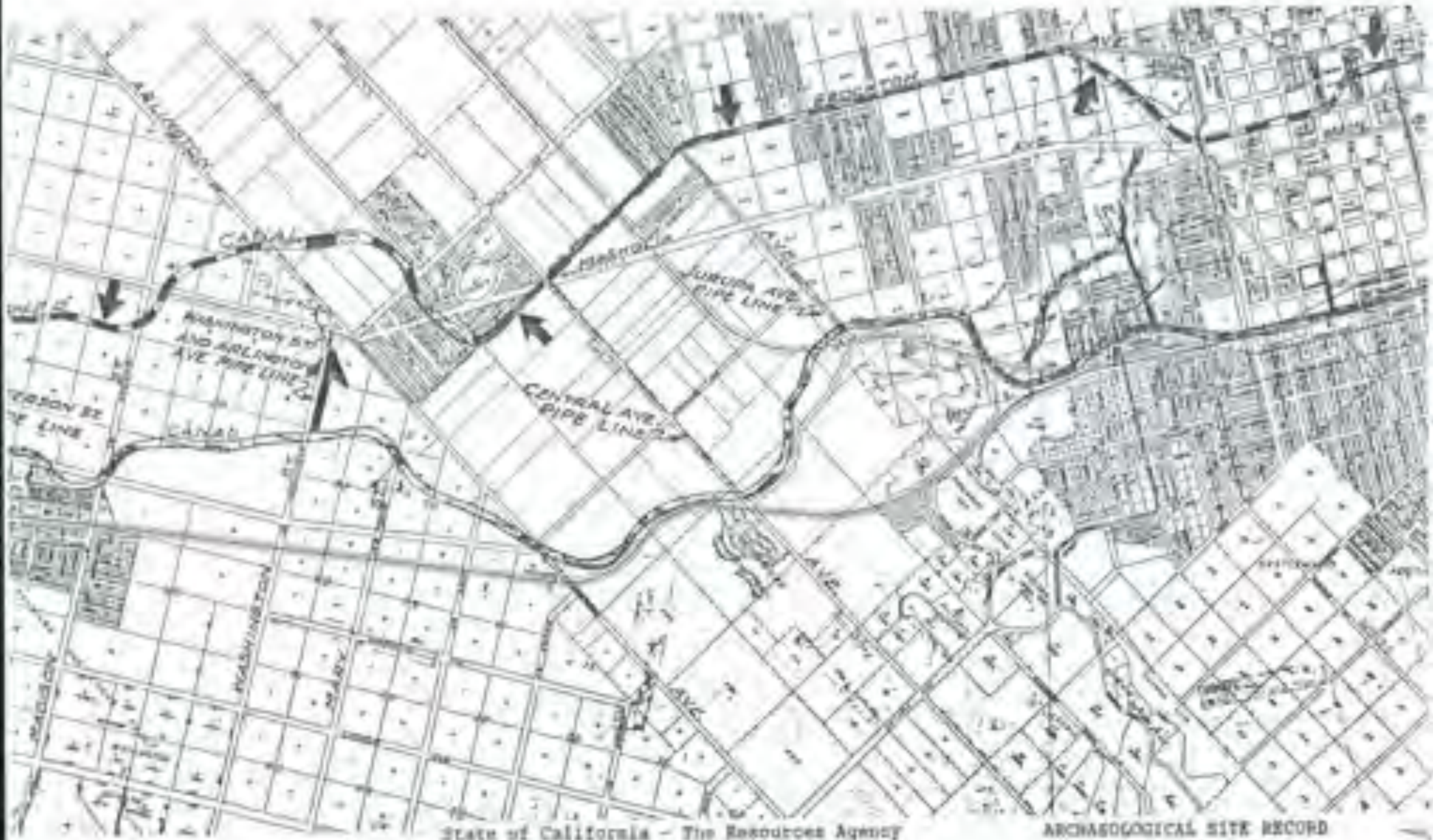
PAGE 2 OF 2

PRIMARY NUMBER: CA-SBR-7172/H
TRINOMIAL NUMBER: 33-000172

State of California - The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

ARCHAEOLOGICAL SITE RECORD
Continuation Sheet

PERMANENT TRINOMIAL: CA-SBr-7173H/CA-Riv-4731-H
OTHER DESIGNATIONS: P1074-115H/P1074-116H/MFA-4R/
Riverside Lower Canal



State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

ARCHAEOLOGICAL SITE RECORD
Continuation Sheet

PAGE: 6 OF 8

PERMANENT TRINOMIAL: CA-SBr-7173H/CA-Riv-4791-H
OTHER DESIGNATIONS: P1074-113H/P1074-113R/HEA-8H/
Riverside Lower Canal

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

ARCHAEOLOGICAL SITE RECORD
Continuation Sheet

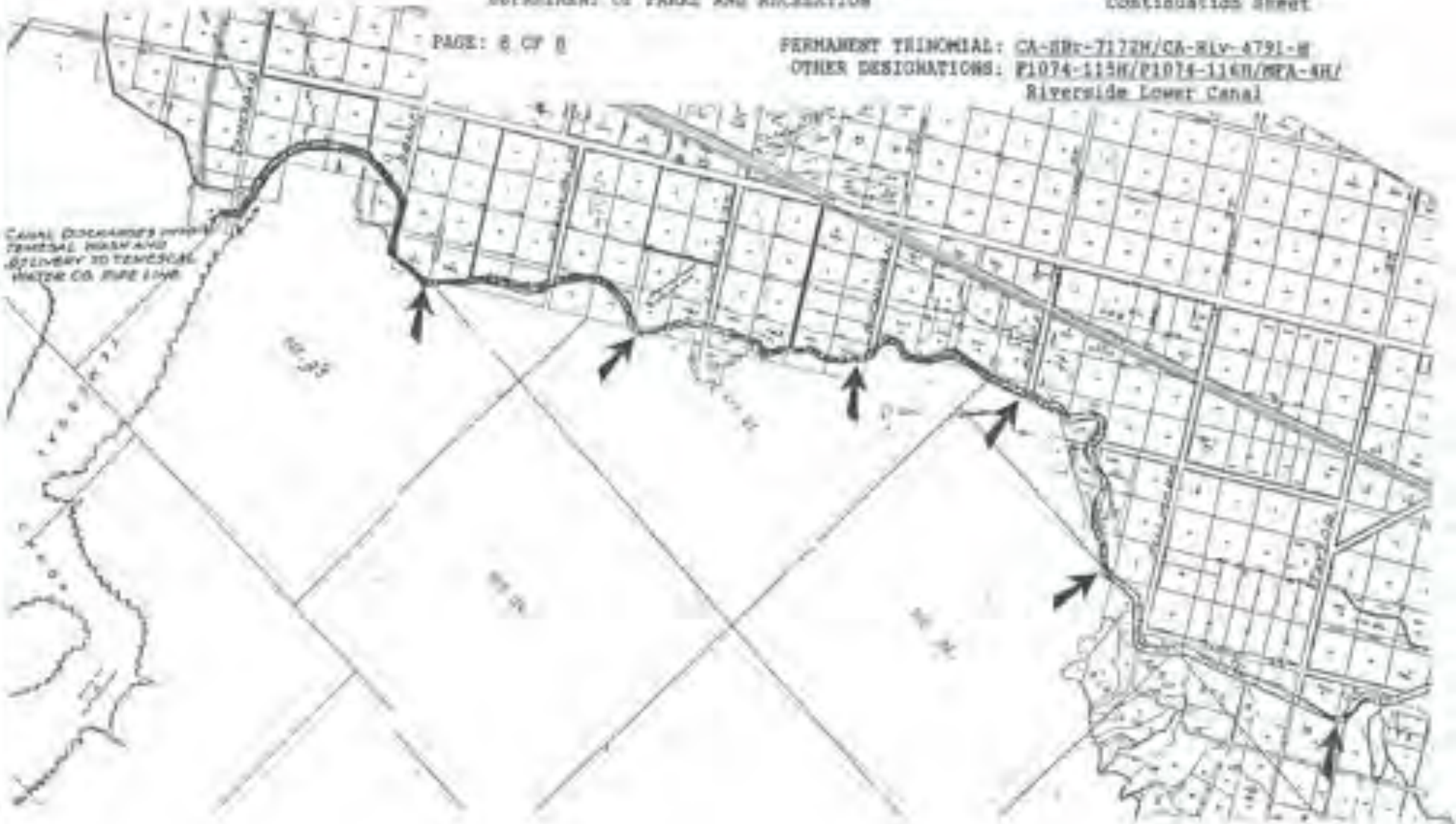
PERMANENT TRINOMIAL: CA-SBr-7172H/CA-Riv-4731-H
OTHER DESIGNATIONS: P1074-113H/P1074-116H/RHA-4H/
Riverside Lower Canal

State of California - The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

ARCHAEOLOGICAL SITE RECORD
Continuation Sheet

PAGE: 8 OF 8

PERMANENT TRINOMIAL: CA-SBr-7172H/CA-Riv-4791-H
OTHER DESIGNATIONS: P1074-115H/P1074-116H/MEA-4H/
Riverside Lower Canal



State of California
DEPARTMENT F PARKS AND RECREATION
PRIMARY RECORD

Primary # [illegible]
HRI # _____
Trinomial _____

Page 1 of 3 * Resource Name or # (Assigned by recorder) AMB Property – Agua Mansa SB Co (Jwb 1362)

P1. Identifier: Isolated Adobe Bricks

*P2. Location: ☐ Not for Publication X Unrestricted
*a. County: San Bernardino and (P2c, P2e, and P2b or P2d. Attach a Location Map as necessary.)
*b. USGS 7.5' Quad San Bernardino South Date 1980 T 1S R SW NW ¼ of SW ¼ of Sec 36 SB B.M.
c. Address: Agua Mansa Road City Colton Zip 92324
d. UTM: (Give more than one for large and/or linear resources) Zone 11 mE/ mN
e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate)

South side of Agua Mansa Road: East of Riverside Avenue; Opposite the Agua Mansa Cemetery.

*P3a. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

Two relatively small fragments of adobe brick.

*P3b. Resource Attributes: (List attributes and codes) AP-16 (Isolated find)

*P4. Resources Present: ☐ Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District X Other (Isolates, etc.)

See attached

P5a. Description of Photo: (view, date, accession #)
See Attached Continuation Sheet

*P6. Date of Construction/Age and Source

X Historic ☐ Prehistoric ☐ Both

*P7. Owner and Address:
AMB Property Corporation
17777 Center Court Drive N, Suite 100
Cerritos, California 90703

*P8. Recorded by: (Name, affiliation, and address)
Jeanette A. McKenna (McKenna et al.)
6008 Friends Avenue
Whittier, California 90601-3724
(562) 696-3852 (562) 693-4059 FAX

*P9. Date Recorded: Oct 13, 2008

*P10. Survey Type: Archaeological Monitoring

*P11. Report Citation: (Cite survey report and other sources, or enter "none".) McKenna, Jeanette A. (2008) – Results of an Archaeological Monitoring at the AMB Property Corporation Site in Colton, San Bernardino County, California. On file, McKenna et al., Whittier, California

*Attachments: NONE X Location Map X Continuation Sheet ☐ Building, Structure, and Object Record
☐ Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record
☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record ☐ Other (List)

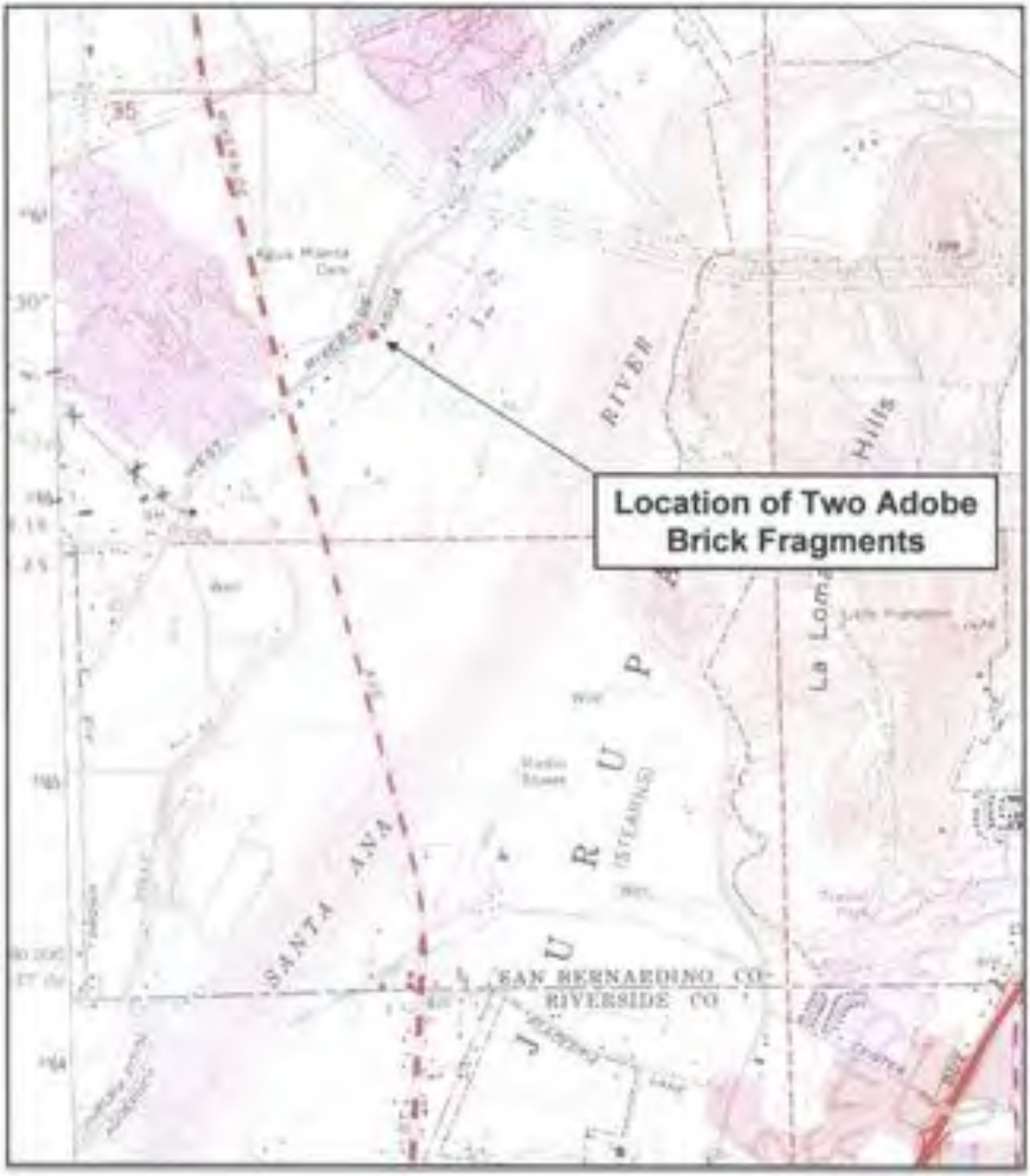
DPR523A (Revised McKenna et al. 2008) *Required Information

State of California
DEPARTMENT F PARKS AND RECREATION

LOCATION MAP

Primary # _____
HRI # _____
Trinomial _____

 * Resource Name or # (Assigned by recorder) AMB Property – Agua Mansa, SB Co. (Job 1362)
*Name of Map: USGS San Bernardino South *Scale: 1:24000 *Date of Map 1980



State of California
DEPARTMENT F PARKS AND RECREATION
CONTINUATION SHEET

Primary # _____
HRI # _____
Trinomial _____

* Resource Name or # (Assigned by recorder) AMB Property, Agua Mansa, SB Co. (Job 1362)

Adobe Brick Fragments

State of California - The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary# [redacted]
HRI#
Trinomial
NRHP Status Code
Other Listings
Review Code: Reviewer: Date:

Page 1 of 3 *Resource Name or #: (Assigned by recorder) CNX-1

P1. Other Identifier: S. Riverside Avenue and W. Slover Avenue Tank Farm

*P2. Location: ☐ Not for Publication ☒ Unrestricted

*a. County: San Bernardino and (P2c, P2e, and P2b or P2d. Attach a Location Map as necessary.)

*b. USGS 7.5' Quad San Bernardino South Date 1980 T 1S; R 5W; SW ¼ of SW ¼ of Sec 24; S.B.M.

c. Address 175 E. Slover Ave City Colton Zip 92324

d. UTM: (Give more than one for large and/or linear resources) Zone 11 [redacted] mE/ [redacted] mN

e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate)

Between CNX milepost 0-1, 0.4 miles south of I-10. Nearest cross streets are S Riverside Avenue and W Slover Avenue. Approximately 125ft south of the area of direct impact of the CNX project.

*P3a. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

CNX-1 is a historic-period actively-used storage tank built between 1955 and 1966. The tanks are cylindrical and several have been altered with new caps and improvements to the exterior staircases. The tanks are three stories high and sit back behind a chain link fence and non-historic-period concrete block wall. Tanks have been added between 1968 and 1980, and also within the past 15 years. The property has an industrial use and is generally surrounded by open space to the south, similar industrial property uses to the east, single and multi-family residences to the north, and commercial and retail buildings to the west and north. CNX-1 is located almost a half-mile south of Interstate 10 within the City of Colton and is located approximately 125- to 250-feet south of area of direct impact caused by the CNX project.

*P3b. Resource Attributes: (List attributes and codes) Ind (ang) Building - HP8

P5a. Photograph or Drawing: (Photograph required for buildings, structures, and objects.)

*P4. Resources Present: ☐Building ☒Structure ☐Object ☐Site ☐District ☐Element of District ☐Other (Isolates, etc.)

P5b. Description of Photo: (view, date, accession #)
View to the East-Southeast, August 2008

*P6. Date Constructed/Age and Source: ☐Historic ☐Prehistoric ☐Both
1955-1966 per USGS Map Survey

*P7. Owner and Address:
Unknown

*P8. Recorded by: (Name, affiliation, and address)
Jeremy Hollins - URS Corp.
1615 Murray Canyon Road, Suite 1000
San Diego, CA 92108-4314

*P9. Date Recorded:
August 2008

*P10. Survey Type: (Describe)
Pedestrian Survey

*P11. Report Citation: (Cite survey report and other sources, or enter "none.")
Proposed Colony Expansion Report, Colonial Pointe, San Bernardino County, CA. Architectural History Survey

*Attachments: ☐NONE ☐Location Map ☒Continuation Sheet ☒Building, Structure, and Object Record ☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐Other (List):

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
Primary # 36-[illegible]
HRI #

BUILDING, STRUCTURE, AND OBJECT RECORD

Page: 2 of 3 *NRHP Status Code 6Z
*Resource Name or # (Assigned by recorder) CNX-1
B1. Historic Name: N/A
B2. Common Name: N/A
B3. Original Use: Heavy Industry
B4. Present Use: Heavy Industry

*B5. Architectural Style: Industrial, Engineering Structure
*B6. Construction History: (Construction date, alterations, and date of alterations)
The tanks are cylindrical and several have been altered with new caps and improvements to the exterior clamcases. The tanks sit back behind a chain link fence and non-historic period concrete block wall. Tanks have been added between 1968 and 1982 and also within the past 15 years.

*B7. Moved? X No ___ Yes ___ Unknown Date: ___ Original Location: ___
*B8. Related Features:
N/A

B9a. Architect: N/A b. Builder: N/A

*B10. Significance: Theme N/A Area Colton, San Bernardino
Period of Significance N/A Property Type Industrial
Applicable Criteria N/A (Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)
The historical significance of CNX-1 within the historic architecture APE was determined by applying the processes and criteria for the National Register of Historic Places (NRHP), California Register of Historical Resources (CRHR), and the definition of a historical resource as defined by CEQA.

Based on site investigations and historic research, CNX-1 does not appear to possess the requisite significance to be eligible for listing on the NRHP and CRHR or considered a historical resource for purposes of CEQA.

(See Continuation Sheet)

B11. Additional Resource Attributes: (List attributes and codes)
*B12. References:

(See Continuation Sheet)

B13. Remarks:
*B14. Evaluator: Jeremy Hollins - URS Corporation
*Date of Evaluation: September 2008

San Bernardino South 7.5-Minute Series USGS Map

(This space reserved for official comments.)

DPR 523B (1/95) *Required information

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
CONTINUATION SHEET

Primary #
HRI #
Trinomial

Page 3 of 3 *Resource Name or # (Assigned by recorder) CNX-1

*Recorded by: URS Corporation *Date September 2008 X Continuation Update

*B10. Continued

CNX-1 lacks a distinctive or distinguishing design, and does not appear to have an important association with a specific significant event, pattern of events, or individuals. While the tank farm has been in operation for approximately 50 years, it does not reflect the industry's importance in Colton or San Bernardino County. Throughout its existence, it has experienced numerous additions and alterations, which have affected its visual appearance and ability to convey its historic period. In summary, the plant is representative of the utilitarian structures found in similar sites within San Bernardino County. Therefore, CNX-1 does not appear to possess the requisite significance to be individually eligible for listing on the NRHP and CRHR or considered a historical resource for purposes of CEQA. An additional and/or subsurface pipeline, which would be located near the north boundary of the property, would not create a new adverse effect or significant impact to CNX-1.

For a property to qualify for listing in the NRHP and CRHR, besides meeting one of the Criteria, it must also retain a significant amount of its historic integrity. CNX-1 does not appear to retain a significant amount of its historic integrity aspects of design, feeling, materials, and association to be eligible to qualify for listing in the NRHP or CRHR or be considered a historical resource for purposes of CEQA.

*B12. References

United States Geological Survey. San Bernardino South, 7.5 Minute, 1954, 1967, 1980.

View to the South

State of California--The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary # 36-025601
HRI #
Trinomial H
NRHP Status Code 6Z
Other Listings
Review Code Reviewer Date

*Resource Name or # (Assigned by recorder) CRM TECH 2712-2

P1. Other Identifier:
*P2. Location: Not for Publication √ Unrestricted *a. County San Bernardino
and (P2b and P2c or P2d. Attach a Location Map as necessary.)
*b. USGS 7.5' Quad San Bernardino South, Calif. Date 1980 photorevised in 1979
T1S R5W NW/NE Sec 30 S.B.B.M. (a portion of the Jurupa [Stearns] land grant)
Elevation: Approximately 885 feet above mean sea level
c. Address 650 Agua Mansa Road City Colton, CA Zip 92316
d. UTM: (Give more than one for large and/or linear resources) Zone 11; 467312 mE/ 3767517 mN
UTM Derivation: USGS Quad √ GPS
e. Other Locational Data: (e.g., parcel #, directions to resource, etc., as appropriate) APN 0260-072-02; on the south side of Agua Mansa Road at Dunn Ranch Road.

*P3a. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries) The one-story residential building at 650 Agua Mansa Road appears to be the product of joining an older rectangular wood-framed mass and a pre-formed rectangular module of similar size but about a foot less tall. These two halves are slightly offset by about three feet, with both halves surmounted by flat roofs ending in medium eaves with exposed rafters and fascia boards painted blue. The exterior walls on the front mass are vertical boards, while the rear portion wall are horizontal boards with *(Continued on p. 3)*

*P3b. Resource Attributes: (List attributes and codes) HP2: Single family property
*P4. Resources Present: √ Building Structure Object Site District Element of District
Other (Isolates, etc.)

P5a. Photograph or Drawing (Photograph required for buildings, structures, and objects.)

P5b. Description of Photo: Photo taken on May 17, 2013; view to the northeast
*P6. Date Constructed/Age of Sources: √ Historic Prehistoric Both
Ca. 1912/1970s (see Items B6 and B12 for details)
*P7. Owner and Address: Agua Mansa Properties, Ontario, CA
*P8. Recorded by (Name, affiliation, and address): Terri Jacquemain and Daniel Ballester, CRM TECH, 1016 East Cooley Drive, Suite A/B, Colton, CA 92324
*P9. Date Recorded: May 17, 2013
*P10. Survey Type: Intensive-level survey for CEQA-compliance purposes

*P11. Report Citation: (Cite survey report and other sources, or enter "none.") Tang, Bai "Tom, Terri Jacquemain, and Daniel Ballester: Historical/Archaeological Resources Survey Report: Assessor's Parcel Numbers 0260-072-01 to -04, 0260-072-15 and -016, City of Colton, San Bernardino County, California. On file, Archaeological Information Center, San Bernardino County Museum, Redlands.

*Attachments: None Location Map √ Continuation Sheet √ Building, Structure, and Object Record
Archaeological Record District Record Linear Resource Record Milling Station Record
Rock Art Record Artifact Record Photograph Record Other (List):

State of California–The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

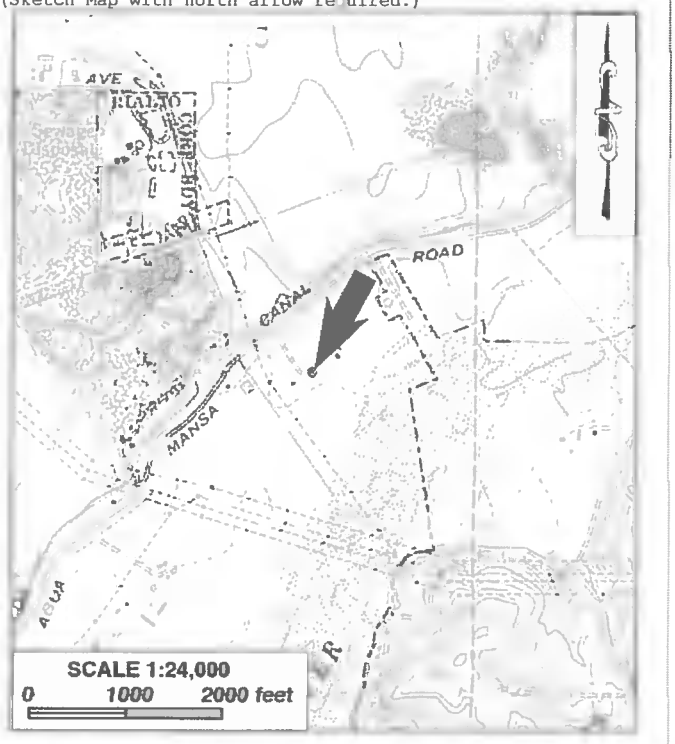
Primary # 36-025601
HRI #

BUILDING, STRUCTURE, AND OBJECT RECORD

*NRHP Status Code 6Z
*Resource Name or # (Assigned by recorder) CRM TECH 2712-2

B1. Historic Name:
B2. Common Name:
B3. Original Use: Residence
B4. Present Use: Vacant
*B5. Architectural Style:
*B6. Construction History: (Construction date, alterations, and date of alterations) The San Bernardino County Assessor real property database indicates that a 948 square-foot residence was first constructed on the property in 1912, a property improvement that nevertheless was not taxed until around 1926, when W.E. Heatlie acquired *(Continued on p. 3)*
*B7. Moved? No ___ Yes √ Unknown Date: ____ Original Location:
*B8. Related Features: See Item P3a.
B9a. Architect: Unknown b. Builder: Unknown
*B10. Significance: Theme Early-20th century residential development
Area Agua Mansa Period of Significance 1912-1945
Property Type single-family residence Applicable Criteria N/A
(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.) The building at 650 Agua Mansa Road is has been extensively modified, evidently including an original component that may date to 1912, and a modern modular unit that likely dates to the 1970s. Extensive historical research yielded little information regarding its early owners or *(Continued on p. 3)*
B11. Additional Resource Attributes: (List attributes and codes)
*B12. References: Bortin, Harry (1965): Great Duck Weather Ain't What It's Quacked Up To Be. *The Pasadena Star-News* November 23:3; County of San Bernardino, County Assessor records and property information database; Scauzillo, Steve (2012): Former Owner of 605 Duck Farm Now a Paso Robles Vintner. *The Whittier Daily News* February 2; O'Neill's Ghostories (2008) The Barrens: Dog Walker 6...(submitted by M.E.) Http://www.blakbirdz.com/ barrensus aguamansa.htm
B13. Remarks: The building lies within the mapped boundaries of 36-015221(Agua Mansa), it's construction date postdates the 1862 flood that destroyed the townsite.
*B14. Evaluator: Terri Jacquemain
*Date of Evaluation: May 2013

(Sketch Map with north arrow required.)



(This space reserved for official comments.)

*Required information

Recorded by: Terri Jacquemain, Daniel Ballester
***Date:** May 2013 √ Continuation ___Update

***P3a. Description** (continued): areas of vertical skirting. The entire building is painted grey with peeling blue trim and rests on a raised concrete footing.

The front of the building faces northwest, with a centered entryway filled with a white panel door covered by a black steel security door. The entry is approached by two concrete steps and sheltered by a doors-width, corrugated metal canopy painted white and supported by metal brackets attached at the top of the door frame. A rear entryway located in a near the southwest corner is approached by three wooden steps, and filled with a white panel door covered by an aluminum screen door. The exterior wall around the entry is slightly recessed from the rest of the rear wall.

Fenestration consists mostly of aluminum-framed sliders, some with wood trim, others untrimmed. A large window to the east of the front entry features a central divided pane flanked by two double-hungs, which appears to have been salvaged and used here, likely procured from the part of the building that was removed to add the pre-formed portion. The building is vacant and in fairy dilapidated condition.

***B6. Construction History** (continued): the property from A. Pellissier. Heatlie was a carpenter at Cal Portland Cement Company. He remained owner through 1947, adding Sarah E. Heatlie to the title in 1945. Sarah became sole owner two years later, after which John O. and Betty J. Tuntland, and Ole O. and Florence D. Tuntland became property owners.

For a time in the 1950s and 1960s the property was in use as a branch operation of the Ward Duck Company, founded in Petaluma in 1906. The enterprise was founded by the father of Patricia Woodland, whose husband Richard Woodland was asked to assume the helm of the company in 1960s, after serving in the military. Ward Duck Company was renamed Woodland Farms, and the couple remained property owners until 2004, when it was acquired by Agua Mansa Properties. The Woodland's main duck-raising operation was located in the La Puente area, where the Woodlands also lived. It closed in 2000. A series of upgrades to the property in 1978 by the Ward Duck Company included electrical work, a 30'x60' barn with a metal roof, and the installation of a mobile home for "offices and security," which is a likely indicator of the arrival of the pre-formed portion of the building.

***B10. Significance** (continued): uses, but has revealed that the property in the 1950s and 1960s served as a stock farm for the Ward Duck Company, founded in Petaluma in 1906 and headquartered in La Puente until closing in 2000. As a minor structure in a peripheral part of a large animal agricultural operation, it does not display a particularly close relationship to this relatively unique business or appear to be closely associated with any important historical events, persons of recognized significance in national, state, or local history. The building does not stand out as an important example of its style, type, period, region, or method of construction, or express any particular ideals or design concepts, and in fact the altered appearance of the building significantly compromises its ability to relate to its 1912 construction date. As such, this building does not meet any of the criteria for listing in the National Register of Historic Places or the California Register of Historical Resources.

State of California--The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary # 36-025602
HRI #
Trinomial H
NRHP Status Code 6Z
Other Listings
Review Code Reviewer Date

Page 1 of 3 *Resource Name or # (Assigned by recorder) CRM TECH 2712-3

P1. Other Identifier:
*P2. Location: Not for Publication √ Unrestricted *a. County San Bernardino
and (P2b and P2c or P2d. Attach a Location Map as necessary.)
*b. USGS 7.5' Quad San Bernardino South, Calif. Date 1980 photorevised in 1979
T1S; R5W NW/NE Sec 30 S.B.B.M. (a portion of the Jurupa [Stearns] land grant)
Elevation: Approximately 885 feet above mean sea level
c. Address 656 Agua Mansa Road City Colton, CA Zip 92316
d. UTM: (Give more than one for large and/or linear resources) Zone 11; 467259 mE/ 3767475 mN
UTM Derivation: USGS Quad √ GPS
e. Other Locational Data: (e.g., parcel #, directions to resource, etc., as appropriate) APN 0260-072-01; on the south side of Agua Mansa Road at Dunn Ranch Road.

*P3a. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries) The one-story single-family residence at 656 Agua Mansa Road faces north to Agua Mansa Road but is set back on the property about 600 feet from the road. This wood-framed structure rests on a concrete foundation and is surmounted by a cross-gable roof, with the room-sized additions on the
(Continued on p. 3)

*P3b. Resource Attributes: (List attributes and codes) HP2: Single family property
*P4. Resources Present: √ Building Structure Object Site District Element of District
Other (isolates, etc.)

P5a. Photograph or Drawing (Photograph required for buildings, structures, and objects.)

P5b. Description of Photo: Photo taken on May 17, 2013; view to the southwest
*P6. Date Constructed/Age of Sources: √ Historic Prehistoric Both
Ca. late 1940s (see Items B6 and B12 for details)
*P7. Owner and Address: Brigette DeLaura, 2024 Mira Monte Ct. Chino Hills, CA
*P8. Recorded by (Name, affiliation, and address): Daniel Ballester, CRM TECH, 1016 East Cooley Drive, Suite A/B, Colton, CA 92324
*P9. Date Recorded: May 17, 2013
*P10. Survey Type: Intensive-level for CEQA-compliance purposes

*P11. Report Citation: (Cite survey report and other sources or enter "none.") Tang, Bai "Tom, Terri Jacquemain, and Daniel Ballester: Historical/Archaeological Resources Survey Report: Assessor's Parcel Numbers 0260-072-01 to -04, 0260-072-15 and -016, City of Colton, San Bernardino County, California. On file, Archaeological Information Center, San Bernardino County Museum, Redlands.

*Attachments: None Location Map √ Continuation Sheet √ Building, Structure, and Object Record
Archaeological Record District Record Linear Resource Record Milling Station Record
Rock Art Record Artifact Record Photograph Record Other (List):

State of California--The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

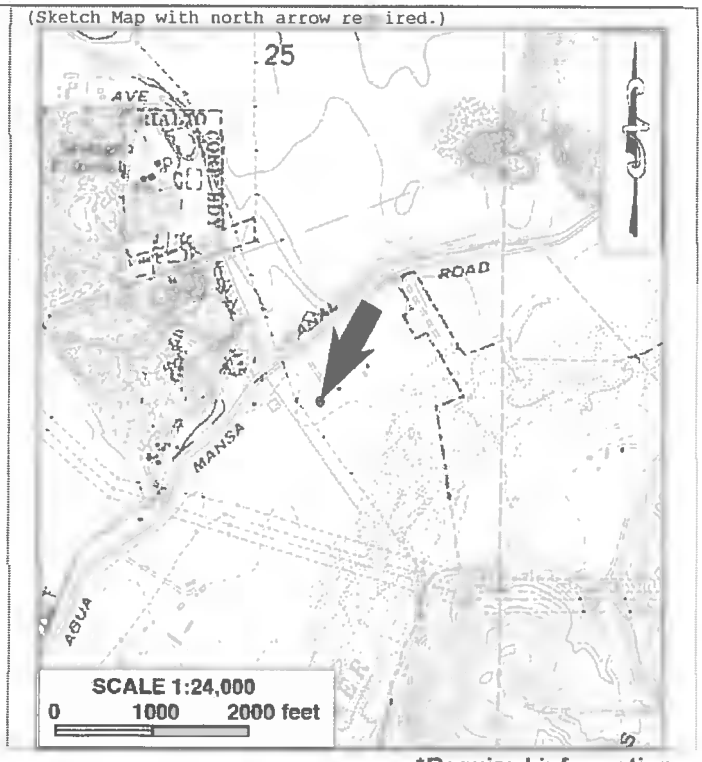
Primary # 36-025602
HRI #

BUILDING, STRUCTURE, AND OBJECT RECORD

*NRHP Status Code 6Z
*Resource Name or # (Assigned by recorder) CRM TECH 2712-3

B1. Historic Name:
B2. Common Name:
B3. Original Use: Residence
B4. Present Use: Vacant
*B5. Architectural Style: Ranch
*B6. Construction History: (Construction date, alterations, and date of alterations) Archival property records indicate building first occurred on the property around 1934, some three years after Geoffrey Peplow acquired the property from Filomena Martinez. Peplow immigrated to the United States from England in 1923 and was working as a farm laborer in 1930. Around 1943, Peplow deeded the property to Elmer L. and Sybil E. Dunn, who lived in Riverside in the 1930s-1940s. *(Continued on p. 3)*
*B7. Moved? √ No ___ Yes ___ Unknown Date: ____ Original Location:
*B8. Related Features: See Item P3a.
B9a. Architect: Unknown b. Builder: Unknown
*B10. Significance: Theme Mid-20th century residential development
Area Agua Mansa Period of Significance 1945-1961
Property Type Residential Applicable Criteria N/A
(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.) Evidently originally dating to the late 1940s, this building appears to have been expanded in all directions except in the front central portion. These additions and remodeling efforts have included the addition of modern window replacements, doors, stucco work, and roofing, leaving the building modern in overall appearance and significantly diminishing its ability to relate to the historic period. It does not demonstrate any *(Continued on p. 3)*
B11. Additional Resource Attributes: (List attributes and codes)
*B12. References: San Bernardino County real property assessment records (1935-1945); U.S. Federal Census records (1930); Riverside City Directory (1939, 1941); Gravefinders.com
B13. Remarks:
*B14. Evaluator: Terri Jacquemain
*Date of Evaluation: May 2013

(Sketch Map with north arrow required.)



(This space reserved for official comments.)

*Required information

Recorded by: Terri Jacquemain
*Date: May 2013 √ Continuation ___ Update

*P3a. **Description** (continued): rear and both sides sporting hipped roofs that are slightly lower than the main roof. The entire roof is sheathed with brown composition sheets and ends in medium eaves and fascia boards painted white. The exterior walls are tan stucco.

The additions create a footprint that generally T-shaped, with the central portion of the primary facade extending out. The main entryway is here, filled with a white panel door with a fanlight. It is sheltered by a large overhang made of wood boards attached under the gable peak and supported by six metal pole with peeling white paint. Below the covering is a concrete slab patio area, painted red, that extends beyond the covering. A red brick chimney with an attached brick oven is found on the west side of the central extension, and two-foot high red and white brick planters high line most of the rest of the extended portion of the primary façade. Low rectangular wood planter boxes are laid out on either side of the central portion. All of the planters are currently empty or weedy.

Fenestration consists of untrimmed, white aluminum, multi-pane replacement windows of various size and orientation, and a few, smaller aluminum sliders. Two large 32-paned windows are featured to the west of the main entry and on the easterly side of the central portion. Two eight-paned windows on the eastern addition, and one on the western portion, along with an high-set aluminum slider, completes the fenestration on the primary facade. A northeast-facing rear entryway filled with a white panel door is found tucked on the rear addition where it meets the main mass.

Outbuildings to the northeast of the residence include two weathered, sheet-metal and concrete block buildings with a flat roofs, a smaller sheet metal building with a pitched medium-pitched metal roof, and a small shed on the western side of the residence. The house is vacant and neglected, with dormant and overgrown grasses and weeds surrounding the buildings.

*B6. **Construction History** (continued): In the meantime, the couple apparently constructed other buildings on the Agua Mansa property, as reflected in improvement tax increases from $150 to $310 in 1947, and to $460 in 1948. The residence currently extant at 656 Agua Mansa Road likely represents one of these later structures. Despite the evident construction on the property, no permits were found on file in city building records. According to a source on hand during the field inspection, the Dunn's property was a working ranch with livestock and horses, and host to the occasional small-scale rodeo.

Elmer Dunn served in the U.S. Marine Corps, and also worked as an attendant at the Riverside Shell Oil station later as a mill operator. Both Elmer (1910-1984) and Sybil (1914-1990) are buried in Riverside National Cemetery. Family members James and Sandra Dunn became property owners around 1991, and remained owners until around 1998.

*B10. **Significance** (continued): notable architectural, artistic, or esthetic merits, and none of the property owners identified in the archival records appears to have attained recognized significance in history, nor have any events of historical interest been identified in the building's past. Consequently, the building is determined not to meet any of the criteria for listing in the National Register of Historic Places or the California Register of Historical Resources.

State of California
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary #
HRI #
Trinomial CA-SBR-31378H

Other Listings:

Review Code: 6Z Reviewer: Jeanette A. McKenna Date: 5/21/17

 *Resource Name or # (assigned by recorder) Manuel Soarea Property, Agua Mansa, SB Co., CA

P1. Other Identifier: Bandini Donation Lots 13 to 22

*P2. Location Not for Publication X Unrestricted

*P2a. County: San Bernardino

P2b. USGS 7.5' Quad: San Bernardino South Date: 1980 T1S ; R4W; SW ¼ Sec. 30 and T1S ; R5W; SE ¼ Sec. 25 ; S.B.B.M.

P2c. Address: Agua Mansa Road City: Colton Zip: 92324

P2d. UTMs: Zone: 11 See Continuation Sheet mE mN

P2e. Other Locational Data: (e.g.: parcel #, directions to resource, elevation, etc., as appropriate)
South side of Agua Mansa Road, between Riverside Avenue (west) and Rancho Road (east); just west of Sewage Treatment Plant and south of Slover Mountain

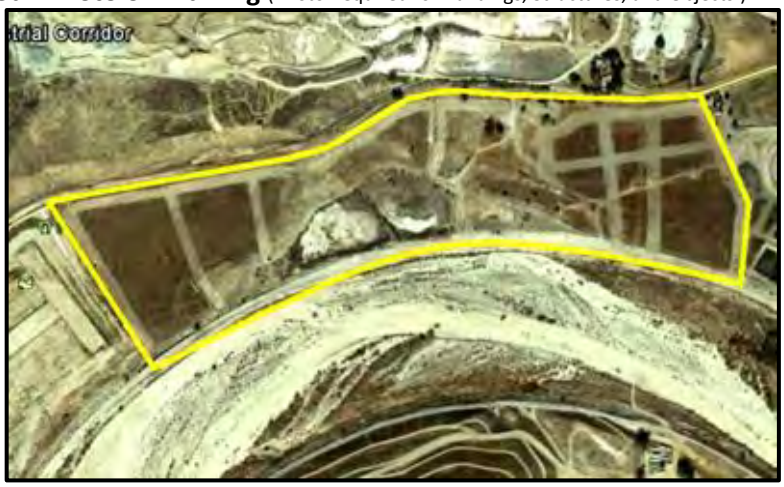
*P3a. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries.)

See Continuation Sheet

P3b. Resource Attributes: (List attributes and codes.) HP-32 (Rural Open Space); HP-33 (Farm/Ranch)

*P4. Resources Present: ☐ Building ☐ Structure ☐ Object X Site
☐ District ☐ Element of District X Others (Isolate, etc.) Artifact Scatter

P5a. Photo or Drawing (Photo Required for Buildings, Structures, and Objects.)



P5b: Description of Photo:
Aerial (2017)

*P6. Date of Construction/Age
X Historic ☐ Prehistoric ☐ Both

*P7. Owner and Address:
California Portland Cement Co.
Agua Mansa Road
Colton, California 92324

*P8. Recorded by: McKenna et al.
Jeanette A. McKenna, Principal
Whittier CA 90601
(562) 696-3852

*P9. Date Recorded: May 21, 2017

*P10. Survey Type: Phase I CEQA

*P11. Report Citation: (Cite survey report and other sources, or enter "None.") McKenna, Jeanette A. (2017) – A Phase I Cultural Resources Investigation of the Portland Cement Co. Project Area on Agua Mansa Road, City of Colton, San Bernardino County, California. On file, McKenna et al., Whittier, California.

*Attachments ☐ NONE X Location Map X Sketch Map X Continuation Sheet ☐ BSO Record
X Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record
☐ Rock Art Record ☐ Artifact Record ☐ Photographic Record X Other (List): Photos

State of California
DEPARTMENT OF PARKS AND RECREATION
ARCHAEOLOGICAL SITE RECORD

Primary #
HRI #
Trinomial

 *Resource Name or # (assigned by recorder) Manuel Soares Property, Agua Mansa, SB Co., CA

A1. Dimensions: a. Length: ½ mile (E/W) b. Width: 1/8 mile (N/S)
Method of Measurement: ☐ Paced ☐ Taped ☐ Visual Estimate X Other
Method of Determination : (check any that apply) X Artifacts X Features ☐ Soil
☐ Vegetation ☐ Topography ☐ Cut bank ☐ Animal Burrow ☐ Excavation
X Property Boundary ☐ Other:
Reliability of Determination: ☐ High X Medium ☐ Low ☐ Explain:
Limitations: (Check any that apply) ☐ Restricted Access ☐ Paved/Built Over X Vegetation
☐ Disturbances ☐ Site Limits Incompletely Defined ☐ Other: (Explain)

A2. Depth: ☐ NONE X Unknown Method of Determination:

A3. Human Remains: ☐ Present X Absent ☐ Possible ☐ Unknown (Explain)

A4. Features: (Number, briefly describe, indicate size, list associated cultural constituents, and show location of each feature on sketch map.) **See Continuation Sheets**

A5. Cultural Constituents: (Describe and quantify artifacts, ecofacts, cultural residues, etc., not associated with features.) **See Continuation Sheets**

A6. Were Specimens Collected? ☐ No X Yes (If yes, attach Artifact record or catalo and identify where specimens are curated.) **McKenna et al., Whittier, CA**

A7. Site Condition: ☐ Good ☐ Fair X Poor
Describe Disturbances: Structural demolitions, disking, grading, other earth moving activities

A8. Nearest Water: (Type, distance, and direction.) **Santa Ana River (adjacent)**

A9. Elevations: 870-900 feet AMSL

A10. Environmental Setting: (Describe culturally relevant variables such as vegetation, fauna, soils, geology, landform, slope, aspect, exposure, etc.) **Primarily along Santa Ana River Bank and Flood Zone**

A11. Historical Information: Part of Bandini Donation (1850s and 1860s; post-1895 occupation)

A12. Age: ☐ Prehistoric X Protohistoric ☐ 1542-1769 ☐ 1769-1848 X 1848-1880
X 1880-1914 X 1914-1945 X 1945-1965 ☐ Post-1965 ☐ Undetermined

A13. Interpretations: (Discuss data potential, function(s), ethnic affiliation, or other interpretations)
Part of the Manuel Soares properties, est. after 1895 to include recently research project area

A14. Remarks: Property slated for redevelopment by California Portland Cement Company

A15. References (Documents, Informants, Maps, and other references) **McKenna, Jeanette A. (2017)**

A16. Photographs (List subjects, direction of view, and accession numbers or attach a Photographic Record.)
Original Media/Digital Files Kept At: McKenna et al., Whittier, CA

A17. Form Prepared by: Jeanette A. McKenna, Principal
Affiliation and Address: **6008 Friends Avenue**
Whittier, California 90601-3724
(562) 696-3852
jeanette.mckennaetal@gmail.com

Date: May 21, 2017

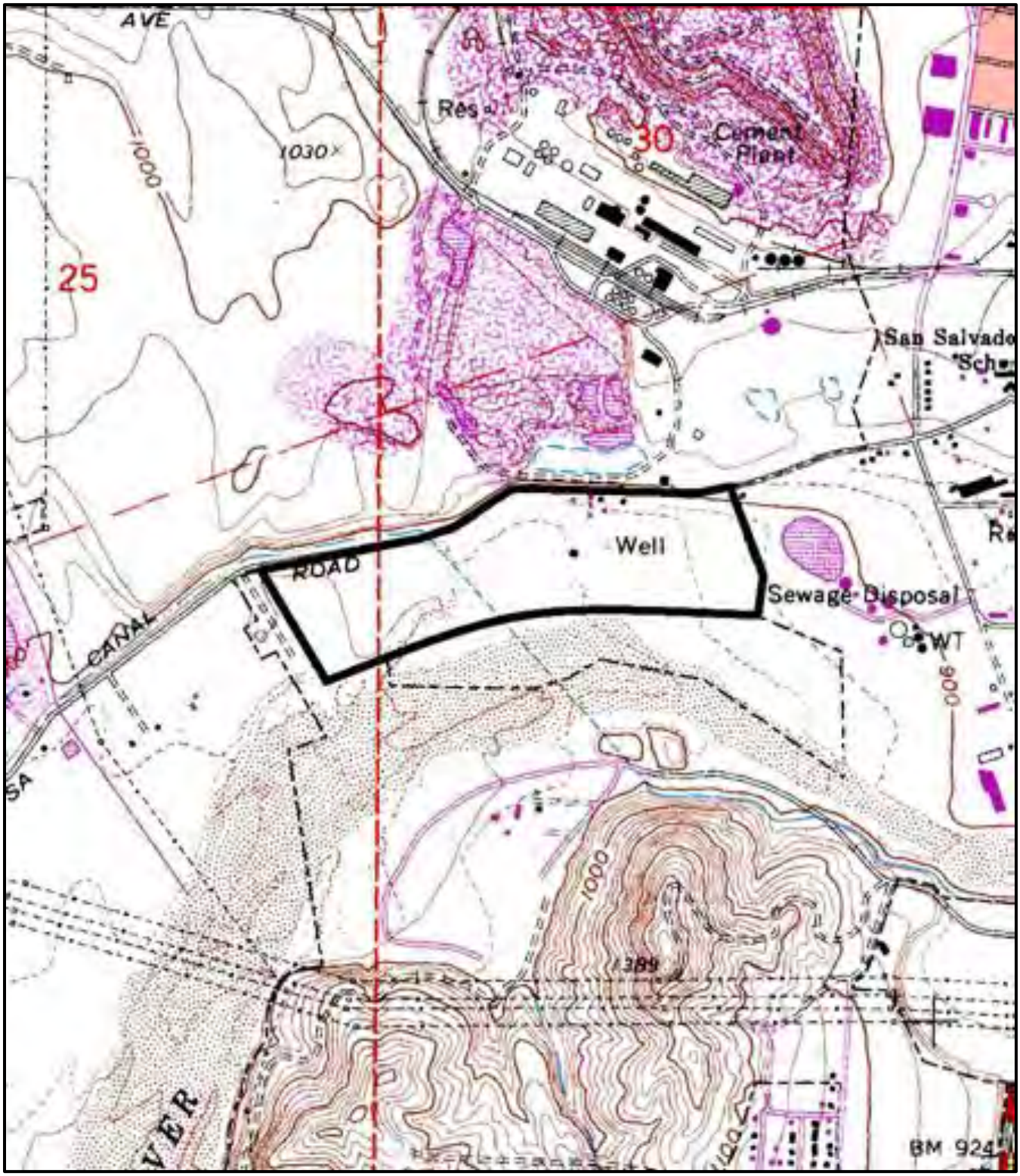
* Required Information

State of California
DEPARTMENT OF PARKS AND RECREATION

LOCATION MAP

Primary #
HRI #
Trinomial

Page 3 of 31 *Resource Name or # (assigned by recorder) Manuel Soares Property, Agua Mansa, SB Co. CA
*Map Name: USGS San Bernardino South *Scale 1:64,000 *Date of Map 1980



* Required Information

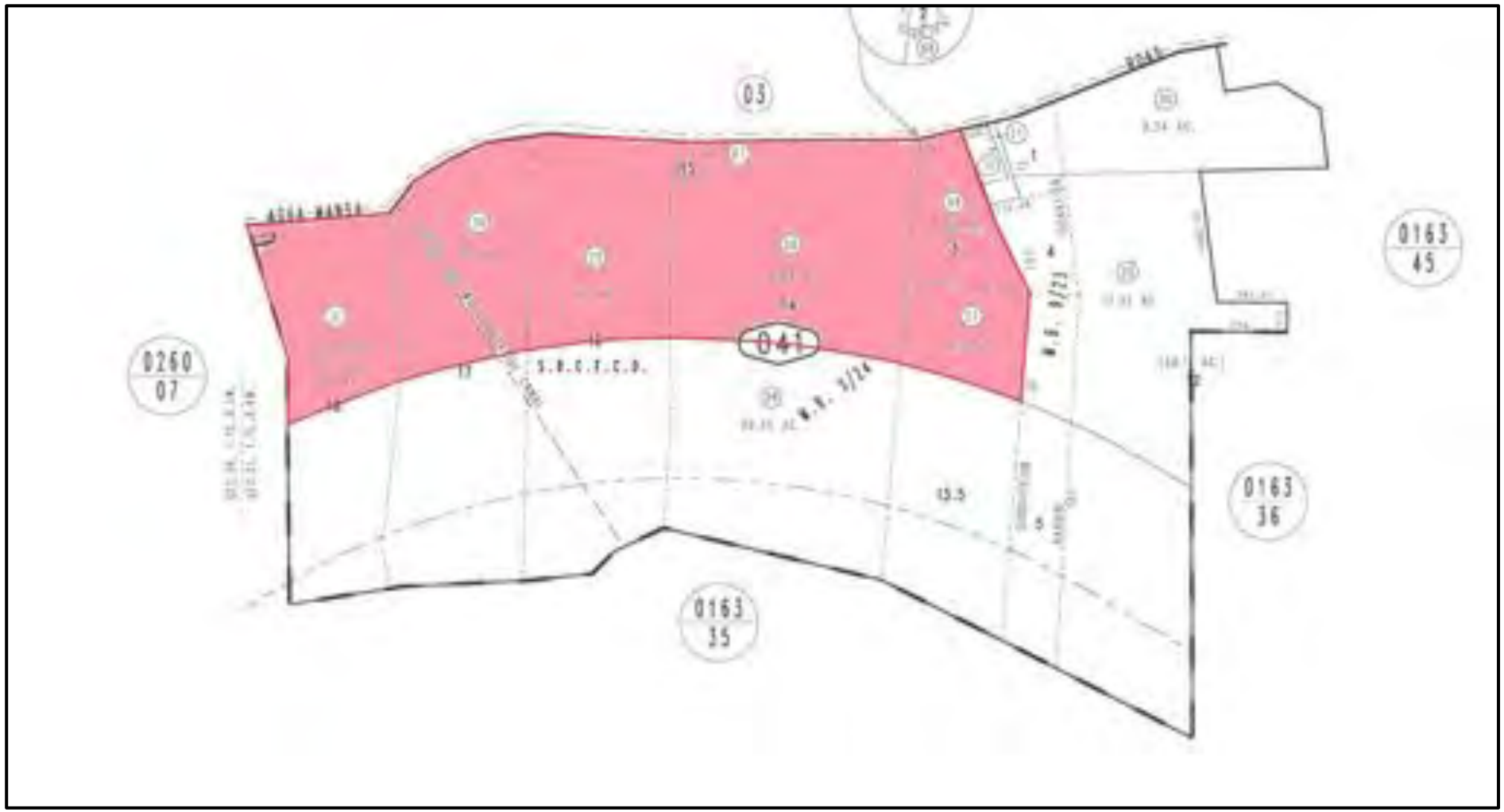
State of California
DEPARTMENT OF PARKS AND RECREATION

CONTINUATION SHEET

Primary #
HRI #
Trinomial

 *Resource Name or # (assigned by recorder) Manuel Soares Property, Agua Mansa, SB Co., CA

Recorded by: Jeanette A. McKenna, McKenna et al., Whittier, CA *Date May 21, 2017 X Continuation Update



36-031378

* Required Information

State of California
DEPARTMENT OF PARKS AND RECREATION

CONTINUATION SHEET

Primary #
HRI #
Trinomial

 *Resource Name or # (assigned by recorder) Manuel Soares Property, Agua Mansa, SB Co., CA

Recorded by: Jeanette A. McKenna, McKenna et al., Whittier, CA *Date May 21, 2017 X Continuation Update

36-031378

* Required Information

State of California
DEPARTMENT OF PARKS AND RECREATION
SKETCH MAP

Primary #
HRI #
Trinomial

Page 6 of 31 ***Resource Name or # (assigned by recorder) Manuel Soares Property, Agua Mansa, SB Co., CA**
Drawn by: Jeanette A. McKenna, McKenna et al., Whittier CA ***Date May 21, 2017**

* Required Information

State of California
DEPARTMENT OF PARKS AND RECREATION

CONTINUATION SHEET

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HRI #
Trinomial

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Recorded by: Jeanette A. McKenna, McKenna et al., Whittier, CA *Date May 21, 2017 X Continuation Update

36-031378

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State of California
DEPARTMENT OF PARKS AND RECREATION

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36-031378

* Required Information

The earliest known records of European contact with Southern California Native Americans date to the mid-1500s, representing minor contact during early explorations by the Spanish. Intensive contact was not established until the 1770s, when Father Garces traversed the Mojave Desert and entered coastal Southern California through the Cajon Pass (Walker 1986).

In the 1770s, the Spanish padres, under the direction of Junipero Serra, began the process of establishing a series of missions throughout Alta California, as California was then known. Noted earlier, the project area is within the boundaries of lands held by the Mission San Gabriel de Archangel. The mission continued to hold these large tracts until the Mexican government declared its independence from Spain and issued orders for the secularization of the Missions (ca. 1824).

By 1833-34, the majority of Mission lands were taken from the Catholic Church and reissued to individuals who had served as either Spanish or Mexican soldiers, settlers, financiers, etc. The Mexican government hoped to initiate a pattern of settlement in Alta California by relocating populations from other Mexican settlements to recently established Alta California settlements (Hanna 1951; McWilliams 1973; Dumke 1944; and Scott 1977).

Maps provided by Avina (1932); the Bureau of Land Management; and Beck and Haase (1977) illustrate the extent of the Rancho/Grant system. In this case, the project area is within the historic Rancho Jurupa (Stearns), originally confirmed to Juan Bandini by Governor Alvarado in 1838. The rancho consisted of approximately seven square leagues in San Bernardino County (now including a portion of Riverside County). Bandini's grant was approved on May 22, 1840 (Avina 1932:53). Gudde (1998:188) describes Jurupa as follows:

> The name was applied because the range and the railroad station are situated on the territory of the Jurupa land grant, dated Sept. 28, 1838. Jurupa, even earlier, had been a rancho of Mission San Gabriel. The origin must be Gabrielino ... "sagebrush-place" (Munro), or a similar form in a related language, with a "place" suffix -*pa*. Jurupa is mentioned as a place by Ord in 1849 (p. 119) and is shown on his sketch of the Los Angeles plains. Riverside was apparently first called Jurupa ... however, the von Leicht-Craven map of 1874 shows the two names in different locations.

Summarizing a discussion presented by McKenna in 1990 and 2007, the Rancho Jurupa was originally under the jurisdiction of the Mission San Gabriel and used for cattle grazing and, with the assistance of "neophytes" (Native American converts), small gardens. The neophytes continued with many of their ancestral ways, despite the influences of the Mission padres. After the declaration of independence by Mexico from Spain, the secularization of the Missions opened large tracts of land for settlement. Following the prior policies of Spain, the Mexican government continued to issue large land grants and supported the settlement of Alta California. Hanna (1951:249-250) notes:

> The ranchos of California comprised one of the quartette [sic] of elements by which Spain accomplished the conquest of the province, the others being missions, presidios and pueblos. The principal of granting lands to encourage settlement and colonization of undeveloped areas is an ancient custom of empire-minded nations, which found its counterpart in the more recent homestead and railroad grant laws of our United States. In the

> beginning, as W.W. Robinson so aptly points out in his "Rancho Become Cities", the ranch grants of California were merely grazing or pasturage permits which entitled the grantees to the use but not the ownership of the land. Eventually these permits became actual transfers of ownership by the regnant sovereign or political jurisdiction. And so California's more than 500 private land grants came into being.

Juan Bandini held the majority of his rancho until his death in 1859 (Newmark and Newmark 1930:254). However, when he needed funds, he sold a large portion of the Rancho Jurupa to Louis Rubidoux, resulting in the identification of the Rancho Jurupa (Rubidoux). The Rancho Jurupa (Stearns) was acquired by Bandini's daughter and son-in-law (Dona Arcadia and Don Abel Stearns) following Bandini's death. Again, citing Newmark and Newmark (1930: 254-255):

> Surrounded by most of his family, Don Juan Bandini, a distinguished Southern Californian and a worthy member of one of the finest Spanish families here, after a long and painful illness, died at the home of his daughter and son-in-law, Dona Arcadia and Don Abel Strearns, in Los Angeles, on November 4, 1859. Don Juan had come to California far back in the early twenties, and to Los Angeles so soon thereafter that he was a familiar and welcome figure here many years before I arrived ... Don Juan married twice. His first wife, courted in 1823, was Dolores, daughter of Captain Jose Estudillo, a *comandante* at Monterey; and of that union were born Dona Arcadia, first wife of Abel Stearns and later of Colonel R.S. Baker; Dona Ysidora, who married Lieutenant Cave H. Couts, a cousin of General Grant; Dona Josefa, later the wife of Pedro C. Carrillo (father of J.J. Carrillo), formally marshal here and now Justice of the Peace at Santa Monica), and the sons, Jose Maria Bandini and Juanito Bandini. Bandini's second wife was Refugio, a daughter of Santiago Arguello and a granddaughter of the governor who made the first grants of land to rancheros of Los Angeles ... By Bandini's second marriage there were three sons: Juan de la Cruz Bandini, Alfredo Bandini and Arturo Bandini.

With the exception of the sale to Rubidoux, the Rancho Jurupa remained intact into the 1880s. As early as 1840, however, Don Juan Bandini offered a portion of his land as a place of settlement for the displaced population from Politana. Politana was a small community of **Native Americans from Abiquiu, New Mexico**, bought to California by the Lugos of the Rancho San Bernardino. This gift of land was known as the "**Bandini Donations**," consisting of approximately 2,200 acres of land along the Santa Ana River in the northeastern portion of the Rancho Jurupa. Various accounts describe this land as covering an area of six miles along the River and one half mile wide along both sides of the River (McKenna 1990:20). These two settlements were named "Agua Mansa" (gentle water) and "La Placita" (small town). Agua Mansa was northwest of the River and La Placita was southeast of the River. [Note: the current project area is within the boundaries of Agua Mansa.]

La Placita was the larger of the two communities and included many of the original families from New Mexico. Both communities were established as pueblos, with small central plazas, a church, and dwellings surrounding the plaza. Individual lands were established along the river frontage and included approximately 550 feet of frontage on the River and approximately 1,300 feet deep, although the frontages varied). The current project area involves all or portions of Bandini's Lots 13, 13 ½ 14, 15, 16, 17, 18, 19,

20, 21, and 22. Farming was conducted near the water source(s) and livestock was kept slightly further away from the River. The community of Agua Mansa was established along the road established to connect Riverside with San Bernardino (later referred to as the Agua Mansa Road). Hayes (1929) suggests the church within the Cemetery at Agua Mansa was the third church built for the community and likely dates to ca. 1854. This structure and the associated Cemetery are located north of Agua Mansa Road and atop the bluff overlooking the community of Agua Mansa (northwest of the current project area).

The floods of the 1860s destroyed the community of Agua Mansa (and La Placita). In 1862, a wall of water estimated to be between thirty and fifty feet tall overran the communities on the Santa Ana River, destroying everything except the church and a single residence near the church (the bluff being above the flood line). In 1868, a second flood destroyed the reestablished community and left many feet of silt and debris atop the community's lands. Following the second flood, the community was officially abandoned and the church fell into ruins.

Harley (1989), Diocesan Archivist for the Diocese of San Bernardino, notes that they "pioneers" of Agua Mansa were the first true settlers along the Santa Ana River and established the first Catholic parish in the area (following secularization of the Missions). Following the floods of 1862 and 1868 (and the demise of the community of Agua Mansa), the Rancho Jurupa was "finally confirmed" to Abel Stearns. All surficial evidence of the New Mexican Native Americans was buried or destroyed.

Later, in 1893, when San Bernardino County was divided into San Bernardino County and Riverside County, the boundary line was established along the line separating the Rancho Jurupa Rubidoux from the Rancho Jurupa Stearns. Lippencott's Water Supply Paper (1898) illustrates the project area and the presence of Agua Mansa Road and other maps of the late 1800s identify the Bandini Donation by name. In 1898, there were two structures illustrated north of the road (presumably the Agua Mansa Church and adjacent residence) and one structure south of the road - in the vicinity of Lot 43.

A review of historic maps illustrated two structures within the project area in ca. 1901; eight structures in 1942; and only three structures in 1980. At the time of this investigation, no structures remained.

Research completed at the San Bernardino County Archives documented property ownerships from 1895. The data for the general area showed various lots now comprising the project area was held by the estate of M. Byrne and P.J. Stockman. No improvements were noted. In a biography of Stockman, Harley (n.d.; on file, McKenna et al.) states:

> Polydore Justin Stockman ... served as pastor at the "mother church" of St. Bernardine's for over two decades. Was a missionary to the Indians before Father Hahn arrived in banning in 1890, and founded ten Catholic churches and chapels plus the first parochial school in today's Inland Empire area ... Father Stockman was born on July 3, 1843, in Belgium, and moved to California from the Diocese of Ghent in December, 1873, after completing his seminary studies ... he was ordained to the priesthood by Bishop Thaddeus Amat ... he was reassigned to be in charge at San Bernardino ... Father Stockman inherited as a mission San Salvador Chapel at Agua Mansa, the third structure for that location which was finished in 1853. This farming community had been in economic de-

cline singe the late 1860's ... Somehow, Father Stockman as a community leader found the time for numerous non-clerical activities. Two examples will suffice to illustrate this dacet of his many-sided career. It was an unfortunate circumstance that the Agua Mansa settlers had continuing problems with their land titles on the tract known as the "Bandini Donation." Juan Bandini only gave each family a paper designating it property, but did not follow through with recorded deeds. Abel Stearns, a son-in-law of Bandini, purchased Rancho Jurupa in 1857. After several dulsatory [superficial] efforts at eviction, Stearns increased the pressure for the people either to leave the land or pay for the property originally granted free. He decided to enter a lawsuit in 1869 to recover the entire tract of the Donation. The pioneers, he claimed, by moving temporarily from their home sites after the disastrous flood of 1862, had thereby forfeited their property rights. Referee T.G. Howard upheld the defendants' cause: "My opinion is that (they) are entitled to the land in dispute, (and) that the plaintiff has not now and never had any title thereto." Howard's decision was later confirmed by Judge Morrison of the 17 District Court in San Bernardino just before Father Stockman appeared on the scene ... although this decision established finally the legal ownership of the village tract, it did not really determine the boundaries. Complicated litigation against the Riverside Lands and Irrigation Company lasted for another quarter of a century. To facilitate matters, the later colonists who had as yet not satisfied the requirements of settlement, conveyed their titles in 1886 to the St. Bernardine's/Agua Mansa pastor so that he could act as trustee. Once the suits were settled in favor of the settlers, the titles were returned by their priest if the families desired to retain ownership. By that time, however, economic pressures had caused many of the descendants to move elsewhere. Father Stockman as a result ended up retaining title to 12 contiguous lots later termed Agua Mansa Rancho. At his death, the property reverted to the Bishop of Los Angeles-San Diego (created in 1922) and thence in 1936 to the Bishop of San Diego when that diocese was created. Finally, California Portland Cement Company bought the dozen parcels in 1977.

Ownership documentation for the lots now identified as being associated with the current project area are as follows:

Lot 13	M.A. Murphy (East 13.58 acres; 1895-1904)
Lot 13	Juan Salazar (West 2.95 acres; 1895-1904)
Lot 13	Ampora Salazar (NW .25 acres; 1895-1904)
Lot 13 ½	J.D. Castillo (12.58 acres; 1895-1904)
	Manuel Soares (1905-1951)
Lot 13	Daniel Salazar (Lot 3 od Subdivision; 1 acre; 1905-1941)
	Manuel Soares (1942-1951)
Lot 14	Alex Frazier (NE 13 acres; 1895-1898)
	E.D. Robert (1899-1903)
	Manuel Soares (1904-1951)
Lot 14	J.D. Castillo (SE 6 acres; 1895-1897)
	William T. Holladay (1898)

E.D. Robert (1899-1903)
Manuel Soares (1904-1951)

Lot 14 W.L. Burnett and M.L Henderson; E ½ W ½; (1895-1896)
W. Burnett est. (5/8), W.L. Burnett (3/16), M.L. Henderson (3/16; 1895-1903)
E.D. Roberts (1904)
Manuel Soares (W ½ W ½; 12.08 acres; 1899-1951)

Lot 15 Est. of D. Belardes (1895-1899)
E.D. Roberts 1899-1903)

Lot 15 Juan Valdez (NE ½; 1895)
E.J. Grieger (1896-1899)
Manuel Soares (1900-1951)

Lot 15 E.J. Grieger (1 acre; NW ½; 1895)
Juan Valdez (1896-1899)
Manuel Soares (1900-1951)

Lot 16 Manuel Soares (16.85 acres; 1895-1951)

Lot 17 Juan Valdez (W ½; 9.25 acres; 1895-1912)

Lot 17 Manuel Soares (E ½; 9.25 acres; 1895-1951; purchased Valdez half)

Lot 18 Mercedes Flores (14.6 acres; 1895-1907)
Manuel Soares (1908-1951)

Lot 19 E. Robinson (1895-1900)
W.E. Pedley (1901-1912)
L.M. Davenport (1911-1912)
John Mynes (1913)
Carl Hirt (1914)
Manuel Soares (1915-1951)

Lot 20 Christian Tongis (1895-1904)
Heirs of Christian Tongis (1905-1907)
Manuel Soares (1908-1951)

Lot 21 Christian Tongis (1895-1904)
Heirs of Christian Tongis (1905-1907)
Manuel Soares (1908-1951)

Lot 22 J.R. Brunn (1895-1914)
Manuel Soares (1915-1951)

As noted, there were various owners of the lots within the project area from 1895 to 1951 (the extent of the records as the Archives). However, the pattern shows Manuel Soares began purchasing lots as early as 1895 (Lot 16; possibly earlier) followed by:

Lot 15 - 1900	Lot 17 - 1912
Lot 14 - 1904	Lot 19 - 1915
Lot 18 - 1908	Lot 22 - 1915
Lot 20 - 1908	Lot 13 - 1942
Lot 21 - 1908	

For all intents and purposes, Manuel Soares owned all of the project area by 1942, as well as other properties in the general area. He maintained ownership until at least 1951. Subsequent owners of all or parts of the project area have been identified as:

The Dioceses of San Diego (pre-1977)
The Portland Cement Company of California (1977)
Cal Mat (1987)
ReAccommodations Co. (1992)
Onoda California, Inc. (1994)
Onoda USA (2013)
The Portland Cement Company of California (2013)

In 1954, structures are still illustrated (3 within the project area). These structures are just north/northwest of the modern well illustrated on the 1980 USGS San Bernardino South Quadrangle. This area appears to equate with the location of Lot 15, as illustrated on the current Assessor Parcel map. As such, this property can be associated with Manuel Soares (by 1900), but also E.J. Grieger (1895) and Juan Valdez (1896-1899). A $100 structural improvement was noted in 1895, suggesting this property was occupied prior to 1895. Any subsequent improvements would have been attributed to Soares.

In 1915 there was a $150 noted improvement and in 1919, improvements increased to $700. A greater listing of over $1500 was noted in 1946, suggesting Soares was still improving the property after World War II (e.g the three noted on the 1954 map). By 1980, seven structures (two older – pre-1969; and five newer – post-1974) were depicted. These, also, are tentatively attributed to the Soares family, pending filling in the data gap between 1951 and 1977.

No structures remained at the time of this survey. A review of historic aerial photographs show the residential/ranching complex intact in 1980, but only one structure remaining in 1995. This structure was demolished just after 2012. Physical evidence of this complex yet still be identifiable in the form of foundations or artifact scatters and these remains may date as early as 1895 (+/-).

As a result of the physical examination of the property, it was confirmed that no standing structures remain with the property boundaries. There was scant evidence of one foundation with the previously identified structure locations illustrated on maps and aerial photograph. The survey confirmed the presence of

numerous examples of historic artifacts scattered throughout the property. The property boundaries were recorded in NAD 27 UTM reading as follows:

SW Corner	467778E/3767446N
SE Corner	468814E/3767576N
NE Corner	468747E/3767884N
NW Corner	467619E/3767698N
Bend on Road	468085E/3767788N
East Bend in Road	468251E/3767895N
Gate on Road	468421E/3767882N

The eastern portion of the project area was crossed by two secondary power lines and the "well" noted on the USGS quadrangle was relocated (468444E/3767760N). There was no visible evidence of the blue-line water course illustrated on the USGS quadrangle. McKenna et al. noted the presence of three shallow earthen basins ringed by thick reeds. These appears to be relatively recent water retention basins.

Following the weed abatement activities, evidence of scattered glass, plastic, terra cotta pottery (modern), bricks, concrete fragments, white ceramic fragments, tile fragments, rubber, and a single metal can were identified. These items were sparsely scattered and simply represented the occupation of the property and the dislocation of materials following demolition activities and periodic weed abatement. To illustrate the more readily identifiable features and/or isolated artifacts identified within the property, McKenna et al. recorded the following:

1. **Well**. The well noted on the USGS quadrangle was identified as a abandoned structure with associated pump and tank assemblages. The 8 ½' shaft is still present, supported by five small concrete footings. Located at 468444E/3767760N, the well is at a surface elevation of 878 feet AMSL.

2. **Ceramic Sherd**. This isolated ceramic sherd is a small fragment of a brownware clay pot. Measuring 3.6 cm x 2.4 cm x .8 cm, this item could be representative of an early pot associated with the New Mexican Native American presence in the area (pre-1862), but could also be associated with the late 1800s presence of the Mexican population. As an isolated artifact with no contextual associations, it is not considered significant, but indicative of the potential for other artifacts of a similar nature to be present. This artifact was recovered from an area along an old dirt access road at 468448E/3767695N.

3. **Glass Scatter**. Found near the isolated ceramic sherd, this glass scatter consists of worn and tumbled opaque glass fragments mixed with some more recent (modern) fragments. Some fragments were amethyst, indicating a late 1800s to early 1900s manufacturing period. There were approximately 50 to 75 fragments. This scatter was quite sparse, given it covered an area of 365 feet east/west and 50 feet north/south. The core area was recorded as 348403E/3767694N.

4. **Water Outfall Structure**. Located at 368338E/3767783N, this feature consists of a reinforced steel pipe with no identifiable markings. It appears to provide drainage from an area near or on Agua Mansa Road and feeds into the Santa Ana River. Given the material, it is considered to be a modern addition to the property.

5. **Concrete Pipe**. This segment of reinforced concrete pipe connects the easternmost retention basin (A) to the central basin (B). The northern extent at Basin A was located at 468294E/3767750N. The southern extent at Basin B was located at 468288E/3767736N.

6. **Concrete Pipe**. This pipe was placed vertically on the western boundary of Basin B (468190E/3767680N. Measuring 19 ½' in diameter, the walls were 2" thick. Again, there were no markings on the pipe, but it is considered modern.

7. **Concrete Pipe**. This pipe connects Basin B with the westernmost Basin C. It is 36 inches in diameter and the eastern extent at Basin B was located at 468162E/ 3767716N. The western extent at Basin C was located at 468156E/3767711N. It, too is considered modern.

8. **Concrete Sewer Access/Manhole**. Marked "Sewer" and "Concrete Conduit Co. 150", this 50 inch diameter manhole was identified in an area of tall grass at 468337E/ 3767791N. It is steel reinforced and considered to be another modern addition to the general area and one associated with the other concrete pipes previously noted.

9. **Collapsed Wooden Pier**. This plank structure appears to have once spanned the area in the southwestern portion of Basin B, permitting access to likely check depths of retained water. It measures roughly 20 inched wide and 8 feet long, with round common nails. It was located at 468204E/3767664N and, with the association to the basins, is considered modern.

10. **Amethyst Glass Fragment**. This partial base was identified at 467919E/3767565N and is representative of the late 1800s and early 1900s manufacturing period. As such, it is indicative of the historic occupation of the property and not an unusual find.

11. **Amber Bottle Base**. Located at 467892E/3767576N, this bottle fragment exhibited no stippling indicative of modern manufacturing and, therefore, is considered another example of glass dating to the historic period and representing the historic occupation of the area – likely the Soares ownership period.

12. **Concrete Slab**. This "L" shaped concrete pad was located directly west of the main site entrance gate on Agua Mansa Road; 468375E/3767838N. This pad measured 43 inches east/west and 28 inches north/south (at its maximum). There are no markings and no indications of use.

13. **Concrete Structure**. This low-profile concrete structure was mostly obscured by weeks, but was identifiable as consisting of three discernable sides approximately 48 inches tall. Located at 468433E/3767934N, the longest wall (east/west trending, measured approximately 24 feet. There was evidence of a superstructure (boards and bolts), and the size suggests it may have served as a garage or storage shed. Located within the identified historic structural complex, this feature appears to represent a later addition to the Soares complex (e.g. 1940s-1950s).

14. **Amethyst Glass Fragment**. This small fragment was identified with the core area of the historic structure location, at 468598E/3767846N. As previously noted, this item is indicative of later 1800s-early 1900s manufacturing and indicative fo the historic occupation of the property.

15. **Hurricane Lamp Glass Fragment**. This amethyst glass fragment has been identified as a rim shard from a Hurricane lamp/lantern. Located at 468432E/3767806N, this item is also indicative of the late 1800s-early 1900s and was likely an oil and wick lamp. No other fragments were noted.

16. **Aqua Bottle Finish**. This partial bottle finish is indicative of the "bead lip" closure often associated with crown caps. Its color suggests a post-1917 manufacturing, consistent with the Soares ownership period. It is roughly finished, exhibiting some tool marks, so may date slightly earlier (not machine made). It was located at 468490E/3767850N.

17. **Aqua Bottle Finish**. This partial bottle finish is indicative of the "bead lip" closure often associated with crown caps. Its color suggests a post-1917 manufacturing, consistent with the Soares ownership period. It was located at 468505E/3767861N.

18. **Glass Marble**. This very pale green marble is relatively large (1.05 inches) and exhibits impurities that suggest it is a home-made toy. It is slightly off-centered and exhibits evidence of melting and molding. It was located at 468438E/3767852N and recovered by McKenna et al. Its presence suggests children was on-site at some point, likely Soares children during the first half of the 20th century.

19. **Field Fence**. This fence is represented by a hollow steel poles set into a concrete footings and attached to strung wire (not barbed wire). This fence line runs north to south from Agua Mansa Road for approximately 230 feet and averages four feet in height. The northern point was marked at 468284E/3767885N and the southern point at 468284E/3767815N.

20. **Amethyst Glass Fragment**. Located on the edge of Basin C, 468104E/3767714N, this small fragment is another example of pre-1917 glass representative of the early occupation of the property. It was found in a disturbed area, suggesting other examples may be present, but in a buried context.

The scatter of historic artifacts and scant evidence of structural remains area all located in areas known to have been occupied by 1895 (likely earlier) and through the 1950s. Despite the extent of the occupation – attributed primarily to the Manuel Soares family - the extent of the artifact scatter is considered to be quite sparse. Likewise, the demolition of the residential/ranch complex was extensive and little remains of any buildings. Archaeologically, the identified remains are negligible. However, they are indicative of the early occupation of the area and there is evidence to suggest there may be buried archaeological elements within the property, some dating as early as the pre-1862 occupation of the area.

State of California
DEPARTMENT OF PARKS AND RECREATION

CONTINUATION SHEET

Primary #
HRI #
Trinomial

 *Resource Name or # (assigned by recorder) Manuel Soares Property, Agua Mansa, SB Co., CA

Recorded by: Jeanette A. McKenna, McKenna et al., Whittier, CA *Date May 21, 2017 X Continuation Update

36-031378

* Required Information

State of California
DEPARTMENT OF PARKS AND RECREATION

CONTINUATION SHEET

Primary #
HRI #
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 *Resource Name or # (assigned by recorder) Manuel Soares Property, Agua Mansa, SB Co., CA

Recorded by: Jeanette A. McKenna, McKenna et al., Whittier, CA *Date May 21, 2017 X Continuation Update

36-031378

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State of California
DEPARTMENT OF PARKS AND RECREATION

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 *Resource Name or # (assigned by recorder) Manuel Soares Property, Agua Mansa, SB Co., CA

Recorded by: Jeanette A. McKenna, McKenna et al., Whittier, CA *Date May 21, 2017 X Continuation Update

36-031378

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State of California
DEPARTMENT OF PARKS AND RECREATION

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DEPARTMENT OF PARKS AND RECREATION

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State of California
DEPARTMENT OF PARKS AND RECREATION

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36-031378

* Required Information

36-031378

State of California
DEPARTMENT OF PARKS AND RECREATION

CONTINUATION SHEET

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Trinomial

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Recorded by: Jeanette A. McKenna, McKenna et al., Whittier, CA *Date May 21, 2017 X Continuation Update

36-031378

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State of California
DEPARTMENT OF PARKS AND RECREATION

CONTINUATION SHEET

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HRI #

Trinomial

 *Resource Name or # (assigned by recorder) Manuel Soares Property, Agua Mansa, SB Co., CA

Recorded by: Jeanette A. McKenna, McKenna et al., Whittier, CA *Date May 21, 2017 X Continuation Update

36-031378

* Required Information

State of California
DEPARTMENT OF PARKS AND RECREATION

CONTINUATION SHEET

Primary #
HRI #
Trinomial

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Recorded by: Jeanette A. McKenna, McKenna et al., Whittier, CA *Date May 21, 2017 X Continuation Update

36-031378

* Required Information

State of California
DEPARTMENT OF PARKS AND RECREATION

CONTINUATION SHEET

Primary #
HRI #
Trinomial

 *Resource Name or # (assigned by recorder) Manuel Soares Property, Agua Mansa, SB Co., CA

Recorded by: Jeanette A. McKenna, McKenna et al., Whittier, CA *Date May 21, 2017 X Continuation Update

36-031378

* Required Information

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary #
HRI #
Trinomial #
NRHP Status Code
Other Listings
Review Code | Reviewer | Date

 ***Resource Name or #:** AM-001-i

P1. Other Identifier: AM-001-i
***P2. Location:** ☒ **Not for Publication** ☐ **Unrestricted** ***a. County:** San Bernardino
***b. USGS:** San Bernardino South **Date:** 1967 rev 1980 **T**; 1N **R** 5W **of Sec** 36 San Bernardino B. M.
c. Address: N/A **City:** Colton **Zip:** 92324
d. UTM: NAD 83; Zone:11; 466771 **mE** 376687 **mN**
e. Other Locational Data: **Elevation:** 872 feet AMSL
Directions: From the Rancho exit of Interstate 10, head south to Agua Mansa Road and turn right. Take Agua Mansa Road for 1.9 miles to Miguel Bustamante Parkway and turn left (southeast). Travel 0.17 mile on Miguel Bustamante Parkway to the entrance of the Agua Mansa Power Plant. Turn left onto the road leading into the power plant and travel for .09 mile. The isolate is located .03 mile bearing 319 degrees northwest from the end of the road.

***P3a. Description:** This historic-period isolate consists of a green glass oval bottle base fragment, embossed with "S". It contains light stippling around the heel and gas seeds in the glass, suggesting a pre-1950s date of manufacture.

***P3b. Resource Attributes:** AP16: Other (isolate)

***P4. Resources Present:** ☐Building ☐Structure ☐Object ☐Site ☐District ☐Element of District ☒Other (Isolates, etc.)

P5b. Description of Photo: Green glass bottle base, Photo #AM-008 Detail view.

***P6. Date Constructed/Age and Sources:** ☒Historic ☐Prehistoric ☐Both

***P7. Owner and Address:**
City of Colton Electrical Department
150 S. 10th Street
Colton, CA 92324

***P8. Recorded by:**
K. Lindgren, R. Cunningham

ECORP Consulting, Inc.
215 N. 5th Street
Redlands, Ca 92373

***P9. Date Recorded:** 10/29/2013

***P10. Survey Type:** Intensive pedestrian archaeological survey

***P11. Report Citation:**
Lindgren, Kristina and Roger D. Mason.
2014 *Cultural Resources Inventory and Evaluation of the Agua Mansa Substation Project*, *City of Colton, San Bernardino County, California*. Prepared by ECORP Consulting, Inc., Redlands, CA.

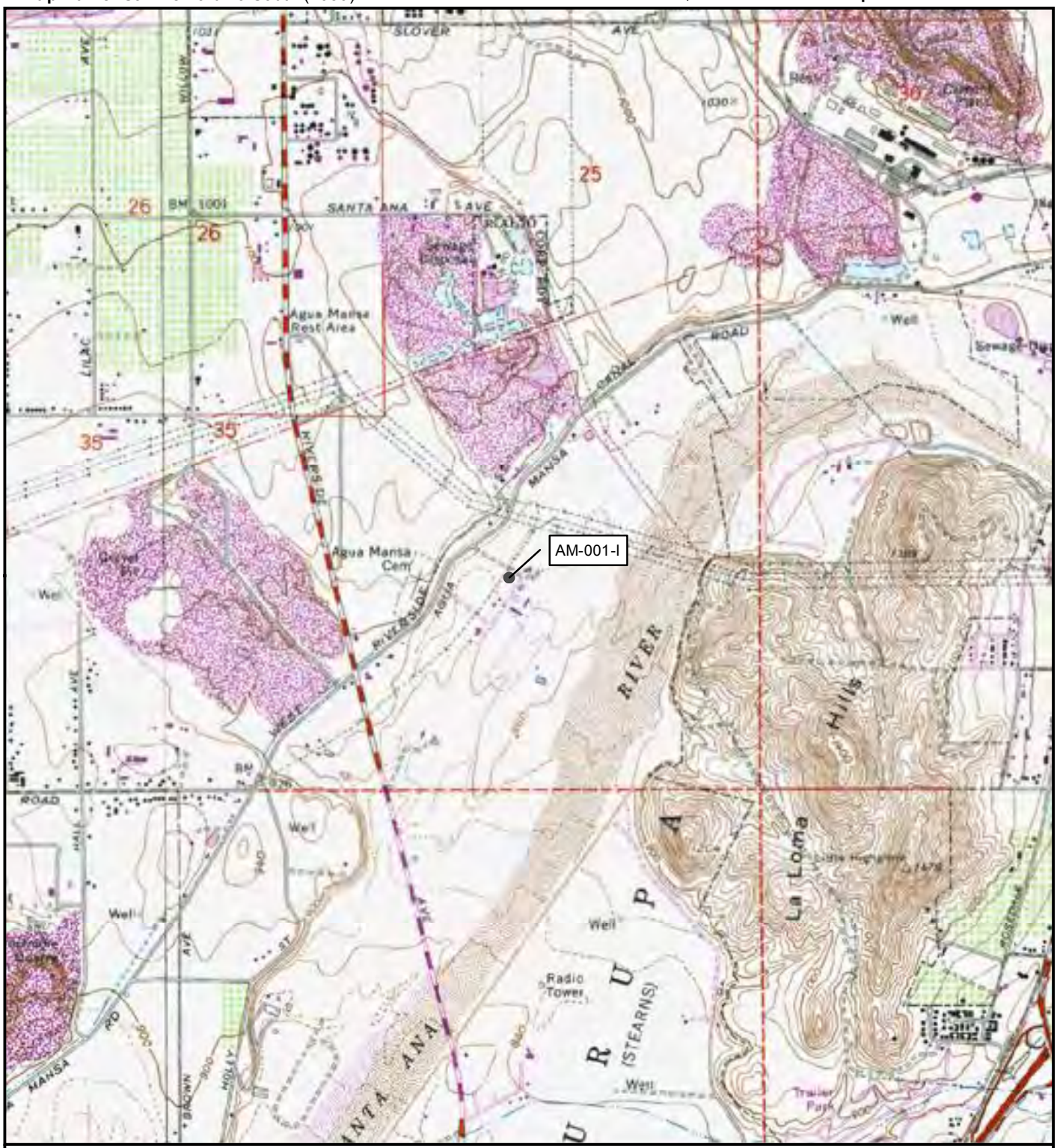
***Attachments:** ☐NONE ☒Location Map ☐Sketch Map ☐Continuation Sheet ☐Building, Structure, and O bject Record ☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐ Other (List):

State of California - The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
LOCATION MAP

Primary #
HRI #
Trinomial

Page 2 **of** 2 ***Resource Name or #:** AM-001-I

***Map Name:** San Bernardino Southn (1980) ***Scale:** 1:24,000 ***Date of Map:** 10/30/2013



Location: N:\2013\2013-133 Aqua Mansa Substation 6 sub to Z Global City of Colton\MAPS\Cultural_Resources\Location_Maps\AM-001_Location.mxd (j-mguidry 10/30/2013

***Required Information**

0 1,000 2,000 4,000 Feet
0 250 500 1,000 Meters

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

DPR 523J (1/95)

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary #
HRI #
Trinomial # CA-SBR-31677H
NRHP Status Code

Other Listings
Review Code | Reviewer | Date

 ***Resource Name or #:** AM-002

P1. Other Identifier: AM-002
***P2. Location:** ☒ **Not for Publication** ☐ **Unrestricted** ***a. County:** San Bernardino
***b. USGS:** San Bernardino South **Date:** 1967 rev 1980 **T**; 1N **R** 5W **of Sec** 36 San Bernardino B. M.
c. Address: N/A **City:** Colton **Zip:** 92324
d. UTM: NAD 83; Zone:11; 466809 **mE** 3766830 **mN**
e. Other Locational Data: **Elevation:** 872 feet AMSL
Directions: From the Rancho exit of Interstate 10, head south to Agua Mansa Road and turn right. Take Agua Mansa Road for 1.9 miles to Miguel Bustamante Parkway and turn left (southeast). Travel 0.17 mile on Miguel Bustamante Parkway to the entrance of the Agua Mansa Power Plant. Turn left onto the road leading into the power plant. The site is located approximately 133 meters at the end of this road on the right.

***P3a. Description:** This site consists of one-historic period barn (Feature 1), one historic-period concrete horse rehabilitation pond (Feature 2), and 1 glass artifact. Feature 1 is a wood-frame corrugated metal barn, Feature 2 is an empty concrete horse training pond with an isolated glass bottle base fragment, partially embossed with a Duraglas maker's mark located on the northern edge.

***P3b. Resource Attributes:** HP4: Ancillary Buildings

***P4. Resources Present:** ☒Building ☐Structure ☐Object ☐Site ☐District ☐Element of District ☐ Other (Isolates, etc.)

P5b. Description of Photo: Overview of Feature 1 and 2, Photo #186, View southeast,

***P6. Date Constructed/Age and Sources:** ☒Historic ☐Prehistoric ☐Both

***P7. Owner and Address:**
City of Colton Electrical Department
150 S. 10th Street
Colton, CA 92324

***P8. Recorded by:**
K. Lindgren, R. Cunningham

ECORP Consulting, Inc.
215 N. 5th Street
Redlands, Ca 92373

***P9. Date Recorded:** 10/29/2013

***P10. Survey Type:** Intensive pedestrian archaeological survey

***P11. Report Citation:**
Lindgren, Kristina and Roger D. Mason.
2014 *Cultural Resources Inventory and Evaluation of the Agua Mansa Substation Project*, *City of Colton, San Bernardino County, California*. Prepared by ECORP Consulting, Inc., Redlands, CA.

***Attachments:** ☐NONE ☒Location Map ☒Sketch Map ☐Continuation Sheet ☐Building, Structure, and O bject Record ☒Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☒Photograph Record ☐ Other (List):

State of California - The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

ARCHAEOLOGICAL SITE RECORD

Primary # :
Trinomial :

 Resource Name or Number (Assigned by recorder): AM-002

***A1. Dimensions: a. Length:** 77 meters (NE/SW) × **b. Width:** 42 meters (NW/SE)
Method of Measurement: ☐ Paced ☐ Taped ☒Visual estimate (with Google Earth) ☐ Other:
Method of Determination (Check any that apply.): ☐ Artifacts ☒Features ☐ Soil ☐ Vegetation ☐ Topography ☐ Cut bank ☐ Animal burrow ☐ Excavation ☐ Property boundary ☐ Other (Explain):
Reliability of Determination: ☒ High ☐ Medium ☐ Low Explain:
Limitations (Check any that apply): ☐ Restricted access ☐ Paved/built over ☐ Disturbances ☐ Site limits incompletely defined ☐ Vegetation ☐ Other (Explain):

A2. Depth: ☐ None ☒ Unknown Method of Determination:

***A3. Human Remains: ☐ Present ☐ Absent ☐ Possible ☒Unknown (Explain): Not tested**

***A4. Features (Number, briefly describe, indicate size, list associated cultural constituents, and show location of each feature on sketch map.):**

Feature 1 is a historic-period wood frame building, referred to by Agua Mansa Power Plant employees as "the Barn". It is covered in corrugated metal sheets, and is rectangular in shape, measuring approximately 57 feet northeast/southwest by 31 feet northwest/southeast. It has a gable roof approximately 25 feet tall from foundation to roof, and two large sliding doors, one on the southwest façade and one on the northeast façade. One plywood door in an unfinished wood frame is located on the southeast façade. The door is approximately 6' high. Three visible utility poles have been incorporated into the construction of the building, and are located in the door on the southeast façade, in the east corner and in the south corner. The utility pole incorporated into the door on the southeastern face is located to the left of the door frame, which is fixed to this pole. The pole near the door is dark and looks to be treated with creosote. The height of the pole is unknown as it terminates inside of the structure. The second utility pole is incorporated in the structure frame on the east corner and is connected to an outside utility line. The third utility pole is incorporated into the south corner. One large industrial light is mounted on the southeast façade. The barn has a poured-concrete slab foundation. There are two poured-concrete pads located at both large sliding doors on southwest and northeast facades.

Feature 2 is a circular, concrete-lined horse rehabilitation pond, which is currently empty of water. It is approximately 105 feet in diameter. The pond has a central "turret" constructed from concrete that is approximately 8 feet tall from the pond bottom and four courses of cinder blocks. The turret is topped with approximately 2 ½' metal railing. The turret has a steel and plywood gang plank extending to northeast edge of horse pond. The gang plank is mounted to a cinderblock base on the northeast edge of horse pond. The base is supported by four utility type poles. The base is approximately 3 feet high at the northeast end and approximately 8 feet high at the southwest end, due to slope of pond. A horse holding area is attached to the base. The holding area is located to the north, and consists of two cinder block walls approximately 8 feet high, on a concrete pad. The area is lined with rubber mats. The walls are 9 courses of cinder blocks. The concrete leading into the pond from the holding area is undulated for traction, creating seven steps into the pond. This is also lined with rubber mats. Rubber mats are located south of the gang plank base, but the lining is only slightly undulating here. The pond contains two pump mounts located within pond, both approximately 5 feet from the outer edge of the pond. The mounts consist of 5-7 courses of concrete cornered brick capped by a concrete pad. Height ranges from 1 foot, 7 inches to 2 feet, 3 inches (due to slope of pond). The mounts measure 2 feet 8 inches by 2 feet across. A concrete encased pipe leads from rear of mount to edge of pond.

***A5. Cultural Constituents (Describe and quantify artifacts, ecofacts, cultural residues, etc., not associated with features.):**
A brown glass bottle base fragment partially embossed with a scripted Duraglas maker's mark was found on the northwestern edge of the horse pond. This maker's mark was in use from 1940-1963 (Toulouse 1971).

A6. Were Specimens Collected? ☒ No ☐ Yes (If yes, attach Artifact Record or catalog and identify where specimens are curated.)

***A7. Site Condition: ☐ Good ☒ Fair ☐ Poor (Describe disturbances.):**

***A8. Nearest Water (Type, distance, and direction.):** Santa Ana River located 585 meters to the southeast

***A9. Elevation:** 870 feet AMSL

A10. Environmental Setting (Describe culturally relevant variables such as: vegetation, fauna, soils, geology, landform, slope, aspect, exposure, etc.): Vegetation consists of a planted lemon tree between features, and an ornamental tree of unknown species located outside the northwest façade.

A11. Historical Information: McKenna states in an oral interview with previous owner Mr. Beckett in 1993 that all structures on this property were built approximately 25 years ago (in 1993), in support of the horse breeding and rehabilitation facility. (McKenna 1993)

***A12. Age: ☐ Prehistoric ☐ Protohistoric ☐ 1542-1769 ☐ 1769-1848 ☐ 1848-1880 ☐ 1880-1914 ☐ 1914-1945 ☒ Post 1945 ☐ Undetermined (Describe position in regional prehistoric chronology or factual historical dates if known):**

State of California - The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
ARCHAEOLOGICAL SITE RECORD

Primary # :
Trinomial :

 Resource Name or Number (Assigned by recorder): AM-002

A13. Interpretations (Discuss data potential function[s], ethnic affiliation, and other interpretations):

A14. Remarks: These structures were recorded and evaluated because they are slated for demolition under the proposed Agua Mansa Substation Project. AM-002 was evaluated for the CRHR using the four standard eligibility criteria and seven elements of integrity criteria outlined in *Section 4.6 Evaluation Methods*. According to the archival research, Feature 1 (the corrugated metal barn) was built in 1966-1967 and is therefore 46-47 years old. Feature 2 (the horse pond) was built immediately after, most likely late 1967, making it also 46 years old. As these fall close to the 50-year historic period threshold, they were both evaluated.

Archival research and additional fieldwork did not show that these two features were related to an event that was significant in the region's history. The most significant historic event in the region was related to Santa Ana River flooding and the New Mexican pioneers dating over 100 years prior. Therefore, site AM-002 is not significant under Criteria 1.

Research into the previous owners of the property did not reveal any persons identified with significant events in the regions' history. Therefore, the two features of site AM-002 are not eligible under Criteria 2 of the CRHR. The corrugated metal and wood frame structure (Feature 1) and the concrete horse pond (Feature 2) are of conventional design, lacking architectural distinction, and do not strongly embody the distinctive characteristics of any period, type, or method of construction. These were utilitarian structures designed for use in breeding and rehabilitating horses. Thus, site AM-002 is not considered eligible under Criteria 3 of the CRHR.

The two features as they stand alone do not provide additional information into their former use as a horse breeding and rehabilitation facility and therefore, do not provide information important to the prehistory or history of the local area, California, or the nation. Therefore, the site AM-002 is not considered eligible under Criteria 4 of the CRHR.

A15. References (Documents, informants, maps, and other references):

McKenna, Jeanette
1993 *Cultural Resources Investigations and Historic Research for the Santa Ana Watershed Project Authority Site 1 Project Area and Associated Soil Testing Areas, Agua Mansa, San Bernardino County, CA.* On file at the San Bernardino County Archaeological Information Center, San Bernardino, CA

Toulouse, Julian Harrison
1971 *Bottle Makers and their Marks.* Thomas Nelson, Inc: New York.

A16. Photograph (List subjects, direction of view, and accession numbers or attach a Photograph Record.): Camera C12-11Photos 159, 161 and 178
Original Media/Negatives Kept at: ECORP Consulting, Inc.

***A17. Form Prepared by:** Kristina Lindgren **Date:** November 4, 2013

***Affiliation and Address:** ECORP Consulting, Inc., 215 N. 5th Street, Redlands, CA 92373

State of California - The Resources Agency
DEPARTMENT OF PARKS AND RECREATION **Primary #:**
CONTINUATION SHEET **HRI#/Trinomial:**

 ***Resource Name or Number (Assigned by recorder):** AM-002
***Recorded by:** ECORP Consulting, Inc. ***Date:** 10/29/2013 ☒ **Continuation** ☐ **Update**

Feature 1 (AM-002): Southwest and Southeast Facade. Photo # 159

Feature 1 (AM-002): Southeast and Northeast Façade. View West. Photo # 161

State of California - The Resources Agency
DEPARTMENT OF PARKS AND RECREATION **Primary #:**
CONTINUATION SHEET **HRI#/Trinomial:**

Page 5 **of** 7 ***Resource Name or Number (Assigned by recorder):** AM-002
***Recorded by:** ECORP Consulting, Inc. ***Date:** 10/29/2013 ☒ **Continuation** ☐ **Update**

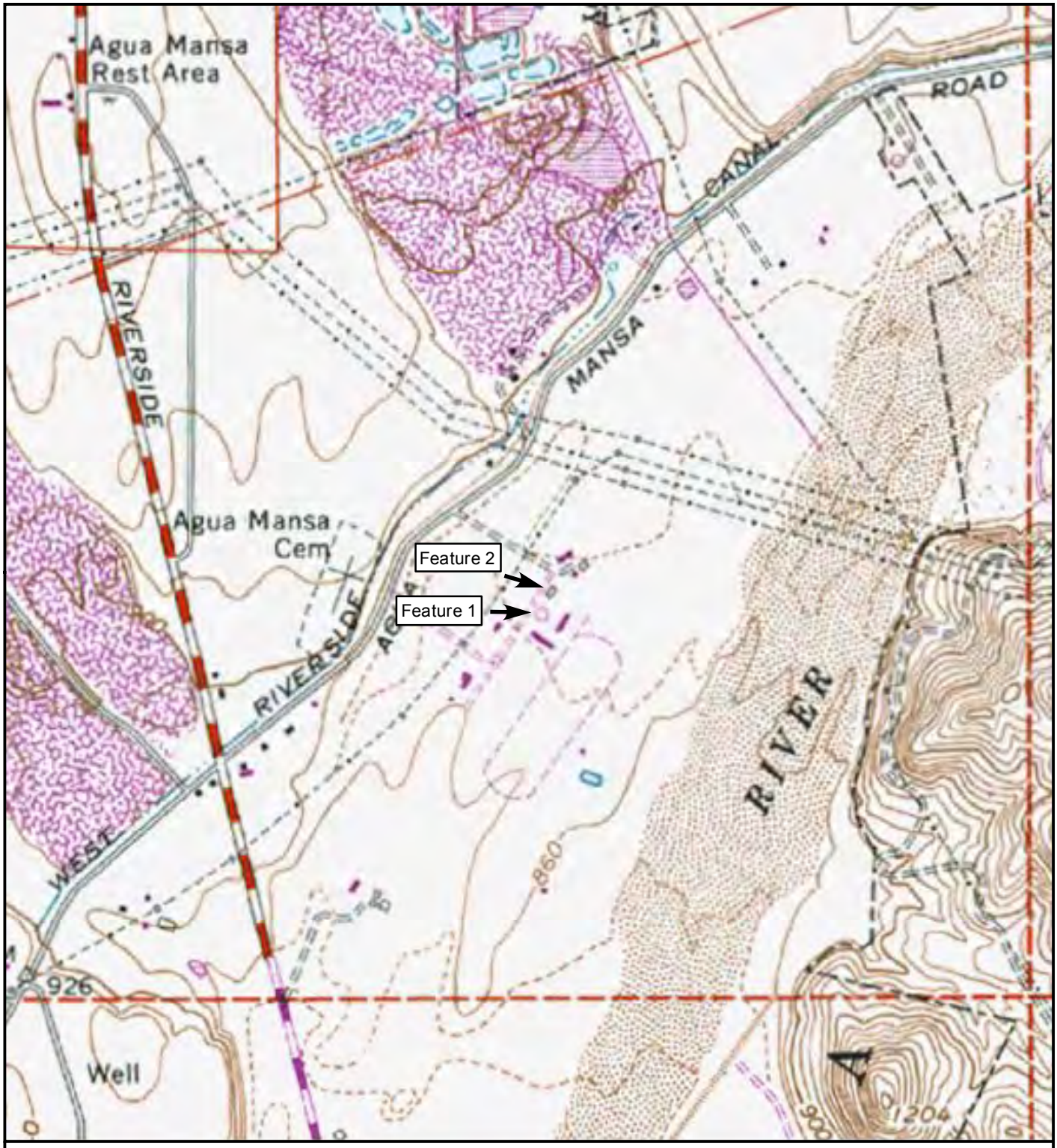
Feature 2 (AM-002): Overview of Horse Rehabilitation Pond, with Barn in Background. View Northeast Photo # 178

State of California - The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
SKETCH MAP

Primary #
HRI #
Trinomial

Page 6 **of** 7 ***Resource Name or #:** AM-002

***Drawn By:** Kristina Lindgren ***Date:** 10/29/2013



***Required Information**

0 200 400 800 1,200 1,600 2,000 Feet
0 250 500 Meters

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

DPR 523K (1/95)

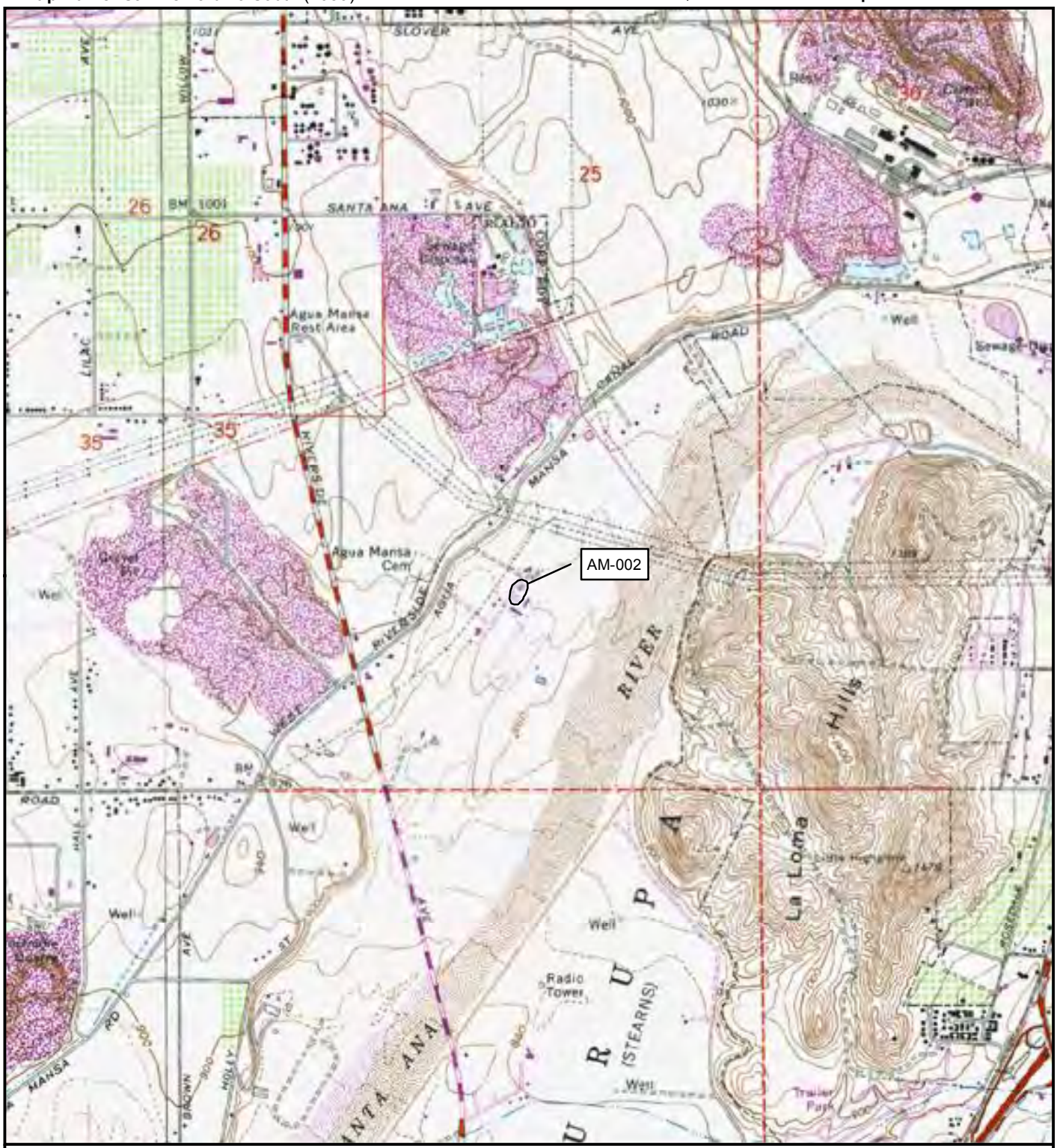
Location: \\Rocklin\MAP PNG DATA\2013\2013-133 Agua Mansa Substation 6 sub to Z Global City of Colton\MAPS\Cultural_Resources\Sketch_Maps\AM-002_Sketch_v2.mxd *jmgudry 11/1/2013*

State of California - The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
LOCATION MAP

Primary #
HRI #
Trinomial

Page 7 **of** 7 ***Resource Name or #:** AM-002

***Map Name:** San Bernardino Southn (1980) ***Scale:** 1:24,000 ***Date of Map:** 10/30/2013



Location: N:\2013\2013-133 Aqua Mansa Substation 6 sub to Z Global City of Colton\MAPS\Cultural_Resources\Location_Maps\AM-002_Location.mxd (MGudry) -mgudry 10/30/2013

***Required Information**

0 1,000 2,000 4,000 Feet
0 250 500 1,000 Meters

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

DPR 523J (1/95)

State of California—The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary # _____
HRI # _____
Trinomial CA-SBR-31715H
NRHP Status Code _____
Other Listings _____
Review Code _____ Reviewer _____ Date _____

Page 1 of 9 *Resource Name or # (Assigned by recorder) Agua Mansa Ditch CRM TECH 2946-1H

P1. Other Identifier: Agua Mansa Ditch

*P2. Location: ☐ Not for Publication ☒ Unrestricted

*a. County San Bernardino and (P2c, P2e, and P2b or P2d. Attach a Location Map as necessary.)

*b. USGS 7.5' Quad San Bernardino South, Calif. Date 1980
T1S; R5W; S.B. B.M. [a portion of the Jurupa (Stearns) land grant]

c. Address N/A City Colton Zip 92324

d. UTM: (Give more than one for large and/or linear resources) Zone 11; A: 467,593 mE/ 3,767,808 mN
B: 467,262 mE/ 3,767,441 mN

UTM Derivation: ___USGS Quad _√_ GPS (NAD 83)

e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, decimal degrees, etc., as appropriate) The segment of the ditch reported on here is located in the field between Agua Mansa Road and the Santa Ana River, beginning approx. 1 mile west of S. Rancho Avenue, within APNs 0260-072-01 to -04, -15, and -16. The northeast end (Point A)is about 400 feet south-southeast of Agua Mansa Road while the southwest end (Point B)is about 700 feet south-southeast of the road. The alignment is approx. 880 feet above mean sea level.

*P3a. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)
The site consists of a portion of the Agua Mansa Ditch. The ditch was encountered at depths varying from 6 inches to 1 foot below the ground surface. The ditch would have originally been an unlined open channel with, possibly, some portions being rock-lined. The segment encountered here is now concrete-lined. The sloping sidewalls often contain rounded river rocks that were split, with the flat surfaces set in a layer of mortar 0.5 to .75 inches thick. Smaller rocks were used to support these larger split rocks. The concrete bottom of the ditch is typically approx. 26 inches wide and 3 inches thick. The sloping side walls are about 12 inches high.

*P3b. Resource Attributes: (List attributes and codes) HP20: Canal (segment)

*P4. Resources Present: ☐ Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other (isolates, etc.)

P5a. Photograph or Drawing (Photograph required for buildings, structures, and objects.)

P5b. Description of Photo (view, date, accession #): Facing northeasterly; 07/09/2015

*P6. Date Constructed/Age and Sources:
☒ Historic ☐ Prehistoric ☐ Both
Ca. 1862 (see Items L3 and L7 for details)

*P7. Owner and Address:
N/A

*P8. Recorded by (Name, affiliation, and address): John Goodman, CRM TECH, 1016 East Cooley Drive, Suite A/B, Colton, CA 92324

*P9. Date Recorded: 07/8-10/2015

*P10. Survey Type (describe):
Archaeological monitoring for CEQA-compliance

*P11. Report Citation: (Cite survey report and other sources, or enter "none.") See Continuation Sheet, page 9

*Attachments: ☐None ☒ Location Map ☒Sketch Map ☒Continuation Sheet ☐Building, Structure, and Object Record
☒Archaeological Record ☐District Record ☒Linear Resource Record ☐Milling Station Record ☐Rock Art Record
☐Artifact Record ☐Photograph Record ☒Other (List): Easement map

State of California—The Resources Agency **Primary #**
DEPARTMENT OF PARKS AND RECREATION **Trinomial**

ARCHAEOLOGICAL SITE RECORD

 ***Resource Name or #** (Assigned by recorder) Agua Mansa Ditch CRM TECH 2946-1H

A1. **Dimensions:** **a. Length** 1,700 feet **b. Width** 30 inches
Method of Measurement: ☐ Paced ☐ Taped ☐ Visual estimate Other: GIS / USGS quad.
Method of Determination (Check any that apply.): ☐ Artifacts ☒ Features ☐ Soil ☐ Vegetation ☐ Topography
☐ Cut bank ☐ Animal burrow ☒ Excavation ☐ Property boundary ☒ Other (Explain): ALTA map showing easement; backhoe excavations at various locations
Reliability of Determination: ☐ High ☒ Medium ☐ Low Explain: Not found in all backhoe cuts.
Limitations (Check any that apply): ☐ Restricted access ☐ Paved/built over ☒ Site limits incompletely defined
☒ Disturbances ☐ Vegetation ☐ Other (Explain): Explored only in area indicated. The property was previously used as a chicken ranch and then a paintball park.

A2. **Depth:** 12 in. ☐ None ☐ Unknown Method of Determination: Backhoe and tape measure

***A3.** **Human Remains:** ☐ Present ☒Absent ☐ Possible ☐ Unknown (Explain):

***A4.** **Features** (Number, briefly describe, indicate size, list associated cultural constituents, and show location of each feature on sketch map.):
The Agua Mansa Ditch; see Items L3, L6, and L7 below

***A5.** **Cultural Constituents:** (Describe and quantify artifacts, ecofacts, cultural residues, etc., not associated with features.): None

***A6.** **Were Specimens Collected?** ☒ No ☐ Yes (If yes, attach Artifact Record or catalog and identify where specimens are curated.)

***A7.** **Site Condition:** ☐ Good ☒ Fair ☐ Poor (Describe disturbances.): see A1. Limitations

***A8.** **Nearest Water** (Type, distance, and direction.): The Santa Ana River is located approx. 860 ft. southeast from the site.

***A9.** **Elevation:** Approx. 880 ft. above mean sea level.

A10. Environmental Setting: (Describe culturally relevant variables such as vegetation, fauna, soils, geology, landform, slope, aspect, exposure, etc.):
The property is surrounded by open land to the south, east, and west. Agua Mansa Road borders the property on the north. The site is located on relatively level ground. The property had been mostly cleared of vegetation at the time of the fieldwork, but some fiddle necks, tumbleweeds, foxtails, wild mustard, datura, small grasses and scrubs were present. Soils in the top 10 inches consist of silty sand with plant roots and rodent burrows; well-sorted flood sands were encountered from 10 to 38 inches; and a semi-compacted silty sand was found below 38 inches.

A11. Historical Information: The ditch was originally constructed to bring water to the fields of the town of Agua Mansa. See L3, L6, and L7, below.

***A12.** **Age:** ☐ Prehistoric ☐ Protohistoric ☐1542-1769 ☐ 1769-1848 ☐ 1848-1880 ☒1880-1914 ☐1914-1945
☐ Post 1945 ☐ Undetermined **Describe position in regional prehistoric chronology or factual historic dates if known:**
The Agua Mansa Ditch was constructed in 1862 as a part of the rebuilding effort after the flood that washed out the village of Agua Mansa had also deposited a layer of sand over the fields, making irrigation necessary (Scott 1977:70). The "crude" (undoubtedly earthen) ditch was among the earliest in the area and integral to the growth of the rebuilt Agua Mansa settlement. In 1885, the ditch was extended north and east to meet the Meeks and Daley Ditch (*ibid.*:64). But by 1900, very little agriculture was occurring in Agua Mansa.

A13. Interpretations (Discuss data potential, function[s], ethnic affiliation, and other interpretations): The ditch was used by early Hispanic/Americans to irrigate their agricultural fields.

A14. Remarks: Exploratory excavations encountered the ditch only at certain locations within the project area.

A15. References (Documents, informants, maps, and other references.): See Continuation Sheet, page 9

A16. Photographs (List subjects, direction of view, and accession numbers or attach a Photograph Record.):
Original Media/Negatives Kept at: CRM TECH, 1016 East Cooley Drive, Ste.B, Colton, CA 92324

***A17.** **Form Prepared by:** John Goodman, Michael Hogan, Salvadore Boites **Date:** 05/12/2017
Affiliation and Address: CRM TECH, 1016 East Cooley Drive, Suite A/B, Colton, CA 92324

State of California—The Resources Agency **Primary #** _____
DEPARTMENT OF PARKS AND RECREATION **HRI #** _____
LINEAR FEATURE RECORD
Trinomial _____

Page 3 **of** 9 ***Resource Name or #** (Assigned by recorder) Agua Mansa Ditch CRM TECH 2946-1H

L1. Historic and/or Common Name: Agua Mansa Ditch

L2a. Portion Described: ☐Entire Resource ☒Segment ☐ Point Observation **Designation:** _____

b. Location of Point or Segment: (Provide UTM coordinates, legal description, and any other useful locational data. Show the area that has been field inspected on a Location Map.)

UTM coordinates (NAD 83) of endpoints **A:** 467,593 **mE**/ 3,767,808 **mN**
B: 467,262 **mE**/ 3,767,441 **mN**

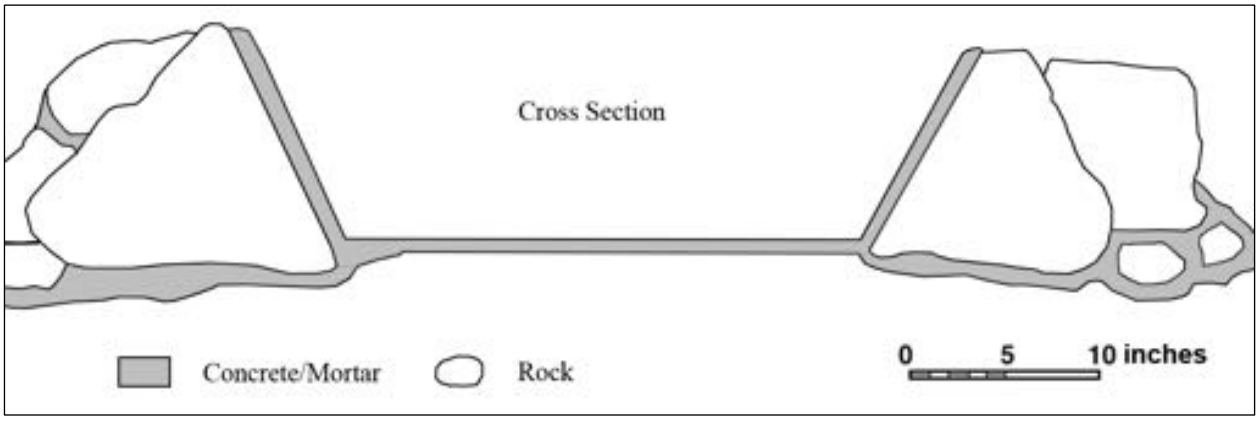
The easement is shown on the ALTA land title site survey map (see attached): "An easement shown or dedicated on the map of subdivision of the Bandini Donation recorded July 29, 1886 and on file in Book 3, page 24, of Tract maps. For: Agua Mansa Ditch and incidental purposes. *Approximate location shown hereon" (see Continuation Sheet, page 5).

L3. Description: (Describe construction details, materials, and artifacts found at this segment/point. Provide plans/ sections as appropriate.)

The ditch would have originally been unimproved, cut into the ground, but possibly with segments rock- or wood-lined. The portions of the segment encountered here had been concrete-lined. The sloping sidewalls often contain rounded river rocks that were split, with the flat surfaces making the inner wall of sides of the ditch. They were set in a layer of mortar 0.5 to 0.75 inches thick. Smaller rocks were used to support these larger split rocks. The bottom of the ditch is typically approx. 26 inches wide, with the concrete about 3 inches thick. The sloping side walls are about 12 inches high. The ditch was encountered at depths varying from 6 inches to 1 foot below the ground surface.

L4. Dimensions: (In feet for historic features and meters for pre-historic features)
- **a. Top Width** approx. 38 inches
- **b. Bottom Width** approx. 26 inches
- **c. Depth** approx. 12 in
- **d. Length of Segment** approx.1,700 ft

L4e. Sketch of Cross-Section (Include scale)
Facing: Northeast



L5. Associated Resources: none

State of California—The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
LINEAR FEATURE RECORD (cont.)

Primary #
HRI #
Trinomial

 *Resource Name or # (Assigned by recorder) Agua Mansa Ditch CRM TECH 2946-1H

L6. Setting (Describe natural features, landscape characteristics, slope, etc. as appropriate) This segment of the ditch is located above the bank of the north side of the Santa Ana River. The land is relatively level in this area. Trenching revealed that the soils consist of an upper disturbed soil stratum of silty sand with plant roots and rodent burrows that extended to a depth of approx. 10 inches; well-sorted flood sands were encountered from 10 to 38 inches, and a semi-compacted silty sand was found below 38 inches. The area had undoubtedly been farmed in the past, and by at least 1938 the City of Colton had installed a wastewater treatment plant near the eastern end of the segment of the ditch reported on here. By the 1970s a chicken ranch was in operation on the property, and by 2009 the area had been converted into an outdoor paintball field/park (historicalaerials.com).

L7. Integrity Considerations: The Agua Mansa Ditch was constructed in 1862 as a part of the rebuilding effort after the flood that washed out the village had also deposited a layer of sand over the agricultural fields, making irrigation necessary (Scott 1977.:70). The "crude" ditch was among the earliest in the area and integral to the growth of the rebuilt Agua Mansa settlement. Initially used to irrigate some 300 acres of "bottom land," by 1880 that number had dropped to around 116 acres (Scott 1977:70). Owners of the ditch incorporated as the Agua Mansa Water Company in 1885, and sold a third interest to the North Riverside Land and Water Company in 1887 (*ibid.*). In the same year, the ditch was extended north and east to meet the Meeks and Daley Ditch (*ibid.*:64). As the rising water table in the vicinity significantly diminished arable land in the low-lying area, by 1900 very little of the original Agua Mansa land was under cultivation (*ibid.*:68, 70). A deep frost in 1913 killed much of local citrus and other crops, further sealing the demise of the ditch (*ibid.*:68; Garcia and Rockman 2007:3). The ditch would have been an earthen canal, with, possibly, parts lined with rocks or wood. At some point, it was lined with concrete, possibly after being connected to the Meeks and Daley Ditch. The course of this recorded segment of the ditch is still visible in the 1938 aerial photo of the area (historicalaerials.com). It is unclear if the ditch was buried by nature (a flood episode) or by man. As noted previously, a chicken ranch and then a paintball park operated on this land. The town of Agua Mansa, and the Agua Mansa Ditch represent vestiges of a colorful chapter of the Agua Mansa area's early history, with both the former village and the ditch continuing to enjoy a high level of local historical interest. The fact that the segment of the ditch reported on here has been lined with concrete reduces the site's integrity as it relates to this early period of the history of the area. However, the ditch did continue to play a role in the irrigation and water transport into the early 1900s. This segment of the ditch relates to this later period of the history of the area.

L8a. Photograph, Map or Drawing
See P5a and L4e above and Continuation sheets below

L8b. Description of Photo, Map, or Drawing (View, scale, etc.) See P5a and L4e above and continuation sheets below

L9. Remarks: Ditch not present at all trench excavation locations; see Continuation sheet below.

L10. Form Prepared by: (Name, affiliation and address) John Goodman, Michael Hogan, and Sal Boites, CRM TECH, 1016 E. Cooley Drive, Suite B; Colton, CA 92324

L11. Date: Aug. 28, 2017

State of California - Natural Resources Agency
DEPARTMENT OF PARKS AND RECREATION

Primary#
HRI #
Trinomial

CONTINUATION SHEET

Property Name: Agua Mansa Ditch CRM TECH 2946-1H

State of California—The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
LOCATION MAP

Primary #
HRI #
Trinomial

Page 6 of 9 *Resource Name or # (Assigned by recorder) Agua Mansa Ditch CRM TECH 2946-1H
*Map Name: San Bernardino South, Calif. *Scale: 1:24,000 *Date of Map: 1980

*Required information

State of California—The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
SKETCH MAP

Primary #
HRI #
Trinomial

Page 7 of 9 *Resource Name or # (Assigned by recorder) Agua Mansa Ditch CRM TECH 2946-1H

*Drawn by: Daniel Ballester *Date of Map: 06/14/2015

DPR 523K (Rev. 1/1995)(Word 9/2013) NOTE: Include bar scale and north arrow.

State of California - Natural Resources Agency
DEPARTMENT OF PARKS AND RECREATION

Primary#
HRI #
Trinomial

CONTINUATION SHEET

Property Name: Agua Mansa Ditch CRM TECH 2946-1H
Page 8 of 9

Recorded by: John Goodman & Daniel Ballester ***Date:** March 21, 2016

Table 1. Summary of Soil and Trench Attributes from Backhoe Exposure of the Ditch.

Trench #	Location	Length (Ft)	Width (In)	Depth of Trench (Ft)	Comment
1	SW corner	100	24	6	Ditch found at 11-1/2 inches below the surface; ditch impacted in this area with loose rocks and mortar, but ditch outline is apparent
2	SW corner	100	24	6	Ditch not encountered; impacted in this area
3	SW area	70	24	6	Ditch not encountered; impacted in this area
4	SW area	100	24	8	Ditch not encountered; impacted in this area
5	Central area	100	24	8	Ditch not encountered; impacted in this area
6	NE area	100	24	8	Intact ditch found at 6 inches below surface
7	East central	70	24	8	Intact ditch found at 6 inches below the surface
8	East central	100	24	8	Intact ditch found at 8 inches below surface

State of California - Natural Resources Agency
DEPARTMENT OF PARKS AND RECREATION

Primary#
HRI #
Trinomial

CONTINUATION SHEET

Property Name: Agua Mansa Ditch CRM TECH 2946-1H
Page 9 of 9

***P11. Report Citation; and** A15. References

Garcia, Kyle, and Marcy Rockman
2007 Results of Cultural Resource Assessment for the GO-131D Project Evaluation in Colton, California. On file, Archaeological Information Center, San Bernardino County Museum, Redlands.

HistoricAerial.com
1938-1959 Aerial photographs of project vicinity, taken in 1938, 1948, and 1959. Http://www.historicaerials.com.

Scott, M. B.
1977 Development of water facilities in the Santa Ana River Basin, California, 1810-1968: A Compilation of Historical Notes Derived from Many Sources Describing Ditch and Canal Companies, Diversions, and Water Rights. USGS Publications Warehouse; Open File Report; http://pubs.er.usgs.gov/publication/ofr77398.

Appendix D: Geotechnical Exploration and Review of Grading and Improvement Plan

NMG Geotechnical, Inc.

January 16, 2023

Project No. 20079-02

To: Dopudja & Wells Consulting
6789 Quail Hill Parkway, #421
Irvine, CA 92603

Attention: Mr. Stephen Dopudja

Subject: Geotechnical Exploration and Review of Grading and Improvement Plan, Proposed Lake Rialto, City of Rialto, County of San Bernardino, California

In accordance with your request and authorization, NMG Geotechnical, Inc. (NMG) has performed a geotechnical exploration and review of the grading and improvement plan for the proposed Lake Rialto, in the city of Rialto, California. We have reviewed the grading and improvement plan of the proposed lake prepared by Wilson Mikami Corporation, received on November 29, 2022. The site is located south of the Waste Water Treatment Plant (WWTP) located at 501 E. Santa Ana Avenue in an industrial area of the city of Rialto (Figure 1). The subject property is a topographically low area that was historically used as sand and gravel quarries and infiltration ponds.

NMG previously performed a geotechnical exploration of a portion of the subject site in 2010 for a proposed bio-fuel production plant. Related to that plant, we also performed geotechnical exploration of a portion of the Agua Mansa Landfill property to the south and the Holliday property to the west. Plans for the plant did not move beyond the initial feasibility studies. The pertinent boring and trench data from these studies were compiled and reviewed prior to drilling three additional hollow-stem-auger borings. The pertinent data from the prior studies are also included in this report.

The main geotechnical issues for this proposed habitat and lake project are:

- Stability of the perimeter slopes, especially during emptying and re-filling of the lake;
- Erodibility and potential soil piping of the sandy alluvium;
- Impact of lake development on existing slopes and adjacent properties, including existing electric transmission towers along the southern portion of the site;
- Presence of uncertified fills placed during prior grading/disposal at the site;
- Presence of the Agua Mansa Landfill rubble material along the southern boundary of the subject site; and
- The potential for strong seismic shaking.

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This report provides our geotechnical findings and conclusions, and provides preliminary recommendations for project design, grading and construction. The project aspects related to potential hazardous materials, groundwater quality and biological concerns are not under the purview of NMG.

If you have any questions regarding this report, please contact our office. We appreciate the opportunity to provide our services.

Respectfully submitted,

NMG GEOTECHNICAL, INC.

Terri Wright, CEG 1342
Principal Geologist

Ted Miyake, RCE 44864
Principal Engineer

TW/TM/je

Distribution: Addressee (E-Mail)
Mr. Scott Wilson, Wilson-Mikami (E-Mail)

DRAFT

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Figures

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Figure 2 – Regional Active Fault Map – Rear of Text

Appendices

Appendix A – References
Appendix B – Boring, CPT and Trench Logs
Appendix C – Laboratory Test Results
Appendix D – Seismic Data
Appendix E – Slope Stability Analysis
Appendix F – General Earthwork and Grading Specifications

Plates

Plate 1 – Geotechnical Map
Plate 2 – Remedial Measures Map
Plate 3 – Cross-Sections A-A' through E-E'

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1.0 INTRODUCTION

1.1 Purpose and Scope of Services

NMG Geotechnical, Inc. (NMG) has performed geotechnical exploration at the proposed Lake Rialto located to the south of the Waste Water Treatment Plant (WWTP) in the city of Rialto, County of San Bernardino, California. This study included a geotechnical review of the grading and improvement plan titled "City of Rialto Grading and Improvement Plan" (Sheets 1 through 10 of 10), prepared by Wilson Mikami Corporation (WMC) and received by NMG on November 29, 2022. The purpose of our study was to evaluate the site conditions, identify potential geotechnical issues and constraints, and to provide remedial grading measures for the proposed grading. We have worked with the project team, including Dopudja & Wells Consulting, WMC as civil engineer, Buck Associates Consultants as biologist, and the City of Rialto as reviewers for the past two years.

This report presents our geotechnical findings, conclusions, and recommendations for design, grading and construction. This report includes appendices with pertinent references (Appendix A); geotechnical boring, CPT and trench logs (Appendix B); laboratory test data (Appendix C); updated seismic analysis (Appendix D); slope stability analysis (Appendix E); and General Earthwork and Grading Specifications (Appendix F). Illustrations include Site Location and Regional Fault Map (Figures 1 and 2); Geotechnical Map (Plate 1); Remedial Measures Map (Plate 2); and Geologic Cross-Sections (Plate 3).

Our scope of services for this study includes the following.

- **Background and Aerial Photo Review:** The background review included researching and compiling geotechnical data related to the site, including both published and unpublished reports, maps, and records of groundwater data. This study also included a review of stereoscopic pairs of aerial photographs dating back to 1930, and review of topographic maps dating back to 1901. The collected data were compiled onto a map. A list of the reviewed references is included in Appendix A.
- **Site Reconnaissance:** NMG visited the site to evaluate current site conditions, map the limits of the landfill and the perimeter slope conditions, and to locate and stake boring locations prior to our subsurface exploration. We also reviewed site locations with representatives of the WWTP and contacted DigAlert for utility clearance prior to the field work.
- **Subsurface Exploration:** The additional subsurface exploration consisted of excavation, sampling, and surface logging of three additional hollow-stem-auger borings at the site (H-1 through H-3). The logs of these and prior borings, CPTs and trenches by NMG and others are presented in Appendix B. Their locations are shown on the Geotechnical Map (Plate 1).
- **Laboratory Testing:** Laboratory testing of selected earth materials was conducted in general conformance with applicable ASTM test standards for soil classification and evaluation of engineering properties. Test results from this and prior studies are summarized and presented in Appendix C. The in-situ moisture content and dry density data are included on the geotechnical boring logs (Appendix B).

- **Geotechnical Analysis:** Geotechnical analysis of the collected data included preparation of a geotechnical map, creating an overall geologic and hydrogeologic site model, developing geologic cross-sections, and preparation of geotechnical boring logs. We evaluated and analyzed the proposed conceptual grading in light of general slope stability, settlement and liquefaction potential. The seismic data is updated per the 2022 California Building Code. Analyses were also performed to provide general recommendations for design of foundations and structures.
- **Report Preparation:** We prepared this report, which includes preliminary recommendations related to future lake design, rough grading, design of structures and construction, with accompanying illustrations and appendices.

Please note our scope of work did not include biological assessment of the site or environmental evaluations of the subsurface soil or groundwater.

1.2 Site Location and Description

The roughly 14.5-acre site is located south of the WWTP located at 501 E. Santa Ana Avenue in an industrial area of the city of Rialto (Figure 1). Current access to the site is through the plant. The subject property is an undeveloped area that was historically used for sand and gravel quarries and as infiltration ponds for the WWTP. The site is a topographically low area that has been graded many times in the past, resulting in a number of areas of undocumented fills (Plate 1). The elevations within the site vary from a high of 935 feet above mean sea level (msl) at the southwest corner to a low of 878 feet msl in the eastern basin area. The bottom of the western basin varies from 892 to 900 feet msl and the eastern basin from 878 to 890 feet msl.

There are three WWTP clarifier tanks located to the northwest of the site, with a concrete drainage channel that outlets into a rip-rap pad (an infiltrates) in the northern-central portion of the site. A chain link fence separates the WWTP from the subject site. There is also a bioenergy facility northeast of the lake site with tanks and equipment pads that is also enclosed with a chain link fence. The Agua Mansa landfill (construction and demolition debris) is located to the south of the site.

The Rialto Channel is a concrete lined channel located immediately east of the site and the landfill. Currently, secondary treated effluent water from the WWTP is discharged to the channel. This channel extends to the south approximately 3,200 feet and drains into a meander in the Santa Ana River.

There are two Southern California Edison (SCE) easements that cross the southern portion of the site in an east-west direction. The overhead power line easements have three metal and wood towers/poles located within the project limits (shown on Plate 1). There is also an underground pipeline associated with the waste water treatment plant that exists along the eastern side of the site, between the WWTP and the Rialto Channel.

The eastern basin has been used as an equipment yard and is relatively free of vegetation. The western basin is covered with grasses, shrubs and some trees.

1.3 Site History

Our review of historic aerial photographs dating back to 1930 and historic topographic maps dating back to 1901 revealed the following.

- Agua Mansa Road and Riverside Avenue appear on the 1901 topographic map.
- Prior to 1930, the sites were essentially in their natural condition as a flat alluvial plain with low grasses and dirt roads. It appears there was a dirt road traversing the southern side of the property with an overhead power line. The original topography ranged in elevation from approximately 950 to 1,000 feet msl, sloping gently toward the southwest.
- In 1959, it appears the northern portion of the waste water treatment plant had been constructed, with several ponds at the WWTP and two large basin excavations in the area of the subject site that appear to have water in the bottom. A sand and gravel quarry was being excavated to the west and northwest of the site, extending slightly onto the landfill property to the southwest.
- By 1966, a larger basin was added to the north of the two basins seen in the 1959 photos. Between 1966 and 1980, these basins had various amounts of water and sediment. Also, it appeared that the shape of the basins had been modified throughout this time and there were more structures constructed at the WWTP. The Rialto Channel appears to have been constructed by 1978.
- By 1977, the Agua Mansa landfill site had been mined extensively for sand and gravel and the southern portion of the site consisted of a deep pit that had filled with groundwater. Between 1986 and 1989, the Agua Mansa site began to be used as a landfill and in 1995, landfill operations were ongoing throughout the Agua Mansa site.
- Beginning in the 1995 photo, it appears the basins were dry and no longer used for infiltration. The secondary treated effluent water from the WWTP was being outlet into the Rialto Channel.
- By 2002, the waste water treatment plant to the north of the City site had been expanded to nearly its current extent. The v-ditch draining from the WWTP with a rip-rap pad for infiltration was constructed.
- In the 2006 photos, it appears there was ongoing grading in the bottom of the easterly basin, with heavy equipment extending from the bioenergy facility property to the northeast. In 2007, the eastern basin and the energy company property was cleared of vegetation and appeared to have been recently graded as pads.
- In 2009, the bioenergy facility to the northeast had been constructed.
- By 2019, the third clarifier tank had been constructed on the WWTP. By 2020, the two small tanks at the southern end of the energy company had also been constructed.

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1.4 Previous Studies

We reviewed data from several prior site-specific groundwater studies published for the Agua Mansa site and unpublished data for the subject site. The more substantial studies are summarized below.

- Pioneer Consultants performed a geotechnical evaluation of the La Roca Pit at the Agua Mansa landfill in 1975. Their study included evaluating the existing aggregate onsite and determining the depth to groundwater at the site. Their investigation in the quarry excavation encountered groundwater from 6 to 12 feet deep. They recommended mining operations continue down to or near the groundwater table, after which the site modified to be used as a disposal site.

- In 1980 and 1985, Gary S. Rasmussen and Associates (Rasmussen and Associates, 1980, 1985a, 1985b) performed engineering geology and groundwater quality evaluations at the Agua Mansa site. During their February 1980 site visit, groundwater was observed in the deep pit in the southern portion of the site. They estimated groundwater was at an elevation of 859.5 feet msl, provided recommendations regarding type of material to be disposed of in the landfill, and recommended two monitoring wells be installed at the site.

- In July 2007, Kleinfelder, Inc. performed a limited subsurface exploration of the City site for a proposed Rialto BioSolids Processing Facility addition that was never constructed. They excavated seven hollow-stem-auger borings throughout the site. Their boring locations are shown on Plate 1 and copies of the boring logs are provided in Appendix B.

- In 2010, NMG performed geotechnical investigations at the subject site, the eastern portion of the landfill site, and at the Holliday site to the west for a proposed bio-fuel production plant. The studies included numerous hollow-stem borings, cone penetrometer probes, test pits, and laboratory testing. Downhole geophysics were performed on the Holliday site to the west. Boring, trench and CPT locations from that study pertinent to this study are shown on Plate 1; copies of the logs are provided in Appendix B, and copies of the laboratory test results from the prior study are included in Appendix C.

- In 2018, AECOM performed a supplemental geotechnical investigation at the WWTP and prepared a memorandum presenting the data and the recommendations for the WWTP clarifier tank # 3. They drilled two borings (SB-4 and SB-5) in the area of the proposed tank (Plate 1). The boring logs are provided in Appendix B and the associated laboratory testing is included in Appendix C. The tank site was subsequently graded and the tank constructed in 2019, which can be seen on historic aerial photos.

These and other pertinent published reports and maps reviewed for this study are referenced in Appendix A.

1.5 Proposed Project

The proposed Lake Rialto will consist of restoration of the existing low-lying areas to the south of the WWTP to accommodate the biofiltration and/or storage of the secondary treated wastewater from the WWTP. There are two planned basins, including the western shallow basin

that will be used for permanent water quality treatment and the eastern deep basin to store water with perimeter vegetation. The eastern basin (or lake) will be larger and deeper (bottom elevation of 857 feet msl). Both the western basin and lake will be lined and have a water surface at 905 feet msl. Based on these elevations, the western basin will have up to 10 feet of water and the eastern basin will have up to 48 feet of water.

The lake supply waste water will be piped through an 18- to 24-inch RCP pipe drain system along the north side of the lake to outlet into the western basin at the west and northeast corners, and at the bottom of the lake. There will be a small island in the western basin at 908 feet msl. There will be an earthen bench around both basins and a large pad area at the northwestern edge of the lake at a 903 elevation that will be used for planting vegetation.

The WWTP currently outlets into the Rialto Channel and the lake will be used to stop flow to the channel for a few days. There will be a drain structure at the southeast end of the lake bottom that will be used to empty the lake at least once a year. We understand the lake will be emptied slowly through a nearly horizontal pipe that will be connected to the bottom of a pump station wet well at the southeast corner of the lake. The pump station with a wet well 72 feet below ground is planned in the southeast corner of the lake, as shown on Sheets 7 and 8 of the grading plan. The nearly horizontal outlet pipe is designed as an 18-inch reinforced concrete pipe (RCP) that will extend approximately 230 feet from the lake to the wet well. The design elevation of the RCP is near 852 to 855 feet msl.

The lake will then be filled over several days with the discharge from the WWTP, so the channel can remain dry for a time.

The plan reviewed for this report is the "City of Rialto Grading and Improvement Plan, Lake Rialto," prepared by Wilson Mikami Corporation and dated September 12, 2022. It includes 10 sheets as follows:

- Sheet 1 is the title sheet with notes, a vicinity map and plan index;
- Sheets 2 and 3 are the detail sheets, including the liner information;
- Sheet 4 is the grading plan;
- Sheets 5 through 7 are the drainage inlet and outlet plan and profile sheets;
- Sheet 8 is the pump station precise grading plan;
- Sheet 9 shows the offsite parking plan; and
- Sheet 10 is the erosion control plan.

The proposed grading will include up to 28 feet of cut below existing grades and up to 15 feet of fill above existing grades. The perimeter cut and fill slopes are designed at a 2H:1V slope ratio and up to 60 feet high to the perimeter access road, and then up to 30 feet high above the lake level. Interior slopes in the western basin and between the two basins are designed at 2H:1V and vary between 7 and 17 feet high.

2.0 GEOTECHNICAL FINDINGS

2.1 Geologic Setting

The site is located in San Bernardino County, just north of the Santa Ana River and the La Loma Hills in the Peninsular Range Province of California. The site is underlain by deep alluvium at the southern side of San Bernardino valley area. The site has undergone several episodes of grading and there are undocumented fills locally throughout the site. Directly south of the site is the Agua Mansa Landfill, from which rubble fills have extended onto the subject site. The site is located in a seismically complex area, with both strike-slip and frontal thrust fault systems. There are no active faults mapped within the site. The closest active fault is the San Jacinto Fault located approximately 3 miles northeast of the site.

2.2 Earth Units

Earth units consist primarily of younger Holocene-age alluvium with lessor amounts of undocumented fill materials within the low areas. The earth units are described below.

Undocumented Fill: Varying amounts of undocumented fill (non-engineered and/or tested fills) are mapped at the site. The limits of these fill are difficult to distinguish since the soil composition is similar to the underlying native deposits. Based on the historic aerial photos, the onsite basins have been excavated down to groundwater, and have been reshaped several times over the past 60 years. There may be more fill than shown on the Geotechnical Map (Plate 1), especially in the bottom of the basins.

Prior mapping and exploration by Kleinfelder encountered fill materials. Two of their borings (B-1 and B-5) in the eastern basin area encountered up to 30 feet of fill that consisted of olive brown to gray brown silty sand and sand with silt and gravel. They found petroleum odor at 15 feet in both borings and wood in the sample at 20 feet in B-5 indicating it was fill. We drilled an additional boring (H-2) in this area and encountered mostly light yellowish-brown, olive brown to dark gray silty fine to coarse sand that was dense to very dense. There was a sandy silt layer with gravel between 20 and 25 feet in H-2 that may have been near the bottom of the fill. The blow counts in the fill were quite high, over 68 blows per foot with a 140-pound weight dropping 30 inches per blow.

The undocumented fill material at the Agua Mansa landfill is inert construction debris (NMG, 2010b). NMG previously drilled at the eastern end of the landfill, directly south of the subject site. Six exploratory borings encountered the undocumented fill/debris material, which ranged from 15 to 65 feet thick in the borings. Borings Y-1 and Y-2 are shown on Plate 1 and the logs are included in Appendix B. The material generally consisted of varying amounts of sand and silt, with a large quantity of construction debris (wood, concrete and steel) and rubber tires. During the time of our fieldwork, landfill activities were ongoing and we observed broken concrete, tile, plaster, rebar, concrete light poles, and other inert construction debris being dumped. Since that time, they have placed additional fill. Currently, there is a 50-foot high 3H:1V fill slope along the southern boundary of the subject site. It appears that some of the undocumented fill with rubble from the landfill operations extends onto the subject site, locally covering the southern slopes. These fills contain mostly concrete slabs with reinforcement steel,

rock, asphalt and other construction materials. These materials were placed locally over the eroded slope in the southeast corner of the eastern basin and appears to have spilled over the southern slope of the western basin.

Alluvium: Holocene-age alluvium was encountered in all the borings excavated onsite. Borings at the subject site encountered alluvium at the ground surface locally and below fill. Borings at the Agua Mansa site encountered alluvium at the base of the landfill material, at depths of 15 to 65 feet below ground surface at the time of exploration. Alluvium is also exposed locally in the perimeter slopes. The alluvium was generally found to consist of gray, olive brown and yellowish-brown fine to coarse-grained sand and gravel, with trace silt and clay. The material was moist, dense, highly friable, micaceous and locally iron-stained. Scattered thin silt layers were observed in the borings onsite. The alluvium below a depth of 5 feet was generally dense to very dense based on high blow counts and dry density test results. Samples were sometimes disturbed due to the presence of cobbles and clean sands.

2.3 Geologic Structure

The geologic structure within the native alluvium has been influenced by active streambed deposition. The alluvium was likely deposited as runoff within the ancient Lytle Creek riverbed, which was previously identified within the subject site (Rasmussen and Associates, 1980). The alluvium was deposited in relatively flat layers that have not been structurally tilted. Limited exposures at the site show that the crude layers within the alluvium are generally sub-horizontal.

2.4 Faulting and Seismicity

Faulting: The site is located in a complex seismically active area with several Holocene-age faults nearby. The right-lateral strike-slip San Andreas Fault, which separates the Pacific Plate from the North American Plate, and the San Jacinto Fault lie within 10 and 3.8 miles, respectively, northeast of the site (Figure 2). The San Bernardino Mountains to the northeast of the site were tectonically created by the combined seismic forces from these strike-slip faults. The frontal thrust fault (the Cucamonga Fault) system is located along the base of the San Gabriel Mountains, approximately 10 miles northwest of the site. The primary seismic hazard for this site is ground shaking and secondary effects due to a future earthquake on one of these major regionally active faults.

The site is not located within a fault-rupture hazard zone as defined by the Alquist-Priolo Special Studies Zones Act (CGS, 2018) and no evidence of active faulting was observed during this investigation or prior work at the site (Appendix A). There are no faults mapped by the State at the site (Figure 2, CGS 2010).

Using the USGS deaggregation computer program (2023) and the site coordinates of 34.0512 degrees north latitude and -117.3605 degrees west longitude, the main contributing active fault to the site is the San Jacinto Fault located 6.2 km northeast of site. This fault has a Moment Magnitude (M_W) of 8.0.

Seismicity: Properties in southern California are subject to seismic hazards of varying degrees depending upon the proximity, degree of activity, and capability of nearby faults. These hazards

can be primary (i.e., directly related to the energy release of an earthquake such as surface rupture and ground shaking) or secondary (i.e., related to the effect of earthquake energy on the physical world which can cause phenomena such as liquefaction and ground lurching).

As previously discussed, the site is not located within a fault-rupture hazard zone and no evidence of active faulting was observed during this exploration, or by prior work at the site. Therefore, the potential for primary ground rupture is considered slight to nil. The primary seismic hazard for this site is ground shaking due to a future earthquake on one of the major regional active faults, such as the San Jacinto, San Andreas, or the Cucamonga Faults.

Seismic design parameters were calculated based on computer program by the Structural Engineers Association/Office of Statewide Health Planning and Development (2023) and the results are presented in Section 3.18 of this report. The data is also presented in Appendix D.

The secondary seismic hazards of tsunami or seiche are considered very slight to nil, as the site is located greater than 50 miles from the ocean and no confined bodies of water or reservoirs are within the vicinity of the site. Once the lake is filled, there is a potential for seiche during a future earthquake event. However, the lake and western basin are all surrounded by earthen berms in a low area, and thus, is not anticipated to adversely impact the surrounding properties. The site is not located in an area designated as susceptible to liquefaction as mapped by the County of San Bernardino (2021). The densities of the underlying soils should make the potential for liquefaction low (further discussed in Section 2.9).

2.5 Mass Movements

There are no landslides mapped at the site and the site is not mapped by the County of San Bernardino as susceptible to landslides (2021). The topography at site consists of locally over-steepened slopes within the native alluvium, and shallow surficial failure, erosion and creep features are evident on the steep slopes.

Cross-Section A-A' (Plate 3) shows the area of the prior erosion gully and mapped surficial failures that were observed in 2010 by NMG. This area of the slope was repaired and recompacted with an excavator and bulldozer; however, we understand it was not observed and tested by a geotechnical engineer.

2.6 Groundwater

Groundwater was encountered in the deeper exploratory borings during investigations between 2007 and 2021. In July 2007, the groundwater below the eastern basin was at elevation of 845 feet msl (B-1 by Kleinfelder, 2007). In borings drilled by NMG between April and August of 2010, groundwater was encountered at elevations of 839 to 840 feet msl. Recent borings drilled in February 2021 by NMG found the groundwater at an elevation of 835 feet msl in Boring H-2.

Historically, groundwater beneath the landfill was as shallow as 870 feet msl in 1947 and as deep as 806 feet msl in 1970 (Rasmussen and Associates, 1980). This represents a groundwater fluctuation of 64 feet over a period of only 23 years. In 1980, groundwater was observed and measured at an elevation of 859.5 feet msl. These fluctuations and the shallow groundwater were

probably influenced by periods of heavy rainfall, grading of the sand and gravel quarries around the site, and possibly from historic use of infiltration ponds at the site.

In general, due to the coarse-grained nature of the native alluvium, the vicinity of the site to the Santa Ana River, and the site being located within a groundwater recharge area, fluctuations in groundwater levels should be anticipated depending upon local conditions such as rainfall, high-water levels in the river, groundwater pumping, and nearby irrigation practices.

2.7 Laboratory Testing

Laboratory testing was performed on representative samples of onsite soils collected during our field exploration to characterize their engineering properties. Laboratory tests performed on selected relatively undisturbed and bulk soil samples included:

- In-situ moisture content and dry density;
- Grain-size distribution;
- Atterberg limits;
- Consolidation;
- Direct shear;
- Specific gravity; and
- Corrosivity to metals.

Laboratory tests were conducted in general conformance with applicable American Society for Testing and Materials (ASTM) standard test methods.

NMG also performed a significant amount of laboratory testing at and adjacent to the subject site. These data include tests of expansion index, soluble sulfate, maximum density and optimum moisture content, R-value, drainage (effective porosity), and hydraulic conductivity.

The vast majority of native soil at the site is sand and gravel, generally classified as SM and SP, with some amounts of ML (silt) per the Unified Soil Classification System. (Hence, the attraction of sand and aggregate mining for the area.) The in-place soil also has relatively high dry densities and low compressibility. Hydro-consolidation (collapse) potential ranged from 0.4 percent to 2.7 percent in a sample from Boring H-3 in the bottom of the west basin. Collapse potentials from more numerous testing of alluvium at the adjacent sites were significantly less, generally zero to less than 1 percent (NMG, 2010a and 2010b). Near-surface soils, both fill and alluvium, are predominantly non-expansive (expansive soil was encountered by NMG at an adjacent site but was the product of other activities).

Direct shear tests on three samples from this study had ultimate friction angles between 32 and 37 with cohesions of zero to 310 psf, respectively. Peak values ranged from 37 to 39 with cohesions of zero to 440 psf, respectively. These values were higher than the majority of testing from alluvium samples from adjacent areas.

The soil at the subject site and adjacent areas showed negligible soluble sulfate contents, moderate corrosion potentials (to ferrous metals), and relatively low chloride contents.

Twelve samples from the adjacent study area were tested for effective and total porosity and hydraulic conductivity. The samples tested were collected from either the native alluvium (depths of 15 to 30 feet deep) or from the underlying alluvial fan deposits (depths of 40 to 57.5 feet deep). The results indicate that the upper alluvium samples had generally higher hydraulic conductivity (0.0015 to 0.0030 cm/sec or 4.3 to 8.5 feet/day), while the underlying fan deposits had lower hydraulic conductivities (1.82E-04 to 9.58E-06 cm/sec or 0.52 to 0.03 feet/day).

Test results for this exploration are summarized in Appendix C, along with pertinent laboratory test results from adjacent sites. In-situ moisture content and dry density data from this study are also shown on the geotechnical boring logs (Appendix B).

2.8 Slope Stability

As previously mentioned, there have been surficial failures and erosion on the existing perimeter slopes around the basins. These existing slopes vary in steepness from 2H:1V to 1H:1V, and are up to 70 feet high. There are local areas of alluvium exposure, and some of the slopes have been repaired as fill slopes.

Several geologic cross-sections were developed for the site to show these existing slopes and their relationship to adjacent existing improvements (Plate 3). Slope stability analysis was performed on cross-sections showing the steeper and/or higher slopes and those located below existing structures. Cross-Section B-B' crosses the eastern basin in a north-south direction, showing the waste water treatment plant to the north and the landfill in the south. Cross-Section D-D' is drawn through a slope below the existing waste water effluent pipeline and offsite structures/tanks of the adjacent bioenergy facility. Cross-Section E-E' shows a slope in relation to an existing power pole on the hilltop. The proposed grading, as shown on our cross-sections, includes the perimeter landscape bench around most of the basins at an elevation of 902 feet msl, and upper pedestrian access path at an elevation of 908 feet msl just above the lake level. The path creates a raised fill bench at the toe of the existing perimeter slopes above the east side of the basin. The lake bottom will be cut down approximately 25 feet below existing bottom grade (as shown on Cross-Sections D-D' and E-E' on Plate 3). The future lake water level will be at an operating level of 905 feet msl (shown on cross-sections). We understand the lake will be drained at least once a year.

The perimeter slopes expose alluvium and fill. Both are similar in composition and were assigned the same shear strength parameters for the slope stability analyses: an internal friction angle (phi) of 30 degrees with a cohesion of 75 pcf. These parameters were derived from a compilation of the shear test results from this study as well as studies by NMG of adjacent areas. Results from thirteen samples, including samples with more fine-grained soil (silts), were combined in a single plot to determine an appropriate strength parameter for the slope stability analyses. The plot with selected strength envelope is included at the front of Appendix E.

The slope stability analysis was first performed on the perimeter slopes for the eastern basin assuming the high-water elevation of 905 feet in the basin, with the recommended slope stabilization measures shown on Cross-Sections B-B', D-D' and E-E' for both static and psedo-static conditions. This analysis shows the factor-of-safety (FOS) of the designed grading is

acceptable with respect to slope stability, being greater than 1.5 for static and greater than 1.0 for the pseudo-static conditions.

In the event of lake liner leakage, groundwater levels could rise around the lake and impact slope stability. Therefore, we analyzed a "worst case" scenario where the groundwater was modeled behind in these slopes as building up to the lake level and then sloping down away from the reservoir to intersect the local groundwater table at 840 feet msl. Rapid drawdown analysis was then performed assuming the lake was empty but with this groundwater present behind the liner. These analyses resulted in FOS of less than 1.0 (0.86 to 0.92) near the slope-face, implying the potential for unacceptable local slope failures. Sensitivity analysis was performed to determine maximum acceptable groundwater rise behind the perimeter slopes that would still result in an acceptable FOS of 1.1 or greater.

Results are summarized below with a following discussion.

Northern Slope on Cross-Section B-B': The slope along the north side of the eastern basin as shown on Cross-Section B-B' is relatively high (82 feet), with the existing hillside above the graded basin up to the WWTP. Our analysis indicates a FOS of equal to or greater than 1.5 static and 1.1 pseudo-static. The rapid drawdown analyses from the highwater operating lake level to an empty lake show that the FOS will be less than 1.0 (0.92) near the slope-face. The maximum groundwater elevation behind the slopes to have a FOS of at least 1.1 is at an elevation of 884 feet msl.

Southern Slope on Cross-Section B-B': The slope along the south side of the eastern basin with the SCE transmission line towers shown on Cross-Section B-B' is relatively high (75 feet), with the existing slopes above the graded basin. Our analysis indicates an acceptable FOS equal to or greater than 1.5 static and 1.1 pseudo-static. The rapid drawdown analyses show that the FOS will be 0.86 near the slope-face. The maximum groundwater elevation behind the slopes to have a FOS of at least 1.1 is at an elevation of 887 feet msl.

Eastern Slope Below Bio-energy Facility on Cross-Section D-D': The design slope along the east side of the basin is shown on Cross-Section D-D', below the existing waste water line and the Bio-energy Facility is relatively high (70 feet). The analysis shows the FOS is equal to or greater than 1.5 static and 1.1 pseudo-static. The rapid drawdown analyses show that the FOS will be 0.90 near the slope-face. The maximum groundwater elevation behind the slopes to have a FOS of 1.1 is at an elevation of 879 feet msl.

Southern Slope with SCE Tower on Cross-Section E-E': The slope along the north side of the eastern basin as shown on Cross-Section E-E' is relatively high (70 feet), extending up to the SCE tower on the hilltop. Our analysis indicates a FOS greater than 1.5 static and 1.09 pseudo-static. The rapid drawdown analyses show that the FOS will be 0.91 near the slope-face. The maximum groundwater elevation behind the slopes to have a FOS of 1.1 is at an elevation of 883 feet msl.

We did not perform pseudostatic analyses for the rapid drawdown scenarios as the probability of a combination of earthquake, liner leakage, plus emptying of the lake occurring at the same time is considered very low.

2.9 Liquefaction Potential

Liquefaction is a phenomenon in which earthquake-induced cyclic stresses generate excess pore-water pressure in low density (loose), saturated, sandy soils and soft silts below the water table. This causes a loss of shear strength and, in many cases, ground settlement. For liquefaction to occur, all of the following four conditions must be present:

- There must be severe ground shaking, such as occurs during a strong earthquake.
- The soil material must be saturated or nearly saturated, generally below the water table.
- The corrected normalized standard penetration test (SPT) blow counts (N_1) or the CPT tip resistance (Q) must be relatively low.
- The soil material must be granular (usually sands or silts) with, at most, only low plasticity. Clayey soils and silts of relatively high plasticity are generally not subject to liquefaction.

The site is not located within an area of potential liquefaction, as mapped by the County of San Bernardino (2021). Based on the dense nature of fill and alluvium, the liquefaction potential is considered to be very low.

2.10 Settlement Potential

The conceptual plans show only minor design fills and no significant structures with foundations. Therefore, static settlement potential from those typical loading scenarios is very low. The in-place densities of the site soils indicate that dry sand settlement potential due to earthquake ground shaking is also relatively low. Test results from this study indicate there is a slight potential for settlement due to wetting of granular soils (also referred to as hydro-consolidation or collapse). However, more extensive testing of the alluvium in adjacent areas had much lower collapse potential as we understand that the basins will be lined. The collapse potential in the samples tested from the borings associated with this basin (H-1 and H-2) is relatively low, on the order of 1 percent or less. The samples with the higher collapse potential were from H-3 located in the western basin, which will be lined.

2.11 Existing Utilities and Structures

There are existing overhead and underground utilities and numerous structures/appurtenances located within and adjacent to the site (Plate 1). There are two SCE easements that cross the southern portion of the site in an east-west direction. The overhead power line easement has three power line towers located onsite, some of which are perched on hilltops above the basins. There is an existing waste water (effluent) pipeline that extends from the WWTP at the northeast portion of the site and trends south-southwest along the top of the east basin slope, to an existing manhole structure next to the Rialto Channel where the effluent discharges into the channel.

A groundwater observation well was located to the south within the Agua Mansa site (mapped in 2010); this well could not be found and is assumed buried at this time.

There is a new clarifier tank adjacent to the northwest portion of the site, and there are structures and appurtenances associated with the bioenergy facility to the northeast. There is an existing v-ditch and rip-rap pad onsite that drains water flows from the WWTP, and the water apparently infiltrates into the alluvium below the rip-rap pad in the northern portion of the basin.

2.12 Potential Infiltration

Infiltration testing was not performed at the site during this study. However, we noted runoff from the WWTP through a v-ditch that emptied onto the rip-rap pad within the northern portion of the site that infiltrates into the ground. We observed about 4 inches of water flowing in the v-ditch and it disappeared into the soils (likely alluvium) below the rip-rap. The water was slightly ponded, but some of the water was observed to flow further south into the basin.

In general, we believe the sandy alluvium is highly permeable. The siltier and clayey alluvium would have lower permeability. Compacted fill generally has lower permeability, especially if it has some percentage of fine-grained soil. For reference, laboratory testing of soils for permeability and hydraulic conductivity from the adjacent study by NMG are provided in Appendix C.

2.13 Erosion Potential

Unconsolidated sandy soils in the alluvium and fill are typically highly erodible when exposed at the ground surface and especially on slopes with uncontrolled water flowing over the tops-of-slopes. Infiltrating water can also find its way into the sandy layers and flow laterally and vertically through the soils. With uncontrolled drainage and infiltration, the flowing water in the sandy soils can create soil piping conditions where the hydraulic process in the subsurface granular soils can result in collapse or soil flow with the water creating voids where the layers are exposed at the surface. Seepage forces from water migrating downslope can also induce surficial slumps and/or shallow flow failures. The surface drainage at the site will need to be properly controlled. (See Sections 3.5, 3.10 and 3.20).

2.14 Earthwork Bulking, Shrinkage and Subsidence

The loss or gain of volume (shrinkage or bulking, respectively) of excavated natural materials and recompaction as fill varies according to earth material type and location. This volume change is represented as percent shrinkage (volume loss) or as percent bulking (volume gain) after recompaction of a unit volume of cut in this same material in its natural state. Due to the inherent variability of materials, earthwork volume changes are difficult to accurately quantify.

The following estimates are based on our experience with similar materials.

Earthwork Estimates

Material	*Approximate Percent Shrinkage/Bulking*
Uncertified Fill	5 to 10 percent shrinkage
Colluvium and Topsoil	10 to 15 percent shrinkage
Alluvium	8 to 10 percent shrinkage
Weathered compacted fill	1 to 2 percent shrinkage

Ground subsidence at the site is estimated to be on the order of 0.2 foot, but less in the previously graded areas.

DRAFT

3.0 CONCLUSIONS AND RECOMMENDATIONS

3.1 General Conclusion and Recommendation

Based on the geotechnical exploration and our findings, construction of the proposed improvements is considered geotechnically feasible provided the geotechnical considerations and recommendations presented in this report are implemented during design, grading and construction of the project.

The recommendations herein should be considered minimum and may be superseded by more stringent requirements of the County of San Bernardino, the City of Rialto, and others. In addition to the preliminary recommendations herein, General Earthwork and Grading Specifications are also provided in Appendix F.

3.2 Site Clearing and Preparation

Significant vegetation, miscellaneous trash, concrete structures, pipelines to be abandoned, and other deleterious materials should be removed and disposed of offsite prior to the start of grading. Concrete and asphalt may be incorporated into fill materials provided the resulting material adheres to the recommendations provided in Section 3.4 and Appendix F of this report.

3.3 Remedial Removals

Unsuitable earth materials, including landfill rubble, loose fills and weathered alluvium should be removed prior to placement of new fill. We anticipate the removals will be on the order of 2 to 3 feet deep in the bottom of the basin, and up to 15 feet deep locally in the central portion of the basin where there is an existing loose fill berm. The less weathered, dense undocumented fill and alluvium should be reviewed and tested by the geotechnical consultant to confirm the exposed materials may be left in-place. Some of the loose fills on the perimeter slopes may also need to be removed and recompacted.

The actual depths and lateral limits of remedial removals should be determined in the field during grading based on the exposed conditions. Special consideration should be given to protect in-place the power poles within the SCE easement, as well as the adjacent pipeline and concrete-lined Rialto Channel along the eastern perimeter of the site.

Removal bottoms should expose competent alluvium or fill material. The removal bottoms should be observed, mapped and accepted by the geotechnical consultant prior to removal bottom preparation, and placement of fill.

Groundwater and wet material may be encountered in the northern portion of the site in the area where infiltration is occurring. Also, if grading is performed during the winter months, rain water may collect in the basins. If encountered, wet soil may require special handling, including top-loading and drying-back prior to placement as compacted fill.

3.4 Grading and Earthwork Specifications

Grading and excavations should be performed in accordance with the General Earthwork and Grading Specifications in Appendix F. These specifications include figures that depict minimum grading standards for slope construction and oversize-rock placement. Some specifications are reiterated below with additional recommendations.

Protection of Existing Improvements and Utilities: Existing improvements, including utilities adjacent to the proposed project that are to be protected in-place, should be located and visually marked prior to demolition and grading operations. Conditions of more sensitive improvements should be documented prior to grading for a record of existing conditions. Excavations adjacent to improvements to be protected in-place or any utility easement should be performed with care so as not to destabilize the adjacent ground. Utility lines that are to be abandoned (if any) should be removed and the excavation should be backfilled and compacted in accordance with the recommendations provided herein. The temporary backcuts for the lake embankment stabilization keys recommended in Section 3.5 should be observed by representatives of NMG to evaluate temporary stability conditions, especially where the cuts are below adjacent facilities, power poles, utilities, etc. Stockpiling of soils (more than 5 feet in height) at or near existing structures and over utility lines that are to remain in-place (if any) should not be allowed without review by the geotechnical consultant.

Fill Placement and Compaction: After completion of acceptable remedial removals, the approved bottom should be scarified, moisture-conditioned as needed, and recompacted prior to placement of fill. Fill should be placed in nearly horizontal lifts less than 8 inches in loose thickness, moisture-conditioned, and compacted to a minimum 90 percent of the maximum density as determined by Test Method ASTM D1557 (except as discussed in following sections). Fills placed against ground sloping more than 5H:1V should be keyed and benched into competent material. Moisture content of compacted fill should be over optimum moisture content and relatively uniform throughout the fill material.

Suitable Fill Materials: Onsite materials which are relatively free of deleterious materials, should be suitable for use as compacted fill. The rubble along the southern boundary will require significant material be sifted and disposed of offsite (e.g., steel, wood, etc.).

Oversize Material: Concrete and asphalt materials may be incorporated into the compacted fill provided the concrete is broken down to less than 4 feet in maximum diameter, and asphalt is reduced to a maximum dimension of 12 inches. Efforts should be made to place these recycled materials below 5 feet and/or 2 feet below proposed storm drain pipes/structures. Portland concrete should be free of metal (i.e., rebar, bolts, etc.). There is existing rip-rap locally along the south side of the basins, and this rock material over 12 inches in size should be placed in accordance with our oversize rock disposal specifications in Appendix F.

Slope-Face Construction: Slope-faces should be compacted to a minimum 90 percent relative compaction. Slopes should be either overbuilt and trimmed back to the compacted slope-face or built at grade with back-rolling every 4 vertical feet with a sheepsfoot roller and tested/accepted as the slope is constructed.

3.5 Slope Stabilization

The existing perimeter slopes vary in steepness and stability. Most are surficially unstable and have had erosion and failures over the years. Our slope stability analyses verified these conditions which will require remediation.

The eastern basin includes design fill over cut slopes up to 55 feet high, where the cut portion of the slope will expose sandy alluvium and undocumented fill materials. These materials are typically layered and subject to erosion and surficial instability. Therefore, stabilization fill keys are recommended for these slopes, as shown on the Remedial Measures Map (Plate 2) and the cross-sections (Plate 3). These stabilization fill keys vary from 15 to 20 feet wide, and 2 to 3 feet deep, with a 1 foot tilt-back toward the heel of the key. The backcuts for these slopes should be cut at 2H:1V where possible, but no steeper than 1.5H:1V.

There are design cut slopes above the eastern basin that are up to 30 feet high and anticipated to expose sandy alluvium. These slopes should also be provided with stabilization fills keys 15 feet wide by 2 to 3 feet deep. The backcut on the eastern side, below the existing waste water line, will need to be oversteepened locally to 1:1 (Cross-Section D-D' on Plate 3). This work should be completed after the slope below is stabilized.

There are two other planned cut slopes, one in the western basin and one on the south side of the hilltop with the SCE tower that are 15 to 20 feet high. Stabilization fill keys 15 feet wide by 2 to 3 feet deep are recommended to replace these slopes with compacted fill.

The stabilization fill keys should be constructed in accordance with the Earthwork and Grading Specifications presented in Appendix F. The backcuts should be mapped by an engineering geologist as these keys are excavated to evaluate the stability and to confirm the anticipated conditions, especially in the area of the existing sewer line where the backcut will be steeper. The key bottom should be reviewed and accepted by the geotechnical consultant prior to placement of fill.

3.6 Rippability and Oversize Material

The landfill rubble material includes abundant large slabs of concrete, some with steel reinforcement. Where this material is encountered along the southern edge, excavation and ripping may be difficult and oversize material will be generated. If steel is removed, the concrete and the slabs may be crushed or placed in deeper fill areas. However, the grading may not have enough deep fills to accommodate the amount of concrete generated and some may need to be exported from the site. Alternatively, the bottom of the basin could be overexcavated to place oversize material deeper than 5 feet below design grades. Also, it is possible that some of the material may be used for the designed rip-rap at the storm drain outlets.

The native alluvium and rubble fill is anticipated to be moderately easy to excavate with a D-9 bulldozer. Some cobbles and oversize materials may be generated. Recommendations and specifications for the placement of oversize materials in the fill are provided in more detail in Section 3.4 and Appendix F.

3.7 Lake Liner Design

The proposed water quality basin and lake are intended to hold water. Without a liner, the water loss due to infiltration would be significant. Sheet 2 of 10 of the grading plan shows the details for a liner to be placed on the bottom and sides of both basins below the landscape bench at a 903 foot elevation. This liner will be a reinforced Polypropylene (RPP) liner, 36 mil thick, tan color, Western Environmental Liner. The liner will be anchored in a 1-foot-wide trench at the outside edge of the landscape bench with compacted soil backfill. The bench is designed at a width of 10 feet and will have a 2.5-foot-high slope behind the bench that could be under the water level and may see wave action around the lake. This bench and slope will be provided with a 5-foot-thick fine-grained low permeability soil material that will impede infiltration around the edge of the basins.

Liner should be placed on even, competent grade, free of sharp rock or materials at the surface which may damage the liner. Construction of the liner should be observed/inspected during placement and upon completion to verify proper installation.

Annually, when the lake is emptied, the conditions of the liner should be reviewed. During the time the basins are emptied, maintenance of the liner and storm drain structures should be performed.

3.8 Groundwater, Dewatering, and Monitoring Wells

Groundwater seepage may be encountered during remedial grading near the existing rip-rap pad where infiltration is ongoing and/or if grading is performed during the winter. In these areas/conditions, dewatering may be necessary to complete the proposed grading and construction. We anticipate that dewatering at the site may be accomplished with sump pumps.

As described in Section 2.0, recent studies indicate that the groundwater table should not be encountered during earthwork and construction at the site.

For the proposed filling and emptying of the basins, we recommend installation of three groundwater observation wells to measure the impact (if any) of the new lake to the local water table. These well locations area shown on Plate 2 and the depths should be between 70 and 90 feet deep to intercept the existing water table. These groundwater observation wells should be monitored periodically, including during filling of the basins to evaluate the competency of the liner. Also, prior to and during emptying of the lake, the wells should be monitored to verify that the liner is functional and that groundwater has not risen above the maximum levels determined from rapid drawdown analyses. The action levels for each well are based on the slope stability analysis as discussed in Section 2.8 and shown in Appendix E. The following table summarizes the maximum recommended groundwater elevations at each cross-section location prior to lake draining.

Cross-Section Area	Maximum Allowable Groundwater Elevation Prior to Emptying Lake
B-B' North	884 feet msl
B-B' South	887 feet msl
D-D'	879 feet msl
E-E'	883 feet msl

If the groundwater is at or above these levels, the rapid emptying of the basin is not recommended. Slower rate of lake water discharge should be implemented while monitoring the groundwater levels. If for some reason the groundwater does not lower as the lake is drained, then lake draining should be suspended in order to determine the source of the groundwater and reasons for build up within the slopes.

Automated well reading and groundwater data collection devices are commercially available and should be considered for the recommended groundwater monitoring wells. Telemetry capabilities can also greatly enhance the timely transmission and analysis of groundwater conditions around the lake.

3.9 Settlement

As discussed in Section 2.10, post-construction settlements as the result of the proposed project are expected to be relatively minor with no significant impacts of the planned improvements or adjacent improvements.

3.10 Erosion Protection

There are clean layers of sand in the alluvium and fills that are more prone to erosion. If left unprotected or with uncontrolled drainage, significant erosion may occur.

Measures to reduce soils erosion and potential for soil piping include the following:

- Direct drainage into suitable devices with no ponding of water behind the tops of slopes;
- Replacement of the clean sandy layers exposed at the surface with a uniform compacted fill;
- Adding surface protection and planting to slopes to reduce the potential for slope erosion/soil piping;
- Adding additional anti-seep collars to the proposed storm drains and culverts throughout the site.

3.11 Pedestrian Trail, Access Road, and Offsite Parking Pavements

The proposed pedestrian trails and access roads around the basins will be subject to erosion and degradation if they are not paved or treated. The most durable pavement in a water environment would be Portland cement concrete (PCC), especially in the eastern basin where water levels will annually inundate some of these trails/roads. For pedestrian trail use, a minimum PCC slab thickness of 4 inches over the native soil subgrades is recommended. Some reinforcement is also

recommended because of the water environment. At minimum, we recommend No. 3 reinforcing bar at 24 inches on-center, both directions, or an equivalent welded wire mesh reinforcement.

Asphalt concrete (AC) would not be recommended for trails and access roads around the east lake where they would be submerged for any length of time. For areas which will not be inundated, a full-depth AC pavement (AC on native soil) would be acceptable, as the existing soils at the site are generally very good pavement subgrade materials with high percentages of sand and gravel. (R-values of similar soil from adjacent sites were well over 50.) Therefore, the minimum recommended AC section for access roads which may be used by service trucks is 4 inches of AC over the native soil compacted to a minimum of 95 percent relative compaction, per ASTM D1557.

An alternative to PCC or AC pavements would be a cement treated soil pavement. Native sandy soil would be mixed with Portland cement and water to create a durable layer. We recommend a minimum cement treated layer thickness of 8 inches. The typical cement content for the soil-cement mixture is expected to be 9 to 11 percent by weight. Should this alternative be selected, onsite soil samples will need to be mixed with various concentrations of cement to create soil-cement specimens for compressive strength testing. Based on that testing, a design cement content will be established for the soil-cement pavement section to achieve the desired compressive strength. The cement content may be less (on the order of 6 percent) for areas which will not be subject to lake wave action or concentrated stormwater runoff. Stabilized decomposed granite may also be feasible for such areas.

The offsite parking shown on Sheet 9 is designed with an AC pavement section of 4 inches of AC over 6 inches aggregate base. This section is acceptable if this parking lot is limited to passenger vehicles and light duty service trucks.

Pavements should be constructed in conformance with the Specifications for Public Works Construction (the Greenbook).

3.12 Storm Drain Trenching and Inlet Structures

Sheets 5 and 6 of the grading plan show the proposed storm drain in plan and profile. This drain will tie into the existing waste water (effluent) pipeline in the northeast corner of the site and direct flows into three inlet structures, two in the west basin and one in the east basin. Where the pipe extends downslope, slope anchors should be provided. We also recommend that cutoff trenches be installed at the tops-of-slopes to provide a barrier to reduce the potential for piping of the bedding and shading sand around the storm drain into the basin.

3.13 Wet Well and Outlet Structure

The wet well with pumpstation and outlet structure described in Section 1.5 are relatively deep (72 feet to the wet well). The closest borings to these structures (B-1 by NMG and B-2, by Kleinfelder and Associates) encountered mostly sand, silty sand, gravelly sand and minor clayey sand and silt layers at depth. Although no groundwater was encountered in recent studies, the sandy soils are expected to be locally friable and have poor standup times. Therefore, construction of the pump station and outlet pipe will likely require specialized construction

techniques, such as secant piles for the vertical wet well shaft and micro-tunneling or jack-and-bore for the lateral drain pipe. If required, additional geotechnical parameters for these or other proposed construction methods may be provided upon request.

The contractor/designer for these improvements should carefully evaluate the soil conditions provided in this report and present a written construction plan describing the means and methods to be employed for the structures for review and comment by the geotechnical consultant.

3.14 Foundation Design Parameters

For design of conventional foundations at the site, a net allowable bearing capacity of 2,800 psf may be assumed for a 12-inch-wide footing embedded 12 inches below the lowest adjacent grade. The allowable bearing pressure may be increased by 300 psf for every additional foot of width and by 900 psf for every additional foot of embedment depth up to a maximum of 4,000 psf. Higher bearing capacities may be allowable provided with appropriate settlement analysis of specific structures. The allowable bearing pressure may be increased by one-third for wind and seismic loading. We recommend that strip and isolated footings have a minimum embedment depth of 18 inches.

The footings of freestanding structures (including walls and pilasters) should have a minimum embedment depth of 24 inches into approved soils.

For lateral resistance against sliding, a friction coefficient of 0.38 may be used at the soil-foundation interface. Also, a soil unit weight of 120 pcf may be assumed for onsite materials.

For design of the pole-type foundations (i.e., light poles, shade structures, etc.), an allowable soil-bearing pressure ($_{S1}$) of 360 psf/ft may be used for Equation 18-1 (the "pole" equation) of the 2019 California Building Code (CBC) Section 1807.3.2.1 to determine the depth of embedment for the footings, considering level ground conditions. The equation is applicable for designed embedment depths of less than 12 feet for the purpose of computing lateral pressure. Also, for vertical loads on pole-type foundations, an allowable skin friction of 250 pounds per square foot may be used. For cast-in-place pole-type foundations, the vertical end bearing pressure should be neglected.

3.15 Lateral Earth Pressures

Recommendations for lateral earth pressures for conventional retaining walls and structures (if any) with approved onsite drained soils are as follows:

Lateral Earth Pressures		
Equivalent Fluid Pressure (psf/ft.)		
Conditions	***Level***	***2:1 Slope***
Active	40	65
At Rest	60	85
Passive	360	180 (if sloping in front of wall)

These parameters are based on a soil internal friction angle of 30 degrees and soil unit weight of 120 pcf. The above parameters do not apply for backfill that is highly expansive.

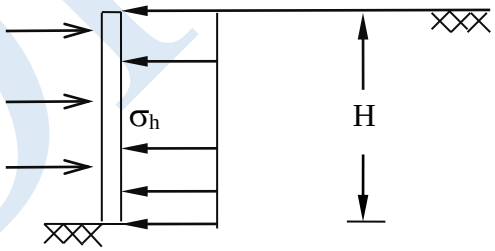
To design an unrestrained retaining wall, such as a cantilever wall, the active earth pressure may be used. For a restrained retaining wall, the at-rest pressure should be used. Passive pressure is used to compute lateral soils resistance developed against lateral structural movement. The passive pressures provided above may be increased by one-third for wind and seismic loads. The passive resistance is taken into account only if it is ensured that the soil against embedded structure will remain intact with time. Future landscaping/planting and improvements adjacent to the retaining walls should also be taken into account in the design of the retaining walls. Excessive soil disturbance, trenches (excavation and backfill), future landscaping adjacent to footings and over-saturation can adversely impact retaining structures and result in reduced lateral resistance. How much of the lateral resistance to be neglected will depend on the foundation type and nature of landscaping in front of the walls. Generally, the upper 1 to 2 feet of earth in front of walls with adjacent landscaping should be neglected for lateral resistance. Trench-type wall footings should have a minimum width of 10 inches.

For sliding resistance, the friction coefficient of 0.38 may be used at the concrete and soil interface. The coefficient of friction may also be increased by one-third for wind and seismic loading. The retaining walls may also need to be designed for additional lateral loads if other structures or walls are planned within a 1H:1V projection.

The seismic lateral earth pressure for walls and structures retaining more than 6 feet of soil and level backfill conditions may be estimated to be an additional 25 pcf for active and at-rest conditions. The earthquake soil pressure has a triangular distribution and is added to the static pressures. For the active and at-rest conditions, the additional earthquake loading is zero at the top and maximum at the base. The seismic lateral earth pressure does not apply to walls retaining less than, or equal to, 6 feet of soil (2022 CBC Section 1803.5.12).

3.16 Temporary Shoring

Temporary braced/anchored shoring of excavations without groundwater, up to 25 feet deep may use the following lateral earth pressure:



Where "H" is the retained height of the shoring, in feet, and σ_h is the uniform soil pressure in psf, as follows:

- Active: $\sigma_h = 23H$
- At-Rest: $\sigma_h = 36H$

3.17 Soil Corrosivity and Soluble Sulfate Contents

Based on laboratory testing, we anticipate that soluble sulfates exposure in the onsite soils may be classified as "S0" per Table 19.3.2.1 of ACI-318-14. Also, onsite soils are anticipated to be moderately corrosive to ferrous metals. Chloride contents were relatively low. Tested pH levels were average. Laboratory test results are included in Appendix C of this report. Other ACI guidelines for structural concrete are recommended.

3.18 Seismic Design Parameters

The following table summarizes the seismic design criteria for the subject site. The seismic design parameters are developed in accordance with 2022 CBC and ASCE 7-16, including Supplement Nos. 1 through 3.

Selected Seismic Design Parameters from 2022 CBC/ASCE 7-16	***Seismic Design Values***	***Reference***
Latitude	34.0512 North	
Longitude	-117.3605 West	
Controlling Seismic Source	San Jacinto	USGS, 2023
Distance to Controlling Seismic Source	3.8 Miles (6.2 km)	USGS, 2023
Site Class per Table 20.3-1 of ASCE 7-16	D	SEA/OSHPD, 2023
Ss, Spectral Acceleration for Short Periods	1.77 g	SEA/OSHPD, 2023
S_1, Spectral Accelerations for 1-Second Periods	0.69 g	SEA/OSHPD, 2023
F_a, Site Coefficient, Table 11.4-1 of ASCE 7-16	1.0	SEA/OSHPD, 2023
F_v, Site Coefficient, Table 11.4-2 of ASCE 7-16	1.7	
S_{DS}, Design Spectral Response Acceleration at Short Periods from Equation 11.4-3 of ASCE 7-16	1.18 g	SEA/OSHPD, 2023
S_{D1}, Design Spectral Response Acceleration at 1-Second Period from Equation 11.4-4 of ASCE 7-16	1.17 g*	
T_S, S_{D1}/ S_{DS}, Section 11.4.6 of ASCE 7-16	0.99 sec*	
T_L, Long-Period Transition Period	8 sec	SEA/OSHPD, 2023
PGA_M, Peak Ground Acceleration Corrected for Site Class Effects from Equation 11.8-1 of ASCE 7-16	0.82 g	SEA/OSHPD, 2023
Seismic Design Category, Section 11.6 of ASCE 7-16	D	

**These values have been increased by 50% as outlined in Supplement No. 3 of ASCE 7-16 Chapter 11.4.8.*

3.19 Utility Installation and Trench Backfill

Excavations should conform to all applicable safety requirements. Trench excavations adjacent to buildings and walls should also be in conformance with the clearance requirements on the grading and foundation plans. Excavations are anticipated to encounter native sandy alluvium or fills which may be classified as Type "C" soils per Cal/OSHA. Trench excavations for the proposed improvements are not anticipated to encounter groundwater; however, wet zones in the soil may be encountered adjacent to landscape areas and depending upon the time of year that

construction is performed. Utility excavations should be stabilized per OSHA requirements (shoring or laying back of trench walls). Excavations should be reviewed periodically by the contractor's qualified person to confirm compliance with Cal/OSHA requirements.

Native soils should be suitable for use as trench backfill though some oversize rock/rubble may be generated in some excavations and should not be used to backfill the pipe zone or within 2 feet of top-of-pipes. Native backfill materials should be compacted to a minimum of 90 percent relative compaction (per ASTM D1557). Select granular backfill (i.e., clean sand with SE 30 or better) may be used in lieu of native soils, but should also be compacted or densified with water jetting and flooding.

3.20 Surface Drainage

Inadequate control of surface runoff or heavy irrigation after development of the site may result in nuisance seepage conditions and/or erosion. Maintaining adequate surface drainage, proper disposal of runoff water and control of irrigation will help reduce the potential for future moisture-related problems. Ponding of water on structural pads should not be allowed.

Surface drainage should be carefully taken into consideration during site planning, grading, landscaping, and future building design and construction. Positive surface drainage should be provided to direct runoff away from slopes and structures and toward pavements or suitable drainage devices. The devices should be maintained and periodically cleaned out, especially immediately before and during the rainy season. Each grading plan (rough and/or precise plan) should incorporate these features.

3.21 Maintenance of Graded Slopes

To reduce the erosion and surficial slumping potential of the graded slopes, permanent manufactured slopes should be protected from erosion by planting with appropriate ground cover or by placing suitable erosion protection. These measures should be applied as soon as is practical and prior to the rainy season. Proper drainage should be designed and maintained to collect surface waters and direct them away from slopes. In addition, the design and construction of improvements and landscaping should also provide appropriate drainage measures.

Consideration should be given to surficial protection of the slopes above the basin access road, such as covering the slope face with jute matting prior to planting.

3.22 Future Plan Reviews

Any modifications to the civil engineered grading plan for the proposed project should be reviewed, analyzed and accepted by the geotechnical consultant prior to grading. Future additional plans (precise grading plans, structural plans, etc.) should be reviewed by the geotechnical consultant and report prepared as needed.

3.23 Observation and Testing During Grading and Construction

The findings, conclusions and recommendations in this report are based upon interpretation of the existing data. Verification and refinement of actual geotechnical conditions during grading is

essential, especially where slope stabilization is involved. Geotechnical observation and testing should be conducted during the future grading operations at the following stages.

- During and following clearing and grubbing, prior to site processing;
- During and following remedial removals to evaluate and accept the removal bottom;
- During and following cutting of slopes and excavation of slope-stabilization measures;
- During placement of compacted fill;
- During and upon completion of excavations for storm-drain structures and during trench backfill;
- During construction of the wet well and outlet pipeline;
- During installation of the groundwater monitoring wells;
- During construction and backfill of utility lines and/or structures;
- During pavement subgrade and aggregate-base preparation for street pavements; and
- When any unusual or unexpected geotechnical conditions are encountered during grading and construction.

Special inspections should also be conducted during placement of the lake liner to verify the following:

- Liner material (approved thickness, toughness, permeability, etc.).
- Lake bottom is free of hard and/or sharp objects.
- Liner is secured as specified.

DRAFT

4.0 LIMITATIONS

This report has been prepared for the exclusive use of our client, Dopudja & Wells and the City of Rialto, based on the specific scope of services requested by our client for the project described herein. This report or its contents should not be used or relied upon for other projects or by other parties without the written consent of our client and NMG and the involvement of a geotechnical professional. The means and methods used by NMG for this study are based on local geotechnical standards of practice, care, and requirements of governing agencies. No warranty or guarantee, express or implied is given.

The findings, conclusions, and recommendations are professional opinions based on interpretations and inferences made from geologic and engineering data from specific locations and depths, observed or collected at a given time. By nature, geologic conditions can vary from point to point, can be very different in between points, and can also change over time. Our conclusions and recommendations are subject to verification and modification with more exploration and/or observations during grading and construction when more subsurface data becomes available.

DRAFT

0 300 600 Feet

1 inch = 600 feet

N

SITE LOCATION MAP

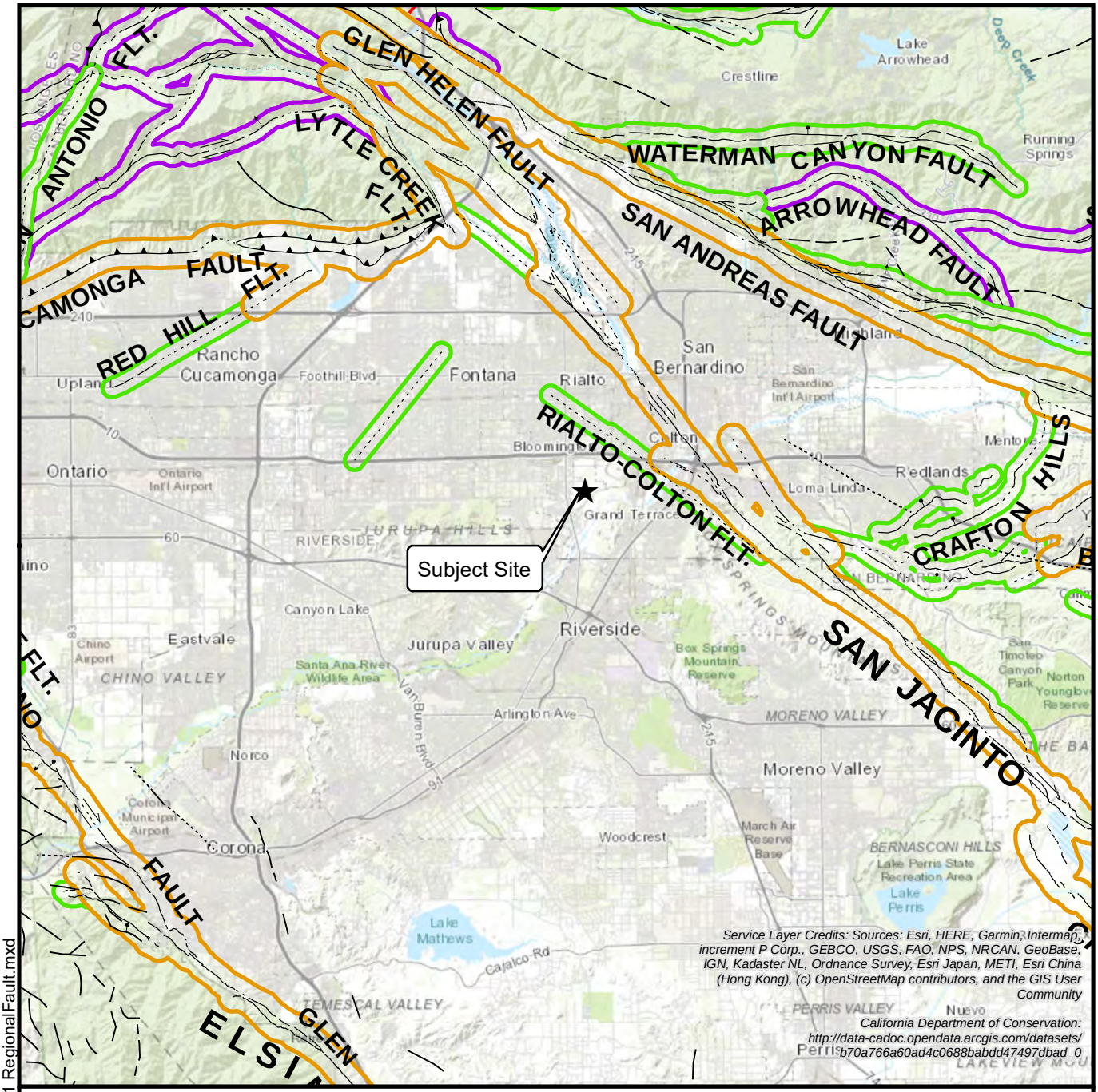
PROPOSED LAKE RIALTO
LOCATED SOUTH OF WWTP
CITY OF RIALTO, CALIFORNIA

Project Number: 20079-02 By: TM/TW
Project Name: DWC/Lake Rialto
Date: 1/16/2023

Figure 1

NMG

P:\2020\20079-02 DWC Lake Rialto\Drafting\GIS\20079-01 SiteLocation.mxd



Legend

Faults

- Certain
- Approximately Located
- Concealed

Recency of Movement

- Historic
- Holocene
- Late Quaternary
- Quaternary

0 2.5 5 Miles

1 inch = 5 miles

N

REGIONAL FAULT MAP

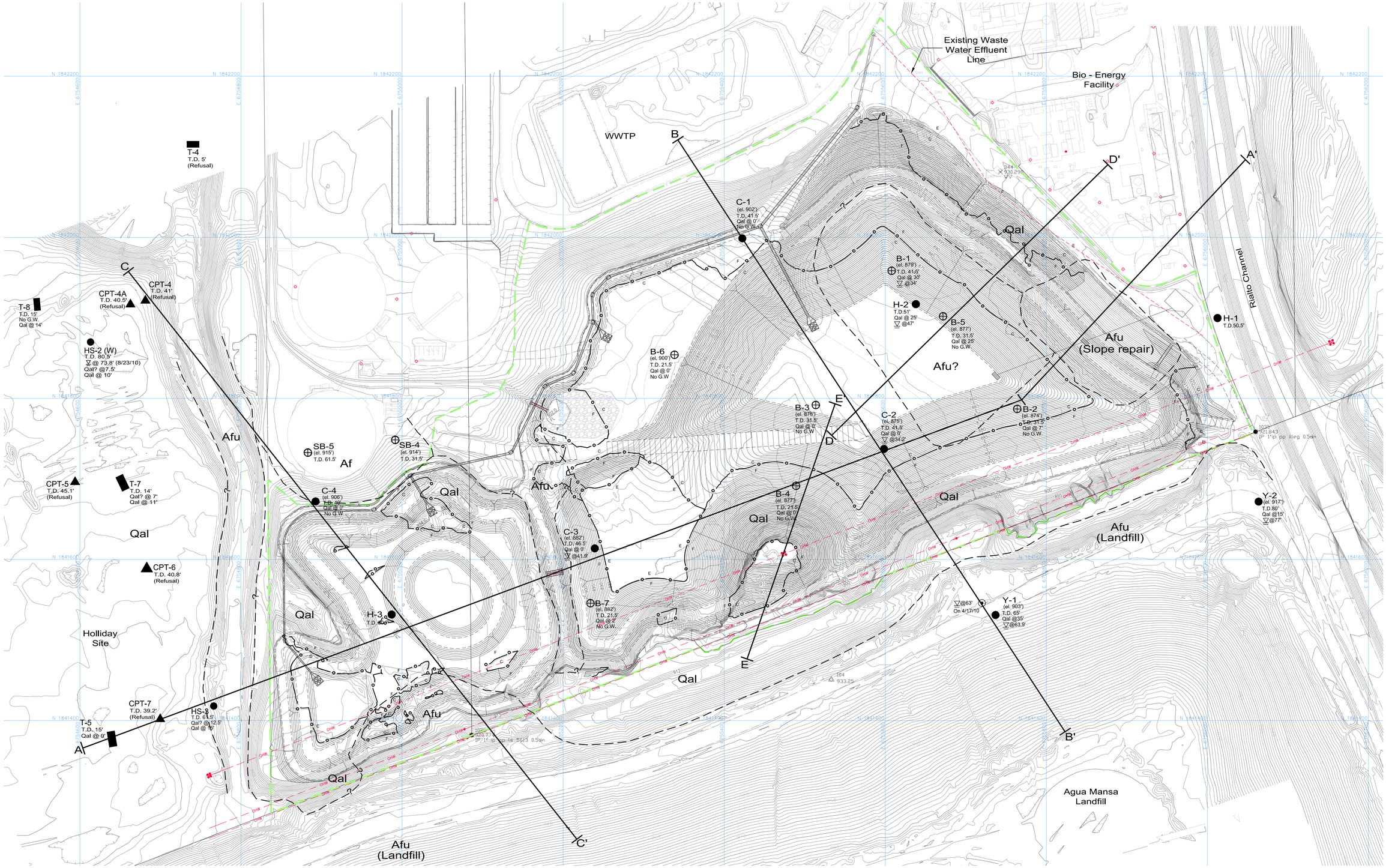
Base: California Geological Survey, Fault Activity Map of California, 2010

PROPOSED LAKE RIALTO
LOCATED SOUTH OF WWTP
CITY OF RIALTO, CALIFORNIA

Project Number: 20079-02 By: TM/TW
Project Name: DWC/Lake Rialto
Date: 1/16/2023 Figure 2

NMG

P:\2020\20079-02 DWC Lake Rialto\Drafting\GIS\20079-01 RegionalFault.mxd



LEGEND

EARTH UNITS - APPROXIMATE LIMITS SHOWN

Af	FILL PLACED BY WWTP, 2019
Afu	UNDOCUMENTED FILL
Qal	ALLUVIUM

SYMBOLS - LOCATIONS ARE APPROXIMATE

● H-3 T.D.50.7'	HOLLOW-STEM AUGER BORING BY NMG, THIS INVESTIGATION SHOWING TOTAL DEPTH
⊕ SB-5 (el. 915') T.D. 61.5'	HOLLOW-STEM AUGER BORING BY AECOM (2018), SHOWING TOP OF BORING ELEVATION AND TOTAL DEPTH
● C-4 (el. 906') T.D. 40' Qal @ 0' No G.W.	HOLLOW-STEM AUGER BORING BY NMG (2010A), SHOWING TOP OF BORING ELEVATION, TOTAL DEPTH, AND DEPTH TO EARTH UNIT AND GROUNDWATER
⊕ B-7 (el. 882') T.D. 21.5' Qal @ 2' No G.W.	HOLLOW-STEM AUGER BORING BY KLEINFELDER AND ASSOCIATES (2007), SHOWING TOP OF BORING ELEVATION, TOTAL DEPTH, AND DEPTH TO EARTH UNIT AND GROUNDWATER

SYMBOLS - LOCATIONS ARE APPROXIMATE

● Y-2 (el. 917') T.D.80' Qal @15' @77'	HOLLOW-STEM AUGER BORING BY NMG (2010B), SHOWING TOP OF BORING ELEVATION, TOTAL DEPTH, AND DEPTH TO EARTH UNIT AND GROUNDWATER
◉ @63' On 4/17/10	APPROXIMATE LOCATION OF PIEZOMETER WELL, SHOWING DEPTH TO GROUNDWATER
● HS-2 T.D.75' @63' Qal @ 10'	HOLLOW-STEM AUGER BORING BY NMG (2010C), SHOWING TOTAL DEPTH, DEPTH TO GROUNDWATER AND DEPTH TO EARTH UNIT
▲ CPT-7 T.D.39.2' (Refusal)	CONE PENETROMETER TEST BY NMG (2010C), SHOWING TOTAL DEPTH
■ T-4 T.D. 5' (Refusal)	TRENCH BY NMG (2010C), SHOWING TOTAL DEPTH

OTHER SYMBOLS - LOCATIONS ARE APPROXIMATE

— — — —	GEOLOGIC CONTACT
E C F	CUT / FILL / EXISTING LINE
— — — —	LIMITS OF THIS REPORT

GRAPHIC SCALE

40 0 20 40 80

(IN FEET)

1 inch = 40 ft.

PLATE 1

GEOTECHNICAL MAP
PROPOSED LAKE RIALTO
CITY OF RIALTO, CALIFORNIA

Project No.: 20079-02 By:TM/TW
Project Name: DWC/Lake Rialto
Date: 1/16/2022 SCALE: 1" = 40

NMG Geotechnical, Inc.

Drawing: P:\2020\20079-02 DWC Lake Rialto\Drafting_WIP\20079-02 Geo Map.dwg Layout: 1 Last Saved: Fri Jan 13, 2023 - 12:45pm Last Plotted: Fri Jan 13, 2023 - 12:46pm By: wsedgwick

Existing Waste Water Effluent Line

Bio - Energy Facility

WWTP

Stabilization Fill Key W=15'; D=2-3' (Backcut 1:1 or Flatter to Protect Existing Pipeline)

Existing 36" Waste Water (effluent) Pipe

Rialto Channel

Future Pump Station With Wet Well

Stabilization Fill Key W=20'; D=2-3'

Stabilization Fill Key W=15'; D=2-3'

Stabilization Fill Key W=15'; D=2-3'

Stabilization Fill Key W=15'; D=2-3'

Stabilization Fill Key W=15'; D=2-3'

Holliday Site

Agua Mansa Landfill

A

A'

B

B'

C

C'

D

D'

E

E'

T.D.70' (887')

T.D.90' (879')

T.D.70' (887')

2-4'

3-5'

10-15'

2'

3'

6

DWF

LEGEND

OTHER SYMBOLS - LOCATIONS ARE APPROXIMATE

C / F — DESIGN CUT / FILL / EXISTING / NATURAL LINE

3-5' — RECOMMENDED DEPTH OF REMEDIAL REMOVAL, BELOW EXISTING GRADE IN FILL AREAS AND BELOW DESIGN GRADE IN CUT AREAS

W=20' D=2-3' — RECOMMENDED STABILIZATION FILL KEY; SHOWING WIDTH AND DEPTH

LIMITS OF THIS REPORT

RECOMMENDED GROUNDWATER MONITORING WELL SHOWING TOTAL DEPTH (AND ACTION LEVEL ELEVATION)

T.D.70' (887')

GRAPHIC SCALE

40 0 20 40 80

(IN FEET)

1 inch = 40 ft.

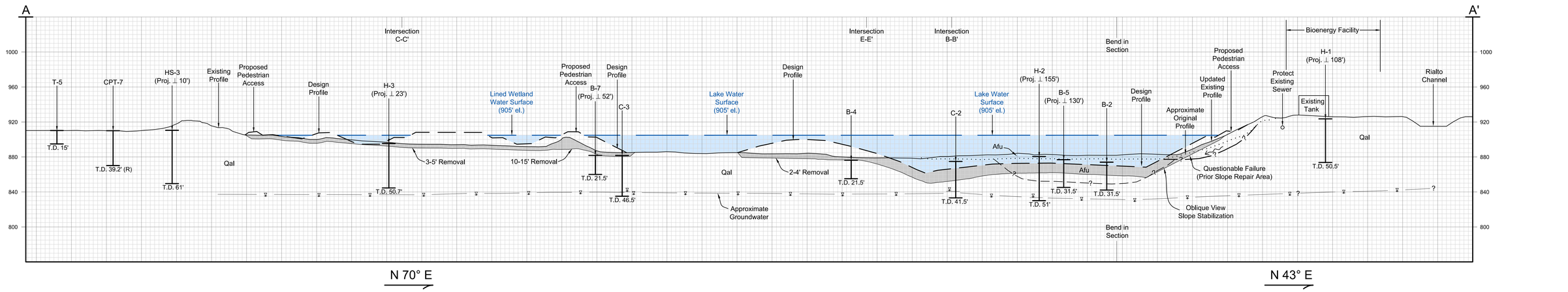
PLATE 2

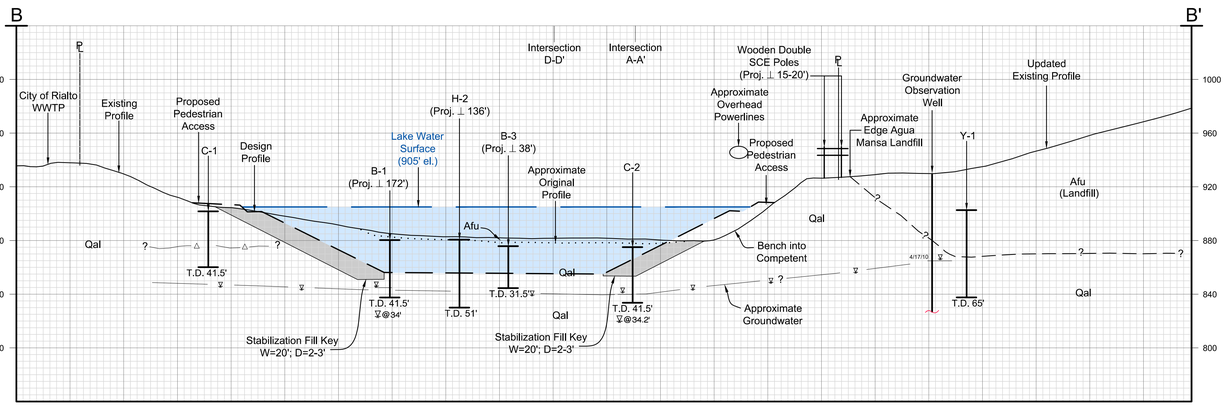
REMEDIAL MEASURES MAP
PROPOSED LAKE RIALTO
CITY OF RIALTO, CALIFORNIA

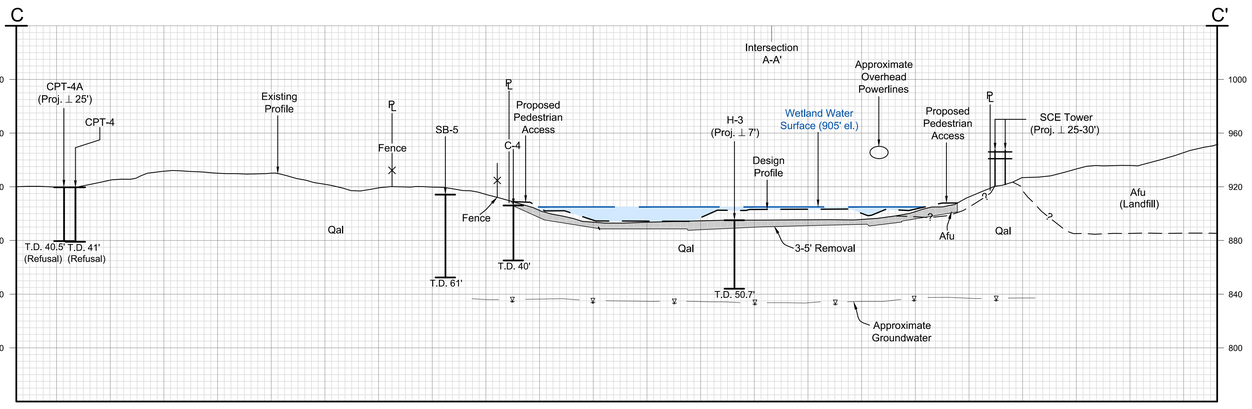
Project No.: 20079-02 By:TM/TW
Project Name: DWC/Lake Rialto
Date: 1/16/2023 SCALE: 1" = 40

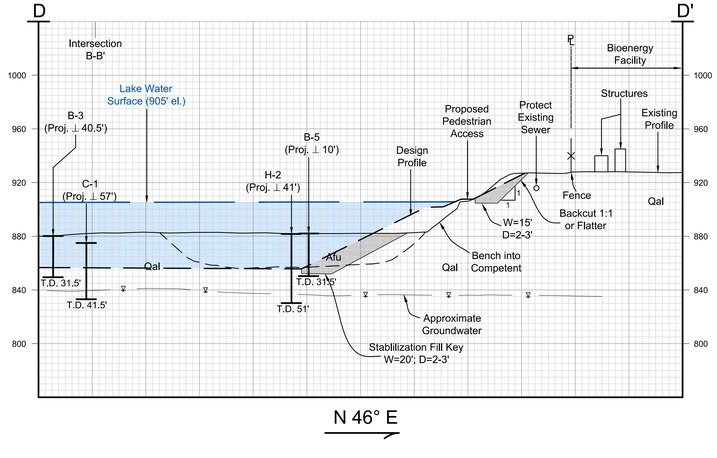
NMG Geotechnical, Inc.

Drawing: P:\2020\20079-02 DWC Lake Rialto\Drafting_WP\20079-02 Rem Plate.dwg Layout: 2 Last Saved: Thu Jan 12, 2023 - 3:53pm Last Plotted: Fri Jan 13, 2023 - 12:36pm By: mrodriguez









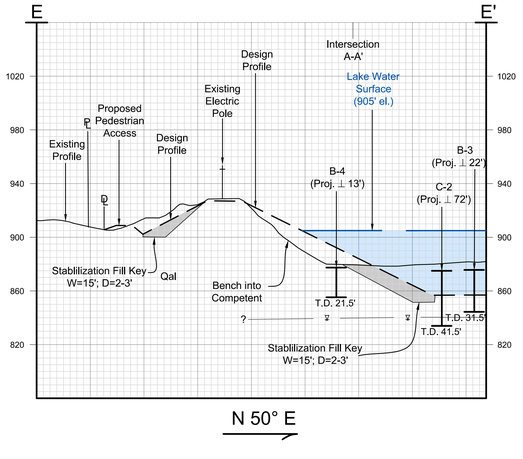


PLATE 3

Project No.: 20079-02	By:TM/TW
Project Name: WYA/Lake Rialto	
Date:1/16/2023	SCALE: 1" = 40'

NMG Geotechnical, Inc.

APPENDIX A

APPENDIX A

REFERENCES

AECOM, 2018, Plant No. 5 Expansion, City of Rialto Wastewater Treatment Plant, Supplemental Geotechnical Design Memorandum (GDM) – Rev.1, dated September 26, 2018.

California Geological Survey (CGS), 2008, Guidelines for Evaluating and Mitigating Seismic Hazards in California, Special Publication 117, Originally Adopted March 13, 1997, Revised and Re-adopted September 11, 2008.

California Geological Survey (CGS), 2010, Fault Activity Map of California and Adjacent Areas (Scale 1: 750,000), Geologic Data Map No. 6, Compiled and Interpreted by Charles W. Jennings and William A. Bryant.

California Geological Survey (CGS), 2018, Earthquake Fault Zones, A Guide for Government Agencies, Property Owners / Developers, and Geoscience Practitioners 2018. for Assessing Fault Rupture Hazards in California, Special Publication 42, Revised

CHJ Materials Laboratory, Inc., 1976, Soils Investigation, Agua Mansa Landfill, Agua Mansa Road, Rialto, California, Job Number: 76364-3, dated August 9, 1976.

County of San Bernardino, 2007, Amended 2010, San Bernardino County Development Code, Adopted March 13, 2007, Effective April 12, 2007, Amended March 25, 2010.

County of San Bernardino, 2021, Geologic Hazard Maps, web site address: http://cms.sbcounty.gov/lus/planning/zoningoverlaymaps/geologichazardmaps.aspx

Dibblee, Thomas W., 2003, Geologic Map of the Riverside East and San Bernardino South (South ½) Quadrangles, San Bernardino and Riverside Counties, California, California Division of Mines and Geology.

Earth Consultants International, 2000, Seismic Hazards – County of Riverside, dated August 1, 2000.

Gary S. Rasmussen and Associates, 1976, Engineering Geology Investigation, Proposed Sanitary Landfill, SW ¼ Sect. 25 & NW ¼ Sect. 36, T1S, R5W, Rialto, California, Project No. 1153, dated August 3, 1976.

Gary S. Rasmussen and Associates, 1980, Engineering Geology Investigation, Agua Mansa Landfill, SW ¼, Section 25 & NW ¼, Section 36, T1S, R5W, SBB&M, Rialto, California, Project No. 1153-2, dated June 30, 1980.

Gary S. Rasmussen and Associates, 1985a, Geologic Evaluation of Ground-Water Quality in the Vicinity of the Agua Mansa Landfill, Project No. 1153.31, dated January 11, 1985.

Gary S. Rasmussen and Associates, 1985b, Addendum to Our Report Dated January 11, 1985, Geologic Evaluation of Ground-Water Quality in the Vicinity of the Agua Mansa Landfill, Project No. 1153.32, dated January 14, 1985.

APPENDIX A

REFERENCES (Cont'd.)

Geotracker, 2021, State of California Water Resources Control Board Data Management System, website address: https://geotracker.waterboards.ca.gov/

Kleinfelder, 2007, Boring Logs and Map, Unpublished, Received from Prior Client, Processes Unlimited.

Nationwide Environmental Title Research, LLC. (NETR), 2021, Historic Aerials by NETR Online, website address: https://www.historicaerials.com.

NMG Geotechnical, Inc., 2010a, Preliminary Geotechnical Exploration and Review of Conceptual Plan, Proposed Rialto Renewable Energy Center Project, City of Rialto, County of San Bernardino, California, Project No. 10049-01, dated May 5, 2010.

NMG Geotechnical, Inc., 2010b, Preliminary Geotechnical Exploration and Review of Preliminary Conceptual Plan for the Yeager Property, Portion of Proposed Rialto Renewable Energy Center Project, City of Rialto, County of San Bernardino, California, Project No. 10049-01, dated October 10, 2010.

NMG Geotechnical, Inc., 2010c, Preliminary Geotechnical Exploration and Design Report, Proposed Rialto Renewable Energy Center Project, 23-Acre Holliday Property, City of Rialto, County of San Bernardino, California, dated October 11, 2010.

Pioneer Consultants, 1975a, Geotechnical Evaluation, Proposed Aggregate Site, La Roca Pit, San Bernardino County, dated January 20, 1975.

Pioneer Consultants, 1975b, Supplemental Geotechnical Investigation, La Roca Pit, San Bernardino County, California, dated February 19, 1975.

Stephenson W.J., Odum, J.K., Williams, R.A., and Anderson, M.L., 2002, Delineation of Faulting and Basin Geometry along a Seismic Reflection Transect in Urbanized San Bernardino Valley, California, Published in Bulletin of Seismological Society of America, Vol. 92, No. 6, pp. 2504-2520, August 2002.

Structural Engineers Association/Office of Statewide Health Planning and Development, 2023, U.S. Seismic Design Maps, web site address: https://seismicmaps.org/

Thomas C. Rogers and Associates, 1980, Environmental Impact Report, Proposed Upgrading of Agua Mansa Landfill to Permit Disposal of Unrestricted Group 2 Solid Waste, City of Rialto, dated July 1980.

United States Geological Survey, 1967, Revised 1980, 7.5 San Bernardino South Quadrangle.

U.S. Geological Survey, 2023, Unified Hazard Tool, NSHM 2014 Dynamic Conterminous (update) Deaggregation Program; web site address: https://earthquake.usgs.gov/hazards/interactive/

United States Geological Survey, 2003, Preliminary Geologic Map of the San Bernardino 30'x60' Quadrangle.

DRAFT

APPENDIX B

BORING LOGS
BY
NMG, THIS STUDY

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	*GRAVEL AND GRAVELLY SOILS* MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	*CLEAN GRAVELS* (LITTLE OR NO FINES)	GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
			GP	POORLY GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)	GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
			GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
	SAND AND SANDY SOILS MORE THAN 50% OF COARSE FRACTION PASSING NO. 4 SIEVE	*CLEAN SANDS* (LITTLE OR NO FINES)	SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
			SP	POORLY GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)	SM	SILTY SANDS, SAND - SILT MIXTURES
			SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	*SILTS AND CLAYS*	LIQUID LIMIT LESS THAN 50	ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
			CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
			OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50	MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDY OR SILTY SOILS, ELASTIC SILTS
			CH	INORGANIC CLAYS OF HIGH PLASTICITY
			OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS			PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: Dual symbols are used to indicate gravels or sand with 5-12% fines and soils with fines classifying as CL-ML. Symbols separated by a slash indicate borderline soil classifications.

Sampler and Symbol Descriptions

- Modified California sample (D-#)
- Standard Penetration Test (S-#)
- Shelby tube sample (T-#)
- Large bulk sample (B-#)
- Small bulk sample (SB-#)
- Approximate depth of groundwater during drilling
- Approximate depth of static groundwater

Note: Number of blows required to advance driven sample 12 inches (or length noted).

Laboratory and Field Test Abbreviations

AL	Atterberg limits (plasticity)
CC	Chemical Testing incl. Soluble Sulfate
CN	Consolidation
DS	Direct Shear
EI	Expansion Index
GS	Grain Size Analysis (Sieve, Hydro. and/or -No. 200)
MD	Maximum Density and Optimum Moisture
RV	Resistance Value (R-Value)
SE	Sand Equivalent
UU	Unconsolidated Undrained Shear Strength

GENERAL NOTES

1. Soil classifications are based on the Unified Soil Classification System and include color, moisture, and relative density or consistency. Field descriptions have been modified to reflect results of laboratory tests where deemed appropriate. Bedrock descriptions are based on visual classification and include rock type, moisture, color, grain size, strength, and weathering.
2. Descriptions on these boring logs apply only at the specific boring locations and at the time the borings were drilled. They are not warranted to be representative of subsurface conditions at other locations or times.

KEY TO LOG OF BORING

West Yost/ Lake Rialto
Bloomington, CA
PROJECT NO. 20079-01

Report: HOLLOW STEM; Project: 20079-01.GPJ; Data Template: NMG_GINT_2016.GDT; Printed: 6/4/21

Date(s) Drilled	2/22/21	Logged By	BF
Drilling Company	2R Drilling, Inc.	Drill Bit Size/Type	10"
Drill Rig Type	CME 75 Hollow Stem	Hammer Data	140 lbs. @ 30-inch drop
Sampling Method(s)	Modified California, Bulk		
Approximate Groundwater Depth:	No Groundwater Encountered.		
Comments			

H-1

Sheet 1 of 2

Total Depth Drilled (ft)	50.5
Approximate Ground Surface Elevation (ft)	924.0 msl

Elevation (ft)	Depth (ft)	SAMPLES Type	SAMPLES Number	SAMPLES Blows per foot	Graphic Log	USCS	MATERIAL DESCRIPTION	Moisture Content (%)	Dry Density (pcf)	OTHER TESTS and REMARKS
	0					SM	Surface: Dirt, top of slope, abundant cobbles. **Alluvium (Qal)** @ 1-5': Brown to dark brown silty gravelly fine to coarse SAND w/ some cobbles, damp, micaceous.			B-1 @ 1-5' CC, GS
			B-1							
920										
	5		D-1	32			@ 5': Dark yellowish brown to brown silty gravelly SAND, damp, medium dense, micaceous, friable, cobble in tip.	2.6	120.9	CC
			D-2	54		SP	@ 7.5': Grayish brown fine to coarse SAND with trace silt and some gravel, damp, dense, slightly micaceous, highly friable.	2.7	118.2	Bottom Ring Disturbed. GS, DS
	10		D-3	93			@ 10': Grayish brown/ Olive brown gravelly fine to coarse SAND with trace silt, damp, very dense, slightly micaceous, highly friable.	3.0	126.4	B-2 @ 10-15' GS
			B-2							
910										
	15		D-4	20		SM	@ 15': Upper: Olive brown silty fine SAND, damp, medium dense, micaceous, highly friable.	8.6	110.2	GS, DS
						SP	Lower: Olive/ Yellowish brown fine to medium SAND with trace to some silt, damp, medium dense, highly friable, micaceous, trace gravel in tip.			
	20		D-5	77/12"			@ 20': Grayish brown very fine to coarse SAND with trace silt, damp, very dense, slightly micaceous, highly friable, beds of finer sand in upper rings.	2.7	114.6	
900										
	25									

LOG OF BORING

West Yost/ Lake Rialto
Bloomington, CA
PROJECT NO. 20079-01

NMG

Elevation (ft)	Depth (ft)	SAMPLES Type	SAMPLES Number	SAMPLES Blows per foot	Graphic Log	USCS	MATERIAL DESCRIPTION	Moisture Content (%)	Dry Density (pcf)	OTHER TESTS and REMARKS
	25		D-6	88/12"		SP	@ 25': Olive brown gravelly fine to coarse SAND with trace silt, damp, very dense, slightly micaceous, friable, some siltier beds in upper rings.	3.0		Disturbed.
	30		D-7 SB-1	76/12"			@ 30': Grayish/ Olive brown fine to coarse SAND with some gravel, damp to moist, very dense, slightly micaceous, highly friable, 1 1/2" clay bed at top of sample.	19.7	96.6	GS, DS SB-1 @ 30.5'
890										
	35		D-8	50/5"			@ 35': No Recovery. Driller observed cobble blocking sample.			
	40		D-9	48		CL	@ 40': Upper: Olive brown sandy silty CLAY, saturated, very stiff, plastic to highly plastic.	42.3		Disturbed. GS, AL
						SM-ML	Lower: Olive brown silty very fine SAND/ sandy SILT, moist, dense/ hard, micaceous, friable, more moist on top of clay layer.			Perched Water, No Groundwater.
880										
	45		D-10	72		SP	@ 45': Upper: Grayish brown fine to coarse SAND with some silt, damp, dense, highly friable, micaceous.	5.4	115.4	
						SM	Lower: Olive brown silty very fine SAND, damp, dense, micaceous, friable.			
	50		D-11	50/6"			@ 50': No Recovery.			
							Notes: Total Depth is 50.5 Feet. No Groundwater Encountered. Backfilled with Cuttings and Jetted/Tamped.			
870										
	55									

LOG OF BORING

West Yost/ Lake Rialto
Bloomington, CA

PROJECT NO. 20079-01

NMG

Report: HOLLOW STEM; Project: 20079-01.GPJ; Data Template: NMG_GINT_2016.GDT; Printed: 6/4/21

Date(s) Drilled	**2/22/21**	Logged By	**BF**
Drilling Company	**2R Drilling, Inc.**	Drill Bit Size/Type	**10"**
Drill Rig Type	**CME 75 Hollow Stem**	Hammer Data	**140 lbs. @ 30-inch drop**
Sampling Method(s)	**Modified California, Bulk**		
Approximate Groundwater Depth:	**Groundwater Stabilized at 45.8 Feet.**		
Comments			

H-2

Sheet 1 of 2

Total Depth Drilled (ft)	**51.0**
Approximate Ground Surface Elevation (ft)	**881.0 msl**

Elevation (ft)	Depth (ft)	SAMPLES Type	SAMPLES Number	SAMPLES Blows per foot	Graphic Log	USCS	MATERIAL DESCRIPTION	Moisture Content (%)	Dry Density (pcf)	OTHER TESTS and REMARKS
	0					ML	Surface: Dirt, light brown gravelly sandy SILT. **Alluvium (Qal)**			
880										B-1 @ 1-5'
			B-1 D-1	68/12"			@ 2.5': Upper: Light olive/ yellowish brown very fine sandy SILT with some gravel, damp, hard, micaceous.	5.6	125.5	GS
						SM-ML	Lower: Light yellowish/ olive brown silty very fine SAND/ sandy SILT, damp, very dense/ hard, micaceous, slightly friable.			
	5		D-2	73		SP-SM	@ 5': Olive/ olive brown with green tint fine to coarse SAND with some silt and some gravel, damp to moist, dense, trace root hairs.	3.8	127.4	
			D-3	92			@ 7.5': Olive/ olive brown with green tint fine to coarse gravelly SAND with some silt, damp to moist, very dense, schist fragments in top of upper rings.	3.6	125.1	
	10		D-4	90/11"			@ 10': Olive/ olive brown with green tint gravelly fine to coarse SAND with some silt, damp to moist, very dense.	3.2	129.9	CN
870										
	15		D-5	87		SM-ML	@ 15': Dark gray silty fine to coarse SAND/ sandy SILT with trace gravel, damp to moist, very dense/ hard, micaceous.	7.3	129.3	
	20		D-6	50/4"		ML	@ 20': Driller observed rig chatter while sampling. Upper: Olive brown sandy SILT with trace gravel, moist, hard, micaceous.	5.4	118.9	AL, GS
860						SM-ML	Lower: Olive gray silty fine to medium SAND/ sandy SILT, moist to wet, very dense/ hard, trace gravel.			
	25									

LOG OF BORING

West Yost/ Lake Rialto
Bloomington, CA
PROJECT NO. 20079-01

NMG

Report: HOLLOW STEM; Project: 20079-01.GPJ; Data Template: NMG_GINT_2016.GDT; Printed: 6/4/21

Elevation (ft)	Depth (ft)	SAMPLES Type	SAMPLES Number	SAMPLES Blows per foot	Graphic Log	USCS	MATERIAL DESCRIPTION	Moisture Content (%)	Dry Density (pcf)	OTHER TESTS and REMARKS
	25		D-7	75/12"		SP	@ 25': Upper: Light yellowish brown medium to coarse SAND with trace gravel, damp, very dense, slightly micaceous, highly friable. Lower: Yellowish brown silty fine to coarse SAND with trace gravel, damp to moist, very dense, micaceous, highly friable.	2.6	122.6	
850	30		D-8	93/11"			@ 30': Light olive brown fine to medium SAND with trace silt, moist, very dense, micaceous, highly friable.	2.8	107.1	CN
	35		D-9	74		ML	@ 35': Upper: Olive to olive brown clayey SILT with some sand and some gravel, moist to wet, hard, slightly plastic, micaceous. Lower: Yellowish olive clayey SILT, moist, hard, slightly plastic, micaceous.	8.0	121.3	
840	40		D-10	83/11"		SM-ML	@ 40': Upper: Olive brown to light olive brown sandy SILT/ silty fine SAND, wet, hard/ very dense, micaceous, slightly plastic, 1/4"-1/2" clay bed in upper rings.	16.6	106.9	
						SP	Lower: Light olive brown fine to medium SAND with trace silt, wet, very dense, slightly micaceous, highly friable.			
	45		D-11	50/5"			@ 45': No recovery.			
830	50		D-12	76/12"			@ 50': Olive brown fine to medium SAND with some silt, saturated, very dense, micaceous, highly friable.	19.4	108.5	
	55						Notes: Total Depth is 51 Feet. Groundwater Encountered at 47 Feet. Groundwater Stabilized at 45.8 Feet. Backfilled with Cuttings and Tamped.			

LOG OF BORING

West Yost/ Lake Rialto
Bloomington, CA

PROJECT NO. 20079-01

NMG

Report: HOLLOW STEM; Project: 20079-01.GPJ; Data Template: NMG_GINT_2016.GDT; Printed: 6/4/21

Date(s) Drilled	2/23/21	Logged By	BF
Drilling Company	2R Drilling, Inc.	Drill Bit Size/Type	10"
Drill Rig Type	CME 75 Hollow Stem	Hammer Data	140 lbs. @ 30-inch drop
Sampling Method(s)	Modified California, Bulk		
Approximate Groundwater Depth:	No Groundwater Encountered.		
Comments			

H-3

Sheet 1 of 2

Total Depth Drilled (ft)	50.7
Approximate Ground Surface Elevation (ft)	895.0 msl

Elevation (ft)	Depth (ft)	SAMPLES Type	SAMPLES Number	SAMPLES Blows per foot	Graphic Log	USCS	MATERIAL DESCRIPTION	Moisture Content (%)	Dry Density (pcf)	OTHER TESTS and REMARKS
	0					ML	Surface: Dirt, twigs and branches. **Alluvium (Qal)**			B-1 @ 1-5'
			B-1 D-1	22			@ 2.5': Light olive gray sandy SILT with trace gravel, dry to damp, stiff, slightly micaceous, silty CLAY in upper rings.	1.2	111.0	CN
890	5		D-2	37		SM-ML	@ 5': Light olive gray sandy SILT/ silty very fine SAND, damp, medium dense/ very stiff, trace rootlets, more sandy in upper rings.	1.5	115.1	
			D-3	29			@ 7.5': Light olive gray andy SILT/ silty very fine SAND, damp, very stiff/ medium dense, micaceous, friable, trace root hairs.	2.4	108.3	
	10		D-4	14			@ 10': Light olive gray sandy SILT/ silty very fine SAND, damp, stiff/ loose, micaceous, friable, trace root hairs.	4.4	98.7	AL, GS, CN
880	15		D-5	17		ML	@ 15': Light olive gray sandy SILT, damp, stiff, micaceous, highly weatherable.	2.0	100.3	
	20		D-6	19			@ 20': Light olive gray sandy SILT with trace gravel, damp, stiff, micaceous, trace rootlets, highly weatherable.	1.6	104.5	
870	25									

LOG OF BORING

West Yost/ Lake Rialto
Bloomington, CA
PROJECT NO. 20079-01

NMG

Report: HOLLOW STEM; Project: 20079-01.GPJ; Data Template: NMG_GINT_2016.GDT; Printed: 6/4/21

Elevation (ft)	Depth (ft)	SAMPLES Type	SAMPLES Number	SAMPLES Blows per foot	Graphic Log	USCS	MATERIAL DESCRIPTION	Moisture Content (%)	Dry Density (pcf)	OTHER TESTS and REMARKS
870	25		D-7	46		ML	@ 25': Light olive gray very fine sandy SILT, damp, hard, micaceous, bedded, trace root hairs.	6.7	96.9	
	30		D-8 SB-1	76		SM-ML	@ 30': Upper: Light olive brown sandy SILT/ silty fine to coarse SAND with some gravel, damp, hard/ very dense, micaceous, highly friable, calcium carbonate in sample ring (SB-1).	3.0		Sample Disturbed, 1 Ring. SB-1 @ 31'.
						SM	Lower: Light olive gray/ brown silty medium to coarse SAND with some gravel, damp, very dense, friable, large cobble in bottom ring.			
860	35		D-9	90/10"		SM-ML	@ 35': Light olive brown/ yellowish brown silty very fine SAND/ sandy SILT, damp, very dense/ hard, micaceous, friable, somewhat interbedded sand and silt.	2.9	108.8	
	40		D-10	73		SP	@ 40': Upper: Light grayish/ yellowish brown very fine to fine SAND with trace silt, damp, dense, friable, micaceous, upper rings are olive brown to dark olive brown silty CLAY/ clayey SILT.	4.5	111.6	
						ML	Lower: Olive to dark olive brown clayey SILT, wet, hard, plastic, micaceous.			
850	45		D-11	76/12"		SM	@ 45': Upper: Olive brown silty very fine SAND, damp, very dense, micaceous, highly friable, trace gravel in upper rings.	7.8	107.7	
						ML	Lower: Yellow/ Olive brown clayey SILT, damp to moist, hard, slightly micaceous, slightly plastic.			
	50		D-12	93/8"		SP-GP	@ 50': Very light gray/ white gravelly fine to coarse SAND with trace silt/ sandy GRAVEL, damp, very dense, cobble in rings, pulverized rock in sample.	0.9		Sample Disturbed, 1 Ring.
840	55						Notes: Total Depth is 50.7 Feet. No Groundwater Encountered. Backfilled with Cuttings and Tamped/Jetted.			

LOG OF BORING

West Yost/ Lake Rialto
Bloomington, CA

PROJECT NO. 20079-01

NMG

BORING LOGS
BY
AECOM, 9/26/18

Project: Rialto WWTP
Project Location: Rialto, CA
Project Number: 60570758

Log of Boring SB-4

Sheet 1 of 2

Date(s) Drilled	5/10/2018 to 5/10/2018	Logged By	J. Leiva	Checked By	C. Goetz
Drilling Method	Hollow-Stem Auger (HSA)	Drill Bit Size/Type	6" bullet	Total Depth of Borehole	31.5´ bgs
Drill Rig Type	CME95	Drilling Contractor	BC2	Surface Elevation	914.0 ft above msl
Borehole Backfill	Cement bentonite grout	Sampling Method(s)	Bulk, SPT, CAL	Hammer Data	140 lb./30 in. Automatic
Boring Location	N 34.1 E -117.4	Groundwater Level(s)	Not Encountered		

Elevation, feet	Depth, feet	SAMPLES Type	Number	Sampling Resist. Blows/6" OR CORE% RQD	Recovery, %	Pocket Penetrometer, tsf	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	REMARKS AND OTHER DETAILS
914.0	0.0									
	0		SS-1					Yellowish brown, Silty SAND (SM), fine to coarse grained sand, little to some fines, few angular to subangular gravel (up to 1"), trace organics, dry [FILL]		
910										
	5		SS-2	11 11 12				Yellowish brown, Silty SAND with Gravel (SM), fine to coarse grained sand, little fine to coarse grained gravel, little fines, medium dense	2.5	*%G=22.6 %S=59.9 %M=13.4 %C=4.1*
905										
904.0	10.0									
	10		SS-3	7 11 21				Yellowish brown, Silty SAND (SM), fine to medium grained sand, some fines, trace fine grained gravel, 2" layer of sandy lean clay, dense [ALLUVIUM]		
900										
	15		SS-4	8 12 21				Light yellowish brown, Silty SAND (SM), fine grained sand, some fines, trace medium grained sand, trace iron oxidized staining	7.2	*%G=0 %S=65.5 %M=31.2 %C=3.3*
895										
	20		SS-5	8 12 15				Similar to SS-4, medium dense Light olive brown, Silty SAND (SM), fine grained sand, some fines, medium dense, dry		*WC=6.6% %G=0 %S=62.8 %M=33.1 %C=4.2*
890										
889.0	25.0									
	25		SS-6	12 19 23				Yellowish brown, Poorly graded SAND with Silt (SP-SM), fine to coarse grained sand, few fines, dense, 6" layer of silty sand, moist		
885										
884.0	30.0									
	30		SS-7	10				Light olive brown, Clayey SAND (SC), fine grained sand, some		

AECOM

Report: GEO_CR; File J:\AE_DEPTS\GEOT\PROJECT FILES (GEOTECH)\RIALTO WWTP\RIALTO (6-1-18, PEGAH)\RIALTO WWTP.GPJ; 6/26/2018 2:15:59 PM

Project: Rialto WWTP
Project Location: Rialto, CA
Project Number: 60570758

Log of Boring SB-4

Sheet 2 of 2

Elevation, feet	Depth, feet	SAMPLES: Type	SAMPLES: Number	SAMPLES: Sampling Resist. Blows/6" OR CORE% RQD	SAMPLES: Recovery, %	SAMPLES: Pocket Penetrometer, tsf	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	REMARKS AND OTHER DETAILS
		SS	7	21 28				882.5 fines, dense, moist 2" layer of coarse grained sand @ 30.2 ft Boring Terminated at 31.5´ bgs	31.5	

880
875
870
865
860
855
850

AECOM

Report: GEO_CR; File J:\AE_DEPTS\GEOT\PROJECT FILES (GEOTECH)\RIALTO WWTP\RIALITO (6-1-18, PEGAH)\RIALTO WWTP.GPJ; 6/26/2018 2:15:59 PM

Project: Rialto WWTP
Project Location: Rialto, CA
Project Number: 60570758

Log of Boring SB-5

Sheet 1 of 2

Date(s) Drilled	5/10/2018 to 5/10/2018	Logged By	J. Leiva	Checked By	C. Goetz
Drilling Method	Hollow-Stem Auger (HSA)	Drill Bit Size/Type	6" bullet	Total Depth of Borehole	61.5' bgs
Drill Rig Type	CME95	Drilling Contractor	BC2	Surface Elevation	915.0 ft above msl
Borehole Backfill	Cement bentonite grout	Sampling Method(s)	Bulk, SPT, CAL	Hammer Data	140 lb./30 in. Automatic
Boring Location	N 34.1 E -117.4	Groundwater Level(s)	Not Encountered		

Elevation, feet	Depth, feet	SAMPLES Type	Number	Sampling Resist. Blows/6" OR CORE% RQD	Recovery, %	Pocket Penetrometer, tsf	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	REMARKS AND OTHER DETAILS
915	0							915.0 0.0 Light brownish gray, Silty SAND (SM), fine to coarse grained sand, little to some fines, few fine to coarse grained gravel (up to 1.5") [FILL]		
		SS	SS-1							
910	5	SS	SS-2	7 8 12				910.0 5.0 Light yellowish brown, Lean CLAY (CL), few silt, trace fine to medium grained sand, trace fine grained gravel, very stiff, dry [ALLUVIUM]	10.9	*LL=46 PL=19 PI=-0.85* *%G=0.2 %S=3.6* *%M=82.3 %C=13.9*
905	10	SS	SS-3	6 9 11				Light yellowish brown, Sandy Lean CLAY (CL), little fine grained sand, very stiff, dry [ALLUVIUM]		
900	15	SS	SS-4	3 8 13				900.0 15.0 Light yellowish brown, Sandy SILT (ML), some fine grained sand, trace medium grained sand, trace fine grained gravel, trace iron oxidized staining, medium dense, dry [ALLUVIUM] little to some medium to coarse grained sand near the bottom	6.3	*%G=3 %S=43.6* *%F=53.4*
895	20	SS	SS-5	13 18 25				895.0 20.0 Light grayish brown, Silty SAND (SM), fine grained sand, little fines, dense, dry Olive brown, Sandy lean CLAY (CL) in shoe		
890	25	SS	SS-6	7 18 26				Light yellowish brown, Silty SAND (SM), fine to medium grained sand, little fines, dense, dry		
885	30	SS	SS-7	8				885.0 30.0 Light brownish gray, Poorly graded SAND with Silt (SP-SM), fine to	1.5	*%G=13.3 %S=79.9* *%M=5.8 %C=1*

AECOM

Report: GEO_CR; File J:\AE_DEPTS\GEOT\PROJECT FILES (GEOTECH)\RIALTO WWTP\RIALTO (6-1-18, PEGAH)\RIALTO WWTP.GPJ; 6/26/2018 2:16:06 PM

Project: Rialto WWTP
Project Location: Rialto, CA
Project Number: 60570758

Log of Boring SB-5

Sheet 2 of 2

Elevation, feet	Depth, feet	SAMPLES Type	Number	Sampling Resist. Blows/6" OR CORE% RQD	Recovery, %	Pocket Penetrometer, tsf	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	REMARKS AND OTHER DETAILS
		SS	7	11 14				coarse grained sand, few fine grained gravel, few fines, medium dense, dry		
								880.0		
880	35	SS	8	18 23 32				Light yellowish brown, SILT with Sand (ML), little fine grained sand, trace medium grained sand, trace iron oxidized staining, hard, moist	15.6	*LL=30 PL=6 PI=-1.4 %G=0 %S=28.8 %M=62.8 %C=8.4*
								875.0		
875	40	SS	9	7 15 23				Light olive brown, Sandy Lean CLAY (CL), dense, 6" layer of clayey sand, hard		
								870.0		
870	45	SS	10	23 50/5"				Light gray, Well-graded SAND (SW), fine to coarse grained sand, few fine grained gravel, trace fines, very dense, dry		
								865.0		
865	50	SS	11	33 50/6"				Light gray, Well-graded SAND with Silt and Gravel (SW-SM), fine to coarse grained sand, little fine to coarse grained gravel (up to 1"), few fines, very dense, dry	2.0	*%G=28.6 %S=62.8 %F=8.6*
								860.0		
860	55	SS	12	34 50/6"				Light gray, Well-graded SAND with Gravel (SW), fine to coarse grained sand, little fine to coarse grained gravel, trace fines, very dense, dry		
								855.0		
855	60	SS	13	19 37 50				Light yellowish brown, Poorly graded SAND (SP), medium grained sand, trace fines, very dense, dry		
								853.5		
850								Boring Terminated at 61.5' bgs		

Report: GEO_CR; File J:\AE_DEPTS\GEO\PROJECT FILES (GEOTECH)\RIALTO WWTP\RIALITO (6-1-18, PEGAH)\RIALTO WWTP.GPJ; 6/26/2018 2:16:06 PM

BORING, TRENCH AND CPT LOGS BY NMG, 10/11/10 10049-02

Report: HOLLOW STEM; Project: P:\2010\10049-02\GINT\10049-02.GPJ; Data Template: NMGNOV98.GDT; Printed: 9/29/10

Date(s) Drilled	8/12/10	Logged By	PA
Drilling Company	Test America	Drill Bit Size/Type	8"
Drill Rig Type	CME 85	Hammer Data	140 lbs @ 30" drop (auto)
Sampling Method(s)	Bulk, Modified California, SPT		
Approximate Groundwater Depth:	Groundwater At 73.7' (8-17-10)		
Comments	Monitering Well Installed		

HS-2

Sheet 1 of 3

Total Depth Drilled (ft)	80.5
Approximate Ground Surface Elevation (ft)	914.2

Elevation (ft)	Depth (ft)	SAMPLES Type	SAMPLES Number	SAMPLES Blows per foot	Graphic Log	USCS	MATERIAL DESCRIPTION	Moisture Content (%)	Dry Density (pcf)	OTHER TESTS and REMARKS
	0					ML/SM	Surface: Loose dry SILT. **Artificial Wash Deposits (Aw)**			
		SPT	1	25			@ 2.5' Pale yellow interbedded SILT/gravelly SAND, dry, medium stiff/dense, laminated, slight FeO staining.	10.0		GS
910	5					GM	@ 5' Pale olive silty coarse-grained sandy pea-GRAVEL, dry, medium dense, massive, slight FeO staining.	6.2	109.1	
		D	1	49						
		SPT	2	27		SM	**Alluvium? (Qal?)** @ 7.5' Pale olive to pale gray silty SAND, dry to damp, medium dense, massive, well-sorted, micaceous, friable.	3.0		
	10	D	2	36		SM/ML	**Alluvium (Qal)** @ 10' Pale olive silty fine-grained SAND/fine grained sandy SILT, moist to very moist, medium stiff, FeO staining, micaceous, massive.	23.3	97.7	6" Tube Sample. CN
		SPT	3	19		ML	@ 12.5' Pale olive to brown SILT with scattered sand lenses, moist, stiff, moderately laminated, FeO staining.	33.7		
900		B	1					21.2		B-1 @ 12.5-15 Feet.
	15	D	3	43			@ 15' Olive SILT, moist, stiff, slight MnO/FeO staining, micaceous, massive.	19.9	100.7	
		SPT	4	33		SM	@ 17.5' Pale olive brown silty fine-grained SAND, moist, medium dense, massive, locally silty, micaceous.	15.9		
	20	D	4	79		ML	@ 20' Olive to gray slightly sandy SILT, moist, stiff, locally sand lenses, massive, slight FeO staining, micaceous.	21.5	100.3	6" Tube Sample. DS
		SPT	5	33		SM/GM	@ 22.5' Pale olive to pale gray silty SAND/sandy GRAVEL, moist, medium dense to dense, graded, silt in upper sample.	14.4		
890	25	D	5	50/6"		GM	@ 25' Pale gray SAND with coarse gravel, damp, dense, poorly sorted, friable, massive.	3.0	109.7	GS
		SPT	6	31		SM	@ 27.5' Pale yellow silty SAND, damp, medium dense, massive, slightly micaceous, friable, locally clean sand.	4.3		
	30									

LOG OF BORING

Rentech/ Rialto

Rialto

PROJECT NO. 10049-02

NMG

Elevation (ft)	Depth (ft)	Sample Type	Sample Number	Blows per foot	Graphic Log	USCS	MATERIAL DESCRIPTION	Moisture Content (%)	Dry Density (pcf)	OTHER TESTS and REMARKS
	30	D	6	83/11"			@ 30' Pale gray silty SAND, damp, dense, massive, micaceous, well-sorted, highly friable.	5.3	103.2	6" Tube Sample.
		SPT	7	35		ML	@ 32.5' Olive SILT, moist, stiff, micaceous, massive.	24.7		
880	35	D	7	50/6"		SM/ML	@ 35' Olive gray SILT to silty SAND, moist to very moist, dense/stiff, micaceous, slight FeO staining, massive, well-sorted, locally trace clay.	25.1	102.9	
		SPT	8	55			@ 37.5' Olive gray SILT to silty SAND, moist, dense/stiff, micaceous, slight FeO staining, massive, well-sorted.	19.4		
	40	D	8	50/3"		ML/GM	@ 40' Upper: Olive SILT, damp, medium stiff, massive, slight FeO staining, locally sandy. Lower: Sandy GRAVEL, damp, very dense, massive, friable, clasts up to 2" in diameter.	4.2	111.5	
		SPT	9	67		GM	**Alluvial Fan Deposits (Qf)** @ 42.5' Sandy GRAVEL, damp, very dense, massive, friable, clasts up to 2" in diameter.	3.0		
870	45	D	9	50/5"			@ 45' Olive coarse-grained sandy GRAVEL with fines, moist, very dense, massive, abundant pea-gravel sized clasts. -Sample Disturbed-	9.7		
		SPT	10	50/4"			@ 47.5' Pale yellow to olive sandy GRAVEL, moist, very dense, massive, poorly sorted.	2.8		
	50	D	10	50/3"			@ 50' Pale gray coarse-grained sandy GRAVEL, moist, very dense, massive, poorly sorted.	6.5	117.9	
		SPT	11	60		SM/GM	@ 52.5' Pale gray coarse-grained sandy GRAVEL grading to a silty SAND, moist, very dense, massive, poorly sorted.	4.0		
860	55	D	11	50/3"		CL/ML	@ 55' Upper: Pale olive to brown silty CLAY/clayey SILT, damp to moist, stiff, moderately plastic, massive, FeO staining.	4.3	122.5	
						SP	Lower: Pale gray SAND with few fines, damp to moist, dense, massive, slightly friable.			
		SPT	12	56		SM	@ 57.5' Pale gray silty SAND with scattered gravel, damp, dense, FeO staining, poorly sorted, massive.	3.8		
	60	D	12	50/6"		SP	@ 60' Pale gray SAND with few fines, damp to moist, dense, well-sorted, massive, friable, micaceous.	3.7	105.0	
850	65									

LOG OF BORING

Rentech/ Rialto
Rialto

PROJECT NO. 10049-02

NMG

Elevation (ft)	Depth (ft)	SAMPLES Type Number	SAMPLES Blows per foot	Graphic Log	USCS	MATERIAL DESCRIPTION	Moisture Content (%)	Dry Density (pcf)	OTHER TESTS and REMARKS
	65								
	70	D-13	41		ML	@ 70' Olive brown SILT with trace CLAY, very moist, stiff, massive, slight FeO/MnO staining.	32.7	92.9	
840	75					▽			
	80	D-14	50/6"			@ 80' No Recovery.			
830	85					Notes: Total Depth: 80.5 Feet. Groundwater Monitoring Well Installed. -Screen from 80-60 Feet. -Sand From 80-58 Feet. -Bentonite Plug From 58-53 Feet. -Cement Slurry From 53-0 Feet. -Well-Head Riser Installed. Groundwater Encountered at 73 Feet During Drilling. Groundwater At 73.85 Feet (8-23-10) Cuttings Drummed and Removed From Site.			
	90								
820	95								
	100								

LOG OF BORING

Rentech/ Rialto
Rialto

PROJECT NO. 10049-02

NMG

Report: HOLLOW STEM; Project: P:\2010\10049-02\GINT\10049-02.GPJ; Data Template: NMGNOV98.GDT; Printed: 9/29/10

Date(s) Drilled	8/11/10	Logged By	PA
Drilling Company	Test America	Drill Bit Size/Type	8"
Drill Rig Type	CME 85	Hammer Data	140 lbs @ 30" drop (auto)
Sampling Method(s)	Modified California, SPT		
Approximate Groundwater Depth:	Groundwater Not Encountered		
Comments			

HS-3

Sheet 1 of 2

Total Depth Drilled (ft)	61.5
Approximate Ground Surface Elevation (ft)	910.8

Elevation (ft)	Depth (ft)	SAMPLES Type	SAMPLES Number	SAMPLES Blows per foot	Graphic Log	USCS	MATERIAL DESCRIPTION	Moisture Content (%)	Dry Density (pcf)	OTHER TESTS and REMARKS
910	0					GM	Surface: Pale yellowish brown slightly sandy SILT, loose, dry, scattered weeds. **Artificial Wash Deposits (Aw)**			
		D	1	16			@ 2.5' Pale brown silty sandy GRAVEL, damp, loose to medium dense, massive.	8.2	91.2	
	5	SPT	1	5		ML	@ 5' Pale gray SILT, dry to damp, loose to medium stiff, laminated, well-sorted, slightly micaceous.	17.1		
		D	2	22			@ 7.5' Pale yellowish brown SILT, dry to damp, medium stiff, micaceous, well-sorted, slightly micaceous.	7.4	83.1	CN
900	10	SPT	2	16		CH	@ 10' Pale yellowish brown silty CLAY, dry to damp, medium stiff, micaceous, well-sorted, slightly micaceous.	10.8		AL
		D	3	29		ML	**Alluvium? (Qal?)** @ 12.5' Pale olive to pale yellow slightly sandy SILT, damp, medium stiff, FeO staining, occasional sand blebs.	6.1	94.6	CN
	15	SPT	3	31		SM/ML	**Alluvium (Qal)** @ 15' Pale gray silty fine-grained SAND/sandy SILT, dry to damp, medium stiff/medium dense, slightly micaceous, highly friable.	2.5		
		D	4	40		SP	@ 17.5' Pale yellowish brown SAND with few fines, dry to damp, medium dense, slightly micaceous, highly friable. -Sample Disturbed-	2.1		6" Tube Sample.
890	20	SPT	4	18		ML	@ 20' Pale gray to olive SILT with trace SAND, moist, stiff, massive, slight FeO staining, micaceous.	19.3		
		D	5	36			@ 22.5' Pale gray to olive SILT with trace SAND, moist, stiff, massive, slight FeO staining, micaceous.	24.9	95.4	6" Tube Sample. CN
	25	SPT	5	24		SM/ML	@ 25' Pale olive gray silty fine-grained SAND/fine-grained sandy SILT, moist, massive, well-sorted, FeO staining.	16.1		
		D	6	39		SP	@ 27.5' Pale yellowish brown SAND with few fines, dry to damp, medium dense, few pebbles, massive, highly friable, micaceous. -Sample Disturbed-	1.8		6" Tube Sample.
	30									

LOG OF BORING

Rentech/ Rialto

Rialto

PROJECT NO. 10049-02

NMG

Elevation (ft)	Depth (ft)	Type	Number	Blows per foot	Graphic Log	USCS	MATERIAL DESCRIPTION	Moisture Content (%)	Dry Density (pcf)	OTHER TESTS and REMARKS
	30	SPT	6	30		SM/SP	@ 30' Pale yellowish brown to gray slightly silty SAND, moist, medium dense, micaceous, scattered clasts up to 1" in diameter, massive, friable.	3.0		
880		D	7	52		SM/ML	@ 32.5' Upper: Pale yellowish brown to gray silty SAND, moist, medium dense, poorly-sorted. Lower: Olive SILT, moist, stiff, FeO staining, micaceous.	4.2	109.1	6" Tube Sample.
	35	SPT	7	23		ML	@ 35' Pale gray to olive silty fine-grained sandy SILT, moist, medium stiff, locally clayey, highly micaceous, massive, slightly friable.	17.5		
		D	8	46		SM/ML	@ 37.5' Upper: Olive silty SAND/sandy SILT, moist, medium dense/stiff, highly micaceous, slight FeO staining, massive.	17.8	96.6	6" Tube Sample.
						SP	Lower: Pale gray SAND with few fines, friable.			
	40	SPT	8	28		SM/ML	@ 40' Olive sandy SILT/silty SAND, moist, medium dense/stiff, massive, highly micaceous, slight FeO staining, slightly friable.	17.8		
870		D	9	53		SP	@ 42.5' Pale yellowish brown SAND with few fines, damp, medium dense, well-sorted, FeO staining, highly friable.	4.5	107.1	6" Tube Sample.
	45	SPT	9	50/5"		GM	**Alluvial Fan Deposits (Qf)** @ 45' Pale gray sandy GRAVEL, damp, dense, massive, scattered cobbles, poorly sorted, micaceous.	2.8		
		D	10	50/4"			@ 47.5' Pale gray sandy GRAVEL with trace silt, damp, dense, clasts up to 2" in diameter, poorly sorted, micaceous, massive.	3.0	118.0	6" Tube Sample.
	50	SPT	10	50/4"			@ 50' Pale gray sandy GRAVEL with trace silt, damp, dense, clasts up to 2" in diameter, poorly sorted, micaceous, massive.	2.4		
860		D	11	72			@ 52.5' Upper: Pale gray sandy GRAVEL with trace silt, damp to moist, dense, massive, poorly sorted, friable.	3.3	120.9	6" Tube Sample.
						ML	Lower: Olive SILT, moist, medium stiff, micaceous, massive.			
	55	SPT	11	25			@ 55' Olive fine-grained sandy SILT, moist, stiff, slight FeO staining, highly micaceous, massive.	21.1		
		D	12	45			@ 57.5' Olive gray SILT with trace clay, moist, medium stiff, locally silty sand lenses, calcium carbonate nodules, FeO staining, micaceous, massive.	29.1	95.6	6" Tube Sample.
	60	SPT	12	23			@ 57.5' Olive gray SILT with trace clay, moist, medium stiff, locally silty sand lenses, calcium carbonate nodules, FeO staining, micaceous, massive.	33.9		
850							Notes: Total Depth: 61.5 Feet. Groundwater Not Encountered. Cement Slurry Backfill. Cuttings Drummed and Removed From Site.			
	65									

LOG OF BORING

Rentech/ Rialto
Rialto

PROJECT NO. 10049-02

NMG

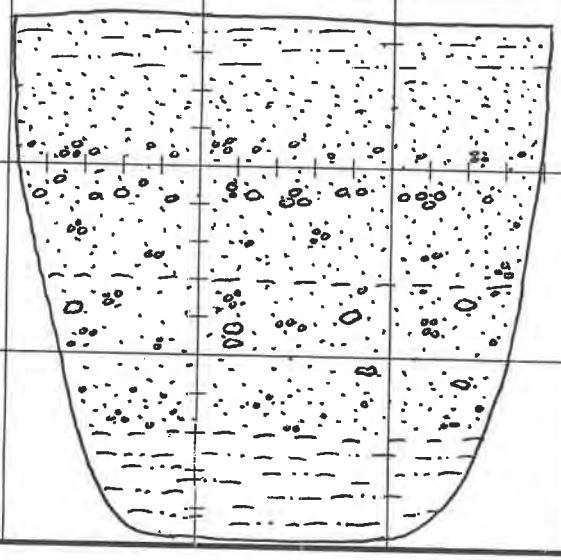
NMG

Project Name: Rentech/ Rialto
Project Number: 10049-02
Equipment: Case 580
Logged By: PA
Elevation: 911 ±
Location:

TRENCH NO.: **T-7**

GEOLOGIC ATTITUDES	DESCRIPTION (DATE: 8/9/10)	GEOLOGIC UNIT	ENGINEERING PROPERTIES: U.S.C.S.	SAMPLE NO.	MOISTURE CONTENT (%)	DRY DENSITY (pcf)
	Artificial Wash Deposits (Aw) Surface: Pale yellow slightly sandy SILT, dry, loose, scattered weeds. @ 0-2' Pale yellow to pale gray silty fine-grained SAND/ sandy SILT, dry to damp, medium stiff, abundant roots, moderately well laminated, micaceous, friable. @ 2-5' Pale gray coarse-grained SAND/GRAVEL, damp, dense, coarsening downwards, friable, roots.	Aw	SM/ML SP/GP			
	Alluvium (Qal)? @ 7' Coarse-grained SAND with scattered gravel and cobbles up to 8" in diameter, few fines. @ 10' SAND with scattered gravel and few fines, no cobbles.	Qal?	SP			
	Alluvium (Qal) @ 11' Olive SILT with trace SAND, moist, medium stiff, FeO staining, micaceous, massive. @ 12' Olive silty fine-grained SAND/sandy SILT, moist, medium dense/stiff, highly micaceous, massive, slightly friable.	Qal	ML SM/ML			
	Notes: Total Depth: 14 Feet. Groundwater Not Encountered. Backfilled With Cuttings.					

GRAPHIC REPRESENTATION: West Wall SCALE: 1" = 5' ± SURFACE SLOPE: 0 TREND: --N20W-->



NMG Geotechnical, Inc.

LOG OF TRENCH NO: T-7

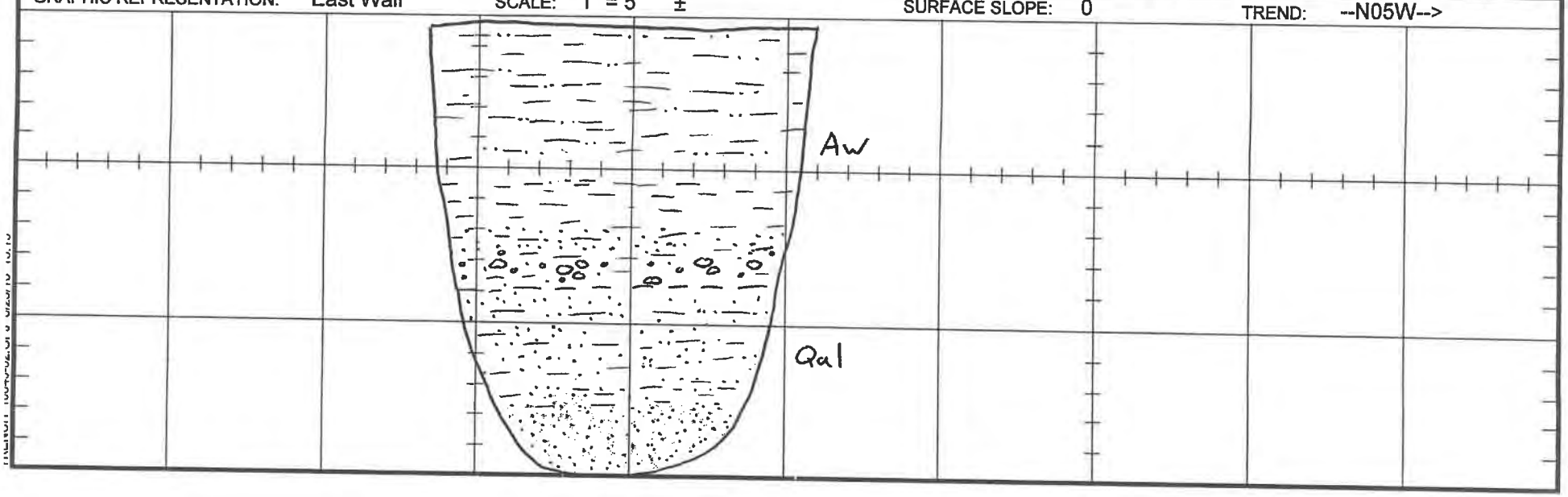
NMG Geotechnical, Inc.

Project Name: Rentech/ Rialto
Project Number: 10049-02
Equipment: Case 580
Logged By: PA
Elevation: 908 ±
Location:
TRENCH NO.: **T-5**

DATE: 8/9/10

GEOLOGIC ATTITUDES	DESCRIPTION:	GEOLOGIC UNIT	ENGINEERING PROPERTIES: U.S.C.S.	SAMPLE NO.	MOISTURE CONTENT (%)	DRY DENSITY (pcf)
B-1 @ 2 Feet	**Artificial Wash Deposits (Aw)** Surface: Pale yellow silty fine-grained SAND/sandy SILT, dry, loose. @ 0-5' Pale olive to pale yellowish brown SILT, damp, medium stiff, thin laminations, roots, occasional burrows, micaceous, moderately fractured, locally friable, slight FeO staining.	Aw	ML	B-1		
	@ 7' Silty SAND/ sandy SILT.		SM/ML			
	@ 8' Scattered cobbles.					
	Alluvium (Qal) @ 9' Olive gray SILT, moist, medium stiff, FeO staining, root-hairs, massive.	Qal	ML			
	@ 13' Pale olive clean SAND, damp to moist, very friable, FeO staining.		SP			
	Notes: Total Depth: 15 Feet. Groundwater Not Encountered. Backfilled With Cuttings.					

GRAPHIC REPRESENTATION: East Wall SCALE: 1" = 5' ± SURFACE SLOPE: 0 TREND: --N05W-->

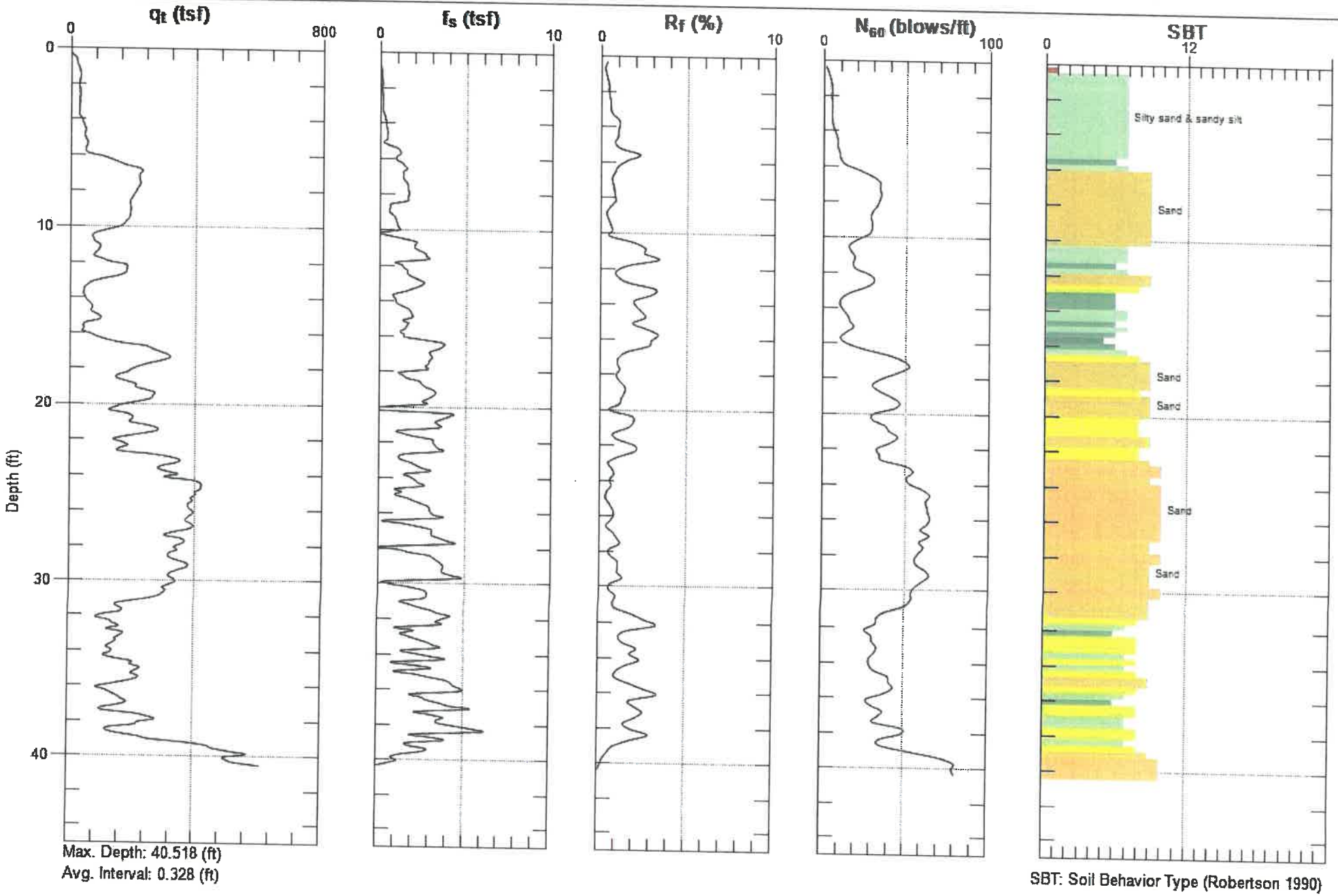


LOG OF TRENCH NO: T-5

GREGG NMG

Site: HOLIDAY TRUCKING
Sounding: CPT-4A

Engineer: P. ANDERSON
Date: 8/18/2010 11:14



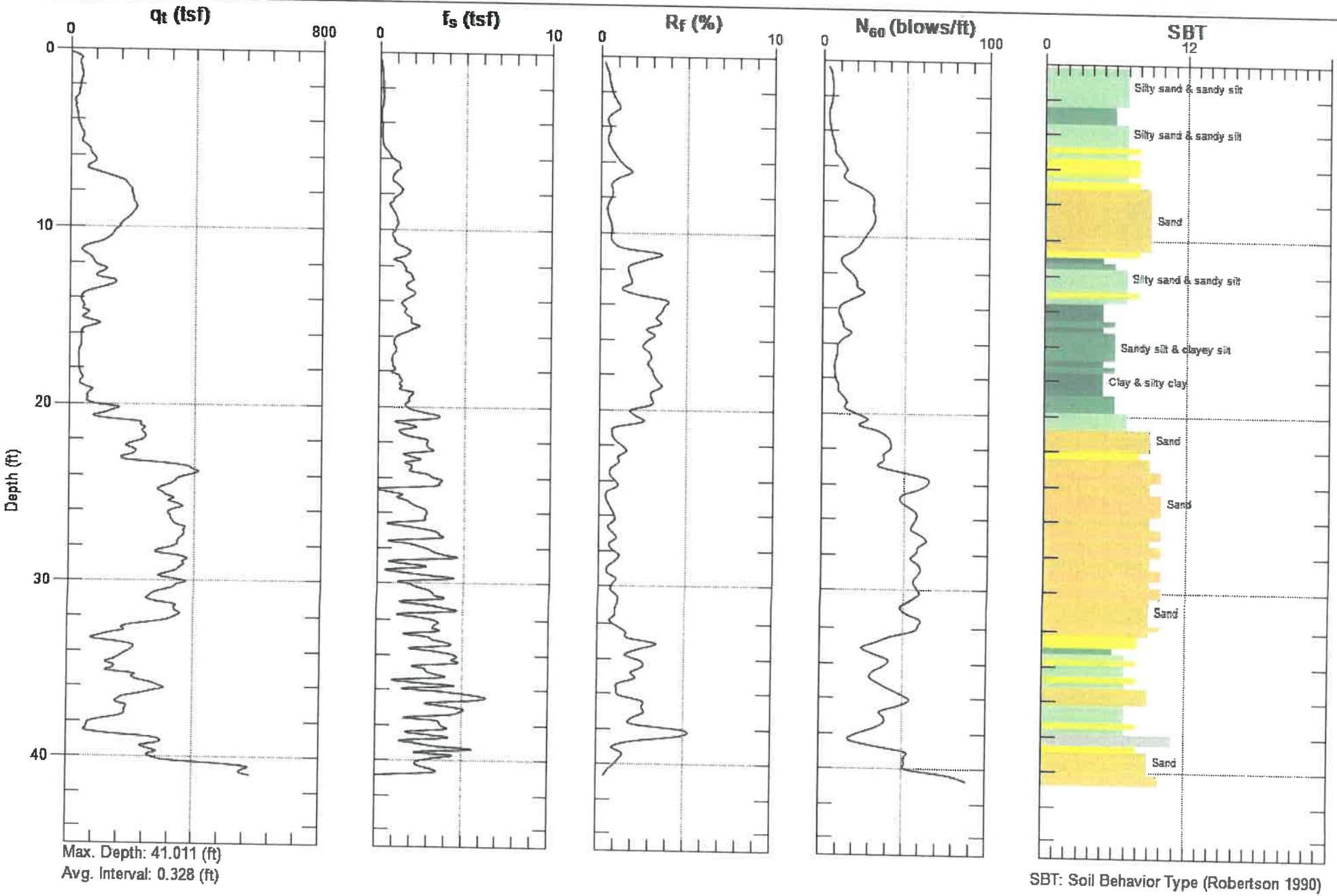
Max. Depth: 40.518 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

GREGG NMG

Site: HOLIDAY TRUCKING
Sounding: CPT-4

Engineer: P. ANDERSON
Date: 8/17/2010 08:47



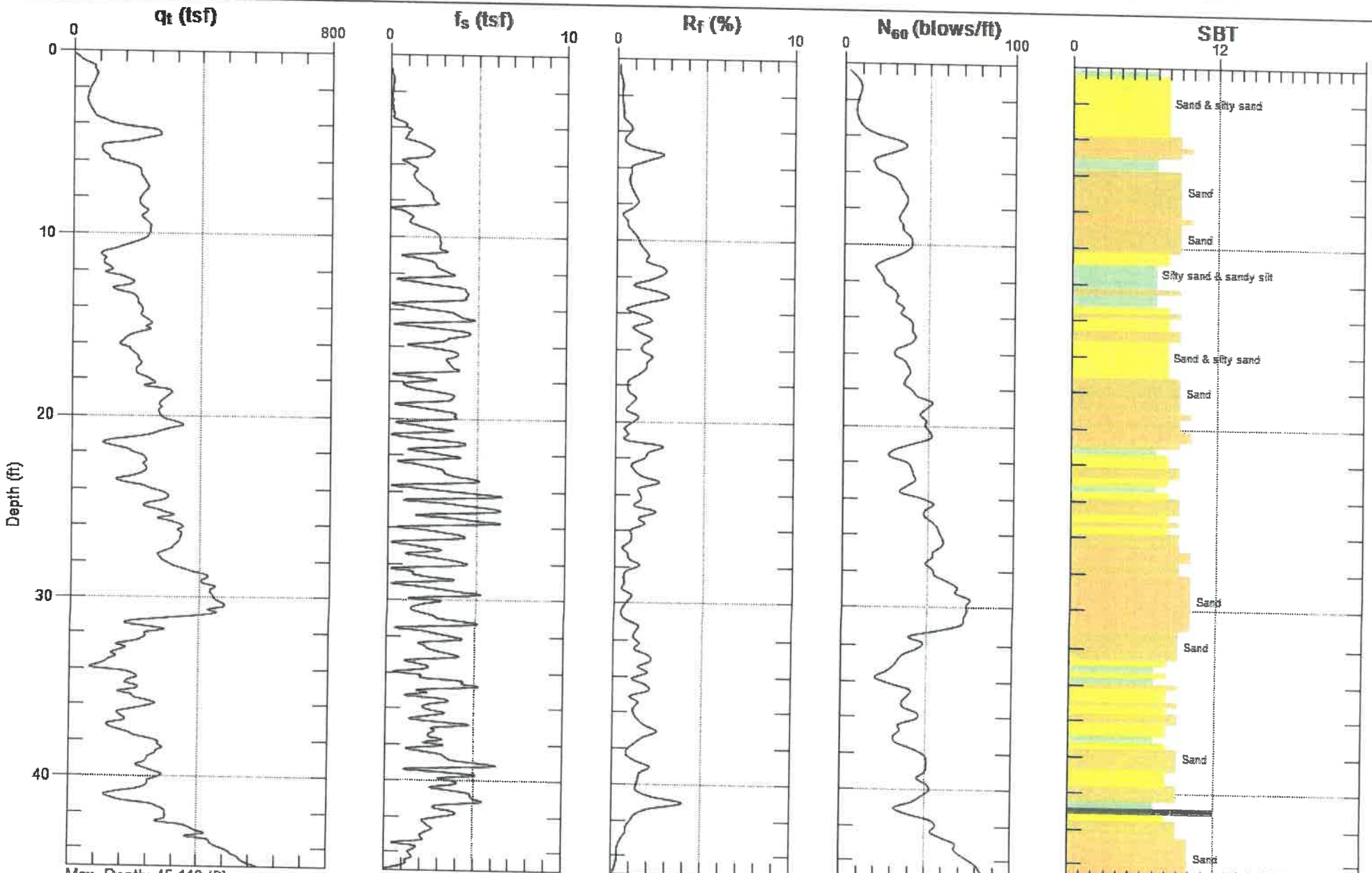
Max. Depth: 41.011 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

GREGG NMG

Site: HOLIDAY TRUCKING
Sounding: CPT-5

Engineer: P. ANDERSON
Date: 8/17/2010 10:13



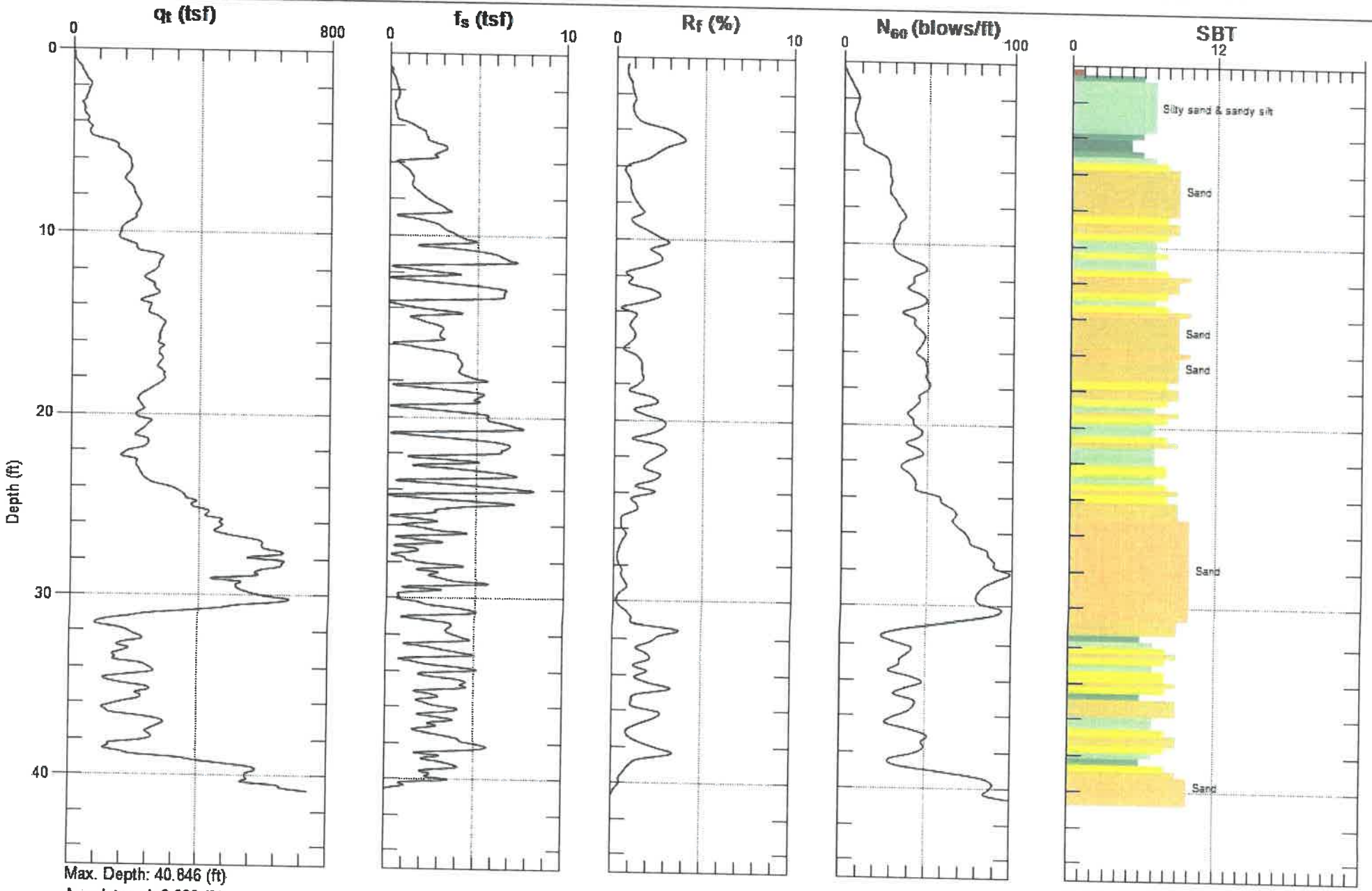
Max. Depth: 45.112 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

GREGG NMG

Site: HOLIDAY TRUCKING
Sounding: CPT-6

Engineer: P. ANDERSON
Date: 8/17/2010 12:22



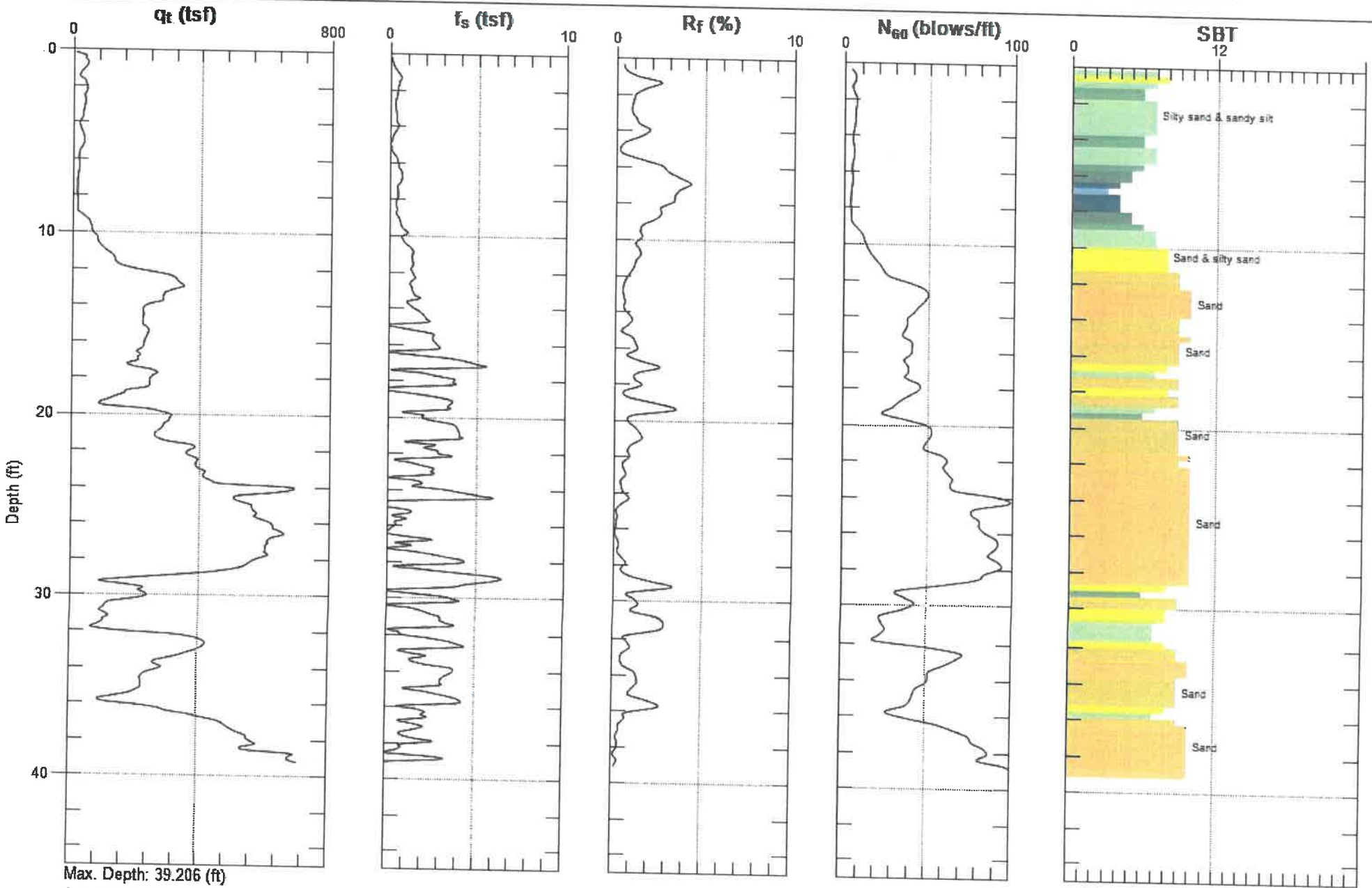
Max. Depth: 40.846 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

GREGG NMG

Site: HOLIDAY TRUCKING
Sounding: CPT-7

Engineer: P. ANDERSON
Date: 8/18/2010 09:49



Max. Depth: 39.206 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

BORING LOGS
BY
NMG, 5/5/10

Report: HOLLOW STEM; Project: P:\2010\10049-01\GINT\10049-01.GPJ; Data Template: NMGNOV98.GDT; Printed: 5/3/10

Date(s) Drilled	4/14/10	Logged By	PA/ TK
Drilling Company	Test America	Drill Bit Size/Type	8"
Drill Rig Type	CME-75	Hammer Data	140 lbs @ 30" Drop
Sampling Method(s)	Modified California, Bulk		
Approximate Groundwater Depth:	Groundwater Not Encountered		
Comments	UTM 11S		

C-1

Sheet 1 of 2

Total Depth Drilled (ft)	41.5
Approximate Ground Surface Elevation (ft)	902.0

Elevation (ft)	Depth (ft)	SAMPLES Type	SAMPLES Number	SAMPLES Blows per foot	Graphic Log	USCS	MATERIAL DESCRIPTION	Moisture Content (%)	Dry Density (pcf)	OTHER TESTS and REMARKS
	0					SM	**Alluvium (Qal)** Surface: Light gray silty SAND/GRAVEL, few weeds, scattered cobbles.			
900			B-1							B-1 @ 0-5 Feet. EI, CC, MD, GS
			D-1	60			@ 2.5' Light yellowish brown silty fine-grained SAND, moist, medium dense, highly micaceous, slightly friable, slight FeO staining.	10.6	101.3	CN
	5		D-2	71			@ 5' Light olive brown silty fine-grained SAND, moist, medium dense to dense, highly micaceous, slight FeO staining, massive, slightly friable.	13.4	104.5	
	10		D-3	50/6"		SP	@ 10' Light gray coarse-grained SAND with gravel, damp, dense, massive, slightly friable. -Sample Disturbed-	1.9		GS
890										
	15		D-4	50/6"			@ 15' Light gray coarse-grained SAND with gravel, damp, dense, massive, slightly friable. - Sample Disturbed-	3.4	96.0	CN
	20		D-5	50/6"			@ 20' Light gray coarse-grained SAND with gravel, damp, dense, slightly micaceous, massive, highly friable. -Sample Disturbed-	2.1		GS
880										
	25		D-6	80		CH/ MH SM	@ 25' Upper: Dark grayish brown silty CLAY/clayey SILT, moist, stiff/dense, slight FeO staining, micaceous, massive. Lower: Pale gray fine-grained silty SAND, damp, dense.	8.5	102.7	AL, GS
	30									

LOG OF BORING

Rentech/ Rialto

Rialto

PROJECT NO. 10049-01

NMG

Elevation (ft)	Depth (ft)	SAMPLES Type Number	SAMPLES Blows per foot	Graphic Log	USCS	MATERIAL DESCRIPTION	Moisture Content (%)	Dry Density (pcf)	OTHER TESTS and REMARKS
	30	D-7	50/6"			@ 30' Pale brown to brown slightly silty SAND, moist, dense, FeO staining, massive, friable. - Disturbed-	10.2	89.4	
870									
	35	D-8	50/5"		SM/GM	@ 35' Olive brown silty SAND with gravel/sandy GRAVEL, moist, dense, massive, friable. - Sample Disturbed-	4.9		
	40	D-9	50/4"			@ 40' -No Recovery- (Cobble in sample tip).			
860						Notes: Total Depth: 41.5 Feet. Groundwater Not Encountered. Backfilled with Concrete Grout.			
	45								
	50								
850									
	55								
	60								
840									
	65								

LOG OF BORING

Rentech/ Rialto
Rialto

PROJECT NO. 10049-01

NMG

Report: HOLLOW STEM; Project: P:\2010\10049-01\GINT\10049-01.GPJ; Data Template: NMGNOV98.GDT; Printed: 4/29/10

Report: HOLLOW STEM; Project: P:\2010\10049-01\GINT\10049-01.GPJ; Data Template: NMGNOV98.GDT; Printed: 5/3/10

Date(s) Drilled	4/14/10	Logged By	PA/ TK
Drilling Company	Test America	Drill Bit Size/Type	8"
Drill Rig Type	CME-75	Hammer Data	140 lbs @ 30" Drop
Sampling Method(s)	Modified California, Bulk		
Approximate Groundwater Depth:	Groundwater Encountered at 34.2 feet.		
Comments	UTM 11S 0466791/ 3767934		

C-2

Sheet 1 of 2

Total Depth Drilled (ft)	41.5
Approximate Ground Surface Elevation (ft)	875.0

Elevation (ft)	Depth (ft)	SAMPLES Type	SAMPLES Number	SAMPLES Blows per foot	Graphic Log	USCS	MATERIAL DESCRIPTION	Moisture Content (%)	Dry Density (pcf)	OTHER TESTS and REMARKS
	0		B-1			SM	**Alluvium (Qal)** Surface: Pale brown sandy SILT/silty SAND, moist, loose, scattered weeds.			CAM 17 Metals, TPH, VOC, SVOC, pH
			D-1	59			@ 2.5' Olive slightly silty SAND, moist, medium dense, locally silty, highly micaceous, slight FeO staining, friable. -Sample Disturbed-	17.5		B-1 @ 0-5 Feet. EI, CC, MD, GS CAM 17 Metals, TPH, VOC, SVOC, pH
870	5		D-2	50/6"		SM/SP	@ 5' Olive slightly silty SAND with scattered gravel, very moist, dense, slightly micaceous, massive, highly friable.	12.7	119.0	
	10		D-3	70			@ 10' -No Recovery-			PID=7ppm at 12-15 feet. VOC, TPH
860	15		D-4	50/6"			@ 15' -No Recovery-.			
	20		D-5	60/6"		SP	@ 20' Light gray SAND with few fines and scattered gravel, damp to moist, dense, massive, highly friable.	4.8	115.8	
850	25		D-6	50/6"			@ 25' Light gray SAND with few fines, damp, dense, massive, micaceous, highly friable. -Sample Disturbed-	4.9		
	30									

LOG OF BORING

Rentech/ Rialto

Rialto

PROJECT NO. 10049-01

NMG

Elevation (ft)	Depth (ft)	SAMPLES Type Number	SAMPLES Blows per foot	Graphic Log	USCS	MATERIAL DESCRIPTION	Moisture Content (%)	Dry Density (pcf)	OTHER TESTS and REMARKS
	30	D-7	50/6"			@ 30' Light olive brown SAND, moist, dense, scattered gravel, slightly micaceous, massive, highly friable. -Sample Disturbed-	4.2		
840	35	D-8	50/6"		ML	@ 35' Olive SILT with trace sand, very moist to saturated, very stiff, highly micaceous, massive, slight FeO staining, slightly friable.	27.6	95.9	
	40	D-9	45		SP	@ 40' Light gray very coarse-grained SAND with gravel, saturated, dense, massive, highly friable. -Sample Disturbed-	10.4		
830	45					Notes: Total Depth: 41.5 Feet. Groundwater @ 34.2 Feet. Backfilled with Cement Grout.			
	50								
820	55								
	60								
810	65								

LOG OF BORING

Rentech/ Rialto
Rialto

PROJECT NO. 10049-01

NMG

Report: HOLLOW STEM; Project: P:\2010\10049-01\GINT\10049-01.GPJ; Data Template: NMGNOV98.GDT; Printed: 4/29/10

Report: HOLLOW STEM; Project: P:\2010\10049-01\GINT\10049-01.GPJ; Data Template: NMGNOV98.GDT; Printed: 5/3/10

Date(s) Drilled	4/13/10	Logged By	PA/ TK
Drilling Company	Test America	Drill Bit Size/Type	8"
Drill Rig Type	CME-75	Hammer Data	140 lbs @ 30" Drop
Sampling Method(s)	Modified California, Bulk		
Approximate Groundwater Depth:	Groundwater Encountered at 41.9 feet.		
Comments	UTM 11S 0466692/ 3767899		

C-3

Sheet 1 of 2

Total Depth Drilled (ft)	46.5
Approximate Ground Surface Elevation (ft)	882.0

Elevation (ft)	Depth (ft)	SAMPLES Type	SAMPLES Number	SAMPLES Blows per foot	Graphic Log	USCS	MATERIAL DESCRIPTION	Moisture Content (%)	Dry Density (pcf)	OTHER TESTS and REMARKS
	0					SM	**Alluvium (Qal)** Surface: Light Brown SAND/GRAVEL.			CAM 17 Metals, TPH, VOC, SVOC, pH
880			B-1 D-1				@ 2.5' -No Sample- (Cobbles).			B-1 @ 0-5 Feet. CAM 17 Metals, TPH, VOC, SVOC, pH
	5		D-2	50/5"		SM SP	@ 5' Upper: Olive silty SAND with trace sand, moist, stiff, highly micaceous, massive. Lower: Pale olive SAND with few fines, damp to moist, dense, massive, slightly friable.	8.3	113.3	GS
	10		D-3	15/5"		SM/ GM	@ 10' Upper: Olive silty fine-grained SAND, moist, medium dense, highly micaceous, slight FeO staining.	3.8	117.5	CN
870			D-4	50/6"		SP	Lower: Coarse-grained sandy GRAVEL, moist, dense. @ 11' Pale gray SAND with few fines, moist, dense, slightly micaceous, slight FeO staining, massive, highly friable, cobble in sample tip.	5.8	113.8	
	15		D-5	50/6"			@ 15' -No Recovery- (Cobble in sample tip).			
	20		D-6	50/6"		GP	@ 20' Pale gray coarse-grained sandy GRAVEL, damp to moist, dense, massive, highly friable. -Sample Disturbed-	2.8		
860										
	25		D-7	55		ML	@ 25' Olive SILT, moist, stiff, highly micaceous, FeO staining, massive.	25.3	101.6	
	30									

LOG OF BORING

Rentech/ Rialto

Rialto

PROJECT NO. 10049-01

NMG

Elevation (ft)	Depth (ft)	SAMPLES Type	SAMPLES Number	SAMPLES Blows per foot	Graphic Log	USCS	MATERIAL DESCRIPTION	Moisture Content (%)	Dry Density (pcf)	OTHER TESTS and REMARKS
	30									
850		D	D-8	83		SP	@ 30' Dark yellowish brown SAND with few fines, moist, medium dense to dense, massive, slightly micaceous, highly friable.	4.8	97.8	
	35									
		D	D-9	79		ML	@ 35' Olive SILT, moist, stiff, FeO staining, highly micaceous, massive.	21.0	101.8	
	40									
840		D	D-10	58		SM	@ 40' Very dark grayish brown silty fine-grained SAND, saturated, medium dense, highly micaceous, FeO staining, massive, slightly friable. ▽	27.2	97.9	
	45									
		D	D-11	50		GP	@ 45' Pale gray coarse-grained sandy GRAVEL, saturated, medium dense, friable, massive.	10.9	127.1	
							Notes: Total Depth: 46.5 Feet. Groundwater Encountered at 41.9 Feet. Backfilled with Cement Grout.			
	50									
830										
	55									
	60									
820										
	65									

LOG OF BORING

Rentech/ Rialto
Rialto

PROJECT NO. 10049-01

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Report: HOLLOW STEM; Project: P:\2010\10049-01\GINT\10049-01.GPJ; Data Template: NMGNOV98.GDT; Printed: 4/29/10

Report: HOLLOW STEM; Project: P:\2010\10049-01\GINT\10049-01.GPJ; Data Template: NMGNOV98.GDT; Printed: 5/3/10

Date(s) Drilled	4/13/10	Logged By	PA/ TK
Drilling Company	Test America	Drill Bit Size/Type	8"
Drill Rig Type	CME-75	Hammer Data	140 lbs @ 30" Drop
Sampling Method(s)	Modified California, Bulk		
Approximate Groundwater Depth:	Groundwater Not Encountered		
Comments	UTM 11S 0466582/ 3767913		

C-4

Sheet 1 of 2

Total Depth Drilled (ft)	40.5
Approximate Ground Surface Elevation (ft)	906.0

Elevation (ft)	Depth (ft)	SAMPLES Type	SAMPLES Number	SAMPLES Blows per foot	Graphic Log	USCS	MATERIAL DESCRIPTION	Moisture Content (%)	Dry Density (pcf)	OTHER TESTS and REMARKS
	0					ML	**Alluvium (Qal)** Surface: Pale brown silty SAND with scattered gravel, weeds.			
			D-1	52			@ 2.5' Olive SILT with trace SAND, moist, stiff, highly micaceous, massive, slight FeO staining.	19.1	89.5	
900	5		D-2	50/6"		SM	@ 5' Olive silty fine-grained SAND, moist, medium dense, micaceous, massive, slight FeO staining, friable.	5.6	103.6	GS
	10		D-3	80			@ 10' Pale olive silty fine-grained SAND, damp, medium dense, micaceous, massive. -Sample Disturbed-	2.9		
890	15		D-4	75		ML/SM	@ 15' Pale gray very fine-grained sandy SILT/silty SAND, damp, stiff, highly micaceous, slight FeO staining, slightly friable.	5.2	103.6	AL, GS
	20		D-5	71			@ 20' Pale gray silty fine-grained SAND/sandy SILT, damp, medium dense/stiff, micaceous, slightly friable, slight FeO staining.	8.6	101.6	
880	25		D-6	50/6"		SM	@ 25' Pale olive silty fine-grained SAND, damp, dense, massive, micaceous, highly friable.	5.3	98.8	
	30									

LOG OF BORING

Rentech/ Rialto

Rialto

PROJECT NO. 10049-01

NMG

Elevation (ft)	Depth (ft)	SAMPLES Type	SAMPLES Number	SAMPLES Blows per foot	Graphic Log	USCS	MATERIAL DESCRIPTION	Moisture Content (%)	Dry Density (pcf)	OTHER TESTS and REMARKS
	30		D-7	90		ML	@ 30' Pale gray SILT with trace clay, moist, stiff, highly micaceous, massive, slightly friable.	15.0	105.5	
870	35		D-8	90			@ 35' Olive SILT with trace SAND, moist, dense, MnO/FeO staining, highly micaceous, slightly friable, cobble in sample tip.	27.9	93.4	
	40		D-9	50/6"			@ 40' No Recovery.			
860	45									
	50									
850	55									
	60									
	65									

Notes:
Total Depth: 40.5 Feet.
Groundwater Not Encountered.
Backfilled with Cement Grout.

LOG OF BORING

Rentech/ Rialto
Rialto

PROJECT NO. 10049-01

NMG

Report: HOLLOW STEM; Project: P:\2010\10049-01\GINT\10049-01.GPJ; Data Template: NMGNOV98.GDT; Printed: 4/29/10

Report: HOLLOW STEM; Project: P:\2010\10049-01\GINT\10049-01.GPJ; Data Template: NMGNOV98.GDT; Printed: 4/29/10

Date(s) Drilled	4/15/10	Logged By	PA/ TK
Drilling Company	Test America	Drill Bit Size/Type	8"
Drill Rig Type	CME-85	Hammer Data	140 lbs @ 30" Drop
Sampling Method(s)	Modified California, Bulk		
Approximate Groundwater Depth:	Groundwater Encountered at 63.9 feet.		
Comments	UTM 11S 0466836/ 3767862		

Y-1

Sheet 1 of 3

Total Depth Drilled (ft)	65.5
Approximate Ground Surface Elevation (ft)	Approx. 903

Elevation (ft)	Depth (ft)	SAMPLES Type	SAMPLES Number	SAMPLES Blows per foot	Graphic Log	USCS	MATERIAL DESCRIPTION	Moisture Content (%)	Dry Density (pcf)	OTHER TESTS and REMARKS
	0		B-1			SM	**Artificial Fill, Undocumented (Afu)** Surface: Brown silty SAND, damp, loose, scattered cobbles/concrete/rebar.			B-1 @ 0-5 Feet.
	5						@ 5' -No Sample- Yellowish brown slightly silty SAND, damp to moist, scattered gravel and cobbles.			CAM 17 Metals, TPH
	10		D-1	50/6"			@ 10' Light olive brown silty SAND, damp, medium dense, cobble in sample tip. -Sample Disturbed-	6.3		
	15		D-2	44			@ 15' Olive gray silty SAND, moist, medium dense, scattered gravel, slightly micaceous, massive, slightly friable.	6.2	110.5	
	20		D-3	44			@ 20' Upper: Black silty SAND with abundant wood fragments and scattered tires, damp, medium dense. Lower: Gray SAND with scattered gravel, damp, medium dense, massive, friable. -Sample Disturbed-	4.7		CAM 17 Metals, TPH, VOC
	25		D-4	16		SM/ML	@ 25' Gray silty SAND/ sandy SILT, moist, loose-medium dense/stiff, scattered gravel, friable.	36.0	67.9	
	30									

LOG OF BORING

Rentech/ Rialto

Rialto

PROJECT NO. 10049-01

NMG

Elevation (ft) / Depth (ft)	SAMPLES Type Number	SAMPLES Blows per foot	Graphic Log	USCS	MATERIAL DESCRIPTION	Moisture Content (%)	Dry Density (pcf)	OTHER TESTS and REMARKS
30	D-5	50/6"		SM	@ 30' Dark olive gray silty SAND, damp, dense, slightly micaceous, slightly friable, hydrocarbon-like odor.	4.9	121.0	
35	D-6	50/5"		SP	**Alluvium (Qal)** @ 35' Pale gray SAND with few fines, damp, scattered gravel, massive, slight FeO staining, highly friable. -Environmental Sample-			CAM 17 Metals, TPH, VOC, SVOC
40	D-7	50/6"			@ 40' -No Recovery-			
45	D-8	50/4"			@ 45' -No Recovery-.			
50	D-9	50/6"		SP	@ 50' Pale gray SAND with gravel and few fines, damp, dense, massive, highly friable, slightly micaceous.	5.7	99.4	
55	D-10	50/6"		ML	@ 55' Olive clayey SILT, moist, stiff, slight FeO staining, micaceous, massive.	31.6	87.8	
60	D-11	50/4"			@ 60' Olive clayey SILT, moist, stiff, slight FeO staining, micaceous, massive. ▽	39.8	80.5	
65								Groundwater: CAM 17 Metals, TPH, VOC.

LOG OF BORING

Rentech/ Rialto
Rialto

PROJECT NO. 10049-01

NMG

Elevation (ft)	Depth (ft)	SAMPLES Type Number	SAMPLES Blows per foot	Graphic Log	USCS	MATERIAL DESCRIPTION	Moisture Content (%)	Dry Density (pcf)	OTHER TESTS and REMARKS
	65	D-12	50/4"			@ 65' -No Recovery-.			SVOC
						Notes: Total Depth: 65 Feet. Groundwater Encountered at 63.9 Feet. Grab-Groundwater Samples Collected Through Augers. Backfilled with Concrete Grout.			
	70								
	75								
	80								
	85								
	90								
	95								
	100								

LOG OF BORING

Rentech/ Rialto
Rialto

PROJECT NO. 10049-01

NMG

Report: HOLLOW STEM; Project: P:\2010\10049-01\GINT\10049-01.GPJ; Data Template: NMGNOV98.GDT; Printed: 4/29/10

Report: HOLLOW STEM; Project: P:\2010\10049-01\GINT\10049-01.GPJ; Data Template: NMGNOV98.GDT; Printed: 5/3/10

Date(s) Drilled	4/19/10	Logged By	PA/ TK
Drilling Company	Test America	Drill Bit Size/Type	8"
Drill Rig Type	CME-95	Hammer Data	140 lbs @ 30" Drop
Sampling Method(s)	Modified California, Bulk		
Approximate Groundwater Depth:	Groundwater Encountered at 77 feet.		
Comments	UTM 11S 0466939/ 3767909		

Y-2

Sheet 1 of 3

Total Depth Drilled (ft)	80.0
Approximate Ground Surface Elevation (ft)	Approx. 917

Elevation (ft) / Depth (ft)	SAMPLES Type	SAMPLES Number	SAMPLES Blows per foot	Graphic Log	USCS	MATERIAL DESCRIPTION	Moisture Content (%)	Dry Density (pcf)	OTHER TESTS and REMARKS
0					SM	**Artificial Fill, Undocumented (Afu)** Surface: Pale yellowish brown SAND/ GRAVEL, loose, scattered concrete.			
5		D-1	20/1"			@ 5' -No Recovery- Brown silty SAND/ GRAVEL with concrete/ asphalt fragments throughout, moist, friable, cobbles in cuttings.			CAM 17 Metals, TPH
10		D-2	50/6"			@ 10' Concrete/asphalt fragments. -Sample Disturbed-			
15		D-3	50/6"		SM/GM	**Alluvium (Qal)** @ 15' Gray slightly silty SAND/GRAVEL, moist, dense, massive, friable. -Sample Disturbed-	4.7		
20		D-4	50/5"		SP	@ 20' Gray coarse-grained gravely SAND, very moist, dense, friable, slightly micaceous.	4.8	122.9	CAM 17 Metals, TPH, VOC. SVOC GS
25		D-5	50/4"			@ 25' Gray coarse-grained gravely SAND/sandy GRAVEL, very moist, dense, friable, slightly micaceous. -No Recovery-			
30									

LOG OF BORING

Rentech/ Rialto

Rialto

PROJECT NO. 10049-01

NMG

Elevation (ft)	Depth (ft)	SAMPLES Type	SAMPLES Number	SAMPLES Blows per foot	Graphic Log	USCS	MATERIAL DESCRIPTION	Moisture Content (%)	Dry Density (pcf)	OTHER TESTS and REMARKS
	30	D	6	50/1"			@ 30' -No Recovery- Cobble in tip.			
	35	D	7	50/3"		ML	@ 35' Upper: Olive fine grained sandy SILT, moist, stiff, scattered sand, FeO staining, highly micaceous.	10.3	102.0	
						SP	Lower: Gray SAND with few fines and scattered gravel, damp to moist, dense, highly friable.			
	40	D	8	50/5"		SM	@ 40' Olive fine-grained silty SAND with gravel and occasional coarse-grained sand, moist, dense, FeO staining, highly micaceous, friable.	9.7	87.1	
	45									
	50	D	9	50/5"		GP	@ 50' -No Recovery- Very coarse-grained sandy GRAVEL, few fines, damp, slightly micaceous, highly friable.			
	55									CAM 17 Metals, TPH
	60	D	10	50/4"		SP	@ 60' Pale gray coarse-grained gravely SAND, damp to moist, dense, micaceous, massive, highly friable. -Disturbed-			GS
	65									

LOG OF BORING

Rentech/ Rialto
Rialto

PROJECT NO. 10049-01

NMG

Report: HOLLOW STEM; Project: P:\2010\10049-01\GINT\10049-01.GPJ; Data Template: NMGNOV98.GDT; Printed: 5/3/10

Elevation (ft) / Depth (ft)	SAMPLES Type / Number	SAMPLES Blows per foot	Graphic Log	USCS	MATERIAL DESCRIPTION	Moisture Content (%)	Dry Density (pcf)	OTHER TESTS and REMARKS
65								
70	D-11	50/2"			@ 70' Pale gray coarse-grained gravely SAND/GRAVEL, moist, very dense, slightly micaceous, massive, highly friable.	5.0	102.2	
75					▽			Grounwater: CAM 17 Metals, TPH, VOC, SVOC
80					Notes: Total Depth: 80 Feet. Groundwater Encountered at 77 Feet. Set Temporary Well to Collect Grab-Groundwater Samples. Backfilled with Cement Grout.			
85								
90								
95								
100								

LOG OF BORING

Rentech/ Rialto
Rialto

PROJECT NO. 10049-01

NMG

Report: HOLLOW STEM; Project: P:\2010\10049-01\GINT\10049-01.GPJ; Data Template: NMGNOV98.GDT; Printed: 4/29/10

BORING LOGS
BY
KLEINFELDER AND ASSOCIATES,
2007

Date Drilled	7/31/07	Water Depth:	34 feet (approx.)
Drilled By:	2R Drilling	Date Measured:	7/31/07
Drilling Method:	CME 75, 8" HSA	Elevation:	879 feet (approx.)
Logged By:	J. Sipe	Datum:	MSL

Elevation (approx.) (feet) / Depth	Sample Number	Blows per 6"	Sample Type	Graphic Log	USCS Description	GEOTECHNICAL DESCRIPTION AND CLASSIFICATION	Dry Unit Weight (pcf)	Moisture Content (%)	Additional Tests & Remarks
	1				SM	**Fill: Silty Sand:** Olive-brown, slightly moist, dense, fine to medium grained sand, with trace coarse grained sand and fine gravel			GS
	2	14 30 39				--brown, medium dense, coarse grained sand	128.0	6.6	CP
875					SP-SM	**Sand with Silt and Gravel:** Gray-brown, slightly moist, dense, fine to coarse grained sand, gravel to 1-1/2"			
5	3	19 20 17				--trace iron-oxide staining			GS,PI
	4	16 50/3"				--olive-gray, very dense			
870									
10	5	10 21 16				--olive-brown, dense, with some fractured rock in sampler			
865									
15	6 7	32 30 20				--gray, mild petroleum type odor, fractured rock in sampler	116.9	4.1	CP
860									
20	8	12 15 20				--olive-brown, dense, fine to medium grained sand			
855					SM	**Silty Sand:** Olive-brown, slightly moist, medium dense, fine to medium grained sand, with some fine gravel to 1", with trace coarse grained sand	117.3	4.8	GS
25	9 10	32 22 10							
850									
30	11	10 4 7			ML	**Alluvium: Sandy Silt:** Olive-brown, moist, stiff, fine to medium grained sand, slightly clayey			GS, PI
845						--groundwater encountered			

KLEINFELDER

Rialto BioSolids Processing Facility
503 E. Santa Ana Ave.
Rialto, California

PLATE A-2a

PROJECT NO. 86093

LOG OF BORING B-1

GEOTECH TEMECULA 86093 RIALTO GINT LOGS 091807.GPJ KA RDLND.GDT 10/22/07

Legend to Logs on Plate A-1

Note: The boundaries between soil and/or rock types shown on the logs are approximate as the transition between different soil layers may be gradual.

Elevation (approx.) (feet) Depth	Sample Number	Blows per 6"	Sample Type	Graphic Log	USCS Description	GEOTECHNICAL DESCRIPTION AND CLASSIFICATION *(Continued From Previous Page)*	Dry Unit Weight (pcf)	Moisture Content (%)	Additional Tests & Remarks
	12	10 18 36				--wet	94.6	29.7	CP
840 40	13	10 16 30			SP	**Sand:** Olive-brown, wet, dense, fine to medium grained sand, with trace fine gravel to 3/8" and trace coarse grained sand			GS
						Boring terminated at approximately 41-1/2 feet No refusal Groundwater was encountered at 34 feet Borehole backfilled using soil from cuttings			

KLEINFELDER

PROJECT NO. 86093

Rialto BioSolids Processing Facility
503 E. Santa Ana Ave.
Rialto, California

LOG OF BORING B-1

PLATE

A-2b

GEOTECH TEMECULA 86093 RIALTO GINT LOGS 091807.GPJ KA ROLND.GDT 10/22/07

Legend to Logs on Plate A-1

Note: The boundaries between soil and/or rock types shown on the logs are approximate as the transition between different soil layers may be gradual.

Date Drilled	7/31/07	Water Depth:	Not Encountered
Drilled By:	2R Drilling	Date Measured:	7/31/07
Drilling Method:	CME 75, 8" HSA	Elevation:	874 feet (approx.)
Logged By:	J. Sipe	Datum:	MSL

Elevation (approx.) (feet) Depth	Sample Number	Blows per 6"	Sample Type	Graphic Log	USCS Description	GEOTECHNICAL DESCRIPTION AND CLASSIFICATION	Dry Unit Weight (pcf)	Moisture Content (%)	Additional Tests & Remarks
	1	8 12 13			SM	**Fill: Silty Sand:** Olive-brown to gray-brown, slightly moist, medium dense, fine to medium grained sand, with trace fine gravel, with interbedded clay and silt layers			
870 5	2	12 11 27					107.4	9.0	CP
	3	4 3 3			SP-SM	**Alluvium: Sand with Silt:** Olive-brown, slightly moist, loose, fine to medium grained sand, with trace coarse grained sand and fine gravel, weakly cemented			
865 10	4	4 6 7					115.3	5.0	CP
860 15	5	4 10 11				--gray-brown, medium dense, with trace iron-oxide staining			
855 20	6	16 50/6"				--dense			
850 25	7	8 16 18				--olive-brown, moist, dense, well graded			GS
845 30	8	20 22 38				--dense			
						Boring terminated at approximately 31-1/2 feet No refusal Groundwater was not encountered Borehole backfilled using soil from cuttings			

GEOTECH TEMECULA 86093 RIALTO GINT LOGS 091807.GPJ KA RDLND.GDT 10/22/07

KLEINFELDER

Rialto BioSolids Processing Facility
503 E. Santa Ana Ave.
Rialto, California

PLATE A-3

PROJECT NO. 86093

LOG OF BORING B-2

Legend to Logs on Plate A-1

Note: The boundaries between soil and/or rock types shown on the logs are approximate as the transition between different soil layers may be gradual.

Date Drilled	7/31/07	Water Depth:	Not Encountered
Drilled By:	2R Drilling	Date Measured:	7/31/07
Drilling Method:	CME 75, 8" HSA	Elevation:	876 feet (approx.)
Logged By:	J. Sipe	Datum:	MSL

Elevation (approx.) (feet) Depth	Sample Number	Blows per 6"	Sample Type	Graphic Log	USCS Description	GEOTECHNICAL DESCRIPTION AND CLASSIFICATION	Dry Unit Weight (pcf)	Moisture Content (%)	Additional Tests & Remarks
875					SM/ ML	**Alluvium: Silty Sand to Sandy Silt:** Olive-brown, slightly moist, fine grained sand, stiff, with trace iron-oxide staining			
	1	4 7 9							
5									
870	2	12 30 48						7.7	GS
	3	12 30 21			SP-SM	**Sand with Silt:** Olive-brown, slightly moist, fine to medium grained sand, very dense, with some fine gravel to 1"			
10									
865	4	20 33 50					104.3	4.4	GS
15									
860	5 9	27 50/6"				--gray-brown, with some coarse grained sand, fractured rock in sampler			
20									
855	6	22 40 35				--with a 4" interbedded silt layer, with some fine gravel to 1", with trace iron-oxide staining, cemented			
25					ML	**Sandy Silt:** Olive-brown, moist, fine grained sand, hard, with trace iron-oxide staining			
850	7	10 15 31					94.3	27.3	PI, CP
30									
845	8	6 10 15				--very stiff			GS
						Boring terminated at approximately 31-1/2 feet No refusal Groundwater was not encountered Borehole backfilled using soil from cuttings			

KLEINFELDER

Rialto BioSolids Processing Facility
503 E. Santa Ana Ave.
Rialto, California

PLATE A-4

PROJECT NO. 86093

LOG OF BORING B-3

Legend to Logs on Plate A-1

Note: The boundaries between soil and/or rock types shown on the logs are approximate as the transition between different soil layers may be gradual.

GEOTECH TEMECULA 86093 RIALTO GINT LOGS 091807.GPJ KA_RDLND.GDT 10/22/07

Date Drilled	7/31/07	Water Depth:	Not Encountered
Drilled By:	2R Drilling	Date Measured:	7/31/07
Drilling Method:	CME 75, 8" HSA	Elevation:	877 feet (approx.)
Logged By:	J. Sipe	Datum:	MSL

Elevation (approx.) (feet) Depth	Sample Number	Blows per 6"	Sample Type	Graphic Log	USCS Description	GEOTECHNICAL DESCRIPTION AND CLASSIFICATION	Dry Unit Weight (pcf)	Moisture Content (%)	Additional Tests & Remarks
875	1	5 9 13			SP-SM	**Alluvium: Sand with Silt:** Gray-brown, slightly moist, medium dense, fine to medium grained sand, with trace iron-oxide staining			
5	2	19 34 50				--olive, very dense, increase in iron-oxide staining			
870	3	12 32 42				--olive-brown, with some coarse grained sand, with trace fine gravel			
10	4	34 50/6"				--gray-brown, fractured rock in sampler			
865									
15	5	50/6"				--no recovery due to fractured rock in sampler			
860									
20						Boring terminated at approximately 21-1/2 feet No refusal Groundwater was not encountered Borehole backfilled using soil from cuttings			

KLEINFELDER

PROJECT NO. 86093

Rialto BioSolids Processing Facility
503 E. Santa Ana Ave.
Rialto, California

LOG OF BORING B-4

PLATE

A-5

Legend to Logs on Plate A-1

Note: The boundaries between soil and/or rock types shown on the logs are approximate as the transition between different soil layers may be gradual.

GEOTECH TEMECULA 86093 RIALTO GINT LOGS 091807.GPJ KA RDLND.GDT 10/22/07

Date Drilled	7/31/07	Water Depth:	Not Encountered
Drilled By:	2R Drilling	Date Measured:	7/31/07
Drilling Method:	CME 75, 8" HSA	Elevation:	877 feet (approx.)
Logged By:	J. Sipe	Datum:	MSL

Elevation (approx.) (feet) Depth	Sample Number	Blows per 6"	Sample Type	Graphic Log	USCS Description	GEOTECHNICAL DESCRIPTION AND CLASSIFICATION	Dry Unit Weight (pcf)	Moisture Content (%)	Additional Tests & Remarks
875					SP-SM	**Fill: Sand with Silt and Gravel:** Olive-brown, slightly moist, medium dense, fine to coarse grained sand, with trace fine to coarse grained gravel to 1-1/2"			
	1	10 11 10							
5	2	20 22 29				--dense	127.5	5.3	GS
870	3	12 15 16				--dark brown to gray, petroleum type odor			
10	4	20 25 43				--fractured rock in sampler	124.4	4.1	
865									
15	5	26 50/6"				--very dense, decrease in petroleum type odor			
860									
20	6	11 50/6"				--wood debris in sample			
855									
25	7	29 50/6"			SP-SM	**Alluvium: Sand with Silt:** Gray-brown, slightly moist, very dense, fine to coarse grained sand, with trace fine gravel, no petroleum type odor			
850									
30	8	40 50/6"				Boring terminated at approximately 31-1/2 feet No refusal Groundwater was not encountered Borehole backfilled using soil from cuttings			

GEOTECH TEMECULA 86093 RIALTO GINT LOGS 091607.GPJ KA_RDLND.GDT 10/22/07

KLEINFELDER

PROJECT NO. 86093

Rialto BioSolids Processing Facility
503 E. Santa Ana Ave.
Rialto, California

LOG OF BORING B-5

PLATE A-6

Legend to Logs on Plate A-1

Note: The boundaries between soil and/or rock types shown on the logs are approximate as the transition between different soil layers may be gradual.

Date Drilled	7/31/07	Water Depth:	Not Encountered
Drilled By:	2R Drilling	Date Measured:	7/31/07
Drilling Method:	CME 75, 8" HSA	Elevation:	900 feet (approx.)
Logged By:	J. Sipe	Datum:	MSL

Elevation (approx.) (feet) Depth	Sample Number	Blows per 6"	Sample Type	Graphic Log	USCS Description	GEOTECHNICAL DESCRIPTION AND CLASSIFICATION	Dry Unit Weight (pcf)	Moisture Content (%)	Additional Tests & Remarks
					SP	**Alluvium: Sand:** Light yellow-brown, dry, very dense, fine to medium grained sand, with trace fine gravel to 3/4"			
895 5	1	19 35 42				--fractured rock in sampler			
890 10	2	34 40 50				--gray-brown		2.5	GS
885 15	3	25 35 50				--light orange-brown, interbedded coarse and fine grained sand, with trace iron-oxide staining			
880 20	4	50/6"				--dark brown, with some coarse grained sand, fractured rock in sampler			
						Boring terminated at approximately 21-1/2 feet No refusal Groundwater was not encountered Borehole backfilled using soil from cuttings			

GEOTECH TEMECULA 86093 RIALTO GINT LOGS 091807.GPJ KA RDLND.GDT 10/22/07

KLEINFELDER

PROJECT NO. 86093

Rialto BioSolids Processing Facility
503 E. Santa Ana Ave.
Rialto, California

LOG OF BORING B-6

PLATE

A-7

Legend to Logs on Plate A-1

Note: The boundaries between soil and/or rock types shown on the logs are approximate as the transition between different soil layers may be gradual.

Date Drilled	7/31/07	Water Depth:	Not Encountered
Drilled By:	2R Drilling	Date Measured:	7/31/07
Drilling Method:	CME 75, 8" HSA	Elevation:	882 feet (approx.)
Logged By:	J. Sipe	Datum:	MSL

Elevation (approx.) (feet) Depth	Sample Number	Blows per 6"	Sample Type	Graphic Log	USCS Description	GEOTECHNICAL DESCRIPTION AND CLASSIFICATION	Dry Unit Weight (pcf)	Moisture Content (%)	Additional Tests & Remarks
	1				SP	**Fill: Sand:** Olive-brown, moist, fine grained sand, with trace fine gravel, with debris and trash			MAX, DS
880	2	7 4 10			SP	**Alluvium: Sand:** Olive-brown, slightly moist, medium dense, fine to medium grained sand, with trace fine gravel			
5	3	50/6"				--gray-brown, very dense			DS
875	4	14 22 31				--fine grained sand			
10	5	10 50/6"				--with fine to coarse grained gravel to 1-1/2", well graded	113.3	2.4	GS
870									
15	6	50/5"				--no recovery due to fractured rock			
865									
20	7	50/6"				--dark brown, increase in fine gravel content			
						Boring terminated at approximately 21-1/2 feet No refusal Groundwater was not encountered Borehole backfilled using soil from cuttings			

KLEINFELDER

Rialto BioSolids Processing Facility
503 E. Santa Ana Ave.
Rialto, California

PLATE
A-8

PROJECT NO. 86093

LOG OF BORING B-7

Legend to Logs on Plate A-1

Note: The boundaries between soil and/or rock types shown on the logs are approximate as the transition between different soil layers may be gradual.

GEOTECH TEMECULA 86093 RIALTO GINT LOGS 091807.GPJ KA RDLMD.GDT 10/22/07

APPENDIX C

LABORATORY TEST RESULTS

THIS INVESTIGATION

West Yost/ Lake Rialto
Project Number: 20079-01

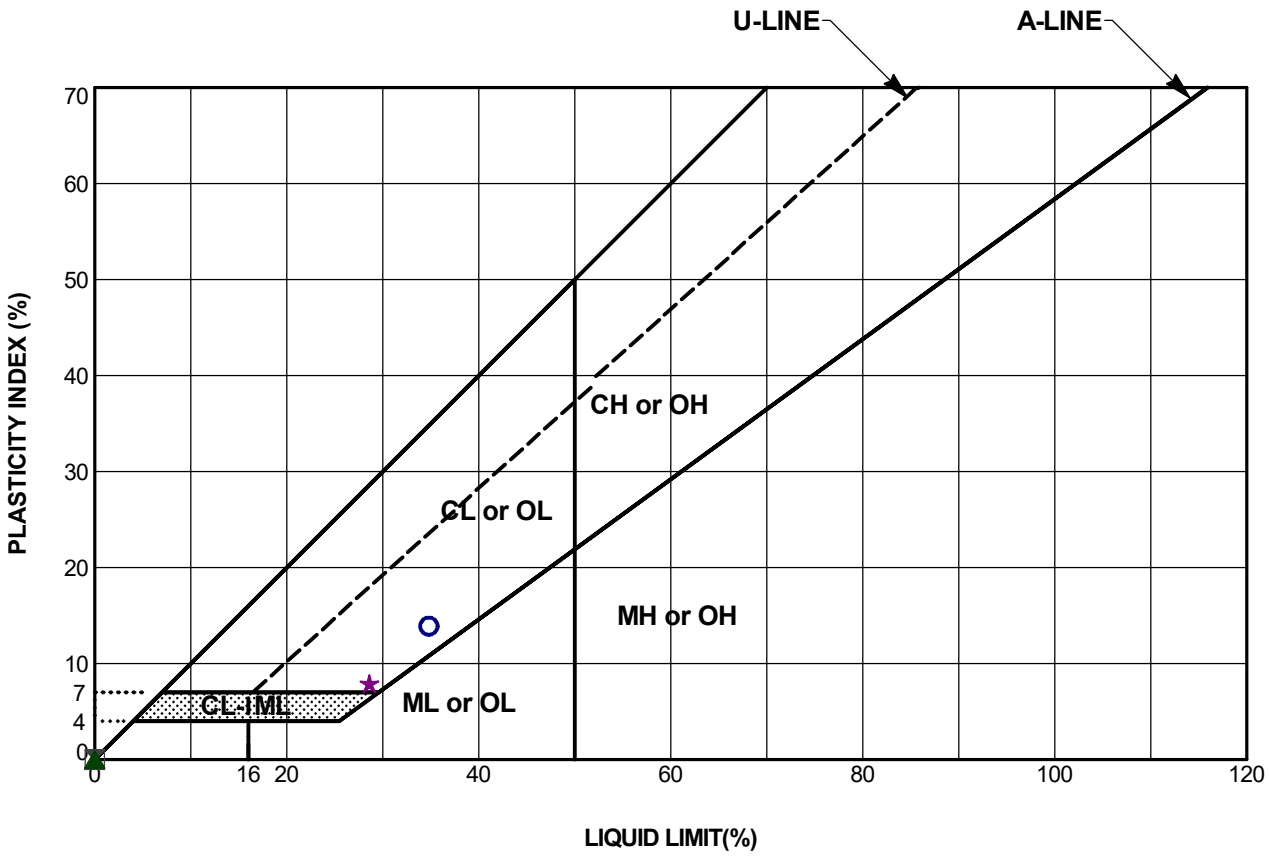
APPENDIX
SUMMARY OF SOIL LABORATORY DATA

Bloomington, CA

Boring/Sample Information						Field Wet Density (pcf)	Field Dry Density (pcf)	Field Moisture Content (%)	Degree of Sat. (%)	Sieve/ Hydrometer		Atterberg Limits		USCS Group Symbol	Direct Shear				Compaction		Expansion Index	R-Value	Soluble Sulfate Content (% by wt)	Remarks
															Ultimate		Peak		Maximum Dry Density (pcf)	Optimum Moisture Content (%)				
Boring No.	Sample No.	Depth (feet)	End Depth (feet)	Elevation (feet)	Blow Count (N)					Fines Content (% pass. #200)	Clay Content (% pass. 2μ)	LL (%)	PI (%)		Cohesion (psf)	Friction Angle (°)	Cohesion (psf)	Friction Angle (°)						
H-1	B-1	1.0	5.0	923.0						10	4			GP-GM										CC
H-1	D-1	5.0		919.0	32	124.0	120.9	2.6	17.5															CC
H-1	D-2	7.5		916.5	54	121.4	118.2	2.7	17.0	5				SW/SP	0	35	0	39.0						
H-1	D-3	10.0		914.0	93	130.1	126.4	3.0	24.0															
H-1	B-2	10.0	15.0	914.0						8	3			SP-SM										
H-1	D-4	15.0		909.0	20	119.7	110.2	8.6	43.8	8				SP-SM	0	32	0	38.0						
H-1	D-5	20.0		904.0	77/12"	117.7	114.6	2.7	15.5															
H-1	D-6	25.0		899.0	88/12"			3.0																Disturbed
H-1	D-7	30.0		894.0	76/12"	115.6	96.6	19.7	71.5	4				SW/SP	310	37	440	37.0						
H-1	D-8	35.0		889.0	50/5"																			NR
H-1	D-9	40.0		884.0	48			42.3		61	17	35	14	CL										Disturbed
H-1	D-10	45.0		879.0	72	121.6	115.4	5.4	31.6															
H-1	D-11	50.0		874.0	50/6"																			NR
H-2	D-1	2.5		878.5	68/12"	132.5	125.5	5.6	44.1	19	5	NP	NP	SM										
H-2	D-2	5.0		876.0	73	132.2	127.4	3.8	31.6															
H-2	D-3	7.5		873.5	92	129.6	125.1	3.6	28.1															
H-2	D-4	10.0		871.0	90/11"	134.0	129.9	3.2	28.8					SP/SM										CN
H-2	D-5	15.0		866.0	87	138.7	129.3	7.3	64.9															
H-2	D-6	20.0		861.0	50/4"	125.3	118.9	5.4	34.9	16	4	NP	NP	SM										
H-2	D-7	25.0		856.0	75/12"	125.9	122.6	2.6	19.0															
H-2	D-8	30.0		851.0	93/11"	110.1	107.1	2.8	13.1					SP/SM										CN
H-2	D-9	35.0		846.0	74	131.0	121.3	8.0	55.4															
H-2	D-10	40.0		841.0	83/11"	124.6	106.9	16.6	77.8															
H-2	D-11	45.0		836.0	50/5"																			NR
H-2	D-12	50.0		831.0	76/12"	129.6	108.5	19.4	95.0															
H-3	D-1	2.5		888.5	22	112.3	111.0	1.2	6.5					SM										CN
H-3	D-2	5.0		886.0	37	116.8	115.1	1.5	8.7															
H-3	D-3	7.5		883.5	29	110.9	108.3	2.4	11.6															
H-3	D-4	10.0		881.0	14	103.1	98.7	4.4	16.8	56	11	29	8	CL										CN
H-3	D-5	15.0		876.0	17	102.4	100.3	2.0	8.0															
H-3	D-6	20.0		871.0	19	106.2	104.5	1.6	7.2															
H-3	D-7	25.0		866.0	46	103.4	96.9	6.7	24.6															
H-3	D-8	30.0		861.0	76			3.0																Disturbed
H-3	D-9	35.0		856.0	90/10"	112.0	108.8	2.9	14.3															
H-3	D-10	40.0		851.0	73	116.6	111.6	4.5	23.7															

APPENDIX
SUMMARY OF SOIL LABORATORY DATA

Boring/Sample Information						Field Wet Density (pcf)	Field Dry Density (pcf)	Field Moisture Content (%)	Degree of Sat. (%)	Sieve/ Hydrometer		Atterberg Limits		USCS Group Symbol	Direct Shear				Compaction		Expansion Index	R-Value	Soluble Sulfate Content (% by wt)	Remarks
															Ultimate		Peak							
Boring No.	Sample No.	Depth (feet)	End Depth (feet)	Elevation (feet)	Blow Count (N)					Fines Content (% pass. #200)	Clay Content (% pass. 2μ)	LL (%)	PI (%)		Cohesion (psf)	Friction Angle (°)	Cohesion (psf)	Friction Angle (°)	Maximum Dry Density (pcf)	Optimum Moisture Content (%)				
H-3	D-11	45.0		846.0	76/12"	116.1	107.7	7.8	37.3															
H-3	D-12	50.0		841.0	93/8"			0.9																Disturbed



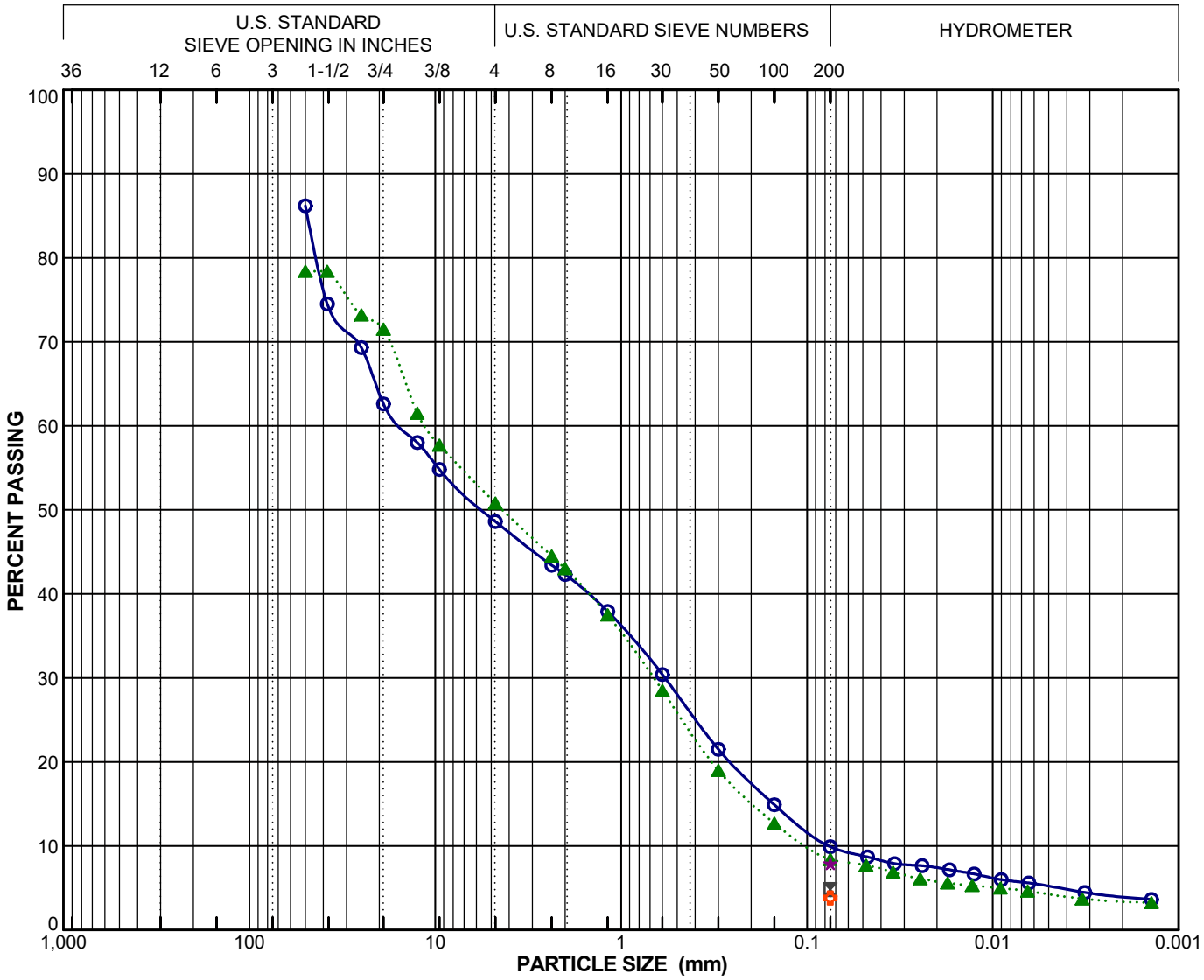
Symbol	Boring Number	Sample Number	Depth (feet)	Passing No. 200 Sieve (%)	LL	PI	USCS	Description
○	H-1	D-9	40.0	61	35	14	CL	(Qal) Yellowish brown sandy CLAY
⊠	H-2	D-1	2.5	19	NP	NP	SM	(Qal) Olive brown silty SAND
▲	H-2	D-6	20.0	16	NP	NP	SM	(Qal) Olive gray silty SAND
★	H-3	D-4	10.0	56	29	8	CL	(Qal) Light grayish brown sandy CLAY

PLASTICITY CHART

West Yost/ Lake Rialto
Bloomington, CA
PROJECT NO. 20079-01

NMG Geotechnical, Inc.

BOULDERS	COBBLES	GRAVEL		SAND			SILT OR CLAY
		coarse	fine	coarse	medium	fine	



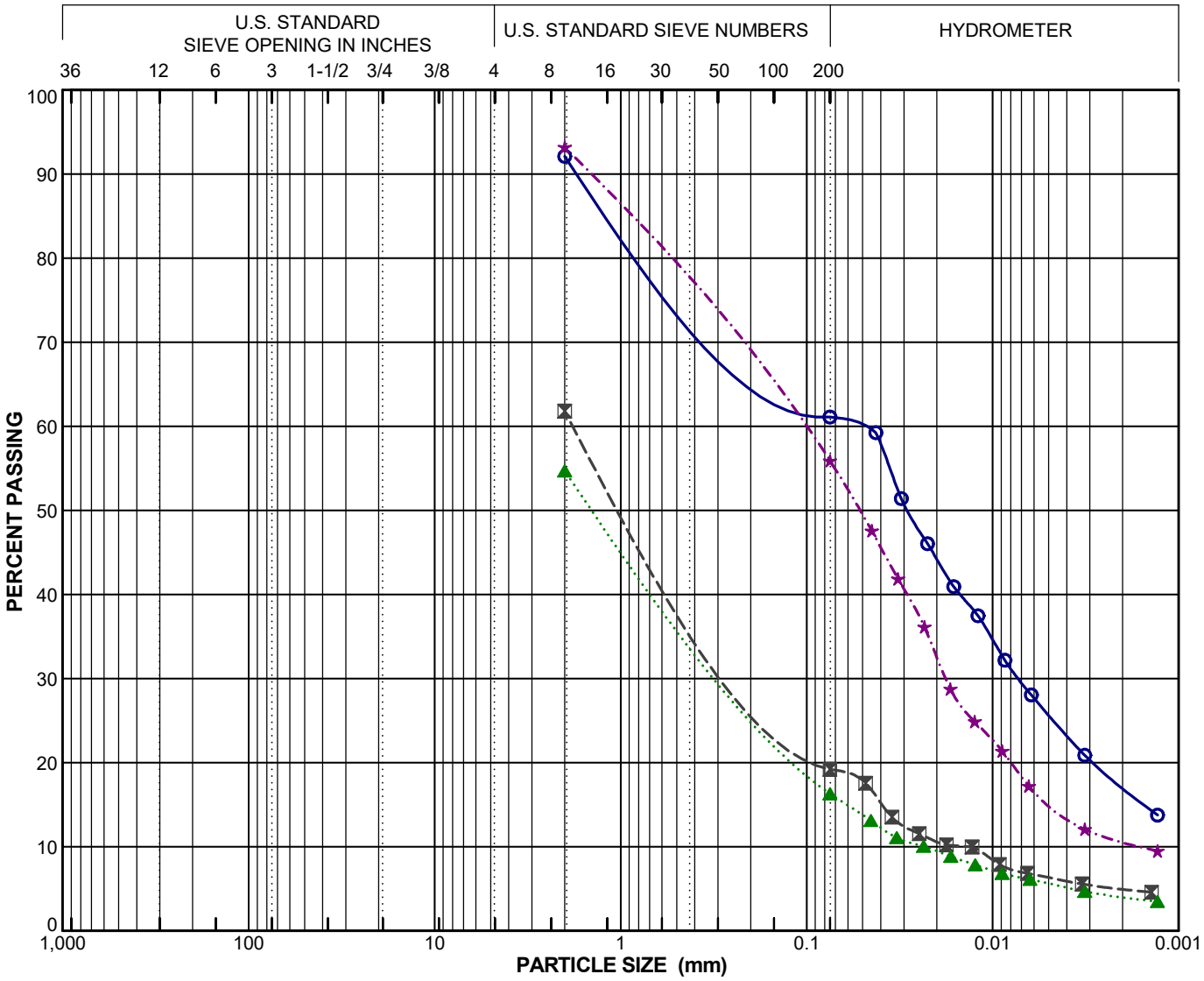
Symbol	Boring Number	Sample Number	Depth (feet)	Field Moisture (%)	LL	PI	Activity PI/-2μ	C_u	C_c	Passing No. 200 Sieve (%)	Passing 2μ (%)	USCS
○	H-1	B-1	1.0 - 5.0					197.2	0.3	10	4	GP-GM
⊠	H-1	D-2	7.5	3						5		SW/SP
▲	H-1	B-2	10.0 - 15.0					115.6	0.4	8	3	SP-SM
★	H-1	D-4	15.0	9						8		SP-SM
✿	H-1	D-7	30.0	20						4		SW/SP

PARTICLE SIZE DISTRIBUTION

West Yost/ Lake Rialto
Bloomington, CA
PROJECT NO. 20079-01

NMG Geotechnical, Inc.

BOULDERS	COBBLES	GRAVEL		SAND			SILT OR CLAY
		coarse	fine	coarse	medium	fine	

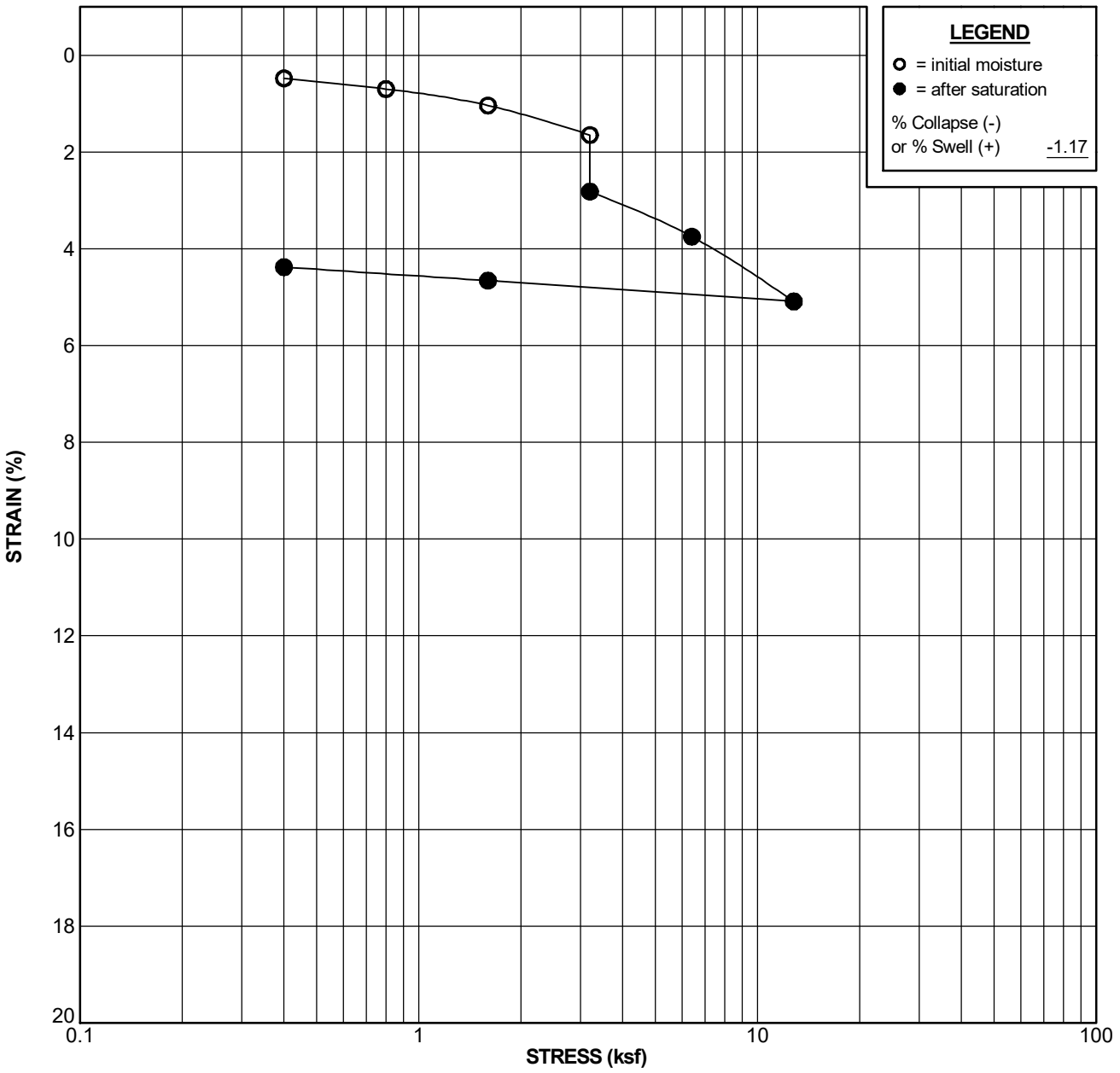


Symbol	Boring Number	Sample Number	Depth (feet)	Field Moisture (%)	LL	PI	Activity PI/-2μ	C_u	C_c	Passing No. 200 Sieve (%)	Passing 2μ (%)	USCS
○	H-1	D-9	40.0	42	35	14	0.82			61	17	CL
⊠	H-2	D-1	2.5	6	NP	NP				19	5	SM
▲	H-2	D-6	20.0	5	NP	NP				16	4	SM
★	H-3	D-4	10.0	4	29	8	0.73			56	11	CL

PARTICLE SIZE DISTRIBUTION

West Yost/ Lake Rialto
Bloomington, CA
PROJECT NO. 20079-01

NMG Geotechnical, Inc.



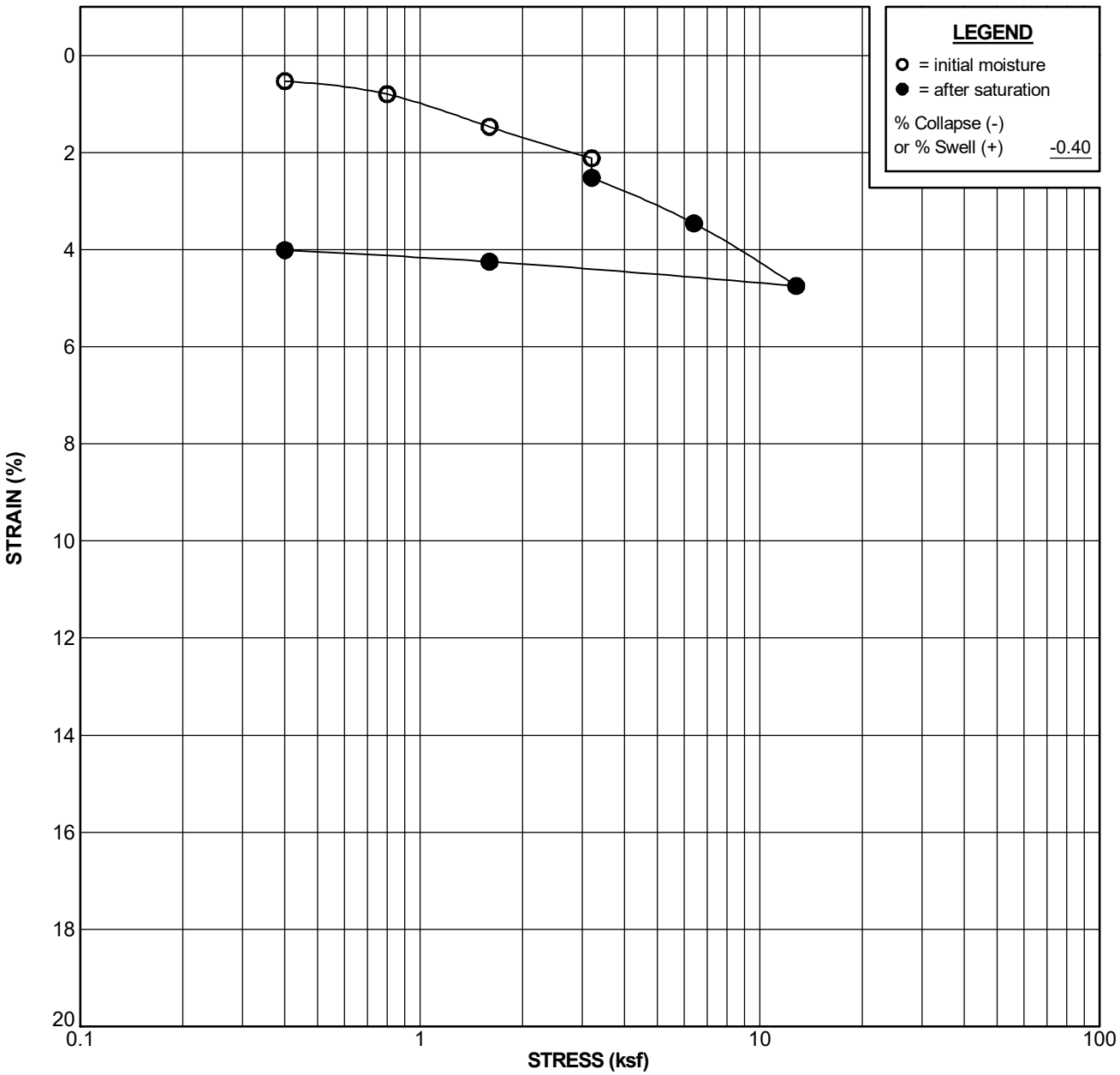
Boring No. H-2	Sample No. D-4	Depth: 10.0 ft
Sample Description: (Qal) Brown SAND with gravel		**USCS:** SP/SM
Liquid Limit:	**Plasticity Index:**	**Percent Passing No. 200 Sieve:**

Test Stage	Moisture Content (%)	Dry Density (pcf)	Degree of Saturation (%)	Void Ratio
Initial	3.3	122.9	24.0	0.371
Final	11.4	128.2	98.0	0.314

CONSOLIDATION TEST RESULTS

West Yost/ Lake Rialto
Bloomington, CA
PROJECT NO. 20079-01

NMG Geotechnical, Inc.



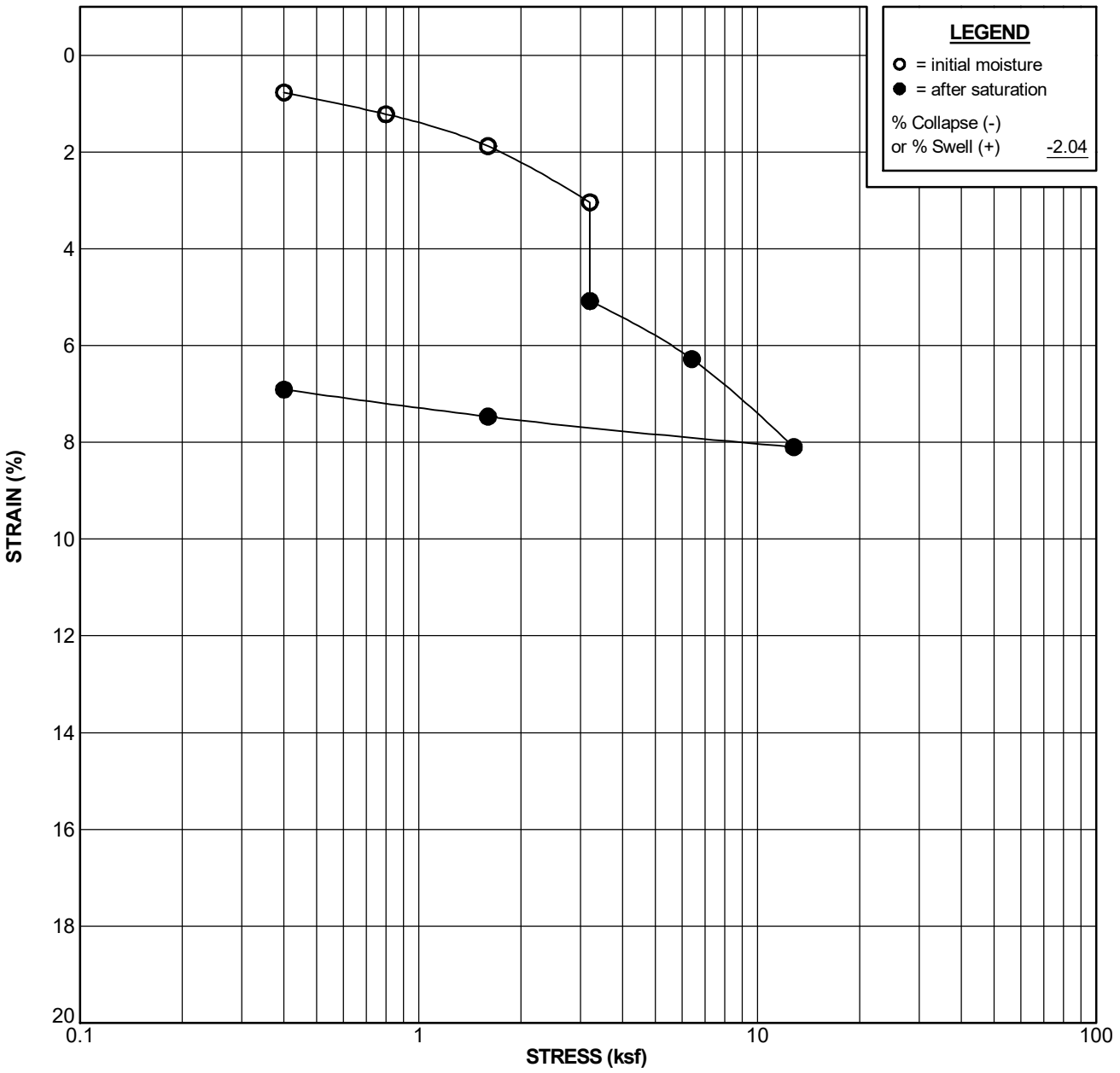
Boring No. H-2	Sample No. D-8	Depth: 30.0 ft
Sample Description: (Qal) Pale yellowish brown SAND		**USCS:** SP/SM
Liquid Limit:	**Plasticity Index:**	**Percent Passing No. 200 Sieve:**

Test Stage	Moisture Content (%)	Dry Density (pcf)	Degree of Saturation (%)	Void Ratio
Initial	2.9	102.8	12.3	0.639
Final	18.5	106.9	86.7	0.576

CONSOLIDATION TEST RESULTS

West Yost/ Lake Rialto
Bloomington, CA
PROJECT NO. 20079-01

NMG Geotechnical, Inc.



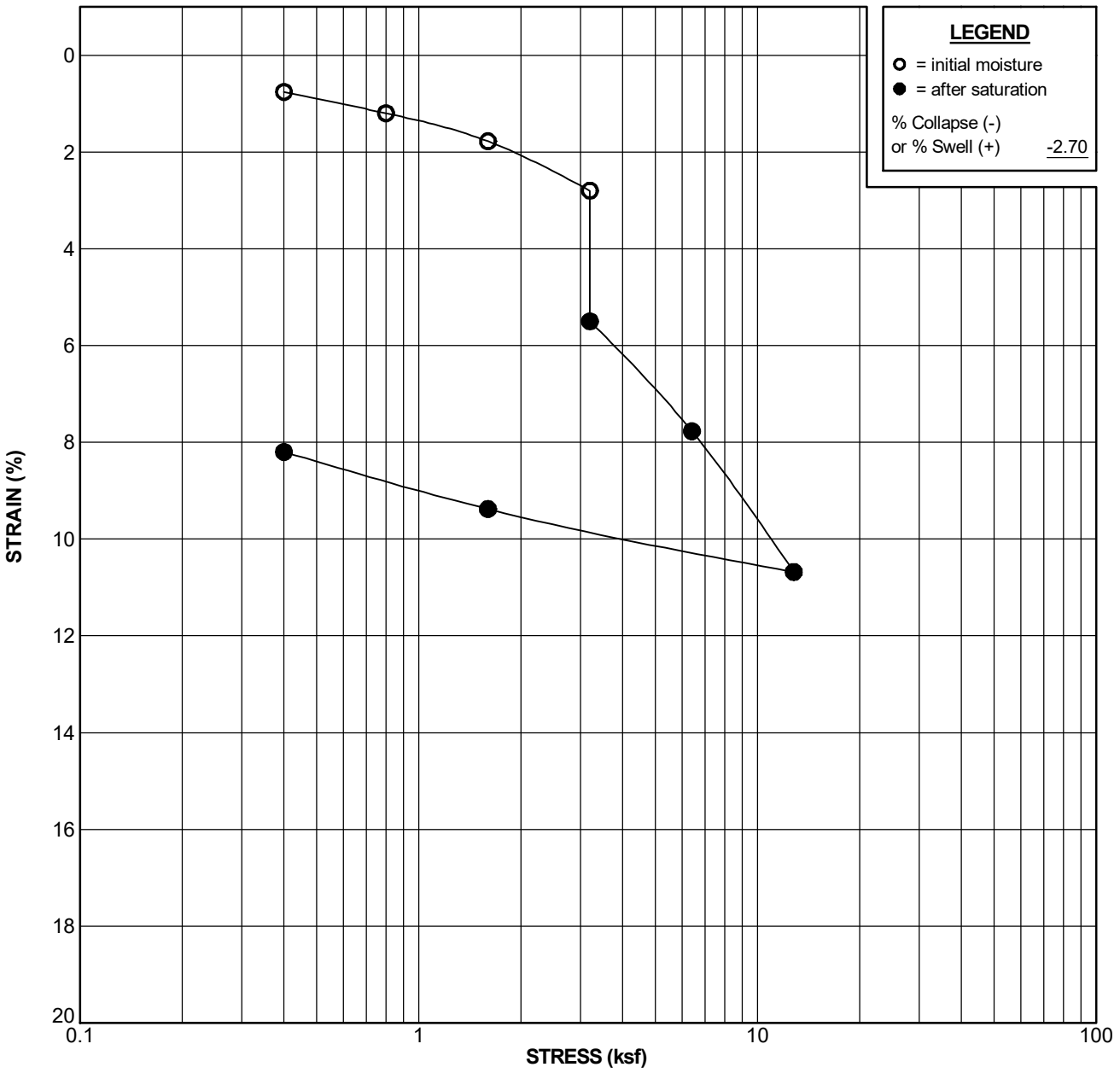
Boring No. H-3	Sample No. D-1	Depth: 2.5 ft
Sample Description: (Qal) Yellowish brown silty SAND		**USCS:** SM
Liquid Limit:	**Plasticity Index:**	**Percent Passing No. 200 Sieve:**

Test Stage	Moisture Content (%)	Dry Density (pcf)	Degree of Saturation (%)	Void Ratio
Initial	1.7	107.0	8.0	0.575
Final	16.7	114.4	95.4	0.473

CONSOLIDATION TEST RESULTS

West Yost/ Lake Rialto
Bloomington, CA
PROJECT NO. 20079-01

NMG Geotechnical, Inc.



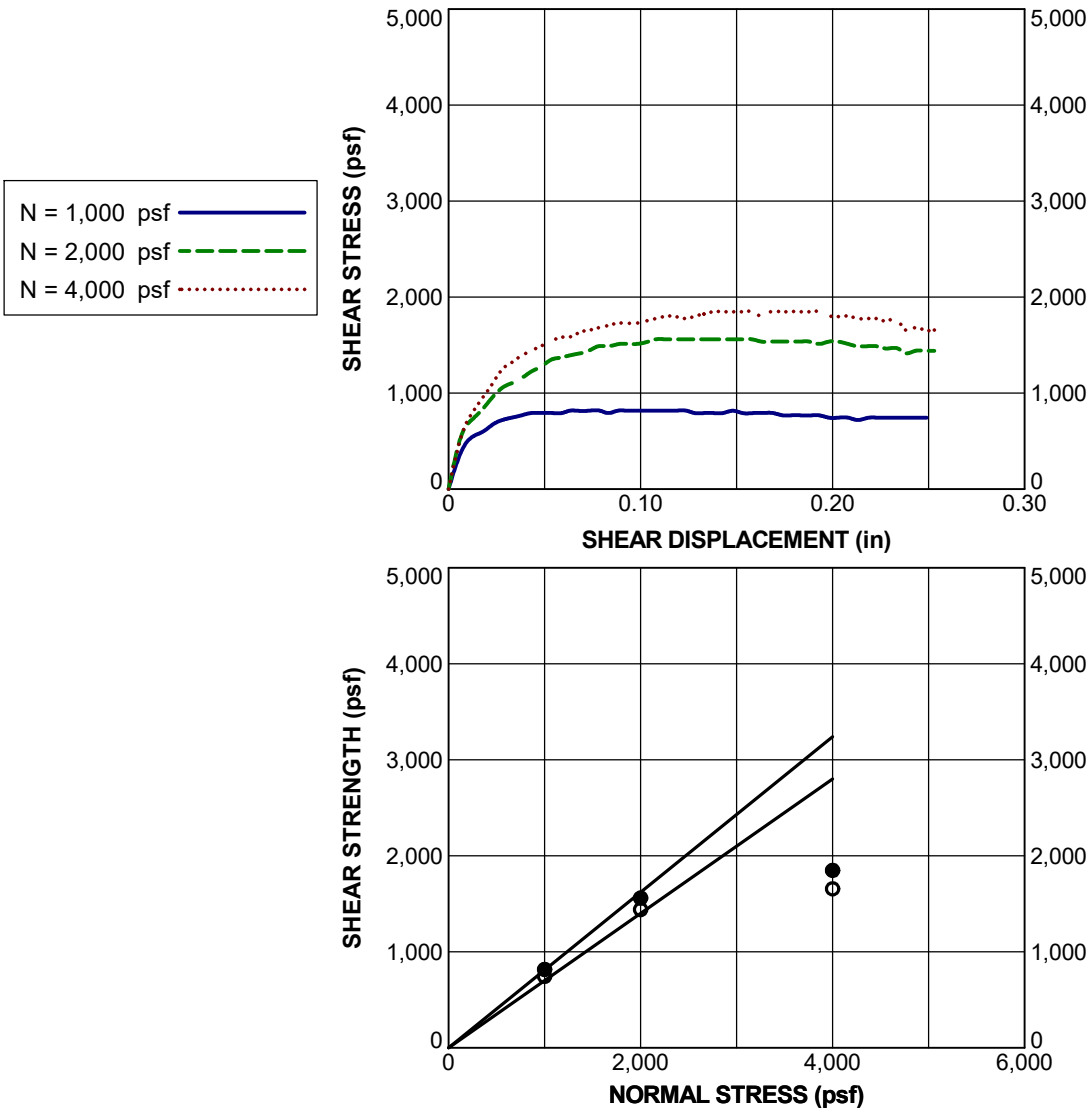
Boring No. H-3	**Sample No. D-4**	**Depth: 10.0 ft**
Sample Description: (Qal) Light grayish brown sandy CLAY		**USCS:** CL
Liquid Limit: 29	**Plasticity Index:** 8	**Percent Passing No. 200 Sieve:** 56

Test Stage	Moisture Content (%)	Dry Density (pcf)	Degree of Saturation (%)	Void Ratio
Initial	4.7	92.5	14.9	0.882
Final	26.5	100.1	100.0	0.739

CONSOLIDATION TEST RESULTS

West Yost/ Lake Rialto
Bloomington, CA
PROJECT NO. 20079-01

NMG Geotechnical, Inc.



Boring No. H-1	**Sample No. D-2**	**Depth: 7.5 ft**
Sample Description: (Qal) Pale gray SAND		**USCS:** SW/SP
Liquid Limit:	**Plasticity Index:**	**Percent Passing No. 200 Sieve:** 5
Final Moisture Content (%): 27.1	**Final Dry Density (pcf):** 107.0	**Degree of Saturation (%):** 100
Sample Type: Undisturbed	**Rate of Shear (in./min.):** 0.05	

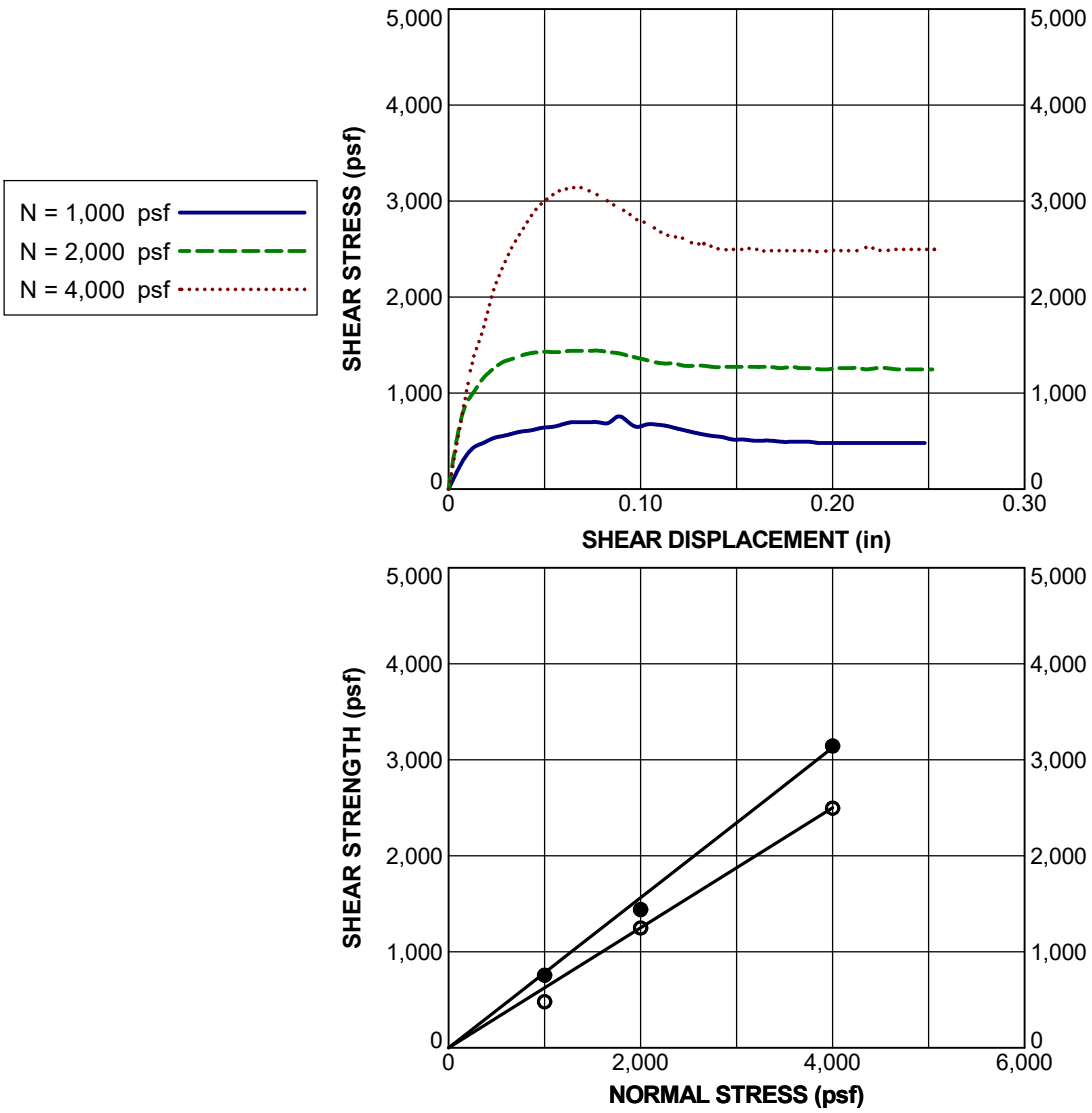
SHEAR STRENGTH PARAMETERS

Parameter	Peak ●	Ultimate ○
Cohesion (psf)	0	0
Friction Angle (degrees)	39.0	35.0

DIRECT SHEAR TEST RESULTS

West Yost/ Lake Rialto
Bloomington, CA
PROJECT NO. 20079-01

NMG Geotechnical, Inc.



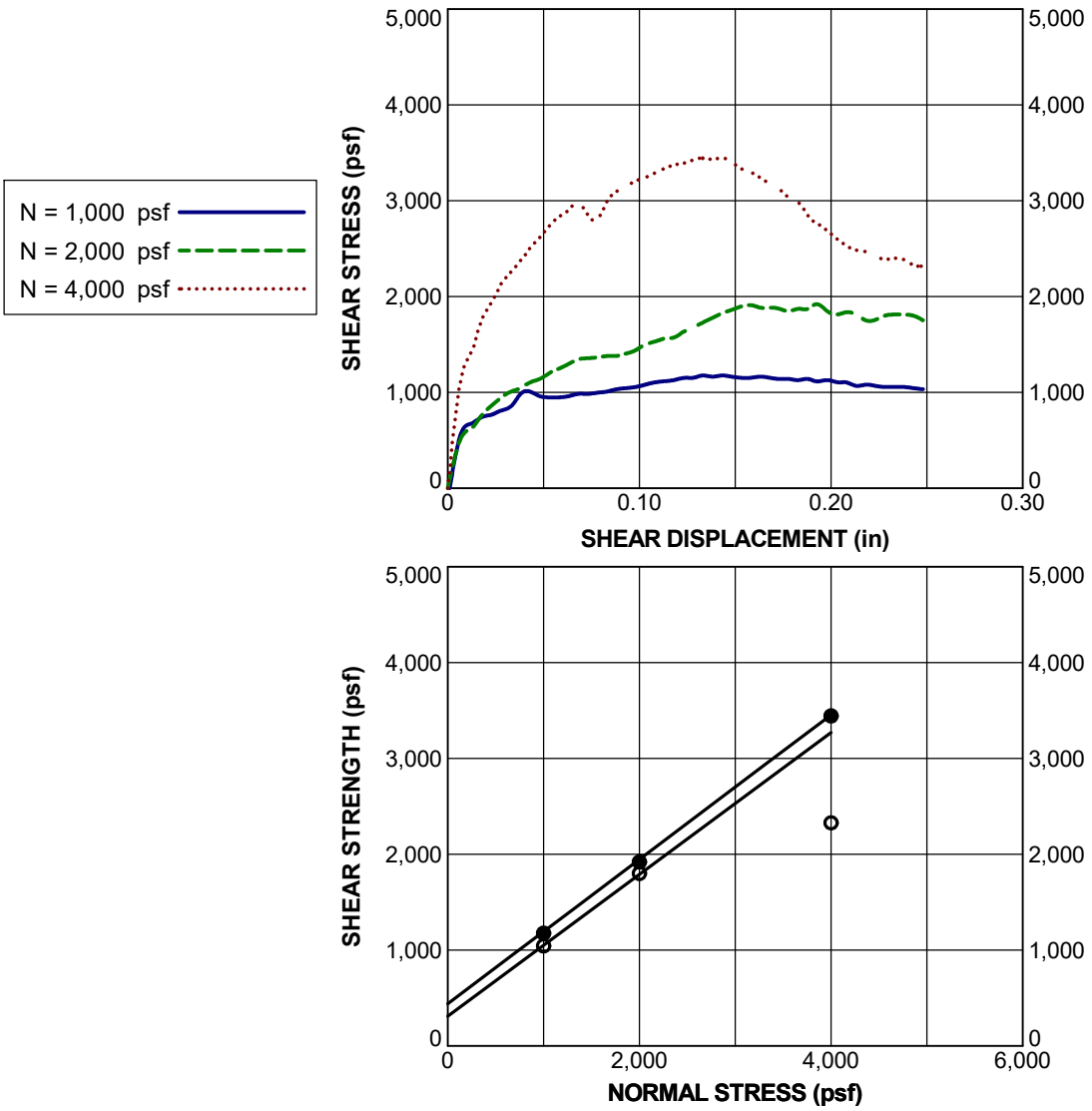
Boring No. H-1		**Sample No. D-4**		**Depth: 15.0 ft**	
Sample Description: (Qal) Light brown SAND with silt				**USCS:**	SP-SM
Liquid Limit:		**Plasticity Index:**		**Percent Passing No. 200 Sieve:**	8
Final Moisture Content (%):	21.4	**Final Dry Density (pcf):**	107.5	**Degree of Saturation (%):**	99
Sample Type:	Undisturbed	**Rate of Shear (in./min.):**	0.05		

SHEAR STRENGTH PARAMETERS		
Parameter	**Peak ●**	**Ultimate ○**
Cohesion (psf)	0	0
Friction Angle (degrees)	38.0	32.0

DIRECT SHEAR TEST RESULTS

West Yost/ Lake Rialto
Bloomington, CA
PROJECT NO. 20079-01

NMG Geotechnical, Inc.



Boring No. H-1	Sample No. D-7	Depth: 30.0 ft
Sample Description: (Qal) Pale yellow SAND		**USCS:** SW/SP
Liquid Limit:	**Plasticity Index:**	**Percent Passing No. 200 Sieve:** 4
Final Moisture Content (%): 24.4	**Final Dry Density (pcf):** 100.4	**Degree of Saturation (%):** 98
Sample Type: Undisturbed	**Rate of Shear (in./min.):** 0.05	

SHEAR STRENGTH PARAMETERS		
Parameter	**Peak ●**	**Ultimate ○**
Cohesion (psf)	440	310
Friction Angle (degrees)	37.0	36.5

DIRECT SHEAR TEST RESULTS

West Yost/ Lake Rialto
Bloomington, CA
PROJECT NO. 20079-01

NMG Geotechnical, Inc.

Leighton

SPECIFIC GRAVITY and ABSORPTION of COARSE and FINE AGGREGATE

ASTM C 127 & C 128

Project Name: West Yost/Lake Rialto | Tested By: G. Bathala | Date: 03/26/21

Project No.: 20079-01 | Checked By: A. Santos | Date: 04/08/21

Boring Number:	H-1	H-1	H-2	H-2	
Sample Number:	D5	D6	D4	D7	
Depth (ft)	20.0	25.0	10.0	25.0	
Sample Description	Light olive brown (SM)g	Olive brown (SM)g	Olive gray (SM)g	Light olive brown SP-SM	
Percent material retained on sieve #4 (%)	18.1	26.4	27.6	3.5	
Percent material passing sieve #4 (%)	81.9	73.6	72.4	96.5	

Sample Passing #4 - ASTM C 128

Wt. of SSD Sample in Air + Container (g)	484.90	306.19	399.55	504.53	
Weight of Container (g)	0.00	0.00	0.00	0.00	
Wt. of Sat. Surface-Dry Sample in Air (g) **(S)**	484.90	306.19	399.55	504.53	
Wt. of Oven-Dry Sample + Container (g)	681.10	533.41	613.38	740.86	
Weight of Container (g)	201.19	234.38	219.26	243.90	
Weight of Oven-Dry Sample (g) **(A)**	479.91	299.03	394.12	496.96	
Weight of Flask + Water + Sample (g) **(C)**	974.22	857.68	919.46	979.46	
Weight of Flask + Water (g) **(B)**	674.05	669.56	671.37	669.56	
Temperature (°C)	24.5	24.5	24.5	24.5	
Correction Factor	0.99897	0.99897	0.99897	0.99897	

Calculations

Bulk Specific Gravity [A/(B+S-C)]	**2.60**	**2.53**	**2.60**	**2.55**	
Bulk Specific Gravity (SSD) [S/(B+S-C)]	**2.62**	**2.59**	**2.64**	**2.59**	
Apparent Specific Gravity [A/(B+A-C)]	**2.67**	**2.70**	**2.70**	**2.66**	
Apparent Spec. Gravity, corrected to 20°C	**2.67**	**2.69**	**2.70**	**2.65**	
Absorption (%) [(S-A)/A]	**1.0**	**2.4**	**1.4**	**1.5**	

Sample Retained #4 - ASTM C 127

Wt. of Sat. Surface-Dry Sample in Air + Cont. (g)	355.4	356.4	399.6	268.2	
Weight of Container (g)	248.7	248.7	248.7	248.7	
Wt. of Sat. Surface-Dry Sample in Air (g) **(B)**	106.7	107.7	150.9	19.5	
Weight of Sample + Container in Water (g)	965.8	965.8	993.3	911.5	
Weight of Container (g)	898.1	898.1	898.1	898.1	
Weight of Sample in Water (g) **(C)**	67.7	67.7	95.2	13.4	
Weight of Oven Dry Sample + Container (g)	353.9	354.6	397.3	268.1	
Weight of Container (g)	248.7	248.7	248.7	248.7	
Weight of Oven Dry Sample (g) **(A)**	105.2	105.9	148.6	19.4	
Temperature (°C)	24.5	24.4	24.5	24.4	
Correction Factor	0.99897	0.99899	0.99897	0.99899	

Calculations

Bulk Specific Gravity [A/(B-C)]	**2.70**	**2.65**	**2.67**	**3.18**	
Bulk Specific Gravity (SSD) [B/(B-C)]	**2.74**	**2.69**	**2.71**	**3.20**	
Apparent Specific Gravity [A/(A-C)]	**2.81**	**2.77**	**2.78**	**3.23**	
Apparent Spec. Gravity, corrected to 20°C	**2.80**	**2.77**	**2.78**	**3.23**	
Absorption (%) [(B-A)/A]	**1.4**	**1.7**	**1.5**	**0.5**	
Combined Apparent Specific Gravity	**2.69**	**2.71**	**2.72**	**2.67**	

Remarks:

Leighton

SPECIFIC GRAVITY of SOILS and SPECIFIC GRAVITY and ABSORPTION of COARSE AGGREGATE

ASTM D 854 and C 127

Project Name: West Yost/Lake Rialto Tested By: G. Bathala Date: 03/26/21

Project No.: 20079-01 Checked By: J. Ward Date: 04/08/21

Boring No.	H-3	H-3			
Sample No.	D2	D5			
Depth (ft)	N/A	N/A			
Sample Description	Pale olive SM	Light olive gray s(ML)			
Percent material retained on sieve #4 (%)	6.0	0.7			
Percent material passing sieve #4 (%)	94.0	99.3			

Sample Passing #4 - ASTM D 854

Flask / Container No.	H	I			
Weight of Dry Soil (g)	59.34	59.79			
Weight of Flask + Water + Soil (g)	710.99	708.45			
Weight of Flask + Water (g)	673.99	671.37			
Temperature (°C)	24.9	24.5			
Correction Factor	0.99887	0.99897			
Specific Gravity of Soil Passing #4	2.65	2.63			
Dry - Back Weight of Soil + Container (g)	304.85	296.30			
Weight of Container	245.54	236.62			
Dry - Back Weight of Soil	59.31	59.68			
Dry - Back Specific Gravity	2.66	2.64			

Sample Retained #4 - ASTM C 127

Wt. of Sat. Surface - Dry Soil in Air + Cont. (g)	273.1	251.1			
Weight of Container (g)	248.7	248.7			
Wt. of Sat. Surface - Dry Soil in Air (g) **(B)**	24.4	2.4			
Weight of Soil + Container in Water (g)	914.4	901.7			
Weight of Container (g)	898.1	900.4			
Weight of Soil in Water (g) **(C)**	16.3	1.3			
Weight of Oven Dry Soil + Container (g)	272.8	251.0			
Weight of Container (g)	248.7	248.7			
Weight of Oven Dry Soil (g) **(A)**	24.1	2.3			
Temperature (°C)	24.4	24.3			
Correction Factor	0.99899	0.99902			

Calculations

Ave. Specific Gravity of Soil Passing #4	**2.65**	**2.63**			
Bulk Specific Gravity [A/(B-C)]	**2.98**	**2.09**			
Bulk Specific Gravity (SSD) [B/(B-C)]	**3.01**	**2.18**			
Apparent Specific Gravity [A/(A-C)]	**3.09**	**2.30**			
Apparent Spec. Gravity, corrected to 20°C	**3.09**	**2.30**			
Absorption (%) [(B-A)/A]	**1.2**	**4.3**			
Combined Apparent Specific Gravity	**2.68**	**2.63**			

Remarks:

Table 1 - Laboratory Tests on Soil Samples

NMG Geotechnical, Inc.
West Yost Lake Rialto
Your #20079-01, HDR Lab #21-0233LAB
25-Mar-21

Sample ID			H-1, B-1 @ 1-5'	H-1, D-1 @ 5'
Resistivity		**Units**		
as-received		ohm-cm	16,400	27,600
saturated		ohm-cm	4,400	6,400
pH			7.2	7.6
Electrical Conductivity		mS/cm	0.09	0.09
Chemical Analyses				
Cations				
calcium	Ca^{2+}	mg/kg	75	72
magnesium	Mg^{2+}	mg/kg	5.8	4.9
sodium	Na^{1+}	mg/kg	11	10
potassium	K^{1+}	mg/kg	13	11
ammonium	NH_4^{1+}	mg/kg	25	23
Anions				
carbonate	CO_3^{2-}	mg/kg	ND	ND
bicarbonate	HCO_3^{1-}	mg/kg	198	220
fluoride	F^{1-}	mg/kg	2.5	3.3
chloride	Cl^{1-}	mg/kg	6.9	5.1
sulfate	SO_4^{2-}	mg/kg	51	61
nitrate	NO_3^{1-}	mg/kg	65	30
phosphate	PO_4^{3-}	mg/kg	13	21
Other Tests				
sulfide	S^{2-}	qual	na	na
Redox		mV	na	na

Resistivity per ASTM G187, pH per ASTM G51, Cations per ASTM D6919, Anions per ASTM D4327, and Alkalinity per APHA 2320-B.

Electrical conductivity in millisiemens/cm and chemical analyses were made on a 1:5 soil-to-water extract.

mg/kg = milligrams per kilogram (parts per million) of dry soil.

Redox = oxidation-reduction potential in millivolts

ND = not detected

na = not analyzed

LABORATORY TEST RESULTS

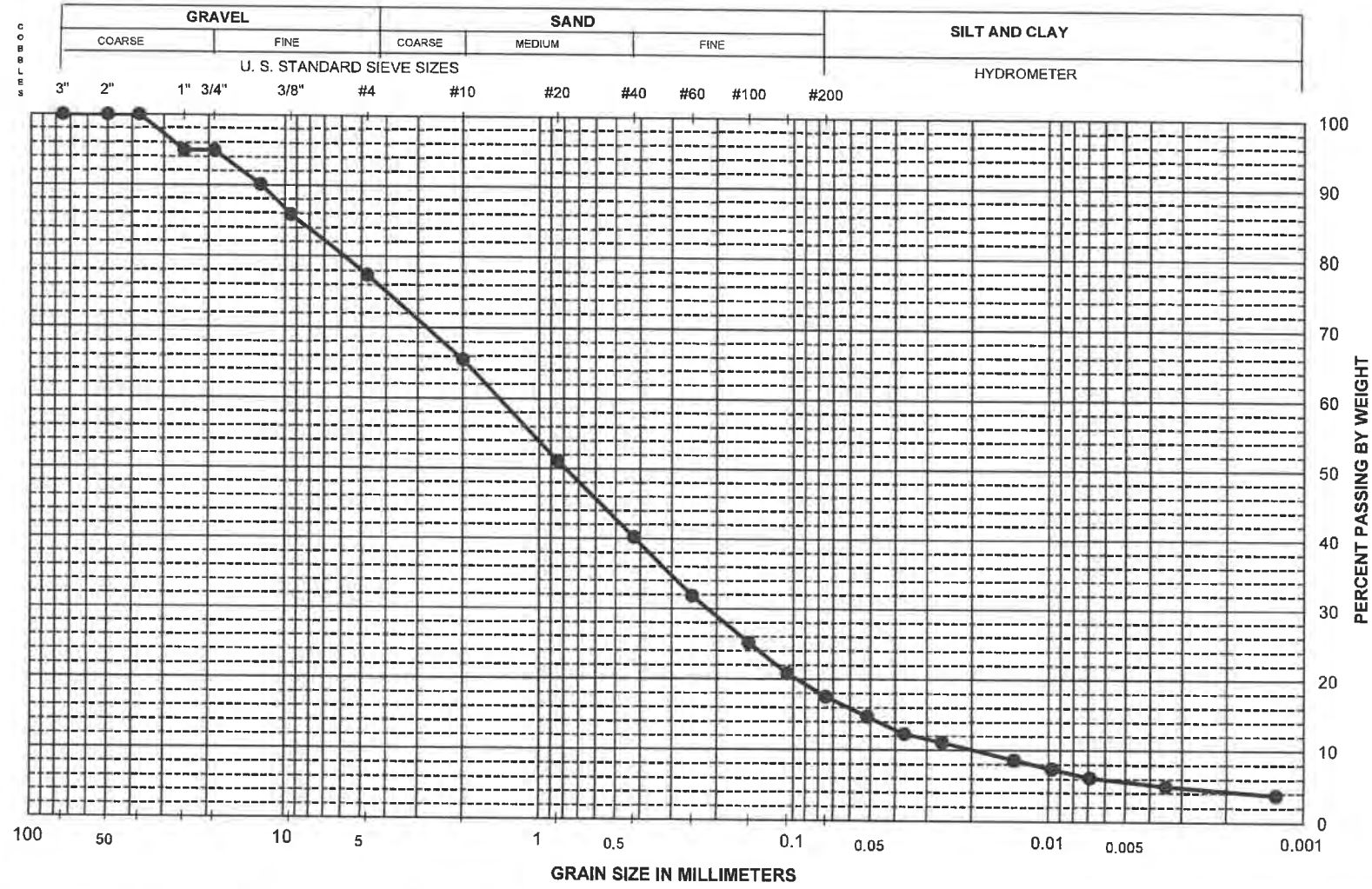
BY AECOM (2018)

Santa Ana Geotechnical Laboratory Testing Summary

Project Name: Rialto WWTP
Project Number: 60570758
Project Engineer: ML

Location				Initial Condition			Limits			Gradation				Direct Shear		
Boring Number	Sample Number	Depth (ft)	USCS Symbol	Water Content (%)	Total Unit Weight (pcf)	Dry Unit Weight (pcf)	Liquid Limit	Plasticity Index	Liquidity Index	Gravel (%)	Sand (%)	Fines (%)		Normal Stress Sequence (ksf)	Peak Friction Angle (deg)	Strength Intercept (ksf)
												Silt	Clay			
SB-1	2	5.0	SP-SM	4.9						27.3	62.5	8.2	2.0			
	4	15.0	SW-SM	2.6						35.1	56.4	5.6	2.9			
	8	35.0	SP-SM	2.7						32.0	58.5	7.0	2.5			
	10	45.0	SW-SM	3.1						13.6	79.5	4.7	2.2			
SB-2	2	5.0	SM	2.8						25.7	60.7	10.2	3.4			
	4	15.0	SM	8.5	114.4	105.5				12.6	55.9	26.8	4.7			
	5	25.0	SM	5.4						9.3	73.2	13.9	3.6			
	7	35.0	SM	15.0						0.0	51.6	45.2	3.2			
	10	50.0	SM	16.4						1.0	85.9	10.9	2.2			
SB-3	2	5.0	SM	3.6						22.6	62.5	11.1	3.8			
	3	10.0	SM	4.6						9.3	69.0	18.7	3.0			
	4	15.0	SP-SM	1.9						0.1	91.5	7.5	0.9			
	7	30.0	ML	23.2			36	8	-0.60	0.0	4.5	85.1	10.4			
SB-4	2	5.0	SM	2.5						22.6	59.9	13.4	4.1			
	4	15.0	SM	7.2						0.0	65.5	31.2	3.3			
	5A	20.0	S	6.6						0.0	62.8	33.1	4.2			
SB-5	2A	5.0	ML	10.9			46	19	-0.85	0.2	3.6	82.3	13.9			
	4	15.0	ML	6.3						3.0	43.6	53.4				
	7	30.0	SP-SM	1.5						13.3	79.9	5.8	1.0			
	8	35.0	ML	15.6			30	6	-1.40	0.0	28.8	62.8	8.4			
	11	50.0	SW-SM	2.0						28.6	62.8	8.6				

UNIFIED SOIL CLASSIFICATION



Sieve No.	Dia. mm	% Finer
3"	75.0	100.0
2"	50.0	100.0
1.5"	37.5	100.0
1"	25.0	94.9
3/4"	19.00	94.9
1/2"	12.50	90.1
3/8"	9.50	85.9
#4	4.75	77.4
#10	2.00	65.5
#20	0.850	51.1
#40	0.425	40.2
#60	0.250	31.8
#100	0.150	25.1
#140	0.106	20.8
#200	0.075	17.5
Hydrometer Analysis	0.0515	14.7
	0.0368	12.3
	0.0262	11.0
	0.0137	8.6
	0.0097	7.4
	0.0069	6.1
	0.0035	4.9
	0.0013	3.7
	0.0013	3.7
	0.0013	3.7

% Cobbles	—
% Gravel	22.6
% Sand	59.9
% Fines	17.5
D_{85}	8.997
D_{60}	1.442
D_{30}	0.218
D_{15}	0.053
D_{10}	0.020
C_u	72.7
C_c	1.7

Boring No.	Sample No.	Depth (ft)	SYMBOL	Wn (%)	LL	PI	% 2 µm	Description and Classification
SB-4	2	5.0	•	2.5	—	—	4.1	**Pale brown Silty SAND with Gravel (SM)**

PROJECT NAME: **Rialto WWTP**

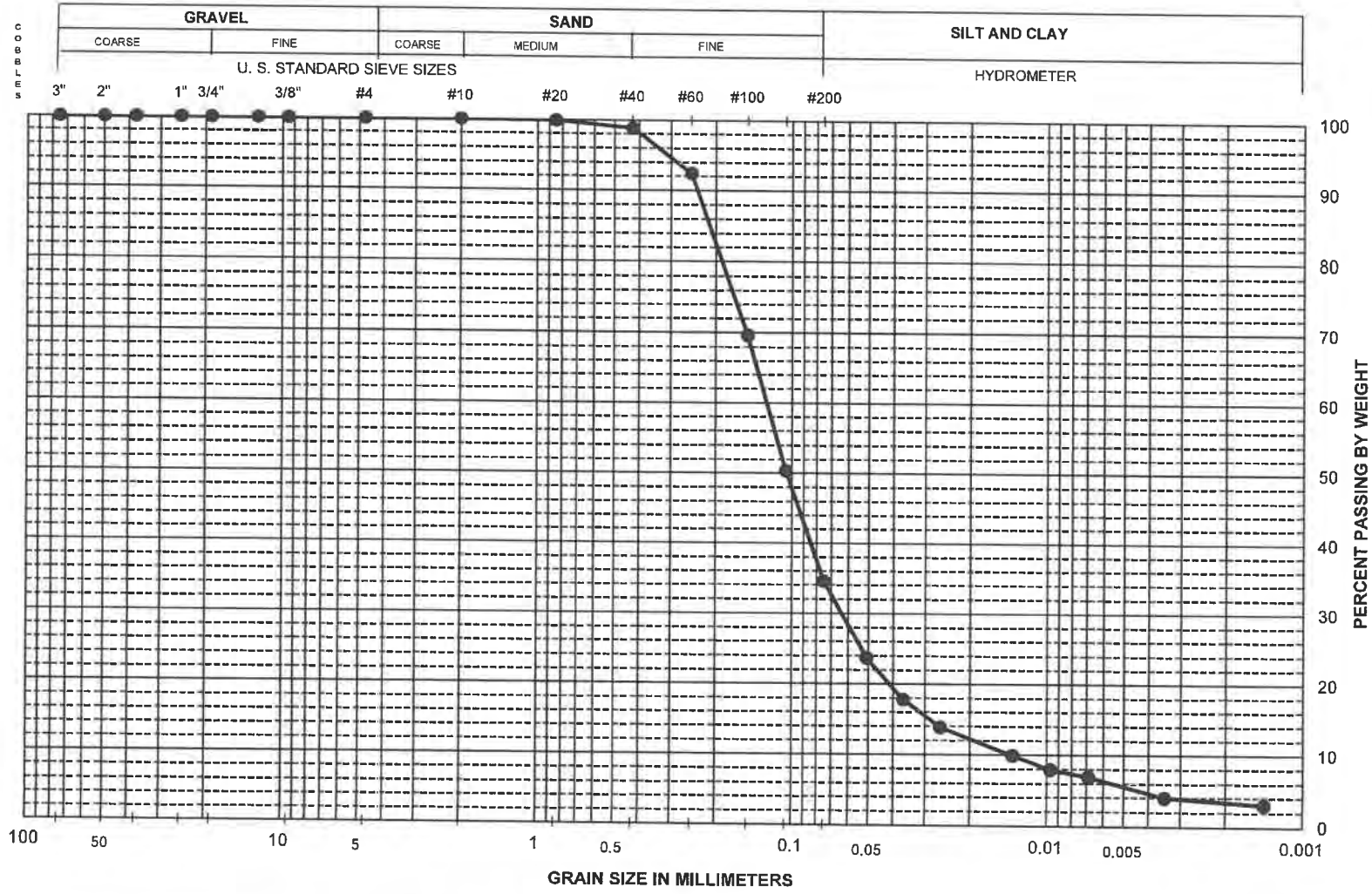
PROJECT NUMBER: **60570758**

PARTICLE-SIZE DISTRIBUTION CURVES

C:\Projects\Rialto\SB-1\Sieve Hydro Rialto WWTP SB-4 5 ft

AECOM

UNIFIED SOIL CLASSIFICATION



Sieve No.	Dia. mm	% Finer
3"	75.0	100.0
2"	50.0	100.0
1.5"	37.5	100.0
1"	25.0	100.0
3/4"	19.00	100.0
1/2"	12.50	100.0
3/8"	9.50	100.0
#4	4.75	100.0
#10	2.00	100.0
#20	0.850	99.9
#40	0.425	98.8
#60	0.250	92.4
#100	0.150	69.6
#140	0.106	50.3
#200	0.075	34.5
Hydrometer Analysis	0.0509	23.7
	0.0366	17.8
	0.0262	13.8
	0.0137	9.9
	0.0097	7.9
	0.0069	6.9
	0.0035	3.9
	0.0014	3.0
	0.0014	3.0
	0.0014	3.0

% Cobbles	---
% Gravel	0.0
% Sand	65.5
% Fines	34.5
D_{85}	0.212
D_{60}	0.126
D_{30}	0.064
D_{15}	0.029
D_{10}	0.014
C_u	9.0
C_c	2.3

Boring No.	Sample No.	Depth (ft)	SYMBOL	Wn (%)	LL	PI	% 2 µm	Description and Classification
SB-4	4	15.0	●	7.2	---	---	3.3	**Pale brown Silty SAND (SM)**

PROJECT NAME: Rialto WWTP

PROJECT NUMBER: 60570758

PARTICLE-SIZE DISTRIBUTION CURVES

C:\Projects\Rialto\SB-1\Sieve Hydro Rialto WWTP SB-4 15 ft

AECOM

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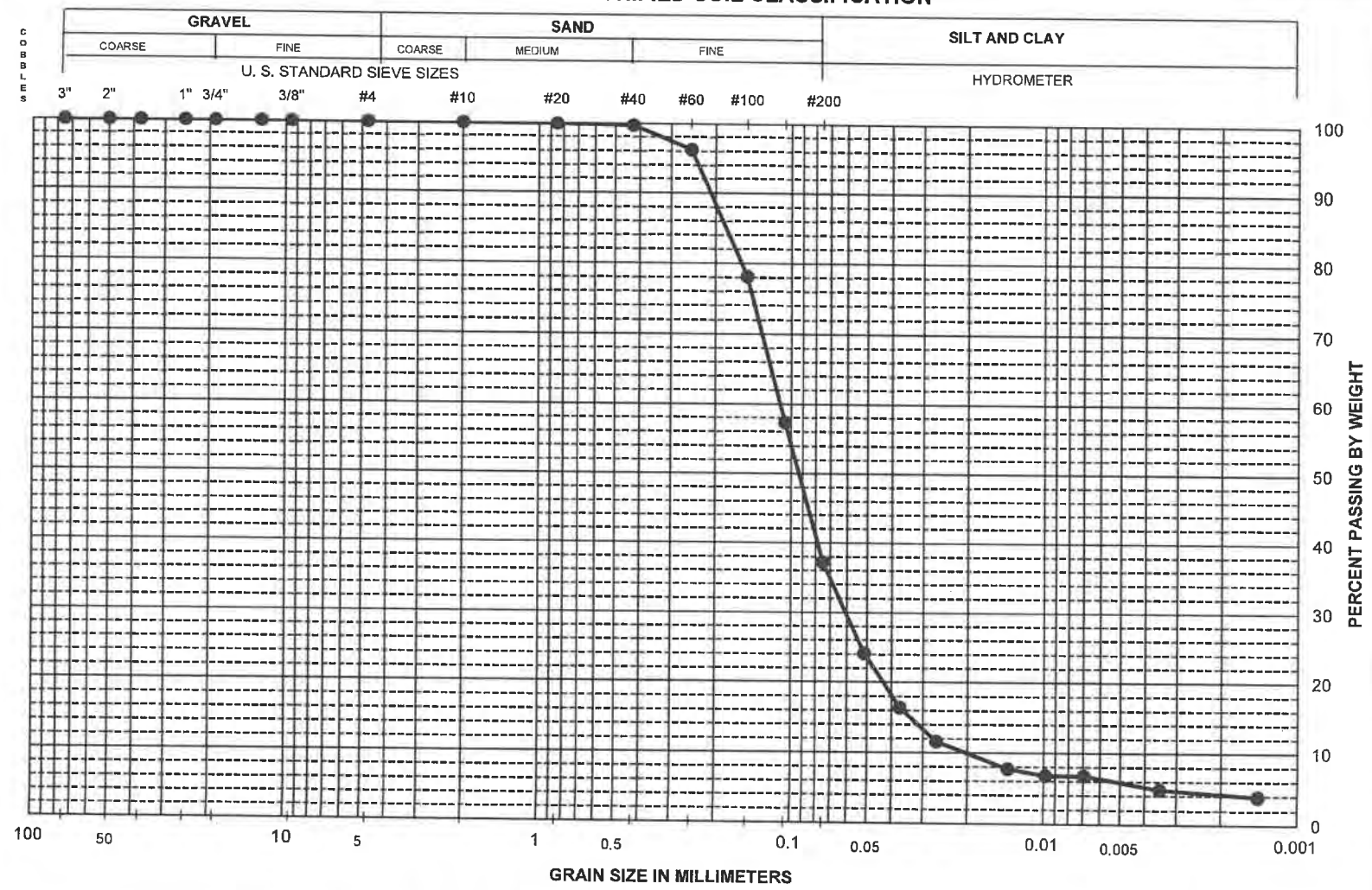


Sieve No.	Dia. mm	% Finer
3"	75.0	100.0
2"	50.0	100.0
1.5"	37.5	100.0
1"	25.0	100.0
3/4"	19.00	100.0
1/2"	12.50	100.0
3/8"	9.50	100.0
#4	4.75	100.0
#10	2.00	100.0
#20	0.850	99.9
#40	0.425	99.7
#60	0.250	96.2
#100	0.150	78.1
#140	0.106	57.3
#200	0.075	37.2
Hydrometer Analysis	0.0514	24.1
	0.0372	16.4
	0.0266	11.6
	0.0139	7.7
	0.0099	6.7
	0.0070	6.7
	0.0035	4.8
	0.0014	3.9
	0.0014	3.9
	0.0014	3.9

% Cobbles	---
% Gravel	0.0
% Sand	62.8
% Fines	37.2
D_{85}	0.182
D_{60}	0.111
D_{30}	0.061
D_{15}	0.034
D_{10}	0.020
C_u	5.4
C_c	1.6

Boring No.	Sample No.	Depth (ft)	SYMBOL	Wn (%)	LL	PI	% 2 µm	Description and Classification
SB-4	5A	20.0	•	6.6	---	---	4.2	**Pale brown Silty SAND (SM)**

PROJECT NAME: Rialto WWTP

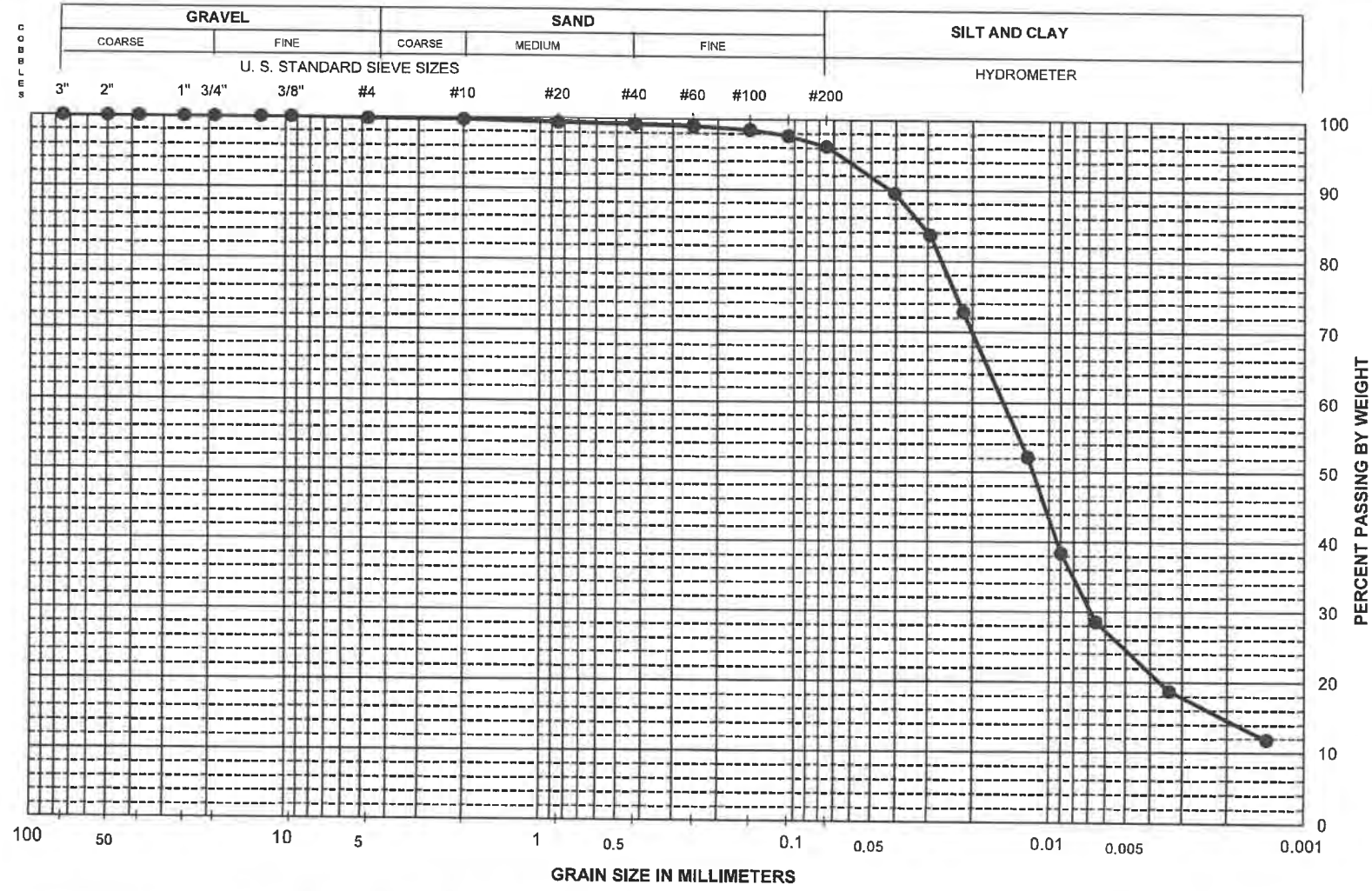
PROJECT NUMBER: 60570758

PARTICLE-SIZE DISTRIBUTION CURVES

C:\Projects\Rialto\SB-1\Sieve Hydro Rialto WWTP SB-4 20 ft

AECOM

UNIFIED SOIL CLASSIFICATION



Sieve No.	Dia. mm	% Finer
3"	75.0	100.0
2"	50.0	100.0
1.5"	37.5	100.0
1"	25.0	100.0
3/4"	19.00	100.0
1/2"	12.50	100.0
3/8"	9.50	100.0
#4	4.75	99.8
#10	2.00	99.7
#20	0.850	99.4
#40	0.425	99.2
#60	0.250	99.0
#100	0.150	98.5
#140	0.106	97.7
#200	0.075	96.2
Hydrometer Analysis	0.0405	89.5
	0.0294	83.6
	0.0218	72.8
	0.0121	52.1
	0.0090	38.4
	0.0066	28.5
	0.0034	18.7
	0.0014	11.8
	0.0014	11.8
	0.0014	11.8

% Cobbles	---
% Gravel	0.2
% Sand	3.6
% Fines	96.2
D_{85}	0.032
D_{60}	0.015
D_{30}	0.007
D_{15}	0.002
D_{10}	----
C_u	----
C_c	----

Boring No.	Sample No.	Depth (ft)	SYMBOL	Wn (%)	LL	PI	% 2 µm	Description and Classification
SB-5	2A	5.0	•	10.9	46	19	13.9	**Pale brown Clayey SILT (ML)**

PROJECT NAME: Rialto WWTP

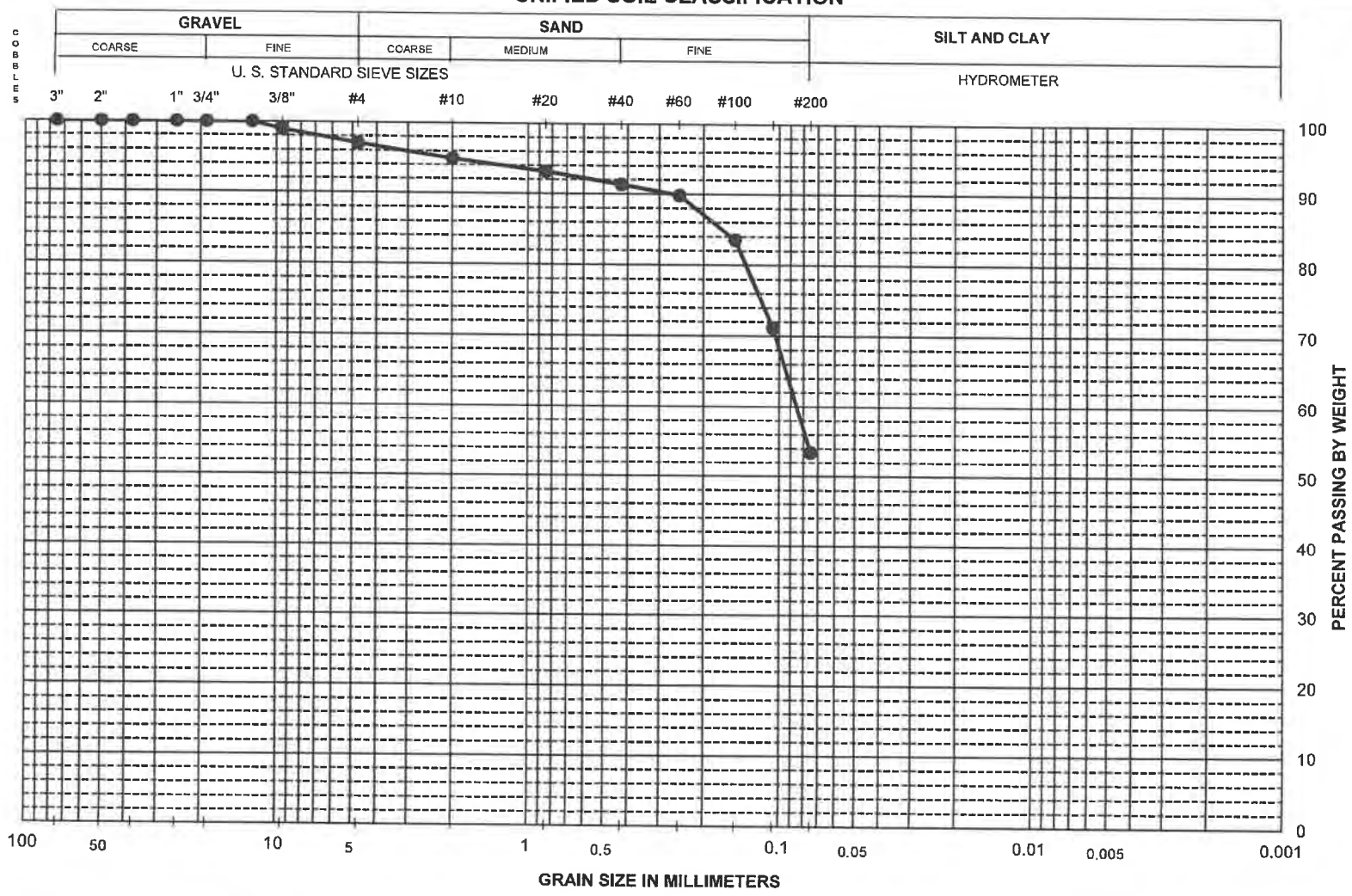
PROJECT NUMBER: 60570758

PARTICLE-SIZE DISTRIBUTION CURVES

C:\Projects\Rialto\SB-1\Sieve Hydro Rialto WWTP SB-5 5 ft

AECOM

UNIFIED SOIL CLASSIFICATION



Sieve No.	Dia. mm	% Finer
3"	75.0	100.0
2"	50.0	100.0
1.5"	37.5	100.0
1"	25.0	100.0
3/4"	19.00	100.0
1/2"	12.50	100.0
3/8"	9.50	98.9
#4	4.75	97.0
#10	2.00	94.9
#20	0.850	93.1
#40	0.425	91.3
#60	0.250	89.8
#100	0.150	83.5
#140	0.106	71.1
#200	0.075	53.4
Hydrometer Analysis		

% Cobbles	---
% Gravel	3.0
% Sand	43.6
% Fines	53.4
D_{85}	0.169
D_{60}	0.085
D_{50}	----
D_{30}	----
D_{15}	----
D_{10}	----
C_u	----
C_c	----

Boring No.	Sample No.	Depth (ft)	SYMBOL	Wn (%)	LL	PI	% 2 µm	Description and Classification
SB-5	4	15.0	●	6.3	---	---	---	**Olive brown Sandy SILT (ML)**

PROJECT NAME: **Rialto WWTP**

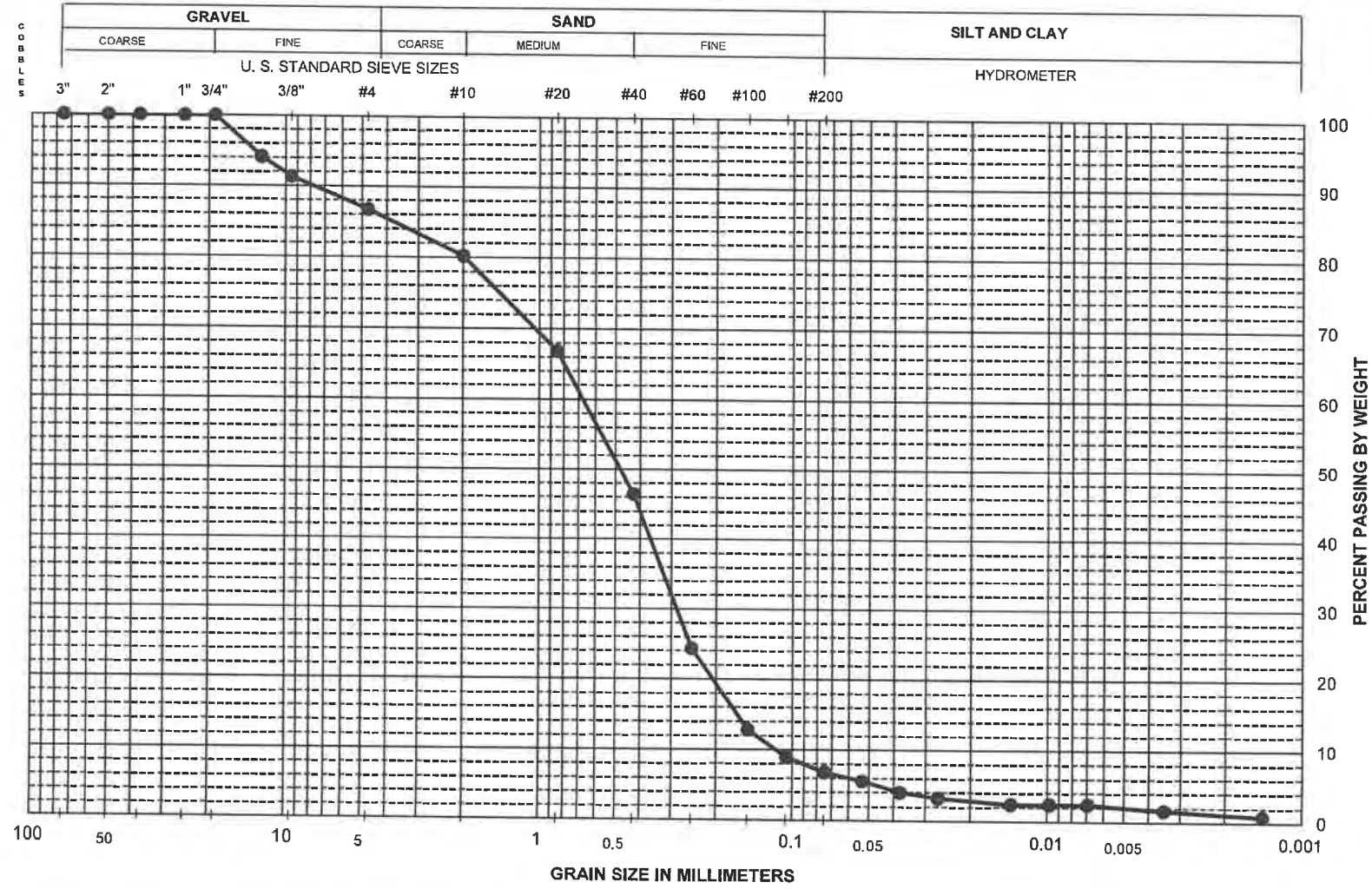
PROJECT NUMBER: **60570758**

PARTICLE-SIZE DISTRIBUTION CURVES

C:\Projects\Rialto\SB-1\Sieve Rialto WWTP SB-5 15 ft

AECOM

UNIFIED SOIL CLASSIFICATION



Sieve No.	Dia. mm	% Finer
3"	75.0	100.0
2"	50.0	100.0
1.5"	37.5	100.0
1"	25.0	100.0
3/4"	19.00	100.0
1/2"	12.50	94.1
3/8"	9.50	91.3
#4	4.75	86.7
#10	2.00	80.2
#20	0.850	66.8
#40	0.425	46.4
#60	0.250	24.3
#100	0.150	12.8
#140	0.106	8.9
#200	0.075	6.8
Hydrometer Analysis	0.0533	5.6
	0.0379	4.0
	0.0269	3.2
	0.0139	2.4
	0.0098	2.4
	0.0070	2.4
	0.0035	1.6
	0.0014	0.8
	0.0014	0.8
	0.0014	0.8

% Cobbles	---
% Gravel	13.3
% Sand	79.9
% Fines	6.8

D_{85}	3.788
D_{60}	0.675
D_{30}	0.287
D_{15}	0.165
D_{10}	0.117
C_u	5.8
C_c	1.0

Boring No.	Sample No.	Depth (ft)	SYMBOL	Wn (%)	LL	PI	% 2 µm	Description and Classification
SB-5	7	30.0	●	1.5	---	---	1.0	**White Poorly Graded SAND with Silt (SP-SM)**

PROJECT NAME: **Rialto WWTP**

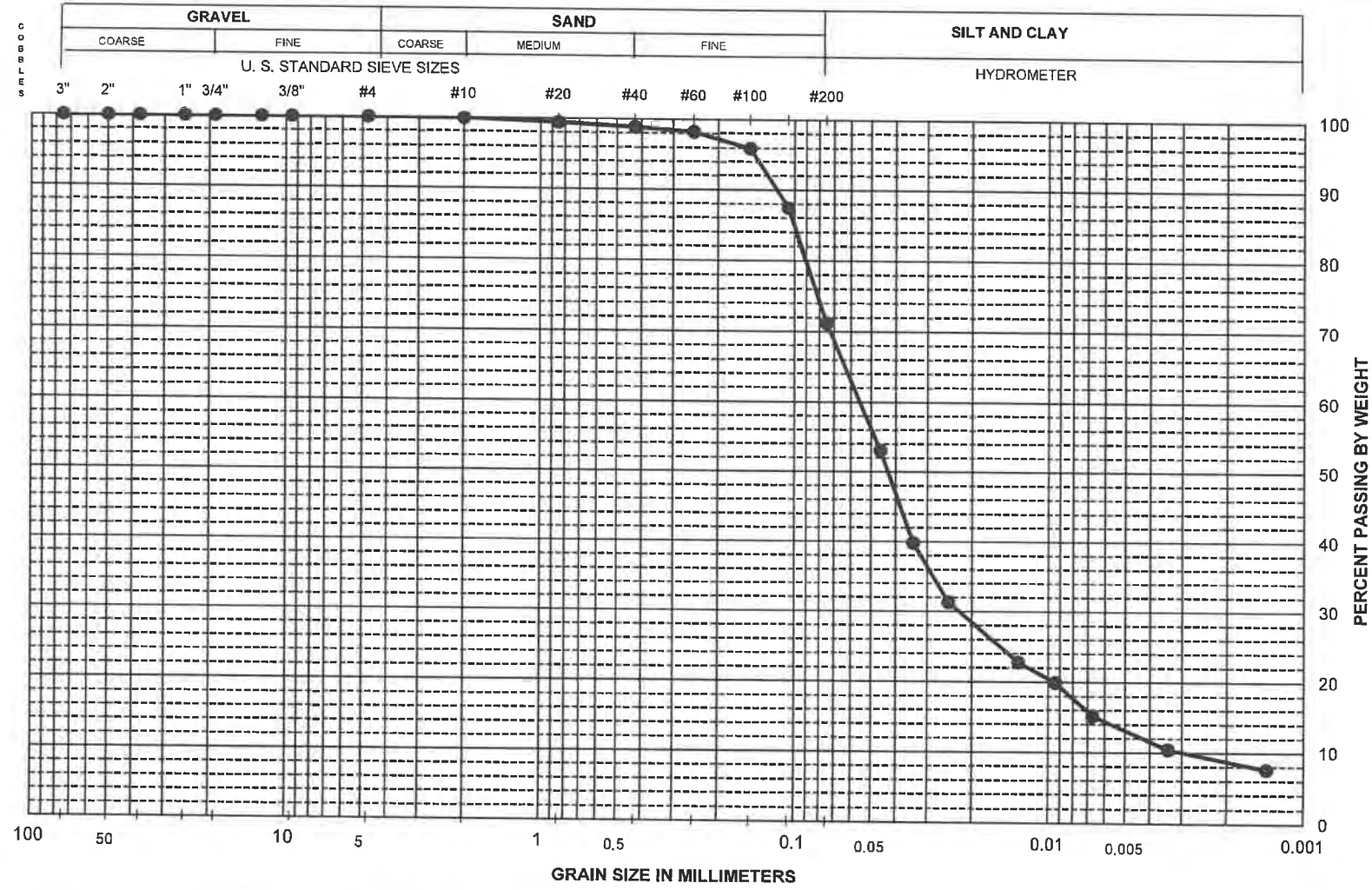
PROJECT NUMBER: **60570758**

PARTICLE-SIZE DISTRIBUTION CURVES

C:\Projects\Rialto\SB-1\Sieve Hydro Rialto WWTP SB-5 30 ft

AECOM

UNIFIED SOIL CLASSIFICATION



Sieve No.	Dia. mm	% Finer
3"	75.0	100.0
2"	50.0	100.0
1.5"	37.5	100.0
1"	25.0	100.0
3/4"	19.00	100.0
1/2"	12.50	100.0
3/8"	9.50	100.0
#4	4.75	100.0
#10	2.00	99.9
#20	0.850	99.4
#40	0.425	98.8
#60	0.250	98.2
#100	0.150	95.9
#140	0.106	87.4
#200	0.075	71.2
Hydrometer Analysis	0.0460	53.1
	0.0341	39.8
	0.0248	31.3
	0.0131	22.7
	0.0094	19.9
	0.0067	15.2
	0.0034	10.4
	0.0014	7.6
	0.0014	7.6
	0.0014	7.6

% Cobbles	---
% Gravel	0.0
% Sand	28.8
% Fines	71.2
D_{85}	0.101
D_{60}	0.055
D_{30}	0.023
D_{15}	0.007
D_{10}	0.003
C_u	18.6
C_c	3.1

Boring No.	Sample No.	Depth (ft)	SYMBOL	Wn (%)	LL	PI	% 2 µm	Description and Classification
SB-5	8	35.0	•	15.6	30	6	8.4	**Pale olive SILT with Sand (ML)**

PROJECT NAME: Rialto WWTP

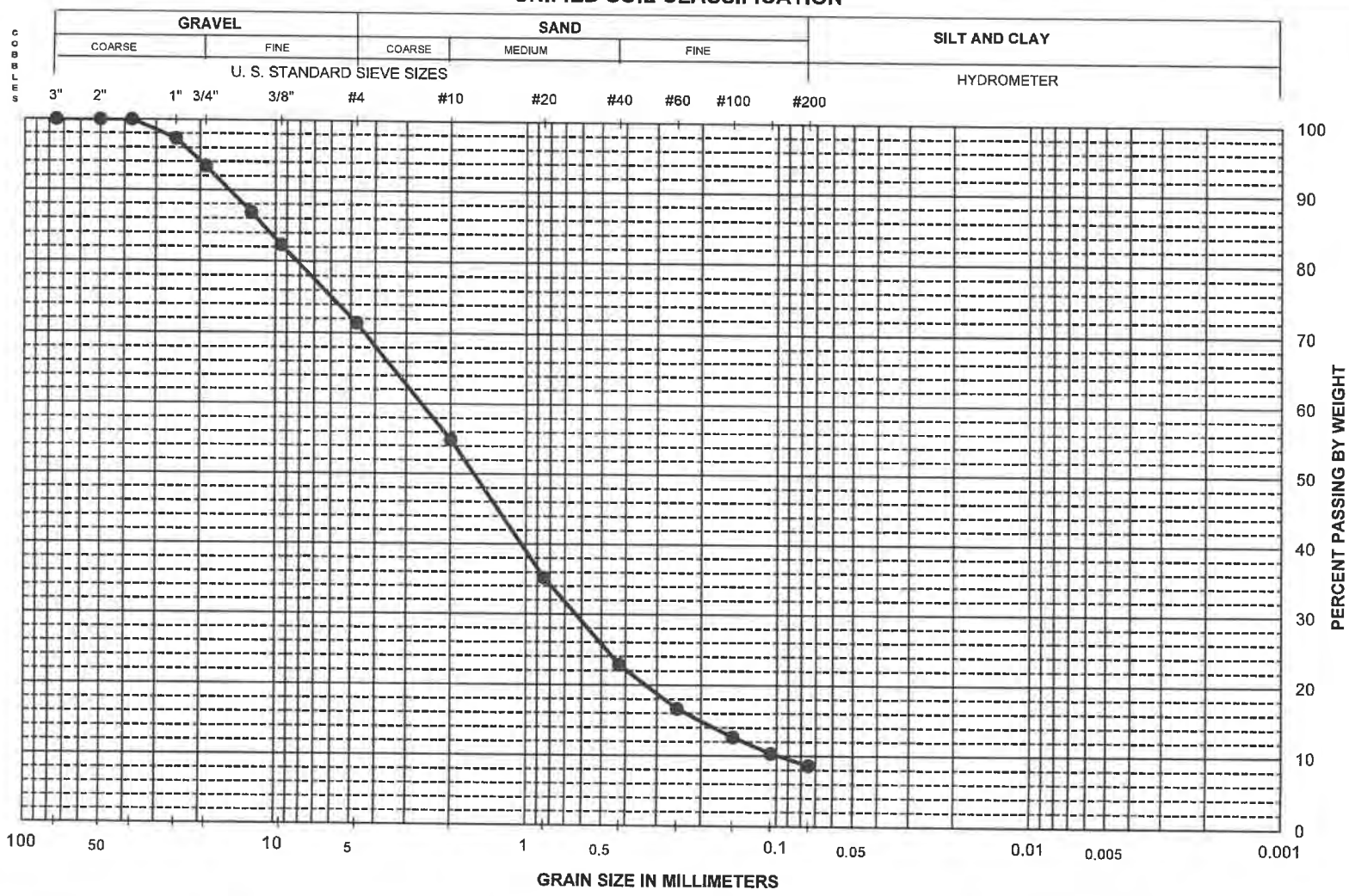
PROJECT NUMBER: 60570758

PARTICLE-SIZE DISTRIBUTION CURVES

C:\Projects\Rialto\SB-1\Sieve Hydro Rialto WWTP SB-5 35 ft

AECOM

UNIFIED SOIL CLASSIFICATION



Sieve No.	Dia. mm	% Finer
3"	75.0	100.0
2"	50.0	100.0
1.5"	37.5	100.0
1"	25.0	97.3
3/4"	19.00	93.4
1/2"	12.50	86.8
3/8"	9.50	82.3
#4	4.75	71.4
#10	2.00	54.9
#20	0.850	35.2
#40	0.425	22.8
#60	0.250	16.6
#100	0.150	12.6
#140	0.106	10.3
#200	0.075	8.6
Hydrometer Analysis		

% Cobbles	---
% Gravel	28.6
% Sand	62.8
% Fines	8.6

D_{85}	11.200
D_{60}	2.613
D_{50}	1.617
D_{30}	0.636
D_{15}	0.204
D_{10}	0.100
C_u	26.2
C_c	1.6

Boring No.	Sample No.	Depth (ft)	SYMBOL	Wn (%)	LL	PI	% 2 µm	Description and Classification
SB-5	11	50.0	•	2.0	---	---	---	**Light olive brown Well-Graded SAND with Silt and Gravel (SW-SM)**

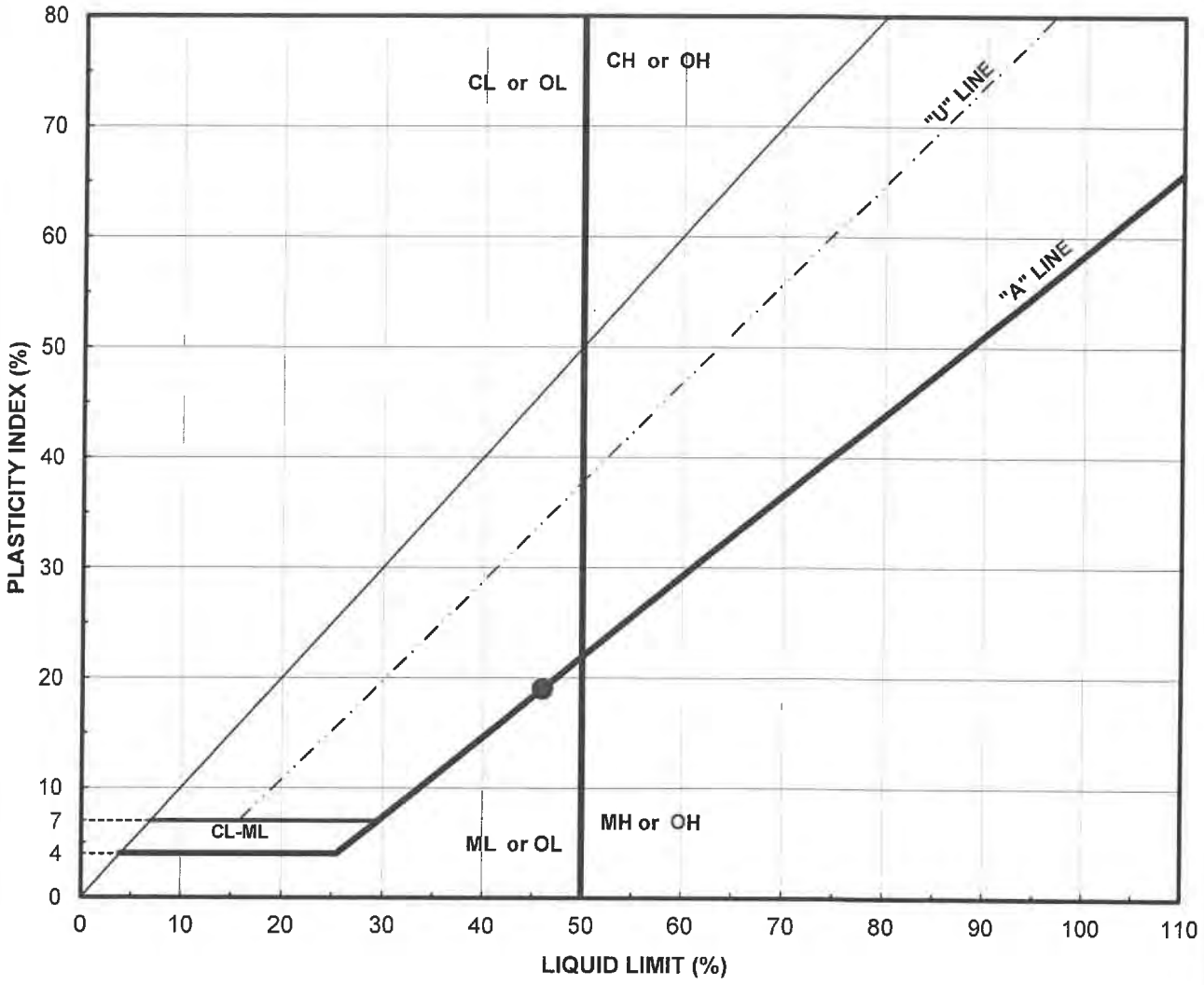
PROJECT NAME: **Rialto WWTP**

PROJECT NUMBER: **60570758**

PARTICLE-SIZE DISTRIBUTION CURVES

C:\Projects\Rialto\SB-1\Sieve Rialto WWTP SB-5 50 ft

AECOM

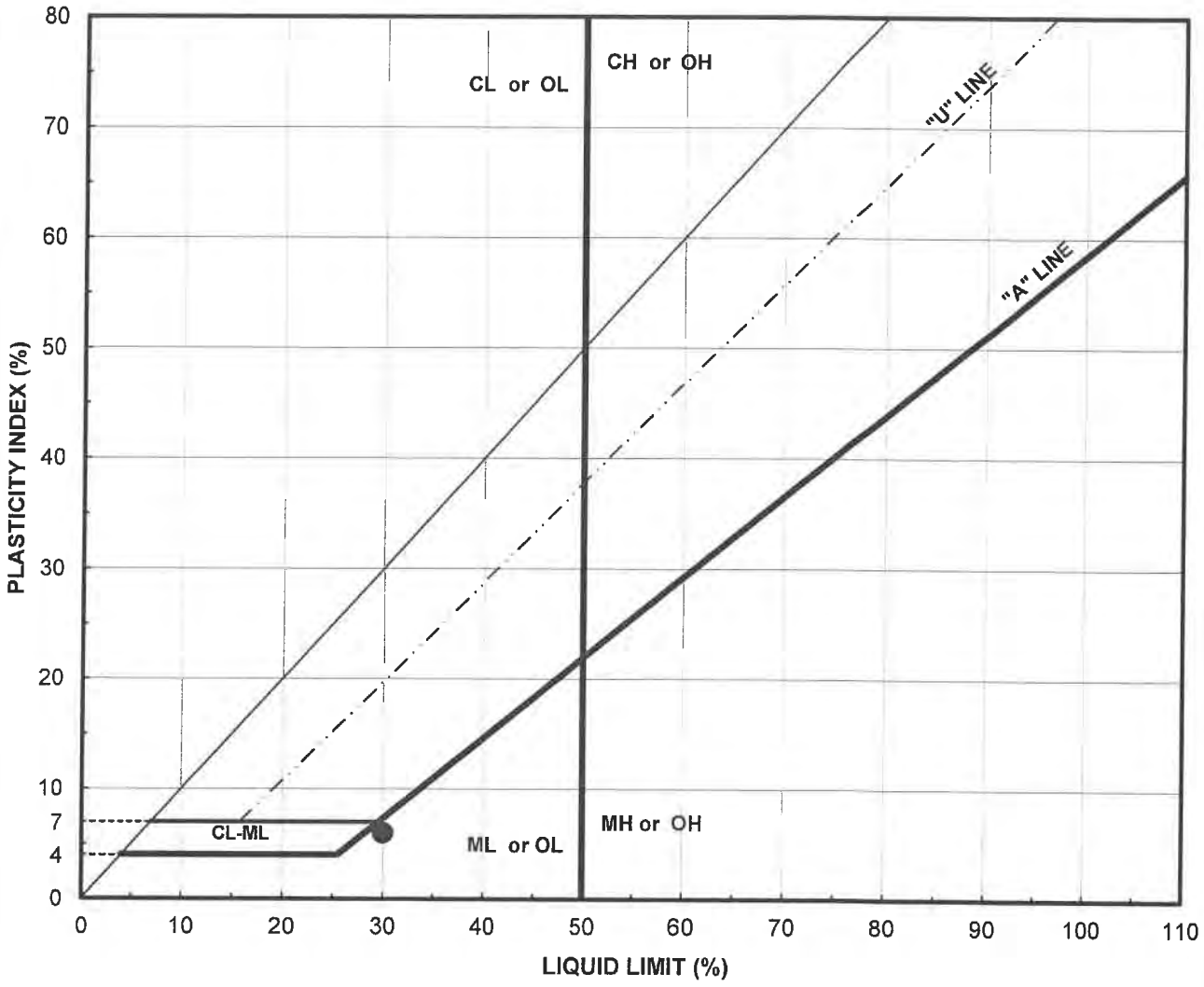


Boring Number	Sample Number	Depth (ft)	Water Content (%)	LL	PI	DESCRIPTION / CLASSIFICATION
SB-5	2A	5.0	10.9	46	19	Pale brown Clayey SILT (ML)

Project Name: Rialto WWTP

Project Number: 60570758

PLASTICITY CHART



Boring Number	Sample Number	Depth (ft)	Water Content (%)	LL	PI	DESCRIPTION / CLASSIFICATION
SB-5	8	35.0	15.6	30	6	Pale olive SILT with Sand (ML)

Project Name: Rialto WWTP

Project Number: 60570758

PLASTICITY CHART

LABORATORY TEST RESULTS

NMG, 5/5/10
10049-01

Sample	Compacted Moisture (%)	Compacted Dry Density (pcf)	Final Moisture (%)	Volumetric Swell (%)	Expansion Index[1] Value/Method		Expansive Classification[2]	Soluble Sulfate (%)	Sulfate Exposure[3]
C-1 B-1 0'-5'	6.4	107.4	17.0	0	0	B	Very Low	0.05	Negligible
C-2 B-1 0'-5'	6.3	121.1	11.4	0	0	B	Very Low	0.05	Negligible

Test Method:

ASTM D4829 / UBC Standard 18-2

HACH SF-1 (Turbidimetric)

Notes:

1. Expansion Index (EI) method of determination:
   [A] E.I. determined by adjusting water content to achieve a 50 ±1% degree of saturation
   [B] E.I. calculated based on measured saturation within the range of 40% and 60%
2. 1997 UBC Table 18-1-B *(Classification of Expansive Soil)*
3. 1997 UBC Table 19-A-4 *(Requirement for Concrete Exposed to Sulfate-Containing Solutions)*

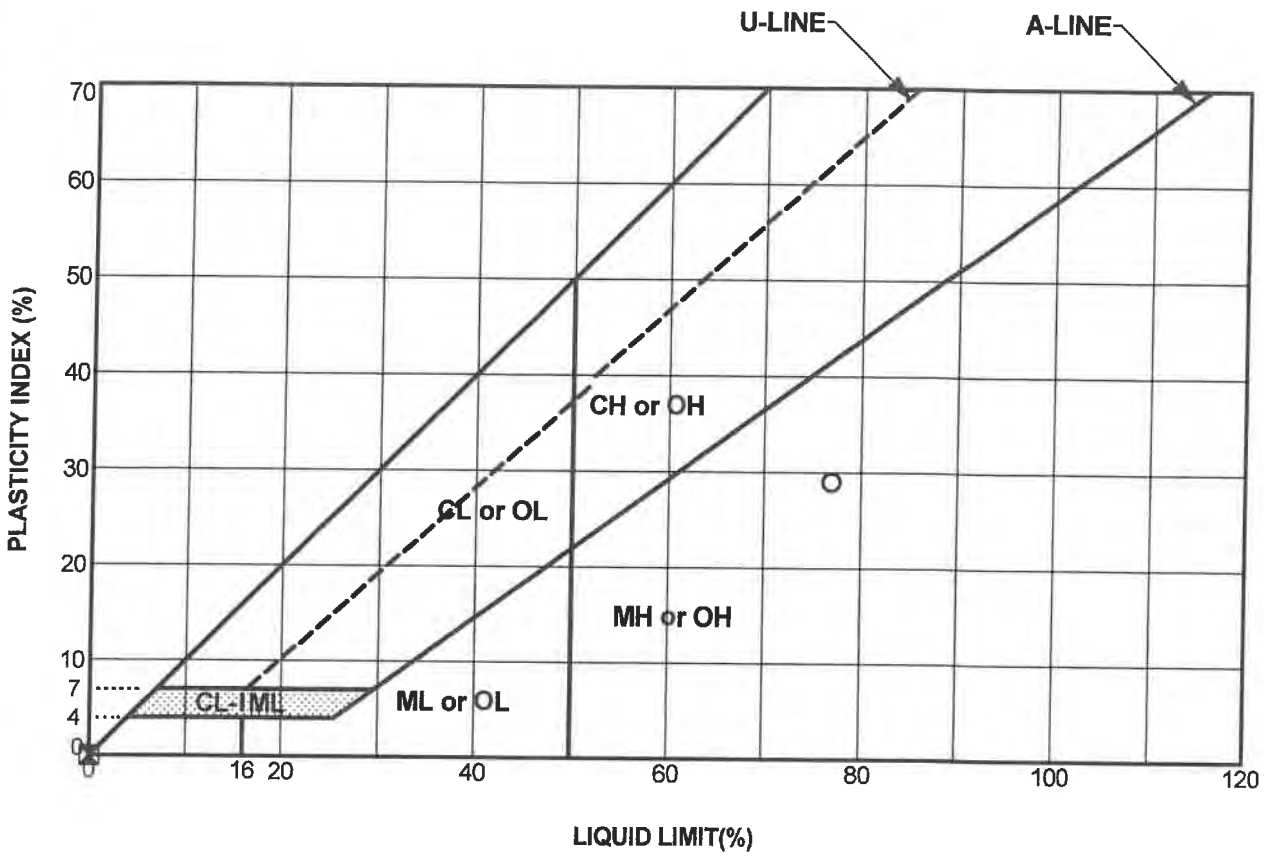
Expansion Index and Soluble Sulfate Test Results

(FRM001 Rev.5)

Project No. 10049-01

Project Name: Rentech / Rialto

NMG

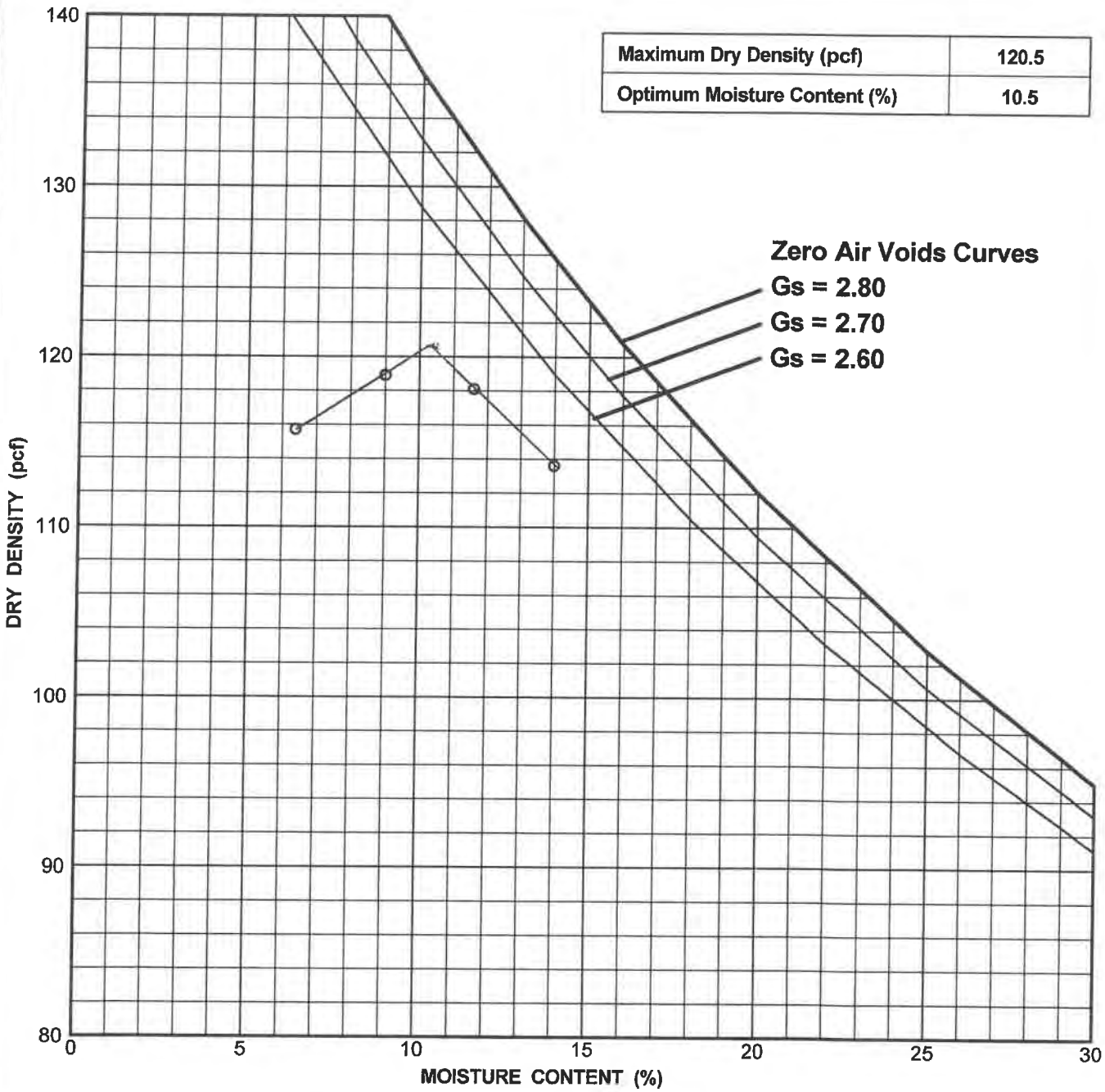


Symbol	Boring Number	Depth (feet)	Sample Number	Passing No. 200 Sieve (%)	LL	PI	USCS	Description
O	C-1	25.0	D-6	96	77	29	CH	(Qal) Dark Grayish Brown Silty CLAY
⊠	C-4	15.0	D-4	41	NP	NP	SM/ML	(Qal) Pale Gray Silty SAND / Sandy SILT

PLASTICITY CHART

Rentech/ Rialto
Rialto
PROJECT NO. 10049-01

NMG Geotechnical, Inc.



Maximum Dry Density (pcf)	120.5
Optimum Moisture Content (%)	10.5

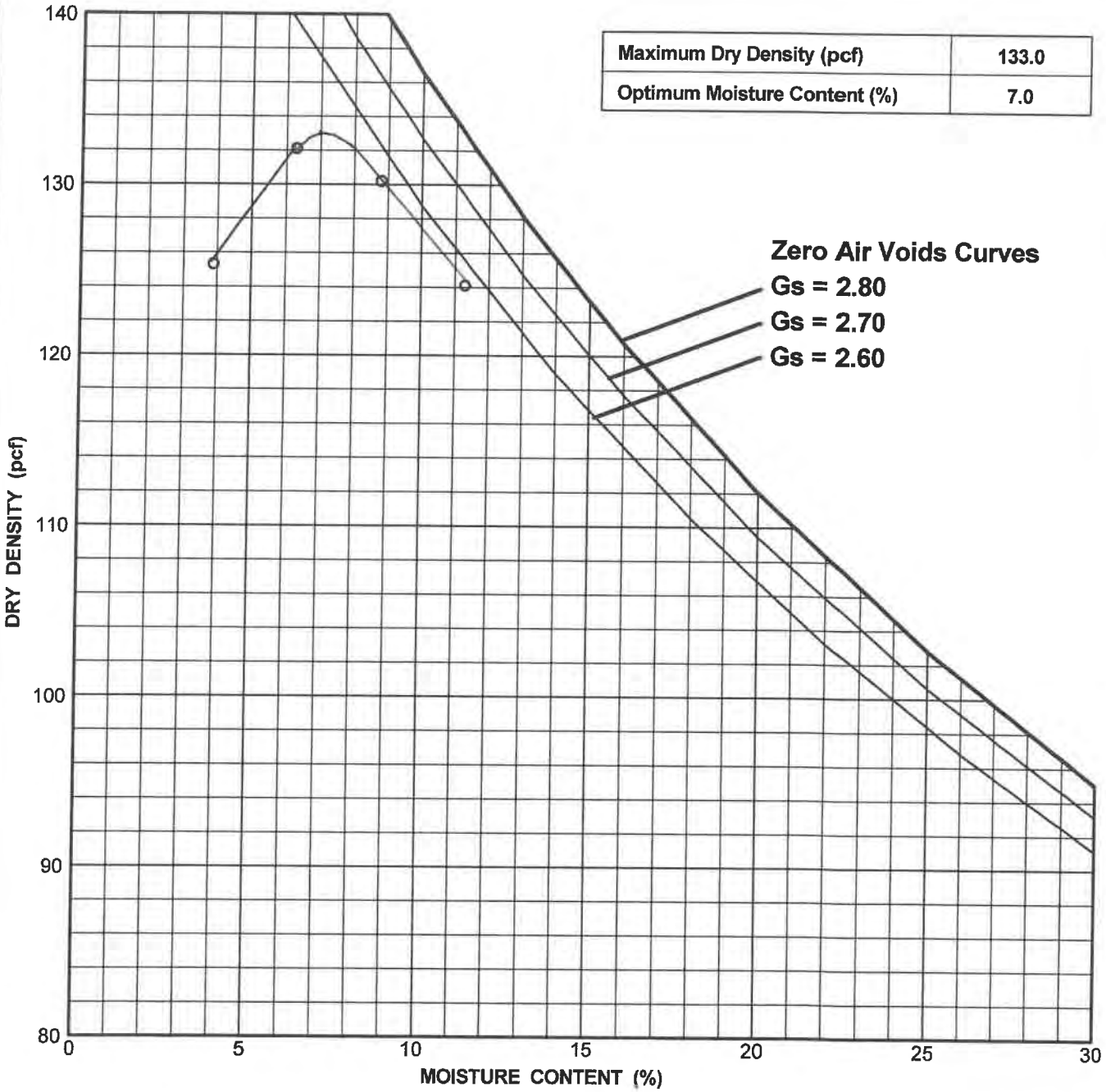
Boring No. C-1	**Sample No. B-1**	**Depth: 2.0 ft**
Sample Description: (Qal) Yellowish Brown Silty SAND		
Liquid Limit:	**Plasticity Index:**	**Percent Passing No. 200 Sieve:** 33
Comments: 1557A		

COMPACTION TEST RESULTS

Rentech/ Rialto
Rialto
PROJECT NO. 10049-01

NMG Geotechnical, Inc.

Maximum Dry Density (pcf)	133.0
Optimum Moisture Content (%)	7.0

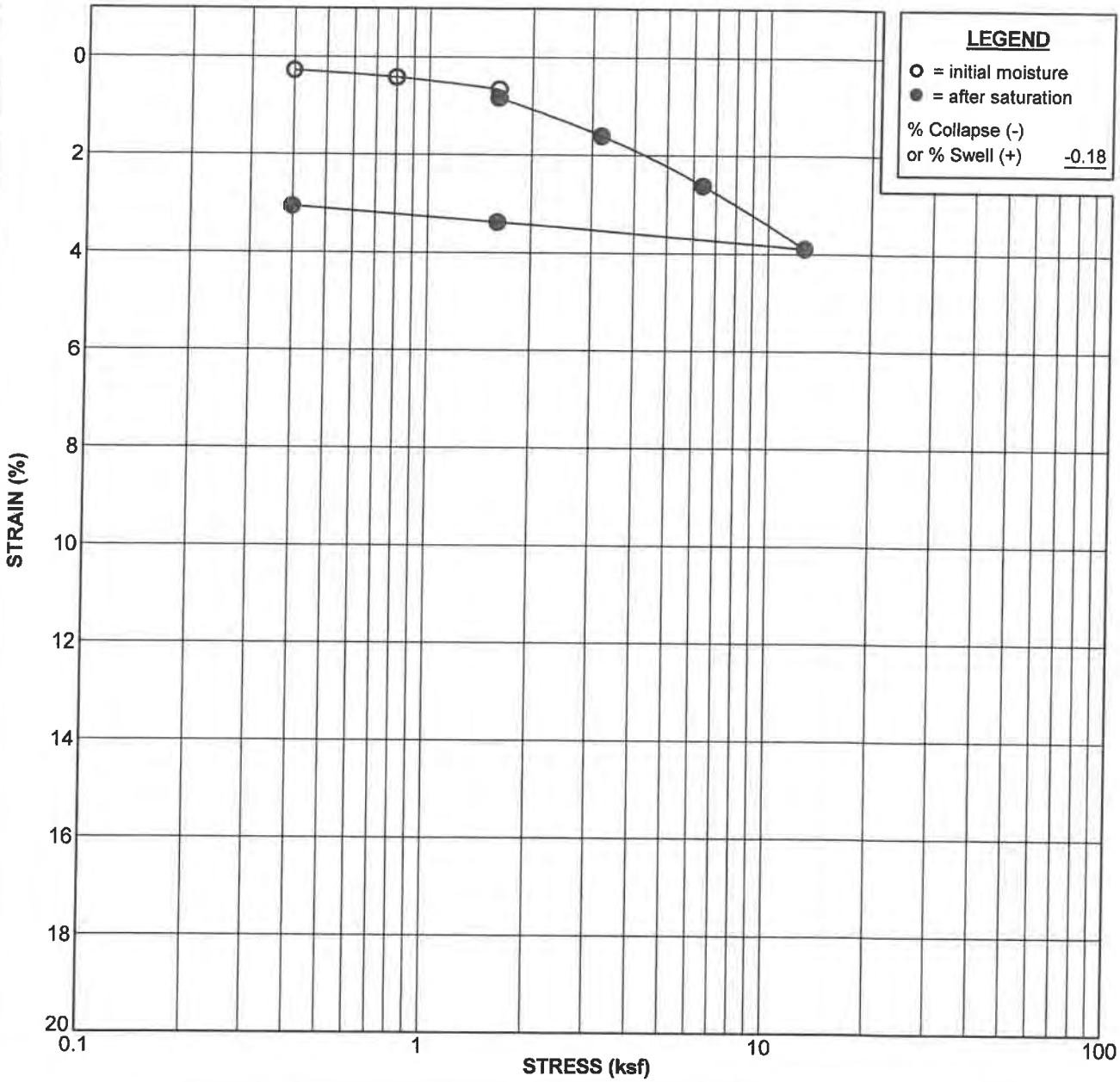


Boring No. C-2	**Sample No. B-1**	**Depth: 2.0 ft**
Sample Description: (Qal) Pale Brown Silty SAND		
Liquid Limit:	**Plasticity Index:**	**Percent Passing No. 200 Sieve:** 20
Comments: 1557A		

COMPACTION TEST RESULTS

Rentech/ Rialto
Rialto
PROJECT NO. 10049-01

NMG Geotechnical, Inc.



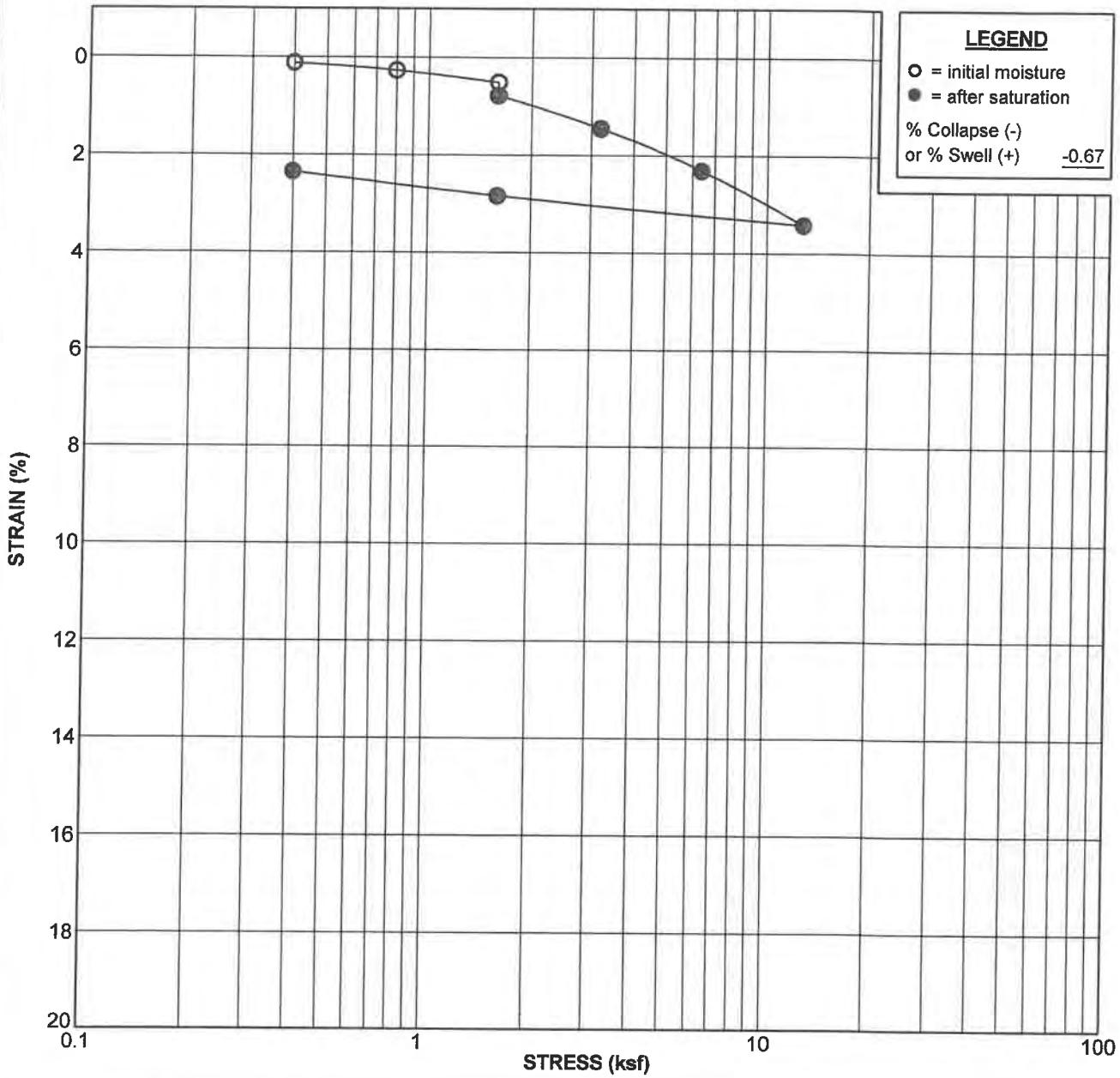
Boring No. C-1	Sample No. D-1	Depth: 2.5 ft
Sample Description:	(Qal) Yellowish Brown Silty SAND	
Liquid Limit:	Plasticity Index:	Percent Passing No. 200 Sieve:

Test Stage	Moisture Content (%)	Dry Density (pcf)	Degree of Saturation (%)	Void Ratio
Initial	5.6	100.6	23.1	0.644
Final	18.8	103.7	83.8	0.595

CONSOLIDATION TEST RESULTS

Rentech/ Rialto
Rialto
PROJECT NO. 10049-01

NMG Geotechnical, Inc.



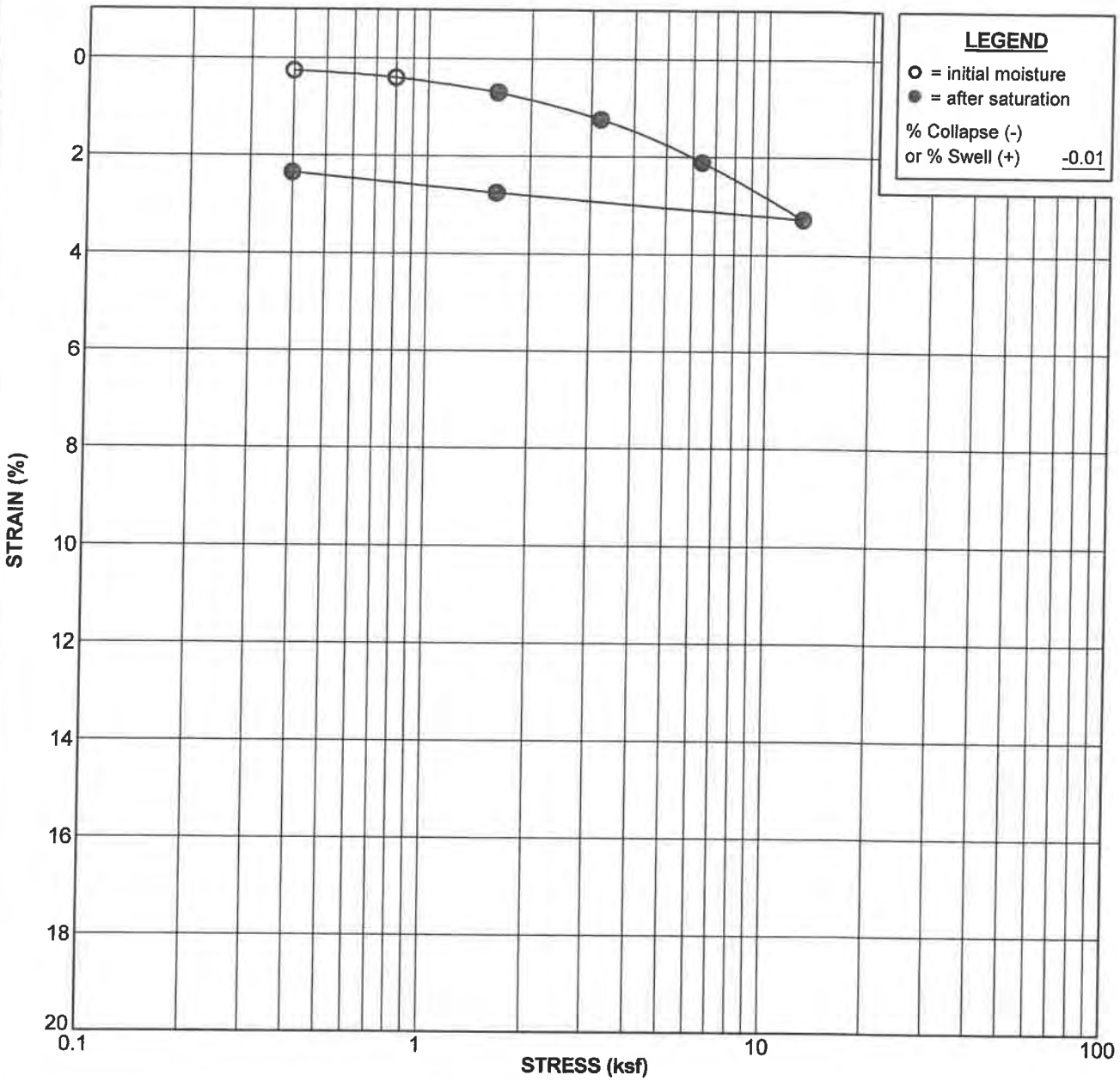
Boring No. C-1	Sample No. D-4	Depth: 15.0 ft
Sample Description:	(Qal) Light Gray SAND	
Liquid Limit:	Plasticity Index:	Percent Passing No. 200 Sieve:

Test Stage	Moisture Content (%)	Dry Density (pcf)	Degree of Saturation (%)	Void Ratio
Initial	4.1	96.0	14.9	0.723
Final	24.9	97.8	95.5	0.691

CONSOLIDATION TEST RESULTS

Rentech/ Rialto
Rialto
PROJECT NO. 10049-01

NMG Geotechnical, Inc.



Boring No. C-3	Sample No. D-3	Depth: 10.0 ft
Sample Description:	(Qal) Olive Silty SAND	
Liquid Limit:	Plasticity Index:	Percent Passing No. 200 Sieve:

Test Stage	Moisture Content (%)	Dry Density (pcf)	Degree of Saturation (%)	Void Ratio
Initial	24.7	90.2	78.6	0.833
Final	26.7	92.3	89.4	0.792

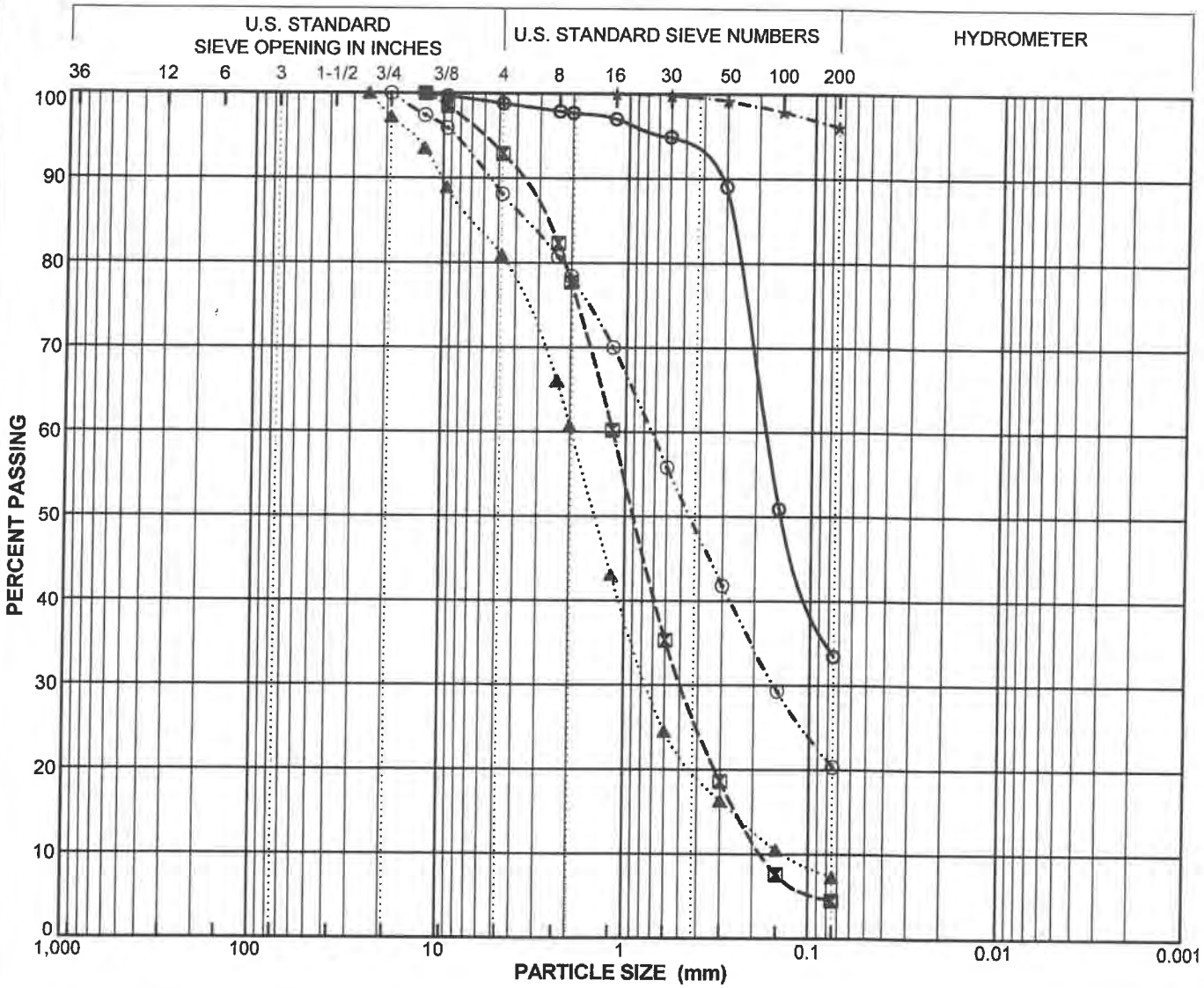
CONSOLIDATION TEST RESULTS

Rentech/ Rialto
Rialto
PROJECT NO. 10049-01

NMG Geotechnical, Inc.

Template: NMCONS; Prj ID: 10049-01.GPJ; Printed: 5/3/10

BOULDERS	COBBLES	GRAVEL		SAND			SILT OR CLAY
		coarse	fine	coarse	medium	fine	



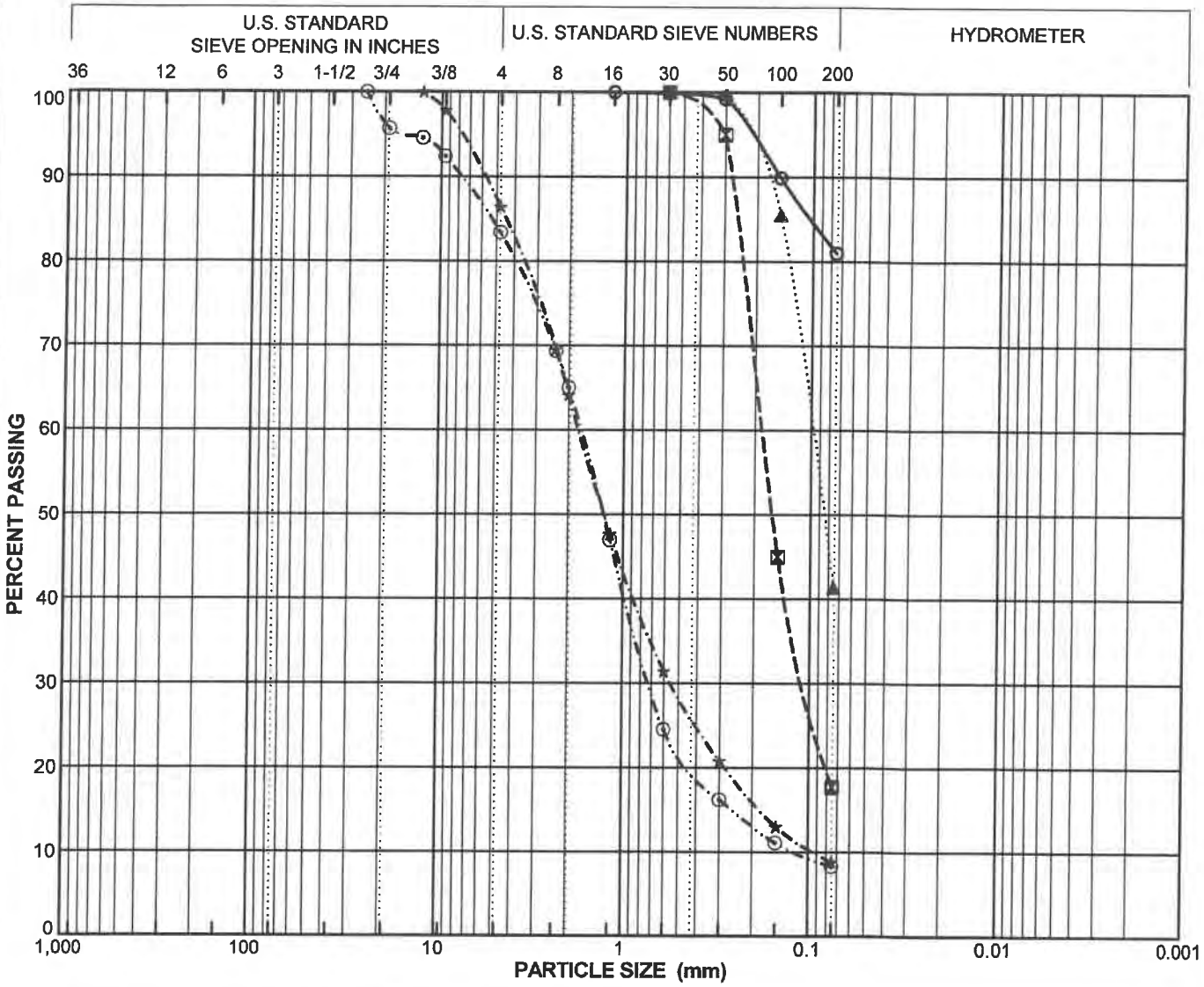
Symbol	Boring Number	Sample Number	Depth (feet)	Field Moisture (%)	LL	PI	Activity PI/-2μ	C_u	C_c	Passing No. 200 Sieve (%)	Passing 2μ (%)	USCS
○	C-1	B-1	2.0							33		SM
⊠	C-1	D-3	10.0	2						5		SP
▲	C-1	D-5	20.0	2						7		SP
★	C-1	D-6	25.0	9	77	29				96		CH
⊙	C-2	B-1	2.0							20		SM

PARTICLE SIZE DISTRIBUTION

Rentech/ Rialto
Rialto
PROJECT NO. 10049-01

NMG Geotechnical, Inc.

BOULDERS	COBBLES	GRAVEL		SAND			SILT OR CLAY
		coarse	fine	coarse	medium	fine	



Symbol	Boring Number	Sample Number	Depth (feet)	Field Moisture (%)	LL	PI	Activity PI/-2μ	C_u	C_c	Passing No. 200 Sieve (%)	Passing 2μ (%)	USCS
O	C-3	D-2	5.0	8						81		SM
⊠	C-4	D-2	5.0	6						18		SM
▲	C-4	D-4	15.0	5	NP	NP				41		SM/ML
★	Y-2	D-4	20.0	5						9		SP
⊙	Y-2	D-10	60.0							8		SP

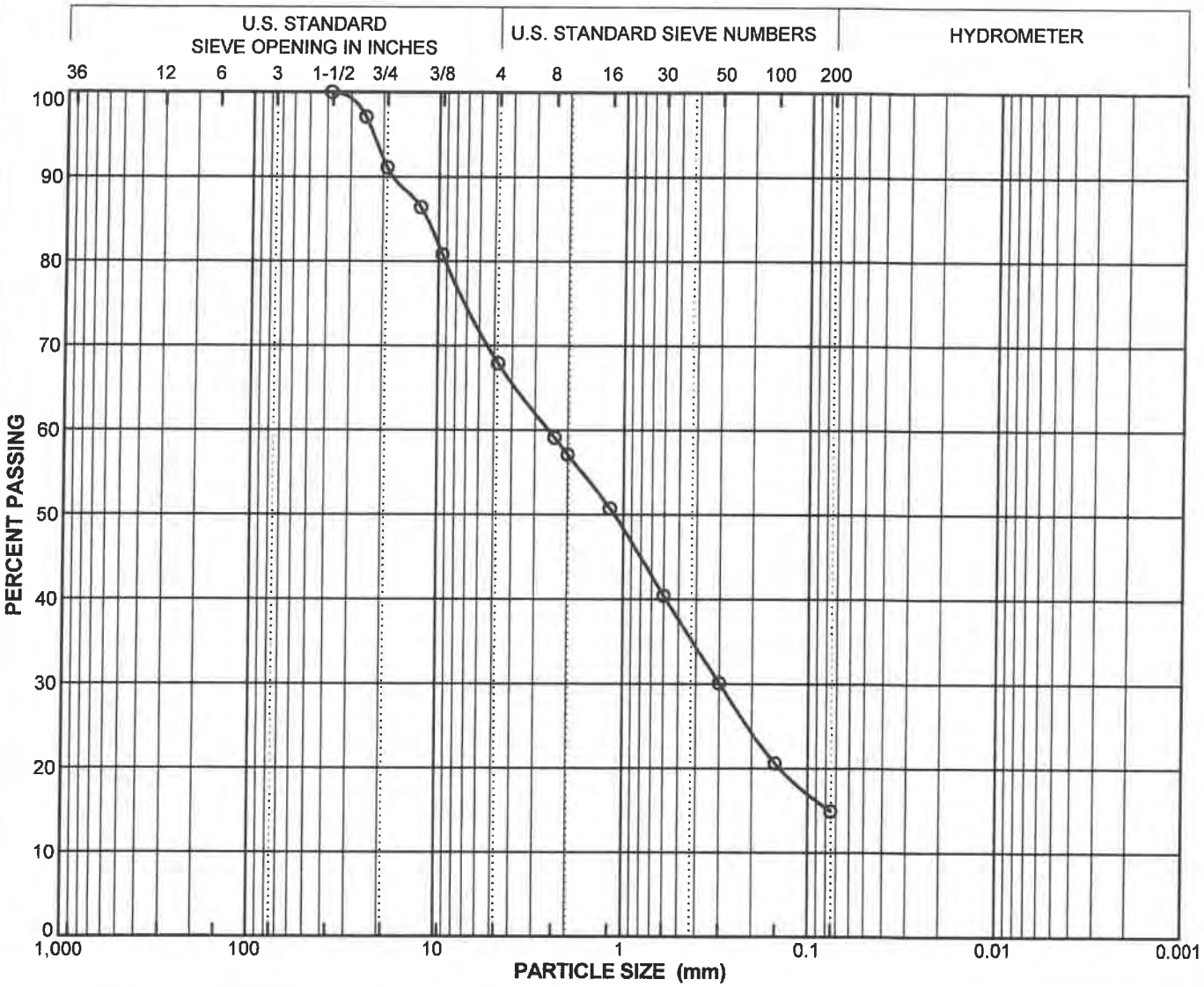
PARTICLE SIZE DISTRIBUTION

Rentech/ Rialto
Rialto
PROJECT NO. 10049-01

NMG Geotechnical, Inc.

Template: NMSIV; Prj ID: 10049-01.GPJ; Printed: 5/3/10

BOULDERS	COBBLES	GRAVEL		SAND			SILT OR CLAY
		coarse	fine	coarse	medium	fine	



Symbol	Boring Number	Sample Number	Depth (feet)	Field Moisture (%)	LL	PI	Activity PI/-2μ	C_u	C_c	Passing No. 200 Sieve (%)	Passing 2μ (%)	USCS
O	Y-5	B-1	2.0							15		SM

PARTICLE SIZE DISTRIBUTION

Rentech/ Rialto
Rialto
PROJECT NO. 10049-01

NMG Geotechnical, Inc.

LABORATORY TEST RESULTS

NMG, 10/11/10
10049-02

APPENDIX C
SUMMARY OF SOIL LABORATORY DATA

Boring/Sample Information					Field Moisture Content (%)	Field Dry Density (pcf)	Sieve/ Hydrometer		Atterberg Limits		USCS Group Symbol	Direct Shear				Compaction		Expansion Index	R-Value	Soluble Sulfate Content (% by wt)	Remarks / Other Laboratory Tests
												Ultimate		Peak		Maximum Dry Density (pcf)	Optimum Moisture Content (%)				
Boring No.	Sample No.	Depth (feet)	Elevation (feet)	Blow Count (N)			Fines Content (% pass. #200)	Clay Content (% pass. 2μ)	LL (%)	PI (%)		Cohesion (psf)	Friction Angle (°)	Cohesion (psf)	Friction Angle (°)						
GS-1	B-1	0.0					25	5	NP	NP	SM							0		0.015	
GS-2	B-1	0.0					4	2			SP							11		0.030	
HA-1	B-1	1.0							52	27	CH							105		0.080	
HS-1	D-2	7.5	903.5	52	9	104					ML	150	27	150	28						
HS-1	B-1	8.5	902.5				65	14	NP	NP	ML	200	29	400	29	119.0	11.5	18		0.055	
HS-1	D-3	12.5	898.5	42	2	112					SM/ML	0	31	0	31						
HS-1	D-9	42.5	868.5	50/3"	3	110	4				SP										
HS-2	SPT-1	2.5	911.7	25	10		44	7			SM										
HS-2	D-2	10.0	904.2	36	23	98					SM/ML										
HS-2	D-4	20.0	894.2	79	22	100					SM/ML	0	31	0	31						
HS-2	D-5	25.0	889.2	50/6"	3	110	7				SP/SM										
HS-3	SPT-2	10.0	900.8	16	11				59	36	CH										
HS-4	SPT-1	2.5	902.5	6	8		44				SM										
HS-4	D-2	10.0	895.0	34	36	87					ML	200	24	200	25						
HS-4	SPT-3	12.5	892.5	18	20		65	9			ML										
HS-4	D-4	20.0	885.0	44	27	97					ML	50	28	50	29						
HS-4	D-5	25.0	880.0	77/11"	6	104	6				SP/SM										
RW-1	D-2	7.5	905.5	50/6"	4	132					SM/SP	0	36	0	37						
RW-1	D-4	17.5	895.5	66	8	106					SM/SP	0	35	0	36						
SRI	B-1	2.8					58	7			ML										
T-1	B-1	4.5	948.0								SM								69		
T-11	B-1	1.0	912.5				65		NP	NP	ML					104.0	14.5				
T-2	B-1	1.0	945.0								SM								68		
T-4	B-1	1.0	942.5				21				SM					128.5	6.5		65		
T-5	B-1	2.0	906.0				93		36	5	ML	40	30	400	28	100.5	19.5	33		0.055	
T-5	B-1	2.1	905.9		22	92					ML										
T-5	B-1	2.2	905.8		22	92					ML										
T-6	B-1	2.0	903.0				99		70	45	CH	100	23	500	25	99.0	21.0	114		0.055	

Laboratory Test Methods

The majority of NMG's laboratory testing is performed in general compliance with the latest test method by the American Standards for Testing and Materials (**ASTM**). Other testing procedures used include the State of California Department of Transportation Test Method (**CTM**), or other test method as designated below. The laboratory test results for this project are included in this appendix. Discussion, conclusion and recommendations pertaining to these results are found in the text of this report.

TEST METHOD		TEST DESCRIPTION
ASTM	*Other*	
D422		Particle Size Distribution (Full Sieve and Hydrometer)
D516	CTM 422	Chloride Content
D1140		Grain Size (Passing No. 200 sieve)
D1557[1]	CTM 216[2]	Soil and Aggregate Base Compaction 1 – Maximum Dry Density 2 – Maximum Wet Density
D1559[1] D1560[2] D2726[1]	CTM 308[2]	Asphalt Concrete Compaction (Maximum Density) 1 – Marshall Apparatus 2 – Hveem Apparatus
D1883		California Bearing Ratio Test
D2166		Unconfined Compressive Strength
D2216		Water (Moisture) Content and Dry Density
D2419	CTM 217	Sand Equivalent Value
D2435		Consolidation Properties
D2487 D2488		Description, Identification and Classification of Soils (Unified Soil Classification System, USCS)
D2844	CTM 301	Resistance (R-Value)
D3080		Direct Shear
D4318		Liquid Limits, Plastic Limit and Plasticity Index (Atterberg Limits)
D4829		Expansion Index
D5156	HACH SF-1 (Turbidimetric) CTM 417,422	Soluble Sulfate Content
G51		Ph
G57	CTM 643	Electric Resistivity

Sample	Compacted Moisture (%)	Compacted Dry Density (pcf)	Final Moisture (%)	Volumetric Swell (%)	Expansion Index[1] Value/Method		Expansive Classification[2]	Soluble Sulfate (%)	Sulfate Exposure[3]
HA-1 B-1 1'-2'	18.7	86.1	41.2	10.2	105	B	High	0.080	Negligible
HS-1 B-1 7.5'-10'	10.5	107.1	21.8	1.8	18	A	Very Low	0.055	Negligible
T-5 B-1 2'	13.6	90.8	33.4	3.7	33	B	Low	0.055	Negligible
T-6 B-1 1'-3'	20.1	88.3	40.7	10.4	114	B	High	0.055	Negligible
GS-1 S-1 0'	7.4	112.7	15.4	0	0	B	Very Low	0.015	Negligible
GS-2 S-1 0'	10.5	104.6	13.8	1.2	11	B	Very Low	0.030	Negligible

Test Method:

ASTM D4829 / UBC Standard 18-2

HACH SF-1 (Turbidimetric)

Notes:

1. Expansion Index (EI) method of determination:
   [A] E.I. determined by adjusting water content to achieve a 50 ±1% degree of saturation
   [B] E.I. calculated based on measured saturation within the range of 40% and 60%
2. 1997 UBC Table 18-1-B *(Classification of Expansive Soil)*
3. 1997 UBC Table 19-A-4 *(Requirement for Concrete Exposed to Sulfate-Containing Solutions)*

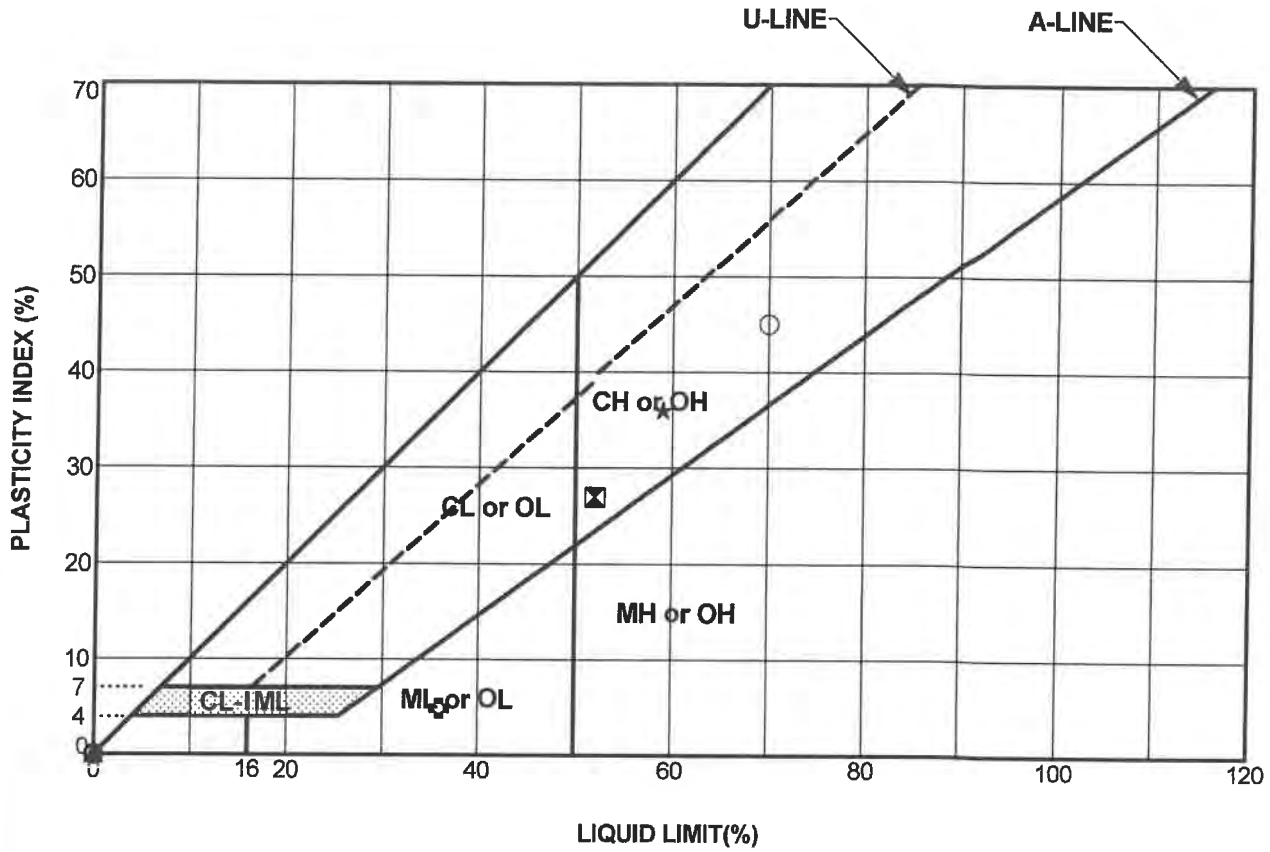
Expansion Index and Soluble Sulfate Test Results

(FRM001 Rev.5)

Project No. 10049-02

Project Name: Rentech / Rialto

NMG



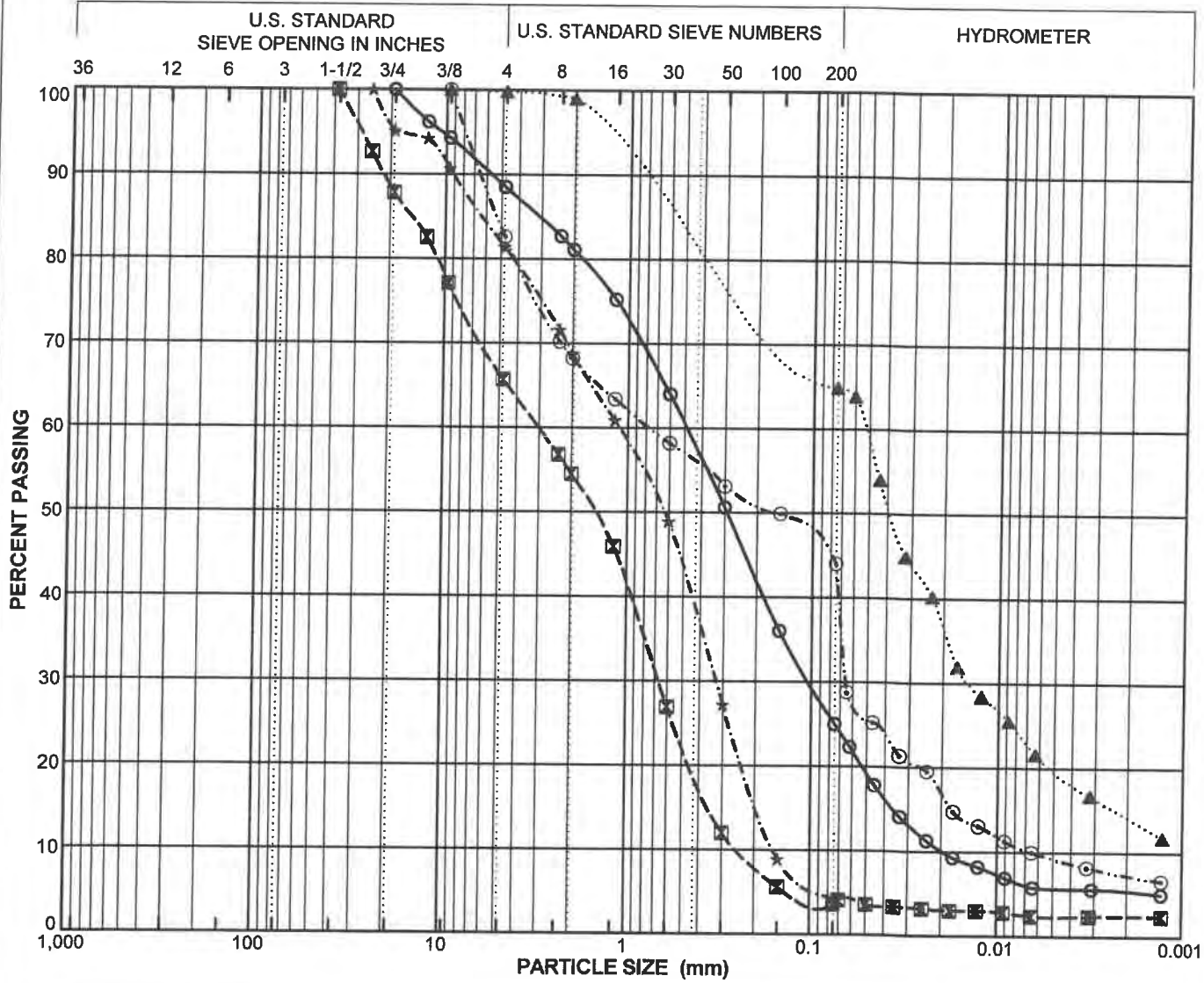
Symbol	Boring Number	Depth (feet)	Sample Number	Passing No. 200 Sieve (%)	LL	PI	USCS	Description
O	GS-1	0.0	S-1	25	NP	NP	SM	(Qf) Yellowish Brown Silty SAND
⊠	HA-1	1.0	B-1		52	27	CH	(Aw) Gray Silty CLAY
▲	HS-1	8.5	B-1	65	NP	NP	ML	(Qal) Yellowish Brown Sandy SILT
★	HS-3	10.0	SPT-2		59	36	CH	(Aw) Pale Yellowish Brown Silty CLAY
⊙	T-11	1.0	B-1	65	NP	NP	ML	(Aw) Pale Yellow Sandy SILT
✿	T-5	2.0	B-1	93	36	5	ML	(Aw) Yellowish Brown Clayey SILT
○	T-6	2.0	B-1	99	70	45	CH	(Aw) Gray Silty CLAY

PLASTICITY CHART

Rentech/ Rialto
Rialto
PROJECT NO. 10049-02

NMG Geotechnical, Inc.

BOULDERS	COBBLES	GRAVEL		SAND			SILT OR CLAY
		coarse	fine	coarse	medium	fine	



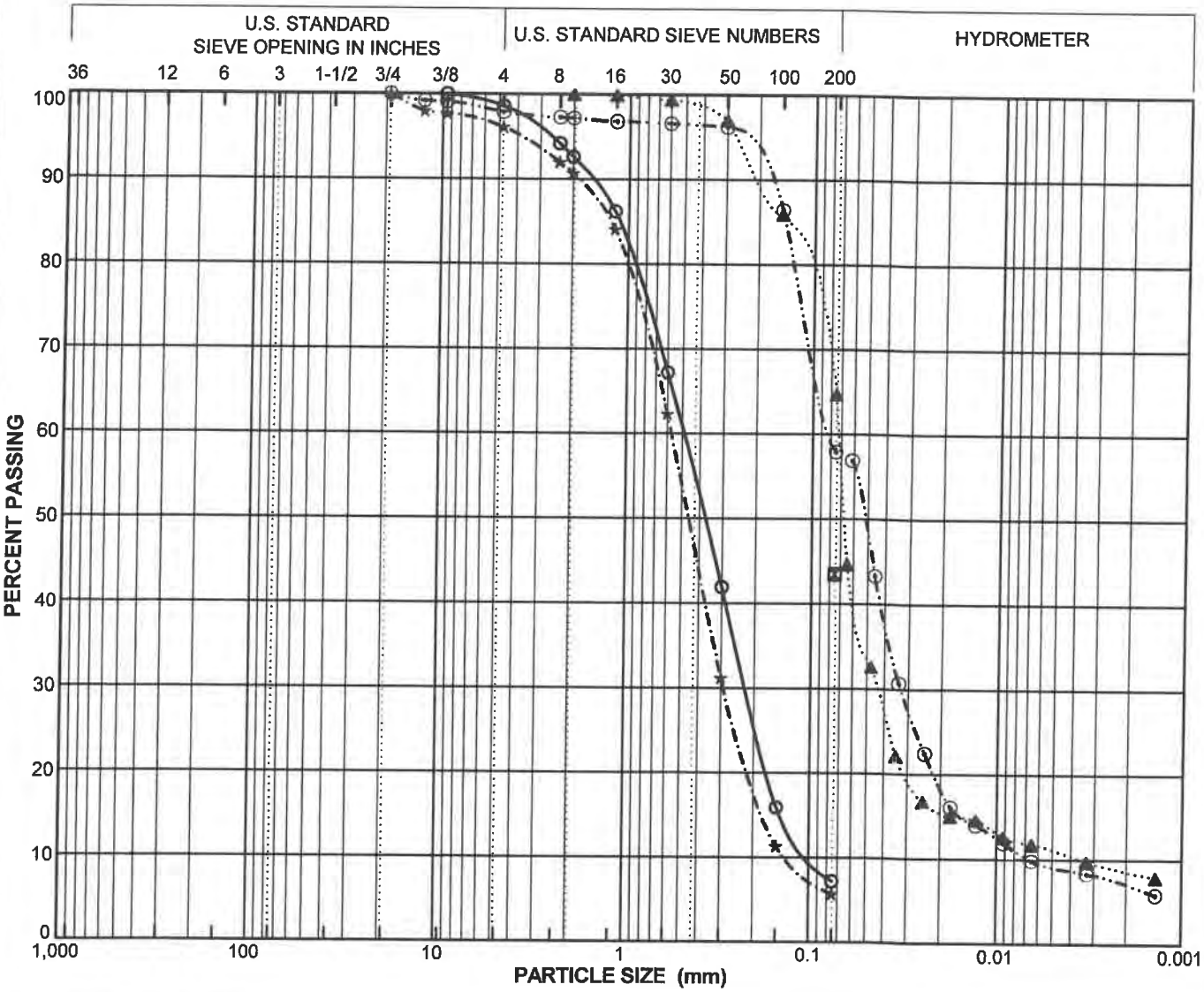
Symbol	Boring Number	Sample Number	Depth (feet)	Field Moisture (%)	LL	PI	Activity PI/-2μ	C_u	C_c	Passing No. 200 Sieve (%)	Passing 2μ (%)	USCS
O	GS-1	S-1	0.0		NP	NP				25	5	SM
⊠	GS-2	S-1	0.0							4	2	SP
▲	HS-1	B-1	8.5		NP	NP				65	14	ML
★	HS-1	D-9	42.5	3				7.1	0.53	4		SP
⊙	HS-2	SPT-1	2.5	10						44	7	SM

PARTICLE SIZE DISTRIBUTION

Rentech/ Rialto
Rialto
PROJECT NO. 10049-02

NMG Geotechnical, Inc.

BOULDERS	COBBLES	GRAVEL		SAND			SILT OR CLAY
		coarse	fine	coarse	medium	fine	



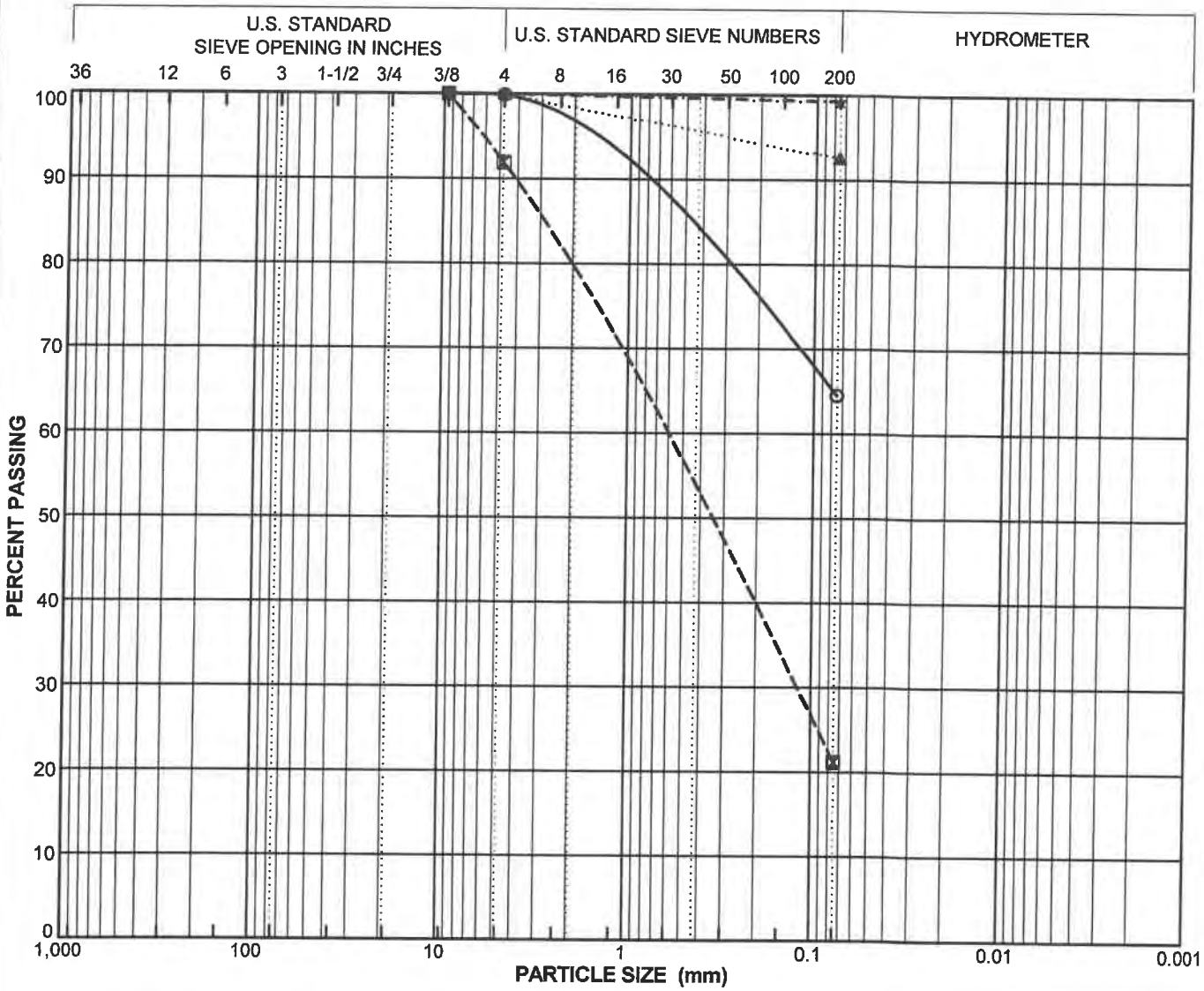
Symbol	Boring Number	Sample Number	Depth (feet)	Field Moisture (%)	LL	PI	Activity PI/-2μ	C_u	C_c	Passing No. 200 Sieve (%)	Passing 2μ (%)	USCS
○	HS-2	D-5	25.0	3				4.5	1.0	7		SP/SM
⊠	HS-4	SPT-1	2.5	8						44		SM
▲	HS-4	SPT-3	12.5	20						65	9	ML
★	HS-4	D-5	25.0	6				4.1	1.1	6		SP/SM
⊙	SRI	B-1	2.8							58	7	ML

PARTICLE SIZE DISTRIBUTION

Rentech/ Rialto
Rialto
PROJECT NO. 10049-02

NMG Geotechnical, Inc.

BOULDERS	COBBLES	GRAVEL		SAND			SILT OR CLAY
		coarse	fine	coarse	medium	fine	



Symbol	Boring Number	Sample Number	Depth (feet)	Field Moisture (%)	LL	PI	Activity PI/-2μ	C_u	C_c	Passing No. 200 Sieve (%)	Passing 2μ (%)	USCS
O	T-11	B-1	1.0		NP	NP				65		ML
⊠	T-4	B-1	1.0							21		SM
▲	T-5	B-1	2.0		36	5				93		ML
★	T-6	B-1	2.0		70	45				99		CH

PARTICLE SIZE DISTRIBUTION

Rentech/ Rialto
Rialto
PROJECT NO. 10049-02

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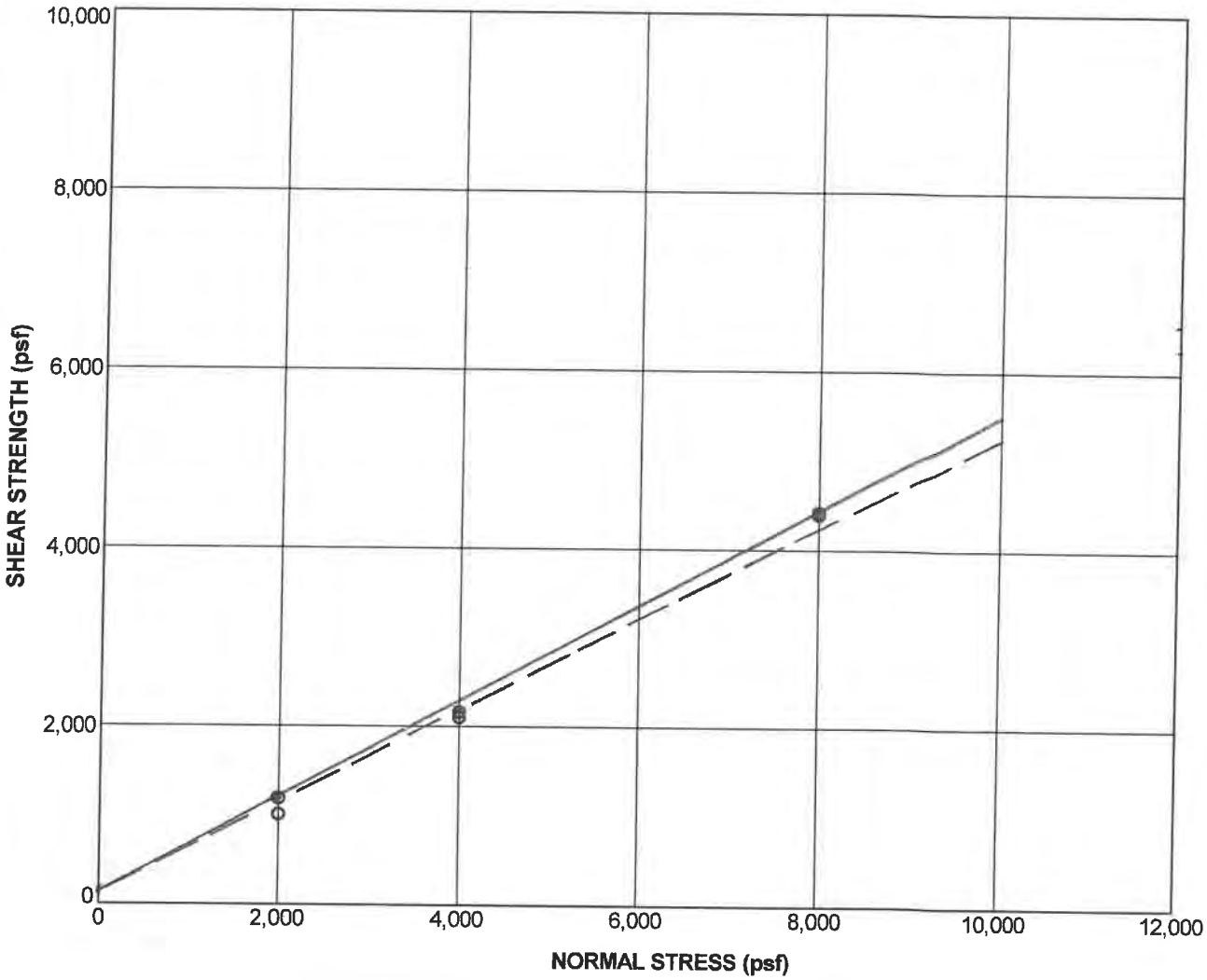


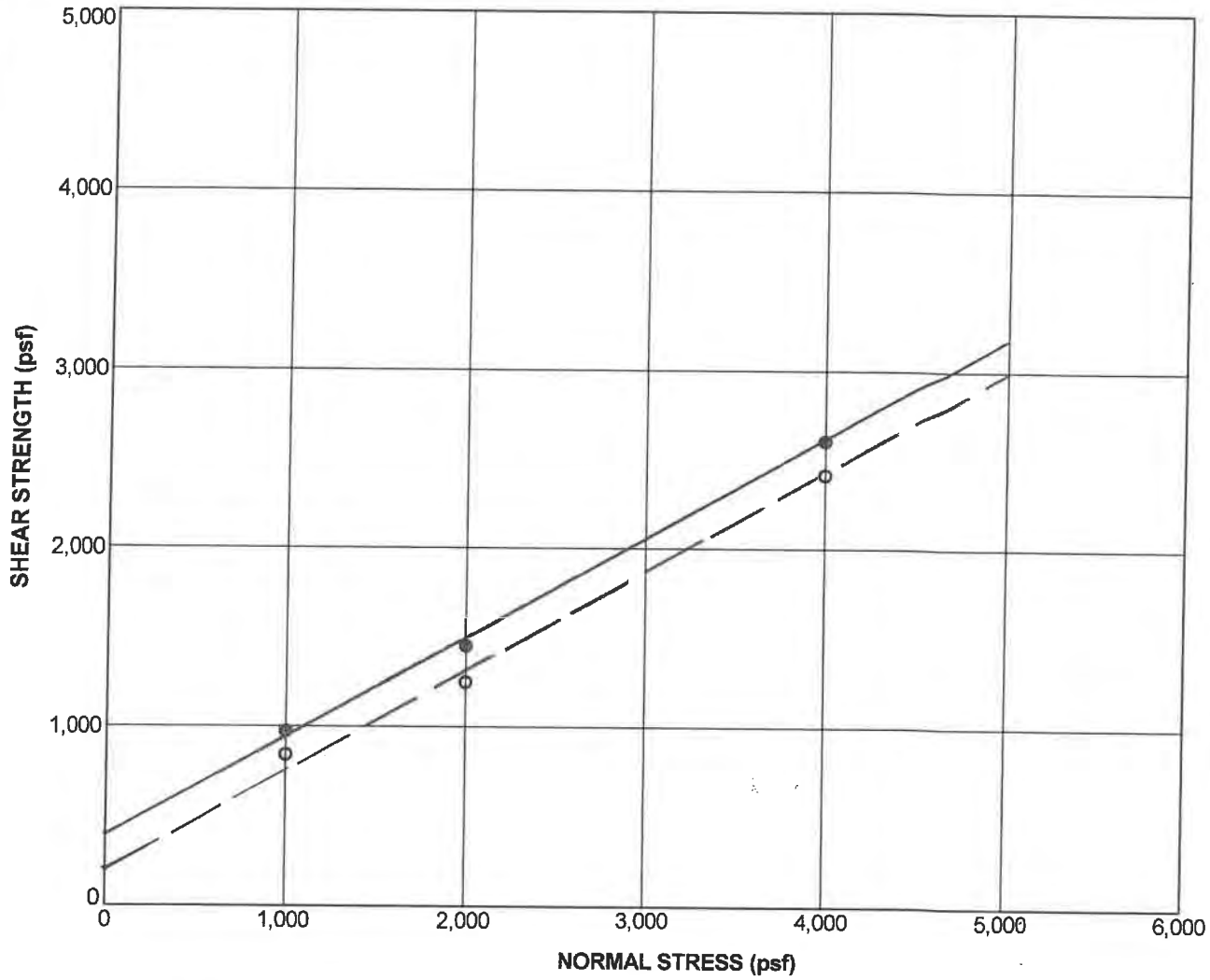
Boring No. HS-1		Sample No. D-2		Depth: 7.5 ft	
Sample Description:	(Qal) Grayish Brown Sandy SILT				
Liquid Limit:		Plasticity Index:		Percent Passing No. 200 Sieve:	
Moisture Content (%):	16.8	Dry Density (pcf):	114.0	Degree of Saturation (%):	99
Sample Type:	Undisturbed	Rate of Shear (in./min.):	0.005		

SHEAR STRENGTH PARAMETERS		
Parameter	Peak ●	Ultimate O
Cohesion (psf)	150	150
Friction Angle (degrees)	28	27.0

DIRECT SHEAR TEST RESULTS

Rentech/ Rialto
Rialto
PROJECT NO. 10049-02

NMG Geotechnical, Inc.



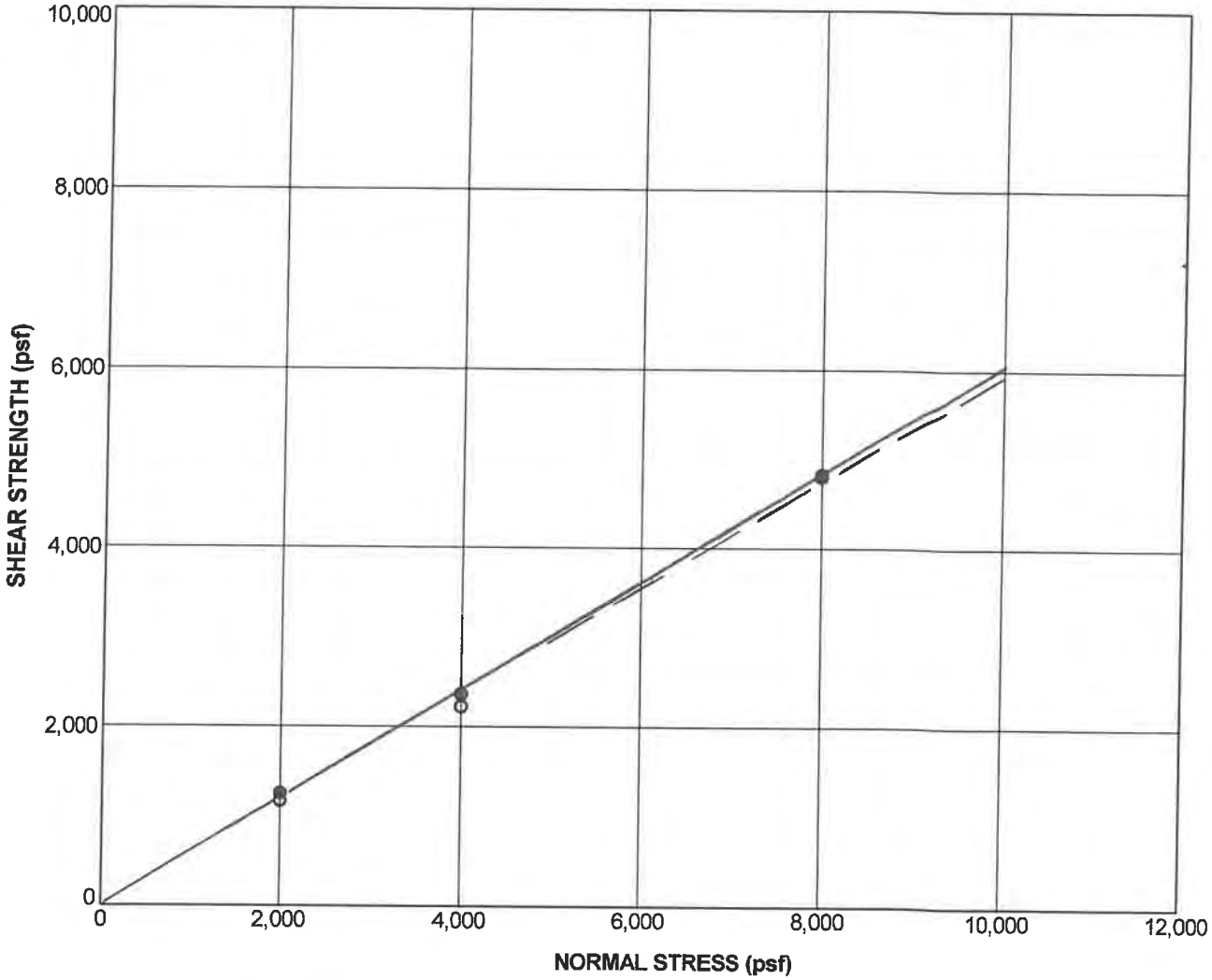
Boring No. HS-1		Sample No. B-1		Depth: 8.5 ft	
Sample Description:	(Qal) Yellowish Brown Sandy SILT				
Liquid Limit:	NP	Plasticity Index:	NP	Percent Passing No. 200 Sieve:	65
Moisture Content (%):	17.2	Dry Density (pcf):	110.2	Degree of Saturation (%):	91
Sample Type:	Remolded to 92% RC	Rate of Shear (in./min.):	0.005		

SHEAR STRENGTH PARAMETERS		
Parameter	Peak ●	Ultimate O
Cohesion (psf)	400	200
Friction Angle (degrees)	29	29.0

DIRECT SHEAR TEST RESULTS

Rentech/ Rialto
Rialto
PROJECT NO. 10049-02

NMG Geotechnical, Inc.



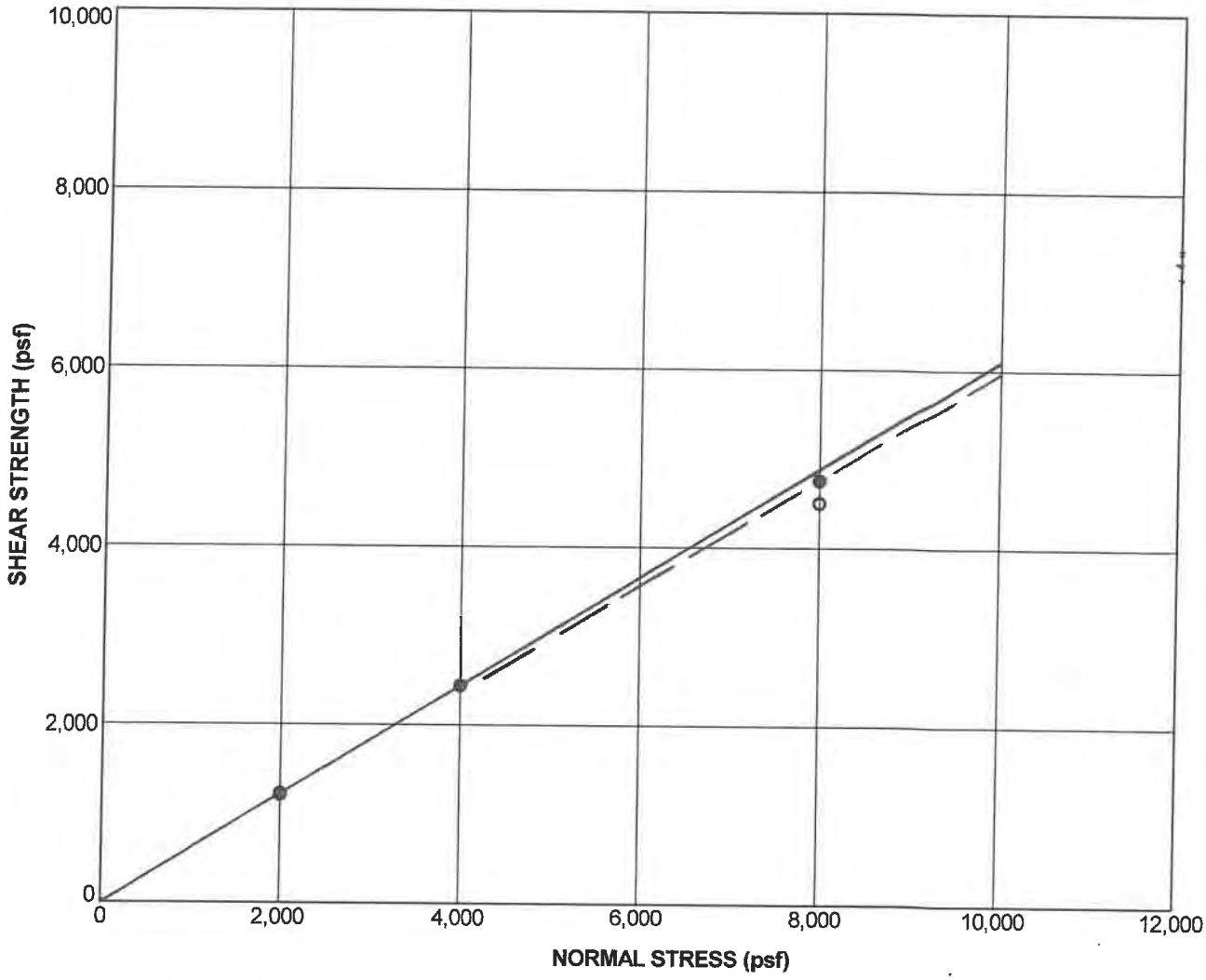
Boring No. HS-1		**Sample No. D-3**		**Depth: 12.5 ft**	
Sample Description:	(Qal) Grayish Brown Silty SAND / Sandy SILT				
Liquid Limit:		**Plasticity Index:**		**Percent Passing No. 200 Sieve:**	
Moisture Content (%):	19.0	**Dry Density (pcf):**	108.8	**Degree of Saturation (%):**	97
Sample Type:	Undisturbed	**Rate of Shear (in./min.):**	0.05		

SHEAR STRENGTH PARAMETERS		
Parameter	**Peak ●**	**Ultimate O**
Cohesion (psf)	0	0
Friction Angle (degrees)	31	31.0

DIRECT SHEAR TEST RESULTS

Rentech/ Rialto
Rialto
PROJECT NO. 10049-02

NMG Geotechnical, Inc.



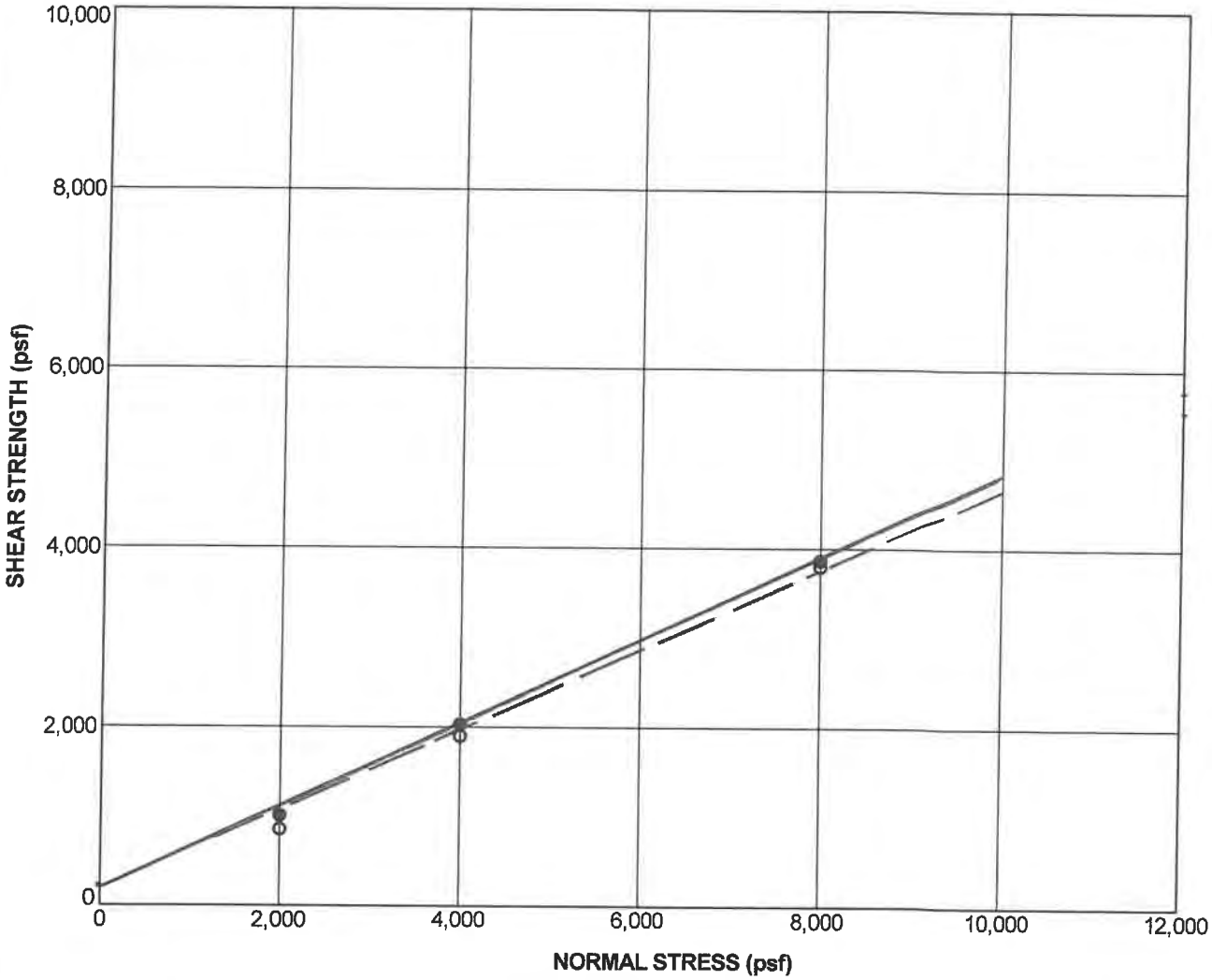
Boring No. HS-2		Sample No. D-4		Depth: 20.0 ft	
Sample Description:	(Qal) Grayish Brown Sandy SILT / Silty SAND				
Liquid Limit:		Plasticity Index:		Percent Passing No. 200 Sieve:	
Moisture Content (%):	21.9	Dry Density (pcf):	104.0	Degree of Saturation (%):	98
Sample Type:	Undisturbed	Rate of Shear (in./min.):	0.05		

SHEAR STRENGTH PARAMETERS		
Parameter	Peak ●	Ultimate O
Cohesion (psf)	0	0
Friction Angle (degrees)	31	31.0

DIRECT SHEAR TEST RESULTS

Rentech/ Rialto
Rialto
PROJECT NO. 10049-02

NMG Geotechnical, Inc.



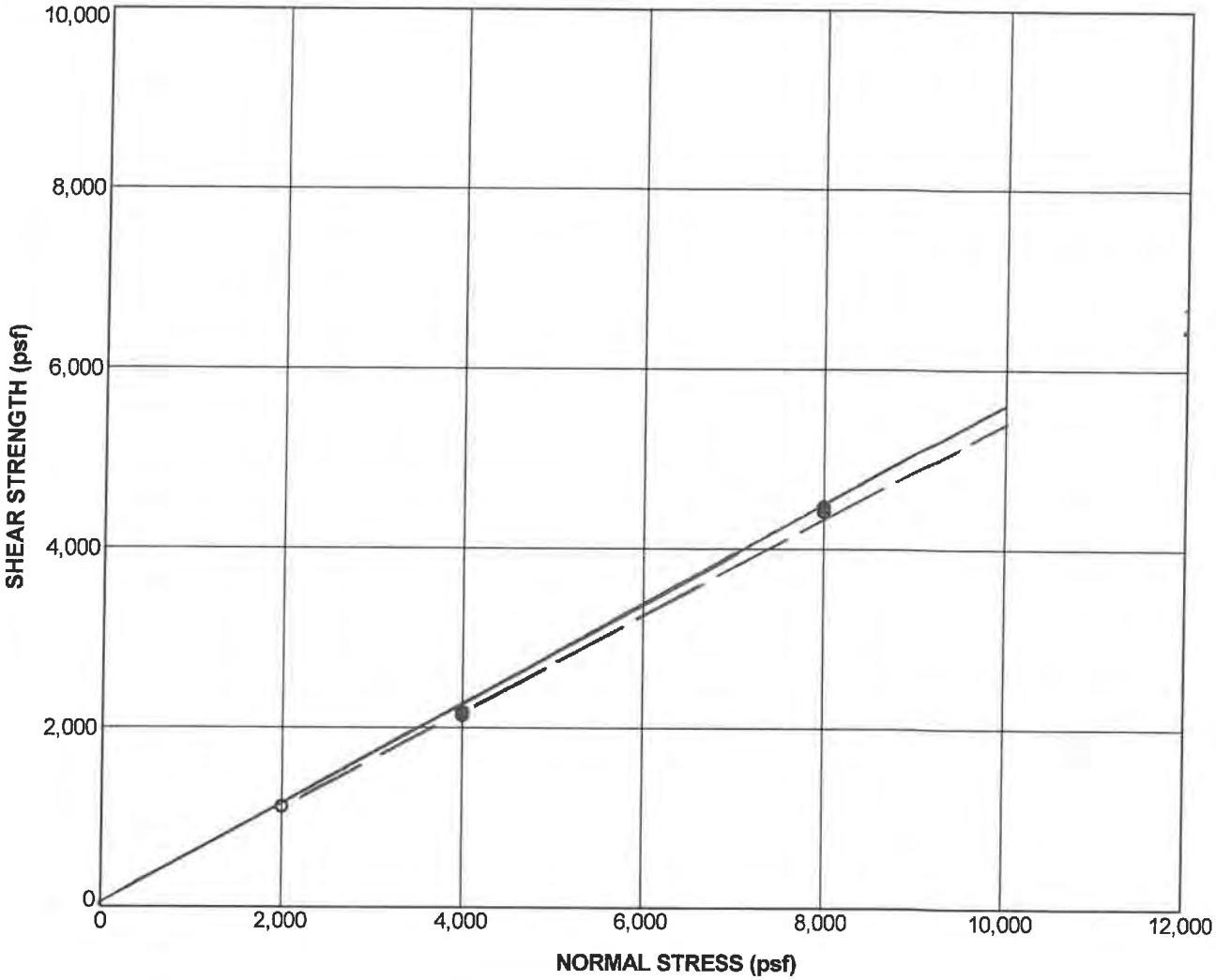
Boring No. HS-4	**Sample No. D-2**	**Depth: 10.0 ft**
Sample Description:	(Qal) Grayish Brown SILT	
Liquid Limit:	**Plasticity Index:**	**Percent Passing No. 200 Sieve:**
Moisture Content (%): 84.9	**Dry Density (pcf):** 92.0	**Degree of Saturation (%):** 282
Sample Type: Undisturbed	**Rate of Shear (in./min.):** 0.005	

SHEAR STRENGTH PARAMETERS		
Parameter	**Peak ●**	**Ultimate O**
Cohesion (psf)	200	200
Friction Angle (degrees)	25	24.0

DIRECT SHEAR TEST RESULTS

Rentech/ Rialto
Rialto
PROJECT NO. 10049-02

NMG Geotechnical, Inc.



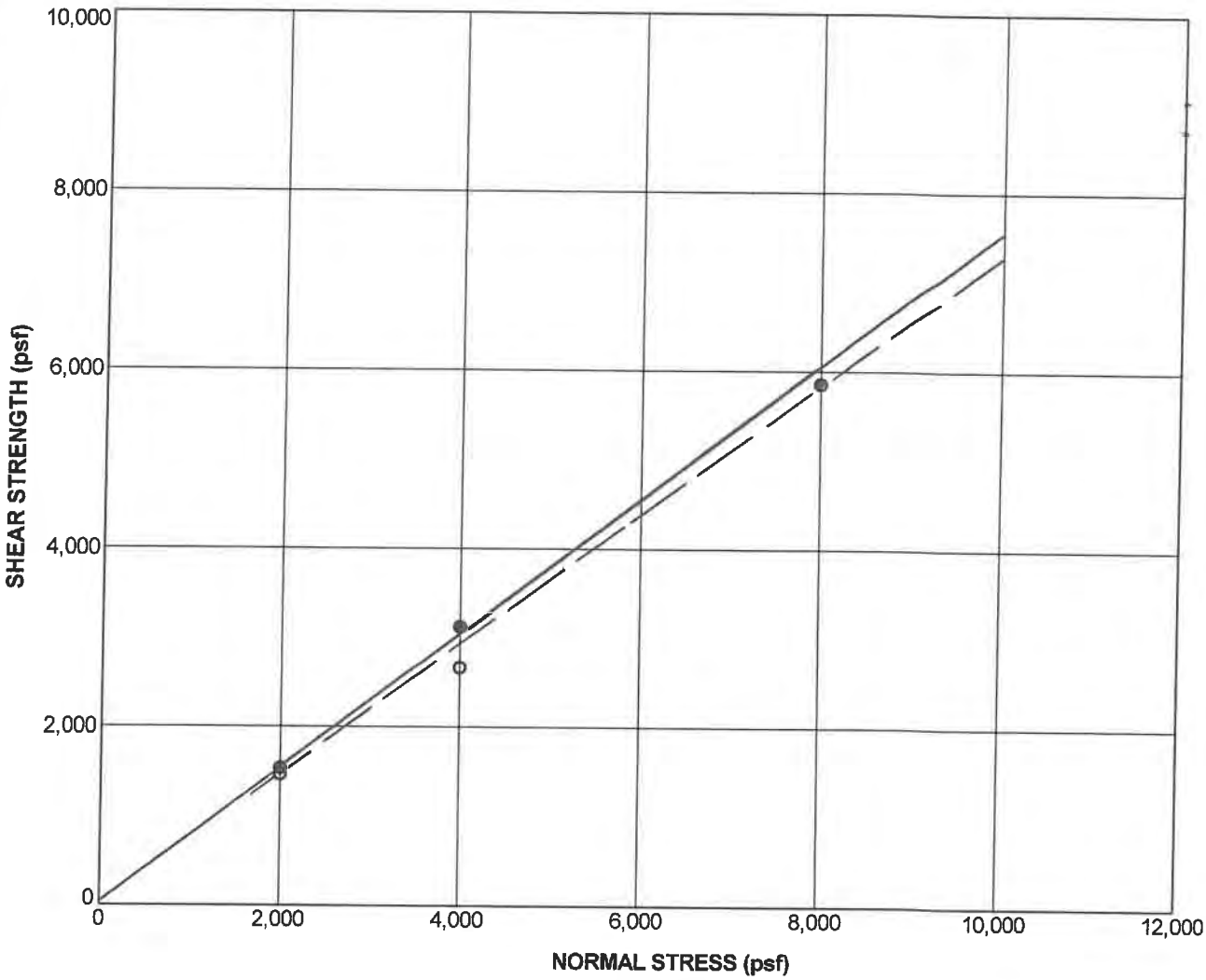
Boring No. HS-4	Sample No. D-4	Depth: 20.0 ft
Sample Description:	(Qal) Grayish Brown Sandy SILT	
Liquid Limit:	Plasticity Index:	Percent Passing No. 200 Sieve:
Moisture Content (%): 28.2	Dry Density (pcf): 94.6	Degree of Saturation (%): 100
Sample Type: Undisturbed	Rate of Shear (in./min.): 0.005	

SHEAR STRENGTH PARAMETERS		
Parameter	Peak ●	Ultimate O
Cohesion (psf)	50	50
Friction Angle (degrees)	29	28.0

DIRECT SHEAR TEST RESULTS

Rentech/ Rialto
Rialto
PROJECT NO. 10049-02

NMG Geotechnical, Inc.



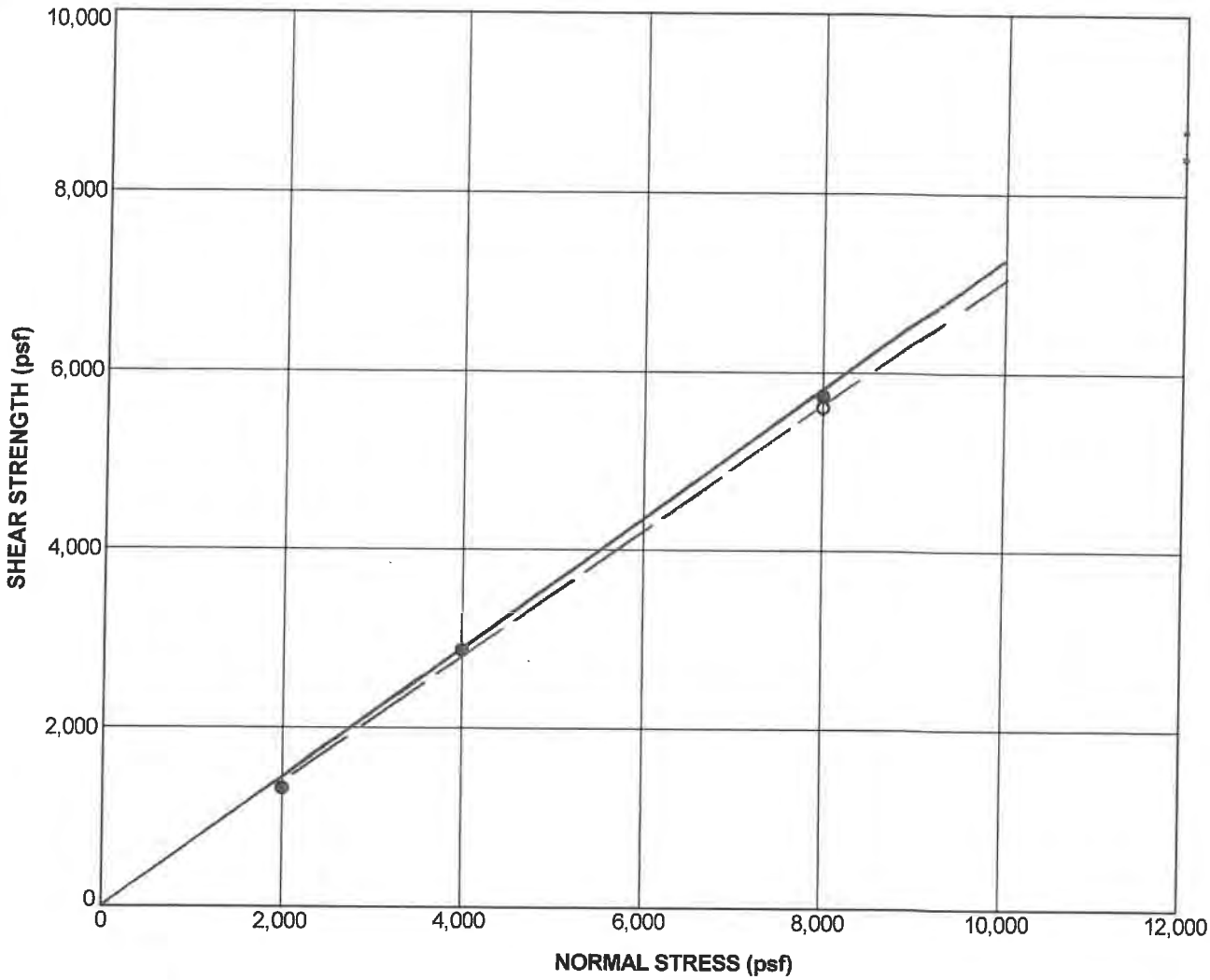
Boring No. RW-1	Sample No. D-2	Depth: 7.5 ft
Sample Description:	(Aw) Grayish Brown Silty SAND w/ Gravel	
Liquid Limit:	Plasticity Index:	Percent Passing No. 200 Sieve:
Moisture Content (%): 13.5	Dry Density (pcf): 120.3	Degree of Saturation (%): 96
Sample Type: Undisturbed	Rate of Shear (in./min.): 0.05	

SHEAR STRENGTH PARAMETERS		
Parameter	Peak ●	Ultimate O
Cohesion (psf)	0	0
Friction Angle (degrees)	37	36.0

DIRECT SHEAR TEST RESULTS

Rentech/ Rialto
Rialto
PROJECT NO. 10049-02

NMG Geotechnical, Inc.



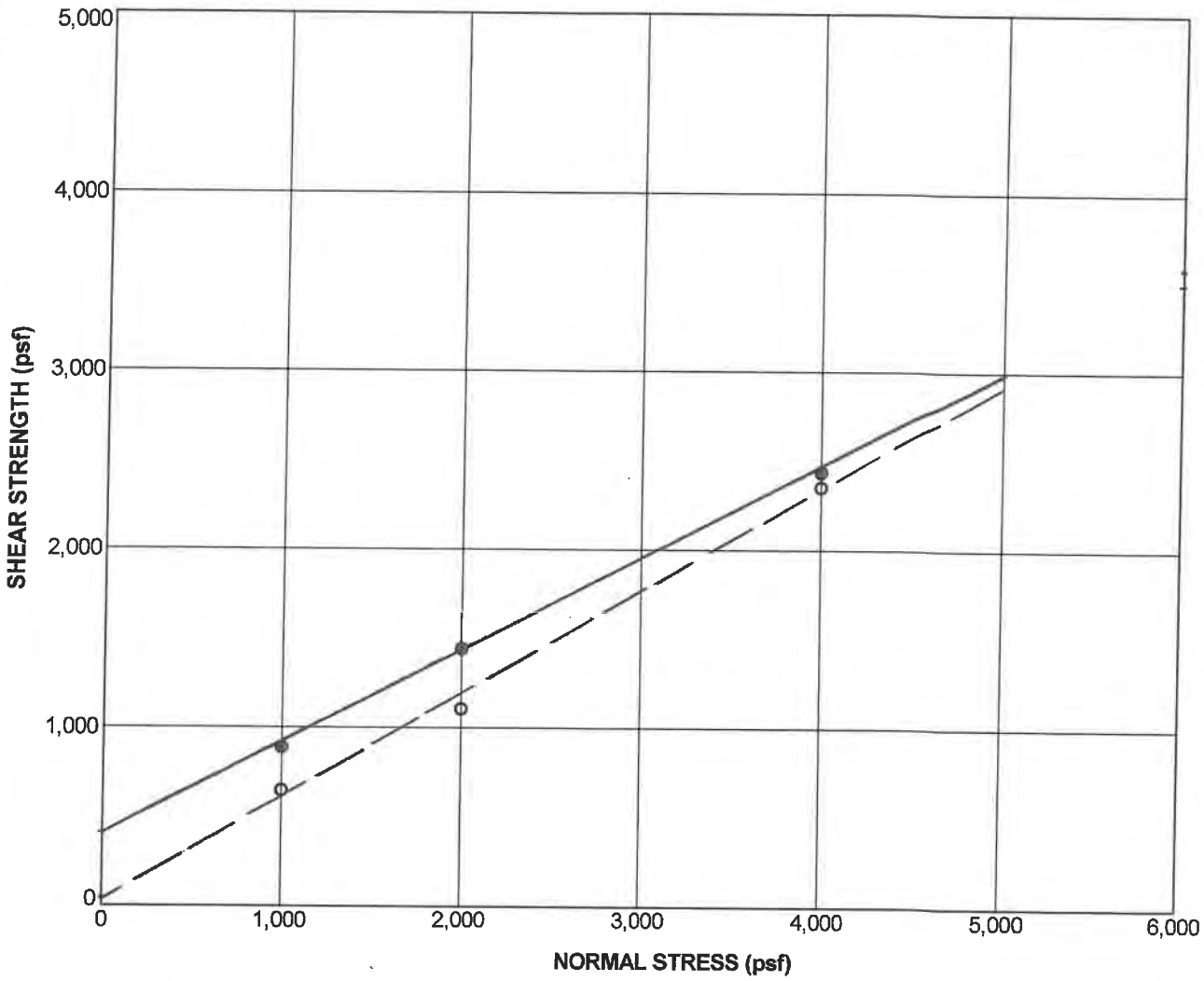
Boring No. RW-1		**Sample No. D-4**		**Depth: 17.5 ft**	
Sample Description:	(Qal) Grayish Brown Silty SAND				
Liquid Limit:		**Plasticity Index:**		**Percent Passing No. 200 Sieve:**	
Moisture Content (%):	21.7	**Dry Density (pcf):**	102.9	**Degree of Saturation (%):**	95
Sample Type:	Undisturbed	**Rate of Shear (in./min.):**	0.05		

SHEAR STRENGTH PARAMETERS		
Parameter	**Peak ●**	**Ultimate O**
Cohesion (psf)	0	0
Friction Angle (degrees)	36	35.0

DIRECT SHEAR TEST RESULTS

Rentech/ Rialto
Rialto
PROJECT NO. 10049-02

NMG Geotechnical, Inc.



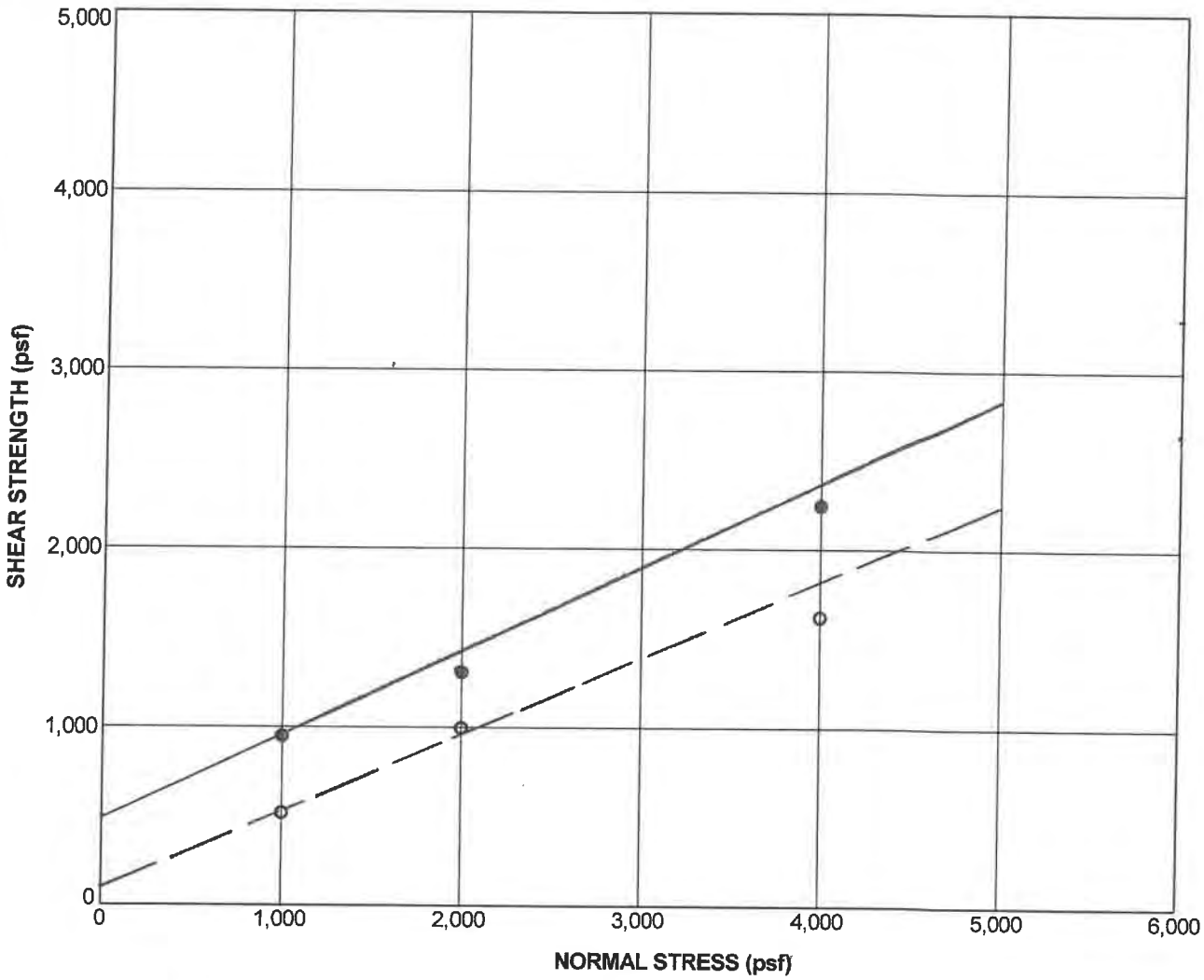
Boring No. T-5		Sample No. B-1		Depth: 2.0 ft	
Sample Description:	(Aw) Yellowish Brown Clayey SILT				
Liquid Limit:	36	Plasticity Index:	5	Percent Passing No. 200 Sieve:	93
Moisture Content (%):	25.5	Dry Density (pcf):	93.3	Degree of Saturation (%):	87
Sample Type:	Remolded to 92% RC	Rate of Shear (in./min.):	0.005		

SHEAR STRENGTH PARAMETERS		
Parameter	Peak ●	Ultimate O
Cohesion (psf)	400	40
Friction Angle (degrees)	28	30.0

DIRECT SHEAR TEST RESULTS

Rentech/ Rialto
Rialto
PROJECT NO. 10049-02

NMG Geotechnical, Inc.



Boring No. T-6		Sample No. B-1		Depth: 2.0 ft	
Sample Description:	(Aw) Gray Silty CLAY				
Liquid Limit:	70	Plasticity Index:	45	Percent Passing No. 200 Sieve:	99
Moisture Content (%):	30.2	Dry Density (pcf):	92.3	Degree of Saturation (%):	101
Sample Type:	Remolded to 92% RC	Rate of Shear (in./min.):	0.005		

SHEAR STRENGTH PARAMETERS		
Parameter	Peak ●	Ultimate O
Cohesion (psf)	500	100
Friction Angle (degrees)	25	23.0

DIRECT SHEAR TEST RESULTS

Rentech/ Rialto
Rialto
PROJECT NO. 10049-02

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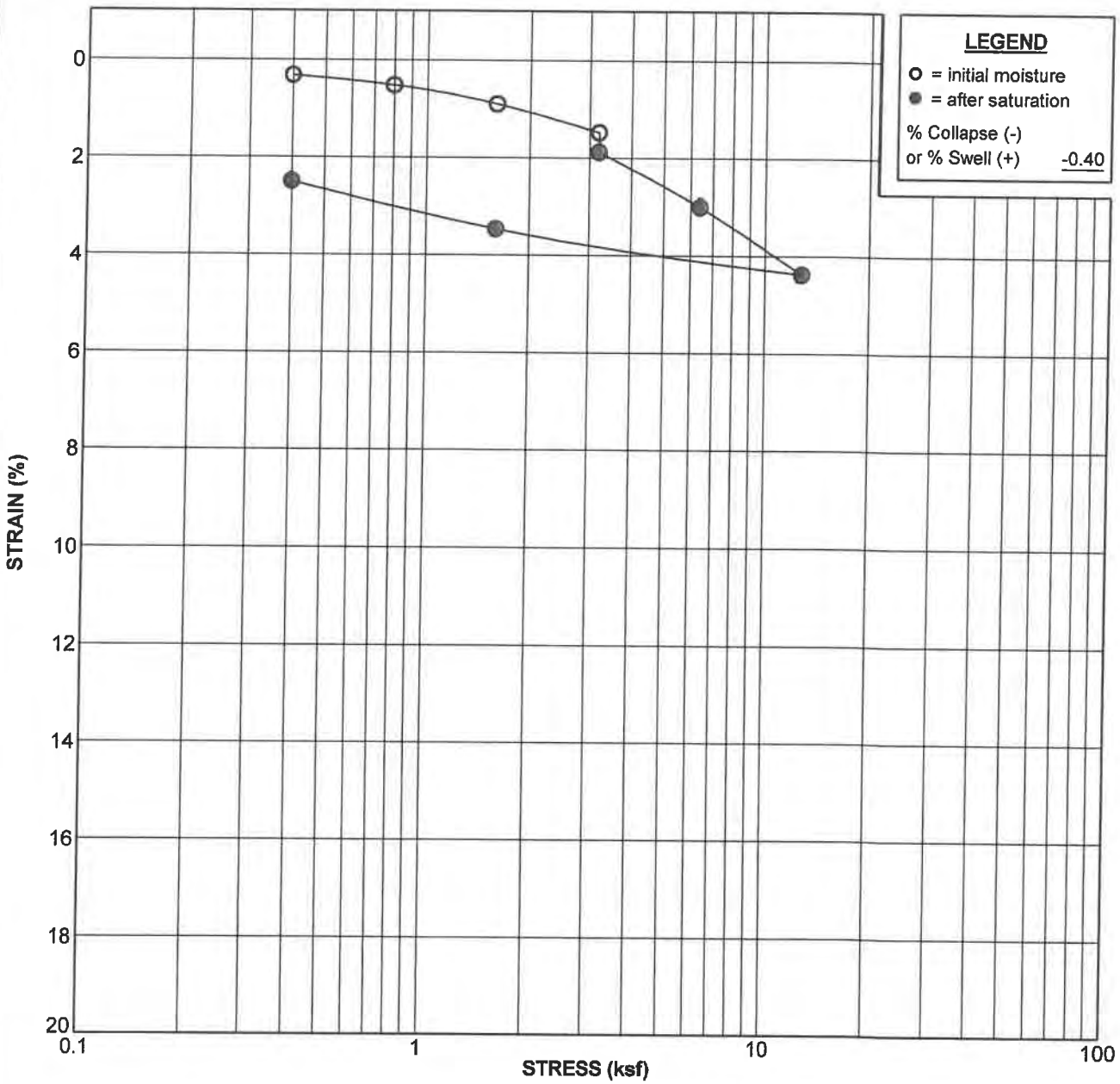

Boring No. HS-1	Sample No. D-2	Depth: 7.5 ft
Sample Description:	(Qal) Grayish Brown Sandy SILT	
Liquid Limit:	Plasticity Index:	Percent Passing No. 200 Sieve:

Test Stage	Moisture Content (%)	Dry Density (pcf)	Degree of Saturation (%)	Void Ratio
Initial	8.8	93.5	30.4	0.768
Final	28.2	103.0	123.4	0.605

CONSOLIDATION TEST RESULTS

Rentech/ Rialto
Rialto
PROJECT NO. 10049-02

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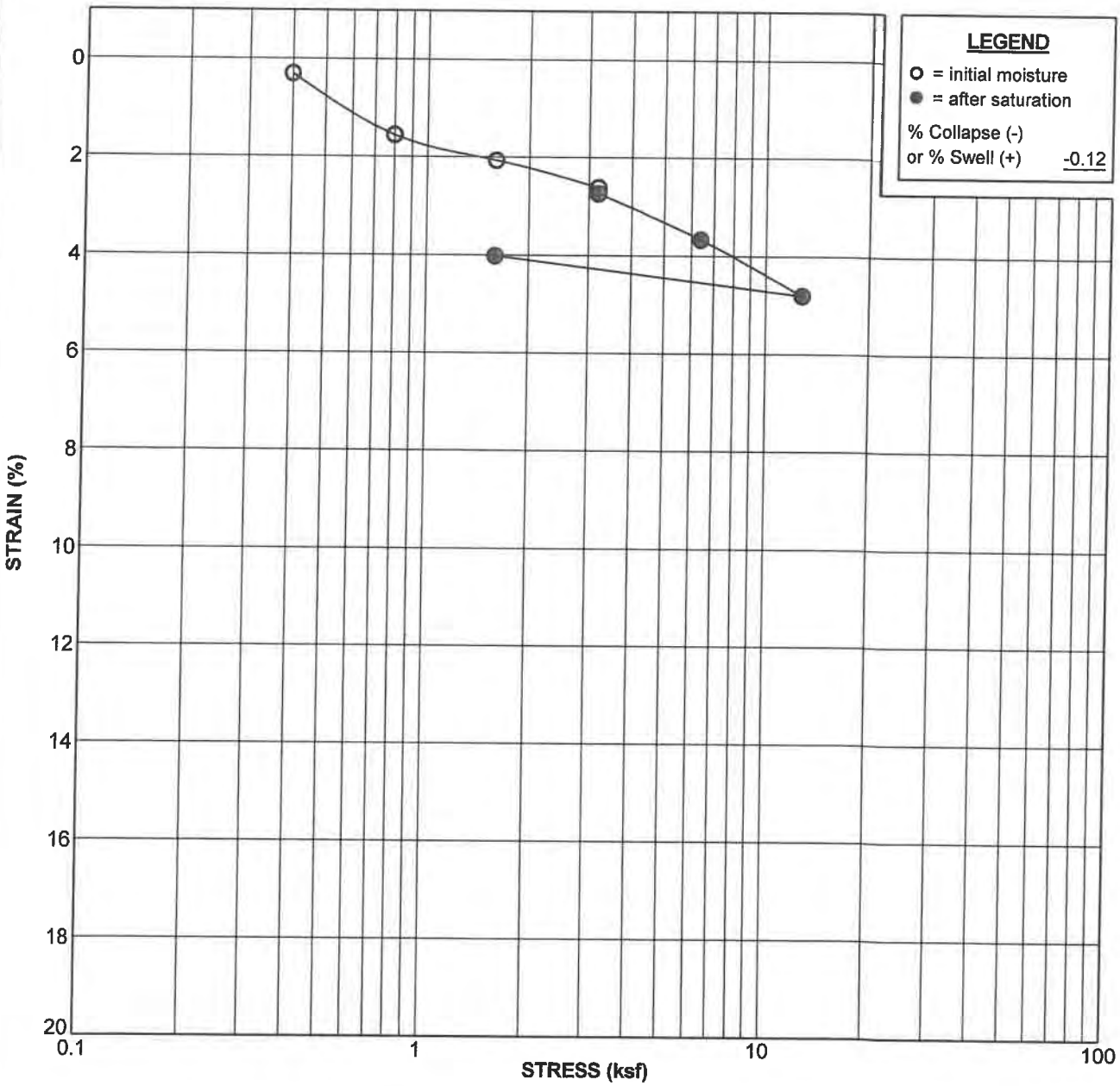


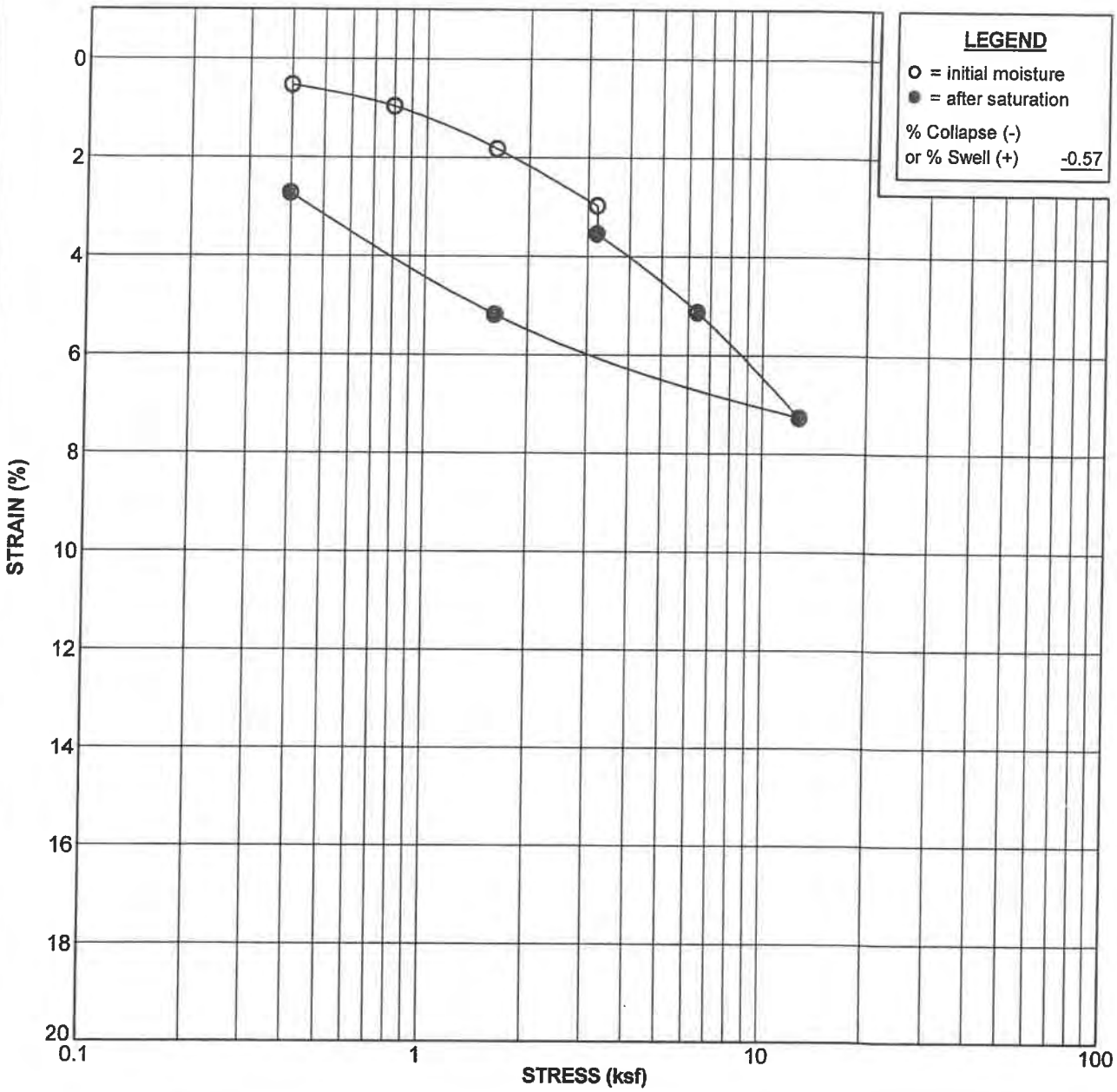
Boring No. HS-2	Sample No. D-2	Depth: 10.0 ft
Sample Description:	(Qal) Pale Olive Silty SAND / Sandy SILT	
Liquid Limit:	Plasticity Index:	Percent Passing No. 200 Sieve:

Test Stage	Moisture Content (%)	Dry Density (pcf)	Degree of Saturation (%)	Void Ratio
Initial	14.2	97.5	53.9	0.697
Final	25.1	100.7	103.6	0.642

CONSOLIDATION TEST RESULTS

Rentech/ Rialto
Rialto
PROJECT NO. 10049-02

NMG Geotechnical, Inc.



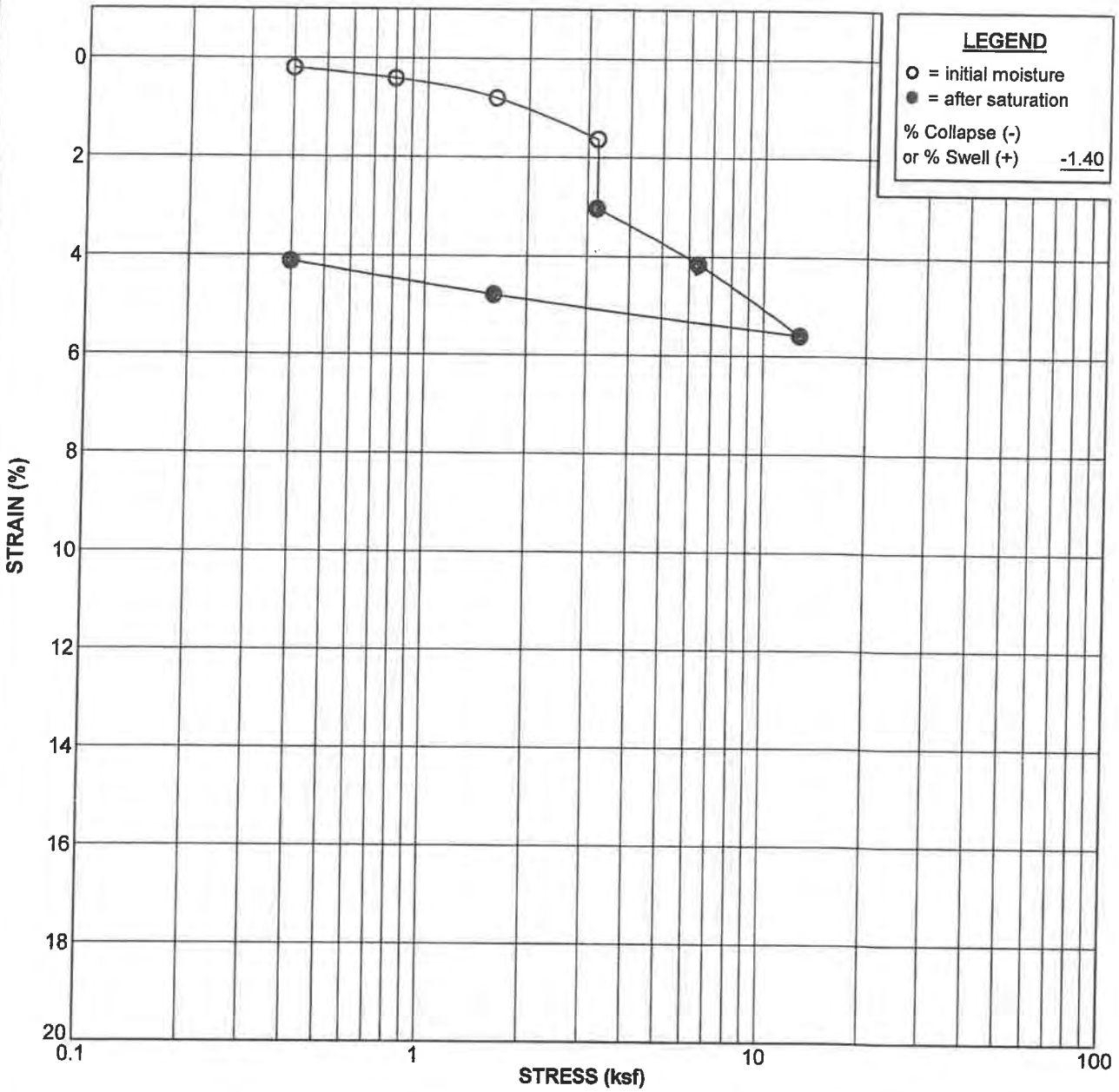
Boring No. HS-3	Sample No. D-2	Depth: 7.5 ft
Sample Description:	(Aw) Pale Yellowish Brown SILT	
Liquid Limit:	Plasticity Index:	Percent Passing No. 200 Sieve:

Test Stage	Moisture Content (%)	Dry Density (pcf)	Degree of Saturation (%)	Void Ratio
Initial	5.2	81.6	13.4	1.027
Final	41.0	83.7	111.4	0.976

CONSOLIDATION TEST RESULTS

Rentech/ Rialto
Rialto
PROJECT NO. 10049-02

NMG Geotechnical, Inc.



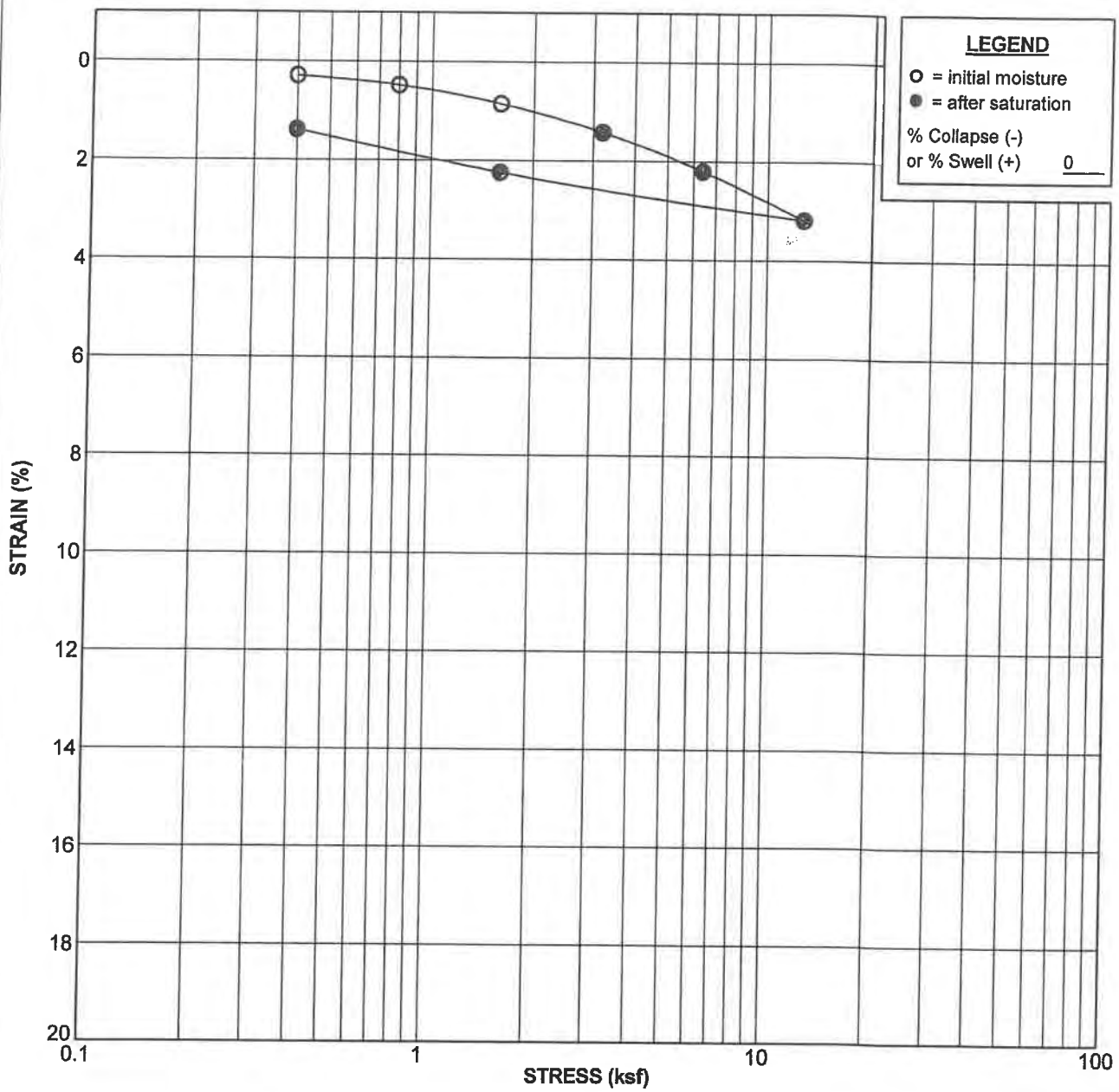
Boring No. HS-3	Sample No. D-3	Depth: 12.5 ft
Sample Description:	(Qal) Pale Yellow Sandy SILT	
Liquid Limit:	Plasticity Index:	Percent Passing No. 200 Sieve:

Test Stage	Moisture Content (%)	Dry Density (pcf)	Degree of Saturation (%)	Void Ratio
Initial	2.3	87.1	6.8	0.899
Final	28.7	90.6	92.2	0.825

CONSOLIDATION TEST RESULTS

Rentech/ Rialto
Rialto
PROJECT NO. 10049-02

NMG Geotechnical, Inc.



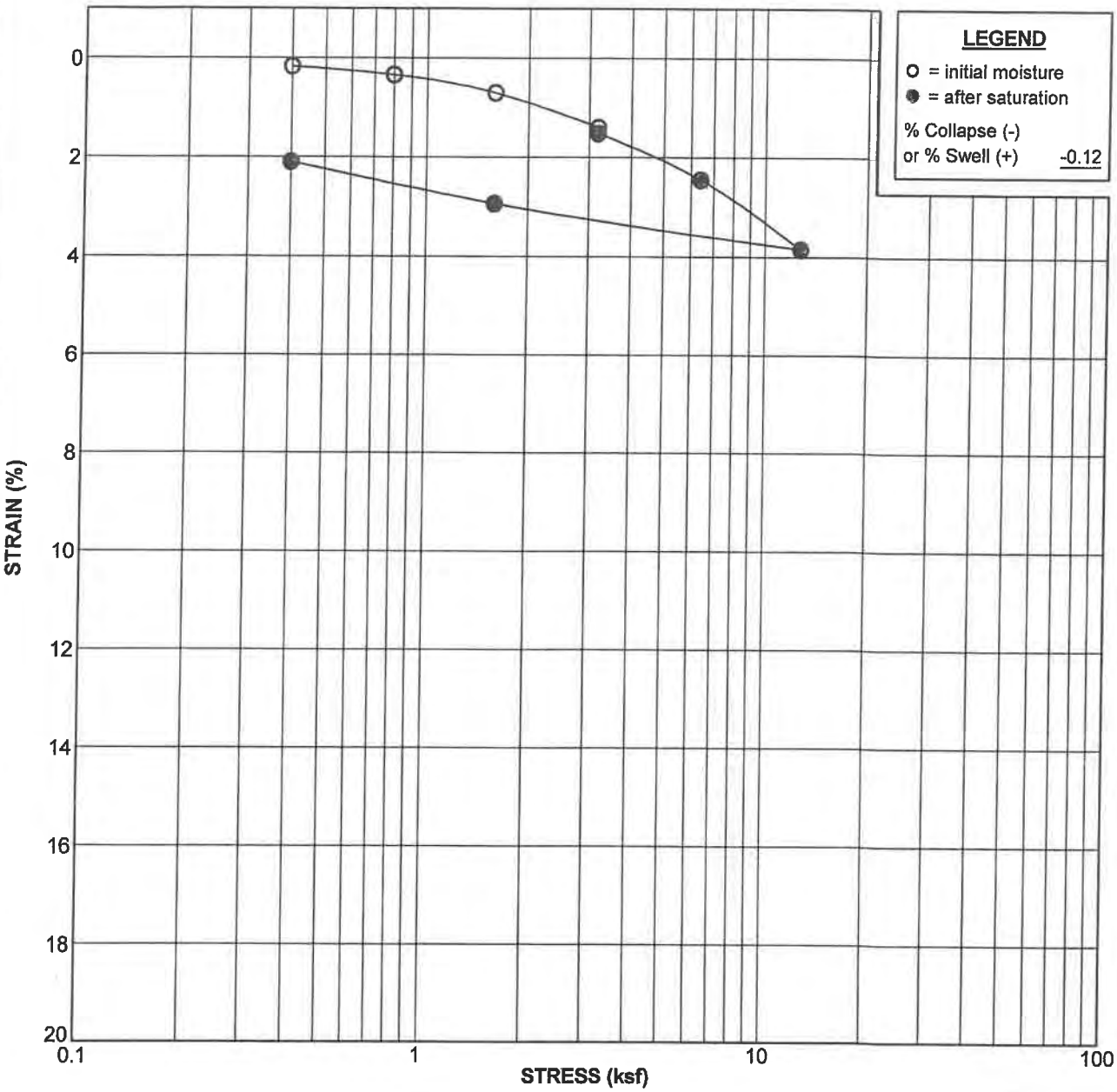
Boring No. HS-3	Sample No. D-5	Depth: 22.5 ft
Sample Description:	(Qal) Gray to Olive SILT	
Liquid Limit:	Plasticity Index:	Percent Passing No. 200 Sieve:

Test Stage	Moisture Content (%)	Dry Density (pcf)	Degree of Saturation (%)	Void Ratio
Initial	25.2	94.2	88.6	0.755
Final	29.7	95.5	107.6	0.732

CONSOLIDATION TEST RESULTS

Rentech/ Rialto
Rialto
PROJECT NO. 10049-02

NMG Geotechnical, Inc.



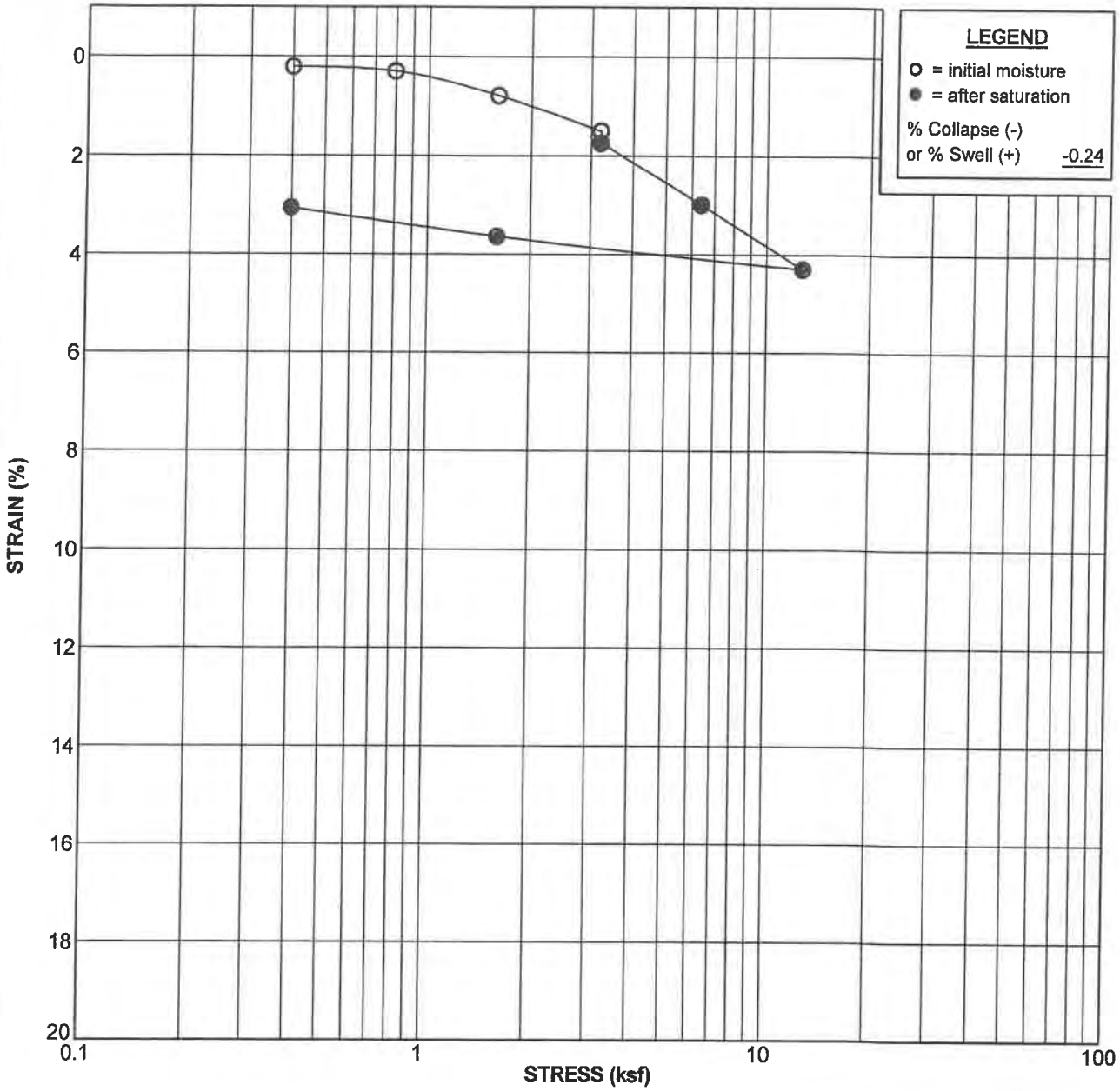
Boring No. HS-4	Sample No. D-1	Depth: 5.0 ft
Sample Description:	(Qal) Pale Olive to Light Gray Silty SAND / Sandy SILT	
Liquid Limit:	Plasticity Index:	Percent Passing No. 200 Sieve:

Test Stage	Moisture Content (%)	Dry Density (pcf)	Degree of Saturation (%)	Void Ratio
Initial	18.6	90.7	59.9	0.823
Final	30.7	92.6	103.5	0.786

CONSOLIDATION TEST RESULTS

Rentech/ Rialto
Rialto
PROJECT NO. 10049-02

NMG Geotechnical, Inc.



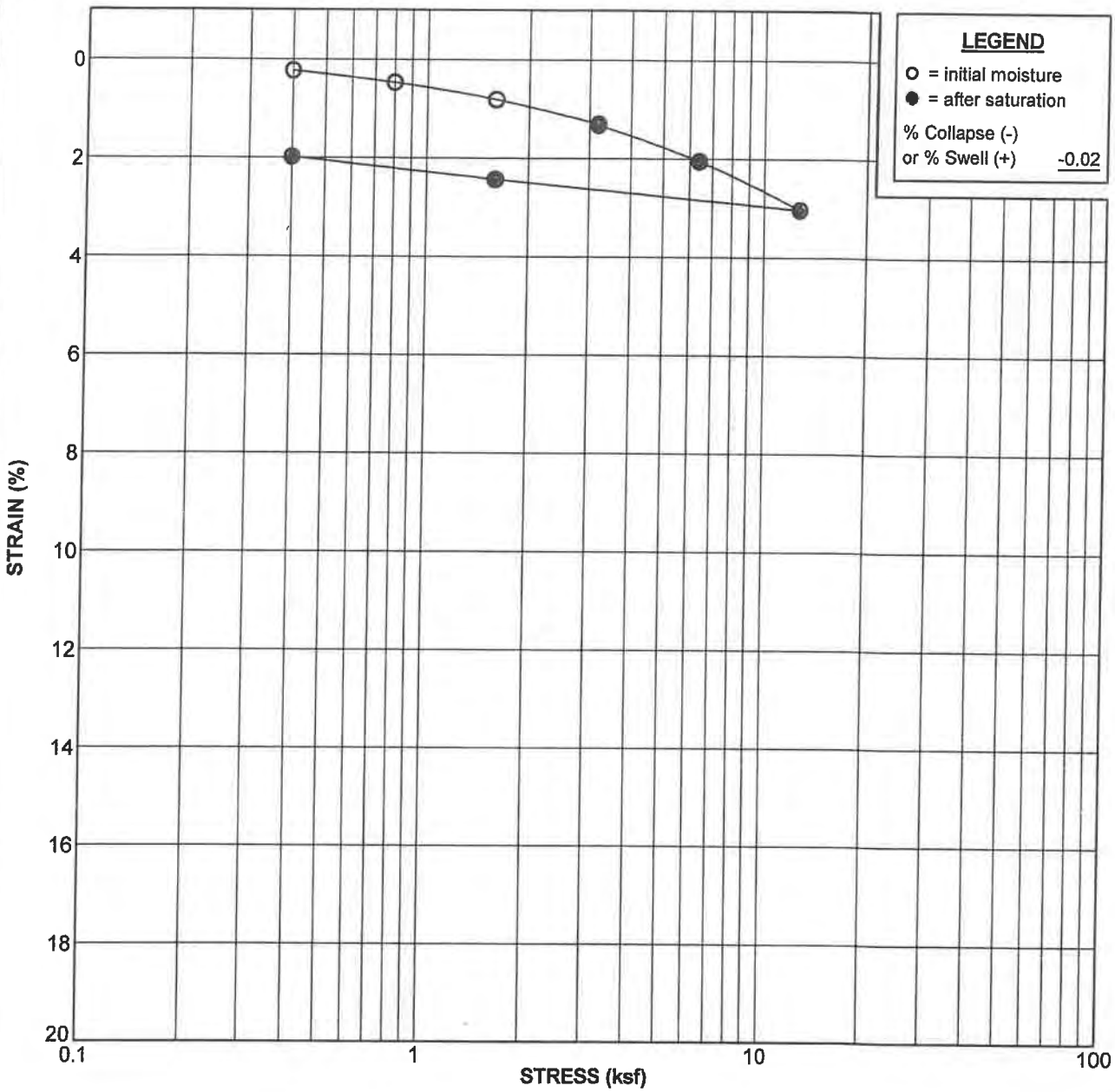
Boring No. HS-4	Sample No. D-3	Depth: 15.0 ft
Sample Description:	(Qal) Pale Olive to Pale Gray Silty SAND / Sandy SILT	
Liquid Limit:	Plasticity Index:	Percent Passing No. 200 Sieve:

Test Stage	Moisture Content (%)	Dry Density (pcf)	Degree of Saturation (%)	Void Ratio
Initial	13.3	88.5	40.4	0.869
Final	29.2	91.2	95.2	0.813

CONSOLIDATION TEST RESULTS

Rentech/ Rialto
Rialto
PROJECT NO. 10049-02

NMG Geotechnical, Inc.



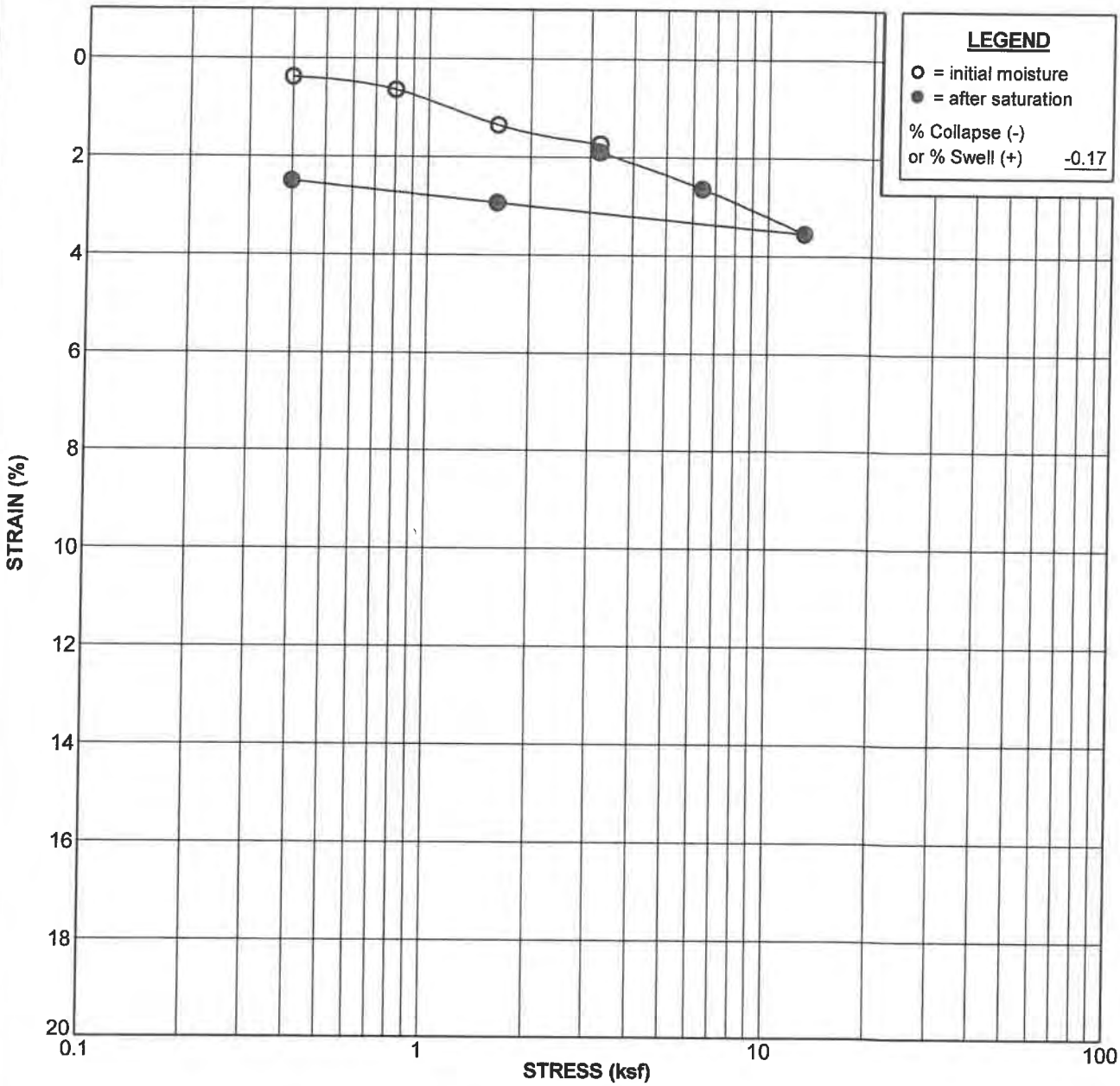
Boring No. HS-4	Sample No. D-6	Depth: 30.0 ft
Sample Description:	(Qal) Olive SILT	
Liquid Limit:	Plasticity Index:	Percent Passing No. 200 Sieve:

Test Stage	Moisture Content (%)	Dry Density (pcf)	Degree of Saturation (%)	Void Ratio
Initial	20.0	101.9	85.0	0.623
Final	22.3	103.8	99.6	0.593

CONSOLIDATION TEST RESULTS

Rentech/ Rialto
Rialto
PROJECT NO. 10049-02

NMG Geotechnical, Inc.



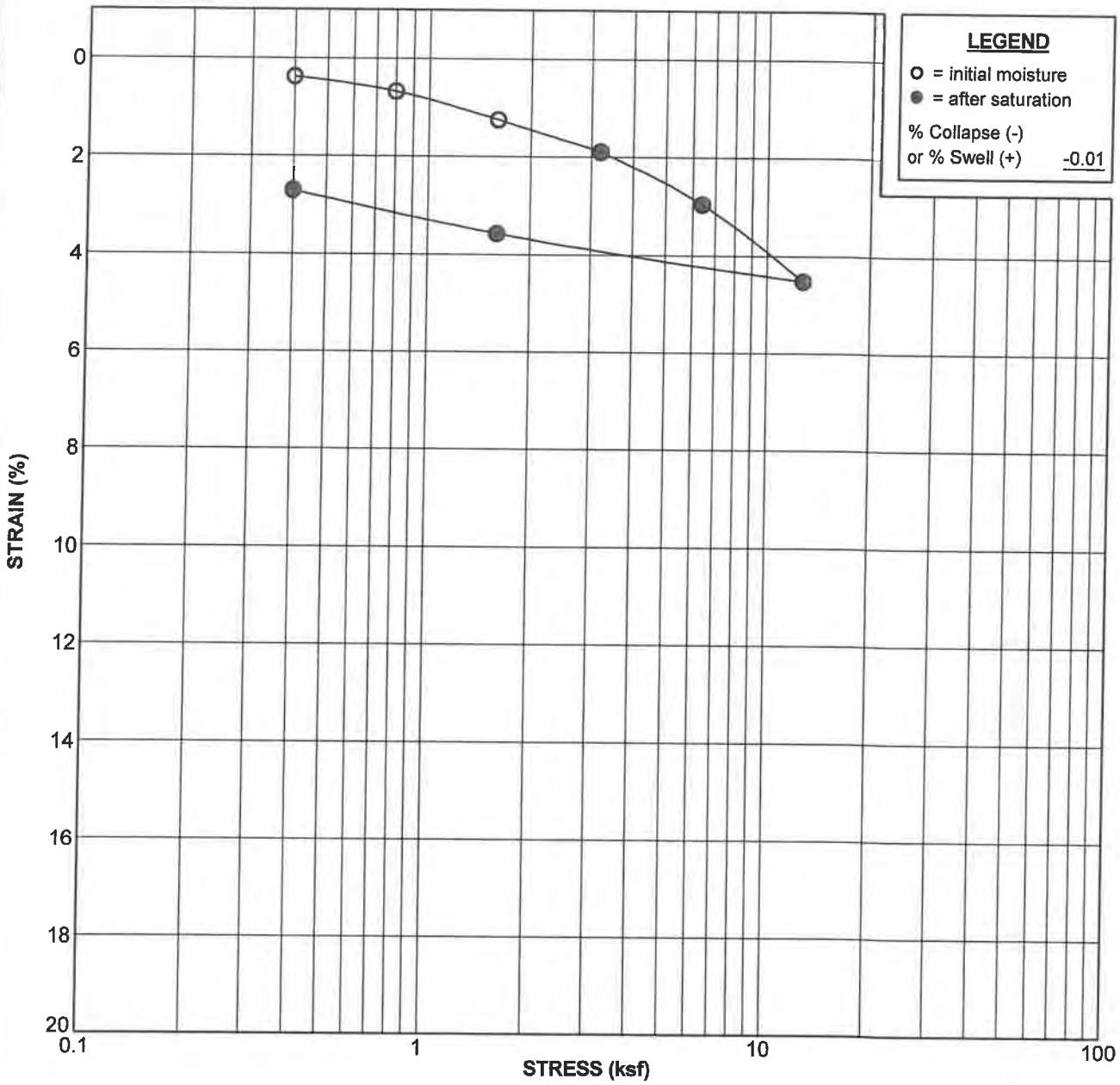
Boring No. RW-1	Sample No. D-3	Depth: 12.5 ft
Sample Description:	(Qal) Pale Gray Silty SAND	
Liquid Limit:	Plasticity Index:	Percent Passing No. 200 Sieve:

Test Stage	Moisture Content (%)	Dry Density (pcf)	Degree of Saturation (%)	Void Ratio
Initial	5.7	93.5	19.6	0.768
Final	25.9	95.8	94.5	0.726

CONSOLIDATION TEST RESULTS

Rentech/ Rialto
Rialto
PROJECT NO. 10049-02

NMG Geotechnical, Inc.



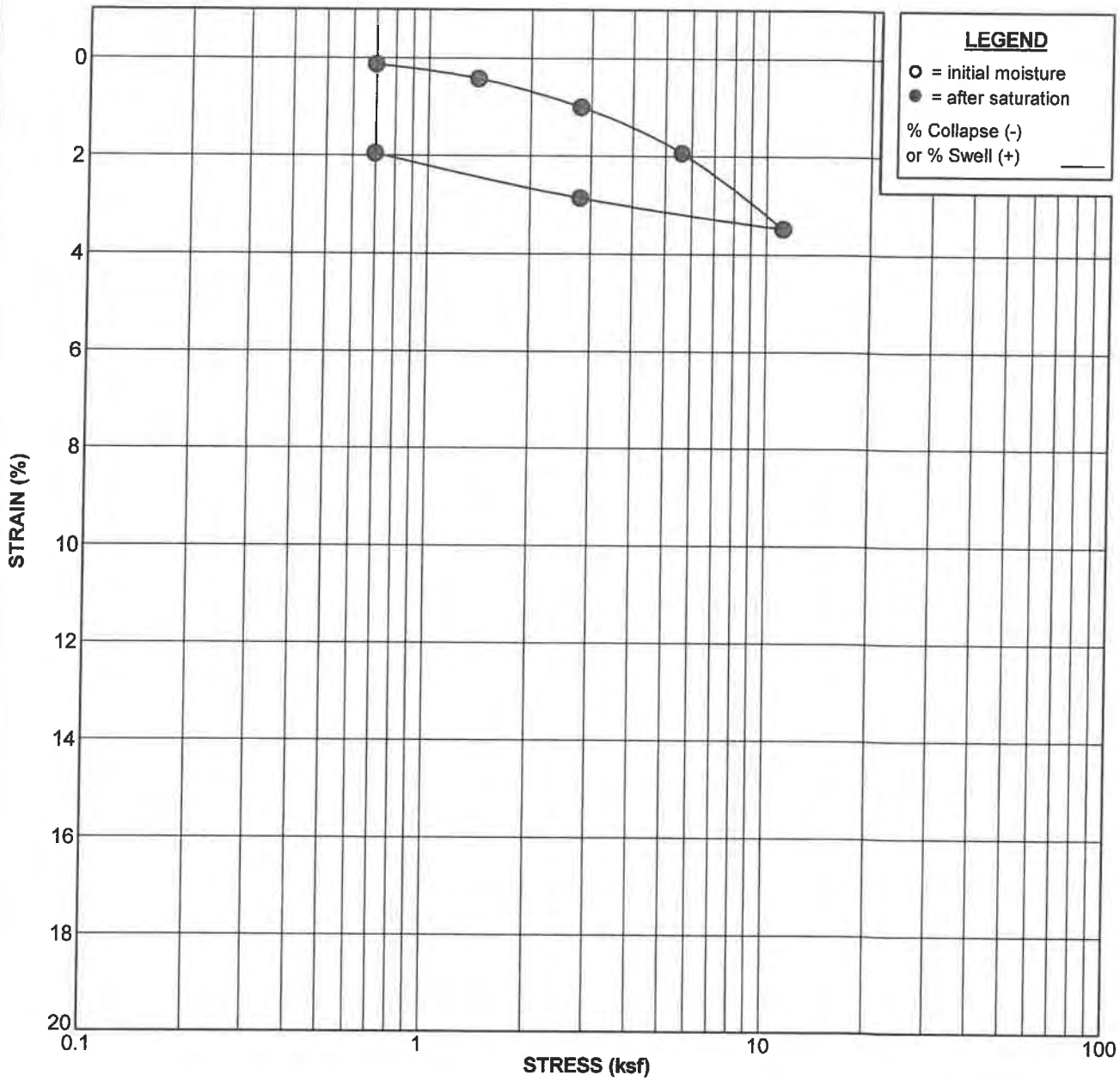
Boring No. RW-1	Sample No. D-5	Depth: 22.5 ft
Sample Description:	(Qal) Pale Gray Silty SAND / Sandy SILT	
Liquid Limit:	Plasticity Index:	Percent Passing No. 200 Sieve:

Test Stage	Moisture Content (%)	Dry Density (pcf)	Degree of Saturation (%)	Void Ratio
Initial	24.8	98.0	95.5	0.688
Final	27.3	100.6	112.4	0.644

CONSOLIDATION TEST RESULTS

Rentech/ Rialto
Rialto
PROJECT NO. 10049-02

NMG Geotechnical, Inc.



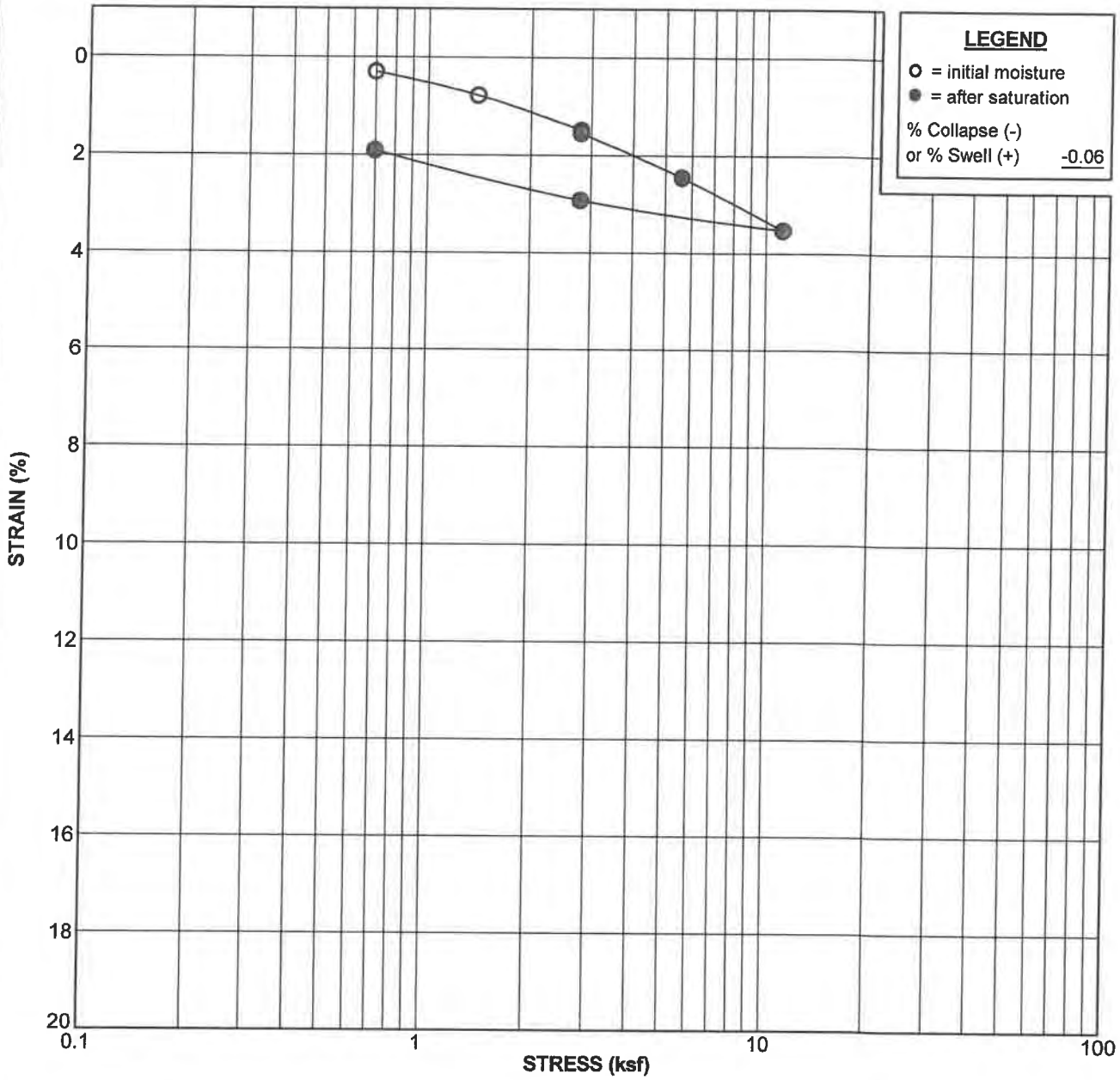
Boring No. T-5	**Sample No. B-1**	**Depth: 2.1 ft**
Sample Description:	(Aw) Yellowish Brown Clayey SILT (Remolded to 92% RC)	
Liquid Limit:	**Plasticity Index:**	**Percent Passing No. 200 Sieve:**

Test Stage	Moisture Content (%)	Dry Density (pcf)	Degree of Saturation (%)	Void Ratio
Initial	21.5	92.4	72.2	0.790
Final	29.0	94.2	101.7	0.755

CONSOLIDATION TEST RESULTS

Rentech/ Rialto
Rialto
PROJECT NO. 10049-02

NMG Geotechnical, Inc.



Boring No. T-5	Sample No. B-1	Depth: 2.2 ft
Sample Description:	(Aw) Yellowish Brown Clayey SILT (Remolded to 92% RC)	
Liquid Limit:	Plasticity Index:	Percent Passing No. 200 Sieve:

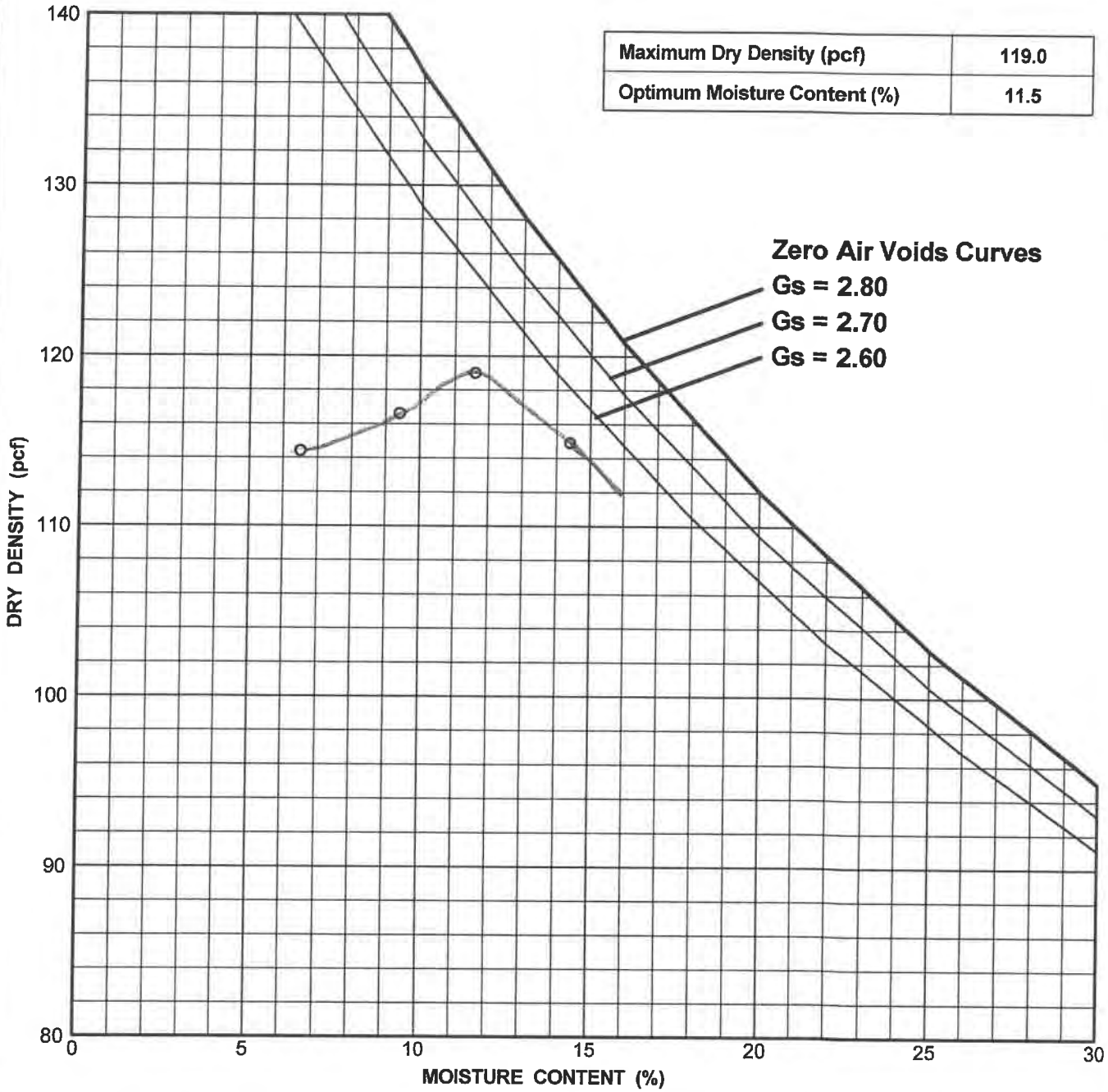
Test Stage	Moisture Content (%)	Dry Density (pcf)	Degree of Saturation (%)	Void Ratio
Initial	21.5	92.3	72.0	0.792
Final	28.9	94.1	101.1	0.757

CONSOLIDATION TEST RESULTS

Rentech/ Rialto
Rialto
PROJECT NO. 10049-02

NMG Geotechnical, Inc.

Maximum Dry Density (pcf)	119.0
Optimum Moisture Content (%)	11.5

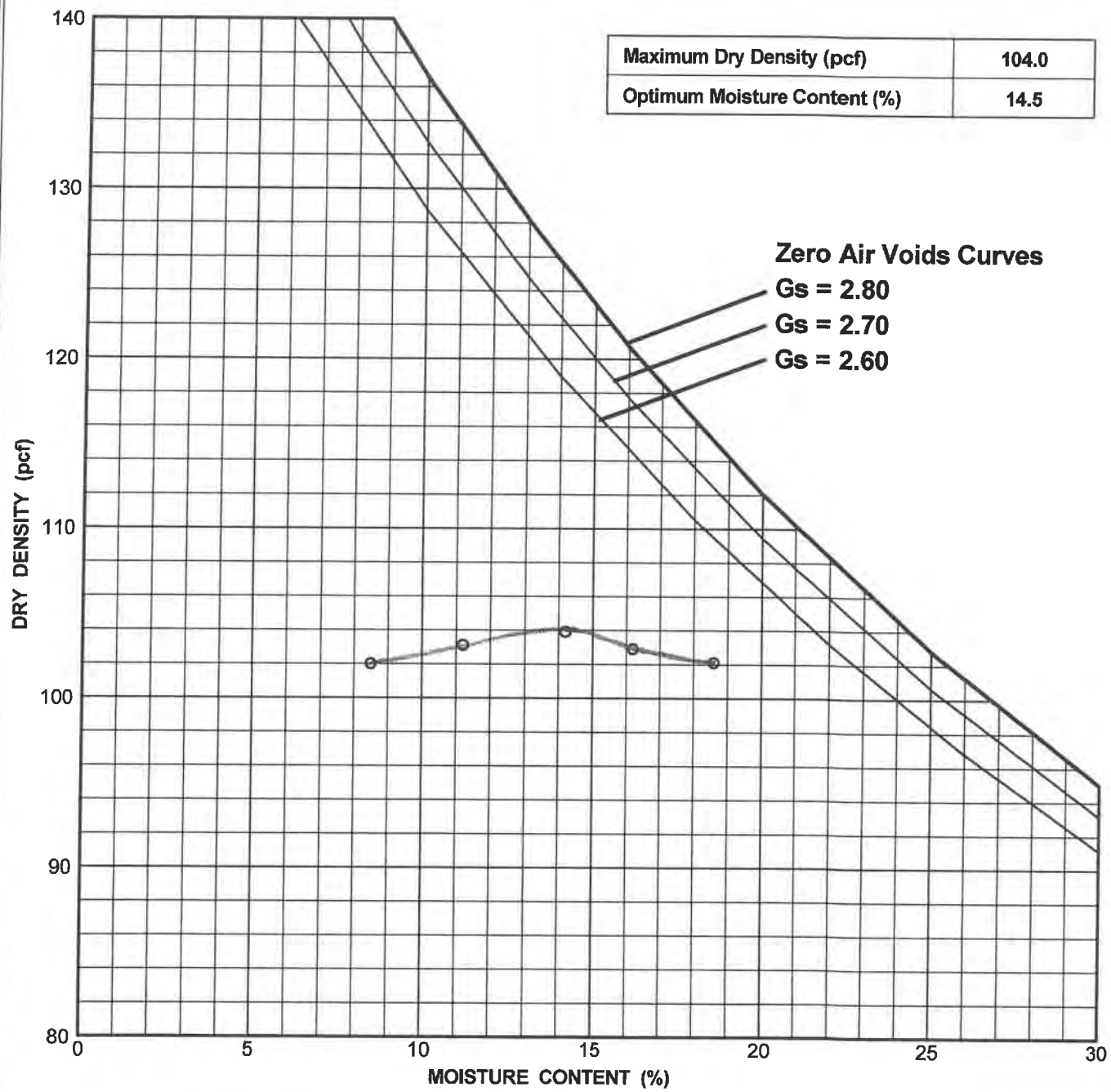


Boring No. HS-1		**Sample No. B-1**		**Depth: 8.5 ft**	
Sample Description:	(Qal) Yellowish Brown Sandy SILT				
Liquid Limit:	NP	**Plasticity Index:**	NP	**Percent Passing No. 200 Sieve:**	65
Comments:	1557A				

COMPACTION TEST RESULTS

Rentech/ Rialto
Rialto
PROJECT NO. 10049-02

NMG Geotechnical, Inc.



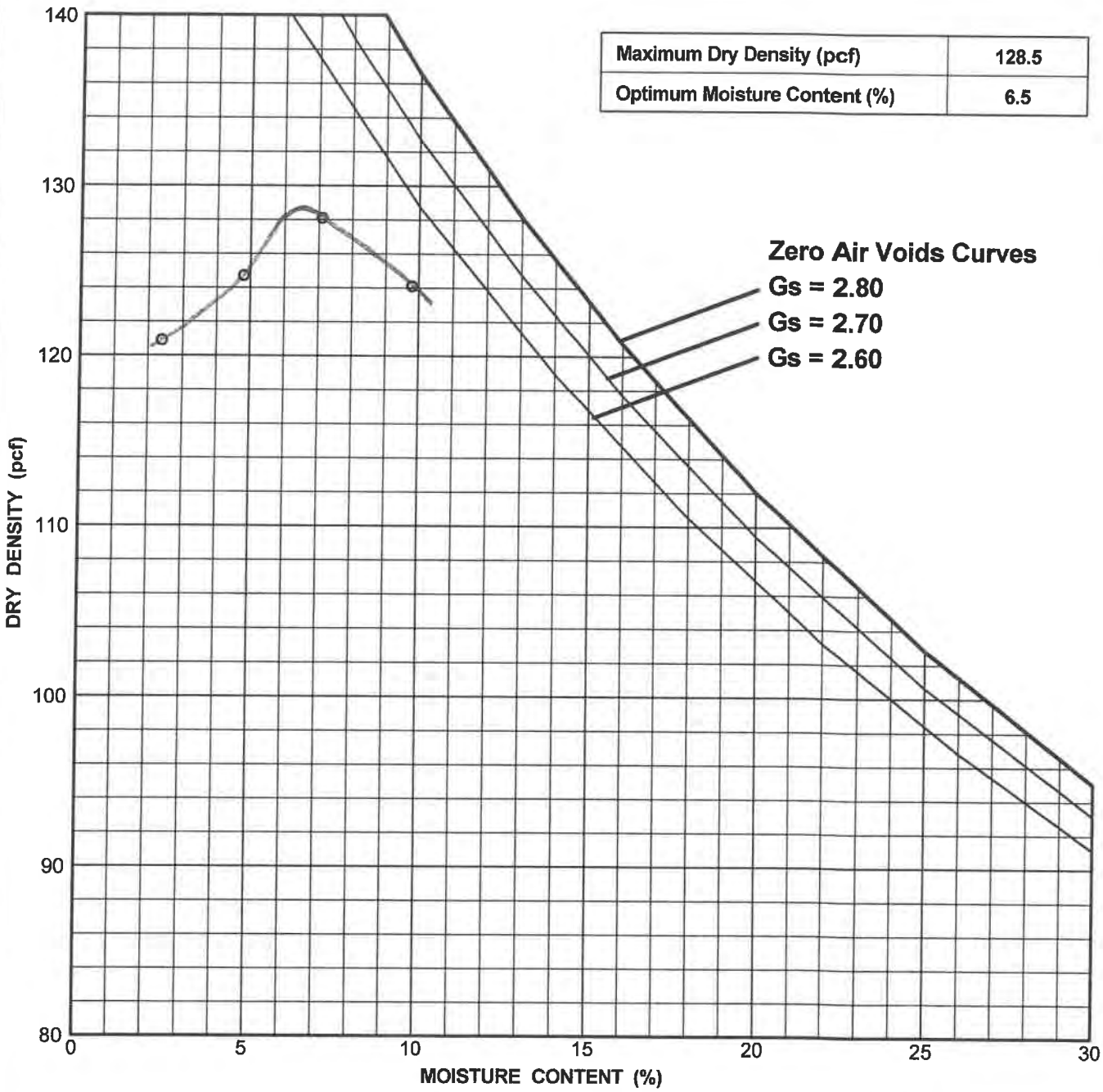
Boring No. T-11		**Sample No. B-1**		**Depth: 1.0 ft**	
Sample Description:	(Aw) Pale Yellow Sandy SILT				
Liquid Limit:	NP	**Plasticity Index:**	NP	**Percent Passing No. 200 Sieve:**	65
Comments:	1557A				

COMPACTION TEST RESULTS

Rentech/ Rialto
Rialto
PROJECT NO. 10049-02

NMG Geotechnical, Inc.

Maximum Dry Density (pcf)	128.5
Optimum Moisture Content (%)	6.5



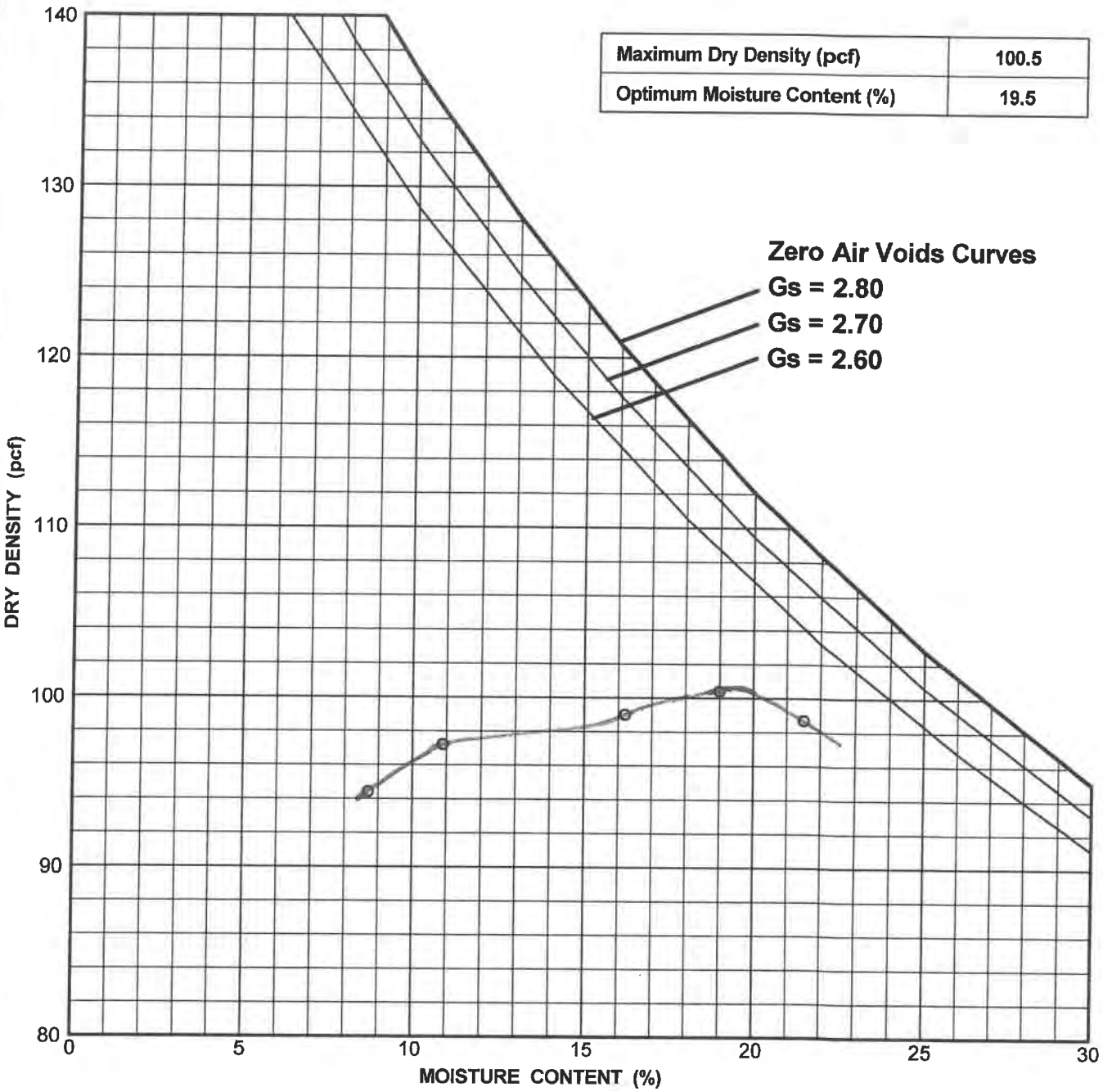
Boring No. T-4	Sample No. B-1	Depth: 1.0 ft
Sample Description: (Afu) Brown Silty SAND		
Liquid Limit:	Plasticity Index:	Percent Passing No. 200 Sieve: 21
Comments: 1557A		

COMPACTION TEST RESULTS

Rentech/ Rialto
Rialto
PROJECT NO. 10049-02

NMG Geotechnical, Inc.

Maximum Dry Density (pcf)	100.5
Optimum Moisture Content (%)	19.5

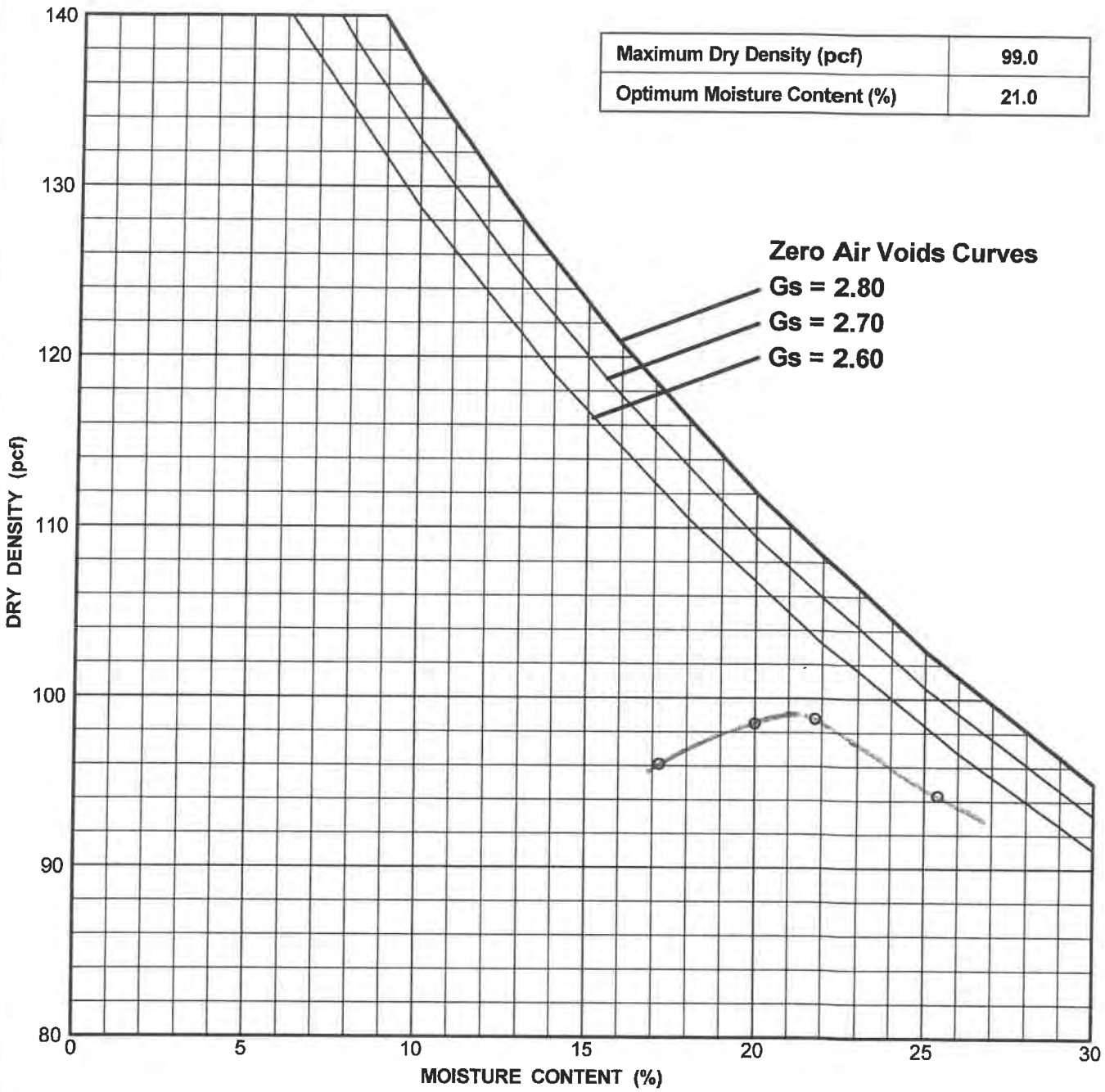


Boring No. T-5		**Sample No. B-1**		**Depth: 2.0 ft**	
Sample Description:	(Aw) Yellowish Brown Clayey SILT				
Liquid Limit:	36	**Plasticity Index:**	5	**Percent Passing No. 200 Sieve:**	93
Comments:	1557A				

COMPACTION TEST RESULTS

Rentech/ Rialto
Rialto
PROJECT NO. 10049-02

NMG Geotechnical, Inc.



Maximum Dry Density (pcf)	99.0
Optimum Moisture Content (%)	21.0

Boring No. T-6		**Sample No. B-1**		**Depth: 2.0 ft**	
Sample Description:	(Aw) Gray Silty CLAY				
Liquid Limit:	70	**Plasticity Index:**	45	**Percent Passing No. 200 Sieve:**	99
Comments:	1557A				

COMPACTION TEST RESULTS

Rentech/ Rialto
Rialto
PROJECT NO. 10049-02

NMG Geotechnical, Inc.

PROJECT NAME : RENTECH / RIALTO

PROJECT NUMBER : NMG#10049-02

SAMPLE I.D/NO.: : T-2 @ 1'

TESTED BY : RMC DATE : 31-Aug-10

SAMPLE LOCATION :

SAMPLED BY : DATE :

SAMPLE DESCRIPTIONS / CLASSIFICATION : GRAYISH BROWN SILTY SAND WITH GRAVEL (SM)

TRIAL NO.		1	2	3	4
MOLD NUMBER		AC3	4	10	
WATER ADDED	(ML)	65	70	75	
COMPACTOR PRESSURE	(PSI)	350	350	350	
GROSS WEIGHT	(GMS)	3272	3295	3288	
TARE WEIGHT	(GMS)	2115	2116	2123	
SAMPLE WET WEIGHT	(GMS)	1157	1179	1165	
EXUDATION PRESSURE	(PSI)	383	308	259	
SAMPLE HEIGHT	(IN.)	2.49	2.54	2.51	
EXPANSION	($IN.x10^{-4}$)	0	0	0	
STABILITY @ 160 PSI (2000 LBS) / @ 80 PSI (1000 LBS)		38 / 24	41 / 25	44 / 26	/
TURNS DISPLACEMENT		3.11	3.28	3.66	
R-VALUE UNCORRECTED		72	69	64	
R-VALUE CORRECTED		72	69	64	
MOISTURE CONTENT	(%)	7.3	7.6	7.9	
DRY DENSITY	(PCF)	131.2	130.7	130.3	
ASSUMED TRAFFIC INDEX		4.0	4.0	4.0	
G.E. BY STABILITY		0.29	0.32	0.37	
G.E. BY EXPANSION		0.00	0.00	0.00	
R-VALUE @ EQUILIBRIUM	(BY EXUDATION)	68			
Gf		1.25			

REMARKS :

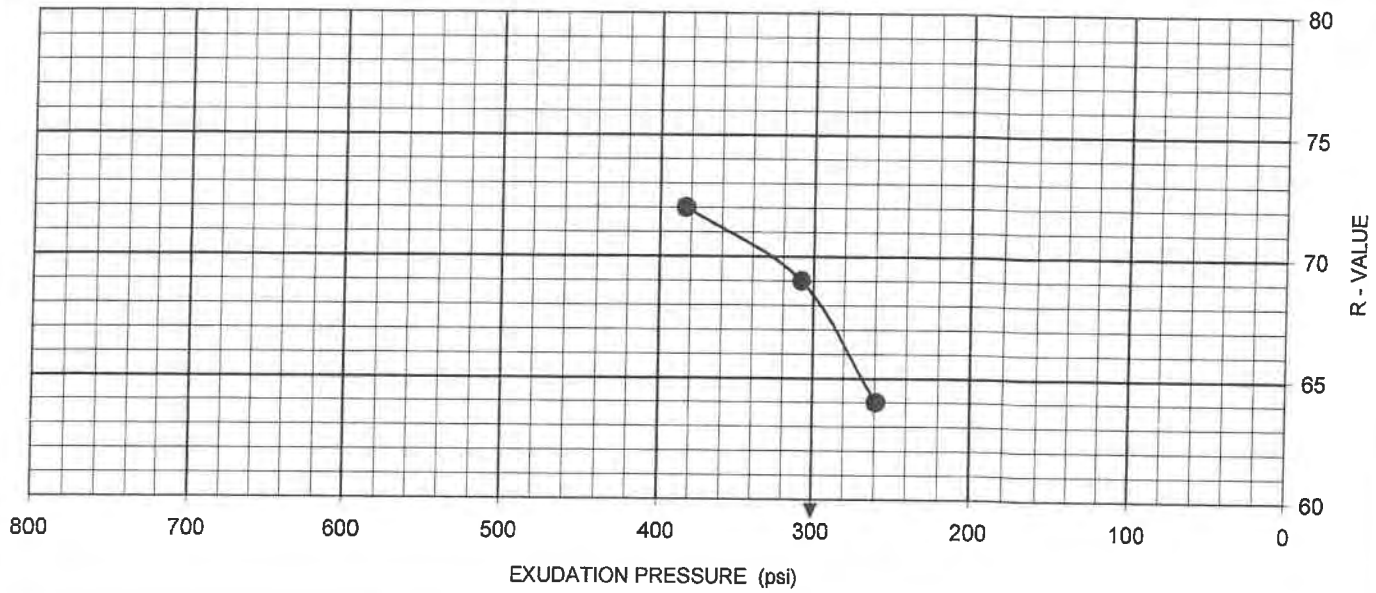
CHECKED BY:

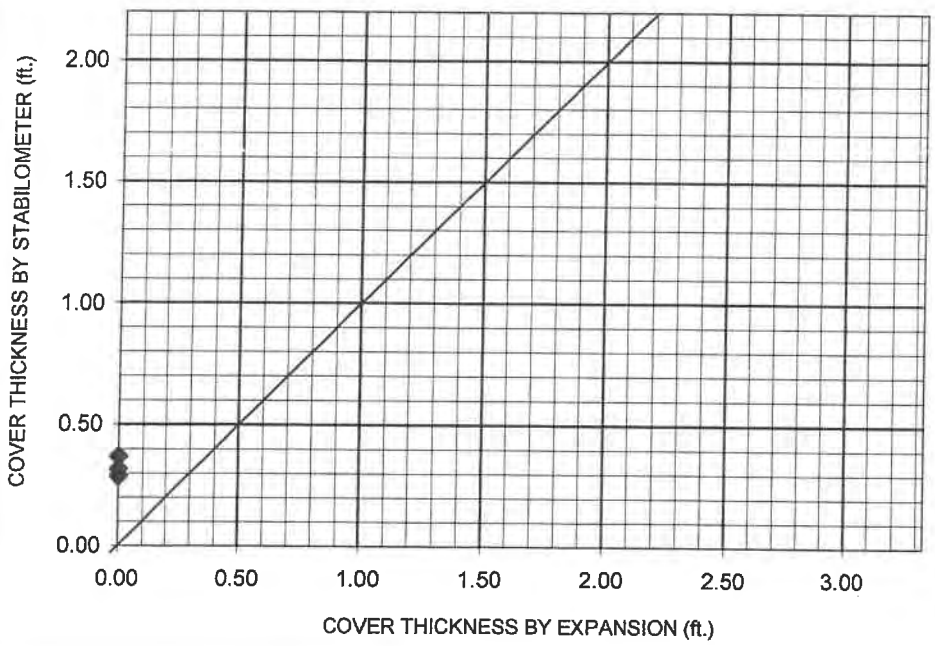
DATE :

THE DATA ABOVE IS BASED UPON PROCESSING AND TESTING OF SAMPLES "AS RECEIVED" FROM THE FIELD TEST PROCEEDURES IN GENERAL CONFORMANCE TO LATEST REVISIONS OF CA TEST METHOD 301.

ZEISER KLING CONSULTANTS, INC.
151 Kalmus Dr., Suite H-6, Costa Mesa Ca. 92626
Tel: (714) 755-1355; Fax: (714) 755-1366

R - VALUE DATA





R - VALUE CURVES

NMG#10049-02

PROJECT NUMBER

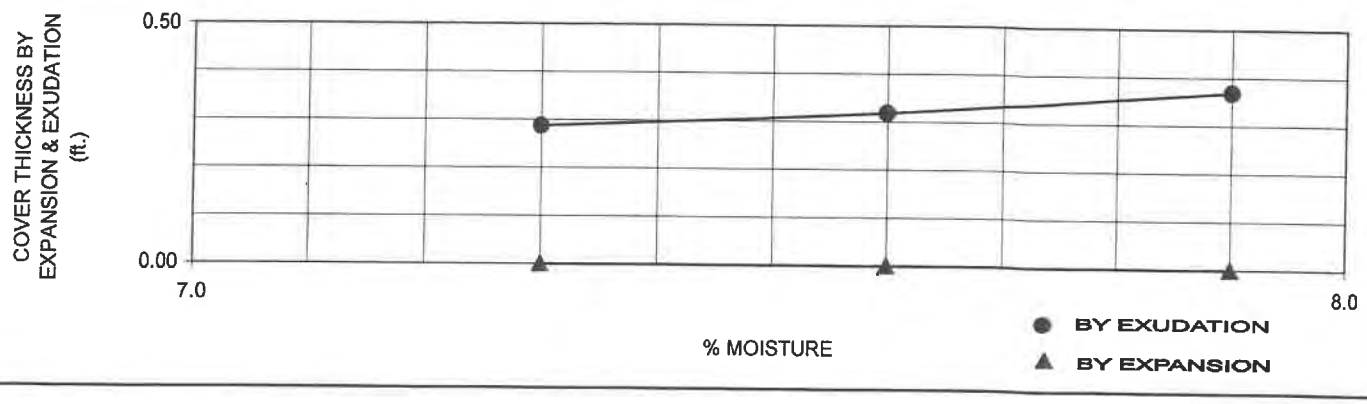
RENTECH / RIALTO

PROJECT NAME

T-2 @ 1'

SAMPLE NO. / LOCATION

R - VALUES	
R-VALUE BY EXUDATION	68
R-VALUE BY EXPANSION	-
COVER THICKNESS (ft.)	-



PROJECT NAME : RENTECH / RIALTO

PROJECT NUMBER : NMG#10049-02

SAMPLE I.D/NO.: : T-4 @ 1'

TESTED BY : RMC DATE : 30-Aug-10

SAMPLE LOCATION :

SAMPLED BY : DATE :

SAMPLE DESCRIPTIONS / CLASSIFICATION : LT. BROWN SILTY SAND WITH GRAVEL (SM)

TRIAL NO.		1	2	3	4
MOLD NUMBER		10	5	4	
WATER ADDED	(ML)	65	90	75	
COMPACTOR PRESSURE	(PSI)	350	350	350	
GROSS WEIGHT	(GMS)	3288	3274	3251	
TARE WEIGHT	(GMS)	2123	2117	2116	
SAMPLE WET WEIGHT	(GMS)	1165	1157	1135	
EXUDATION PRESSURE	(PSI)	396	326	281	
SAMPLE HEIGHT	(IN.)	2.57	2.55	2.50	
EXPANSION	($IN.x10^{-4}$)	0	0	0	
STABILITY @ 160 PSI (2000 LBS) / @ 80 PSI (1000 LBS)		38 / 21	42 / 23	44 / 24	/
TURNS DISPLACEMENT		3.44	3.52	3.63	
R-VALUE UNCORRECTED		70	67	64	
R-VALUE CORRECTED		70	67	64	
MOISTURE CONTENT	(%)	8.7	9.0	9.3	
DRY DENSITY	(PCF)	126.4	126.1	125.9	
ASSUMED TRAFFIC INDEX		4.0	4.0	4.0	
G.E. BY STABILITY		0.31	0.34	0.37	
G.E. BY EXPANSION		0.00	0.00	0.00	
R-VALUE @ EQUILIBRIUM	(BY EXUDATION)	65			
Gf		1.25			

REMARKS :

CHECKED BY:

DATE :

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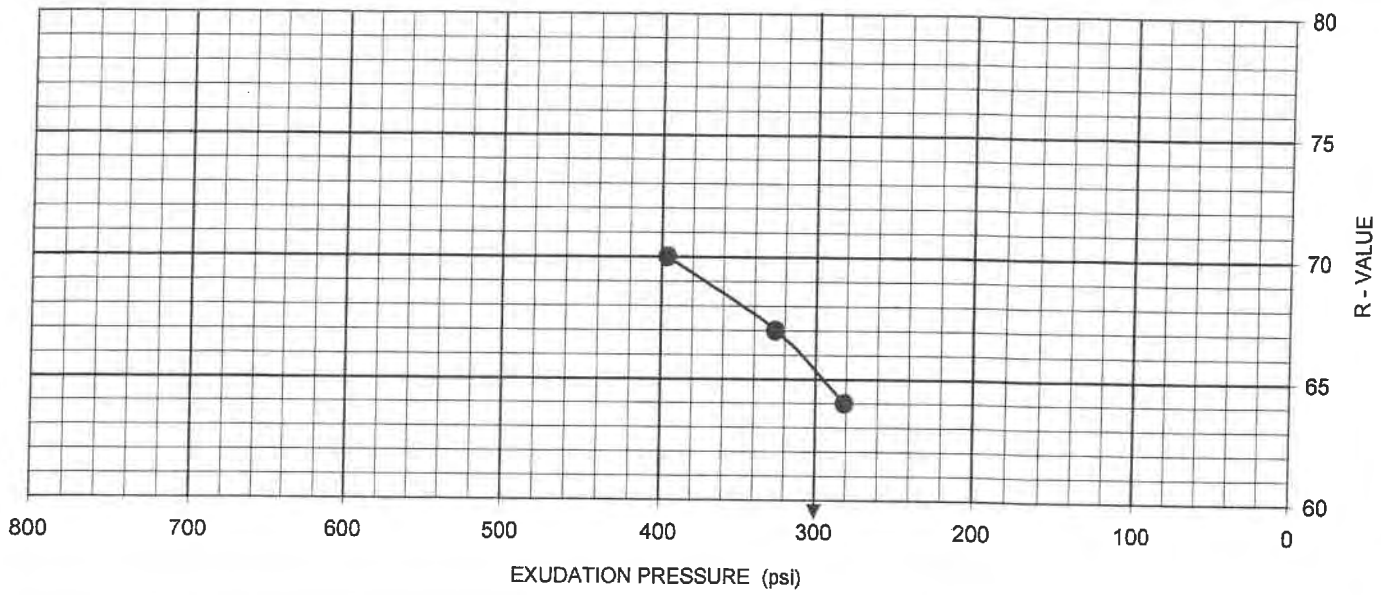
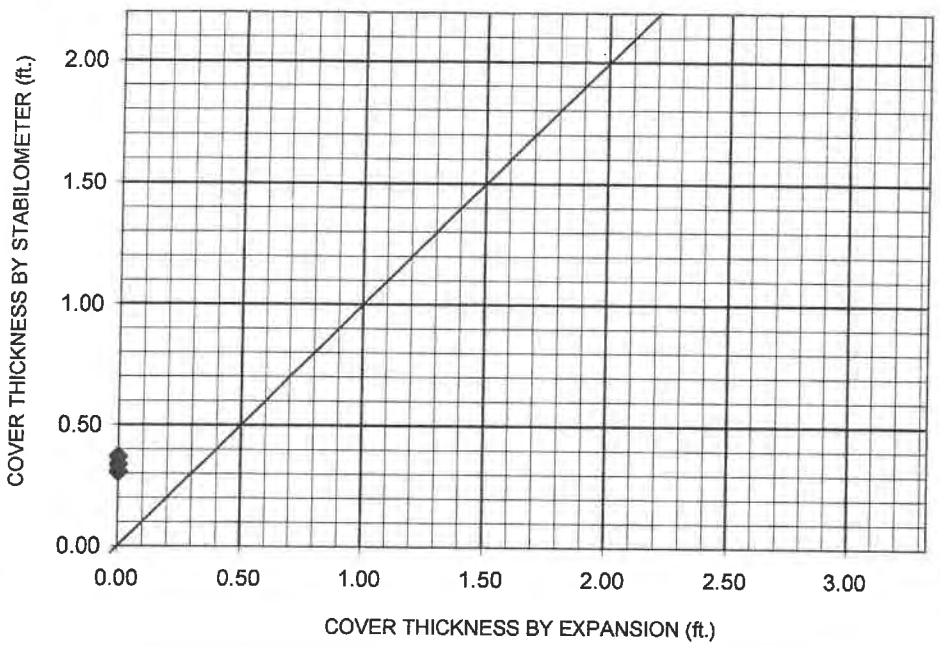
R - VALUE DATA

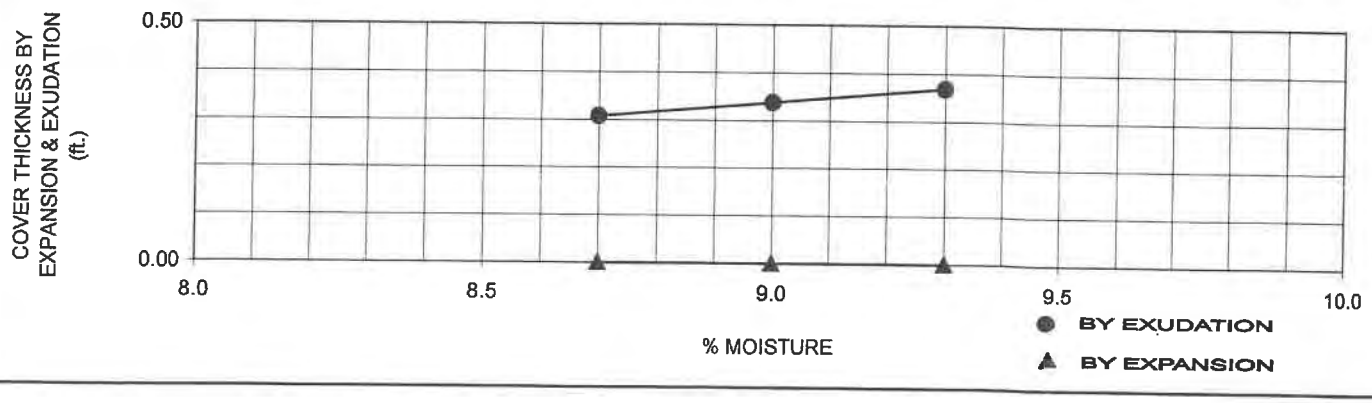




R - VALUE CURVES

NMG#10049-02
PROJECT NUMBER
RENTECH / RIALTO
PROJECT NAME
T-4 @ 1'
SAMPLE NO. / LOCATION

R - VALUES	
R-VALUE BY EXUDATION	65
R-VALUE BY EXPANSION	-
COVER THICKNESS (ft.)	-



PROJECT NAME : RENTECH / RIALTO

PROJECT NUMBER : NMG#10049-02

SAMPLE I.D/NO.: : T-1 @ 4.5'

TESTED BY : RMC DATE : 30-Aug-10

SAMPLE LOCATION :

SAMPLED BY : DATE :

SAMPLE DESCRIPTIONS / CLASSIFICATION : BROWN SILTY SAND WITH GRAVEL (SM)

TRIAL NO.		1	2	3	4
MOLD NUMBER		1	5	7	
WATER ADDED	(ML)	85	90	95	
COMPACTOR PRESSURE	(PSI)	350	350	350	
GROSS WEIGHT	(GMS)	3260	3274	3240	
TARE WEIGHT	(GMS)	2122	2117	2120	
SAMPLE WET WEIGHT	(GMS)	1138	1157	1120	
EXUDATION PRESSURE	(PSI)	347	288	248	
SAMPLE HEIGHT	(IN.)	2.51	2.55	2.47	
EXPANSION	($IN.x10^{-4}$)	0	0	0	
STABILITY @ 160 PSI (2000 LBS) / @ 80 PSI (1000 LBS)		35 / 21	39 / 23	43 / 24	/
TURNS DISPLACEMENT		3.48	3.47	3.50	
R-VALUE UNCORRECTED		72	69	66	
R-VALUE CORRECTED		72	69	66	
MOISTURE CONTENT	(%)	7.9	8.2	8.4	
DRY DENSITY	(PCF)	127.3	127.1	126.7	
ASSUMED TRAFFIC INDEX		4.0	4.0	4.0	
G.E. BY STABILITY		0.29	0.32	0.35	
G.E. BY EXPANSION		0.00	0.00	0.00	
R-VALUE @ EQUILIBRIUM	(BY EXUDATION)	69			
Gf		1.25			

REMARKS :

CHECKED BY:

DATE :

THE DATA ABOVE IS BASED UPON PROCESSING AND TESTING OF SAMPLES "AS RECEIVED" FROM THE FIELD
TEST PROCEEDURES IN GENERAL CONFORMANCE TO LATEST REVISIONS OF CA TEST METHOD 301.

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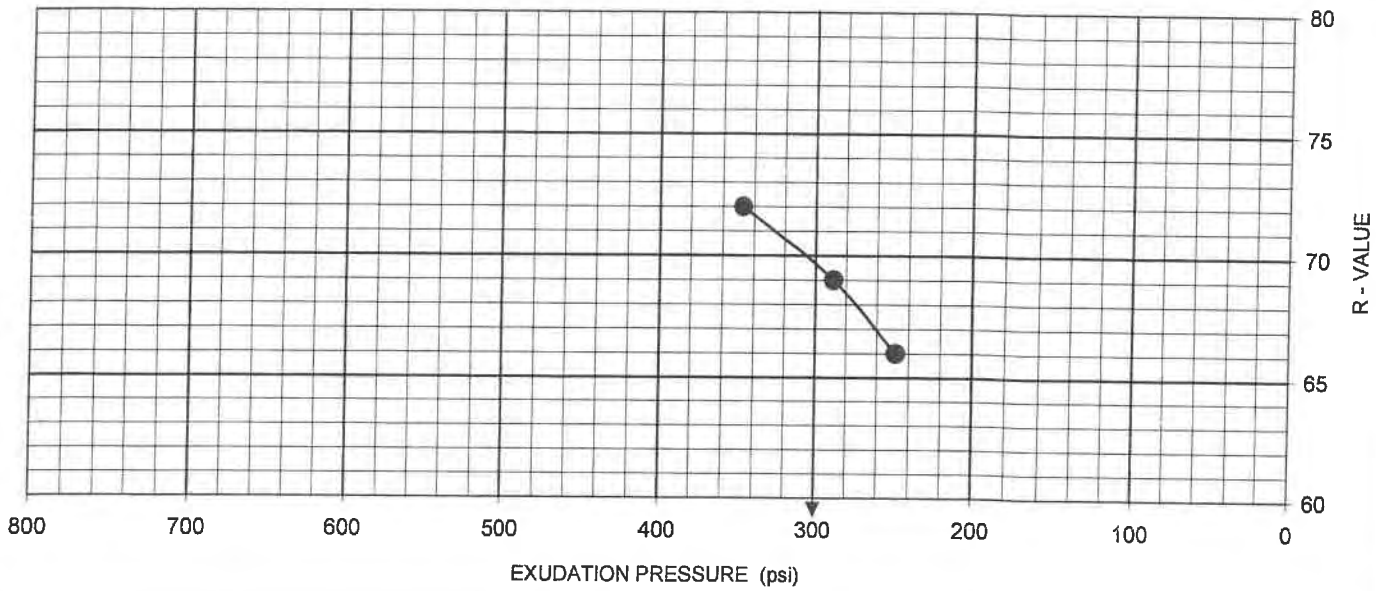
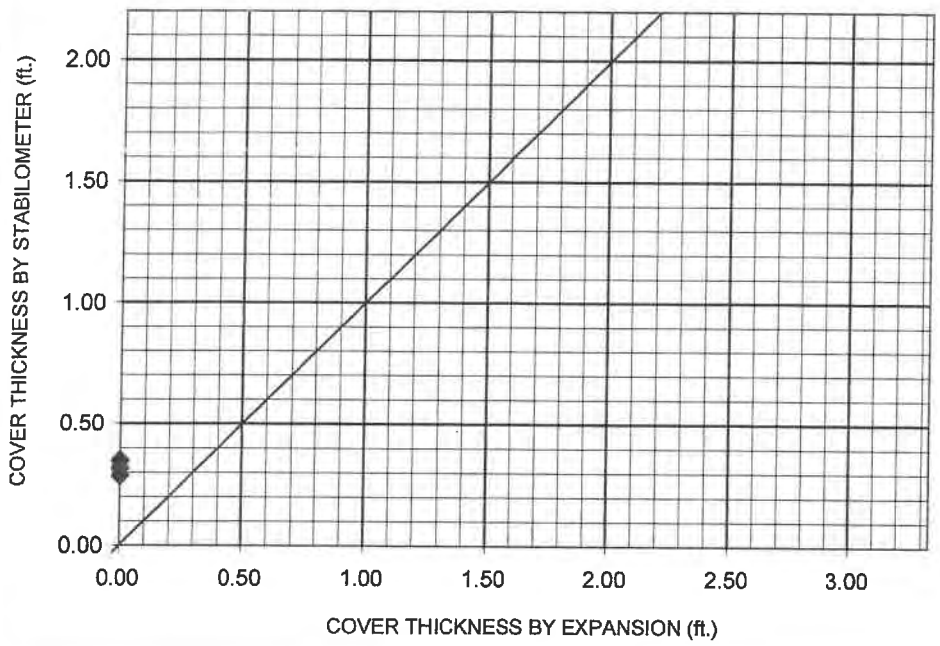
R - VALUE DATA

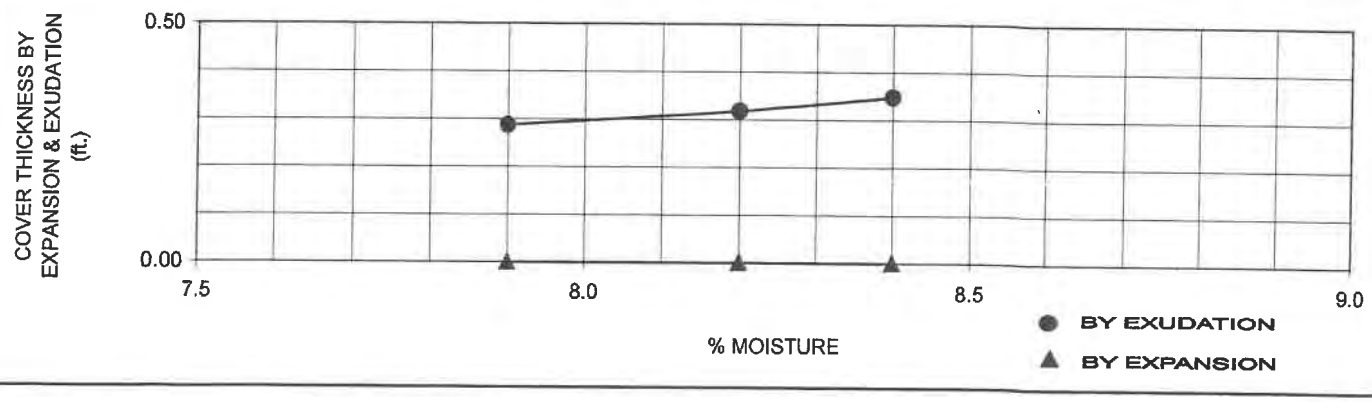




R - VALUE CURVES

NMG#10049-02
PROJECT NUMBER
RENTECH / RIALTO
PROJECT NAME
T-1 @ 4.5'
SAMPLE NO. / LOCATION

R - VALUES	
R-VALUE BY EXUDATION	69
R-VALUE BY EXPANSION	-
COVER THICKNESS (ft.)	-



Order #: 1113554
Matrix: SOLID
Date Sampled: 09/23/2010
Time Sampled:
Sampled By:

Client: NMG Geotechnical
Client Sample ID: GS-1

Analyte	Result	DF	DLR	Units	Date/Analyst	
2580 B Redox Potential						
Redox Potential @ 25 C	436	1		mv	09/28/10	MS
300.0 Chloride by Ion Chromatography						
Chloride	12.7	1	10.0	mg/Kg	09/27/10	WW
Soluble Sulfate	ND	1	0.001	%	09/27/10	WW
9045 pH						
pH	7.55	1		NA	09/27/10	MS
Resistivity in Soil						
Resistivity	7900	1	NA	ohm/cm	09/29/10	APE

DLR = Detection limit for reporting purposes, ND = Not Detected below indicated detection limit, DF = Dilution Factor

Order #: 1113555
Matrix: SOLID
Date Sampled: 09/23/2010
Time Sampled:
Sampled By:

Client: NMG Geotechnical
Client Sample ID: GS-2

Analyte	Result	DF	DLR	Units	Date/Analyst	
2580 B Redox Potential						
Redox Potential @ 25 C	450	1		mv	09/28/10	MS
300.0 Chloride by Ion Chromatography						
Chloride	16.9	1	10.0	mg/Kg	09/27/10	WW
Soluble Sulfate	0.001	1	0.001	%	09/27/10	WW
9045 pH						
pH	7.40	1		NA	09/27/10	MS
Resistivity in Soil						
Resistivity	6400	1	NA	ohm/cm	09/29/10	APE

DLR = Detection limit for reporting purposes, ND = Not Detected below indicated detection limit, DF = Dilution Factor

PTS Laboratories

Project Name: Rentech/Rialto
Project Number: 10049-02

PTS File No: 40603
Client: NMG Geotechnical

TEST PROGRAM

CORE ID	Depth ft.	Core Recovery ft.	Hydraulic Conductivity API RP 40	Effective Porosity Mod. ASTM D425				Notes
		Plugs:	Vert. 1"	Vert. 1.5"				
Date Received: 8/16/10								
HS-1, D-6	27.5	0.50	X	X				
HS-2, D-6	30.0	0.50	X	X				
HS-1, D-12	57.5	0.50	X	X				
HS-1, D-4	17.5	0.50	X	X				
HS-2, D-2A	10.0	0.50	X	X				
HS-4, D-3A	15.0	0.50	X	X				
HS-3, D-4A	17.5	0.50	X	X				
HS-3, D-6A	27.5	0.50	X	X				
HS-3, D-8A	37.5	0.50						
HS-4, D-8A	40.0	0.50	X	X				
HS-3, D-9A	42.5	0.50	X	X				
HS-3, D-11A	52.5	0.50	X	X				
Date Received: 8/20/10								
HS-4, D-10A	50.0	0.50	X	X				
HS-3, D-10A	47.5	0.50						
TOTALS:	14 cores	7.0	12	12				

Laboratory Test Program Notes

PTS File No: 40603
Client: NMG Geotechnical

PHYSICAL PROPERTIES DATA - DRAINAGE (EFFECTIVE) POROSITY

PROJECT NAME: Rentech/Rialto
PROJECT NO: 10049-02

		METHODS:	Mod. ASTM D425	Mod. ASTM D425
SAMPLE ID.	DEPTH, ft.	SAMPLE ORIENTATION (1)	TOTAL POROSITY, %Vb	EFFECTIVE POROSITY, %Vb
HS-1, D-6	27.5	R	33.1	30.1
HS-2, D-6	30.0	V	38.4	34.1
HS-1, D-12	57.5	V	34.5	19.8
HS-1, D-4	17.5	R	39.3	34.5
HS-2, D-2A	10.0	V	41.7	36.5
HS-4, D-3A	15.0	V	48.4	31.4
HS-3, D-4A	17.5	V	37.8	33.7
HS-3, D-6A	27.5	V	42.6	22.9
HS-4, D-8A	40.0	V	32.2	26.7
HS-3, D-9A	42.5	V	41.9	20.8
HS-3, D-11A	52.5	V	34.8	21.3
HS-4, D-10A	50.0	V	30.1	21.5

(1) Sample Orientation: H = horizontal; V = vertical; R = remold Vb = Bulk Volume

PTS File No: 40603
Client: NMG Geotechnical

PHYSICAL PROPERTIES DATA - HYDRAULIC CONDUCTIVITY

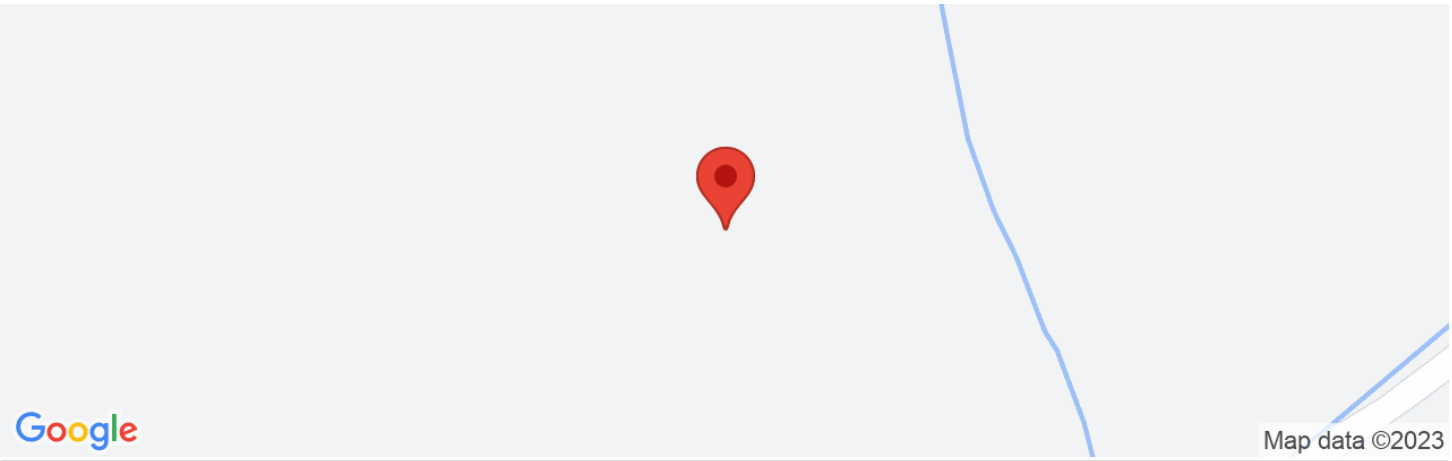
PROJECT NAME: Rentech/Rialto
PROJECT NO: 10049-02

		METHODS:	API RP 40; EPA 9100	
			25 PSI CONFINING STRESS	
SAMPLE ID.	DEPTH, ft.	SAMPLE ORIENTATION (1)	EFFECTIVE (2,3) PERMEABILITY TO WATER, millidarcy	HYDRAULIC CONDUCTIVITY (2,3), cm/s
HS-1, D-6	27.5	R	2613	2.55E-03
HS-2, D-6	30.0	V	3270	3.21E-03
HS-1, D-12	57.5	V	16.0	1.57E-05
HS-1, D-4	17.5	R	1990	1.96E-03
HS-2, D-2A	10.0	V	1854	1.82E-03
HS-4, D-3A	15.0	V	185	1.82E-04
HS-3, D-4A	17.5	V	1439	1.47E-03
HS-3, D-6A	27.5	V	28.0	2.86E-05
HS-4, D-8A	40.0	V	372	3.80E-04
HS-3, D-9A	42.5	V	13.4	1.37E-05
HS-3, D-11A	52.5	V	9.40	9.58E-06
HS-4, D-10A	50.0	V	82.6	8.42E-05

(1) Sample Orientation: H = horizontal; V = vertical; R = remold
(2) Native State or Effective = With as-received pore fluids in place
(3) Permeability to water and hydraulic conductivity measured at saturated conditions

APPENDIX D

Latitude, Longitude: 34.0512, -117.3605



Date	1/3/2023, 3:09:41 PM
Design Code Reference Document	ASCE7-16
Risk Category	II
Site Class	D - Stiff Soil

Type	Value	Description
S_S	1.768	MCE_R ground motion. (for 0.2 second period)
S_1	0.692	MCE_R ground motion. (for 1.0s period)
S_{MS}	1.768	Site-modified spectral acceleration value
S_{M1}	null -See Section 11.4.8	Site-modified spectral acceleration value
S_{DS}	1.179	Numeric seismic design value at 0.2 second SA
S_{D1}	null -See Section 11.4.8	Numeric seismic design value at 1.0 second SA

Type	Value	Description
SDC	null -See Section 11.4.8	Seismic design category
F_a	1	Site amplification factor at 0.2 second
F_v	null -See Section 11.4.8	Site amplification factor at 1.0 second
PGA	0.748	MCE_G peak ground acceleration
F_{PGA}	1.1	Site amplification factor at PGA
PGA_M	0.822	Site modified peak ground acceleration
T_L	8	Long-period transition period in seconds
SsRT	2.07	Probabilistic risk-targeted ground motion. (0.2 second)
SsUH	2.247	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration
SsD	1.768	Factored deterministic acceleration value. (0.2 second)
S1RT	0.801	Probabilistic risk-targeted ground motion. (1.0 second)
S1UH	0.895	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration.
S1D	0.692	Factored deterministic acceleration value. (1.0 second)
PGAd	0.748	Factored deterministic acceleration value. (Peak Ground Acceleration)
PGA_{UH}	0.894	Uniform-hazard (2% probability of exceedance in 50 years) Peak Ground Acceleration
C_{RS}	0.921	Mapped value of the risk coefficient at short periods
C_{R1}	0.896	Mapped value of the risk coefficient at a period of 1 s
C_V	1.454	Vertical coefficient

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U.S. Geological Survey - Earthquake Hazards Program

Unified Hazard Tool

Please do not use this tool to obtain ground motion parameter values for the design code reference documents covered by the U.S. Seismic Design Maps web tools (e.g., the International Building Code and the ASCE 7 or 41 Standard). The values returned by the two applications are not identical.

Input

Edition

Dynamic: Conterminous U.S. 2014 (u…

Spectral Period

Peak Ground Acceleration

Latitude

Decimal degrees

34.0512

Time Horizon

Return period in years

2475

Longitude

Decimal degrees, negative values for western longitudes

-117.3605

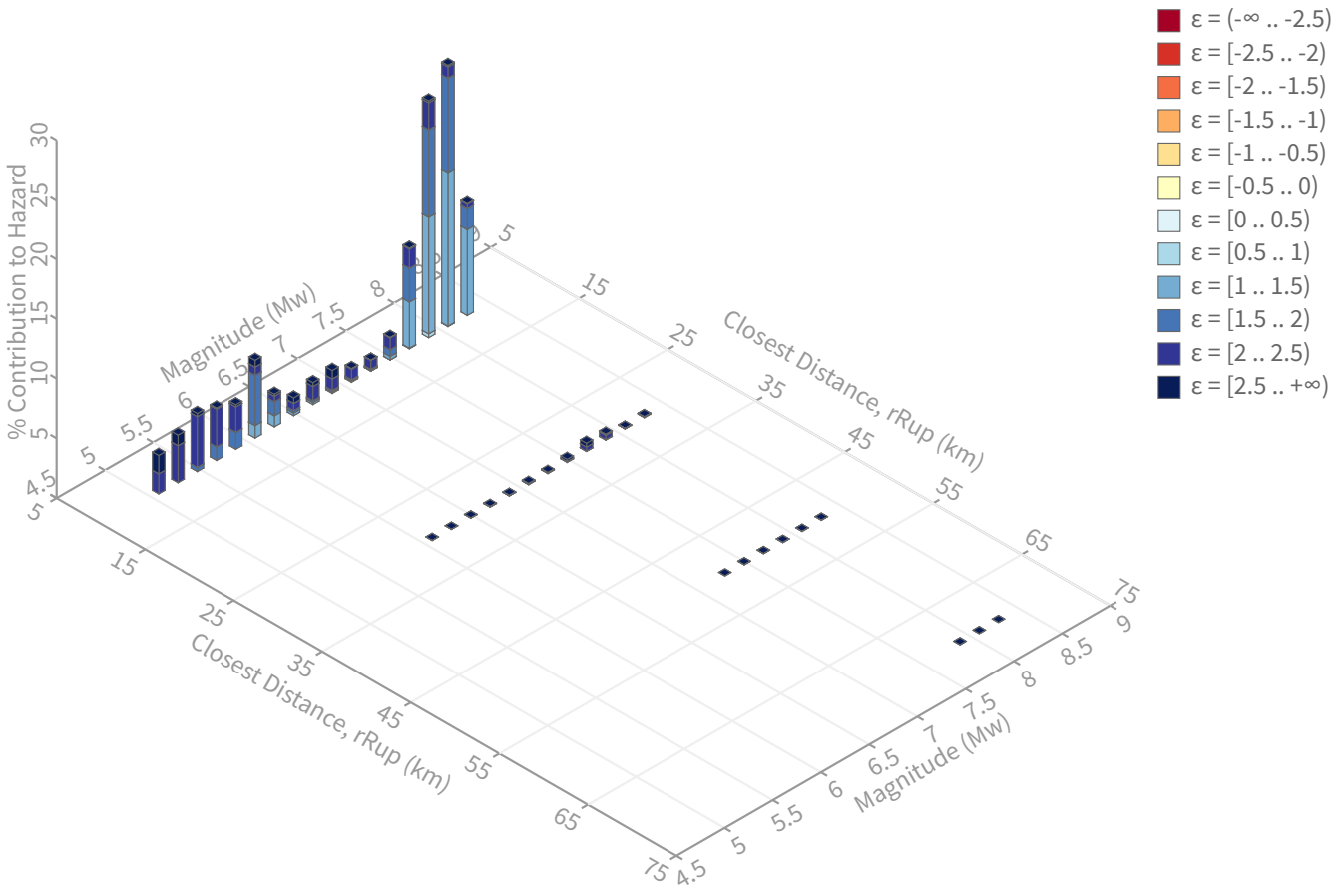
Site Class

259 m/s (Site class D)

Deaggregation

Component

Total


% Contribution to Hazard
Magnitude (Mw)
Closest Distance, rRup (km)
ε = (-∞ .. -2.5)
ε = [-2.5 .. -2)
ε = [-2 .. -1.5)
ε = [-1.5 .. -1)
ε = [-1 .. -0.5)
ε = [-0.5 .. 0)
ε = [0 .. 0.5)
ε = [0.5 .. 1)
ε = [1 .. 1.5)
ε = [1.5 .. 2)
ε = [2 .. 2.5)
ε = [2.5 .. +∞)

Summary statistics for, Deaggregation: Total

Deaggregation targets

Return period: 2475 yrs
Exceedance rate: 0.0004040404 yr^{-1}
PGA ground motion: 0.92402538 g

Recovered targets

Return period: 3318.5272 yrs
Exceedance rate: 0.0003013385 yr^{-1}

Totals

Binned: 100 %
Residual: 0 %
Trace: 0.04 %

Mean (over all sources)

m: 7.23
r: 9.72 km
ε_0: 1.74 σ

Mode (largest m-r bin)

m: 8.1
r: 8.75 km
ε_0: 1.42 σ
Contribution: 21.91 %

Mode (largest m-r-ε_0 bin)

m: 8.1
r: 6.64 km
ε_0: 1.18 σ
Contribution: 12.9 %

Discretization

r: min = 0.0, max = 1000.0, Δ = 20.0 km
m: min = 4.4, max = 9.4, Δ = 0.2
ε: min = -3.0, max = 3.0, Δ = 0.5 σ

Epsilon keys

ε0: [-∞ .. -2.5)
ε1: [-2.5 .. -2.0)
ε2: [-2.0 .. -1.5)
ε3: [-1.5 .. -1.0)
ε4: [-1.0 .. -0.5)
ε5: [-0.5 .. 0.0)
ε6: [0.0 .. 0.5)
ε7: [0.5 .. 1.0)
ε8: [1.0 .. 1.5)
ε9: [1.5 .. 2.0)
ε10: [2.0 .. 2.5)
ε11: [2.5 .. +∞]

Deaggregation Contributors

Source Set ↳ Source	Type	r	m	ε_0	lon	lat	az	%
UC33brAvg_FM31	System							34.63
San Jacinto (San Bernardino) [3]		6.18	8.02	1.29	117.309°W	34.086°N	50.50	20.72
San Andreas (San Bernardino N) [4]		15.74	7.81	1.96	117.278°W	34.175°N	28.73	7.91
San Andreas (North Branch Mill Creek) [0]		15.31	7.99	1.70	117.270°W	34.171°N	31.81	1.78
UC33brAvg_FM32	System							34.58
San Jacinto (San Bernardino) [3]		6.18	8.01	1.30	117.309°W	34.086°N	50.50	20.66
San Andreas (San Bernardino N) [4]		15.74	7.82	1.95	117.278°W	34.175°N	28.73	7.96
San Andreas (North Branch Mill Creek) [0]		15.31	8.00	1.70	117.270°W	34.171°N	31.81	1.86
UC33brAvg_FM31 (opt)	Grid							15.40
PointSourceFinite: -117.361, 34.119		8.73	5.72	2.14	117.361°W	34.119°N	0.00	3.63
PointSourceFinite: -117.361, 34.119		8.73	5.72	2.14	117.361°W	34.119°N	0.00	3.63
PointSourceFinite: -117.361, 34.110		7.98	5.73	2.04	117.361°W	34.110°N	0.00	3.56
PointSourceFinite: -117.361, 34.110		7.98	5.73	2.04	117.361°W	34.110°N	0.00	3.56
UC33brAvg_FM32 (opt)	Grid							15.39
PointSourceFinite: -117.361, 34.119		8.73	5.72	2.14	117.361°W	34.119°N	0.00	3.63
PointSourceFinite: -117.361, 34.119		8.73	5.72	2.14	117.361°W	34.119°N	0.00	3.63
PointSourceFinite: -117.361, 34.110		7.98	5.73	2.04	117.361°W	34.110°N	0.00	3.56
PointSourceFinite: -117.361, 34.110		7.98	5.73	2.04	117.361°W	34.110°N	0.00	3.56

APPENDIX E

APPENDIX E

Slope Stability Analysis

Introduction

The results of our slope stability analyses related to the gross stability of cross sections are presented in this appendix. Slope stability analysis was performed using the computer program GSTABL7. The computer output and plots for selected trial failure surfaces analyzed are included for selected cross-sections.

Computer Aided Analysis

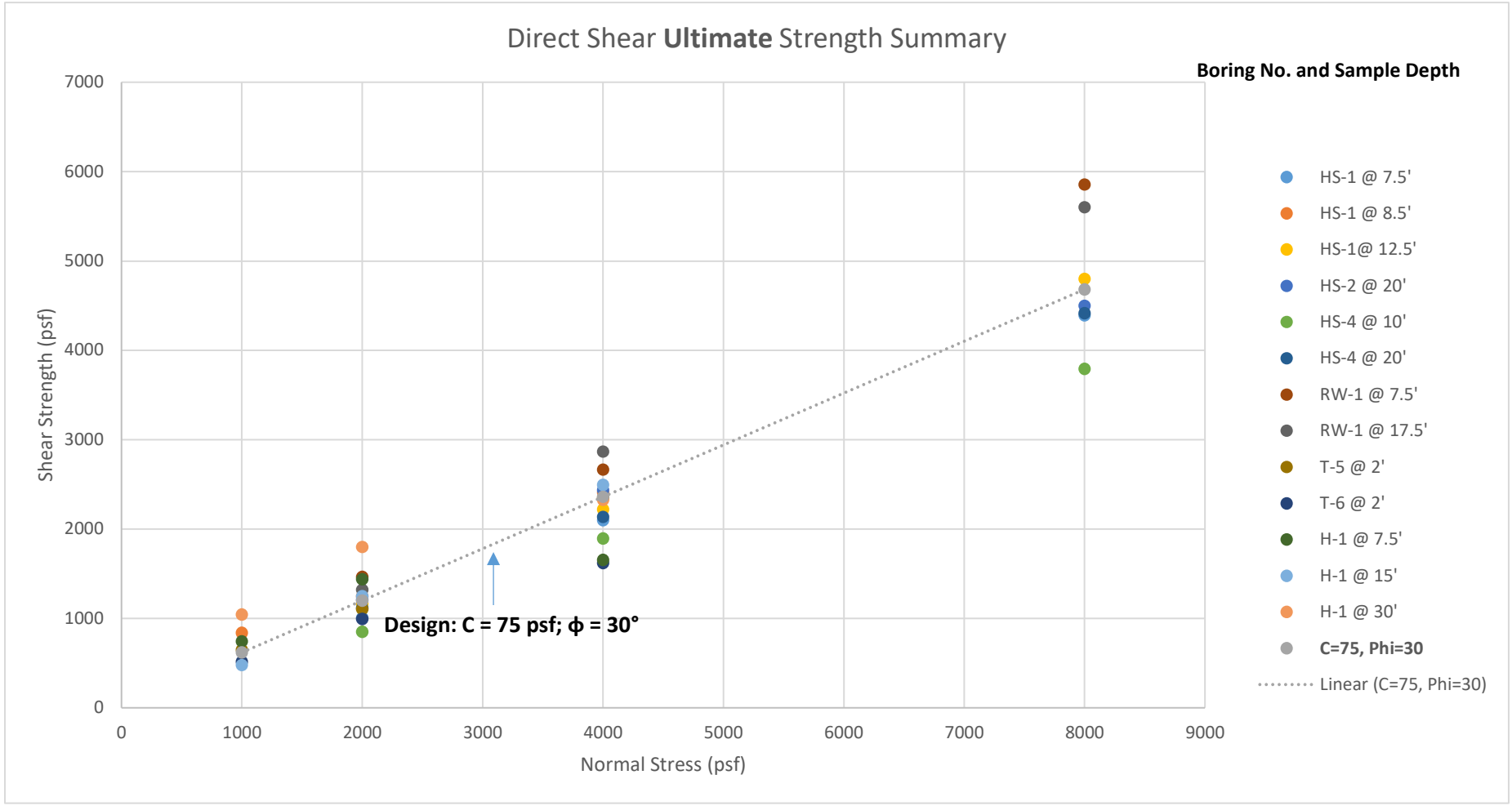
GSTABL7 solve slope stability problems by a two-dimensional limiting equilibrium method. The methods employed in this program include the Modified Bishop Method, which permits circular arc failure surfaces, and the Simplified Janbu Method and Spencer Method, which allow failure surfaces of general shape (circular arc and non-circular). The Simplified Janbu Method provides a solution that satisfies the force equilibrium, while the Spencer Method satisfies both force and moment equilibriums. All methods yield a "factor-of-safety" (FOS) against instability of the slope. A minimum design static factor-of-safety of 1.5 and a pseudo-static (seismic) factor-of-safety of 1.0 was used for global slope stability. The minimum factor-of-safety for rapid drawdown was 1.1.

Summary of Soil Strength Design Values

Based on laboratory direct shear test results at the site as well as from the local area of Rialto and our experience with materials similar to the onsite soils, the following strength parameters were used in our slope stability analysis.

Design Static Soil Strength Parameters

Earth Unit	*Cohesion (psf)*	*Friction Angle (degrees)*
Unidentified Compacted Fill (Afu)	75	30
Alluvium (Qal)	75	30


Direct Shear **Ultimate** Strength Summary
Shear Strength (psf)
Normal Stress (psf)
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
Design: C = 75 psf; ϕ = 30°
Boring No. and Sample Depth
HS-1 @ 7.5'
HS-1 @ 8.5'
HS-1@ 12.5'
HS-2 @ 20'
HS-4 @ 10'
HS-4 @ 20'
RW-1 @ 7.5'
RW-1 @ 17.5'
T-5 @ 2'
T-6 @ 2'
H-1 @ 7.5'
H-1 @ 15'
H-1 @ 30'
C=75, Phi=30
Linear (C=75, Phi=30)

Summary of Slope Stability Analysis

Cross-Section B-B' S

Filename	Description	Factor of Safety (FS)	
		Static	***Pseudostatic***
01, 01p	Design Condition	1.61	1.07
02	Rapid Drawdown Condition-Operating Lake Level El 905’	0.86	--
02m	Rapid Drawdown-Maximum Groundwater El 887’ (28 feet bgs)	1.10	--

Project No.: 20079-02

Project Name: DWC / Lake Rialto

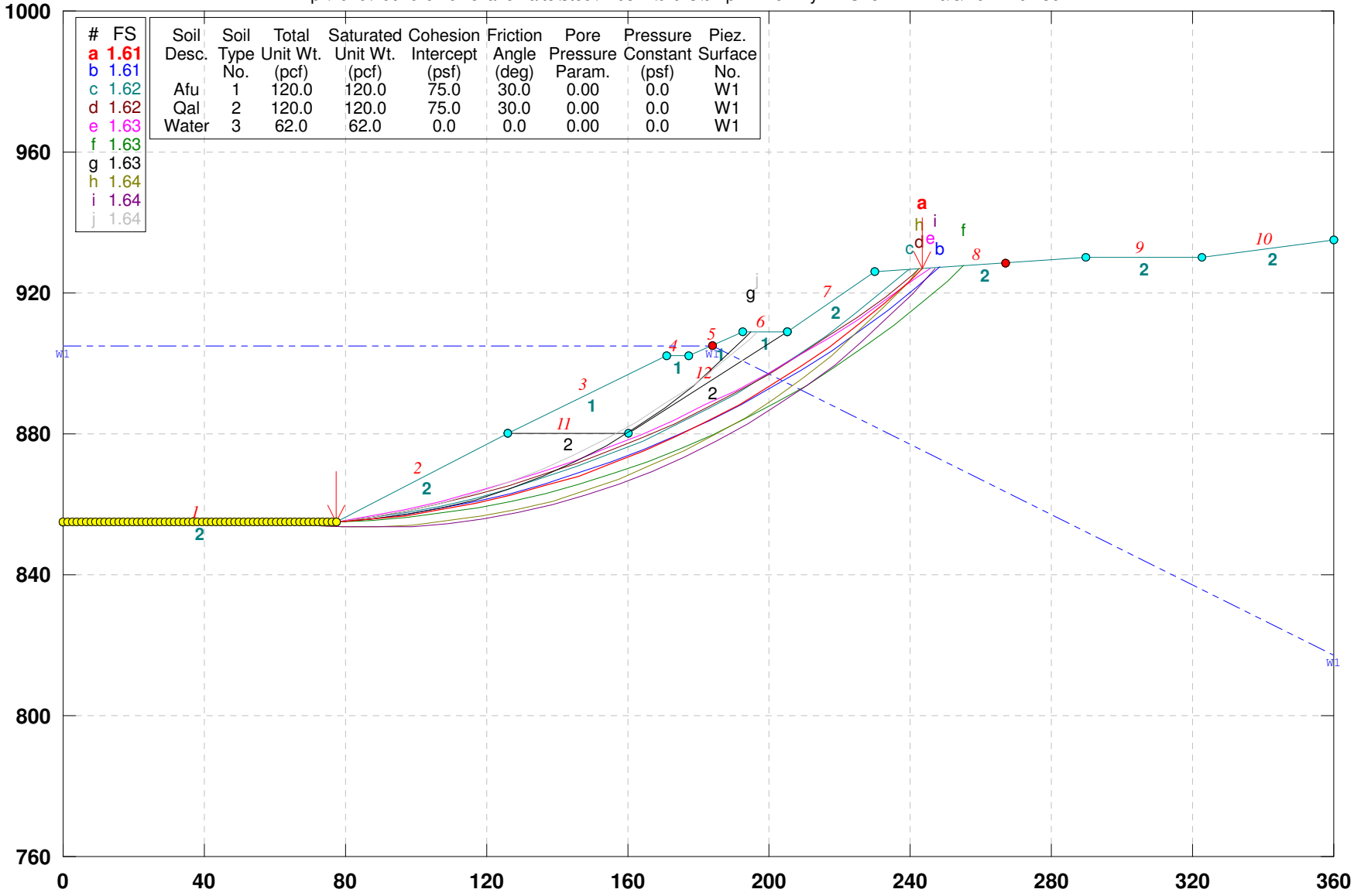
NMG

DWC / Lake Rialto; B-B' S; Design

p:\2020\20079-02 dwc lake rialto\sted\2208xx\b-b' s\01.pl2 Run By: TAC for TM 10/5/2022 04:30PM

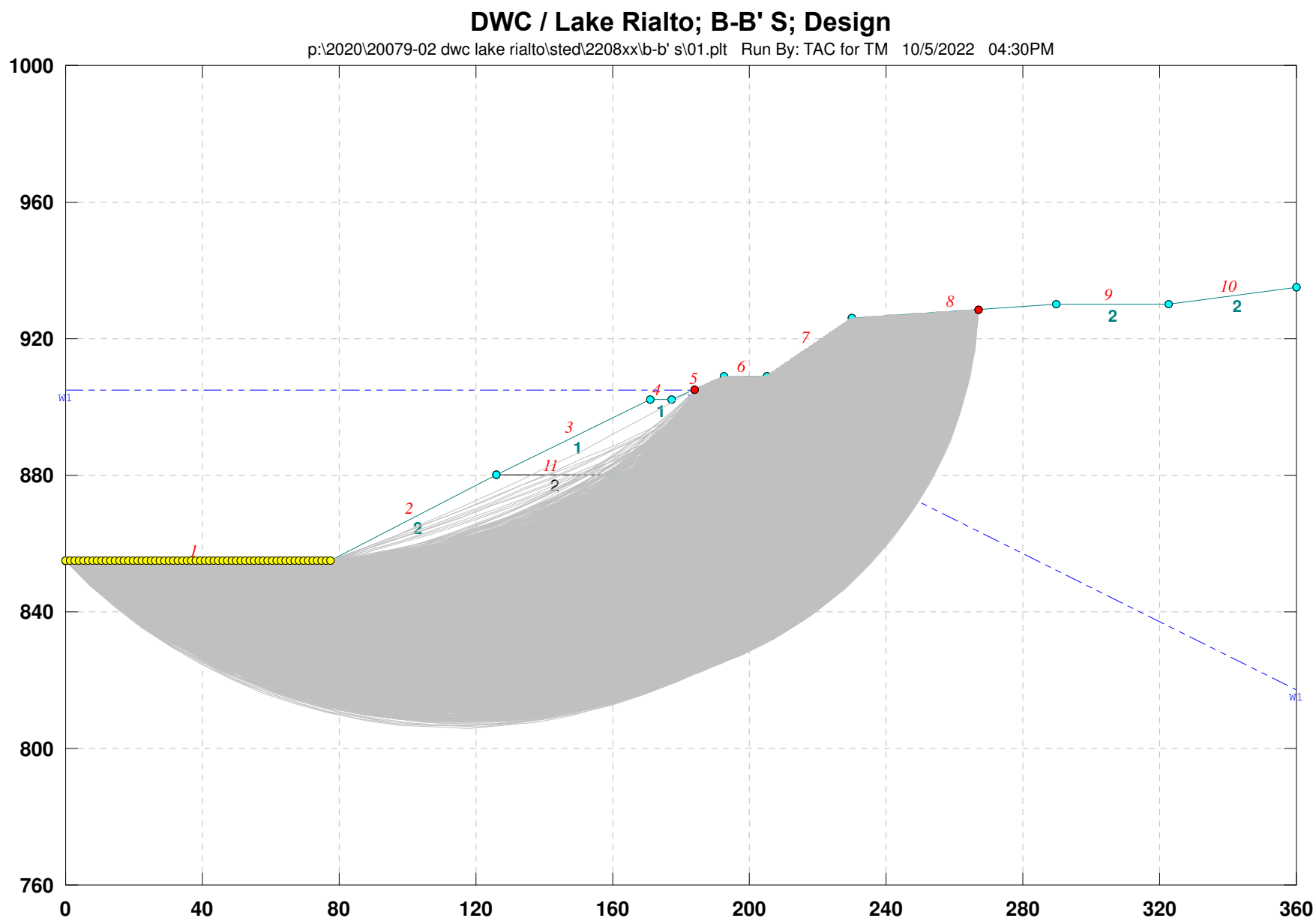
#	FS
a	1.61
b	1.61
c	1.62
d	1.62
e	1.63
f	1.63
g	1.63
h	1.64
i	1.64
j	1.64

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
Afu	1	120.0	120.0	75.0	30.0	0.00	0.0	W1
Qal	2	120.0	120.0	75.0	30.0	0.00	0.0	W1
Water	3	62.0	62.0	0.0	0.0	0.00	0.0	W1



GSTABL7 v.2 FSmin=1.61

Safety Factors Are Calculated By The Modified Bishop Method


DWC / Lake Rialto; B-B' S; Design
p:\2020\20079-02 dwc lake rialto\sted\2208xx\b-b' s\01.plt Run By: TAC for TM 10/5/2022 04:30PM
1000
960
920
880
840
800
760
0
40
80
120
160
200
240
280
320
360
W1
W1
1
2
3
4
5
6
7
8
9
10
11
1
2
1
1
2
2
2

***** GSTABL7 *****

** GSTABL7 by Dr. Garry H. Gregory, Ph.D.,P.E.,D.GE **
** Original Version 1.0, January 1996; Current Ver. 2.005.3, Feb. 2013 **
(All Rights Reserved-Unauthorized Use Prohibited)

****

SLOPE STABILITY ANALYSIS SYSTEM
Modified Bishop, Simplified Janbu, or GLE Method of Slices.
(Includes Spencer & Morgenstern-Price Type Analysis)
Including Pier/Pile, Reinforcement, Soil Nail, Tieback,
Nonlinear Undrained Shear Strength, Curved Phi Envelope,
Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water
Surfaces, Pseudo-Static & Newmark Earthquake, and Applied Forces.

****

Analysis Run Date: 10/5/2022
Time of Run: 04:30PM
Run By: TAC for TM
Input Data Filename: P:\2020\20079-02 DWC Lake Rialto\Sted\2208XX\B-B' S\01.in
Output Filename: P:\2020\20079-02 DWC Lake Rialto\Sted\2208XX\B-B' S\01.OUT
Unit System: English
Plotted Output Filename: P:\2020\20079-02 DWC Lake Rialto\Sted\2208XX\B-B' S\01.PLT
PROBLEM DESCRIPTION: DWC / Lake Rialto; B-B' S; Design
BOUNDARY COORDINATES
10 Top Boundaries
12 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	0.00	855.00	77.50	855.00	2
2	77.50	855.00	126.00	880.00	2
3	126.00	880.00	171.00	902.00	1
4	171.00	902.00	177.50	902.00	1
5	177.50	902.00	192.50	909.00	1
6	192.50	909.00	205.00	909.00	1
7	205.00	909.00	230.00	926.00	2
8	230.00	926.00	290.00	930.00	2
9	290.00	930.00	322.50	930.00	2
10	322.50	930.00	360.00	935.00	2
11	126.00	880.00	160.00	880.00	2
12	160.00	880.00	205.00	909.00	2

User Specified Y-Origin = 760.00(ft)
Default X-Plus Value = 0.00(ft)
Default Y-Plus Value = 0.00(ft)
ISOTROPIC SOIL PARAMETERS
3 Type(s) of Soil

Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
1	120.0	120.0	75.0	30.0	0.00	0.0	1
2	120.0	120.0	75.0	30.0	0.00	0.0	1
3	62.0	62.0	0.0	0.0	0.00	0.0	1

1 PIEZOMETRIC SURFACE(S) SPECIFIED
Unit Weight of Water = 62.40 (pcf)
Piezometric Surface No. 1 Specified by 3 Coordinate Points
Pore Pressure Inclination Factor = 0.50

Point No.	X-Water (ft)	Y-Water (ft)
1	0.00	905.00
2	184.00	905.00
3	360.00	817.00

A Critical Failure Surface Searching Method, Using A Random
Technique For Generating Circular Surfaces, Has Been Specified.
4800 Trial Surfaces Have Been Generated.
80 Surface(s) Initiate(s) From Each Of 60 Points Equally Spaced
Along The Ground Surface Between X = 0.00(ft)
and X = 77.50(ft)
Each Surface Terminates Between X = 184.00(ft)
and X = 267.00(ft)
Unless Further Limitations Were Imposed, The Minimum Elevation
At Which A Surface Extends Is Y = 0.00(ft)
10.00(ft) Line Segments Define Each Trial Failure Surface.
Following Are Displayed The Ten Most Critical Of The Trial

Failure Surfaces Evaluated. They Are
Ordered - Most Critical First.
* * Safety Factors Are Calculated By The Modified Bishop Method * *
Total Number of Trial Surfaces Attempted = 4800
Number of Trial Surfaces With Valid FS = 4800
Statistical Data On All Valid FS Values:
FS Max = 3.059 FS Min = 1.605 FS Ave = 2.241
Standard Deviation = 0.329 Coefficient of Variation = 14.69 %
Failure Surface Specified By 20 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	77.500	855.000
2	87.472	855.750
3	97.408	856.880
4	107.293	858.389
5	117.114	860.274
6	126.856	862.532
7	136.504	865.161
8	146.045	868.155
9	155.465	871.512
10	164.750	875.226
11	173.886	879.292
12	182.860	883.703
13	191.660	888.453
14	200.272	893.536
15	208.683	898.944
16	216.882	904.669
17	224.857	910.703
18	232.595	917.037
19	240.086	923.662
20	243.476	926.898

Circle Center At X = 62.925 ; Y = 1116.172 ; and Radius = 261.578

Factor of Safety
*** 1.605 ***

Individual data on the 29 slices

Slice No.	Width (ft)	Weight (lbs)	Water Force Top (lbs)	Water Force Bot (lbs)	Tie Force Norm (lbs)	Tie Force Tan (lbs)	Earthquake Force Hor (lbs)	Earthquake Force Ver (lbs)	Surcharge Load (lbs)
1	10.0	2626.5	33203.0	30965.9	0.	0.	0.0	0.0	0.0
2	9.9	7613.6	29504.6	30379.2	0.	0.	0.0	0.0	0.0
3	9.9	12070.2	25809.7	29556.0	0.	0.	0.0	0.0	0.0
4	9.8	15976.9	22138.9	28497.2	0.	0.	0.0	0.0	0.0
5	8.9	17493.9	17023.9	24871.2	0.	0.	0.0	0.0	0.0
6	0.9	1825.5	1473.6	2333.4	0.	0.	0.0	0.0	0.0
7	9.6	21917.8	14893.0	25679.9	0.	0.	0.0	0.0	0.0
8	9.5	23825.4	11618.7	23925.5	0.	0.	0.0	0.0	0.0
9	9.4	25172.0	8438.6	21943.7	0.	0.	0.0	0.0	0.0
10	4.5	12568.2	2988.2	9930.2	0.	0.	0.0	0.0	0.0
11	4.7	13398.4	2380.9	9807.5	0.	0.	0.0	0.0	0.0
12	6.3	17892.4	1965.7	12116.5	0.	0.	0.0	0.0	0.0
13	2.9	8086.8	540.3	5194.0	0.	0.	0.0	0.0	0.0
14	3.6	9463.0	676.5	6236.9	0.	0.	0.0	0.0	0.0
15	5.4	13421.8	645.7	8428.8	0.	0.	0.0	0.0	0.0
16	1.1	2838.4	18.2	1696.1	0.	0.	0.0	0.0	0.0
17	7.7	18783.8	0.0	8163.8	0.	0.	0.0	0.0	0.0
18	0.7	1617.4	0.0	539.7	0.	0.	0.0	0.0	0.0
19	0.2	409.0	0.0	131.8	0.	0.	0.0	0.0	0.0
20	7.8	16560.6	0.0	3833.7	0.	0.	0.0	0.0	0.0
21	2.9	5075.7	0.0	323.4	0.	0.	0.0	0.0	0.0
22	1.8	2835.7	0.0	0.0	0.	0.	0.0	0.0	0.0
23	3.7	5521.4	0.0	0.0	0.	0.	0.0	0.0	0.0
24	8.2	12284.1	0.0	0.0	0.	0.	0.0	0.0	0.0
25	8.0	11583.6	0.0	0.0	0.	0.	0.0	0.0	0.0
26	5.1	7062.5	0.0	0.0	0.	0.	0.0	0.0	0.0
27	2.6	3148.9	0.0	0.0	0.	0.	0.0	0.0	0.0
28	7.5	5459.4	0.0	0.0	0.	0.	0.0	0.0	0.0
29	3.4	612.4	0.0	0.0	0.	0.	0.0	0.0	0.0

Failure Surface Specified By 20 Coordinate Points

Point	X-Surf	Y-Surf

Point No.	X-Surf (ft)	Y-Surf (ft)
1	77.500	855.000
2	87.454	855.960
3	97.369	857.258
4	107.235	858.890
5	117.040	860.856
6	126.773	863.152
7	136.422	865.778
8	145.977	868.728
9	155.426	872.001
10	164.759	875.592
11	173.965	879.497
12	183.034	883.712
13	191.954	888.231
14	200.716	893.050
15	209.310	898.164
16	217.726	903.565
17	225.953	909.249
18	233.984	915.208
19	241.808	921.436
20	248.614	927.241

Circle Center At X = 54.173 ; Y = 1149.030 ; and Radius = 294.954

Factor of Safety

*** 1.610 ***

Failure Surface Specified By 20 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	77.500	855.000
2	87.427	856.210
3	97.305	857.762
4	107.124	859.656
5	116.872	861.888
6	126.537	864.456
7	136.107	867.358
8	145.570	870.589
9	154.916	874.145
10	164.134	878.023
11	173.212	882.217
12	182.139	886.724
13	190.905	891.536
14	199.499	896.649
15	207.911	902.057
16	216.130	907.752
17	224.148	913.729
18	231.954	919.979
19	239.539	926.496
20	239.703	926.647

Circle Center At X = 47.535 ; Y = 1142.268 ; and Radius = 288.826

Factor of Safety

*** 1.615 ***

Failure Surface Specified By 20 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	77.500	855.000
2	87.391	856.471
3	97.233	858.242
4	107.017	860.311
5	116.733	862.678
6	126.372	865.338
7	135.926	868.291
8	145.386	871.533
9	154.743	875.061
10	163.989	878.872
11	173.114	882.963
12	182.110	887.329
13	190.969	891.967
14	199.684	896.872
15	208.245	902.040
16	216.645	907.466
17	224.876	913.145

18	232.930	919.072
19	240.800	925.241
20	242.727	926.848

Circle Center At X = 34.203 ; Y = 1180.477 ; and Radius = 328.344

Factor of Safety

*** 1.616 ***

Failure Surface Specified By 20 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	77.500	855.000
2	87.348	856.737
3	97.147	858.732
4	106.890	860.985
5	116.570	863.493
6	126.181	866.255
7	135.716	869.269
8	145.169	872.532
9	154.532	876.044
10	163.800	879.800
11	172.965	883.800
12	182.022	888.039
13	190.965	892.514
14	199.786	897.224
15	208.481	902.164
16	217.042	907.331
17	225.465	912.722
18	233.743	918.332
19	241.870	924.159
20	245.681	927.045

Circle Center At X = 16.585 ; Y = 1229.521 ; and Radius = 379.443

Factor of Safety

*** 1.626 ***

Failure Surface Specified By 21 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	77.500	855.000
2	87.490	855.445
3	97.457	856.258
4	107.387	857.437
5	117.267	858.981
6	127.084	860.888
7	136.824	863.155
8	146.473	865.779
9	156.019	868.756
10	165.450	872.084
11	174.751	875.756
12	183.911	879.768
13	192.917	884.115
14	201.756	888.790
15	210.418	893.788
16	218.890	899.101
17	227.160	904.723
18	235.217	910.646
19	243.051	916.861
20	250.651	923.360
21	255.352	927.690

Circle Center At X = 70.412 ; Y = 1126.423 ; and Radius = 271.516

Factor of Safety

*** 1.631 ***

Failure Surface Specified By 15 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	77.500	855.000
2	87.475	855.714
3	97.390	857.013
4	107.211	858.895
5	116.905	861.351
6	126.437	864.373
7	135.775	867.951
8	144.886	872.073

9	153.739	876.724
10	162.302	881.888
11	170.547	887.547
12	178.444	893.682
13	185.966	900.271
14	193.088	907.291
15	194.628	909.000

Circle Center At X = 70.373 ; Y = 1024.650 ; and Radius = 169.799

Factor of Safety

*** 1.634 ***

Failure Surface Specified By 22 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	59.110	855.000
2	69.069	854.094
3	79.060	853.662
4	89.060	853.706
5	99.046	854.226
6	108.997	855.220
7	118.889	856.686
8	128.700	858.620
9	138.407	861.020
10	147.990	863.878
11	157.426	867.189
12	166.694	870.945
13	175.773	875.137
14	184.642	879.757
15	193.281	884.793
16	201.671	890.234
17	209.793	896.068
18	217.628	902.282
19	225.159	908.861
20	232.368	915.791
21	239.240	923.056
22	242.485	926.832

Circle Center At X = 83.166 ; Y = 1063.567 ; and Radius = 209.949

Factor of Safety

*** 1.640 ***

Failure Surface Specified By 22 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	59.110	855.000
2	69.060	853.999
3	79.046	853.464
4	89.045	853.396
5	99.037	853.795
6	109.000	854.660
7	118.911	855.989
8	128.750	857.779
9	138.494	860.027
10	148.122	862.728
11	157.614	865.875
12	166.949	869.462
13	176.105	873.481
14	185.065	877.923
15	193.807	882.779
16	202.312	888.037
17	210.563	893.687
18	218.542	899.716
19	226.229	906.111
20	233.610	912.858
21	240.668	919.942
22	247.205	927.147

Circle Center At X = 85.509 ; Y = 1067.441 ; and Radius = 214.075

Factor of Safety

*** 1.644 ***

Failure Surface Specified By 15 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	77.500	855.000

2	87.416	856.297
3	97.258	858.065
4	107.005	860.302
5	116.633	863.002
6	126.122	866.158
7	135.449	869.764
8	144.594	873.812
9	153.534	878.291
10	162.251	883.192
11	170.723	888.504
12	178.932	894.215
13	186.860	900.311
14	194.486	906.778
15	196.866	909.000

Circle Center At X = 55.321 ; Y = 1063.158 ; and Radius = 209.336

Factor of Safety

*** 1.644 ***

**** END OF GSTABL7 OUTPUT ****

DWC / Lake Rialto; B-B' S; Design; P-static

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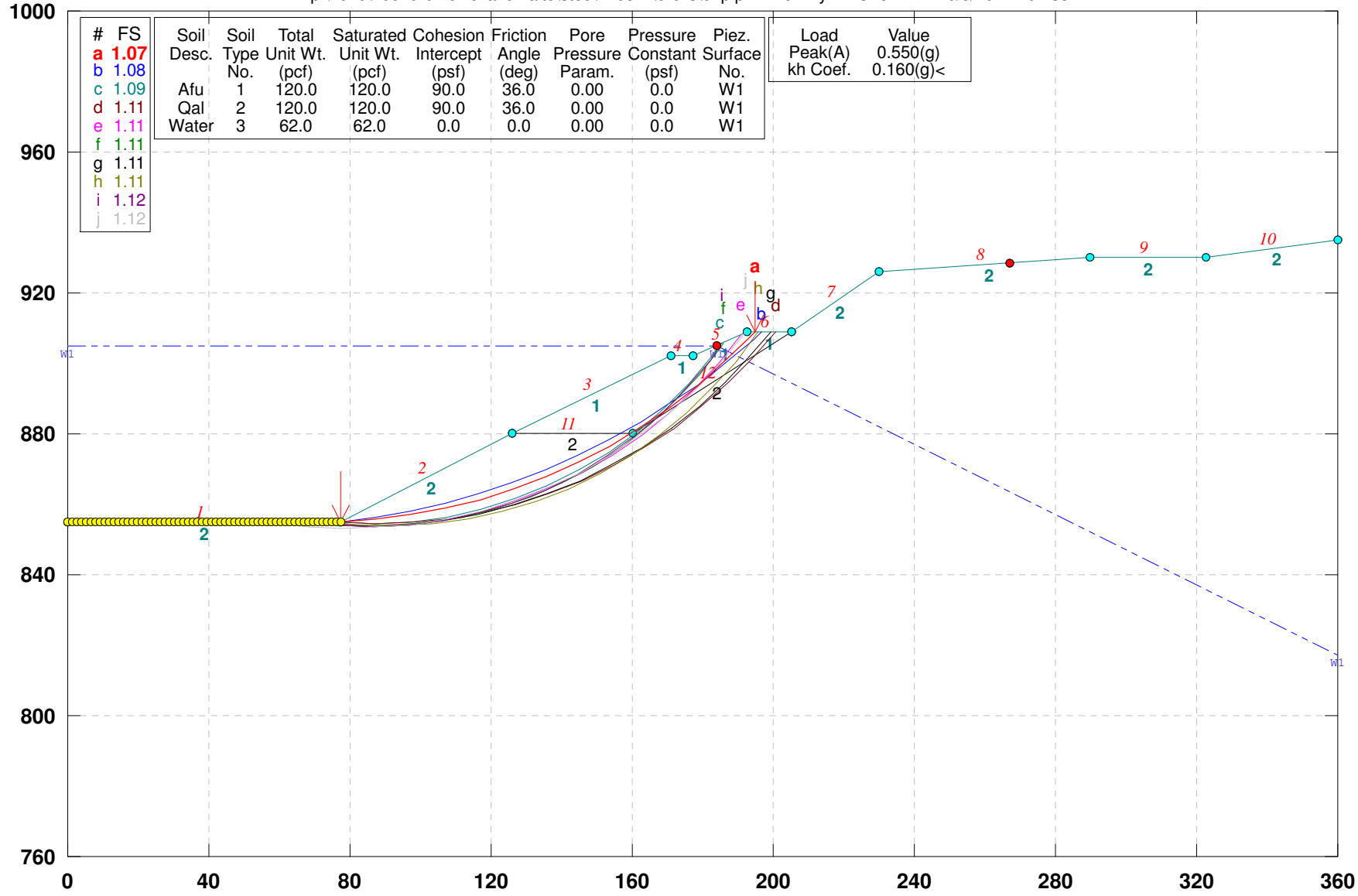


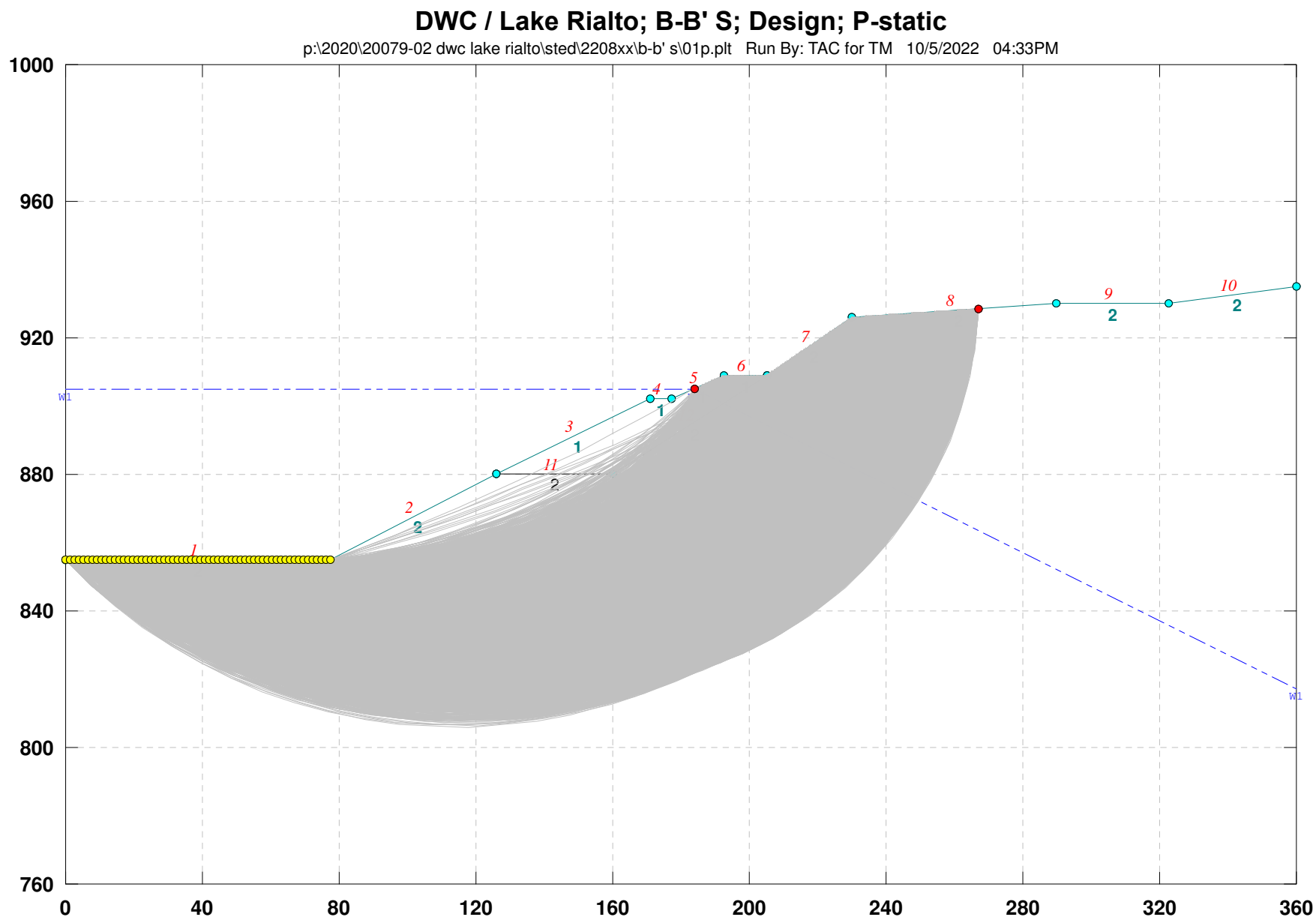
#	FS
a	1.07
b	1.08
c	1.09
d	1.11
e	1.11
f	1.11
g	1.11
h	1.11
i	1.12
j	1.12

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
Afu	1	120.0	120.0	90.0	36.0	0.00	0.0	W1
Qal	2	120.0	120.0	90.0	36.0	0.00	0.0	W1
Water	3	62.0	62.0	0.0	0.0	0.00	0.0	W1

Load	Value
Peak(A)	0.550(g)
kh Coef.	0.160(g)<

GSTABL7 v.2 FSmin=1.07

Safety Factors Are Calculated By The Modified Bishop Method


DWC / Lake Rialto; B-B' S; Design; P-static
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1000
960
920
880
840
800
760
0
40
80
120
160
200
240
280
320
360
W1
W1
1
2
3
4
5
6
7
8
9
10
11
1
2
1
1
2
2
2

***** GSTABL7 *****

** GSTABL7 by Dr. Garry H. Gregory, Ph.D.,P.E.,D.GE **
** Original Version 1.0, January 1996; Current Ver. 2.005.3, Feb. 2013 **
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SLOPE STABILITY ANALYSIS SYSTEM

Modified Bishop, Simplified Janbu, or GLE Method of Slices.
(Includes Spencer & Morgenstern-Price Type Analysis)
Including Pier/Pile, Reinforcement, Soil Nail, Tieback,
Nonlinear Undrained Shear Strength, Curved Phi Envelope,
Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water
Surfaces, Pseudo-Static & Newmark Earthquake, and Applied Forces.

****

Analysis Run Date: 10/5/2022
Time of Run: 04:33PM
Run By: TAC for TM
Input Data Filename: P:\2020\20079-02 DWC Lake Rialto\Sted\2208XX\B-B' S\01p.in
Output Filename: P:\2020\20079-02 DWC Lake Rialto\Sted\2208XX\B-B' S\01p.OUT
Unit System: English
Plotted Output Filename: P:\2020\20079-02 DWC Lake Rialto\Sted\2208XX\B-B' S\01p.PLT
PROBLEM DESCRIPTION: DWC / Lake Rialto; B-B' S; Design; P-sta
tic

BOUNDARY COORDINATES
10 Top Boundaries
12 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	0.00	855.00	77.50	855.00	2
2	77.50	855.00	126.00	880.00	2
3	126.00	880.00	171.00	902.00	1
4	171.00	902.00	177.50	902.00	1
5	177.50	902.00	192.50	909.00	1
6	192.50	909.00	205.00	909.00	1
7	205.00	909.00	230.00	926.00	2
8	230.00	926.00	290.00	930.00	2
9	290.00	930.00	322.50	930.00	2
10	322.50	930.00	360.00	935.00	2
11	126.00	880.00	160.00	880.00	2
12	160.00	880.00	205.00	909.00	2

User Specified Y-Origin = 760.00(ft)
Default X-Plus Value = 0.00(ft)
Default Y-Plus Value = 0.00(ft)

ISOTROPIC SOIL PARAMETERS
3 Type(s) of Soil

Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
1	120.0	120.0	90.0	36.0	0.00	0.0	1
2	120.0	120.0	90.0	36.0	0.00	0.0	1
3	62.0	62.0	0.0	0.0	0.00	0.0	1

1 PIEZOMETRIC SURFACE(S) SPECIFIED
Unit Weight of Water = 62.40 (pcf)
Piezometric Surface No. 1 Specified by 3 Coordinate Points
Pore Pressure Inclination Factor = 0.50

Point No.	X-Water (ft)	Y-Water (ft)
1	0.00	905.00
2	184.00	905.00
3	360.00	817.00

Specified Peak Ground Acceleration Coefficient (A) = 0.550(g)
Specified Horizontal Earthquake Coefficient (kh) = 0.160(g)
Specified Vertical Earthquake Coefficient (kv) = 0.000(g)
Specified Seismic Pore-Pressure Factor = 0.000
A Critical Failure Surface Searching Method, Using A Random
Technique For Generating Circular Surfaces, Has Been Specified.
4800 Trial Surfaces Have Been Generated.
80 Surface(s) Initiate(s) From Each Of 60 Points Equally Spaced
Along The Ground Surface Between X = 0.00(ft)
and X = 77.50(ft)
Each Surface Terminates Between X = 184.00(ft)

and X = 267.00(ft)
Unless Further Limitations Were Imposed, The Minimum Elevation
At Which A Surface Extends Is Y = 0.00(ft)
10.00(ft) Line Segments Define Each Trial Failure Surface.
Following Are Displayed The Ten Most Critical Of The Trial
Failure Surfaces Evaluated. They Are
Ordered - Most Critical First.
* * Safety Factors Are Calculated By The Modified Bishop Method * *
Total Number of Trial Surfaces Attempted = 4800
Number of Trial Surfaces With Valid FS = 4800
Statistical Data On All Valid FS Values:
FS Max = 2.052 FS Min = 1.074 FS Ave = 1.542
Standard Deviation = 0.236 Coefficient of Variation = 15.30 %
Failure Surface Specified By 15 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	77.500	855.000
2	87.475	855.714
3	97.390	857.013
4	107.211	858.895
5	116.905	861.351
6	126.437	864.373
7	135.775	867.951
8	144.886	872.073
9	153.739	876.724
10	162.302	881.888
11	170.547	887.547
12	178.444	893.682
13	185.966	900.271
14	193.088	907.291
15	194.628	909.000

Circle Center At X = 70.373 ; Y = 1024.650 ; and Radius = 169.799
Factor of Safety
*** 1.074 ***
Individual data on the 21 slices

Slice No.	Width (ft)	Weight (lbs)	Water Force Top (lbs)	Water Force Bot (lbs)	Tie Force Norm (lbs)	Tie Force Tan (lbs)	Earthquake Force Hor (lbs)	Earthquake Force Ver (lbs)	Surcharge Load (lbs)
1	10.0	2649.9	33211.4	30977.3	0.	0.	424.0	0.0	0.0
2	9.9	7535.6	29445.8	30349.1	0.	0.	1205.7	0.0	0.0
3	9.8	11585.2	25660.2	29356.7	0.	0.	1853.6	0.0	0.0
4	9.7	14762.6	21903.6	28003.5	0.	0.	2362.0	0.0	0.0
5	9.1	16222.2	17459.1	25129.5	0.	0.	2595.5	0.0	0.0
6	0.4	829.1	756.0	1164.8	0.	0.	132.7	0.0	0.0
7	9.3	18303.2	14595.6	24234.9	0.	0.	2928.5	0.0	0.0
8	9.1	18579.9	11387.2	21832.4	0.	0.	2972.8	0.0	0.0
9	8.9	18057.8	8364.2	19095.3	0.	0.	2889.3	0.0	0.0
10	5.4	10774.0	3815.2	10544.8	0.	0.	1723.8	0.0	0.0
11	3.1	6025.8	1743.6	5488.2	0.	0.	964.1	0.0	0.0
12	8.2	14885.2	2999.0	12656.2	0.	0.	2381.6	0.0	0.0
13	0.5	770.5	97.9	618.8	0.	0.	123.3	0.0	0.0
14	6.5	9029.3	1216.8	7486.3	0.	0.	1444.7	0.0	0.0
15	0.9	1008.6	180.7	871.5	0.	0.	161.4	0.0	0.0
16	5.6	5081.6	483.2	4094.9	0.	0.	813.1	0.0	0.0
17	2.0	1435.1	0.0	748.5	0.	0.	229.6	0.0	0.0
18	2.5	1520.4	0.0	372.4	0.	0.	243.3	0.0	0.0
19	4.0	1603.2	0.0	0.0	0.	0.	256.5	0.0	0.0
20	0.6	140.9	0.0	0.0	0.	0.	22.5	0.0	0.0
21	1.5	157.9	0.0	0.0	0.	0.	25.3	0.0	0.0

Failure Surface Specified By 15 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	77.500	855.000
2	87.416	856.297
3	97.258	858.065
4	107.005	860.302
5	116.633	863.002
6	126.122	866.158
7	135.449	869.764

8	144.594	873.812
9	153.534	878.291
10	162.251	883.192
11	170.723	888.504
12	178.932	894.215
13	186.860	900.311
14	194.486	906.778
15	196.866	909.000

Circle Center At X = 55.321 ; Y = 1063.158 ; and Radius = 209.336

Factor of Safety

*** 1.080 ***

Failure Surface Specified By 14 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	77.500	855.000
2	87.494	854.663
3	97.482	855.153
4	107.396	856.466
5	117.167	858.595
6	126.728	861.523
7	136.015	865.232
8	144.963	869.696
9	153.512	874.884
10	161.604	880.760
11	169.181	887.286
12	176.194	894.415
13	182.593	902.099
14	184.968	905.485

Circle Center At X = 86.637 ; Y = 975.176 ; and Radius = 120.523

Factor of Safety

*** 1.094 ***

Failure Surface Specified By 15 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	77.500	855.000
2	87.492	854.592
3	97.487	854.885
4	107.438	855.876
5	117.295	857.560
6	127.010	859.930
7	136.536	862.974
8	145.825	866.677
9	154.833	871.020
10	163.514	875.983
11	171.828	881.541
12	179.732	887.667
13	187.188	894.331
14	194.159	901.500
15	200.495	909.000

Circle Center At X = 88.315 ; Y = 997.456 ; and Radius = 142.866

Factor of Safety

*** 1.105 ***

Failure Surface Specified By 16 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	68.305	855.000
2	78.266	854.114
3	88.265	853.993
4	98.244	854.636
5	108.145	856.041
6	117.910	858.199
7	127.480	861.097
8	136.801	864.719
9	145.818	869.043
10	154.478	874.044
11	162.730	879.692
12	170.526	885.955
13	177.820	892.796
14	184.570	900.174
15	190.736	908.047

16	190.861	908.235

Circle Center At X = 84.856 ; Y = 984.587 ; and Radius = 130.639

Factor of Safety

*** 1.106 ***

Failure Surface Specified By 15 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	72.246	855.000
2	82.203	854.072
3	92.202	853.992
4	102.173	854.760
5	112.042	856.370
6	121.739	858.812
7	131.195	862.068
8	140.340	866.113
9	149.109	870.920
10	157.439	876.453
11	165.270	882.672
12	172.545	889.533
13	179.212	896.986
14	185.223	904.978
15	185.778	905.863

Circle Center At X = 88.148 ; Y = 971.737 ; and Radius = 117.815

Factor of Safety

*** 1.109 ***

Failure Surface Specified By 16 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	66.992	855.000
2	76.948	854.064
3	86.945	853.816
4	96.935	854.258
5	106.871	855.388
6	116.705	857.200
7	126.391	859.685
8	135.883	862.833
9	145.135	866.627
10	154.104	871.051
11	162.746	876.082
12	171.021	881.697
13	178.889	887.869
14	186.313	894.568
15	193.257	901.764
16	199.334	909.000

Circle Center At X = 85.544 ; Y = 998.705 ; and Radius = 144.898

Factor of Safety

*** 1.112 ***

Failure Surface Specified By 16 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	73.559	855.000
2	83.511	854.021
3	93.509	853.829
4	103.492	854.425
5	113.396	855.806
6	123.161	857.963
7	132.725	860.882
8	142.030	864.546
9	151.017	868.932
10	159.630	874.011
11	167.817	879.754
12	175.526	886.124
13	182.709	893.081
14	189.322	900.582
15	195.323	908.581
16	195.589	909.000

Circle Center At X = 90.952 ; Y = 980.577 ; and Radius = 126.776

Factor of Safety

*** 1.112 ***

Failure Surface Specified By 15 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	66.992	855.000
2	76.924	853.844
3	86.919	853.511
4	96.907	854.004
5	106.820	855.319
6	116.591	857.448
7	126.153	860.376
8	135.440	864.082
9	144.391	868.542
10	152.943	873.725
11	161.038	879.596
12	168.621	886.115
13	175.641	893.237
14	182.049	900.914
15	185.408	905.690

Circle Center At X = 85.948 ; Y = 974.617 ; and Radius = 121.110

Factor of Safety

*** 1.115 ***

Failure Surface Specified By 17 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	57.797	855.000
2	67.718	853.750
3	77.703	853.208
4	87.702	853.377
5	97.663	854.256
6	107.537	855.841
7	117.273	858.124
8	126.822	861.093
9	136.136	864.733
10	145.168	869.026
11	153.872	873.949
12	162.204	879.479
13	170.122	885.587
14	177.585	892.242
15	184.557	899.411
16	191.002	907.057
17	192.374	908.941

Circle Center At X = 80.326 ; Y = 993.806 ; and Radius = 140.622

Factor of Safety

*** 1.120 ***

**** END OF GSTABL7 OUTPUT ****

DWC / Lake Rialto; B-B' S; Rapid Drawdown

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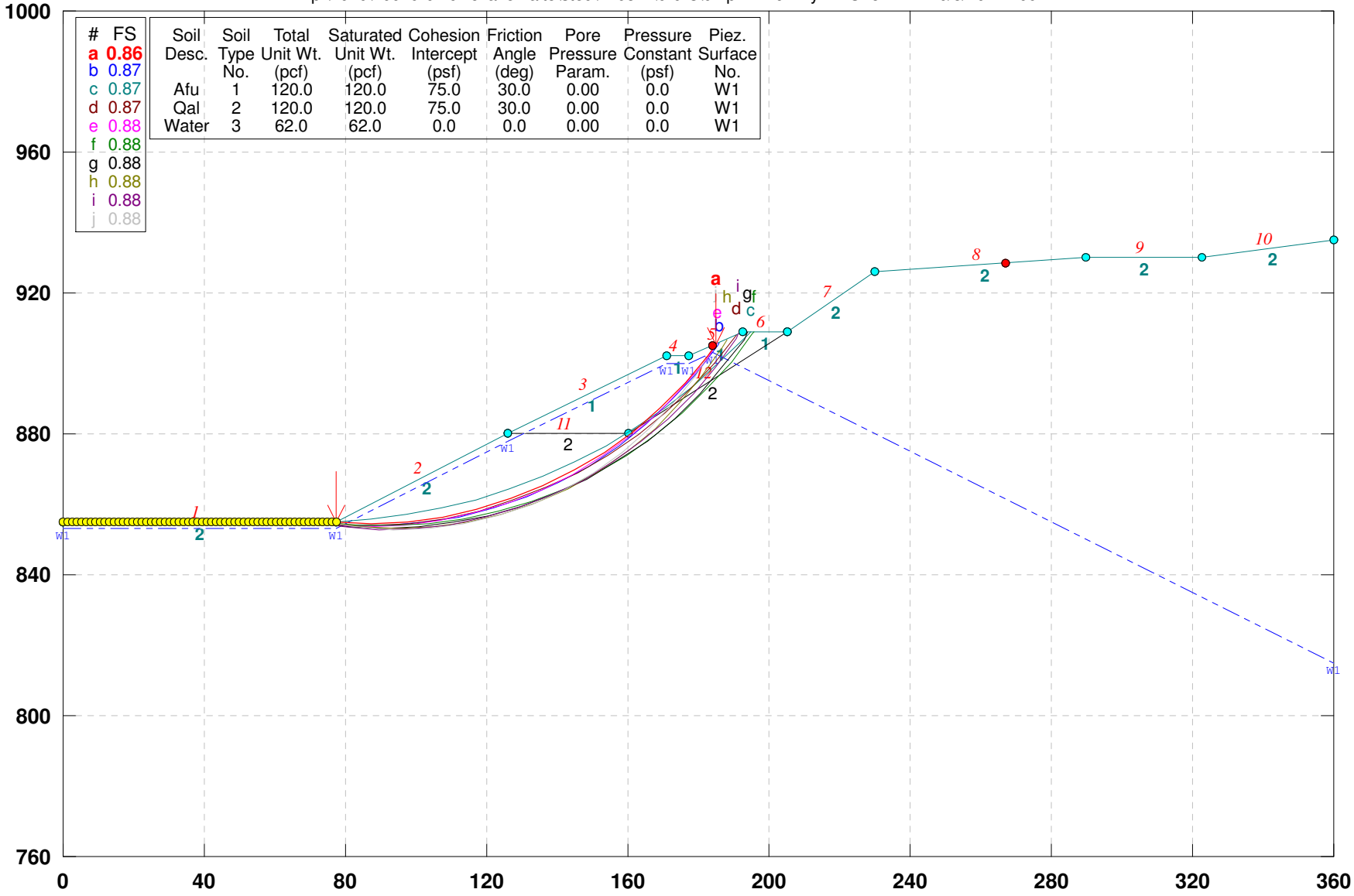

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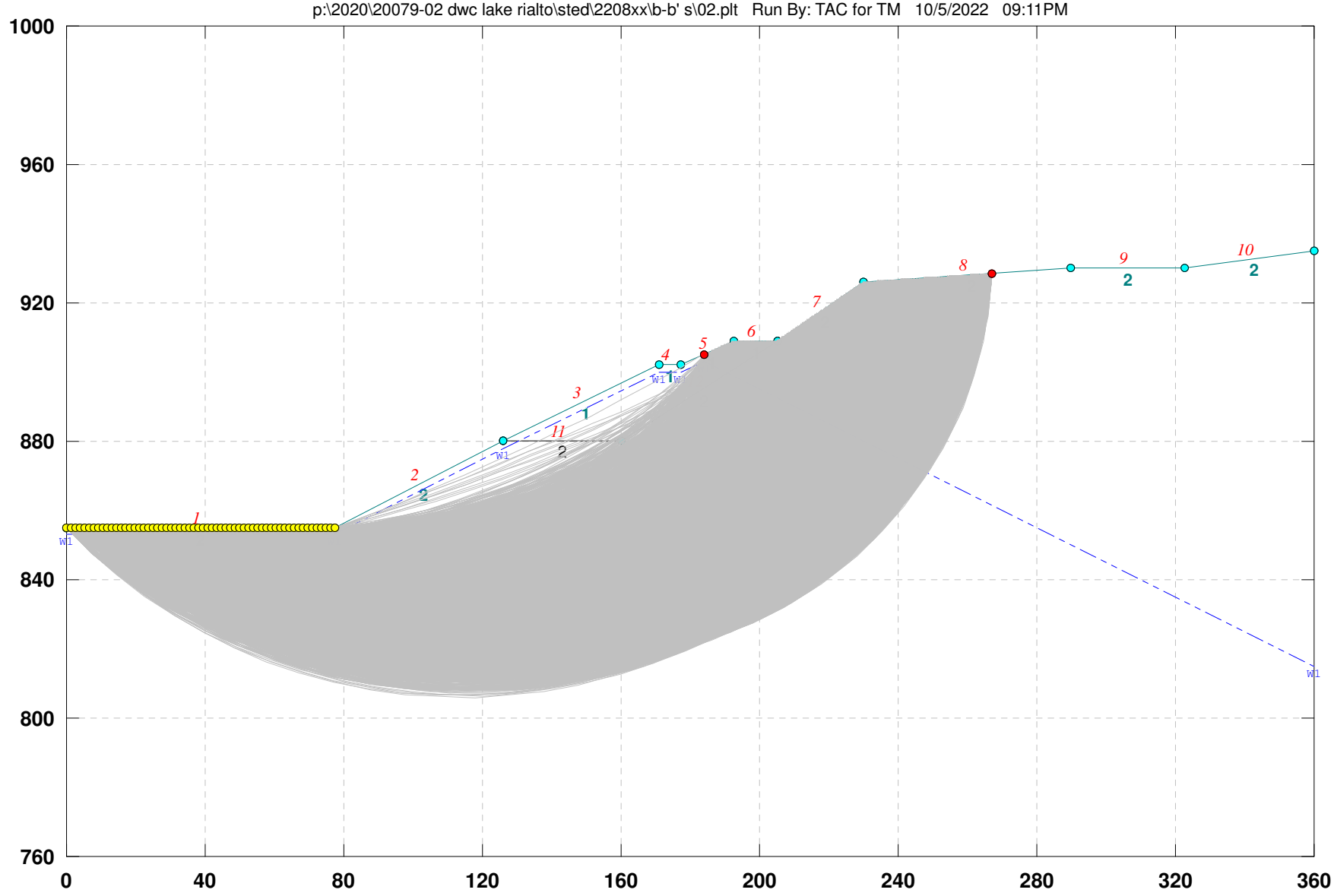
Safety Factors Are Calculated By The Modified Bishop Method


DWC / Lake Rialto; B-B' S; Rapid Drawdown
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920
880
840
800
760
0
40
80
120
160
200
240
280
320
360
W1

***** GSTABL7 *****

** GSTABL7 by Dr. Garry H. Gregory, Ph.D.,P.E.,D.GE **
** Original Version 1.0, January 1996; Current Ver. 2.005.3, Feb. 2013 **
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SLOPE STABILITY ANALYSIS SYSTEM
Modified Bishop, Simplified Janbu, or GLE Method of Slices.
(Includes Spencer & Morgenstern-Price Type Analysis)
Including Pier/Pile, Reinforcement, Soil Nail, Tieback,
Nonlinear Undrained Shear Strength, Curved Phi Envelope,
Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water
Surfaces, Pseudo-Static & Newmark Earthquake, and Applied Forces.

****

Analysis Run Date: 10/5/2022
Time of Run: 09:11PM
Run By: TAC for TM
Input Data Filename: P:\2020\20079-02 DWC Lake Rialto\Sted\2208XX\B-B' S\02.in
Output Filename: P:\2020\20079-02 DWC Lake Rialto\Sted\2208XX\B-B' S\02.OUT
Unit System: English
Plotted Output Filename: P:\2020\20079-02 DWC Lake Rialto\Sted\2208XX\B-B' S\02.PLT
PROBLEM DESCRIPTION: DWC / Lake Rialto; B-B' S; Rapid Drawdow
n

BOUNDARY COORDINATES
10 Top Boundaries
12 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	0.00	855.00	77.50	855.00	2
2	77.50	855.00	126.00	880.00	2
3	126.00	880.00	171.00	902.00	1
4	171.00	902.00	177.50	902.00	1
5	177.50	902.00	192.50	909.00	1
6	192.50	909.00	205.00	909.00	1
7	205.00	909.00	230.00	926.00	2
8	230.00	926.00	290.00	930.00	2
9	290.00	930.00	322.50	930.00	2
10	322.50	930.00	360.00	935.00	2
11	126.00	880.00	160.00	880.00	2
12	160.00	880.00	205.00	909.00	2

User Specified Y-Origin = 760.00(ft)
Default X-Plus Value = 0.00(ft)
Default Y-Plus Value = 0.00(ft)

ISOTROPIC SOIL PARAMETERS
3 Type(s) of Soil

Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
1	120.0	120.0	75.0	30.0	0.00	0.0	1
2	120.0	120.0	75.0	30.0	0.00	0.0	1
3	62.0	62.0	0.0	0.0	0.00	0.0	1

1 PIEZOMETRIC SURFACE(S) SPECIFIED
Unit Weight of Water = 62.40 (pcf)
Piezometric Surface No. 1 Specified by 7 Coordinate Points
Pore Pressure Inclination Factor = 0.50

Point No.	X-Water (ft)	Y-Water (ft)
1	0.00	853.00
2	77.50	853.00
3	126.00	878.00
4	171.00	900.00
5	177.50	900.00
6	184.00	903.00
7	360.00	815.00

A Critical Failure Surface Searching Method, Using A Random
Technique For Generating Circular Surfaces, Has Been Specified.
4800 Trial Surfaces Have Been Generated.
80 Surface(s) Initiate(s) From Each Of 60 Points Equally Spaced
Along The Ground Surface Between X = 0.00(ft)
and X = 77.50(ft)

Each Surface Terminates Between X = 184.00(ft)
and X = 267.00(ft)
Unless Further Limitations Were Imposed, The Minimum Elevation
At Which A Surface Extends Is Y = 0.00(ft)
10.00(ft) Line Segments Define Each Trial Failure Surface.
Following Are Displayed The Ten Most Critical Of The Trial
Failure Surfaces Evaluated. They Are
Ordered - Most Critical First.
* * Safety Factors Are Calculated By The Modified Bishop Method * *
Total Number of Trial Surfaces Attempted = 4800
Number of Trial Surfaces With Valid FS = 4800
Statistical Data On All Valid FS Values:
FS Max = 1.830 FS Min = 0.859 FS Ave = 1.326
Standard Deviation = 0.203 Coefficient of Variation = 15.29 %
Failure Surface Specified By 14 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	77.500	855.000
2	87.494	854.663
3	97.482	855.153
4	107.396	856.466
5	117.167	858.595
6	126.728	861.523
7	136.015	865.232
8	144.963	869.696
9	153.512	874.884
10	161.604	880.760
11	169.181	887.286
12	176.194	894.415
13	182.593	902.099
14	184.968	905.485

Circle Center At X = 86.637 ; Y = 975.176 ; and Radius = 120.523
Factor of Safety
*** 0.859 ***
Individual data on the 21 slices

Slice No.	Width (ft)	Weight (lbs)	Water Force Top (lbs)	Water Force Bot (lbs)	Tie Force Norm (lbs)	Tie Force Tan (lbs)	Earthquake Force Hor (lbs)	Earthquake Force Ver (lbs)	Surcharge Load (lbs)
1	3.6	437.0	0.0	0.0	0.	0.	0.0	0.0	0.0
2	6.4	2854.5	0.0	619.3	0.	0.	0.0	0.0	0.0
3	10.0	9370.6	0.0	3249.5	0.	0.	0.0	0.0	0.0
4	9.9	14329.4	0.0	5610.5	0.	0.	0.0	0.0	0.0
5	9.8	18054.0	0.0	7482.7	0.	0.	0.0	0.0	0.0
6	8.8	18842.5	0.0	8139.9	0.	0.	0.0	0.0	0.0
7	0.7	1639.6	0.0	719.8	0.	0.	0.0	0.0	0.0
8	3.4	7660.4	0.0	3467.3	0.	0.	0.0	0.0	0.0
9	5.9	13790.1	0.0	6257.5	0.	0.	0.0	0.0	0.0
10	8.9	21068.0	0.0	9934.2	0.	0.	0.0	0.0	0.0
11	8.5	19564.6	0.0	9624.9	0.	0.	0.0	0.0	0.0
12	6.5	13854.7	0.0	7141.3	0.	0.	0.0	0.0	0.0
13	1.6	3239.6	0.0	1657.8	0.	0.	0.0	0.0	0.0
14	1.3	2481.5	0.0	1351.1	0.	0.	0.0	0.0	0.0
15	6.3	11372.6	0.0	6111.3	0.	0.	0.0	0.0	0.0
16	1.8	2912.7	0.0	1659.0	0.	0.	0.0	0.0	0.0
17	5.2	6373.0	0.0	3801.4	0.	0.	0.0	0.0	0.0
18	1.3	1066.1	0.0	611.5	0.	0.	0.0	0.0	0.0
19	5.1	2534.8	0.0	966.9	0.	0.	0.0	0.0	0.0
20	0.3	67.5	0.0	3.3	0.	0.	0.0	0.0	0.0
21	2.1	257.2	0.0	0.0	0.	0.	0.0	0.0	0.0

Failure Surface Specified By 15 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	72.246	855.000
2	82.203	854.072
3	92.202	853.992
4	102.173	854.760
5	112.042	856.370
6	121.739	858.812
7	131.195	862.068

8	140.340	866.113
9	149.109	870.920
10	157.439	876.453
11	165.270	882.672
12	172.545	889.533
13	179.212	896.986
14	185.223	904.978
15	185.778	905.863

Circle Center At X = 88.148 ; Y = 971.737 ; and Radius = 117.815

Factor of Safety

*** 0.867 ***

Failure Surface Specified By 15 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	77.500	855.000
2	87.475	855.714
3	97.390	857.013
4	107.211	858.895
5	116.905	861.351
6	126.437	864.373
7	135.775	867.951
8	144.886	872.073
9	153.739	876.724
10	162.302	881.888
11	170.547	887.547
12	178.444	893.682
13	185.966	900.271
14	193.088	907.291
15	194.628	909.000

Circle Center At X = 70.373 ; Y = 1024.650 ; and Radius = 169.799

Factor of Safety

*** 0.870 ***

Failure Surface Specified By 16 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	68.305	855.000
2	78.266	854.114
3	88.265	853.993
4	98.244	854.636
5	108.145	856.041
6	117.910	858.199
7	127.480	861.097
8	136.801	864.719
9	145.818	869.043
10	154.478	874.044
11	162.730	879.692
12	170.526	885.955
13	177.820	892.796
14	184.570	900.174
15	190.736	908.047
16	190.861	908.235

Circle Center At X = 84.856 ; Y = 984.587 ; and Radius = 130.639

Factor of Safety

*** 0.871 ***

Failure Surface Specified By 15 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	66.992	855.000
2	76.924	853.844
3	86.919	853.511
4	96.907	854.004
5	106.820	855.319
6	116.591	857.448
7	126.153	860.376
8	135.440	864.082
9	144.391	868.542
10	152.943	873.725
11	161.038	879.596
12	168.621	886.115
13	175.641	893.237

14	182.049	900.914
15	185.408	905.690

Circle Center At X = 85.948 ; Y = 974.617 ; and Radius = 121.110

Factor of Safety

*** 0.875 ***

Failure Surface Specified By 16 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	73.559	855.000
2	83.511	854.021
3	93.509	853.829
4	103.492	854.425
5	113.396	855.806
6	123.161	857.963
7	132.725	860.882
8	142.030	864.546
9	151.017	868.932
10	159.630	874.011
11	167.817	879.754
12	175.526	886.124
13	182.709	893.081
14	189.322	900.582
15	195.323	908.581
16	195.589	909.000

Circle Center At X = 90.952 ; Y = 980.577 ; and Radius = 126.776

Factor of Safety

*** 0.876 ***

Failure Surface Specified By 16 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	70.932	855.000
2	80.849	853.712
3	90.838	853.239
4	100.832	853.584
5	110.764	854.744
6	120.569	856.711
7	130.180	859.473
8	139.533	863.011
9	148.566	867.302
10	157.218	872.316
11	165.431	878.020
12	173.151	884.377
13	180.326	891.342
14	186.908	898.871
15	192.852	906.912
16	194.146	909.000

Circle Center At X = 91.652 ; Y = 975.294 ; and Radius = 122.065

Factor of Safety

*** 0.878 ***

Failure Surface Specified By 15 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	74.873	855.000
2	84.773	853.593
3	94.762	853.111
4	104.752	853.559
5	114.657	854.933
6	124.392	857.220
7	133.873	860.401
8	143.017	864.448
9	151.746	869.328
10	159.984	874.996
11	167.660	881.405
12	174.708	888.499
13	181.067	896.217
14	186.682	904.491
15	188.011	906.905

Circle Center At X = 94.944 ; Y = 960.699 ; and Radius = 107.587

Factor of Safety

*** 0.878 ***

Failure Surface Specified By 16 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	69.619	855.000
2	79.511	853.538
3	89.492	852.924
4	99.489	853.162
5	109.430	854.251
6	119.242	856.183
7	128.853	858.944
8	138.194	862.513
9	147.197	866.866
10	155.797	871.969
11	163.931	877.787
12	171.539	884.276
13	178.567	891.390
14	184.963	899.077
15	190.682	907.281
16	191.369	908.472

Circle Center At X = 91.715 ; Y = 970.033 ; and Radius = 117.136

Factor of Safety

*** 0.879 ***

Failure Surface Specified By 15 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	73.559	855.000
2	83.435	853.427
3	93.416	852.814
4	103.410	853.168
5	113.323	854.485
6	123.062	856.752
7	132.538	859.948
8	141.660	864.044
9	150.345	869.002
10	158.511	874.774
11	166.081	881.308
12	172.986	888.542
13	179.160	896.408
14	184.546	904.834
15	184.850	905.430

Circle Center At X = 94.758 ; Y = 956.297 ; and Radius = 103.491

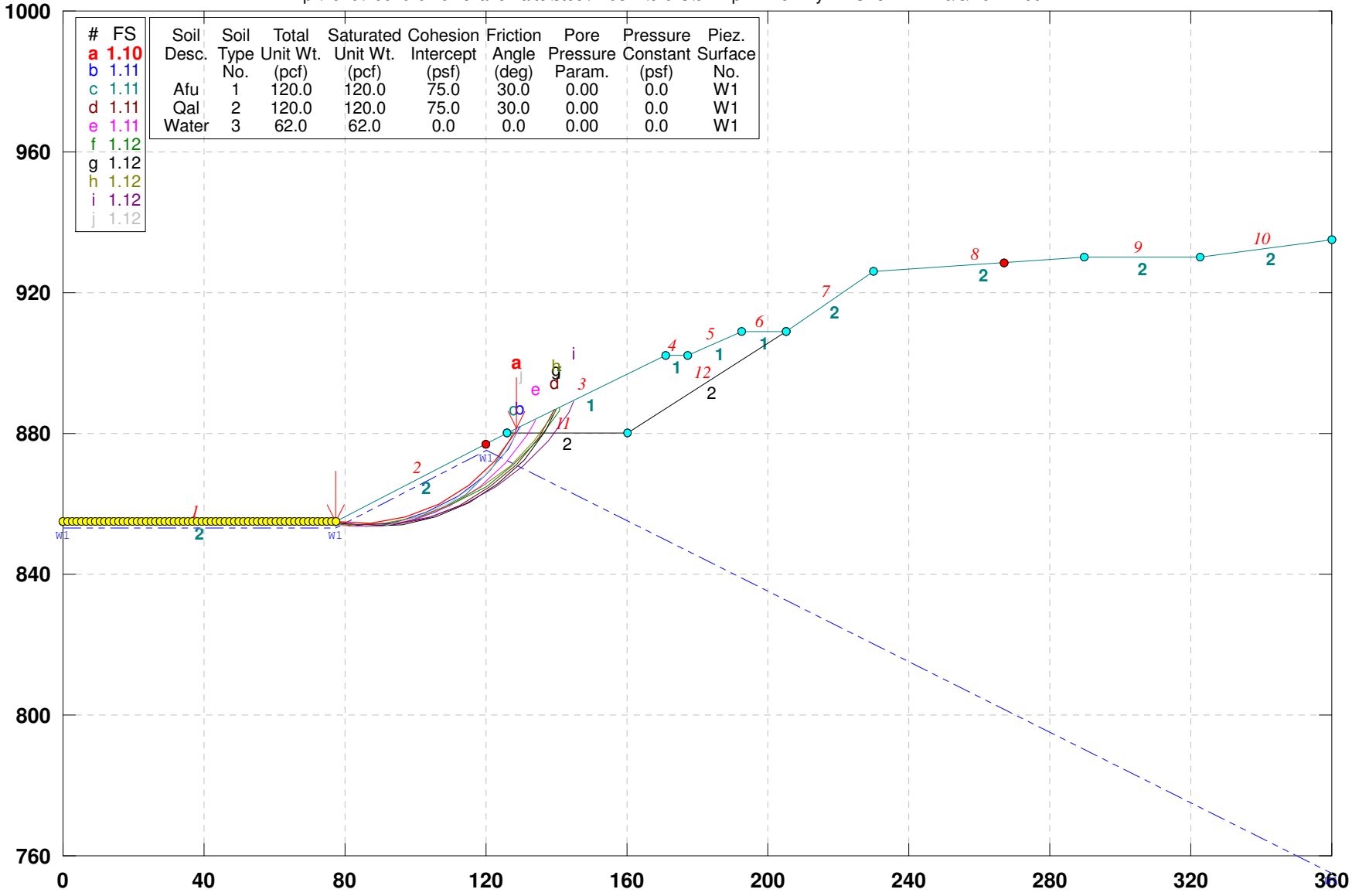
Factor of Safety

*** 0.881 ***

**** END OF GSTABL7 OUTPUT ****

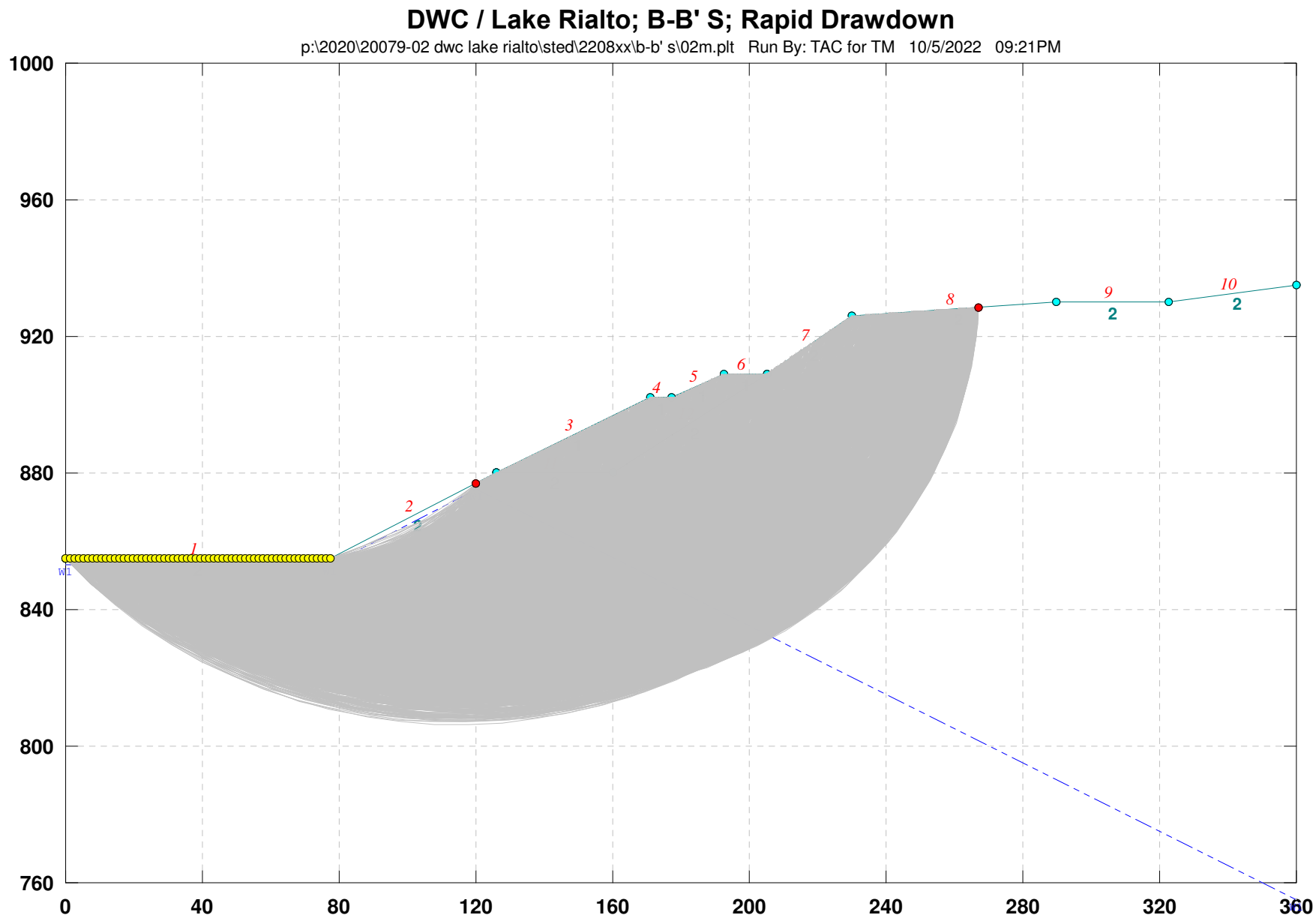
DWC / Lake Rialto; B-B' S; Rapid Drawdown

p:\2020\20079-02 dwc lake rialto\sted\2208xx\b-b' s\02m.pl2 Run By: TAC for TM 10/5/2022 09:21PM



GSTABL7 v.2 FSmin=1.10

Safety Factors Are Calculated By The Modified Bishop Method


DWC / Lake Rialto; B-B' S; Rapid Drawdown
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1000
960
920
880
840
800
760
0
40
80
120
160
200
240
280
320
360
1
2
3
4
5
6
7
8
9
10
2
2
w1

***** GSTABL7 *****

** GSTABL7 by Dr. Garry H. Gregory, Ph.D.,P.E.,D.GE **
** Original Version 1.0, January 1996; Current Ver. 2.005.3, Feb. 2013 **
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SLOPE STABILITY ANALYSIS SYSTEM

Modified Bishop, Simplified Janbu, or GLE Method of Slices.
(Includes Spencer & Morgenstern-Price Type Analysis)
Including Pier/Pile, Reinforcement, Soil Nail, Tieback,
Nonlinear Undrained Shear Strength, Curved Phi Envelope,
Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water
Surfaces, Pseudo-Static & Newmark Earthquake, and Applied Forces.

****

Analysis Run Date: 10/5/2022
Time of Run: 09:21PM
Run By: TAC for TM
Input Data Filename: P:\2020\20079-02 DWC Lake Rialto\Sted\2208XX\B-B' S\02m.in
Output Filename: P:\2020\20079-02 DWC Lake Rialto\Sted\2208XX\B-B' S\02m.OUT
Unit System: English
Plotted Output Filename: P:\2020\20079-02 DWC Lake Rialto\Sted\2208XX\B-B' S\02m.PLT
PROBLEM DESCRIPTION: DWC / Lake Rialto; B-B' S; Rapid Drawdow
n

BOUNDARY COORDINATES
10 Top Boundaries
12 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	0.00	855.00	77.50	855.00	2
2	77.50	855.00	126.00	880.00	2
3	126.00	880.00	171.00	902.00	1
4	171.00	902.00	177.50	902.00	1
5	177.50	902.00	192.50	909.00	1
6	192.50	909.00	205.00	909.00	1
7	205.00	909.00	230.00	926.00	2
8	230.00	926.00	290.00	930.00	2
9	290.00	930.00	322.50	930.00	2
10	322.50	930.00	360.00	935.00	2
11	126.00	880.00	160.00	880.00	2
12	160.00	880.00	205.00	909.00	2

User Specified Y-Origin = 760.00(ft)
Default X-Plus Value = 0.00(ft)
Default Y-Plus Value = 0.00(ft)

ISOTROPIC SOIL PARAMETERS
3 Type(s) of Soil

Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
1	120.0	120.0	75.0	30.0	0.00	0.0	1
2	120.0	120.0	75.0	30.0	0.00	0.0	1
3	62.0	62.0	0.0	0.0	0.00	0.0	1

1 PIEZOMETRIC SURFACE(S) SPECIFIED
Unit Weight of Water = 62.40 (pcf)
Piezometric Surface No. 1 Specified by 4 Coordinate Points
Pore Pressure Inclination Factor = 0.50

Point No.	X-Water (ft)	Y-Water (ft)
1	0.00	853.00
2	77.50	853.00
3	120.00	875.00
4	360.00	755.00

A Critical Failure Surface Searching Method, Using A Random
Technique For Generating Circular Surfaces, Has Been Specified.
4800 Trial Surfaces Have Been Generated.
80 Surface(s) Initiate(s) From Each Of 60 Points Equally Spaced
Along The Ground Surface Between X = 0.00(ft)
and X = 77.50(ft)
Each Surface Terminates Between X = 120.00(ft)
and X = 267.00(ft)
Unless Further Limitations Were Imposed, The Minimum Elevation
At Which A Surface Extends Is Y = 0.00(ft)

10.00(ft) Line Segments Define Each Trial Failure Surface.
Following Are Displayed The Ten Most Critical Of The Trial
Failure Surfaces Evaluated. They Are
Ordered - Most Critical First.
* * Safety Factors Are Calculated By The Modified Bishop Method * *
Total Number of Trial Surfaces Attempted = 4800
Number of Trial Surfaces With Valid FS = 4800
Statistical Data On All Valid FS Values:
FS Max = 4.651 FS Min = 1.101 FS Ave = 1.747
Standard Deviation = 0.319 Coefficient of Variation = 18.26 %
Failure Surface Specified By 8 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	77.500	855.000
2	87.495	854.685
3	97.358	856.335
4	106.706	859.887
5	115.177	865.201
6	122.441	872.074
7	128.218	880.236
8	128.700	881.320

Circle Center At X = 84.139 ; Y = 905.045 ; and Radius = 50.484
Factor of Safety
*** 1.101 ***
Individual data on the 12 slices

Slice No.	Width (ft)	Weight (lbs)	Water Force Top (lbs)	Water Force Bot (lbs)	Tie Force Norm (lbs)	Tie Force Tan (lbs)	Earthquake Force Hor (lbs)	Earthquake Force Ver (lbs)	Surcharge Load (lbs)
1	3.6	435.3	0.0	0.0	0.	0.	0.0	0.0	0.0
2	6.4	2843.3	0.0	618.8	0.	0.	0.0	0.0	0.0
3	9.9	8502.7	0.0	2911.3	0.	0.	0.0	0.0	0.0
4	9.3	10695.6	0.0	4234.6	0.	0.	0.0	0.0	0.0
5	8.5	9853.5	0.0	4334.4	0.	0.	0.0	0.0	0.0
6	4.8	4735.2	0.0	2322.7	0.	0.	0.0	0.0	0.0
7	2.4	1938.7	0.0	655.0	0.	0.	0.0	0.0	0.0
8	0.9	609.0	0.0	73.9	0.	0.	0.0	0.0	0.0
9	2.7	1310.5	0.0	0.0	0.	0.	0.0	0.0	0.0
10	2.1	479.9	0.0	0.0	0.	0.	0.0	0.0	0.0
11	0.2	18.6	0.0	0.0	0.	0.	0.0	0.0	0.0
12	0.5	24.5	0.0	0.0	0.	0.	0.0	0.0	0.0

Failure Surface Specified By 8 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	73.559	855.000
2	83.498	853.891
3	93.463	854.724
4	103.079	857.469
5	111.982	862.022
6	119.837	868.211
7	126.347	875.802
8	129.757	881.837

Circle Center At X = 84.250 ; Y = 904.872 ; and Radius = 51.005
Factor of Safety
*** 1.108 ***
Failure Surface Specified By 8 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	76.186	855.000
2	86.088	853.598
3	96.049	854.472
4	105.556	857.576
5	114.113	862.749
6	121.279	869.724
7	126.682	878.139
8	127.631	880.797

Circle Center At X = 87.297 ; Y = 897.036 ; and Radius = 43.479
Factor of Safety
*** 1.113 ***
Failure Surface Specified By 9 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	73.559	855.000
2	83.465	853.626
3	93.460	853.939
4	103.260	855.929
5	112.585	859.540
6	121.169	864.669
7	128.768	871.170
8	135.164	878.857
9	139.707	886.701

Circle Center At X = 86.618 ; Y = 912.748 ; and Radius = 59.206

Factor of Safety

*** 1.114 ***

Failure Surface Specified By 9 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	70.932	855.000
2	80.819	853.498
3	90.815	853.771
4	100.605	855.810
5	109.879	859.550
6	118.344	864.874
7	125.733	871.612
8	131.811	879.553
9	134.071	883.946

Circle Center At X = 84.289 ; Y = 909.631 ; and Radius = 56.241

Factor of Safety

*** 1.114 ***

Failure Surface Specified By 10 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	72.246	855.000
2	82.202	854.062
3	92.186	854.626
4	101.973	856.678
5	111.342	860.173
6	120.083	865.032
7	127.997	871.144
8	134.907	878.373
9	140.656	886.555
10	141.059	887.362

Circle Center At X = 83.474 ; Y = 920.466 ; and Radius = 66.422

Factor of Safety

*** 1.115 ***

Failure Surface Specified By 9 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	76.186	855.000
2	86.104	853.719
3	96.093	854.187
4	105.848	856.389
5	115.068	860.259
6	123.473	865.677
7	130.804	872.479
8	136.837	880.454
9	140.136	886.911

Circle Center At X = 88.436 ; Y = 910.796 ; and Radius = 57.125

Factor of Safety

*** 1.117 ***

Failure Surface Specified By 10 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	70.932	855.000
2	80.879	853.973
3	90.868	854.455
4	100.670	856.434
5	110.063	859.865
6	118.833	864.670
7	126.780	870.740

8	133.723	877.936
9	139.505	886.096
10	139.843	886.768

Circle Center At X = 82.709 ; Y = 920.078 ; and Radius = 66.135

Factor of Safety

*** 1.118 ***

Failure Surface Specified By 10 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	74.873	855.000
2	84.821	853.986
3	94.809	854.479
4	104.609	856.469
5	113.998	859.911
6	122.763	864.726
7	130.703	870.805
8	137.639	878.008
9	143.412	886.174
10	144.964	889.271

Circle Center At X = 86.609 ; Y = 919.809 ; and Radius = 65.863

Factor of Safety

*** 1.121 ***

Failure Surface Specified By 9 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	70.932	855.000
2	80.810	853.443
3	90.803	853.818
4	100.536	856.112
5	109.645	860.240
6	117.787	866.045
7	124.658	873.311
8	130.000	881.765
9	130.091	882.000

Circle Center At X = 83.877 ; Y = 904.994 ; and Radius = 51.642

Factor of Safety

*** 1.121 ***

**** END OF GSTABL7 OUTPUT ****

Summary of Slope Stability Analysis

Cross-Section B-B' N

Filename	Description	Factor of Safety (FS)	
		Static	***Pseudostatic***
01, 01p	Design Condition	1.77	1.14
02	Rapid Drawdown Condition-Operating Lake Level El 905’	0.92	--
02m	Rapid Drawdown-Maximum Groundwater El 884’ (21 feet bgs)	1.10	--

Project No.: 20079-02

Project Name: DWC / Lake Rialto

NMG

DWC / Lake Rialto; B-B' N; Design

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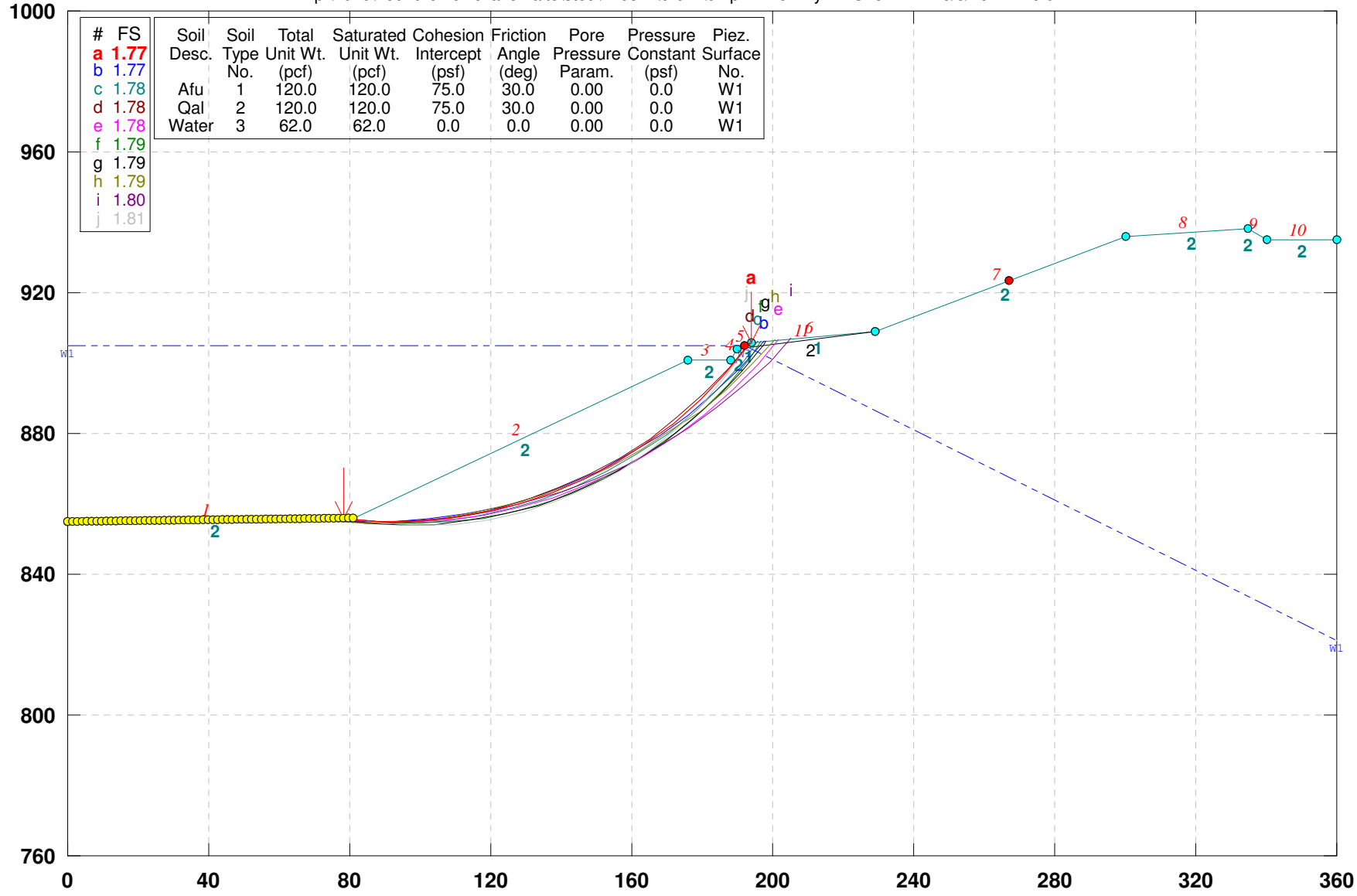
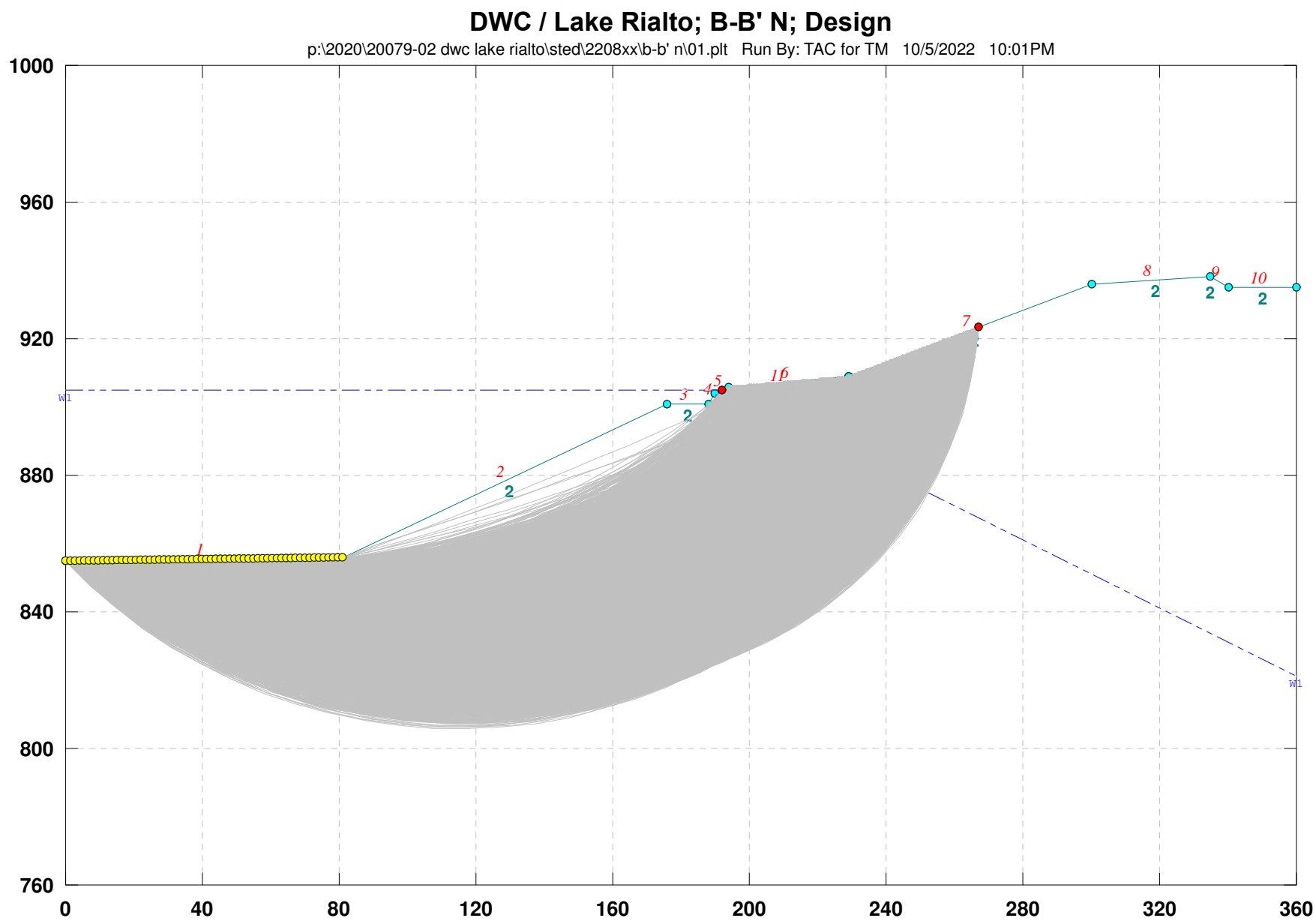


GSTABL7 v.2 FSmin=1.77

Safety Factors Are Calculated By The Modified Bishop Method


DWC / Lake Rialto; B-B' N; Design
p:\2020\20079-02 dwc lake rialto\sted\2208xx\b-b' n\01.plt Run By: TAC for TM 10/5/2022 10:01PM
1000
960
920
880
840
800
760
0
40
80
120
160
200
240
280
320
360
W1
W1
1
2
2
3
2
4
5
16
7
8
2
9
2
10
2

***** GSTABL7 *****

** GSTABL7 by Dr. Garry H. Gregory, Ph.D.,P.E.,D.GE **
** Original Version 1.0, January 1996; Current Ver. 2.005.3, Feb. 2013 **
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****

SLOPE STABILITY ANALYSIS SYSTEM
Modified Bishop, Simplified Janbu, or GLE Method of Slices.
(Includes Spencer & Morgenstern-Price Type Analysis)
Including Pier/Pile, Reinforcement, Soil Nail, Tieback,
Nonlinear Undrained Shear Strength, Curved Phi Envelope,
Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water
Surfaces, Pseudo-Static & Newmark Earthquake, and Applied Forces.

****

Analysis Run Date: 10/5/2022
Time of Run: 10:01PM
Run By: TAC for TM
Input Data Filename: P:\2020\20079-02 DWC Lake Rialto\Sted\2208XX\B-B' N\01.in
Output Filename: P:\2020\20079-02 DWC Lake Rialto\Sted\2208XX\B-B' N\01.OUT
Unit System: English
Plotted Output Filename: P:\2020\20079-02 DWC Lake Rialto\Sted\2208XX\B-B' N\01.PLT
PROBLEM DESCRIPTION: DWC / Lake Rialto; B-B' N; Design
BOUNDARY COORDINATES
10 Top Boundaries
11 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	0.00	855.00	81.00	856.00	2
2	81.00	856.00	176.00	901.00	2
3	176.00	901.00	188.00	901.00	2
4	188.00	901.00	190.00	904.00	2
5	190.00	904.00	194.00	906.00	1
6	194.00	906.00	229.00	909.00	1
7	229.00	909.00	300.00	936.00	2
8	300.00	936.00	335.00	938.00	2
9	335.00	938.00	340.00	935.00	2
10	340.00	935.00	360.00	935.00	2
11	190.00	904.00	229.00	909.00	2

User Specified Y-Origin = 760.00(ft)
Default X-Plus Value = 0.00(ft)
Default Y-Plus Value = 0.00(ft)
ISOTROPIC SOIL PARAMETERS
3 Type(s) of Soil

Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
1	120.0	120.0	75.0	30.0	0.00	0.0	1
2	120.0	120.0	75.0	30.0	0.00	0.0	1
3	62.0	62.0	0.0	0.0	0.00	0.0	1

1 PIEZOMETRIC SURFACE(S) SPECIFIED
Unit Weight of Water = 62.40 (pcf)
Piezometric Surface No. 1 Specified by 3 Coordinate Points
Pore Pressure Inclination Factor = 0.50

Point No.	X-Water (ft)	Y-Water (ft)
1	0.00	905.00
2	192.00	905.00
3	360.00	821.00

A Critical Failure Surface Searching Method, Using A Random
Technique For Generating Circular Surfaces, Has Been Specified.
4800 Trial Surfaces Have Been Generated.
80 Surface(s) Initiate(s) From Each Of 60 Points Equally Spaced
Along The Ground Surface Between X = 0.00(ft)
and X = 81.00(ft)
Each Surface Terminates Between X = 192.00(ft)
and X = 267.00(ft)
Unless Further Limitations Were Imposed, The Minimum Elevation
At Which A Surface Extends Is Y = 0.00(ft)
10.00(ft) Line Segments Define Each Trial Failure Surface.
Following Are Displayed The Ten Most Critical Of The Trial
Failure Surfaces Evaluated. They Are

Ordered - Most Critical First.
* * Safety Factors Are Calculated By The Modified Bishop Method * *
Total Number of Trial Surfaces Attempted = 4800
Number of Trial Surfaces With Valid FS = 4800
Statistical Data On All Valid FS Values:
FS Max = 3.478 FS Min = 1.769 FS Ave = 2.611
Standard Deviation = 0.379 Coefficient of Variation = 14.50 %
Failure Surface Specified By 15 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	78.254	855.966
2	88.222	855.158
3	98.222	855.150
4	108.190	855.943
5	118.063	857.531
6	127.778	859.903
7	137.271	863.046
8	146.482	866.938
9	155.353	871.555
10	163.825	876.867
11	171.845	882.841
12	179.362	889.436
13	186.326	896.612
14	192.694	904.323
15	193.795	905.897

Circle Center At X = 93.319 ; Y = 979.908 ; and Radius = 124.854
Factor of Safety
*** 1.769 ***
Individual data on the 21 slices

Slice No.	Width (ft)	Weight (lbs)	Water Force Top (lbs)	Water Force Bot (lbs)	Tie Force Norm (lbs)	Tie Force Tan (lbs)	Earthquake Force Hor (lbs)	Earthquake Force Ver (lbs)	Surcharge Load (lbs)
1	2.7	42.3	8399.0	8447.9	0.	0.	0.0	0.0	0.0
2	7.2	1958.1	23579.7	22401.3	0.	0.	0.0	0.0	0.0
3	10.0	7961.9	29835.6	31103.8	0.	0.	0.0	0.0	0.0
4	10.0	13125.0	26486.5	30858.9	0.	0.	0.0	0.0	0.0
5	9.9	17156.9	23029.5	30116.3	0.	0.	0.0	0.0	0.0
6	9.7	19980.6	19547.5	28880.6	0.	0.	0.0	0.0	0.0
7	9.5	21566.8	16120.8	27159.7	0.	0.	0.0	0.0	0.0
8	9.2	21935.0	12824.4	24964.8	0.	0.	0.0	0.0	0.0
9	8.9	21152.5	9726.7	22309.9	0.	0.	0.0	0.0	0.0
10	8.5	19332.2	6887.5	19212.1	0.	0.	0.0	0.0	0.0
11	8.0	16629.0	4356.7	15691.1	0.	0.	0.0	0.0	0.0
12	4.2	7654.2	1429.8	7014.5	0.	0.	0.0	0.0	0.0
13	3.4	5259.7	839.1	4755.1	0.	0.	0.0	0.0	0.0
14	7.0	6665.4	1738.3	7472.8	0.	0.	0.0	0.0	0.0
15	1.7	677.8	417.8	1209.6	0.	0.	0.0	0.0	0.0
16	2.0	635.9	562.5	1009.3	0.	0.	0.0	0.0	0.0
17	2.0	534.7	69.8	534.6	0.	0.	0.0	0.0	0.0
18	0.7	105.8	0.0	56.5	0.	0.	0.0	0.0	0.0
19	0.0	2.1	0.0	0.5	0.	0.	0.0	0.0	0.0
20	0.2	17.3	0.0	2.2	0.	0.	0.0	0.0	0.0
21	0.9	48.2	0.0	0.0	0.	0.	0.0	0.0	0.0

Failure Surface Specified By 16 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	72.763	855.898
2	82.734	855.135
3	92.733	855.080
4	102.712	855.732
5	112.620	857.089
6	122.406	859.145
7	132.023	861.887
8	141.421	865.304
9	150.554	869.377
10	159.375	874.087
11	167.841	879.409
12	175.909	885.317
13	183.539	891.782

14	190.692	898.770
15	197.332	906.247
16	197.364	906.288

Circle Center At X = 88.517 ; Y = 996.190 ; and Radius = 141.173

Factor of Safety

*** 1.770 ***

Failure Surface Specified By 15 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	75.508	855.932
2	85.449	854.845
3	95.445	854.549
4	105.432	855.046
5	115.349	856.334
6	125.133	858.403
7	134.722	861.241
8	144.055	864.831
9	153.075	869.148
10	161.724	874.168
11	169.948	879.857
12	177.696	886.179
13	184.917	893.096
14	191.568	900.564
15	195.803	906.155

Circle Center At X = 94.174 ; Y = 980.610 ; and Radius = 126.067

Factor of Safety

*** 1.776 ***

Failure Surface Specified By 15 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	70.017	855.864
2	79.963	854.824
3	89.959	854.535
4	99.948	854.999
5	109.874	856.213
6	119.681	858.169
7	129.312	860.858
8	138.714	864.264
9	147.834	868.367
10	156.619	873.145
11	165.020	878.569
12	172.989	884.611
13	180.481	891.234
14	187.453	898.402
15	193.665	905.832

Circle Center At X = 88.798 ; Y = 987.391 ; and Radius = 132.861

Factor of Safety

*** 1.782 ***

Failure Surface Specified By 15 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	78.254	855.966
2	88.217	855.107
3	98.216	854.981
4	108.198	855.590
5	118.108	856.930
6	127.892	858.995
7	137.499	861.772
8	146.875	865.248
9	155.972	869.402
10	164.738	874.214
11	173.127	879.656
12	181.095	885.699
13	188.596	892.312
14	195.592	899.457
15	201.674	906.658

Circle Center At X = 94.925 ; Y = 991.022 ; and Radius = 136.081

Factor of Safety

*** 1.783 ***

Failure Surface Specified By 15 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	78.254	855.966
2	88.179	854.742
3	98.171	854.346
4	108.162	854.782
5	118.081	856.047
6	127.862	858.131
7	137.435	861.021
8	146.735	864.696
9	155.698	869.131
10	164.261	874.295
11	172.366	880.153
12	179.956	886.664
13	186.978	893.783
14	193.385	901.461
15	196.737	906.235

Circle Center At X = 97.928 ; Y = 974.604 ; and Radius = 120.258

Factor of Safety

*** 1.786 ***

Failure Surface Specified By 16 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	74.136	855.915
2	84.043	854.555
3	94.027	853.990
4	104.024	854.224
5	113.971	855.254
6	123.804	857.075
7	133.460	859.675
8	142.878	863.036
9	151.997	867.139
10	160.761	871.956
11	169.112	877.457
12	176.997	883.607
13	184.367	890.367
14	191.173	897.692
15	197.374	905.538
16	197.906	906.335

Circle Center At X = 96.116 ; Y = 979.083 ; and Radius = 125.114

Factor of Safety

*** 1.789 ***

Failure Surface Specified By 16 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	65.898	855.814
2	75.853	854.862
3	85.848	854.559
4	95.842	854.908
5	105.792	855.906
6	115.657	857.549
7	125.393	859.830
8	134.960	862.739
9	144.318	866.265
10	153.427	870.391
11	162.248	875.102
12	170.744	880.376
13	178.879	886.192
14	186.618	892.525
15	193.929	899.347
16	200.730	906.577

Circle Center At X = 85.494 ; Y = 1008.209 ; and Radius = 153.650

Factor of Safety

*** 1.791 ***

Failure Surface Specified By 16 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	71.390	855.881
2	81.357	855.066
3	91.355	854.893

4	101.344	855.361
5	111.283	856.469
6	121.129	858.212
7	130.844	860.584
8	140.387	863.574
9	149.718	867.170
10	158.799	871.358
11	167.592	876.119
12	176.062	881.435
13	184.174	887.284
14	191.893	893.640
15	199.189	900.479
16	205.275	906.966

Circle Center At X = 89.076 ; Y = 1010.515 ; and Radius = 155.642

Factor of Safety

*** 1.800 ***

Failure Surface Specified By 15 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	79.627	855.983
2	89.515	854.493
3	99.499	853.921
4	109.493	854.273
5	119.412	855.545
6	129.171	857.727
7	138.687	860.800
8	147.879	864.738
9	156.668	869.507
10	164.980	875.066
11	172.744	881.369
12	179.893	888.362
13	186.366	895.984
14	192.109	904.170
15	192.817	905.408

Circle Center At X = 100.692 ; Y = 962.188 ; and Radius = 108.274

Factor of Safety

*** 1.805 ***

**** END OF GSTABL7 OUTPUT ****

DWC / Lake Rialto; B-B' N; Design; P-Static

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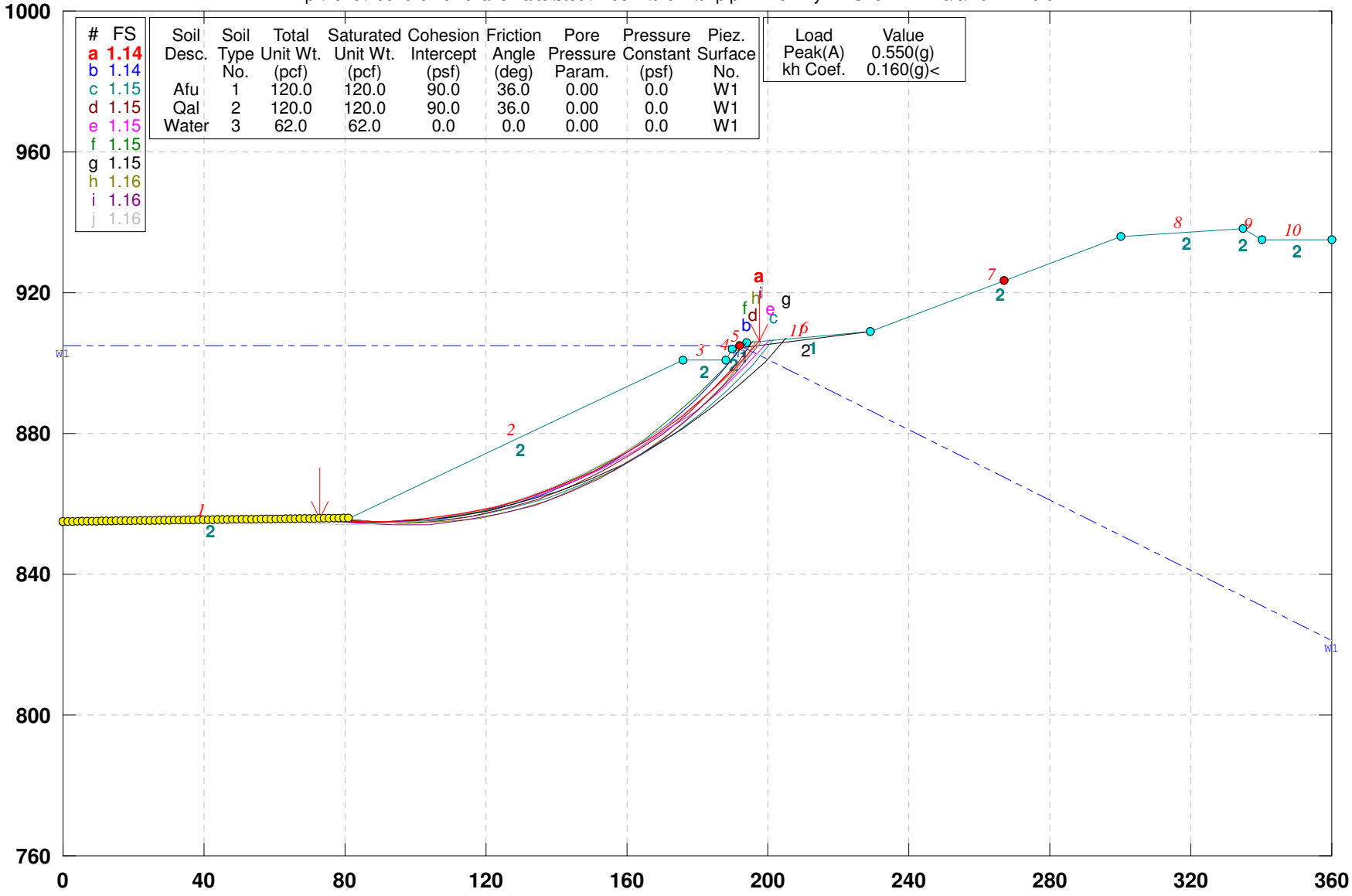


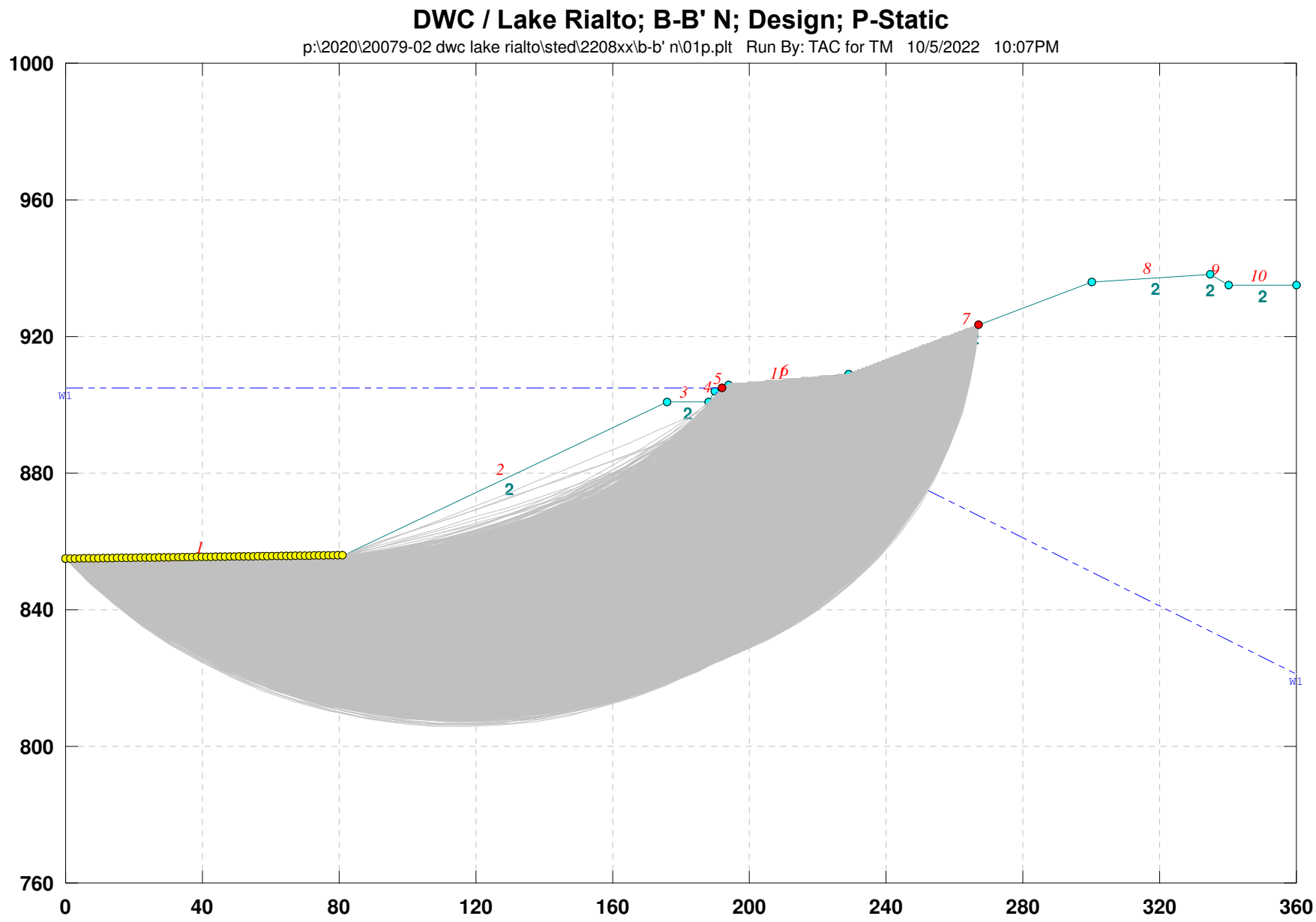
#	FS
a	1.14
b	1.14
c	1.15
d	1.15
e	1.15
f	1.15
g	1.15
h	1.16
i	1.16
j	1.16

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
Afu	1	120.0	120.0	90.0	36.0	0.00	0.0	W1
Qal	2	120.0	120.0	90.0	36.0	0.00	0.0	W1
Water	3	62.0	62.0	0.0	0.0	0.00	0.0	W1

Load	Value
Peak(A)	0.550(g)
kh Coef.	0.160(g)<

GSTABL7 v.2 FSmin=1.14

Safety Factors Are Calculated By The Modified Bishop Method


DWC / Lake Rialto; B-B' N; Design; P-Static
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920
880
840
800
760
0
40
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120
160
200
240
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320
360
W1
W1
1
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9
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10
2

***** GSTABL7 *****

** GSTABL7 by Dr. Garry H. Gregory, Ph.D.,P.E.,D.GE **
** Original Version 1.0, January 1996; Current Ver. 2.005.3, Feb. 2013 **
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****

SLOPE STABILITY ANALYSIS SYSTEM

Modified Bishop, Simplified Janbu, or GLE Method of Slices.
(Includes Spencer & Morgenstern-Price Type Analysis)
Including Pier/Pile, Reinforcement, Soil Nail, Tieback,
Nonlinear Undrained Shear Strength, Curved Phi Envelope,
Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water
Surfaces, Pseudo-Static & Newmark Earthquake, and Applied Forces.

****

Analysis Run Date: 10/5/2022
Time of Run: 10:07PM
Run By: TAC for TM
Input Data Filename: P:\2020\20079-02 DWC Lake Rialto\Sted\2208XX\B-B' N\01p.in
Output Filename: P:\2020\20079-02 DWC Lake Rialto\Sted\2208XX\B-B' N\01p.OUT
Unit System: English
Plotted Output Filename: P:\2020\20079-02 DWC Lake Rialto\Sted\2208XX\B-B' N\01p.PLT
PROBLEM DESCRIPTION: DWC / Lake Rialto; B-B' N; Design; P-Static

BOUNDARY COORDINATES
10 Top Boundaries
11 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	0.00	855.00	81.00	856.00	2
2	81.00	856.00	176.00	901.00	2
3	176.00	901.00	188.00	901.00	2
4	188.00	901.00	190.00	904.00	2
5	190.00	904.00	194.00	906.00	1
6	194.00	906.00	229.00	909.00	1
7	229.00	909.00	300.00	936.00	2
8	300.00	936.00	335.00	938.00	2
9	335.00	938.00	340.00	935.00	2
10	340.00	935.00	360.00	935.00	2
11	190.00	904.00	229.00	909.00	2

User Specified Y-Origin = 760.00(ft)
Default X-Plus Value = 0.00(ft)
Default Y-Plus Value = 0.00(ft)

ISOTROPIC SOIL PARAMETERS
3 Type(s) of Soil

Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
1	120.0	120.0	90.0	36.0	0.00	0.0	1
2	120.0	120.0	90.0	36.0	0.00	0.0	1
3	62.0	62.0	0.0	0.0	0.00	0.0	1

1 PIEZOMETRIC SURFACE(S) SPECIFIED
Unit Weight of Water = 62.40 (pcf)
Piezometric Surface No. 1 Specified by 3 Coordinate Points
Pore Pressure Inclination Factor = 0.50

Point No.	X-Water (ft)	Y-Water (ft)
1	0.00	905.00
2	192.00	905.00
3	360.00	821.00

Specified Peak Ground Acceleration Coefficient (A) = 0.550(g)
Specified Horizontal Earthquake Coefficient (kh) = 0.160(g)
Specified Vertical Earthquake Coefficient (kv) = 0.000(g)
Specified Seismic Pore-Pressure Factor = 0.000
A Critical Failure Surface Searching Method, Using A Random
Technique For Generating Circular Surfaces, Has Been Specified.
4800 Trial Surfaces Have Been Generated.
80 Surface(s) Initiate(s) From Each Of 60 Points Equally Spaced
Along The Ground Surface Between X = 0.00(ft)
and X = 81.00(ft)
Each Surface Terminates Between X = 192.00(ft)
and X = 267.00(ft)

Unless Further Limitations Were Imposed, The Minimum Elevation
At Which A Surface Extends Is Y = 0.00(ft)
10.00(ft) Line Segments Define Each Trial Failure Surface.
Following Are Displayed The Ten Most Critical Of The Trial
Failure Surfaces Evaluated. They Are
Ordered - Most Critical First.
* * Safety Factors Are Calculated By The Modified Bishop Method * *
Total Number of Trial Surfaces Attempted = 4800
Number of Trial Surfaces With Valid FS = 4800
Statistical Data On All Valid FS Values:
FS Max = 2.263 FS Min = 1.141 FS Ave = 1.641
Standard Deviation = 0.250 Coefficient of Variation = 15.22 %
Failure Surface Specified By 16 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	72.763	855.898
2	82.734	855.135
3	92.733	855.080
4	102.712	855.732
5	112.620	857.089
6	122.406	859.145
7	132.023	861.887
8	141.421	865.304
9	150.554	869.377
10	159.375	874.087
11	167.841	879.409
12	175.909	885.317
13	183.539	891.782
14	190.692	898.770
15	197.332	906.247
16	197.364	906.288

Circle Center At X = 88.517 ; Y = 996.190 ; and Radius = 141.173
Factor of Safety
*** 1.141 ***
Individual data on the 24 slices

Slice No.	Width (ft)	Weight (lbs)	Water Force Top (lbs)	Water Force Bot (lbs)	Tie Force Norm (lbs)	Tie Force Tan (lbs)	Earthquake Force Hor (lbs)	Earthquake Force Ver (lbs)	Surcharge Load (lbs)
1	8.2	361.9	25214.3	25474.9	0.	0.	57.9	0.0	0.0
2	1.7	251.5	5816.0	5402.7	0.	0.	40.2	0.0	0.0
3	10.0	4898.4	31630.1	31133.0	0.	0.	783.7	0.0	0.0
4	10.0	10196.8	28303.0	30946.7	0.	0.	1631.5	0.0	0.0
5	9.9	14528.8	24879.1	30319.7	0.	0.	2324.6	0.0	0.0
6	9.8	17825.4	21423.6	29255.0	0.	0.	2852.1	0.0	0.0
7	9.6	20050.5	18000.0	27758.0	0.	0.	3208.1	0.0	0.0
8	9.4	21201.2	14669.1	25836.3	0.	0.	3392.2	0.0	0.0
9	9.1	21308.2	11487.2	23499.5	0.	0.	3409.3	0.0	0.0
10	8.8	20434.7	8505.6	20759.2	0.	0.	3269.5	0.0	0.0
11	8.5	18675.1	5769.4	17629.3	0.	0.	2988.0	0.0	0.0
12	8.1	16152.1	3316.7	14125.5	0.	0.	2584.3	0.0	0.0
13	0.1	169.9	25.2	145.6	0.	0.	27.2	0.0	0.0
14	7.5	11229.2	1881.7	10119.6	0.	0.	1796.7	0.0	0.0
15	4.5	3768.3	1113.5	4296.1	0.	0.	602.9	0.0	0.0
16	2.0	1291.9	562.5	1375.4	0.	0.	206.7	0.0	0.0
17	0.7	476.7	39.9	396.4	0.	0.	76.3	0.0	0.0
18	1.3	811.0	29.8	675.3	0.	0.	129.8	0.0	0.0
19	1.2	623.1	0.0	379.9	0.	0.	99.7	0.0	0.0
20	0.8	368.4	0.0	149.7	0.	0.	58.9	0.0	0.0
21	0.9	335.9	0.0	58.9	0.	0.	53.7	0.0	0.0
22	1.1	259.5	0.0	0.0	0.	0.	41.5	0.0	0.0
23	1.3	113.2	0.0	0.0	0.	0.	18.1	0.0	0.0
24	0.0	0.1	0.0	0.0	0.	0.	0.0	0.0	0.0

Failure Surface Specified By 15 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	78.254	855.966
2	88.222	855.158
3	98.222	855.150
4	108.190	855.943

5	118.063	857.531
6	127.778	859.903
7	137.271	863.046
8	146.482	866.938
9	155.353	871.555
10	163.825	876.867
11	171.845	882.841
12	179.362	889.436
13	186.326	896.612
14	192.694	904.323
15	193.795	905.897

Circle Center At X = 93.319 ; Y = 979.908 ; and Radius = 124.854

Factor of Safety

*** 1.144 ***

Failure Surface Specified By 15 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	78.254	855.966
2	88.217	855.107
3	98.216	854.981
4	108.198	855.590
5	118.108	856.930
6	127.892	858.995
7	137.499	861.772
8	146.875	865.248
9	155.972	869.402
10	164.738	874.214
11	173.127	879.656
12	181.095	885.699
13	188.596	892.312
14	195.592	899.457
15	201.674	906.658

Circle Center At X = 94.925 ; Y = 991.022 ; and Radius = 136.081

Factor of Safety

*** 1.148 ***

Failure Surface Specified By 15 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	75.508	855.932
2	85.449	854.845
3	95.445	854.549
4	105.432	855.046
5	115.349	856.334
6	125.133	858.403
7	134.722	861.241
8	144.055	864.831
9	153.075	869.148
10	161.724	874.168
11	169.948	879.857
12	177.696	886.179
13	184.917	893.096
14	191.568	900.564
15	195.803	906.155

Circle Center At X = 94.174 ; Y = 980.610 ; and Radius = 126.067

Factor of Safety

*** 1.149 ***

Failure Surface Specified By 16 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	65.898	855.814
2	75.853	854.862
3	85.848	854.559
4	95.842	854.908
5	105.792	855.906
6	115.657	857.549
7	125.393	859.830
8	134.960	862.739
9	144.318	866.265
10	153.427	870.391
11	162.248	875.102

12	170.744	880.376
13	178.879	886.192
14	186.618	892.525
15	193.929	899.347
16	200.730	906.577

Circle Center At X = 85.494 ; Y = 1008.209 ; and Radius = 153.650

Factor of Safety

*** 1.150 ***

Failure Surface Specified By 15 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	70.017	855.864
2	79.963	854.824
3	89.959	854.535
4	99.948	854.999
5	109.874	856.213
6	119.681	858.169
7	129.312	860.858
8	138.714	864.264
9	147.834	868.367
10	156.619	873.145
11	165.020	878.569
12	172.989	884.611
13	180.481	891.234
14	187.453	898.402
15	193.665	905.832

Circle Center At X = 88.798 ; Y = 987.391 ; and Radius = 132.861

Factor of Safety

*** 1.151 ***

Failure Surface Specified By 16 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	71.390	855.881
2	81.357	855.066
3	91.355	854.893
4	101.344	855.361
5	111.283	856.469
6	121.129	858.212
7	130.844	860.584
8	140.387	863.574
9	149.718	867.170
10	158.799	871.358
11	167.592	876.119
12	176.062	881.435
13	184.174	887.284
14	191.893	893.640
15	199.189	900.479
16	205.275	906.966

Circle Center At X = 89.076 ; Y = 1010.515 ; and Radius = 155.642

Factor of Safety

*** 1.153 ***

Failure Surface Specified By 15 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	78.254	855.966
2	88.179	854.742
3	98.171	854.346
4	108.162	854.782
5	118.081	856.047
6	127.862	858.131
7	137.435	861.021
8	146.735	864.696
9	155.698	869.131
10	164.261	874.295
11	172.366	880.153
12	179.956	886.664
13	186.978	893.783
14	193.385	901.461
15	196.737	906.235

Circle Center At X = 97.928 ; Y = 974.604 ; and Radius = 120.258

```
       Factor of Safety
      ***    1.157   ***
Failure Surface Specified By 16 Coordinate Points
  Point      X-Surf      Y-Surf
   No.        (ft)        (ft)
    1         74.136      855.915
    2         84.043      854.555
    3         94.027      853.990
    4        104.024      854.224
    5        113.971      855.254
    6        123.804      857.075
    7        133.460      859.675
    8        142.878      863.036
    9        151.997      867.139
   10        160.761      871.956
   11        169.112      877.457
   12        176.997      883.607
   13        184.367      890.367
   14        191.173      897.692
   15        197.374      905.538
   16        197.906      906.335
Circle Center At X =    96.116 ; Y =   979.083 ; and Radius =   125.114
       Factor of Safety
      ***    1.157   ***
Failure Surface Specified By 17 Coordinate Points
  Point      X-Surf      Y-Surf
   No.        (ft)        (ft)
    1         60.407      855.746
    2         70.342      854.612
    3         80.330      854.125
    4         90.329      854.289
    5        100.296      855.101
    6        110.189      856.559
    7        119.967      858.657
    8        129.587      861.385
    9        139.010      864.733
   10        148.196      868.686
   11        157.105      873.227
   12        165.701      878.337
   13        173.947      883.994
   14        181.808      890.176
   15        189.250      896.855
   16        196.243      904.003
   17        198.272      906.366
Circle Center At X =    82.817 ; Y =  1007.972 ; and Radius =   153.867
       Factor of Safety
      ***    1.160   ***
          **** END OF GSTABL7 OUTPUT ****
```

DWC / Lake Rialto; B-B' N; Rapid Drawdown

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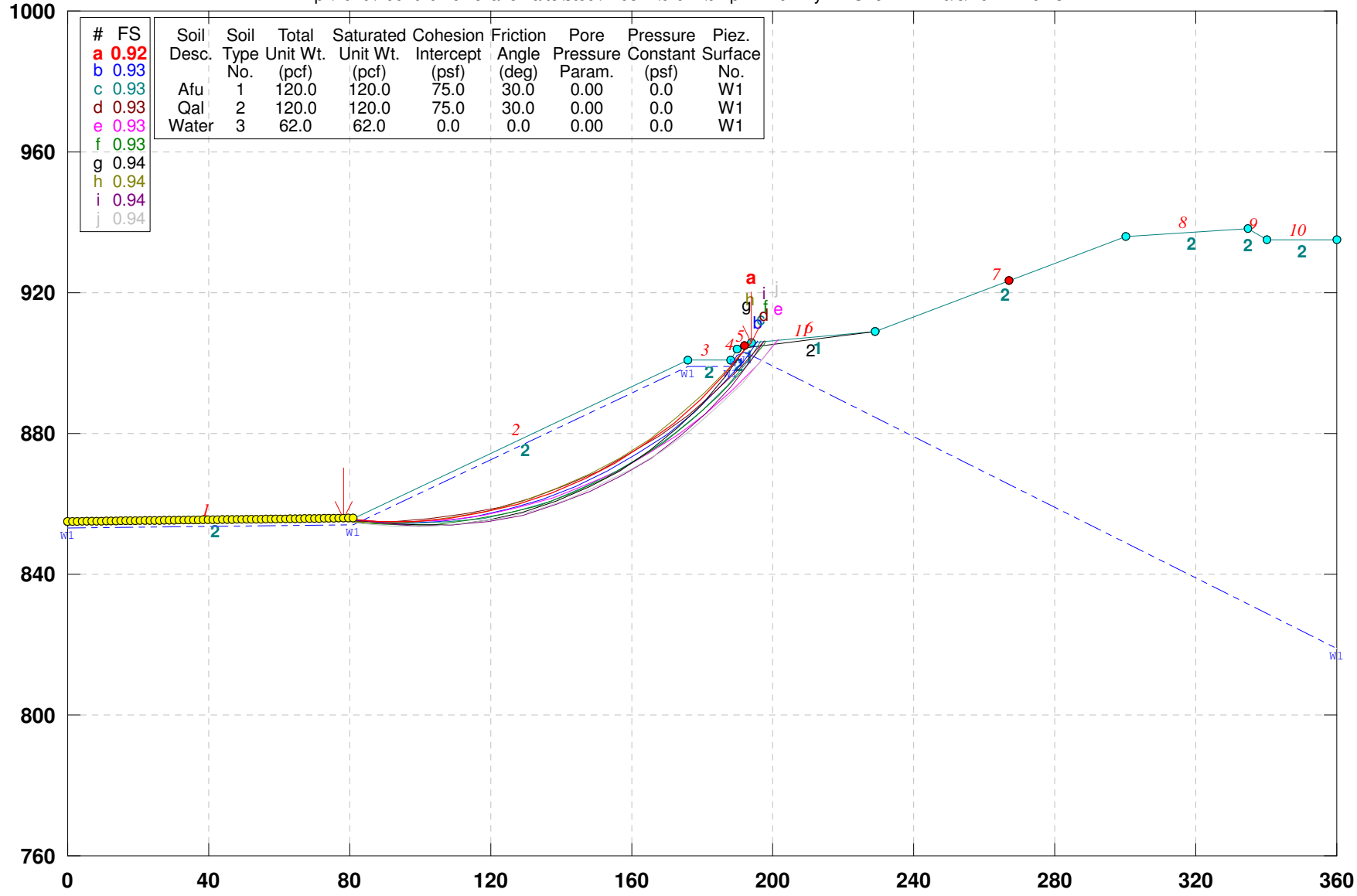
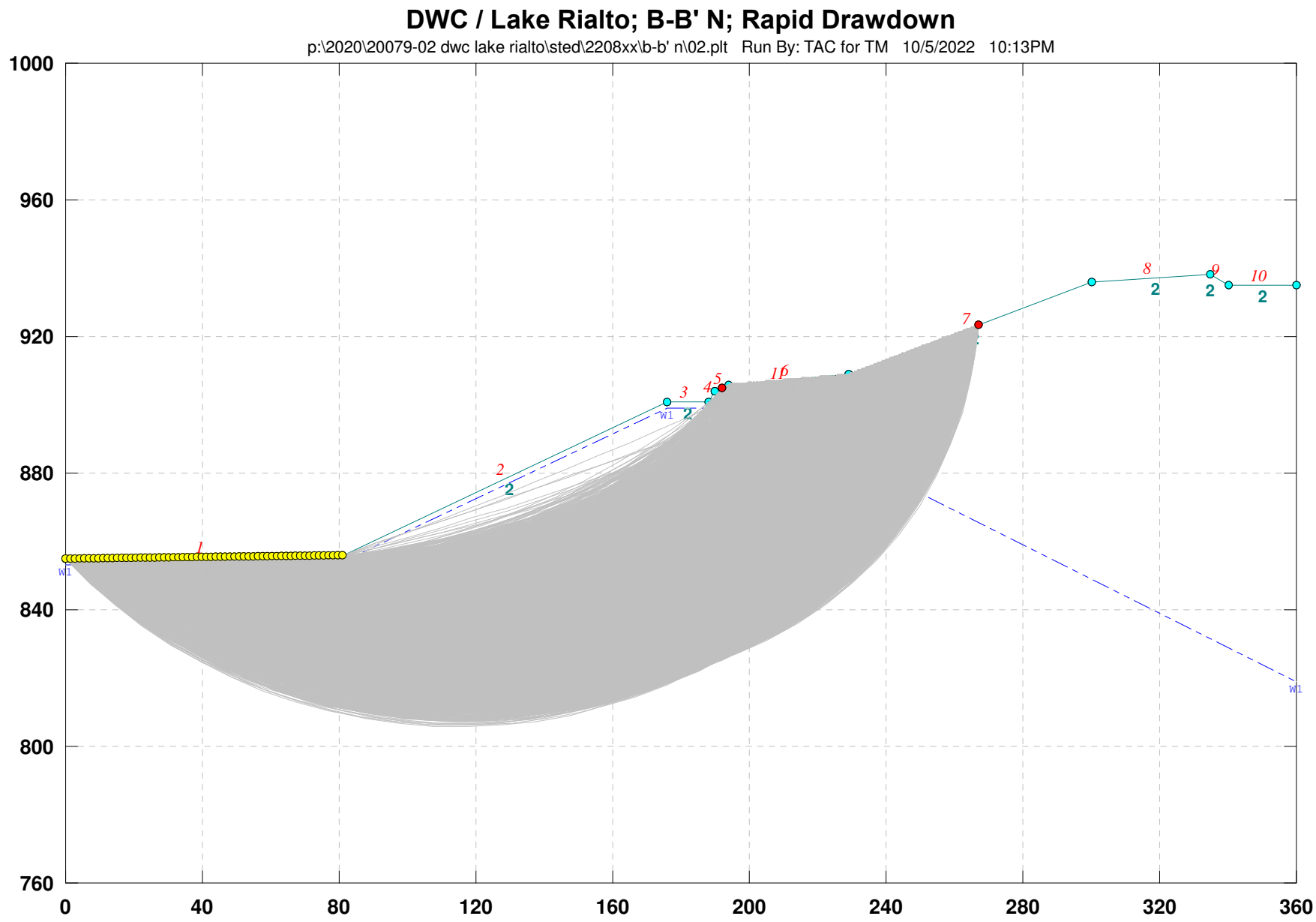


GSTABL7 v.2 FSmin=0.92

Safety Factors Are Calculated By The Modified Bishop Method


DWC / Lake Rialto; B-B' N; Rapid Drawdown
p:\2020\20079-02 dwc lake rialto\sted\2208xx\b-b' n\02.plt Run By: TAC for TM 10/5/2022 10:13PM
1000
960
920
880
840
800
760
0
40
80
120
160
200
240
280
320
360
1
2
3
4
5
6
7
8
9
10
W1
2

***** GSTABL7 *****

** GSTABL7 by Dr. Garry H. Gregory, Ph.D.,P.E.,D.GE **
** Original Version 1.0, January 1996; Current Ver. 2.005.3, Feb. 2013 **
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****

SLOPE STABILITY ANALYSIS SYSTEM

Modified Bishop, Simplified Janbu, or GLE Method of Slices.
(Includes Spencer & Morgenstern-Price Type Analysis)
Including Pier/Pile, Reinforcement, Soil Nail, Tieback,
Nonlinear Undrained Shear Strength, Curved Phi Envelope,
Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water
Surfaces, Pseudo-Static & Newmark Earthquake, and Applied Forces.

****

Analysis Run Date: 10/5/2022
Time of Run: 10:13PM
Run By: TAC for TM
Input Data Filename: P:\2020\20079-02 DWC Lake Rialto\Sted\2208XX\B-B' N\02.in
Output Filename: P:\2020\20079-02 DWC Lake Rialto\Sted\2208XX\B-B' N\02.OUT
Unit System: English
Plotted Output Filename: P:\2020\20079-02 DWC Lake Rialto\Sted\2208XX\B-B' N\02.PLT
PROBLEM DESCRIPTION: DWC / Lake Rialto; B-B' N; Rapid Drawdow
n

BOUNDARY COORDINATES
10 Top Boundaries
11 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	0.00	855.00	81.00	856.00	2
2	81.00	856.00	176.00	901.00	2
3	176.00	901.00	188.00	901.00	2
4	188.00	901.00	190.00	904.00	2
5	190.00	904.00	194.00	906.00	1
6	194.00	906.00	229.00	909.00	1
7	229.00	909.00	300.00	936.00	2
8	300.00	936.00	335.00	938.00	2
9	335.00	938.00	340.00	935.00	2
10	340.00	935.00	360.00	935.00	2
11	190.00	904.00	229.00	909.00	2

User Specified Y-Origin = 760.00(ft)
Default X-Plus Value = 0.00(ft)
Default Y-Plus Value = 0.00(ft)

ISOTROPIC SOIL PARAMETERS
3 Type(s) of Soil

Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
1	120.0	120.0	75.0	30.0	0.00	0.0	1
2	120.0	120.0	75.0	30.0	0.00	0.0	1
3	62.0	62.0	0.0	0.0	0.00	0.0	1

1 PIEZOMETRIC SURFACE(S) SPECIFIED
Unit Weight of Water = 62.40 (pcf)
Piezometric Surface No. 1 Specified by 7 Coordinate Points
Pore Pressure Inclination Factor = 0.50

Point No.	X-Water (ft)	Y-Water (ft)
1	0.00	853.00
2	81.00	854.00
3	176.00	899.00
4	188.00	899.00
5	190.00	902.00
6	192.00	903.00
7	360.00	819.00

A Critical Failure Surface Searching Method, Using A Random
Technique For Generating Circular Surfaces, Has Been Specified.
4800 Trial Surfaces Have Been Generated.
80 Surface(s) Initiate(s) From Each Of 60 Points Equally Spaced
Along The Ground Surface Between X = 0.00(ft)
and X = 81.00(ft)
Each Surface Terminates Between X = 192.00(ft)
and X = 267.00(ft)

Unless Further Limitations Were Imposed, The Minimum Elevation
At Which A Surface Extends Is Y = 0.00(ft)
10.00(ft) Line Segments Define Each Trial Failure Surface.
Following Are Displayed The Ten Most Critical Of The Trial
Failure Surfaces Evaluated. They Are
Ordered - Most Critical First.
* * Safety Factors Are Calculated By The Modified Bishop Method * *
Total Number of Trial Surfaces Attempted = 4800
Number of Trial Surfaces With Valid FS = 4800
Statistical Data On All Valid FS Values:
FS Max = 1.999 FS Min = 0.924 FS Ave = 1.419
Standard Deviation = 0.215 Coefficient of Variation = 15.16 %
Failure Surface Specified By 15 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	78.254	855.966
2	88.222	855.158
3	98.222	855.150
4	108.190	855.943
5	118.063	857.531
6	127.778	859.903
7	137.271	863.046
8	146.482	866.938
9	155.353	871.555
10	163.825	876.867
11	171.845	882.841
12	179.362	889.436
13	186.326	896.612
14	192.694	904.323
15	193.795	905.897

Circle Center At X = 93.319 ; Y = 979.908 ; and Radius = 124.854
Factor of Safety
*** 0.924 ***
Individual data on the 21 slices

Slice No.	Width (ft)	Weight (lbs)	Water Force Top (lbs)	Water Force Bot (lbs)	Tie Force Norm (lbs)	Tie Force Tan (lbs)	Earthquake Force Hor (lbs)	Earthquake Force Ver (lbs)	Surcharge Load (lbs)
1	2.7	42.3	0.0	0.0	0.	0.	0.0	0.0	0.0
2	3.1	425.5	0.0	0.0	0.	0.	0.0	0.0	0.0
3	4.1	1532.6	0.0	262.4	0.	0.	0.0	0.0	0.0
4	10.0	7961.9	0.0	2627.2	0.	0.	0.0	0.0	0.0
5	10.0	13125.0	0.0	5085.5	0.	0.	0.0	0.0	0.0
6	9.9	17156.9	0.0	7074.6	0.	0.	0.0	0.0	0.0
7	9.7	19980.6	0.0	8581.7	0.	0.	0.0	0.0	0.0
8	9.5	21566.8	0.0	9597.2	0.	0.	0.0	0.0	0.0
9	9.2	21935.0	0.0	10114.4	0.	0.	0.0	0.0	0.0
10	8.9	21152.5	0.0	10130.2	0.	0.	0.0	0.0	0.0
11	8.5	19332.2	0.0	9644.5	0.	0.	0.0	0.0	0.0
12	8.0	16629.0	0.0	8660.2	0.	0.	0.0	0.0	0.0
13	4.2	7654.2	0.0	4183.5	0.	0.	0.0	0.0	0.0
14	3.4	5259.7	0.0	3080.6	0.	0.	0.0	0.0	0.0
15	7.0	6665.4	0.0	3728.8	0.	0.	0.0	0.0	0.0
16	1.7	677.8	0.0	225.4	0.	0.	0.0	0.0	0.0
17	2.0	635.9	0.0	83.3	0.	0.	0.0	0.0	0.0
18	1.3	391.4	0.0	54.7	0.	0.	0.0	0.0	0.0
19	1.4	249.1	0.0	0.0	0.	0.	0.0	0.0	0.0
20	0.0	2.1	0.0	0.0	0.	0.	0.0	0.0	0.0
21	1.1	65.5	0.0	0.0	0.	0.	0.0	0.0	0.0

Failure Surface Specified By 15 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	75.508	855.932
2	85.449	854.845
3	95.445	854.549
4	105.432	855.046
5	115.349	856.334
6	125.133	858.403
7	134.722	861.241
8	144.055	864.831

9	153.075	869.148
10	161.724	874.168
11	169.948	879.857
12	177.696	886.179
13	184.917	893.096
14	191.568	900.564
15	195.803	906.155

Circle Center At X = 94.174 ; Y = 980.610 ; and Radius = 126.067

Factor of Safety

*** 0.926 ***

Failure Surface Specified By 15 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	78.254	855.966
2	88.179	854.742
3	98.171	854.346
4	108.162	854.782
5	118.081	856.047
6	127.862	858.131
7	137.435	861.021
8	146.735	864.696
9	155.698	869.131
10	164.261	874.295
11	172.366	880.153
12	179.956	886.664
13	186.978	893.783
14	193.385	901.461
15	196.737	906.235

Circle Center At X = 97.928 ; Y = 974.604 ; and Radius = 120.258

Factor of Safety

*** 0.928 ***

Failure Surface Specified By 16 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	72.763	855.898
2	82.734	855.135
3	92.733	855.080
4	102.712	855.732
5	112.620	857.089
6	122.406	859.145
7	132.023	861.887
8	141.421	865.304
9	150.554	869.377
10	159.375	874.087
11	167.841	879.409
12	175.909	885.317
13	183.539	891.782
14	190.692	898.770
15	197.332	906.247
16	197.364	906.288

Circle Center At X = 88.517 ; Y = 996.190 ; and Radius = 141.173

Factor of Safety

*** 0.929 ***

Failure Surface Specified By 15 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	78.254	855.966
2	88.217	855.107
3	98.216	854.981
4	108.198	855.590
5	118.108	856.930
6	127.892	858.995
7	137.499	861.772
8	146.875	865.248
9	155.972	869.402
10	164.738	874.214
11	173.127	879.656
12	181.095	885.699
13	188.596	892.312
14	195.592	899.457

15	201.674	906.658

Circle Center At X = 94.925 ; Y = 991.022 ; and Radius = 136.081

Factor of Safety

*** 0.930 ***

Failure Surface Specified By 16 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	74.136	855.915
2	84.043	854.555
3	94.027	853.990
4	104.024	854.224
5	113.971	855.254
6	123.804	857.075
7	133.460	859.675
8	142.878	863.036
9	151.997	867.139
10	160.761	871.956
11	169.112	877.457
12	176.997	883.607
13	184.367	890.367
14	191.173	897.692
15	197.374	905.538
16	197.906	906.335

Circle Center At X = 96.116 ; Y = 979.083 ; and Radius = 125.114

Factor of Safety

*** 0.931 ***

Failure Surface Specified By 15 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	79.627	855.983
2	89.515	854.493
3	99.499	853.921
4	109.493	854.273
5	119.412	855.545
6	129.171	857.727
7	138.687	860.800
8	147.879	864.738
9	156.668	869.507
10	164.980	875.066
11	172.744	881.369
12	179.893	888.362
13	186.366	895.984
14	192.109	904.170
15	192.817	905.408

Circle Center At X = 100.692 ; Y = 962.188 ; and Radius = 108.274

Factor of Safety

*** 0.936 ***

Failure Surface Specified By 15 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	70.017	855.864
2	79.963	854.824
3	89.959	854.535
4	99.948	854.999
5	109.874	856.213
6	119.681	858.169
7	129.312	860.858
8	138.714	864.264
9	147.834	868.367
10	156.619	873.145
11	165.020	878.569
12	172.989	884.611
13	180.481	891.234
14	187.453	898.402
15	193.665	905.832

Circle Center At X = 88.798 ; Y = 987.391 ; and Radius = 132.861

Factor of Safety

*** 0.936 ***

Failure Surface Specified By 15 Coordinate Points

Point	X-Surf	Y-Surf

Point No.	X-Surf (ft)	Y-Surf (ft)
1	79.627	855.983
2	89.501	854.402
3	99.477	853.704
4	109.475	853.893
5	119.417	854.969
6	129.224	856.922
7	138.820	859.738
8	148.127	863.395
9	157.074	867.863
10	165.588	873.107
11	173.604	879.086
12	181.058	885.752
13	187.891	893.054
14	194.049	900.933
15	197.525	906.302

Circle Center At X = 102.346 ; Y = 966.257 ; and Radius = 112.590

Factor of Safety

*** 0.939 ***

Failure Surface Specified By 16 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	72.763	855.898
2	82.644	854.359
3	92.614	853.595
4	102.614	853.611
5	112.583	854.406
6	122.459	855.975
7	132.182	858.310
8	141.694	861.396
9	150.937	865.214
10	159.854	869.741
11	168.390	874.949
12	176.495	880.806
13	184.119	887.278
14	191.214	894.324
15	197.739	901.902
16	201.197	906.617

Circle Center At X = 97.439 ; Y = 981.386 ; and Radius = 127.891

Factor of Safety

*** 0.940 ***

**** END OF GSTABL7 OUTPUT ****

DWC / Lake Rialto; B-B' N; Rapid Drawdown

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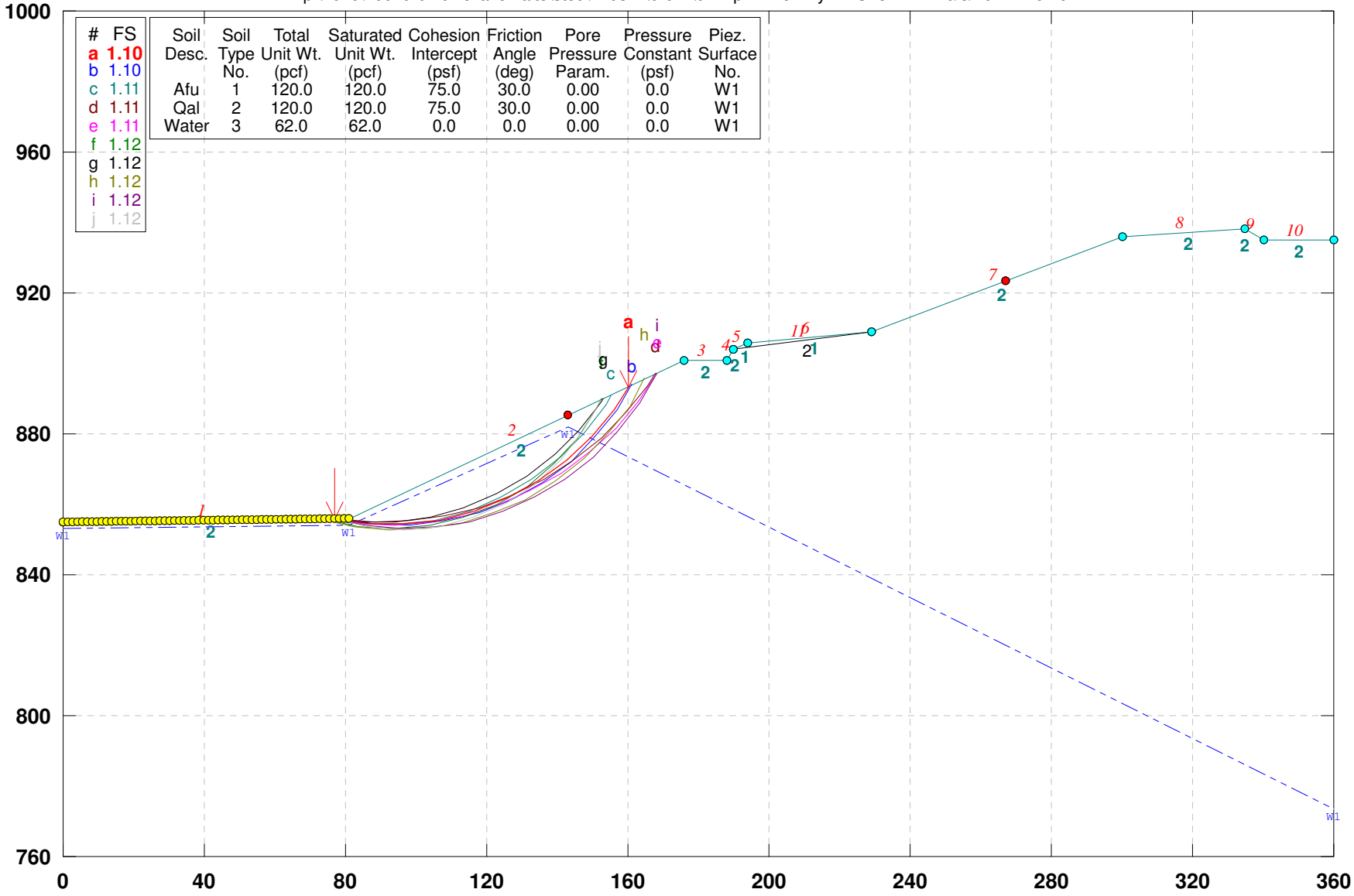
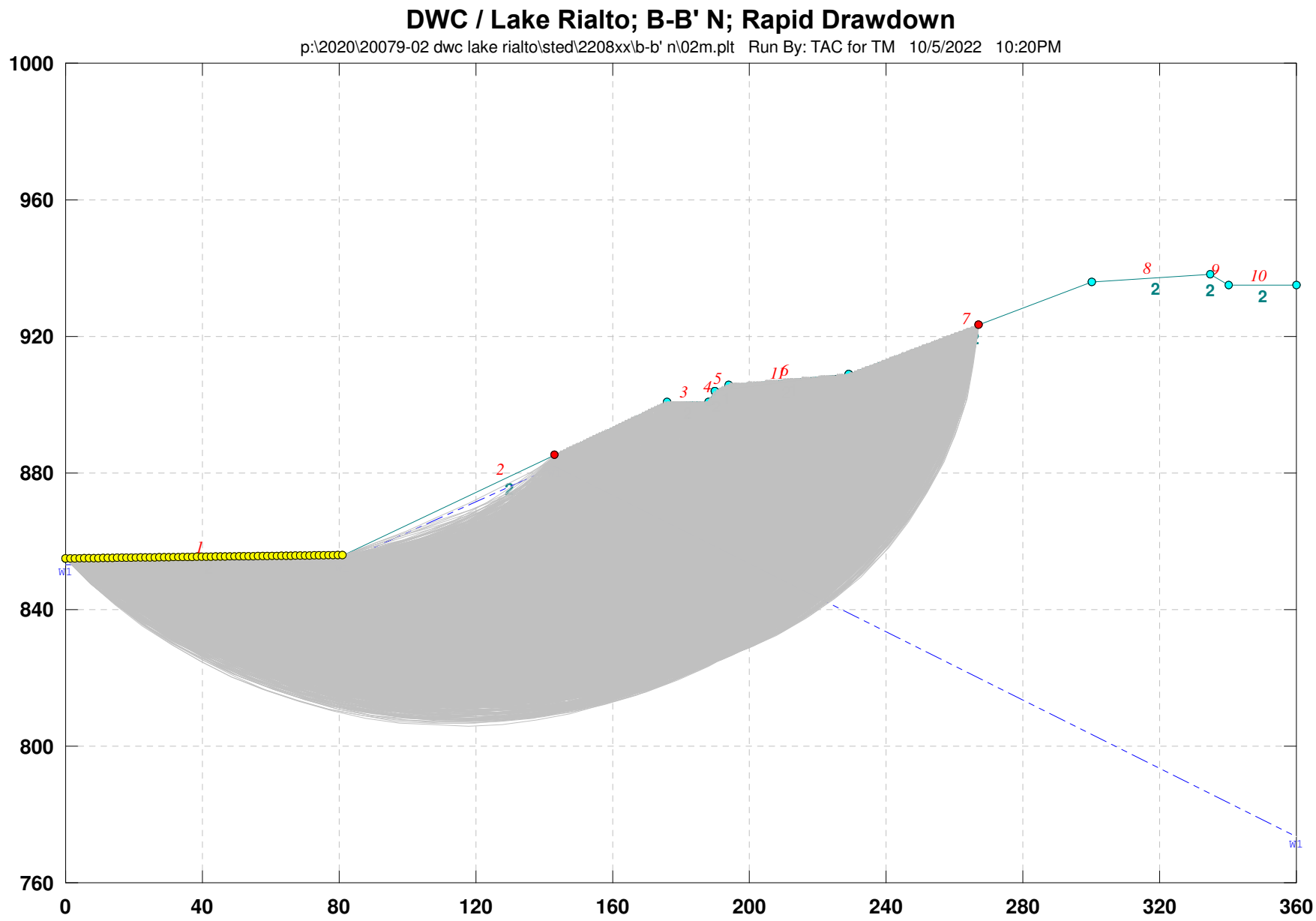


GSTABL7 v.2 FSmin=1.10

Safety Factors Are Calculated By The Modified Bishop Method


DWC / Lake Rialto; B-B' N; Rapid Drawdown
p:\2020\20079-02 dwc lake rialto\sted\2208xx\b-b' n\02m.plt Run By: TAC for TM 10/5/2022 10:20PM
1000
960
920
880
840
800
760
0
40
80
120
160
200
240
280
320
360
1
2
3
4
5
16
7
8
9
10
2
2
2
w1
w1

***** GSTABL7 *****

** GSTABL7 by Dr. Garry H. Gregory, Ph.D.,P.E.,D.GE **
** Original Version 1.0, January 1996; Current Ver. 2.005.3, Feb. 2013 **
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****

SLOPE STABILITY ANALYSIS SYSTEM
Modified Bishop, Simplified Janbu, or GLE Method of Slices.
(Includes Spencer & Morgenstern-Price Type Analysis)
Including Pier/Pile, Reinforcement, Soil Nail, Tieback,
Nonlinear Undrained Shear Strength, Curved Phi Envelope,
Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water
Surfaces, Pseudo-Static & Newmark Earthquake, and Applied Forces.

****

Analysis Run Date: 10/5/2022
Time of Run: 10:20PM
Run By: TAC for TM
Input Data Filename: P:\2020\20079-02 DWC Lake Rialto\Sted\2208XX\B-B' N\02m.in
Output Filename: P:\2020\20079-02 DWC Lake Rialto\Sted\2208XX\B-B' N\02m.OUT
Unit System: English
Plotted Output Filename: P:\2020\20079-02 DWC Lake Rialto\Sted\2208XX\B-B' N\02m.PLT
PROBLEM DESCRIPTION: DWC / Lake Rialto; B-B' N; Rapid Drawdow
n

BOUNDARY COORDINATES
10 Top Boundaries
11 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	0.00	855.00	81.00	856.00	2
2	81.00	856.00	176.00	901.00	2
3	176.00	901.00	188.00	901.00	2
4	188.00	901.00	190.00	904.00	2
5	190.00	904.00	194.00	906.00	1
6	194.00	906.00	229.00	909.00	1
7	229.00	909.00	300.00	936.00	2
8	300.00	936.00	335.00	938.00	2
9	335.00	938.00	340.00	935.00	2
10	340.00	935.00	360.00	935.00	2
11	190.00	904.00	229.00	909.00	2

User Specified Y-Origin = 760.00(ft)
Default X-Plus Value = 0.00(ft)
Default Y-Plus Value = 0.00(ft)

ISOTROPIC SOIL PARAMETERS
3 Type(s) of Soil

Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
1	120.0	120.0	75.0	30.0	0.00	0.0	1
2	120.0	120.0	75.0	30.0	0.00	0.0	1
3	62.0	62.0	0.0	0.0	0.00	0.0	1

1 PIEZOMETRIC SURFACE(S) SPECIFIED
Unit Weight of Water = 62.40 (pcf)
Piezometric Surface No. 1 Specified by 4 Coordinate Points
Pore Pressure Inclination Factor = 0.50

Point No.	X-Water (ft)	Y-Water (ft)
1	0.00	853.00
2	81.00	854.00
3	143.00	882.00
4	360.00	773.50

A Critical Failure Surface Searching Method, Using A Random
Technique For Generating Circular Surfaces, Has Been Specified.
4800 Trial Surfaces Have Been Generated.
80 Surface(s) Initiate(s) From Each Of 60 Points Equally Spaced
Along The Ground Surface Between X = 0.00(ft)
and X = 81.00(ft)
Each Surface Terminates Between X = 143.00(ft)
and X = 267.00(ft)
Unless Further Limitations Were Imposed, The Minimum Elevation
At Which A Surface Extends Is Y = 0.00(ft)
10.00(ft) Line Segments Define Each Trial Failure Surface.

Following Are Displayed The Ten Most Critical Of The Trial
Failure Surfaces Evaluated. They Are
Ordered - Most Critical First.
* * Safety Factors Are Calculated By The Modified Bishop Method * *
Total Number of Trial Surfaces Attempted = 4800
Number of Trial Surfaces With Valid FS = 4800
Statistical Data On All Valid FS Values:
FS Max = 2.861 FS Min = 1.101 FS Ave = 1.709
Standard Deviation = 0.274 Coefficient of Variation = 16.05 %
Failure Surface Specified By 11 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	76.881	855.949
2	86.782	854.540
3	96.781	854.416
4	106.713	855.578
5	116.414	858.007
6	125.721	861.663
7	134.482	866.485
8	142.549	872.394
9	149.791	879.291
10	156.085	887.061
11	160.002	893.422

Circle Center At X = 92.746 ; Y = 931.935 ; and Radius = 77.624
Factor of Safety
*** 1.101 ***
Individual data on the 14 slices

Slice No.	Width (ft)	Weight (lbs)	Water Force Top (lbs)	Water Force Bot (lbs)	Tie Force Norm (lbs)	Tie Force Tan (lbs)	Earthquake Force Hor (lbs)	Earthquake Force Ver (lbs)	Surcharge Load (lbs)
1	4.1	157.4	0.0	0.0	0.	0.	0.0	0.0	0.0
2	2.3	370.1	0.0	0.0	0.	0.	0.0	0.0	0.0
3	3.5	1307.3	0.0	208.3	0.	0.	0.0	0.0	0.0
4	10.0	7954.1	0.0	2507.9	0.	0.	0.0	0.0	0.0
5	9.9	12909.1	0.0	4782.2	0.	0.	0.0	0.0	0.0
6	9.7	15930.3	0.0	6288.7	0.	0.	0.0	0.0	0.0
7	9.3	16915.2	0.0	7002.3	0.	0.	0.0	0.0	0.0
8	8.8	15962.6	0.0	6911.3	0.	0.	0.0	0.0	0.0
9	8.1	13364.7	0.0	6017.1	0.	0.	0.0	0.0	0.0
10	0.5	684.2	0.0	330.2	0.	0.	0.0	0.0	0.0
11	6.3	8365.2	0.0	2248.5	0.	0.	0.0	0.0	0.0
12	0.5	533.1	0.0	0.0	0.	0.	0.0	0.0	0.0
13	6.3	5211.8	0.0	0.0	0.	0.	0.0	0.0	0.0
14	3.9	1058.9	0.0	0.0	0.	0.	0.0	0.0	0.0

Failure Surface Specified By 11 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	78.254	855.966
2	88.135	854.424
3	98.132	854.203
4	108.071	855.307
5	117.776	857.716
6	127.077	861.389
7	135.811	866.261
8	143.822	872.246
9	150.971	879.238
10	157.132	887.115
11	161.158	893.969

Circle Center At X = 94.796 ; Y = 929.522 ; and Radius = 75.393
Factor of Safety
*** 1.103 ***
Failure Surface Specified By 11 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	75.508	855.932
2	85.403	854.481
3	95.402	854.372
4	105.325	855.609
5	114.992	858.168

6	124.227	862.004
7	132.863	867.045
8	140.743	873.202
9	147.724	880.363
10	153.679	888.396
11	155.191	891.143

Circle Center At X = 91.205 ; Y = 928.483 ; and Radius = 74.229

Factor of Safety

*** 1.105 ***

Failure Surface Specified By 12 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	78.254	855.966
2	88.221	855.148
3	98.217	855.413
4	108.126	856.760
5	117.831	859.171
6	127.218	862.618
7	136.176	867.062
8	144.601	872.450
9	152.393	878.718
10	159.460	885.793
11	165.720	893.591
12	168.042	897.230

Circle Center At X = 90.831 ; Y = 946.917 ; and Radius = 91.816

Factor of Safety

*** 1.107 ***

Failure Surface Specified By 12 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	74.136	855.915
2	84.022	854.415
3	94.016	854.044
4	103.986	854.807
5	113.807	856.695
6	123.350	859.682
7	132.494	863.731
8	141.120	868.789
9	149.118	874.792
10	156.385	881.662
11	162.827	889.310
12	168.112	897.264

Circle Center At X = 92.289 ; Y = 942.127 ; and Radius = 88.102

Factor of Safety

*** 1.112 ***

Failure Surface Specified By 11 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	74.136	855.915
2	83.896	853.738
3	93.872	853.055
4	103.838	853.880
5	113.567	856.195
6	122.836	859.948
7	131.435	865.053
8	139.168	871.393
9	145.859	878.825
10	151.356	887.178
11	152.619	889.925

Circle Center At X = 93.402 ; Y = 919.327 ; and Radius = 66.274

Factor of Safety

*** 1.117 ***

Failure Surface Specified By 11 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	74.136	855.915
2	84.066	854.734
3	94.065	854.852
4	103.964	856.267
5	113.596	858.955

6	122.798	862.871
7	131.413	867.947
8	139.297	874.100
9	146.315	881.223
10	152.349	889.197
11	152.817	890.018

Circle Center At X = 88.161 ; Y = 931.499 ; and Radius = 76.874

Factor of Safety

*** 1.120 ***

Failure Surface Specified By 12 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	72.763	855.898
2	82.513	853.676
3	92.466	852.714
4	102.461	853.028
5	112.335	854.613
6	121.926	857.442
7	131.079	861.471
8	139.644	866.632
9	147.482	872.843
10	154.465	880.001
11	160.479	887.991
12	164.888	895.736

Circle Center At X = 95.014 ; Y = 930.881 ; and Radius = 78.215

Factor of Safety

*** 1.120 ***

Failure Surface Specified By 13 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	75.508	855.932
2	85.294	853.874
3	95.261	853.055
4	105.251	853.487
5	115.110	855.164
6	124.681	858.059
7	133.816	862.128
8	142.371	867.306
9	150.212	873.513
10	157.216	880.650
11	163.274	888.607
12	168.290	897.258
13	168.337	897.370

Circle Center At X = 96.811 ; Y = 932.922 ; and Radius = 79.882

Factor of Safety

*** 1.122 ***

Failure Surface Specified By 11 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	76.881	855.949
2	86.594	853.569
3	96.565	852.810
4	106.526	853.693
5	116.209	856.193
6	125.351	860.244
7	133.708	865.736
8	141.054	872.521
9	147.191	880.417
10	151.953	889.210
11	152.118	889.688

Circle Center At X = 96.187 ; Y = 913.727 ; and Radius = 60.918

Factor of Safety

*** 1.122 ***

**** END OF GSTABL7 OUTPUT ****

Summary of Slope Stability Analysis

Cross-Section D-D'

Filename	Description	Factor of Safety (FS)	
		Static	***Pseudostatic***
01, 01p	Design Condition	1.72	1.13
02	Rapid Drawdown Condition-Operating Lake Level El 905'	0.90	--
02m	Rapid Drawdown-Maximum Groundwater El 879' (26 feet bgs)	1.10	--

Project No.: 20079-02

Project Name: DWC / Lake Rialto

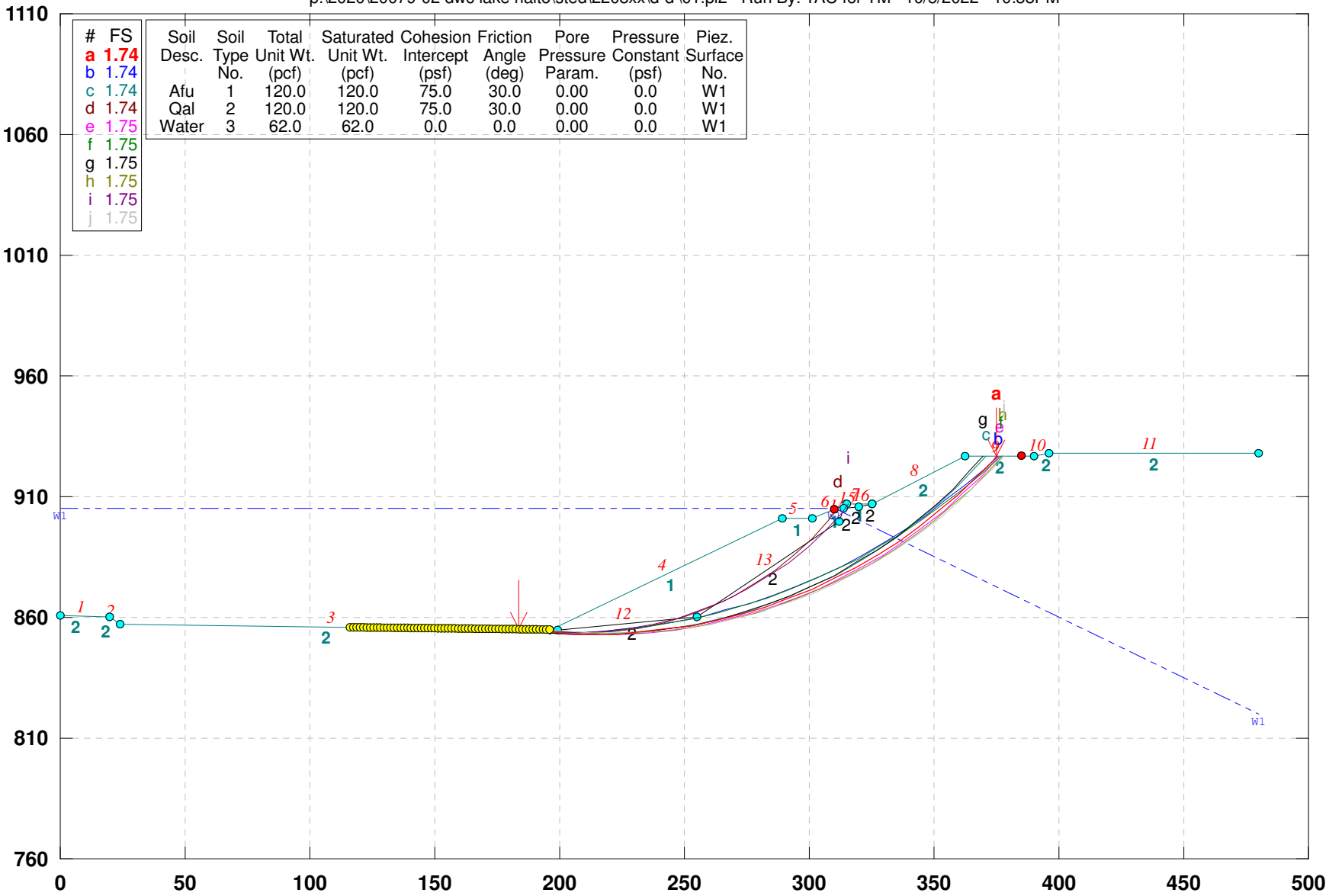
NMG

DWC / Lake Rialto; D-D'; Design

p:\2020\20079-02 dwc lake rialto\sted\2208xx\d-d'\01.pl2 Run By: TAC for TM 10/5/2022 10:38PM

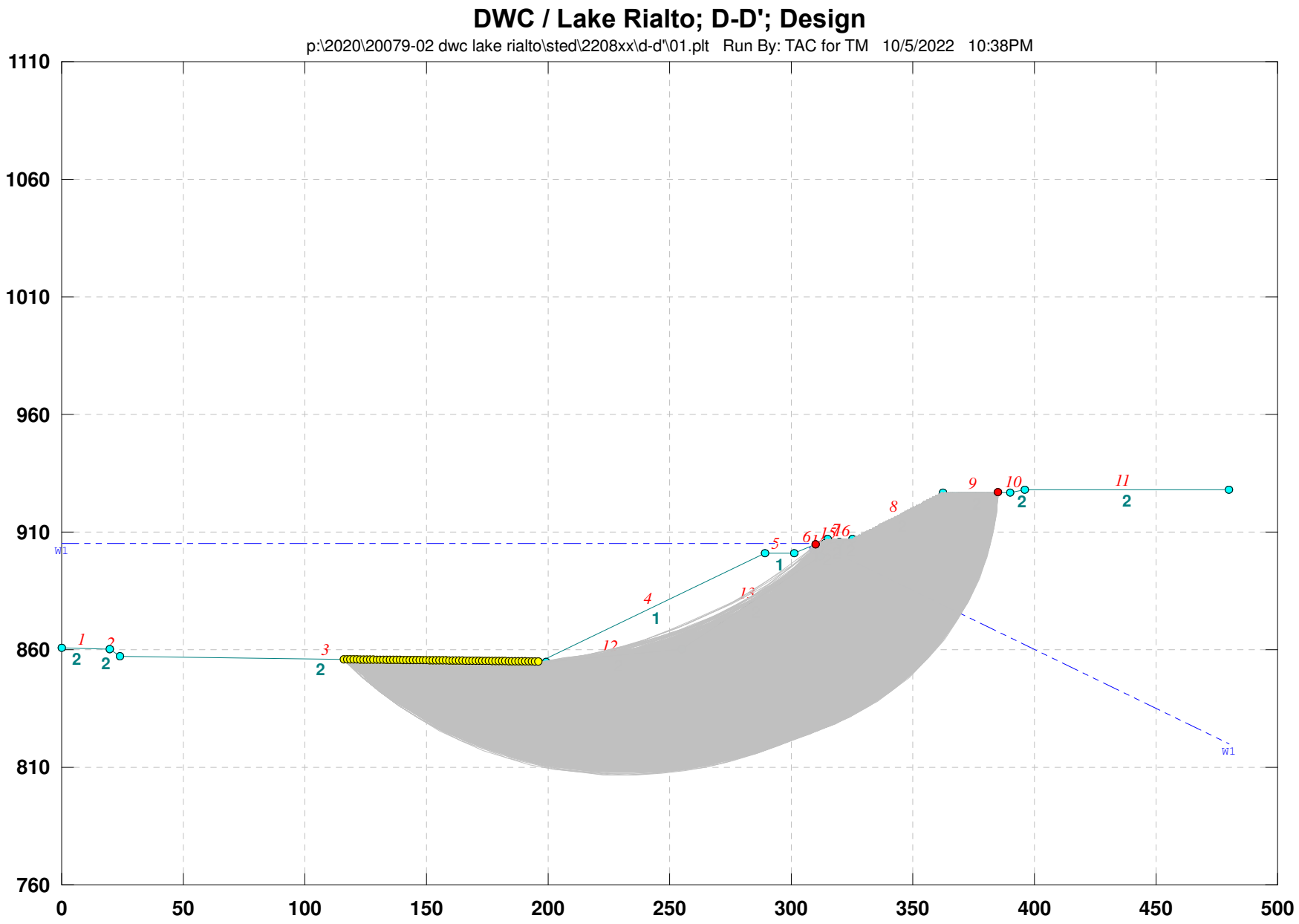
#	FS
a	1.74
b	1.74
c	1.74
d	1.74
e	1.75
f	1.75
g	1.75
h	1.75
i	1.75
j	1.75

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
Afu	1	120.0	120.0	75.0	30.0	0.00	0.0	W1
Qal	2	120.0	120.0	75.0	30.0	0.00	0.0	W1
Water	3	62.0	62.0	0.0	0.0	0.00	0.0	W1



GSTABL7 v.2 FSmin=1.74

Safety Factors Are Calculated By The Modified Bishop Method


DWC / Lake Rialto; D-D'; Design
p:\2020\20079-02 dwc lake rialto\sted\2208xx\d-d'\01.plt Run By: TAC for TM 10/5/2022 10:38PM
1110
1060
1010
960
910
860
810
760
0
50
100
150
200
250
300
350
400
450
500
W1
W1
1
2
3
4
5
6
7
8
9
10
11
12
13
1
2
2
2
1
2
2

***** GSTABL7 *****

** GSTABL7 by Dr. Garry H. Gregory, Ph.D.,P.E.,D.GE **
** Original Version 1.0, January 1996; Current Ver. 2.005.3, Feb. 2013 **
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SLOPE STABILITY ANALYSIS SYSTEM
Modified Bishop, Simplified Janbu, or GLE Method of Slices.
(Includes Spencer & Morgenstern-Price Type Analysis)
Including Pier/Pile, Reinforcement, Soil Nail, Tieback,
Nonlinear Undrained Shear Strength, Curved Phi Envelope,
Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water
Surfaces, Pseudo-Static & Newmark Earthquake, and Applied Forces.

Analysis Run Date: 10/5/2022
Time of Run: 10:38PM
Run By: TAC for TM
Input Data Filename: P:\2020\20079-02 DWC Lake Rialto\Sted\2208XX\D-D'\01.in
Output Filename: P:\2020\20079-02 DWC Lake Rialto\Sted\2208XX\D-D'\01.OUT
Unit System: English
Plotted Output Filename: P:\2020\20079-02 DWC Lake Rialto\Sted\2208XX\D-D'\01.PLT
PROBLEM DESCRIPTION: DWC / Lake Rialto; D-D'; Design
BOUNDARY COORDINATES
11 Top Boundaries
16 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	0.00	861.00	20.00	860.00	2
2	20.00	860.00	24.00	857.00	2
3	24.00	857.00	196.00	855.00	2
4	196.00	855.00	289.00	901.00	1
5	289.00	901.00	301.00	901.00	1
6	301.00	901.00	315.00	907.00	1
7	315.00	907.00	325.00	907.00	1
8	325.00	907.00	362.50	927.00	2
9	362.50	927.00	390.00	927.00	2
10	390.00	927.00	396.00	928.00	2
11	396.00	928.00	480.00	928.00	2
12	199.00	855.00	255.00	860.00	2
13	255.00	860.00	312.00	900.00	2
14	312.00	900.00	314.00	905.00	2
15	314.00	905.00	320.00	906.00	2
16	320.00	906.00	325.00	907.00	2

User Specified Y-Origin = 760.00(ft)
Default X-Plus Value = 0.00(ft)
Default Y-Plus Value = 0.00(ft)
ISOTROPIC SOIL PARAMETERS
3 Type(s) of Soil

Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
1	120.0	120.0	75.0	30.0	0.00	0.0	1
2	120.0	120.0	75.0	30.0	0.00	0.0	1
3	62.0	62.0	0.0	0.0	0.00	0.0	1

1 PIEZOMETRIC SURFACE(S) SPECIFIED
Unit Weight of Water = 62.40 (pcf)
Piezometric Surface No. 1 Specified by 3 Coordinate Points
Pore Pressure Inclination Factor = 0.50

Point No.	X-Water (ft)	Y-Water (ft)
1	0.00	905.00
2	310.00	905.00
3	480.00	820.00

A Critical Failure Surface Searching Method, Using A Random
Technique For Generating Circular Surfaces, Has Been Specified.
4800 Trial Surfaces Have Been Generated.
80 Surface(s) Initiate(s) From Each Of 60 Points Equally Spaced
Along The Ground Surface Between X = 116.00(ft)
and X = 196.00(ft)
Each Surface Terminates Between X = 310.00(ft)
and X = 385.00(ft)

Unless Further Limitations Were Imposed, The Minimum Elevation
At Which A Surface Extends Is Y = 0.00(ft)
10.00(ft) Line Segments Define Each Trial Failure Surface.
Following Are Displayed The Ten Most Critical Of The Trial
Failure Surfaces Evaluated. They Are
Ordered - Most Critical First.
* * Safety Factors Are Calculated By The Modified Bishop Method * *
Total Number of Trial Surfaces Attempted = 4800
Number of Trial Surfaces With Valid FS = 4800
Statistical Data On All Valid FS Values:
FS Max = 3.143 FS Min = 1.739 FS Ave = 2.351
Standard Deviation = 0.337 Coefficient of Variation = 14.33 %
Failure Surface Specified By 23 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	183.796	855.142
2	193.728	853.978
3	203.704	853.281
4	213.702	853.052
5	223.699	853.292
6	233.674	854.000
7	243.604	855.175
8	253.469	856.813
9	263.246	858.912
10	272.915	861.467
11	282.453	864.471
12	291.839	867.920
13	301.054	871.804
14	310.076	876.116
15	318.887	880.846
16	327.467	885.984
17	335.796	891.517
18	343.857	897.435
19	351.631	903.725
20	359.103	910.371
21	366.255	917.360
22	373.071	924.677
23	375.041	927.000

Circle Center At X = 213.585 ; Y = 1066.429 ; and Radius = 213.377
Factor of Safety
*** 1.739 ***
Individual data on the 36 slices

Slice No.	Width (ft)	Weight (lbs)	Water Force Top (lbs)	Water Force Bot (lbs)	Tie Force Norm (lbs)	Tie Force Tan (lbs)	Earthquake Force Hor (lbs)	Earthquake Force Ver (lbs)	Surcharge Load (lbs)
1	9.9	624.7	30938.0	31474.5	0.	0.	0.0	0.0	0.0
2	2.3	303.7	7085.8	7261.0	0.	0.	0.0	0.0	0.0
3	3.0	729.8	10287.4	9624.0	0.	0.	0.0	0.0	0.0
4	4.7	2371.8	15507.2	15170.1	0.	0.	0.0	0.0	0.0
5	10.0	9737.0	30425.9	32343.9	0.	0.	0.0	0.0	0.0
6	10.0	15662.4	26983.8	32340.5	0.	0.	0.0	0.0	0.0
7	10.0	20972.7	23493.9	32044.8	0.	0.	0.0	0.0	0.0
8	9.9	25624.8	19986.5	31457.5	0.	0.	0.0	0.0	0.0
9	9.9	29585.1	16491.7	30579.8	0.	0.	0.0	0.0	0.0
10	1.5	4928.0	2258.8	4691.7	0.	0.	0.0	0.0	0.0
11	8.2	27901.4	10780.0	24722.1	0.	0.	0.0	0.0	0.0
12	9.7	35343.1	9656.5	27961.9	0.	0.	0.0	0.0	0.0
13	9.5	37121.6	6372.5	26227.3	0.	0.	0.0	0.0	0.0
14	6.5	26483.2	2561.3	17117.0	0.	0.	0.0	0.0	0.0
15	2.8	11447.8	708.6	7096.8	0.	0.	0.0	0.0	0.0
16	9.2	34242.6	2286.6	21804.9	0.	0.	0.0	0.0	0.0
17	0.1	188.8	14.6	121.1	0.	0.	0.0	0.0	0.0
18	8.9	31130.6	1251.1	19216.0	0.	0.	0.0	0.0	0.0
19	0.1	264.0	0.0	137.4	0.	0.	0.0	0.0	0.0
20	1.9	6617.7	0.0	3414.5	0.	0.	0.0	0.0	0.0
21	1.3	4559.0	0.0	2223.3	0.	0.	0.0	0.0	0.0
22	0.7	2270.8	0.0	1067.6	0.	0.	0.0	0.0	0.0
23	1.0	3395.4	0.0	1546.3	0.	0.	0.0	0.0	0.0
24	3.9	12686.4	0.0	5382.9	0.	0.	0.0	0.0	0.0

25	1.1	3448.2	0.0	1391.3	0.	0.	0.0	0.0	0.0
26	5.0	14394.3	0.0	5151.8	0.	0.	0.0	0.0	0.0
27	2.5	6633.9	0.0	1879.1	0.	0.	0.0	0.0	0.0
28	8.3	21775.5	0.0	3051.7	0.	0.	0.0	0.0	0.0
29	0.5	1204.8	0.0	9.6	0.	0.	0.0	0.0	0.0
30	7.6	18558.1	0.0	0.0	0.	0.	0.0	0.0	0.0
31	7.8	17306.8	0.0	0.0	0.	0.	0.0	0.0	0.0
32	7.5	14478.1	0.0	0.0	0.	0.	0.0	0.0	0.0
33	3.4	5732.7	0.0	0.0	0.	0.	0.0	0.0	0.0
34	3.8	5170.2	0.0	0.0	0.	0.	0.0	0.0	0.0
35	6.8	4892.7	0.0	0.0	0.	0.	0.0	0.0	0.0
36	2.0	274.5	0.0	0.0	0.	0.	0.0	0.0	0.0

Failure Surface Specified By 24 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	167.525	855.331
2	177.472	854.303
3	187.452	853.673
4	197.450	853.442
5	207.448	853.611
6	217.432	854.179
7	227.385	855.146
8	237.292	856.509
9	247.136	858.267
10	256.902	860.417
11	266.575	862.956
12	276.138	865.878
13	285.577	869.181
14	294.877	872.858
15	304.022	876.903
16	312.998	881.311
17	321.791	886.073
18	330.387	891.183
19	338.772	896.633
20	346.932	902.413
21	354.855	908.514
22	362.528	914.927
23	369.938	921.642
24	375.397	927.000

Circle Center At X = 198.241 ; Y = 1103.534 ; and Radius = 250.097

Factor of Safety

*** 1.740 ***

Failure Surface Specified By 22 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	185.152	855.126
2	195.085	853.966
3	205.062	853.295
4	215.061	853.115
5	225.056	853.426
6	235.024	854.228
7	244.940	855.519
8	254.781	857.295
9	264.523	859.552
10	274.142	862.286
11	283.615	865.488
12	292.920	869.153
13	302.033	873.269
14	310.933	877.829
15	319.598	882.820
16	328.008	888.231
17	336.142	894.048
18	343.980	900.258
19	351.503	906.846
20	358.694	913.795
21	365.535	921.089
22	370.556	927.000

Circle Center At X = 213.742 ; Y = 1056.446 ; and Radius = 203.339

Factor of Safety

*** 1.741 ***

Failure Surface Specified By 15 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	191.932	855.047
2	201.877	854.004
3	211.874	853.754
4	221.859	854.300
5	231.769	855.638
6	241.542	857.759
7	251.115	860.651
8	260.427	864.294
9	269.421	868.666
10	278.039	873.739
11	286.226	879.482
12	293.930	885.856
13	301.104	892.823
14	307.701	900.339
15	311.575	905.532

Circle Center At X = 210.011 ; Y = 979.441 ; and Radius = 125.700

Factor of Safety

*** 1.743 ***

Failure Surface Specified By 23 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	186.508	855.110
2	196.435	853.901
3	206.408	853.167
4	216.405	852.911
5	226.402	853.132
6	236.378	853.832
7	246.308	855.007
8	256.172	856.655
9	265.945	858.773
10	275.606	861.355
11	285.132	864.397
12	294.502	867.890
13	303.694	871.826
14	312.688	876.198
15	321.463	880.995
16	329.998	886.205
17	338.275	891.817
18	346.274	897.818
19	353.977	904.195
20	361.367	910.933
21	368.426	918.016
22	375.138	925.428
23	376.430	927.000

Circle Center At X = 216.767 ; Y = 1062.102 ; and Radius = 209.192

Factor of Safety

*** 1.745 ***

Failure Surface Specified By 25 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	164.813	855.363
2	174.756	854.288
3	184.732	853.603
4	194.728	853.308
5	204.727	853.403
6	214.715	853.890
7	224.677	854.766
8	234.597	856.030
9	244.459	857.681
10	254.250	859.717
11	263.954	862.133
12	273.556	864.926
13	283.041	868.092
14	292.396	871.627
15	301.605	875.524
16	310.655	879.778
17	319.532	884.383

18	328.222	889.330
19	336.713	894.614
20	344.990	900.225
21	353.042	906.155
22	360.856	912.395
23	368.420	918.936
24	375.723	925.767
25	376.942	927.000

Circle Center At X = 197.280 ; Y = 1109.216 ; and Radius = 255.921

Factor of Safety

*** 1.745 ***

Failure Surface Specified By 22 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	183.796	855.142
2	193.718	853.893
3	203.690	853.140
4	213.686	852.884
5	223.683	853.126
6	233.656	853.866
7	243.580	855.101
8	253.429	856.829
9	263.181	859.045
10	272.809	861.744
11	282.292	864.918
12	291.605	868.561
13	300.725	872.663
14	309.629	877.214
15	318.296	882.203
16	326.704	887.617
17	334.831	893.443
18	342.659	899.667
19	350.167	906.272
20	357.337	913.243
21	364.150	920.562
22	369.571	927.000

Circle Center At X = 213.836 ; Y = 1053.552 ; and Radius = 200.671

Factor of Safety

*** 1.746 ***

Failure Surface Specified By 22 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	190.576	855.063
2	200.513	853.942
3	210.493	853.303
4	220.491	853.147
5	230.486	853.474
6	240.453	854.284
7	250.369	855.575
8	260.212	857.344
9	269.957	859.587
10	279.583	862.297
11	289.066	865.470
12	298.385	869.098
13	307.517	873.172
14	316.442	877.682
15	325.139	882.619
16	333.587	887.970
17	341.766	893.724
18	349.657	899.865
19	357.243	906.382
20	364.504	913.257
21	371.425	920.475
22	377.102	927.000

Circle Center At X = 218.731 ; Y = 1059.851 ; and Radius = 206.715

Factor of Safety

*** 1.746 ***

Failure Surface Specified By 16 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)

1	187.864	855.095
2	197.814	854.093
3	207.810	853.811
4	217.800	854.250
5	227.733	855.407
6	237.557	857.277
7	247.220	859.850
8	256.673	863.112
9	265.866	867.047
10	274.752	871.634
11	283.285	876.849
12	291.419	882.665
13	299.114	889.052
14	306.328	895.977
15	313.024	903.404
16	315.825	907.000

Circle Center At X = 206.762 ; Y = 992.188 ; and Radius = 138.390

Factor of Safety

*** 1.747 ***

Failure Surface Specified By 22 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	193.288	855.032
2	203.235	854.001
3	213.220	853.453
4	223.219	853.387
5	233.211	853.805
6	243.170	854.705
7	253.074	856.086
8	262.900	857.943
9	272.625	860.273
10	282.226	863.070
11	291.681	866.327
12	300.967	870.038
13	310.062	874.193
14	318.947	878.783
15	327.599	883.796
16	335.999	889.222
17	344.128	895.048
18	351.965	901.259
19	359.492	907.841
20	366.693	914.780
21	373.551	922.059
22	377.774	927.000

Circle Center At X = 219.598 ; Y = 1060.032 ; and Radius = 206.682

Factor of Safety

*** 1.747 ***

**** END OF GSTABL7 OUTPUT ****

DWC / Lake Rialto; D-D'; Design; P-Static

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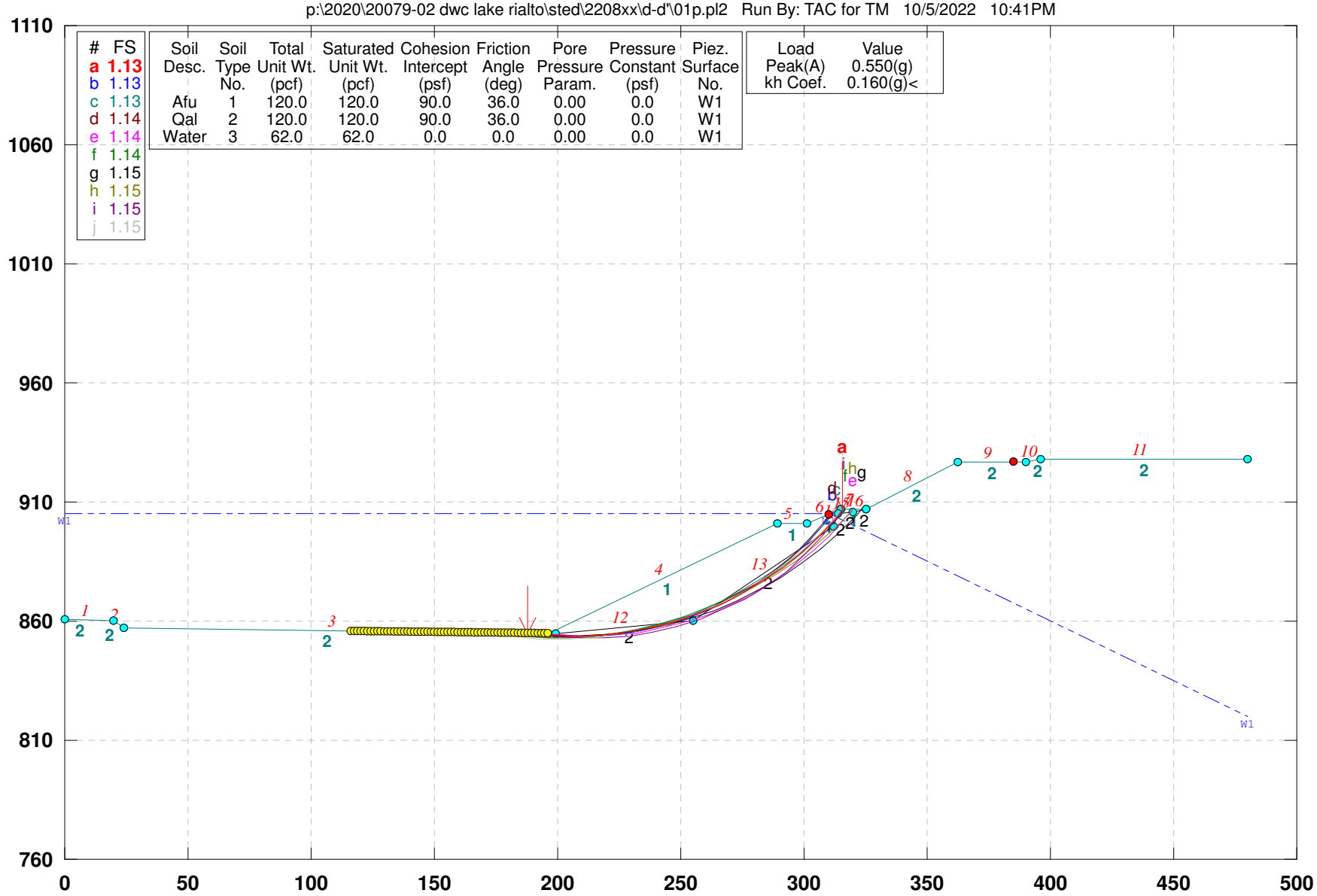
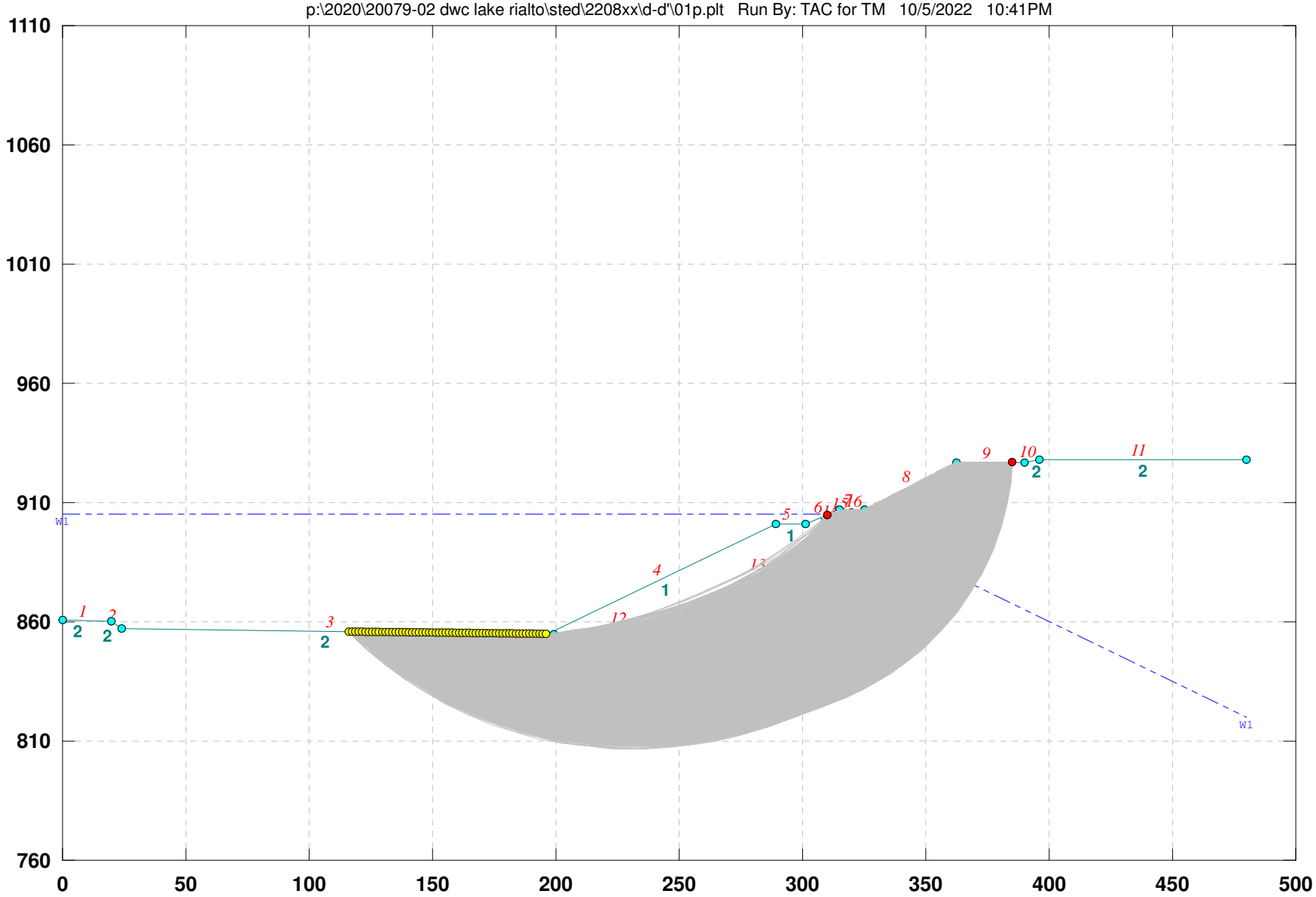


GSTABL7 v.2 FSmin=1.13

Safety Factors Are Calculated By The Modified Bishop Method


DWC / Lake Rialto; D-D'; Design; P-Static
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1110
1060
1010
960
910
860
810
760
0
50
100
150
200
250
300
350
400
450
500
W1
W1
1
2
3
4
5
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11
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13
16

***** GSTABL7 *****

** GSTABL7 by Dr. Garry H. Gregory, Ph.D.,P.E.,D.GE **
** Original Version 1.0, January 1996; Current Ver. 2.005.3, Feb. 2013 **
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SLOPE STABILITY ANALYSIS SYSTEM
Modified Bishop, Simplified Janbu, or GLE Method of Slices.
(Includes Spencer & Morgenstern-Price Type Analysis)
Including Pier/Pile, Reinforcement, Soil Nail, Tieback,
Nonlinear Undrained Shear Strength, Curved Phi Envelope,
Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water
Surfaces, Pseudo-Static & Newmark Earthquake, and Applied Forces.

Analysis Run Date: 10/5/2022
Time of Run: 10:41PM
Run By: TAC for TM
Input Data Filename: P:\2020\20079-02 DWC Lake Rialto\Sted\2208XX\D-D'\01p.in
Output Filename: P:\2020\20079-02 DWC Lake Rialto\Sted\2208XX\D-D'\01p.OUT
Unit System: English
Plotted Output Filename: P:\2020\20079-02 DWC Lake Rialto\Sted\2208XX\D-D'\01p.PLT
PROBLEM DESCRIPTION: DWC / Lake Rialto; D-D'; Design; P-Stati
c

BOUNDARY COORDINATES
11 Top Boundaries
16 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	0.00	861.00	20.00	860.00	2
2	20.00	860.00	24.00	857.00	2
3	24.00	857.00	196.00	855.00	2
4	196.00	855.00	289.00	901.00	1
5	289.00	901.00	301.00	901.00	1
6	301.00	901.00	315.00	907.00	1
7	315.00	907.00	325.00	907.00	1
8	325.00	907.00	362.50	927.00	2
9	362.50	927.00	390.00	927.00	2
10	390.00	927.00	396.00	928.00	2
11	396.00	928.00	480.00	928.00	2
12	199.00	855.00	255.00	860.00	2
13	255.00	860.00	312.00	900.00	2
14	312.00	900.00	314.00	905.00	2
15	314.00	905.00	320.00	906.00	2
16	320.00	906.00	325.00	907.00	2

User Specified Y-Origin = 760.00(ft)
Default X-Plus Value = 0.00(ft)
Default Y-Plus Value = 0.00(ft)

ISOTROPIC SOIL PARAMETERS
3 Type(s) of Soil

Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
1	120.0	120.0	90.0	36.0	0.00	0.0	1
2	120.0	120.0	90.0	36.0	0.00	0.0	1
3	62.0	62.0	0.0	0.0	0.00	0.0	1

1 PIEZOMETRIC SURFACE(S) SPECIFIED
Unit Weight of Water = 62.40 (pcf)
Piezometric Surface No. 1 Specified by 3 Coordinate Points
Pore Pressure Inclination Factor = 0.50

Point No.	X-Water (ft)	Y-Water (ft)
1	0.00	905.00
2	310.00	905.00
3	480.00	820.00

Specified Peak Ground Acceleration Coefficient (A) = 0.550(g)
Specified Horizontal Earthquake Coefficient (kh) = 0.160(g)
Specified Vertical Earthquake Coefficient (kv) = 0.000(g)
Specified Seismic Pore-Pressure Factor = 0.000
A Critical Failure Surface Searching Method, Using A Random
Technique For Generating Circular Surfaces, Has Been Specified.
4800 Trial Surfaces Have Been Generated.

80 Surface(s) Initiate(s) From Each Of 60 Points Equally Spaced
Along The Ground Surface Between X = 116.00(ft)
and X = 196.00(ft)
Each Surface Terminates Between X = 310.00(ft)
and X = 385.00(ft)
Unless Further Limitations Were Imposed, The Minimum Elevation
At Which A Surface Extends Is Y = 0.00(ft)
10.00(ft) Line Segments Define Each Trial Failure Surface.
Following Are Displayed The Ten Most Critical Of The Trial
Failure Surfaces Evaluated. They Are
Ordered - Most Critical First.
* * Safety Factors Are Calculated By The Modified Bishop Method * *
Total Number of Trial Surfaces Attempted = 4800
Number of Trial Surfaces With Valid FS = 4800
Statistical Data On All Valid FS Values:
FS Max = 2.085 FS Min = 1.130 FS Ave = 1.564
Standard Deviation = 0.231 Coefficient of Variation = 14.79 %
Failure Surface Specified By 16 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	187.864	855.095
2	197.814	854.093
3	207.810	853.811
4	217.800	854.250
5	227.733	855.407
6	237.557	857.277
7	247.220	859.850
8	256.673	863.112
9	265.866	867.047
10	274.752	871.634
11	283.285	876.849
12	291.419	882.665
13	299.114	889.052
14	306.328	895.977
15	313.024	903.404
16	315.825	907.000

Circle Center At X = 206.762 ; Y = 992.188 ; and Radius = 138.390
Factor of Safety
*** 1.130 ***
Individual data on the 28 slices

Slice No.	Width (ft)	Weight (lbs)	Water Force Top (lbs)	Water Force Bot (lbs)	Tie Force Norm (lbs)	Tie Force Tan (lbs)	Earthquake Force Hor (lbs)	Earthquake Force Ver (lbs)	Surcharge Load (lbs)
1	8.1	353.6	25361.5	25672.7	0.	0.	56.6	0.0	0.0
2	1.8	275.2	6257.1	5780.7	0.	0.	44.0	0.0	0.0
3	1.2	300.9	4030.3	3770.5	0.	0.	48.1	0.0	0.0
4	8.8	4997.7	28419.1	28083.4	0.	0.	799.6	0.0	0.0
5	10.0	11127.5	28993.4	31805.1	0.	0.	1780.4	0.0	0.0
6	9.9	15985.1	25419.2	31307.1	0.	0.	2557.6	0.0	0.0
7	9.8	19784.8	21798.4	30362.6	0.	0.	3165.6	0.0	0.0
8	6.6	15040.8	12754.2	19924.1	0.	0.	2406.5	0.0	0.0
9	3.1	7433.9	5446.4	9052.3	0.	0.	1189.4	0.0	0.0
10	9.5	24038.5	14693.1	27155.8	0.	0.	3846.2	0.0	0.0
11	7.1	18805.0	8989.5	19401.4	0.	0.	3008.8	0.0	0.0
12	2.1	5690.9	2348.8	5509.0	0.	0.	910.5	0.0	0.0
13	8.9	23901.2	8193.3	22251.6	0.	0.	3824.2	0.0	0.0
14	8.5	22342.7	5308.6	19193.3	0.	0.	3574.8	0.0	0.0
15	5.7	14193.0	2153.9	11446.3	0.	0.	2270.9	0.0	0.0
16	2.4	5573.6	603.8	4305.2	0.	0.	891.8	0.0	0.0
17	7.7	13980.2	1920.5	11944.0	0.	0.	2236.8	0.0	0.0
18	1.9	2499.7	470.9	2454.4	0.	0.	399.9	0.0	0.0
19	5.3	5575.8	1033.9	5336.2	0.	0.	892.1	0.0	0.0
20	0.1	90.1	11.9	86.3	0.	0.	14.4	0.0	0.0
21	3.6	2578.8	219.9	2304.3	0.	0.	412.6	0.0	0.0
22	3.0	1371.2	0.0	638.3	0.	0.	219.4	0.0	0.0
23	0.0	15.4	0.0	0.2	0.	0.	2.5	0.0	0.0
24	0.6	188.7	0.0	0.0	0.	0.	30.2	0.0	0.0
25	0.3	68.9	0.0	0.0	0.	0.	11.0	0.0	0.0
26	0.3	65.7	0.0	0.0	0.	0.	10.5	0.0	0.0

27	0.7	112.7	0.0	0.0	0.	0.	18.0	0.0	0.0
28	0.8	52.4	0.0	0.0	0.	0.	8.4	0.0	0.0

Failure Surface Specified By 15 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	191.932	855.047
2	201.877	854.004
3	211.874	853.754
4	221.859	854.300
5	231.769	855.638
6	241.542	857.759
7	251.115	860.651
8	260.427	864.294
9	269.421	868.666
10	278.039	873.739
11	286.226	879.482
12	293.930	885.856
13	301.104	892.823
14	307.701	900.339
15	311.575	905.532

Circle Center At X = 210.011 ; Y = 979.441 ; and Radius = 125.700

Factor of Safety

*** 1.132 ***

Failure Surface Specified By 16 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	182.440	855.158
2	192.371	853.978
3	202.360	853.511
4	212.357	853.760
5	222.310	854.724
6	232.169	856.397
7	241.883	858.772
8	251.402	861.835
9	260.678	865.571
10	269.663	869.962
11	278.310	874.984
12	286.577	880.611
13	294.419	886.816
14	301.797	893.566
15	308.674	900.826
16	313.050	906.164

Circle Center At X = 203.906 ; Y = 992.917 ; and Radius = 139.422

Factor of Safety

*** 1.134 ***

Failure Surface Specified By 16 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	185.152	855.126
2	195.072	853.858
3	205.059	853.348
4	215.055	853.601
5	225.004	854.613
6	234.847	856.380
7	244.526	858.891
8	253.987	862.132
9	263.173	866.084
10	272.031	870.723
11	280.511	876.023
12	288.563	881.954
13	296.140	888.480
14	303.198	895.564
15	309.696	903.165
16	311.358	905.439

Circle Center At X = 206.776 ; Y = 984.330 ; and Radius = 131.001

Factor of Safety

*** 1.136 ***

Failure Surface Specified By 16 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)

1	191.932	855.047
2	201.872	853.955
3	211.866	853.595
4	221.859	853.969
5	231.797	855.076
6	241.628	856.908
7	251.298	859.456
8	260.755	862.707
9	269.948	866.643
10	278.827	871.242
11	287.345	876.481
12	295.456	882.330
13	303.116	888.758
14	310.284	895.731
15	316.921	903.211
16	319.815	907.000

Circle Center At X = 211.806 ; Y = 989.497 ; and Radius = 135.910

Factor of Safety

*** 1.142 ***

Failure Surface Specified By 17 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	175.661	855.237
2	185.568	853.877
3	195.543	853.176
4	205.543	853.137
5	215.524	853.758
6	225.442	855.038
7	235.253	856.971
8	244.915	859.549
9	254.386	862.760
10	263.623	866.590
11	272.587	871.023
12	281.238	876.038
13	289.539	881.615
14	297.453	887.728
15	304.945	894.352
16	311.983	901.456
17	316.792	907.000

Circle Center At X = 201.145 ; Y = 1004.218 ; and Radius = 151.145

Factor of Safety

*** 1.144 ***

Failure Surface Specified By 17 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	185.152	855.126
2	195.097	854.075
3	205.089	853.668
4	215.086	853.909
5	225.046	854.795
6	234.929	856.323
7	244.692	858.487
8	254.295	861.277
9	263.697	864.683
10	272.860	868.689
11	281.744	873.279
12	290.313	878.433
13	298.531	884.131
14	306.364	890.348
15	313.778	897.058
16	320.743	904.234
17	323.101	907.000

Circle Center At X = 206.372 ; Y = 1008.280 ; and Radius = 154.617

Factor of Safety

*** 1.145 ***

Failure Surface Specified By 18 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	174.305	855.252
2	184.218	853.935

3	194.194	853.240
4	204.193	853.169
5	214.178	853.723
6	224.109	854.899
7	233.946	856.693
8	243.653	859.098
9	253.190	862.105
10	262.521	865.702
11	271.609	869.874
12	280.419	874.605
13	288.916	879.878
14	297.067	885.671
15	304.840	891.962
16	312.205	898.726
17	319.134	905.937
18	320.034	907.000

Circle Center At X = 200.341 ; Y = 1013.002 ; and Radius = 159.884

Factor of Safety

*** 1.148 ***

Failure Surface Specified By 16 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	189.220	855.079
2	199.095	853.505
3	209.065	852.731
4	219.065	852.761
5	229.031	853.595
6	238.896	855.228
7	248.599	857.650
8	258.075	860.843
9	267.264	864.789
10	276.105	869.461
11	284.543	874.829
12	292.521	880.858
13	299.988	887.509
14	306.896	894.739
15	313.201	902.502
16	316.289	907.000

Circle Center At X = 213.717 ; Y = 976.577 ; and Radius = 123.943

Factor of Safety

*** 1.153 ***

Failure Surface Specified By 17 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	172.949	855.268
2	182.810	853.607
3	192.762	852.627
4	202.758	852.335
5	212.750	852.731
6	222.691	853.814
7	232.534	855.578
8	242.233	858.015
9	251.741	861.113
10	261.013	864.858
11	270.006	869.232
12	278.676	874.214
13	286.983	879.782
14	294.887	885.907
15	302.352	892.562
16	309.341	899.714
17	315.540	907.000

Circle Center At X = 202.003 ; Y = 997.607 ; and Radius = 145.274

Factor of Safety

*** 1.153 ***

**** END OF GSTABL7 OUTPUT ****

DWC / Lake Rialto; D-D'; Rapid Drawdown

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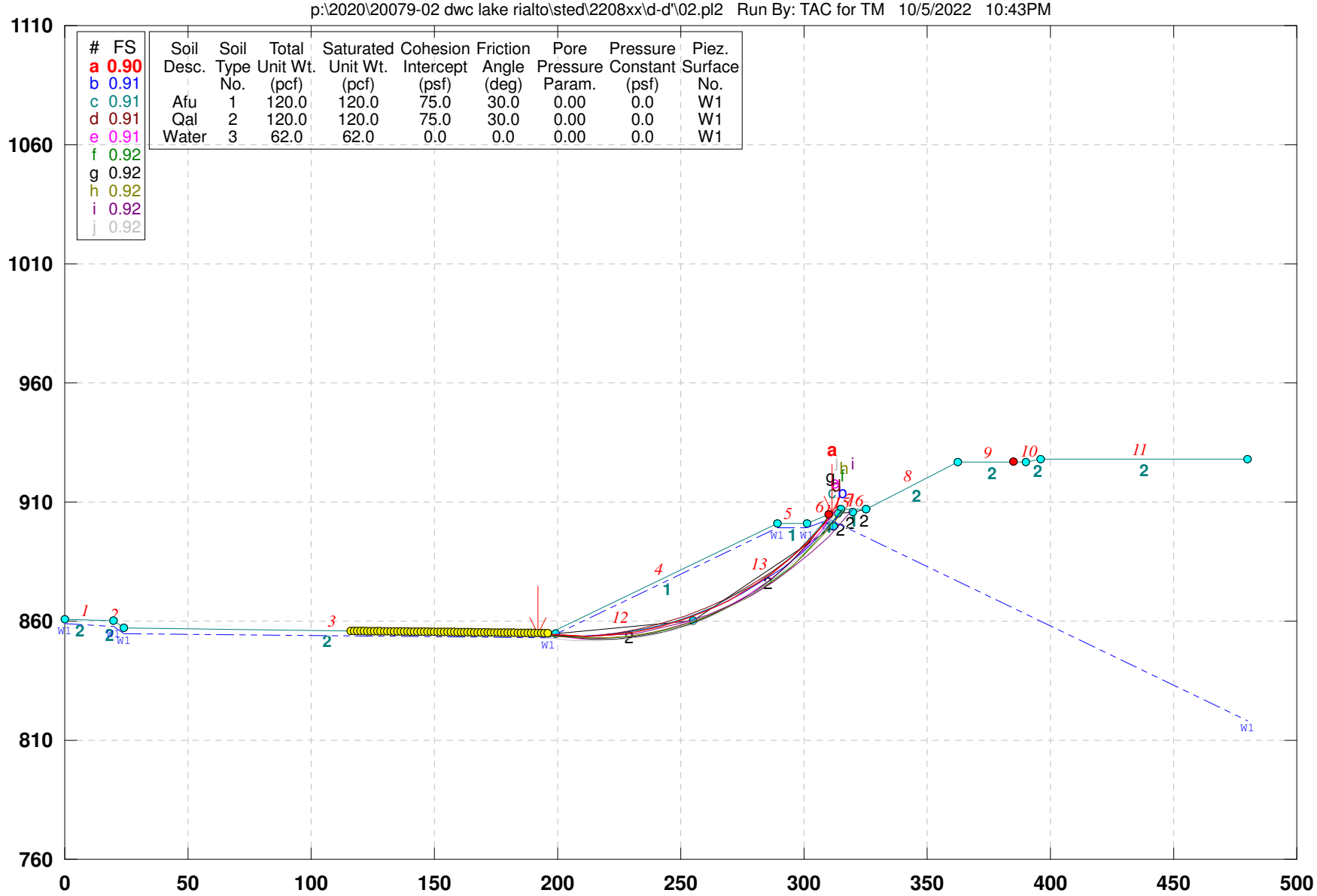
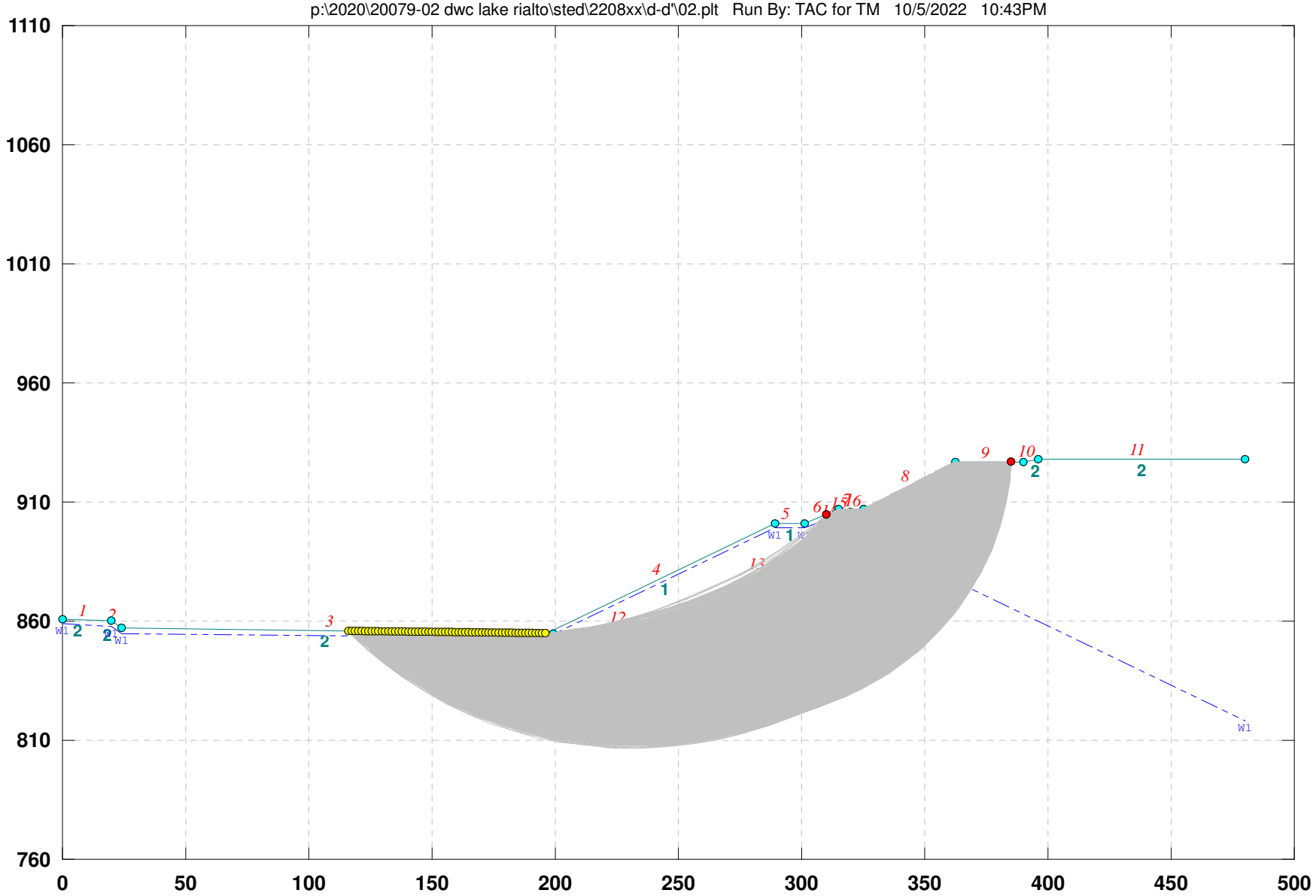


GSTABL7 v.2 FSmin=0.90

Safety Factors Are Calculated By The Modified Bishop Method


DWC / Lake Rialto; D-D'; Rapid Drawdown
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1060
1010
960
910
860
810
760
0
50
100
150
200
250
300
350
400
450
500
W1

***** GSTABL7 *****

** GSTABL7 by Dr. Garry H. Gregory, Ph.D.,P.E.,D.GE **
** Original Version 1.0, January 1996; Current Ver. 2.005.3, Feb. 2013 **
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SLOPE STABILITY ANALYSIS SYSTEM
Modified Bishop, Simplified Janbu, or GLE Method of Slices.
(Includes Spencer & Morgenstern-Price Type Analysis)
Including Pier/Pile, Reinforcement, Soil Nail, Tieback,
Nonlinear Undrained Shear Strength, Curved Phi Envelope,
Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water
Surfaces, Pseudo-Static & Newmark Earthquake, and Applied Forces.

Analysis Run Date: 10/5/2022
Time of Run: 10:43PM
Run By: TAC for TM
Input Data Filename: P:\2020\20079-02 DWC Lake Rialto\Sted\2208XX\D-D'\02.in
Output Filename: P:\2020\20079-02 DWC Lake Rialto\Sted\2208XX\D-D'\02.OUT
Unit System: English
Plotted Output Filename: P:\2020\20079-02 DWC Lake Rialto\Sted\2208XX\D-D'\02.PLT
PROBLEM DESCRIPTION: DWC / Lake Rialto; D-D'; Rapid Drawdown
BOUNDARY COORDINATES
11 Top Boundaries
16 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	0.00	861.00	20.00	860.00	2
2	20.00	860.00	24.00	857.00	2
3	24.00	857.00	196.00	855.00	2
4	196.00	855.00	289.00	901.00	1
5	289.00	901.00	301.00	901.00	1
6	301.00	901.00	315.00	907.00	1
7	315.00	907.00	325.00	907.00	1
8	325.00	907.00	362.50	927.00	2
9	362.50	927.00	390.00	927.00	2
10	390.00	927.00	396.00	928.00	2
11	396.00	928.00	480.00	928.00	2
12	199.00	855.00	255.00	860.00	2
13	255.00	860.00	312.00	900.00	2
14	312.00	900.00	314.00	905.00	2
15	314.00	905.00	320.00	906.00	2
16	320.00	906.00	325.00	907.00	2

User Specified Y-Origin = 760.00(ft)
Default X-Plus Value = 0.00(ft)
Default Y-Plus Value = 0.00(ft)
ISOTROPIC SOIL PARAMETERS
3 Type(s) of Soil

Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
1	120.0	120.0	75.0	30.0	0.00	0.0	1
2	120.0	120.0	75.0	30.0	0.00	0.0	1
3	62.0	62.0	0.0	0.0	0.00	0.0	1

1 PIEZOMETRIC SURFACE(S) SPECIFIED
Unit Weight of Water = 62.40 (pcf)
Piezometric Surface No. 1 Specified by 8 Coordinate Points
Pore Pressure Inclination Factor = 0.50

Point No.	X-Water (ft)	Y-Water (ft)
1	0.00	859.00
2	20.00	858.00
3	24.00	855.00
4	196.00	853.00
5	289.00	899.00
6	301.00	899.00
7	310.00	903.00
8	480.00	818.00

A Critical Failure Surface Searching Method, Using A Random
Technique For Generating Circular Surfaces, Has Been Specified.
4800 Trial Surfaces Have Been Generated.

80 Surface(s) Initiate(s) From Each Of 60 Points Equally Spaced
Along The Ground Surface Between X = 116.00(ft)
and X = 196.00(ft)
Each Surface Terminates Between X = 310.00(ft)
and X = 385.00(ft)
Unless Further Limitations Were Imposed, The Minimum Elevation
At Which A Surface Extends Is Y = 0.00(ft)
10.00(ft) Line Segments Define Each Trial Failure Surface.
Following Are Displayed The Ten Most Critical Of The Trial
Failure Surfaces Evaluated. They Are
Ordered - Most Critical First.
* * Safety Factors Are Calculated By The Modified Bishop Method * *
Total Number of Trial Surfaces Attempted = 4800
Number of Trial Surfaces With Valid FS = 4800
Statistical Data On All Valid FS Values:
FS Max = 1.857 FS Min = 0.902 FS Ave = 1.354
Standard Deviation = 0.193 Coefficient of Variation = 14.25 %
Failure Surface Specified By 15 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	191.932	855.047
2	201.877	854.004
3	211.874	853.754
4	221.859	854.300
5	231.769	855.638
6	241.542	857.759
7	251.115	860.651
8	260.427	864.294
9	269.421	868.666
10	278.039	873.739
11	286.226	879.482
12	293.930	885.856
13	301.104	892.823
14	307.701	900.339
15	311.575	905.532

Circle Center At X = 210.011 ; Y = 979.441 ; and Radius = 125.700
Factor of Safety
*** 0.902 ***
Individual data on the 24 slices

Slice No.	Width (ft)	Weight (lbs)	Water Force Top (lbs)	Water Force Bot (lbs)	Tie Force Norm (lbs)	Tie Force Tan (lbs)	Earthquake Force Hor (lbs)	Earthquake Force Ver (lbs)	Surcharge Load (lbs)
1	4.1	92.6	0.0	0.0	0.	0.	0.0	0.0	0.0
2	2.7	385.9	0.0	0.0	0.	0.	0.0	0.0	0.0
3	0.3	74.5	0.0	1.5	0.	0.	0.0	0.0	0.0
4	1.3	391.1	0.0	40.3	0.	0.	0.0	0.0	0.0
5	1.6	658.7	0.0	129.1	0.	0.	0.0	0.0	0.0
6	10.0	7798.0	0.0	2532.3	0.	0.	0.0	0.0	0.0
7	10.0	13532.6	0.0	5229.5	0.	0.	0.0	0.0	0.0
8	9.9	18162.2	0.0	7468.0	0.	0.	0.0	0.0	0.0
9	9.8	21589.8	0.0	9233.8	0.	0.	0.0	0.0	0.0
10	4.9	11858.5	0.0	5234.5	0.	0.	0.0	0.0	0.0
11	4.7	11907.0	0.0	5281.0	0.	0.	0.0	0.0	0.0
12	9.3	24687.9	0.0	11305.0	0.	0.	0.0	0.0	0.0
13	2.3	6102.0	0.0	2899.6	0.	0.	0.0	0.0	0.0
14	6.7	18300.9	0.0	8697.8	0.	0.	0.0	0.0	0.0
15	8.6	23003.0	0.0	11390.8	0.	0.	0.0	0.0	0.0
16	8.2	20624.0	0.0	10686.6	0.	0.	0.0	0.0	0.0
17	2.8	6553.5	0.0	3583.1	0.	0.	0.0	0.0	0.0
18	4.9	10166.4	0.0	6062.8	0.	0.	0.0	0.0	0.0
19	5.4	8150.3	0.0	4963.2	0.	0.	0.0	0.0	0.0
20	1.6	1784.6	0.0	1008.5	0.	0.	0.0	0.0	0.0
21	0.1	102.9	0.0	51.9	0.	0.	0.0	0.0	0.0
22	6.6	4652.8	0.0	2250.8	0.	0.	0.0	0.0	0.0
23	1.8	592.5	0.0	143.6	0.	0.	0.0	0.0	0.0
24	2.0	228.7	0.0	0.0	0.	0.	0.0	0.0	0.0

Failure Surface Specified By 16 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)

1	187.864	855.095
2	197.814	854.093
3	207.810	853.811
4	217.800	854.250
5	227.733	855.407
6	237.557	857.277
7	247.220	859.850
8	256.673	863.112
9	265.866	867.047
10	274.752	871.634
11	283.285	876.849
12	291.419	882.665
13	299.114	889.052
14	306.328	895.977
15	313.024	903.404
16	315.825	907.000

Circle Center At X = 206.762 ; Y = 992.188 ; and Radius = 138.390

Factor of Safety

*** 0.907 ***

Failure Surface Specified By 16 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	185.152	855.126
2	195.072	853.858
3	205.059	853.348
4	215.055	853.601
5	225.004	854.613
6	234.847	856.380
7	244.526	858.891
8	253.987	862.132
9	263.173	866.084
10	272.031	870.723
11	280.511	876.023
12	288.563	881.954
13	296.140	888.480
14	303.198	895.564
15	309.696	903.165
16	311.358	905.439

Circle Center At X = 206.776 ; Y = 984.330 ; and Radius = 131.001

Factor of Safety

*** 0.909 ***

Failure Surface Specified By 16 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	182.440	855.158
2	192.371	853.978
3	202.360	853.511
4	212.357	853.760
5	222.310	854.724
6	232.169	856.397
7	241.883	858.772
8	251.402	861.835
9	260.678	865.571
10	269.663	869.962
11	278.310	874.984
12	286.577	880.611
13	294.419	886.816
14	301.797	893.566
15	308.674	900.826
16	313.050	906.164

Circle Center At X = 203.906 ; Y = 992.917 ; and Radius = 139.422

Factor of Safety

*** 0.914 ***

Failure Surface Specified By 16 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	190.576	855.063
2	200.444	853.446
3	210.415	852.678
4	220.414	852.766

5	230.370	853.708
6	240.208	855.499
7	249.858	858.124
8	259.247	861.565
9	268.308	865.796
10	276.973	870.787
11	285.181	876.500
12	292.869	882.894
13	299.983	889.923
14	306.469	897.534
15	312.281	905.671
16	312.411	905.890

Circle Center At X = 214.393 ; Y = 969.408 ; and Radius = 116.799

Factor of Safety

*** 0.914 ***

Failure Surface Specified By 16 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	193.288	855.032
2	203.183	853.589
3	213.165	852.980
4	223.162	853.208
5	233.105	854.271
6	242.925	856.163
7	252.552	858.869
8	261.919	862.371
9	270.960	866.644
10	279.612	871.658
11	287.814	877.379
12	295.509	883.765
13	302.642	890.773
14	309.165	898.353
15	315.030	906.452
16	315.361	907.000

Circle Center At X = 215.453 ; Y = 972.323 ; and Radius = 119.368

Factor of Safety

*** 0.915 ***

Failure Surface Specified By 15 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	193.288	855.032
2	203.145	853.348
3	213.114	852.564
4	223.114	852.686
5	233.061	853.713
6	242.874	855.637
7	252.473	858.442
8	261.778	862.104
9	270.713	866.594
10	279.205	871.875
11	287.184	877.903
12	294.584	884.629
13	301.345	891.997
14	307.411	899.947
15	310.679	905.148

Circle Center At X = 216.768 ; Y = 962.812 ; and Radius = 110.309

Factor of Safety

*** 0.917 ***

Failure Surface Specified By 16 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	189.220	855.079
2	199.095	853.505
3	209.065	852.731
4	219.065	852.761
5	229.031	853.595
6	238.896	855.228
7	248.599	857.650
8	258.075	860.843
9	267.264	864.789

10	276.105	869.461
11	284.543	874.829
12	292.521	880.858
13	299.988	887.509
14	306.896	894.739
15	313.201	902.502
16	316.289	907.000

Circle Center At X = 213.717 ; Y = 976.577 ; and Radius = 123.943

Factor of Safety

*** 0.917 ***

Failure Surface Specified By 16 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	191.932	855.047
2	201.872	853.955
3	211.866	853.595
4	221.859	853.969
5	231.797	855.076
6	241.628	856.908
7	251.298	859.456
8	260.755	862.707
9	269.948	866.643
10	278.827	871.242
11	287.345	876.481
12	295.456	882.330
13	303.116	888.758
14	310.284	895.731
15	316.921	903.211
16	319.815	907.000

Circle Center At X = 211.806 ; Y = 989.497 ; and Radius = 135.910

Factor of Safety

*** 0.917 ***

Failure Surface Specified By 16 Coordinate Points

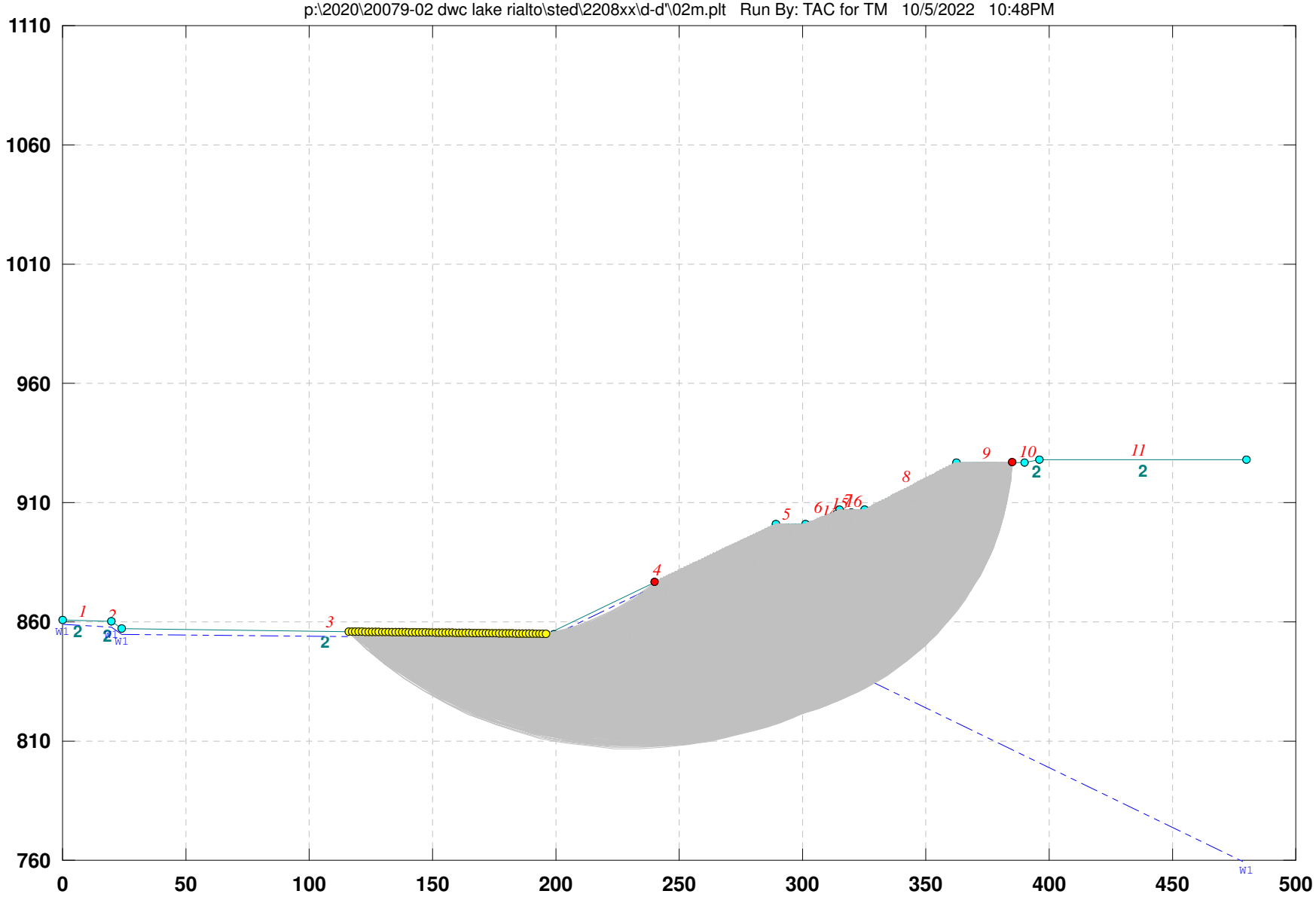
Point No.	X-Surf (ft)	Y-Surf (ft)
1	186.508	855.110
2	196.315	853.155
3	206.253	852.042
4	216.250	851.779
5	226.232	852.369
6	236.128	853.806
7	245.866	856.081
8	255.375	859.177
9	264.586	863.071
10	273.431	867.735
11	281.848	873.135
12	289.774	879.233
13	297.152	885.983
14	303.928	893.337
15	310.053	901.242
16	313.309	906.275

Circle Center At X = 214.348 ; Y = 968.822 ; and Radius = 117.070

Factor of Safety

*** 0.923 ***

**** END OF GSTABL7 OUTPUT ****


DWC / Lake Rialto; D-D'; Rapid Drawdown
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760
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150
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250
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350
400
450
500
W1
W1
W1
1
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11
2
2
2
2
2

DWC / Lake Rialto; D-D'; Rapid Drawdown

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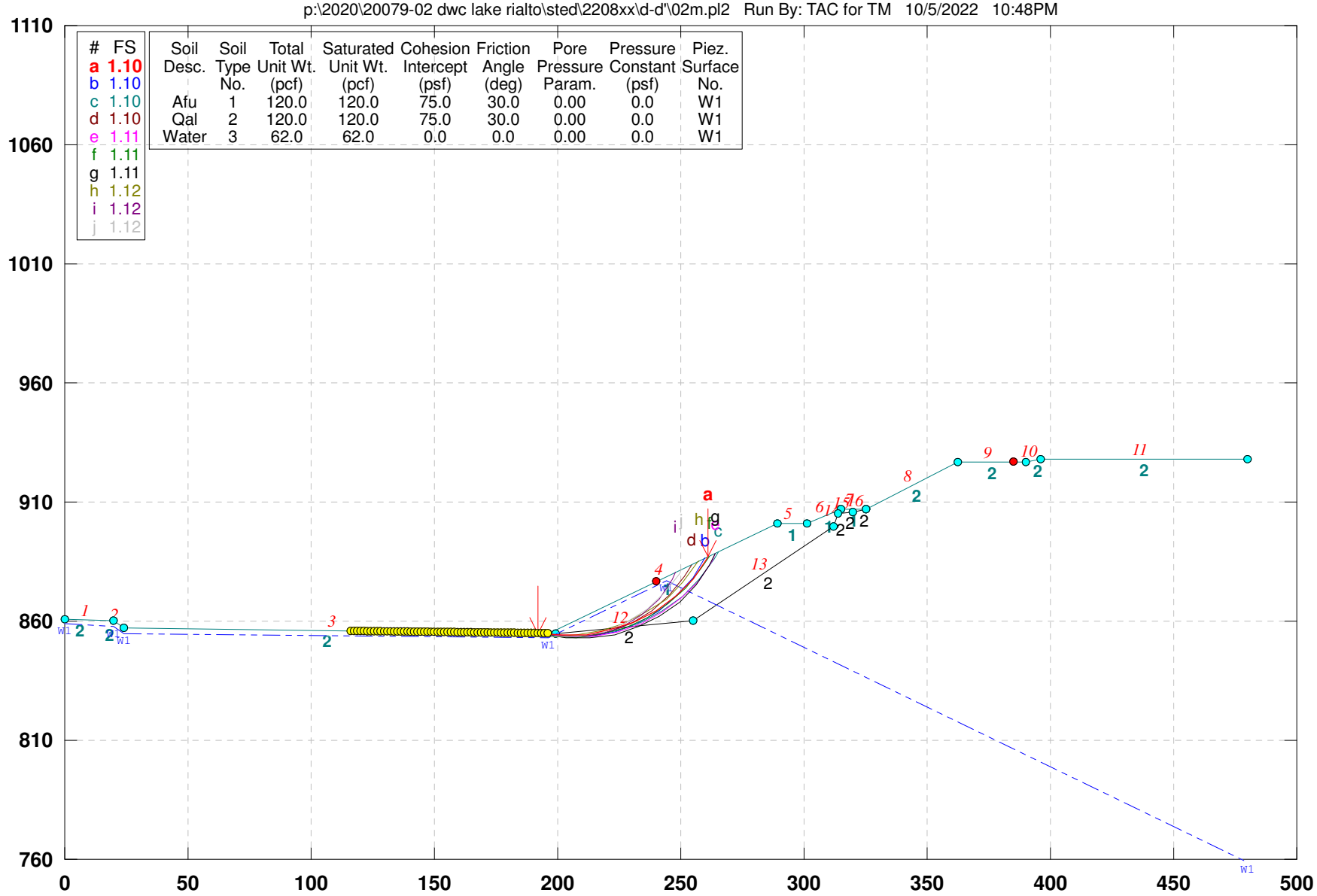

GSTABL7 v.2 FSmin=1.10

Safety Factors Are Calculated By The Modified Bishop Method

***** GSTABL7 *****

** GSTABL7 by Dr. Garry H. Gregory, Ph.D.,P.E.,D.GE **
** Original Version 1.0, January 1996; Current Ver. 2.005.3, Feb. 2013 **
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SLOPE STABILITY ANALYSIS SYSTEM
Modified Bishop, Simplified Janbu, or GLE Method of Slices.
(Includes Spencer & Morgenstern-Price Type Analysis)
Including Pier/Pile, Reinforcement, Soil Nail, Tieback,
Nonlinear Undrained Shear Strength, Curved Phi Envelope,
Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water
Surfaces, Pseudo-Static & Newmark Earthquake, and Applied Forces.

****

Analysis Run Date: 10/5/2022
Time of Run: 10:48PM
Run By: TAC for TM
Input Data Filename: P:\2020\20079-02 DWC Lake Rialto\Sted\2208XX\D-D'\02m.in
Output Filename: P:\2020\20079-02 DWC Lake Rialto\Sted\2208XX\D-D'\02m.OUT
Unit System: English
Plotted Output Filename: P:\2020\20079-02 DWC Lake Rialto\Sted\2208XX\D-D'\02m.PLT
PROBLEM DESCRIPTION: DWC / Lake Rialto; D-D'; Rapid Drawdown
BOUNDARY COORDINATES
11 Top Boundaries
16 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	0.00	861.00	20.00	860.00	2
2	20.00	860.00	24.00	857.00	2
3	24.00	857.00	196.00	855.00	2
4	196.00	855.00	289.00	901.00	1
5	289.00	901.00	301.00	901.00	1
6	301.00	901.00	315.00	907.00	1
7	315.00	907.00	325.00	907.00	1
8	325.00	907.00	362.50	927.00	2
9	362.50	927.00	390.00	927.00	2
10	390.00	927.00	396.00	928.00	2
11	396.00	928.00	480.00	928.00	2
12	199.00	855.00	255.00	860.00	2
13	255.00	860.00	312.00	900.00	2
14	312.00	900.00	314.00	905.00	2
15	314.00	905.00	320.00	906.00	2
16	320.00	906.00	325.00	907.00	2

User Specified Y-Origin = 760.00(ft)
Default X-Plus Value = 0.00(ft)
Default Y-Plus Value = 0.00(ft)
ISOTROPIC SOIL PARAMETERS
3 Type(s) of Soil

Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
1	120.0	120.0	75.0	30.0	0.00	0.0	1
2	120.0	120.0	75.0	30.0	0.00	0.0	1
3	62.0	62.0	0.0	0.0	0.00	0.0	1

1 PIEZOMETRIC SURFACE(S) SPECIFIED
Unit Weight of Water = 62.40 (pcf)
Piezometric Surface No. 1 Specified by 6 Coordinate Points
Pore Pressure Inclination Factor = 0.50

Point No.	X-Water (ft)	Y-Water (ft)
1	0.00	859.00
2	20.00	858.00
3	24.00	855.00
4	196.00	853.00
5	244.00	877.00
6	480.00	759.00

A Critical Failure Surface Searching Method, Using A Random
Technique For Generating Circular Surfaces, Has Been Specified.
4800 Trial Surfaces Have Been Generated.
80 Surface(s) Initiate(s) From Each Of 60 Points Equally Spaced
Along The Ground Surface Between X = 116.00(ft)

and X = 196.00(ft)
Each Surface Terminates Between X = 240.00(ft)
and X = 385.00(ft)
Unless Further Limitations Were Imposed, The Minimum Elevation
At Which A Surface Extends Is Y = 0.00(ft)
10.00(ft) Line Segments Define Each Trial Failure Surface.
Following Are Displayed The Ten Most Critical Of The Trial
Failure Surfaces Evaluated. They Are
Ordered - Most Critical First.
* * Safety Factors Are Calculated By The Modified Bishop Method * *
Total Number of Trial Surfaces Attempted = 4800
Number of Trial Surfaces With Valid FS = 4800
Statistical Data On All Valid FS Values:
FS Max = 5.180 FS Min = 1.095 FS Ave = 1.766
Standard Deviation = 0.340 Coefficient of Variation = 19.25 %
Failure Surface Specified By 10 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	191.932	855.047
2	201.876	853.994
3	211.866	854.453
4	221.672	856.413
5	231.070	859.830
6	239.845	864.625
7	247.797	870.689
8	254.743	877.883
9	260.525	886.042
10	261.107	887.204

Circle Center At X = 203.875 ; Y = 919.838 ; and Radius = 65.882
Factor of Safety
*** 1.095 ***
Individual data on the 16 slices

Slice No.	Width (ft)	Weight (lbs)	Water Force Top (lbs)	Water Force Bot (lbs)	Tie Force Norm (lbs)	Tie Force Tan (lbs)	Earthquake Force Hor (lbs)	Earthquake Force Ver (lbs)	Surcharge Load (lbs)
1	4.1	93.6	0.0	0.0	0.	0.	0.0	0.0	0.0
2	2.7	379.2	0.0	0.0	0.	0.	0.0	0.0	0.0
3	0.3	83.1	0.0	1.9	0.	0.	0.0	0.0	0.0
4	1.2	372.6	0.0	39.2	0.	0.	0.0	0.0	0.0
5	1.7	679.7	0.0	135.0	0.	0.	0.0	0.0	0.0
6	10.0	7376.4	0.0	2365.4	0.	0.	0.0	0.0	0.0
7	9.8	11578.4	0.0	4465.4	0.	0.	0.0	0.0	0.0
8	2.2	3055.3	0.0	1274.4	0.	0.	0.0	0.0	0.0
9	7.2	10365.7	0.0	4377.4	0.	0.	0.0	0.0	0.0
10	8.8	12940.6	0.0	5897.4	0.	0.	0.0	0.0	0.0
11	4.2	5736.0	0.0	2861.5	0.	0.	0.0	0.0	0.0
12	3.8	4756.5	0.0	1826.0	0.	0.	0.0	0.0	0.0
13	2.9	3156.0	0.0	512.5	0.	0.	0.0	0.0	0.0
14	4.1	3555.3	0.0	0.0	0.	0.	0.0	0.0	0.0
15	5.8	2444.1	0.0	0.0	0.	0.	0.0	0.0	0.0
16	0.6	30.5	0.0	0.0	0.	0.	0.0	0.0	0.0

Failure Surface Specified By 9 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	193.288	855.032
2	203.178	853.551
3	213.175	853.766
4	222.992	855.670
5	232.345	859.209
6	240.964	864.280
7	248.600	870.737
8	255.033	878.393
9	259.802	886.558

Circle Center At X = 206.916 ; Y = 912.290 ; and Radius = 58.858
Factor of Safety
*** 1.097 ***
Failure Surface Specified By 10 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)

1	194.644	855.016
2	204.580	853.887
3	214.572	854.280
4	224.389	856.186
5	233.802	859.560
6	242.595	864.324
7	250.561	870.368
8	257.518	877.552
9	263.303	885.708
10	265.023	889.141

Circle Center At X = 207.056 ; Y = 919.055 ; and Radius = 65.231

Factor of Safety

*** 1.099 ***

Failure Surface Specified By 9 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	190.576	855.063
2	200.445	853.449
3	210.444	853.616
4	220.253	855.557
5	229.562	859.211
6	238.072	864.462
7	245.514	871.142
8	251.649	879.038
9	254.109	883.742

Circle Center At X = 204.516 ; Y = 909.328 ; and Radius = 56.027

Factor of Safety

*** 1.103 ***

Failure Surface Specified By 10 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	194.644	855.016
2	204.540	853.577
3	214.538	853.751
4	224.378	855.533
5	233.803	858.876
6	242.566	863.694
7	250.438	869.860
8	257.215	877.213
9	262.719	885.562
10	264.122	888.695

Circle Center At X = 208.508 ; Y = 914.919 ; and Radius = 61.487

Factor of Safety

*** 1.105 ***

Failure Surface Specified By 10 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	187.864	855.095
2	197.717	853.384
3	207.715	853.187
4	217.627	854.508
5	227.225	857.317
6	236.286	861.548
7	244.600	867.104
8	251.977	873.855
9	258.244	881.648
10	261.607	887.451

Circle Center At X = 204.029 ; Y = 918.464 ; and Radius = 65.399

Factor of Safety

*** 1.111 ***

Failure Surface Specified By 10 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	193.288	855.032
2	203.115	853.178
3	213.113	852.980
4	223.005	854.443
5	232.518	857.526
6	241.388	862.144
7	249.369	868.169

8	256.241	875.434
9	261.813	883.738
10	264.033	888.651

Circle Center At X = 209.326 ; Y = 912.527 ; and Radius = 59.690

Factor of Safety

*** 1.114 ***

Failure Surface Specified By 10 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	187.864	855.095
2	197.777	853.775
3	207.775	853.982
4	217.624	855.712
5	227.094	858.923
6	235.964	863.540
7	244.026	869.457
8	251.092	876.533
9	256.996	884.604
10	257.391	885.365

Circle Center At X = 201.441 ; Y = 918.893 ; and Radius = 65.227

Factor of Safety

*** 1.115 ***

Failure Surface Specified By 8 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	196.000	855.000
2	205.885	853.488
3	215.854	854.267
4	225.385	857.296
5	233.975	862.416
6	241.173	869.357
7	246.601	877.756
8	247.590	880.518

Circle Center At X = 207.532 ; Y = 896.596 ; and Radius = 43.165

Factor of Safety

*** 1.122 ***

Failure Surface Specified By 9 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	189.220	855.079
2	199.082	853.420
3	209.080	853.622
4	218.866	855.678
5	228.100	859.516
6	236.461	865.002
7	243.657	871.946
8	249.437	880.106
9	250.223	881.820

Circle Center At X = 203.003 ; Y = 906.875 ; and Radius = 53.598

Factor of Safety

*** 1.123 ***

**** END OF GSTABL7 OUTPUT ****

Summary of Slope Stability Analysis

Cross-Section E-E'

Filename	Description	Factor of Safety (FS)	
		Static	***Pseudostatic***
01, 01p	Design Condition	1.50	1.09
02	Rapid Drawdown Condition-Operating Lake Level El 905'	0.91	--
02m	Rapid Drawdown-Maximum Groundwater El 883' (22' feet bgs)	1.10	--

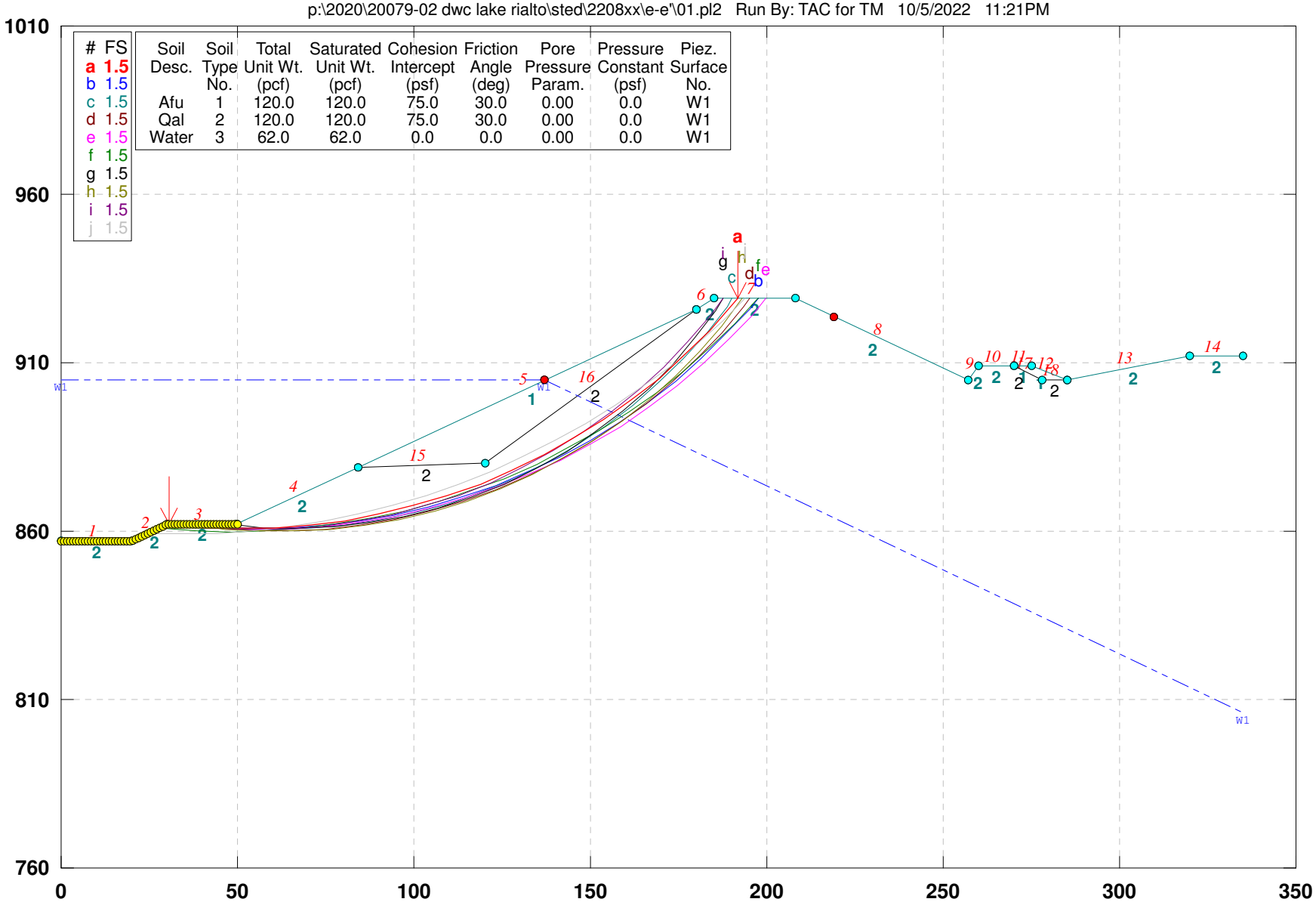
Project No.: 20079-02

Project Name: DWC / Lake Rialto

NMG

DWC / Lake Rialto; E-E'; Design

p:\2020\20079-02 dwc lake rialto\sted\2208xx\e-e'\01.pl2 Run By: TAC for TM 10/5/2022 11:21PM

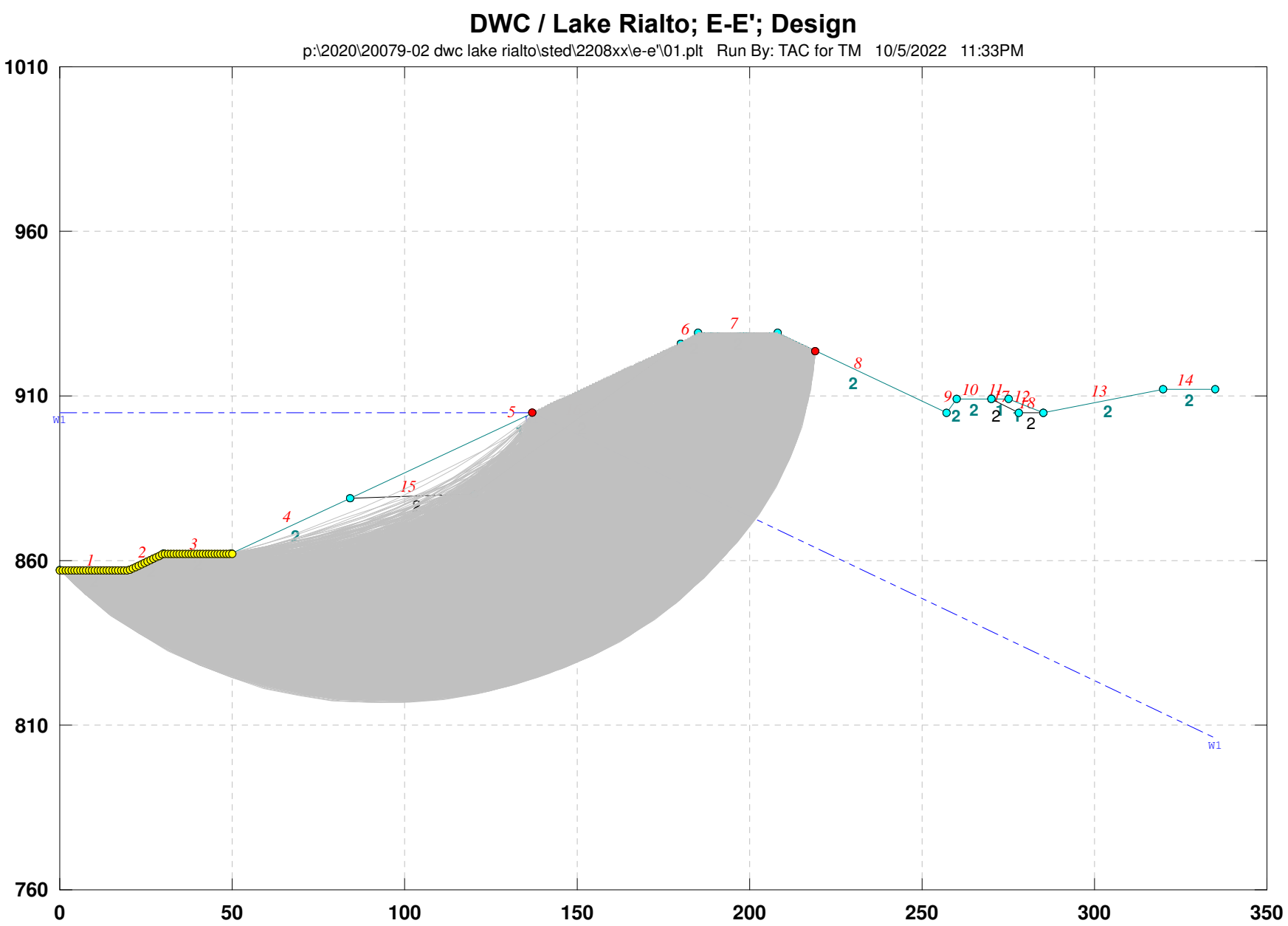


#	FS
a	1.5
b	1.5
c	1.5
d	1.5
e	1.5
f	1.5
g	1.5
h	1.5
i	1.5
j	1.5

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
Afu	1	120.0	120.0	75.0	30.0	0.00	0.0	W1
Qal	2	120.0	120.0	75.0	30.0	0.00	0.0	W1
Water	3	62.0	62.0	0.0	0.0	0.00	0.0	W1

GSTABL7 v.2 FSmin=1.5

Safety Factors Are Calculated By The Modified Bishop Method


DWC / Lake Rialto; E-E'; Design
p:\2020\20079-02 dwc lake rialto\sted\2208xx\e-e'\01.plt Run By: TAC for TM 10/5/2022 11:33PM
1010
960
910
860
810
760
0
50
100
150
200
250
300
350
W1
W1
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

***** GSTABL7 *****

** GSTABL7 by Dr. Garry H. Gregory, Ph.D.,P.E.,D.GE **
** Original Version 1.0, January 1996; Current Ver. 2.005.3, Feb. 2013 **
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SLOPE STABILITY ANALYSIS SYSTEM
Modified Bishop, Simplified Janbu, or GLE Method of Slices.
(Includes Spencer & Morgenstern-Price Type Analysis)
Including Pier/Pile, Reinforcement, Soil Nail, Tieback,
Nonlinear Undrained Shear Strength, Curved Phi Envelope,
Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water
Surfaces, Pseudo-Static & Newmark Earthquake, and Applied Forces.

****

Analysis Run Date: 10/5/2022
Time of Run: 11:21PM
Run By: TAC for TM
Input Data Filename: P:\2020\20079-02 DWC Lake Rialto\Sted\2208XX\E-E'\01.in
Output Filename: P:\2020\20079-02 DWC Lake Rialto\Sted\2208XX\E-E'\01.OUT
Unit System: English
Plotted Output Filename: P:\2020\20079-02 DWC Lake Rialto\Sted\2208XX\E-E'\01.PLT
PROBLEM DESCRIPTION: DWC / Lake Rialto; E-E'; Design
BOUNDARY COORDINATES
14 Top Boundaries
18 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	0.00	857.00	20.00	857.00	2
2	20.00	857.00	30.00	862.00	2
3	30.00	862.00	50.00	862.00	2
4	50.00	862.00	84.00	879.00	2
5	84.00	879.00	180.00	926.00	1
6	180.00	926.00	185.00	929.00	2
7	185.00	929.00	208.00	929.00	2
8	208.00	929.00	257.00	905.00	2
9	257.00	905.00	260.00	909.00	2
10	260.00	909.00	270.00	909.00	2
11	270.00	909.00	275.00	909.00	1
12	275.00	909.00	285.00	905.00	1
13	285.00	905.00	320.00	912.00	2
14	320.00	912.00	335.00	912.00	2
15	84.00	879.00	120.00	880.00	2
16	120.00	880.00	180.00	926.00	2
17	270.00	909.00	278.00	905.00	2
18	278.00	905.00	285.00	905.00	2

User Specified Y-Origin = 760.00(ft)
Default X-Plus Value = 0.00(ft)
Default Y-Plus Value = 0.00(ft)
ISOTROPIC SOIL PARAMETERS
3 Type(s) of Soil

Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
1	120.0	120.0	75.0	30.0	0.00	0.0	1
2	120.0	120.0	75.0	30.0	0.00	0.0	1
3	62.0	62.0	0.0	0.0	0.00	0.0	1

1 PIEZOMETRIC SURFACE(S) SPECIFIED
Unit Weight of Water = 62.40 (pcf)
Piezometric Surface No. 1 Specified by 3 Coordinate Points
Pore Pressure Inclination Factor = 0.50

Point No.	X-Water (ft)	Y-Water (ft)
1	0.00	905.00
2	137.00	905.00
3	335.00	806.00

A Critical Failure Surface Searching Method, Using A Random
Technique For Generating Circular Surfaces, Has Been Specified.
4800 Trial Surfaces Have Been Generated.
80 Surface(s) Initiate(s) From Each Of 60 Points Equally Spaced
Along The Ground Surface Between X = 0.00(ft)
and X = 50.00(ft)

Each Surface Terminates Between X = 137.00(ft)
and X = 219.00(ft)
Unless Further Limitations Were Imposed, The Minimum Elevation
At Which A Surface Extends Is Y = 0.00(ft)
10.00(ft) Line Segments Define Each Trial Failure Surface.
Following Are Displayed The Ten Most Critical Of The Trial
Failure Surfaces Evaluated. They Are
Ordered - Most Critical First.
* * Safety Factors Are Calculated By The Modified Bishop Method * *
Total Number of Trial Surfaces Attempted = 4800
Number of Trial Surfaces With Valid FS = 4800
Statistical Data On All Valid FS Values:
FS Max = 2.884 FS Min = 1.484 FS Ave = 2.120
Standard Deviation = 0.329 Coefficient of Variation = 15.51 %
Failure Surface Specified By 20 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	30.508	862.000
2	40.468	861.097
3	50.462	860.755
4	60.459	860.975
5	70.429	861.756
6	80.339	863.095
7	90.158	864.990
8	99.855	867.432
9	109.399	870.416
10	118.761	873.931
11	127.911	877.966
12	136.820	882.508
13	145.459	887.544
14	153.802	893.058
15	161.822	899.031
16	169.494	905.445
17	176.793	912.280
18	183.698	919.514
19	190.184	927.125
20	191.609	929.000

Circle Center At X = 51.578 ; Y = 1038.521 ; and Radius = 177.774
Factor of Safety
*** 1.484 ***
Individual data on the 27 slices

Slice No.	Width (ft)	Weight (lbs)	Water Force Top (lbs)	Water Force Bot (lbs)	Tie Force Norm (lbs)	Tie Force Tan (lbs)	Earthquake Force Hor (lbs)	Earthquake Force Ver (lbs)	Surcharge Load (lbs)
1	10.0	539.6	26722.4	27113.7	0.	0.	0.0	0.0	0.0
2	9.5	1219.5	25577.2	26226.7	0.	0.	0.0	0.0	0.0
3	0.5	75.0	1381.6	1275.4	0.	0.	0.0	0.0	0.0
4	10.0	4637.5	28087.5	27540.4	0.	0.	0.0	0.0	0.0
5	10.0	9997.6	24536.6	27228.1	0.	0.	0.0	0.0	0.0
6	9.9	14586.9	20953.9	26566.5	0.	0.	0.0	0.0	0.0
7	3.7	6430.5	6875.1	9668.1	0.	0.	0.0	0.0	0.0
8	6.2	11905.3	10478.3	15889.4	0.	0.	0.0	0.0	0.0
9	9.7	21152.4	13886.5	24204.5	0.	0.	0.0	0.0	0.0
10	9.5	23107.0	10544.6	22511.5	0.	0.	0.0	0.0	0.0
11	9.4	24214.0	7332.5	20484.0	0.	0.	0.0	0.0	0.0
12	1.2	3288.0	746.9	2601.8	0.	0.	0.0	0.0	0.0
13	7.9	21207.8	3538.8	15526.5	0.	0.	0.0	0.0	0.0
14	8.9	23991.0	1436.7	15452.0	0.	0.	0.0	0.0	0.0
15	0.2	483.8	1.2	292.5	0.	0.	0.0	0.0	0.0
16	8.5	22270.3	0.0	9791.1	0.	0.	0.0	0.0	0.0
17	1.0	2545.4	0.0	841.8	0.	0.	0.0	0.0	0.0
18	7.4	18309.1	0.0	3866.5	0.	0.	0.0	0.0	0.0
19	2.8	6743.7	0.0	352.8	0.	0.	0.0	0.0	0.0
20	5.2	11631.4	0.0	0.0	0.	0.	0.0	0.0	0.0
21	7.7	15411.7	0.0	0.0	0.	0.	0.0	0.0	0.0
22	7.3	12071.2	0.0	0.0	0.	0.	0.0	0.0	0.0
23	3.2	4330.9	0.0	0.0	0.	0.	0.0	0.0	0.0
24	3.7	4229.5	0.0	0.0	0.	0.	0.0	0.0	0.0
25	1.3	1302.1	0.0	0.0	0.	0.	0.0	0.0	0.0

26	5.2	3058.7	0.0	0.0	0.	0.	0.0	0.0	0.0
27	1.4	160.3	0.0	0.0	0.	0.	0.0	0.0	0.0

Failure Surface Specified By 20 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	34.746	862.000
2	44.705	861.094
3	54.698	860.740
4	64.696	860.939
5	74.668	861.692
6	84.583	862.995
7	94.410	864.845
8	104.120	867.235
9	113.683	870.160
10	123.070	873.609
11	132.251	877.572
12	141.199	882.037
13	149.886	886.990
14	158.285	892.416
15	166.372	898.299
16	174.121	904.620
17	181.508	911.360
18	188.511	918.499
19	195.108	926.014
20	197.450	929.000

Circle Center At X = 56.126 ; Y = 1041.135 ; and Radius = 180.407

Factor of Safety

*** 1.486 ***

Failure Surface Specified By 19 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	40.678	862.000
2	50.624	860.959
3	60.616	860.562
4	70.613	860.810
5	80.573	861.702
6	90.455	863.235
7	100.217	865.402
8	109.819	868.194
9	119.221	871.600
10	128.384	875.605
11	137.270	880.192
12	145.841	885.344
13	154.062	891.037
14	161.899	897.249
15	169.319	903.953
16	176.290	911.122
17	182.785	918.726
18	188.776	926.732
19	190.255	929.000

Circle Center At X = 61.774 ; Y = 1015.516 ; and Radius = 154.959

Factor of Safety

*** 1.488 ***

Failure Surface Specified By 20 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	34.746	862.000
2	44.671	860.776
3	54.651	860.150
4	64.651	860.122
5	74.635	860.694
6	84.566	861.864
7	94.409	863.626
8	104.129	865.975
9	113.691	868.903
10	123.060	872.399
11	132.203	876.450
12	141.087	881.041
13	149.679	886.157
14	157.950	891.778

15	165.868	897.885
16	173.406	904.456
17	180.537	911.467
18	187.235	918.892
19	193.476	926.706
20	195.093	929.000

Circle Center At X = 60.132 ; Y = 1026.618 ; and Radius = 166.564

Factor of Safety

*** 1.493 ***

Failure Surface Specified By 20 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	34.746	862.000
2	44.700	861.046
3	54.692	860.637
4	64.691	860.773
5	74.668	861.454
6	84.592	862.678
7	94.436	864.441
8	104.168	866.738
9	113.761	869.563
10	123.186	872.906
11	132.414	876.758
12	141.418	881.108
13	150.172	885.942
14	158.650	891.246
15	166.825	897.005
16	174.674	903.201
17	182.174	909.815
18	189.302	916.829
19	196.037	924.221
20	199.937	929.000

Circle Center At X = 57.231 ; Y = 1043.704 ; and Radius = 183.090

Factor of Safety

*** 1.496 ***

Failure Surface Specified By 21 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	27.966	860.983
2	37.933	860.170
3	47.929	859.871
4	57.926	860.086
5	67.900	860.814
6	77.823	862.054
7	87.669	863.802
8	97.412	866.054
9	107.026	868.804
10	116.487	872.044
11	125.768	875.766
12	134.846	879.960
13	143.697	884.615
14	152.296	889.718
15	160.622	895.257
16	168.652	901.217
17	176.366	907.581
18	183.742	914.333
19	190.761	921.456
20	197.405	928.930
21	197.462	929.000

Circle Center At X = 48.751 ; Y = 1054.391 ; and Radius = 194.521

Factor of Safety

*** 1.496 ***

Failure Surface Specified By 18 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	47.458	862.000
2	57.417	861.097
3	67.415	860.889
4	77.403	861.375
5	87.333	862.554

6	97.157	864.419
7	106.829	866.963
8	116.300	870.173
9	125.525	874.032
10	134.460	878.523
11	143.061	883.624
12	151.287	889.310
13	159.098	895.553
14	166.457	902.324
15	173.328	909.590
16	179.677	917.316
17	185.475	925.464
18	187.638	929.000

Circle Center At X = 65.458 ; Y = 1004.483 ; and Radius = 143.616

Factor of Safety

*** 1.497 ***

Failure Surface Specified By 19 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	36.441	862.000
2	46.354	860.688
3	56.331	860.002
4	66.331	859.947
5	76.314	860.522
6	86.241	861.725
7	96.073	863.551
8	105.771	865.992
9	115.295	869.040
10	124.608	872.682
11	133.673	876.903
12	142.455	881.688
13	150.917	887.015
14	159.027	892.866
15	166.752	899.216
16	174.062	906.040
17	180.928	913.311
18	187.321	921.000
19	193.162	929.000

Circle Center At X = 62.207 ; Y = 1018.532 ; and Radius = 158.638

Factor of Safety

*** 1.497 ***

Failure Surface Specified By 19 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	33.898	862.000
2	43.839	860.916
3	53.829	860.454
4	63.827	860.618
5	73.796	861.406
6	83.696	862.815
7	93.489	864.841
8	103.136	867.474
9	112.600	870.704
10	121.844	874.520
11	130.831	878.905
12	139.526	883.844
13	147.896	889.316
14	155.908	895.300
15	163.530	901.773
16	170.733	908.710
17	177.488	916.083
18	183.770	923.864
19	187.411	929.000

Circle Center At X = 56.210 ; Y = 1020.419 ; and Radius = 159.983

Factor of Safety

*** 1.499 ***

Failure Surface Specified By 20 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	24.576	859.288

2	34.575	859.113
3	44.571	859.395
4	54.544	860.133
5	64.472	861.325
6	74.336	862.969
7	84.115	865.061
8	93.788	867.598
9	103.335	870.574
10	112.736	873.982
11	121.972	877.816
12	131.023	882.068
13	139.871	886.728
14	148.496	891.787
15	156.882	897.235
16	165.011	903.060
17	172.865	909.250
18	180.428	915.792
19	187.685	922.672
20	193.776	929.000

Circle Center At X = 33.426 ; Y = 1077.999 ; and Radius = 218.890

Factor of Safety

*** 1.499 ***

**** END OF GSTABL7 OUTPUT ****

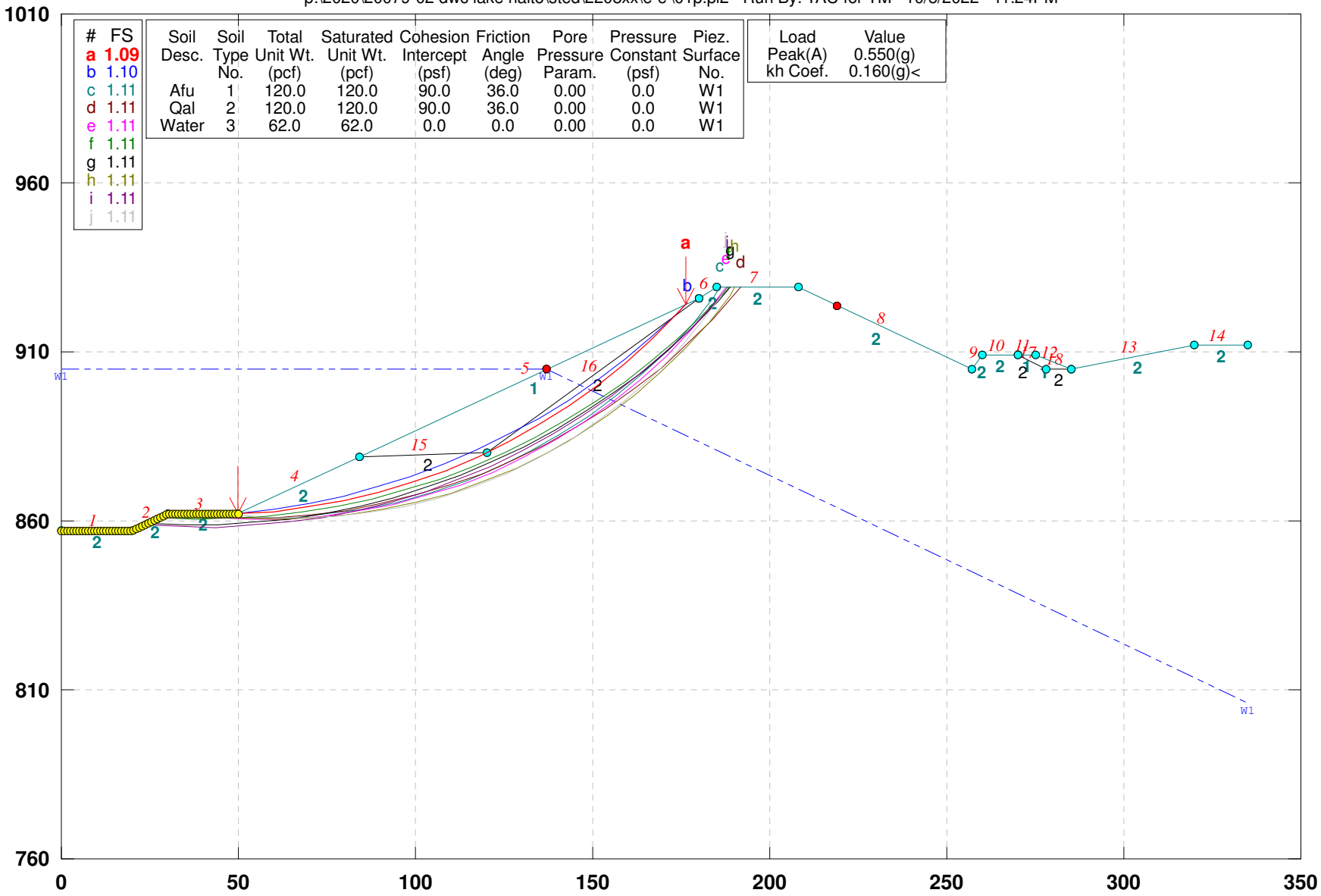
DWC / Lake Rialto; E-E'; Design; P-Static

p:\2020\20079-02 dwc lake rialto\sted\2208xx\e-e'\01p.pl2 Run By: TAC for TM 10/5/2022 11:24PM

#	FS
a	1.09
b	1.10
c	1.11
d	1.11
e	1.11
f	1.11
g	1.11
h	1.11
i	1.11
j	1.11

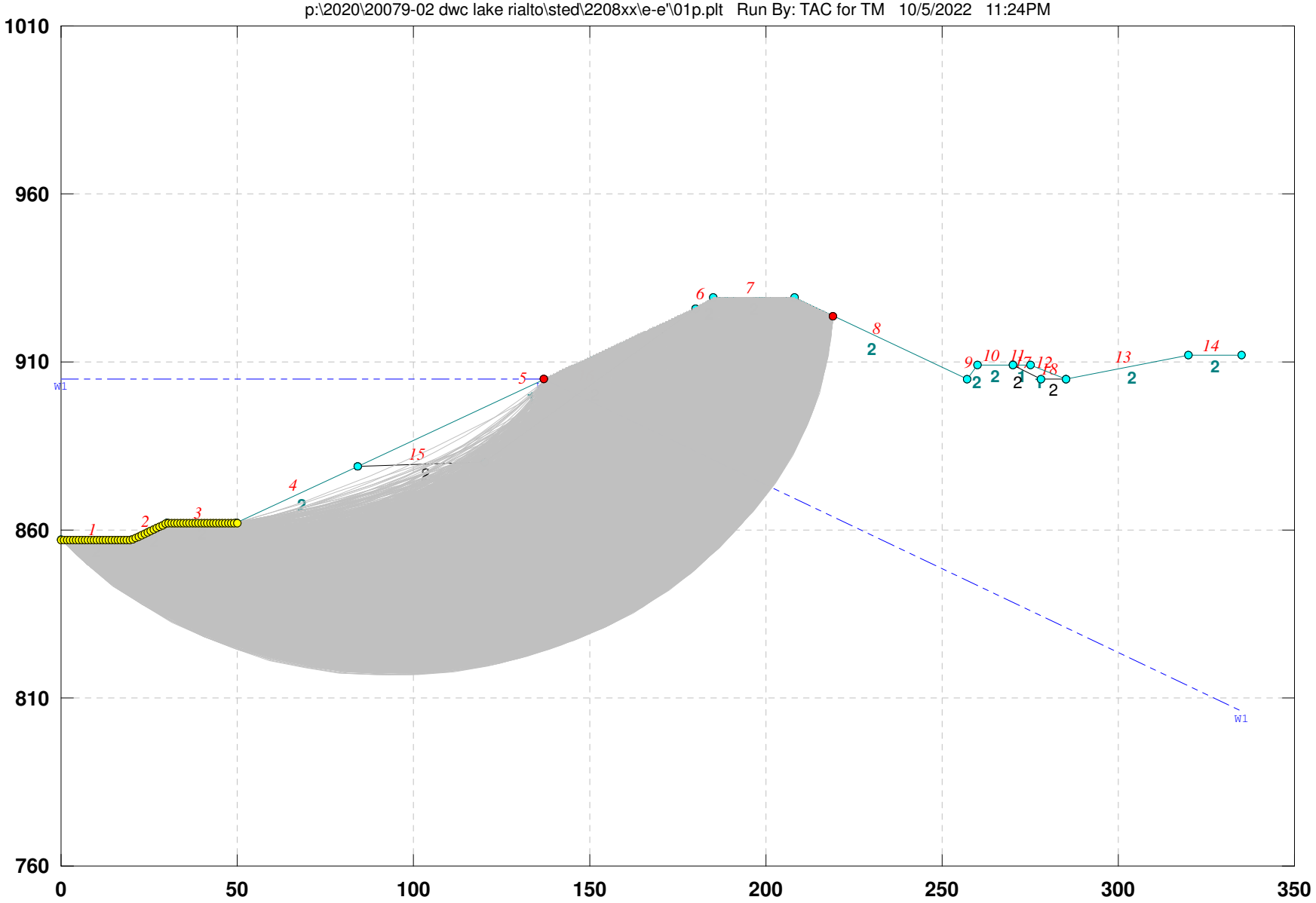
Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
Afu	1	120.0	120.0	90.0	36.0	0.00	0.0	W1
Qal	2	120.0	120.0	90.0	36.0	0.00	0.0	W1
Water	3	62.0	62.0	0.0	0.0	0.00	0.0	W1

Load	Value
Peak(A)	0.550(g)
kh Coef.	0.160(g)<



GSTABL7 v.2 FSmin=1.09

Safety Factors Are Calculated By The Modified Bishop Method


DWC / Lake Rialto; E-E'; Design; P-Static
p:\2020\20079-02 dwc lake rialto\sted\2208xx\e-e'\01p.plt Run By: TAC for TM 10/5/2022 11:24PM
1010
960
910
860
810
760
0
50
100
150
200
250
300
350
W1
W1

***** GSTABL7 *****

** GSTABL7 by Dr. Garry H. Gregory, Ph.D.,P.E.,D.GE **
** Original Version 1.0, January 1996; Current Ver. 2.005.3, Feb. 2013 **
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SLOPE STABILITY ANALYSIS SYSTEM
Modified Bishop, Simplified Janbu, or GLE Method of Slices.
(Includes Spencer & Morgenstern-Price Type Analysis)
Including Pier/Pile, Reinforcement, Soil Nail, Tieback,
Nonlinear Undrained Shear Strength, Curved Phi Envelope,
Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water
Surfaces, Pseudo-Static & Newmark Earthquake, and Applied Forces.

****

Analysis Run Date: 10/5/2022
Time of Run: 11:24PM
Run By: TAC for TM
Input Data Filename: P:\2020\20079-02 DWC Lake Rialto\Sted\2208XX\E-E'\01p.in
Output Filename: P:\2020\20079-02 DWC Lake Rialto\Sted\2208XX\E-E'\01p.OUT
Unit System: English
Plotted Output Filename: P:\2020\20079-02 DWC Lake Rialto\Sted\2208XX\E-E'\01p.PLT
PROBLEM DESCRIPTION: DWC / Lake Rialto; E-E'; Design; P-Stati
c

BOUNDARY COORDINATES
14 Top Boundaries
18 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	0.00	857.00	20.00	857.00	2
2	20.00	857.00	30.00	862.00	2
3	30.00	862.00	50.00	862.00	2
4	50.00	862.00	84.00	879.00	2
5	84.00	879.00	180.00	926.00	1
6	180.00	926.00	185.00	929.00	2
7	185.00	929.00	208.00	929.00	2
8	208.00	929.00	257.00	905.00	2
9	257.00	905.00	260.00	909.00	2
10	260.00	909.00	270.00	909.00	2
11	270.00	909.00	275.00	909.00	1
12	275.00	909.00	285.00	905.00	1
13	285.00	905.00	320.00	912.00	2
14	320.00	912.00	335.00	912.00	2
15	84.00	879.00	120.00	880.00	2
16	120.00	880.00	180.00	926.00	2
17	270.00	909.00	278.00	905.00	2
18	278.00	905.00	285.00	905.00	2

User Specified Y-Origin = 760.00(ft)
Default X-Plus Value = 0.00(ft)
Default Y-Plus Value = 0.00(ft)

ISOTROPIC SOIL PARAMETERS
3 Type(s) of Soil

Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
1	120.0	120.0	90.0	36.0	0.00	0.0	1
2	120.0	120.0	90.0	36.0	0.00	0.0	1
3	62.0	62.0	0.0	0.0	0.00	0.0	1

1 PIEZOMETRIC SURFACE(S) SPECIFIED
Unit Weight of Water = 62.40 (pcf)
Piezometric Surface No. 1 Specified by 3 Coordinate Points
Pore Pressure Inclination Factor = 0.50

Point No.	X-Water (ft)	Y-Water (ft)
1	0.00	905.00
2	137.00	905.00
3	335.00	806.00

Specified Peak Ground Acceleration Coefficient (A) = 0.550(g)
Specified Horizontal Earthquake Coefficient (kh) = 0.160(g)
Specified Vertical Earthquake Coefficient (kv) = 0.000(g)
Specified Seismic Pore-Pressure Factor = 0.000
A Critical Failure Surface Searching Method, Using A Random

Technique For Generating Circular Surfaces, Has Been Specified.
4800 Trial Surfaces Have Been Generated.
80 Surface(s) Initiate(s) From Each Of 60 Points Equally Spaced
Along The Ground Surface Between X = 0.00(ft)
and X = 50.00(ft)
Each Surface Terminates Between X = 137.00(ft)
and X = 219.00(ft)
Unless Further Limitations Were Imposed, The Minimum Elevation
At Which A Surface Extends Is Y = 0.00(ft)
10.00(ft) Line Segments Define Each Trial Failure Surface.
Following Are Displayed The Ten Most Critical Of The Trial
Failure Surfaces Evaluated. They Are
Ordered - Most Critical First.
* * Safety Factors Are Calculated By The Modified Bishop Method * *
Total Number of Trial Surfaces Attempted = 4800
Number of Trial Surfaces With Valid FS = 4800
Statistical Data On All Valid FS Values:
FS Max = 2.076 FS Min = 1.086 FS Ave = 1.563
Standard Deviation = 0.267 Coefficient of Variation = 17.07 %
Failure Surface Specified By 16 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	50.000	862.000
2	59.972	862.748
3	69.885	864.061
4	79.708	865.935
5	89.409	868.363
6	98.957	871.337
7	108.320	874.848
8	117.469	878.885
9	126.374	883.435
10	135.006	888.482
11	143.339	894.012
12	151.344	900.005
13	158.996	906.443
14	166.270	913.304
15	173.144	920.568
16	176.130	924.105

Circle Center At X = 41.910 ; Y = 1037.561 ; and Radius = 175.747
Factor of Safety
*** 1.086 ***
Individual data on the 22 slices

Slice No.	Width (ft)	Weight (lbs)	Water Force Top (lbs)	Water Force Bot (lbs)	Tie Force Norm (lbs)	Tie Force Tan (lbs)	Earthquake Force Hor (lbs)	Earthquake Force Ver (lbs)	Surcharge Load (lbs)
1	10.0	2535.4	28180.6	26598.5	0.	0.	405.7	0.0	0.0
2	9.9	7208.5	24576.9	25955.4	0.	0.	1153.4	0.0	0.0
3	9.8	11080.7	20971.3	24961.2	0.	0.	1772.9	0.0	0.0
4	4.3	5899.4	8105.9	10636.0	0.	0.	943.9	0.0	0.0
5	5.4	8203.6	9273.5	12983.2	0.	0.	1312.6	0.0	0.0
6	9.5	16195.1	13939.6	21933.8	0.	0.	2591.2	0.0	0.0
7	9.4	17440.3	10659.2	19910.2	0.	0.	2790.5	0.0	0.0
8	9.1	17872.8	7534.8	17555.2	0.	0.	2859.6	0.0	0.0
9	2.2	4274.9	1364.6	3872.6	0.	0.	684.0	0.0	0.0
10	1.1	2104.9	614.8	1849.2	0.	0.	336.8	0.0	0.0
11	5.7	11151.5	2620.2	9154.4	0.	0.	1784.2	0.0	0.0
12	8.6	16471.2	1884.0	11881.8	0.	0.	2635.4	0.0	0.0
13	2.0	3663.9	74.8	2367.2	0.	0.	586.2	0.0	0.0
14	6.3	11098.7	0.0	4916.1	0.	0.	1775.8	0.0	0.0
15	3.1	5087.0	0.0	1281.9	0.	0.	813.9	0.0	0.0
16	3.2	4852.9	0.0	435.5	0.	0.	776.5	0.0	0.0
17	1.7	2550.4	0.0	0.0	0.	0.	408.1	0.0	0.0
18	7.7	9751.6	0.0	0.0	0.	0.	1560.3	0.0	0.0
19	7.3	6655.2	0.0	0.0	0.	0.	1064.8	0.0	0.0
20	6.9	3319.6	0.0	0.0	0.	0.	531.1	0.0	0.0
21	0.4	97.4	0.0	0.0	0.	0.	15.6	0.0	0.0
22	2.6	274.5	0.0	0.0	0.	0.	43.9	0.0	0.0

Failure Surface Specified By 16 Coordinate Points

Point	X-Surf	Y-Surf

Point No.	X-Surf (ft)	Y-Surf (ft)
1	50.000	862.000
2	59.918	863.278
3	69.762	865.040
4	79.507	867.282
5	89.131	869.999
6	98.610	873.183
7	107.922	876.829
8	117.044	880.925
9	125.955	885.464
10	134.633	890.434
11	143.057	895.823
12	151.206	901.618
13	159.063	907.805
14	166.606	914.369
15	173.820	921.295
16	176.768	924.418

Circle Center At X = 29.014 ; Y = 1064.561 ; and Radius = 203.645

Factor of Safety

*** 1.095 ***

Failure Surface Specified By 19 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	35.593	862.000
2	45.548	861.053
3	55.543	860.734
4	65.538	861.043
5	75.494	861.981
6	85.372	863.542
7	95.132	865.721
8	104.735	868.509
9	114.144	871.895
10	123.322	875.866
11	132.232	880.406
12	140.839	885.497
13	149.109	891.119
14	157.009	897.250
15	164.509	903.865
16	171.577	910.938
17	178.188	918.442
18	184.313	926.346
19	186.114	929.000

Circle Center At X = 55.620 ; Y = 1019.750 ; and Radius = 159.016

Factor of Safety

*** 1.107 ***

Failure Surface Specified By 20 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	30.508	862.000
2	40.468	861.097
3	50.462	860.755
4	60.459	860.975
5	70.429	861.756
6	80.339	863.095
7	90.158	864.990
8	99.855	867.432
9	109.399	870.416
10	118.761	873.931
11	127.911	877.966
12	136.820	882.508
13	145.459	887.544
14	153.802	893.058
15	161.822	899.031
16	169.494	905.445
17	176.793	912.280
18	183.698	919.514
19	190.184	927.125
20	191.609	929.000

Circle Center At X = 51.578 ; Y = 1038.521 ; and Radius = 177.774

Factor of Safety

*** 1.109 ***
Failure Surface Specified By 19 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	33.898	862.000
2	43.839	860.916
3	53.829	860.454
4	63.827	860.618
5	73.796	861.406
6	83.696	862.815
7	93.489	864.841
8	103.136	867.474
9	112.600	870.704
10	121.844	874.520
11	130.831	878.905
12	139.526	883.844
13	147.896	889.316
14	155.908	895.300
15	163.530	901.773
16	170.733	908.710
17	177.488	916.083
18	183.770	923.864
19	187.411	929.000

Circle Center At X = 56.210 ; Y = 1020.419 ; and Radius = 159.983
Factor of Safety
*** 1.110 ***
Failure Surface Specified By 20 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	27.966	860.983
2	37.960	860.643
3	47.959	860.814
4	57.936	861.493
5	67.865	862.680
6	77.721	864.371
7	87.478	866.562
8	97.111	869.247
9	106.594	872.420
10	115.903	876.072
11	125.015	880.193
12	133.904	884.774
13	142.548	889.801
14	150.926	895.262
15	159.014	901.143
16	166.791	907.428
17	174.239	914.102
18	181.336	921.146
19	188.066	928.543
20	188.441	929.000

Circle Center At X = 39.635 ; Y = 1056.768 ; and Radius = 196.132
Factor of Safety
*** 1.110 ***
Failure Surface Specified By 20 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	24.576	859.288
2	34.568	858.877
3	44.567	858.970
4	54.550	859.566
5	64.489	860.665
6	74.360	862.264
7	84.139	864.358
8	93.799	866.943
9	103.317	870.010
10	112.668	873.554
11	121.828	877.565
12	130.775	882.032
13	139.485	886.944
14	147.937	892.289
15	156.109	898.053

16	163.979	904.222
17	171.529	910.780
18	178.738	917.709
19	185.590	924.994
20	188.994	929.000

Circle Center At X = 37.773 ; Y = 1056.910 ; and Radius = 198.062

Factor of Safety

*** 1.111 ***

Failure Surface Specified By 19 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	40.678	862.000
2	50.624	860.959
3	60.616	860.562
4	70.613	860.810
5	80.573	861.702
6	90.455	863.235
7	100.217	865.402
8	109.819	868.194
9	119.221	871.600
10	128.384	875.605
11	137.270	880.192
12	145.841	885.344
13	154.062	891.037
14	161.899	897.249
15	169.319	903.953
16	176.290	911.122
17	182.785	918.726
18	188.776	926.732
19	190.255	929.000

Circle Center At X = 61.774 ; Y = 1015.516 ; and Radius = 154.959

Factor of Safety

*** 1.112 ***

Failure Surface Specified By 20 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	23.729	858.864
2	33.710	858.258
3	43.710	858.178
4	53.700	858.623
5	63.653	859.593
6	73.541	861.085
7	83.337	863.095
8	93.014	865.617
9	102.545	868.644
10	111.903	872.168
11	121.063	876.180
12	130.000	880.667
13	138.688	885.618
14	147.105	891.019
15	155.225	896.854
16	163.028	903.109
17	170.490	909.765
18	177.593	916.805
19	184.316	924.208
20	188.228	929.000

Circle Center At X = 40.278 ; Y = 1048.029 ; and Radius = 189.887

Factor of Safety

*** 1.112 ***

Failure Surface Specified By 18 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	47.458	862.000
2	57.417	861.097
3	67.415	860.889
4	77.403	861.375
5	87.333	862.554
6	97.157	864.419
7	106.829	866.963
8	116.300	870.173

9	125.525	874.032
10	134.460	878.523
11	143.061	883.624
12	151.287	889.310
13	159.098	895.553
14	166.457	902.324
15	173.328	909.590
16	179.677	917.316
17	185.475	925.464
18	187.638	929.000

Circle Center At X = 65.458 ; Y = 1004.483 ; and Radius = 143.616

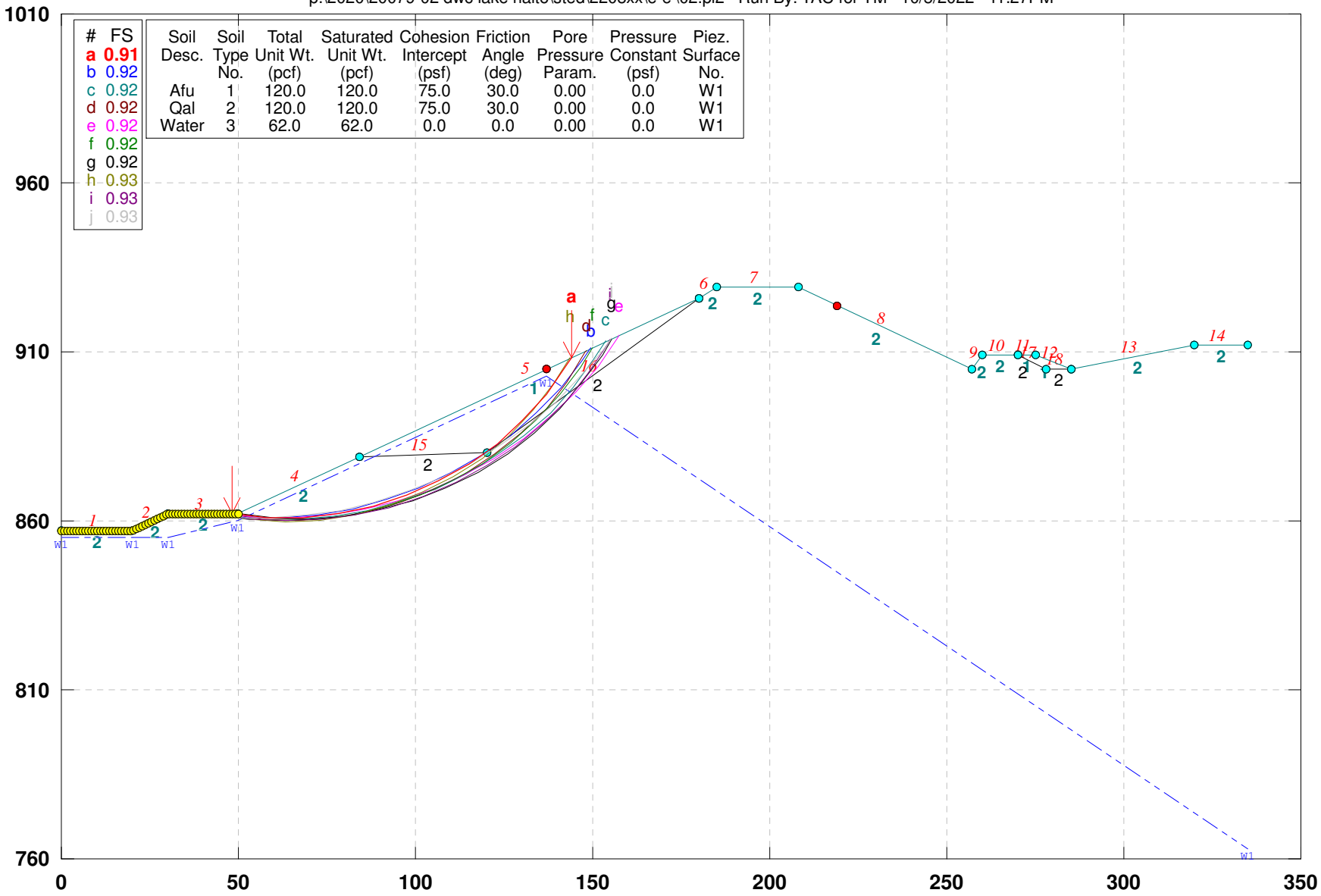
Factor of Safety

*** 1.113 ***

**** END OF GSTABL7 OUTPUT ****

DWC / Lake Rialto; E-E'; Rapid Drawdown

p:\2020\20079-02 dwc lake rialto\sted\2208xx\e-e'\02.pl2 Run By: TAC for TM 10/5/2022 11:27PM

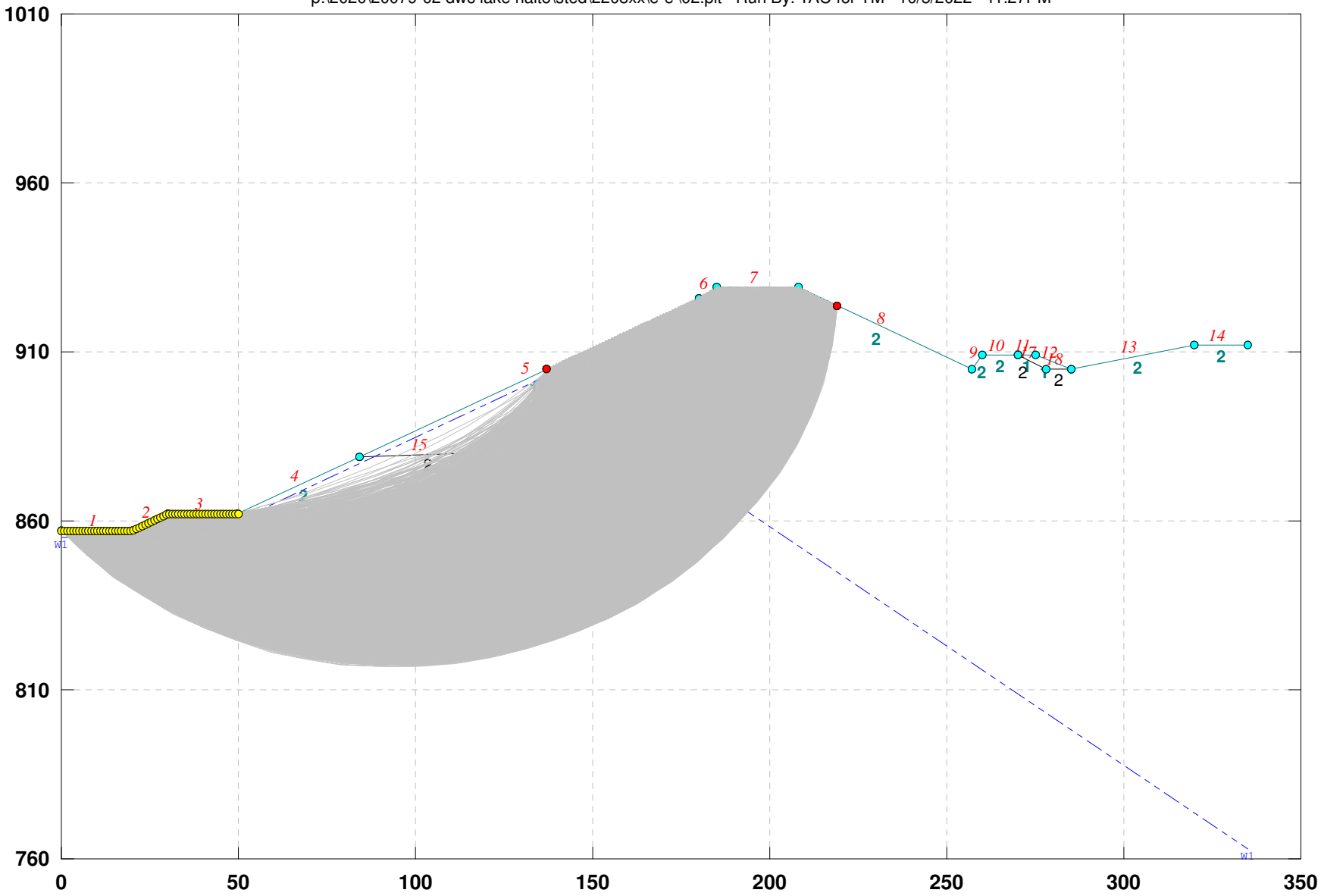


GSTABL7 v.2 FSmin=0.91

Safety Factors Are Calculated By The Modified Bishop Method

DWC / Lake Rialto; E-E'; Rapid Drawdown

p:\2020\20079-02 dwc lake rialto\sted\2208xx\e-e'\02.plt Run By: TAC for TM 10/5/2022 11:27PM



***** GSTABL7 *****

** GSTABL7 by Dr. Garry H. Gregory, Ph.D.,P.E.,D.GE **
** Original Version 1.0, January 1996; Current Ver. 2.005.3, Feb. 2013 **
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SLOPE STABILITY ANALYSIS SYSTEM
Modified Bishop, Simplified Janbu, or GLE Method of Slices.
(Includes Spencer & Morgenstern-Price Type Analysis)
Including Pier/Pile, Reinforcement, Soil Nail, Tieback,
Nonlinear Undrained Shear Strength, Curved Phi Envelope,
Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water
Surfaces, Pseudo-Static & Newmark Earthquake, and Applied Forces.

Analysis Run Date: 10/5/2022
Time of Run: 11:27PM
Run By: TAC for TM
Input Data Filename: P:\2020\20079-02 DWC Lake Rialto\Sted\2208XX\E-E'\02.in
Output Filename: P:\2020\20079-02 DWC Lake Rialto\Sted\2208XX\E-E'\02.OUT
Unit System: English
Plotted Output Filename: P:\2020\20079-02 DWC Lake Rialto\Sted\2208XX\E-E'\02.PLT
PROBLEM DESCRIPTION: DWC / Lake Rialto; E-E'; Rapid Drawdown
BOUNDARY COORDINATES
14 Top Boundaries
18 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	0.00	857.00	20.00	857.00	2
2	20.00	857.00	30.00	862.00	2
3	30.00	862.00	50.00	862.00	2
4	50.00	862.00	84.00	879.00	2
5	84.00	879.00	180.00	926.00	1
6	180.00	926.00	185.00	929.00	2
7	185.00	929.00	208.00	929.00	2
8	208.00	929.00	257.00	905.00	2
9	257.00	905.00	260.00	909.00	2
10	260.00	909.00	270.00	909.00	2
11	270.00	909.00	275.00	909.00	1
12	275.00	909.00	285.00	905.00	1
13	285.00	905.00	320.00	912.00	2
14	320.00	912.00	335.00	912.00	2
15	84.00	879.00	120.00	880.00	2
16	120.00	880.00	180.00	926.00	2
17	270.00	909.00	278.00	905.00	2
18	278.00	905.00	285.00	905.00	2

User Specified Y-Origin = 760.00(ft)
Default X-Plus Value = 0.00(ft)
Default Y-Plus Value = 0.00(ft)
ISOTROPIC SOIL PARAMETERS
3 Type(s) of Soil

Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
1	120.0	120.0	75.0	30.0	0.00	0.0	1
2	120.0	120.0	75.0	30.0	0.00	0.0	1
3	62.0	62.0	0.0	0.0	0.00	0.0	1

1 PIEZOMETRIC SURFACE(S) SPECIFIED
Unit Weight of Water = 62.40 (pcf)
Piezometric Surface No. 1 Specified by 6 Coordinate Points
Pore Pressure Inclination Factor = 0.50

Point No.	X-Water (ft)	Y-Water (ft)
1	0.00	855.00
2	20.00	855.00
3	30.00	855.00
4	50.00	860.00
5	137.00	903.00
6	335.00	763.00

A Critical Failure Surface Searching Method, Using A Random
Technique For Generating Circular Surfaces, Has Been Specified.
4800 Trial Surfaces Have Been Generated.

80 Surface(s) Initiate(s) From Each Of 60 Points Equally Spaced
Along The Ground Surface Between X = 0.00(ft)
and X = 50.00(ft)
Each Surface Terminates Between X = 137.00(ft)
and X = 219.00(ft)
Unless Further Limitations Were Imposed, The Minimum Elevation
At Which A Surface Extends Is Y = 0.00(ft)
10.00(ft) Line Segments Define Each Trial Failure Surface.
Following Are Displayed The Ten Most Critical Of The Trial
Failure Surfaces Evaluated. They Are
Ordered - Most Critical First.
* * Safety Factors Are Calculated By The Modified Bishop Method * *
Total Number of Trial Surfaces Attempted = 4800
Number of Trial Surfaces With Valid FS = 4800
Statistical Data On All Valid FS Values:
FS Max = 1.941 FS Min = 0.912 FS Ave = 1.404
Standard Deviation = 0.256 Coefficient of Variation = 18.25 %
Failure Surface Specified By 13 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	48.305	862.000
2	58.253	860.976
3	68.252	861.020
4	78.190	862.132
5	87.953	864.300
6	97.427	867.498
7	106.506	871.690
8	115.085	876.828
9	123.066	882.853
10	130.358	889.697
11	136.877	897.280
12	142.549	905.516
13	144.131	908.439

Circle Center At X = 62.839 ; Y = 954.335 ; and Radius = 93.472
Factor of Safety
*** 0.912 ***
Individual data on the 19 slices

Slice No.	Width (ft)	Weight (lbs)	Water Force Top (lbs)	Water Force Bot (lbs)	Tie Force Norm (lbs)	Tie Force Tan (lbs)	Earthquake Force Hor (lbs)	Earthquake Force Ver (lbs)	Surcharge Load (lbs)
1	1.7	17.8	0.0	0.0	0.	0.	0.0	0.0	0.0
2	3.1	402.0	0.0	0.0	0.	0.	0.0	0.0	0.0
3	5.2	2234.7	0.0	456.1	0.	0.	0.0	0.0	0.0
4	10.0	9153.9	0.0	3124.5	0.	0.	0.0	0.0	0.0
5	9.9	14351.8	0.0	5571.8	0.	0.	0.0	0.0	0.0
6	5.8	10297.2	0.0	4216.9	0.	0.	0.0	0.0	0.0
7	4.0	7639.4	0.0	3171.7	0.	0.	0.0	0.0	0.0
8	0.8	1509.9	0.0	649.9	0.	0.	0.0	0.0	0.0
9	8.7	18222.6	0.0	7904.1	0.	0.	0.0	0.0	0.0
10	9.1	19830.5	0.0	9054.9	0.	0.	0.0	0.0	0.0
11	8.6	18386.2	0.0	8885.3	0.	0.	0.0	0.0	0.0
12	4.2	8433.5	0.0	4354.8	0.	0.	0.0	0.0	0.0
13	3.8	7208.0	0.0	3692.5	0.	0.	0.0	0.0	0.0
14	7.3	11931.9	0.0	6550.5	0.	0.	0.0	0.0	0.0
15	6.5	7669.3	0.0	4412.0	0.	0.	0.0	0.0	0.0
16	0.1	111.2	0.0	68.2	0.	0.	0.0	0.0	0.0
17	2.6	1926.4	0.0	652.1	0.	0.	0.0	0.0	0.0
18	3.0	1282.6	0.0	0.0	0.	0.	0.0	0.0	0.0
19	1.6	203.9	0.0	0.0	0.	0.	0.0	0.0	0.0

Failure Surface Specified By 14 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	42.373	862.000
2	52.325	861.019
3	62.325	860.957
4	72.288	861.813
5	82.130	863.581
6	91.769	866.245
7	101.122	869.784

8	110.111	874.166
9	118.659	879.355
10	126.694	885.308
11	134.149	891.973
12	140.960	899.295
13	147.070	907.212
14	149.523	911.079

Circle Center At X = 58.050 ; Y = 969.279 ; and Radius = 108.418

Factor of Safety

*** 0.915 ***

Failure Surface Specified By 14 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	46.610	862.000
2	56.542	860.836
3	66.540	860.636
4	76.511	861.400
5	86.361	863.123
6	96.000	865.787
7	105.336	869.369
8	114.284	873.835
9	122.759	879.142
10	130.683	885.243
11	137.982	892.079
12	144.587	899.587
13	150.437	907.697
14	153.567	913.059

Circle Center At X = 63.655 ; Y = 963.849 ; and Radius = 103.265

Factor of Safety

*** 0.917 ***

Failure Surface Specified By 14 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	46.610	862.000
2	56.507	860.570
3	66.501	860.198
4	76.477	860.887
5	86.324	862.630
6	95.931	865.406
7	105.189	869.185
8	113.995	873.924
9	122.249	879.570
10	129.857	886.059
11	136.736	893.318
12	142.806	901.264
13	147.999	909.810
14	148.319	910.490

Circle Center At X = 65.019 ; Y = 954.301 ; and Radius = 94.119

Factor of Safety

*** 0.918 ***

Failure Surface Specified By 15 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	45.763	862.000
2	55.714	861.016
3	65.714	860.923
4	75.682	861.723
5	85.539	863.408
6	95.206	865.965
7	104.607	869.375
8	113.667	873.609
9	122.312	878.633
10	130.476	884.409
11	138.091	890.890
12	145.099	898.024
13	151.442	905.755
14	157.071	914.020
15	157.649	915.058

Circle Center At X = 61.751 ; Y = 972.885 ; and Radius = 112.031

Factor of Safety

*** 0.920 ***
Failure Surface Specified By 14 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	42.373	862.000
2	52.250	860.439
3	62.234	859.874
4	72.225	860.312
5	82.121	861.749
6	91.824	864.169
7	101.235	867.548
8	110.261	871.853
9	118.811	877.040
10	126.798	883.057
11	134.143	889.844
12	140.771	897.331
13	146.616	905.445
14	150.008	911.317

Circle Center At X = 62.891 ; Y = 959.335 ; and Radius = 99.475

Factor of Safety
*** 0.922 ***
Failure Surface Specified By 14 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	50.000	862.000
2	59.934	860.853
3	69.933	860.695
4	79.898	861.530
5	89.731	863.348
6	99.336	866.131
7	108.618	869.853
8	117.485	874.476
9	125.850	879.955
10	133.631	886.236
11	140.752	893.258
12	147.141	900.950
13	152.737	909.238
14	155.239	913.877

Circle Center At X = 66.561 ; Y = 961.087 ; and Radius = 100.462

Factor of Safety
*** 0.923 ***
Failure Surface Specified By 13 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	43.220	862.000
2	53.077	860.312
3	63.059	859.720
4	73.046	860.233
5	82.915	861.844
6	92.547	864.534
7	101.823	868.269
8	110.631	873.004
9	118.863	878.681
10	126.419	885.232
11	133.207	892.576
12	139.143	900.623
13	143.490	908.125

Circle Center At X = 63.414 ; Y = 950.275 ; and Radius = 90.555

Factor of Safety
*** 0.925 ***
Failure Surface Specified By 15 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	43.220	862.000
2	53.104	860.480
3	63.088	859.916
4	73.080	860.313
5	82.988	861.667
6	92.721	863.965
7	102.187	867.188

8	111.301	871.303
9	119.978	876.275
10	128.137	882.056
11	135.704	888.594
12	142.609	895.827
13	148.787	903.690
14	154.182	912.110
15	155.038	913.779

Circle Center At X = 63.960 ; Y = 963.985 ; and Radius = 104.073

Factor of Safety

*** 0.925 ***

Failure Surface Specified By 15 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	38.983	862.000
2	48.939	861.063
3	58.938	860.951
4	68.913	861.664
5	78.795	863.198
6	88.516	865.541
7	98.011	868.678
8	107.215	872.588
9	116.065	877.244
10	124.501	882.615
11	132.465	888.662
12	139.903	895.347
13	146.764	902.622
14	153.001	910.438
15	155.343	913.928

Circle Center At X = 55.297 ; Y = 982.012 ; and Radius = 121.115

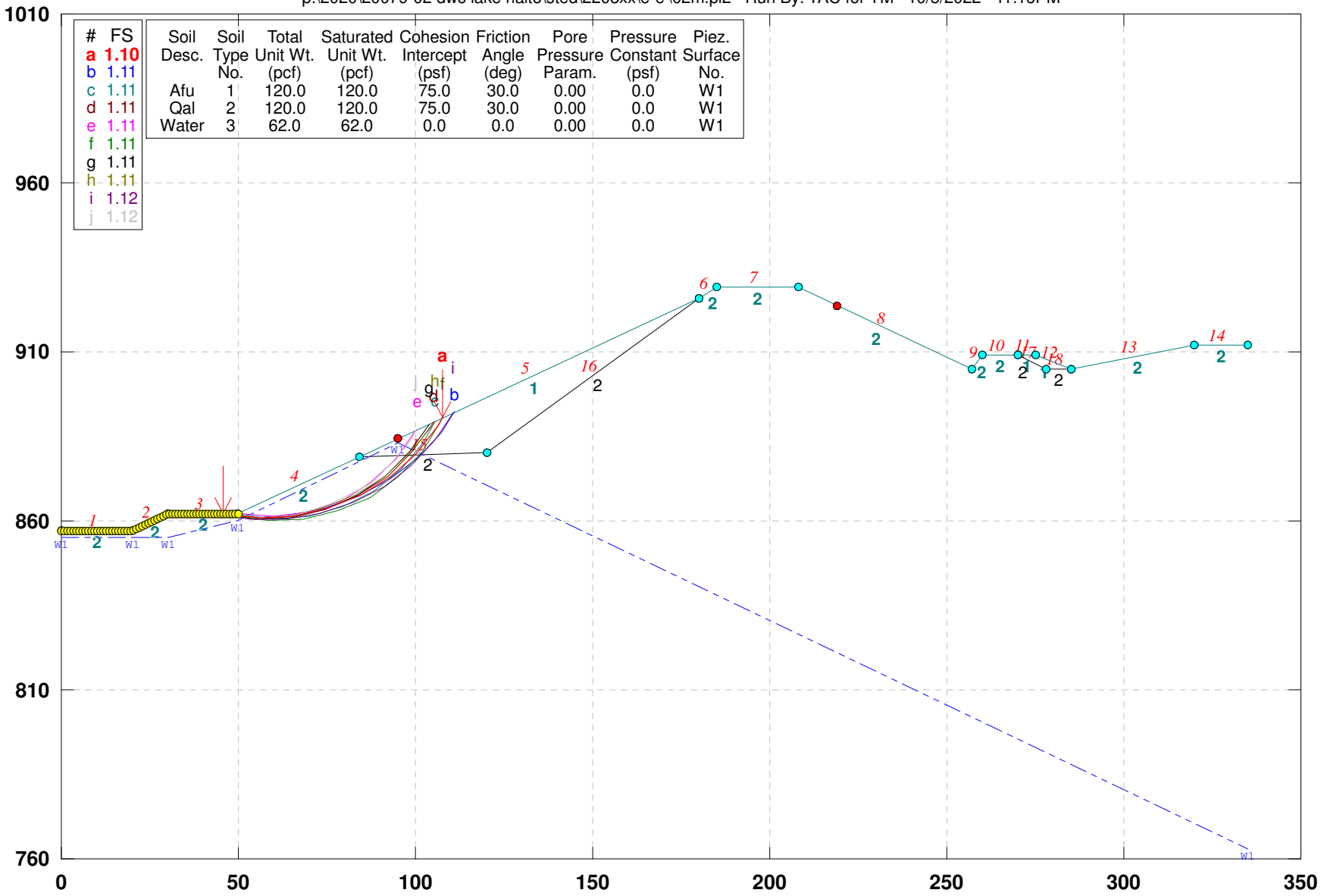
Factor of Safety

*** 0.926 ***

**** END OF GSTABL7 OUTPUT ****

DWC / Lake Rialto; E-E'; Rapid Drawdown

p:\2020\20079-02 dwc lake rialto\sted\2208xx\e-e'\02m.pl2 Run By: TAC for TM 10/5/2022 11:16PM

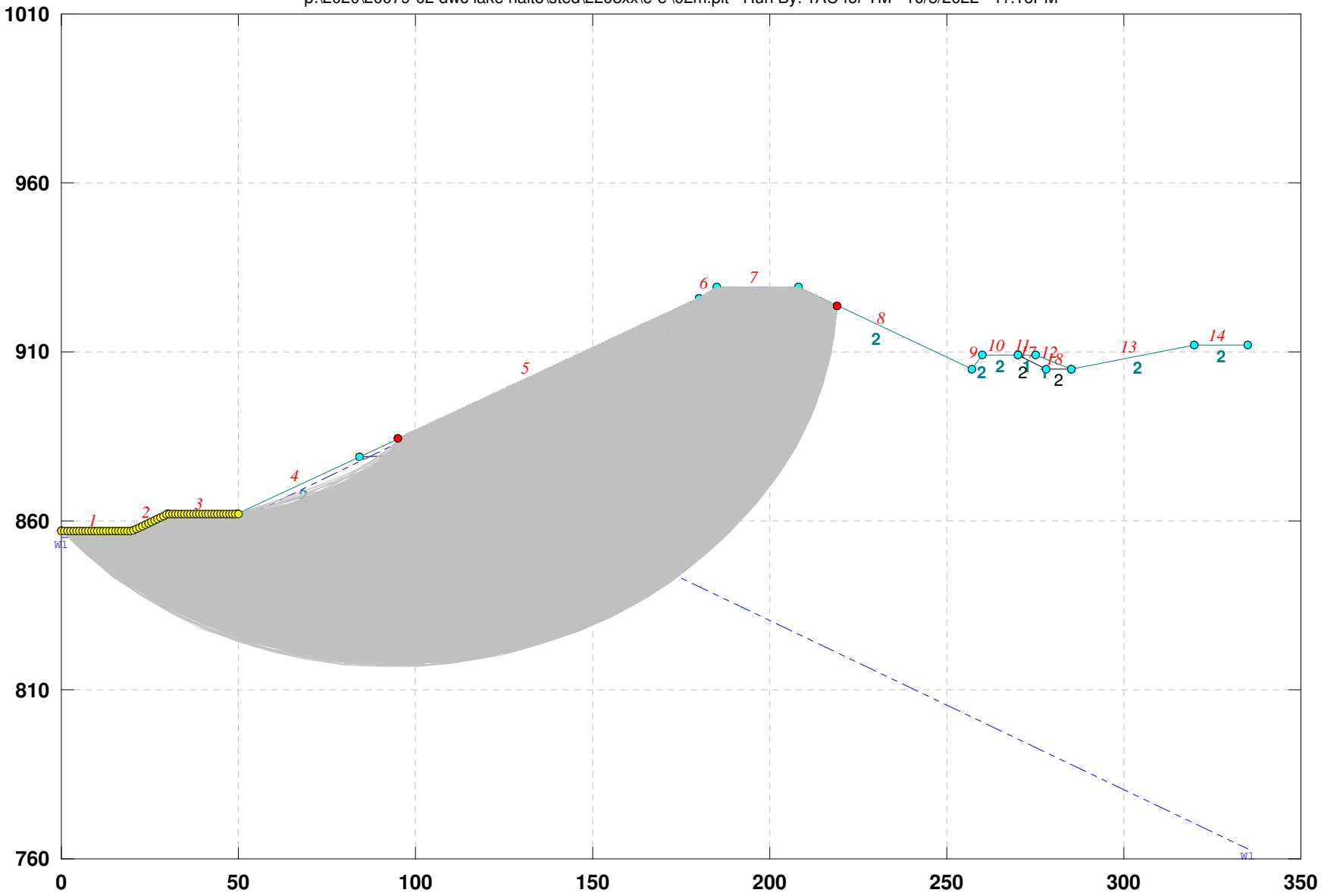


GSTABL7 v.2 FSmin=1.10

Safety Factors Are Calculated By The Modified Bishop Method

DWC / Lake Rialto; E-E'; Rapid Drawdown

p:\2020\20079-02 dwc lake rialto\sted\2208xx\e-e'\02m.plt Run By: TAC for TM 10/5/2022 11:16PM



***** GSTABL7 *****

** GSTABL7 by Dr. Garry H. Gregory, Ph.D.,P.E.,D.GE **
** Original Version 1.0, January 1996; Current Ver. 2.005.3, Feb. 2013 **
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****

SLOPE STABILITY ANALYSIS SYSTEM
Modified Bishop, Simplified Janbu, or GLE Method of Slices.
(Includes Spencer & Morgenstern-Price Type Analysis)
Including Pier/Pile, Reinforcement, Soil Nail, Tieback,
Nonlinear Undrained Shear Strength, Curved Phi Envelope,
Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water
Surfaces, Pseudo-Static & Newmark Earthquake, and Applied Forces.

****

Analysis Run Date: 10/5/2022
Time of Run: 11:16PM
Run By: TAC for TM
Input Data Filename: P:\2020\20079-02 DWC Lake Rialto\Sted\2208XX\E-E'\02m.in
Output Filename: P:\2020\20079-02 DWC Lake Rialto\Sted\2208XX\E-E'\02m.OUT
Unit System: English
Plotted Output Filename: P:\2020\20079-02 DWC Lake Rialto\Sted\2208XX\E-E'\02m.PLT
PROBLEM DESCRIPTION: DWC / Lake Rialto; E-E'; Rapid Drawdown
BOUNDARY COORDINATES
14 Top Boundaries
18 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	0.00	857.00	20.00	857.00	2
2	20.00	857.00	30.00	862.00	2
3	30.00	862.00	50.00	862.00	2
4	50.00	862.00	84.00	879.00	2
5	84.00	879.00	180.00	926.00	1
6	180.00	926.00	185.00	929.00	2
7	185.00	929.00	208.00	929.00	2
8	208.00	929.00	257.00	905.00	2
9	257.00	905.00	260.00	909.00	2
10	260.00	909.00	270.00	909.00	2
11	270.00	909.00	275.00	909.00	1
12	275.00	909.00	285.00	905.00	1
13	285.00	905.00	320.00	912.00	2
14	320.00	912.00	335.00	912.00	2
15	84.00	879.00	120.00	880.00	2
16	120.00	880.00	180.00	926.00	2
17	270.00	909.00	278.00	905.00	2
18	278.00	905.00	285.00	905.00	2

User Specified Y-Origin = 760.00(ft)
Default X-Plus Value = 0.00(ft)
Default Y-Plus Value = 0.00(ft)
ISOTROPIC SOIL PARAMETERS
3 Type(s) of Soil

Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
1	120.0	120.0	75.0	30.0	0.00	0.0	1
2	120.0	120.0	75.0	30.0	0.00	0.0	1
3	62.0	62.0	0.0	0.0	0.00	0.0	1

1 PIEZOMETRIC SURFACE(S) SPECIFIED
Unit Weight of Water = 62.40 (pcf)
Piezometric Surface No. 1 Specified by 6 Coordinate Points
Pore Pressure Inclination Factor = 0.50

Point No.	X-Water (ft)	Y-Water (ft)
1	0.00	855.00
2	20.00	855.00
3	30.00	855.00
4	50.00	860.00
5	95.00	883.00
6	335.00	763.00

A Critical Failure Surface Searching Method, Using A Random
Technique For Generating Circular Surfaces, Has Been Specified.
4800 Trial Surfaces Have Been Generated.

80 Surface(s) Initiate(s) From Each Of 60 Points Equally Spaced
Along The Ground Surface Between X = 0.00(ft)
and X = 50.00(ft)
Each Surface Terminates Between X = 95.00(ft)
and X = 219.00(ft)
Unless Further Limitations Were Imposed, The Minimum Elevation
At Which A Surface Extends Is Y = 0.00(ft)
10.00(ft) Line Segments Define Each Trial Failure Surface.
Following Are Displayed The Ten Most Critical Of The Trial
Failure Surfaces Evaluated. They Are
Ordered - Most Critical First.
* * Safety Factors Are Calculated By The Modified Bishop Method * *
Total Number of Trial Surfaces Attempted = 4800
Number of Trial Surfaces With Valid FS = 4800
Statistical Data On All Valid FS Values:
FS Max = 2.400 FS Min = 1.102 FS Ave = 1.650
Standard Deviation = 0.273 Coefficient of Variation = 16.56 %
Failure Surface Specified By 9 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	45.763	862.000
2	55.695	860.836
3	65.678	861.408
4	75.412	863.701
5	84.602	867.643
6	92.971	873.117
7	100.266	879.957
8	106.267	887.956
9	107.580	890.544

Circle Center At X = 57.404 ; Y = 918.360 ; and Radius = 57.550
Factor of Safety
*** 1.102 ***
Individual data on the 15 slices

Slice No.	Width (ft)	Weight (lbs)	Water Force Top (lbs)	Water Force Bot (lbs)	Tie Force Norm (lbs)	Tie Force Tan (lbs)	Earthquake Force Hor (lbs)	Earthquake Force Ver (lbs)	Surcharge Load (lbs)
1	4.2	126.3	0.0	0.0	0.	0.	0.0	0.0	0.0
2	2.4	354.6	0.0	0.0	0.	0.	0.0	0.0	0.0
3	3.3	1185.8	0.0	192.9	0.	0.	0.0	0.0	0.0
4	10.0	7453.3	0.0	2427.7	0.	0.	0.0	0.0	0.0
5	9.7	11351.4	0.0	4445.1	0.	0.	0.0	0.0	0.0
6	8.6	11656.0	0.0	5039.4	0.	0.	0.0	0.0	0.0
7	0.6	840.5	0.0	367.1	0.	0.	0.0	0.0	0.0
8	2.8	3776.1	0.0	1812.5	0.	0.	0.0	0.0	0.0
9	5.6	7233.9	0.0	3470.4	0.	0.	0.0	0.0	0.0
10	2.0	2391.2	0.0	1309.1	0.	0.	0.0	0.0	0.0
11	4.7	4698.0	0.0	1666.2	0.	0.	0.0	0.0	0.0
12	0.6	474.9	0.0	34.6	0.	0.	0.0	0.0	0.0
13	0.2	185.7	0.0	4.3	0.	0.	0.0	0.0	0.0
14	5.8	3037.4	0.0	0.0	0.	0.	0.0	0.0	0.0
15	1.3	153.3	0.0	0.0	0.	0.	0.0	0.0	0.0

Failure Surface Specified By 9 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	44.915	862.000
2	54.867	861.016
3	64.850	861.591
4	74.623	863.711
5	83.947	867.325
6	92.596	872.345
7	100.359	878.648
8	107.048	886.081
9	111.059	892.248

Circle Center At X = 56.182 ; Y = 925.128 ; and Radius = 64.126
Factor of Safety
*** 1.107 ***
Failure Surface Specified By 8 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)

1	50.000	862.000
2	59.906	860.633
3	69.881	861.342
4	79.494	864.097
5	88.330	868.779
6	96.009	875.185
7	102.198	883.040
8	105.375	889.465

Circle Center At X = 61.529 ; Y = 908.311 ; and Radius = 47.724

Factor of Safety

*** 1.107 ***

Failure Surface Specified By 9 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	44.915	862.000
2	54.825	860.658
3	64.813	861.152
4	74.542	863.464
5	83.684	867.517
6	91.930	873.174
7	99.002	880.243
8	104.662	888.487
9	105.018	889.290

Circle Center At X = 57.143 ; Y = 915.045 ; and Radius = 54.437

Factor of Safety

*** 1.109 ***

Failure Surface Specified By 8 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	50.000	862.000
2	59.966	861.175
3	69.877	862.504
4	79.273	865.926
5	87.718	871.282
6	94.819	878.323
7	100.246	886.722
8	100.352	887.006

Circle Center At X = 58.801 ; Y = 907.476 ; and Radius = 46.320

Factor of Safety

*** 1.110 ***

Failure Surface Specified By 9 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	48.305	862.000
2	58.155	860.276
3	68.152	860.550
4	77.892	862.812
5	86.987	866.970
6	95.069	872.859
7	101.815	880.240
8	106.954	888.819
9	107.559	890.534

Circle Center At X = 61.792 ; Y = 910.043 ; and Radius = 49.901

Factor of Safety

*** 1.112 ***

Failure Surface Specified By 8 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	44.915	862.000
2	54.813	860.570
3	64.801	861.049
4	74.516	863.419
5	83.604	867.593
6	91.731	873.418
7	98.603	880.683
8	103.647	888.619

Circle Center At X = 57.318 ; Y = 912.737 ; and Radius = 52.231

Factor of Safety

*** 1.112 ***

Failure Surface Specified By 9 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	44.068	862.000
2	54.005	860.882
3	63.987	861.485
4	73.717	863.791
5	82.908	867.732
6	91.287	873.191
7	98.605	880.005
8	104.646	887.974
9	105.429	889.491

Circle Center At X = 55.506 ; Y = 918.953 ; and Radius = 58.091

Factor of Safety

*** 1.114 ***

Failure Surface Specified By 9 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	43.220	862.000
2	53.083	860.350
3	63.083	860.371
4	72.939	862.063
5	82.374	865.378
6	91.121	870.223
7	98.936	876.462
8	105.599	883.919
9	110.736	892.090

Circle Center At X = 57.958 ; Y = 919.779 ; and Radius = 59.628

Factor of Safety

*** 1.115 ***

Failure Surface Specified By 8 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	46.610	862.000
2	56.558	860.976
3	66.509	861.965
4	76.060	864.926
5	84.825	869.740
6	92.448	876.212
7	98.622	884.079
8	99.998	886.833

Circle Center At X = 56.700 ; Y = 910.115 ; and Radius = 49.161

Factor of Safety

*** 1.119 ***

**** END OF GSTABL7 OUTPUT ****

APPENDIX F

APPENDIX F

GENERAL EARTHWORK AND GRADING SPECIFICATIONS

1.0 General

1.1 Intent: These General Earthwork and Grading Specifications are for the grading and earthwork shown on the approved grading plan(s) and/or indicated in the geotechnical report(s). These Specifications are a part of the recommendations contained in the geotechnical report(s). In case of conflict, the specific recommendations in the geotechnical report shall supersede these more general Specifications. Observations of the earthwork by the project Geotechnical Consultant during the course of grading may result in new or revised recommendations that could supersede these specifications or the recommendations in the geotechnical report(s).

1.2 Geotechnical Consultant: Prior to commencement of work, the owner shall employ a geotechnical consultant. The geotechnical consultant shall be responsible for reviewing the approved geotechnical report(s) and accepting the adequacy of the preliminary geotechnical findings, conclusions, and recommendations prior to the commencement of the grading.

Prior to commencement of grading, the Geotechnical Consultant shall review the "work plan" prepared by the Earthwork Contractor (Contractor) and schedule sufficient personnel to perform the appropriate level of observation, mapping, and compaction testing.

During the grading and earthwork operations, the Geotechnical Consultant shall observe, map, and document the subsurface exposures to verify the geotechnical design assumptions. If the observed conditions are found to be significantly different than the interpreted assumptions during the design phase, the Geotechnical Consultant shall inform the owner, recommend appropriate changes in design to accommodate the observed conditions, and notify the review agency where required. Subsurface areas to be geotechnically observed, mapped, elevations recorded, and/or tested include natural ground after it has been cleared for receiving fill but before fill is placed, bottoms of all "remedial removal" areas, all key bottoms, and benches made on sloping ground to receive fill.

The Geotechnical Consultant shall observe the moisture-conditioning and processing of the subgrade and fill materials and perform relative compaction testing of fill to determine the attained level of compaction. The Geotechnical Consultant shall provide the test results to the owner and the Contractor on a routine and frequent basis.

1.3 The Earthwork Contractor: The Earthwork Contractor (Contractor) shall be qualified, experienced, and knowledgeable in earthwork logistics, preparation and processing of ground to receive fill, moisture-conditioning and processing of fill, and compacting fill. The Contractor shall review and accept the plans, geotechnical report(s), and these Specifications prior to commencement of grading. The Contractor shall be solely responsible for performing the grading in accordance with the plans and specifications.

The Contractor shall prepare and submit to the owner and the Geotechnical Consultant a work plan that indicates the sequence of earthwork grading, the number of "spreads" of work and the estimated quantities of daily earthwork contemplated for the site prior to commencement of grading. The Contractor shall inform the owner and the Geotechnical Consultant of changes in work schedules and updates to the work plan at least 24 hours in advance of such changes so that appropriate observations and tests can be planned and accomplished. The Contractor shall not assume that the Geotechnical Consultant is aware of all grading operations.

The Contractor shall have the sole responsibility to provide adequate equipment and methods to accomplish the earthwork in accordance with the applicable grading codes and agency ordinances, these Specifications, and the recommendations in the approved geotechnical report(s) and grading plan(s). If, in the opinion of the Geotechnical Consultant, unsatisfactory conditions, such as unsuitable soil, improper moisture condition, inadequate compaction, insufficient buttress key size, adverse weather, etc., are resulting in a quality of work less than required in these specifications, the Geotechnical Consultant shall reject the work and may recommend to the owner that construction be stopped until the conditions are rectified.

2.0 Preparation of Areas to be Filled

2.1 Clearing and Grubbing: Vegetation, such as brush, grass, roots, and other deleterious material shall be sufficiently removed and properly disposed of in a method acceptable to the owner, governing agencies, and the Geotechnical Consultant.

The Geotechnical Consultant shall evaluate the extent of these removals depending on specific site conditions. Earth fill material shall not contain more than 1 percent of organic materials (by volume). No fill lift shall contain more than 5 percent of organic matter. Nesting of the organic materials shall not be allowed.

If potentially hazardous materials are encountered, the Contractor shall stop work in the affected area, and a hazardous material specialist shall be informed

immediately for proper evaluation and handling of these materials prior to continuing to work in that area.

As presently defined by the State of California, most refined petroleum products (gasoline, diesel fuel, motor oil, grease, coolant, etc.) have chemical constituents that are considered to be hazardous waste. As such, the indiscriminate dumping or spillage of these fluids onto the ground may constitute a misdemeanor, punishable by fines and/or imprisonment, and shall not be allowed.

2.2 Processing: Existing ground that has been declared satisfactory for support of fill by the Geotechnical Consultant shall be scarified to a minimum depth of 6 inches. Existing ground that is not satisfactory shall be overexcavated as specified in the following section. Scarification shall continue until soils are broken down and free of large clay lumps or clods and the working surface is reasonably uniform, flat, and free of uneven features that would inhibit uniform compaction.

2.3 Overexcavation: In addition to removals and overexcavations recommended in the approved geotechnical report(s) and the grading plan, soft, loose, dry, saturated, spongy, organic-rich, highly fractured or otherwise unsuitable ground shall be overexcavated to competent ground as evaluated by the Geotechnical Consultant during grading.

2.4 Benching: Where fills are to be placed on ground with slopes steeper than 5:1 (horizontal to vertical units), the ground shall be stepped or benched. Please see the Standard Details for a graphic illustration. The lowest bench or key shall be a minimum of 15 feet wide and at least 2 feet deep, into competent material as evaluated by the Geotechnical Consultant. Other benches shall be excavated a minimum height of 4 feet into competent material or as otherwise recommended by the Geotechnical Consultant. Fill placed on ground sloping flatter than 5:1 shall also be benched or otherwise overexcavated to provide a flat subgrade for the fill.

2.5 Evaluation/Acceptance of Fill Areas: All areas to receive fill, including removal and processed areas, key bottoms, and benches, shall be observed, mapped, elevations recorded, and/or tested prior to being accepted by the Geotechnical Consultant as suitable to receive fill. The Contractor shall obtain a written acceptance from the Geotechnical Consultant prior to fill placement. A licensed surveyor shall provide the survey control for determining elevations of processed areas, keys, and benches.

3.0 Fill Material

3.1 General: Material to be used as fill shall be essentially free of organic matter and other deleterious substances evaluated and accepted by the Geotechnical Consultant prior to placement. Soils of poor quality, such as those with unacceptable gradation, high expansion potential, or low strength shall be placed in areas acceptable to the Geotechnical Consultant or mixed with other soils to achieve satisfactory fill material.

3.2 Oversize: Oversize material defined as rock, or other irreducible material with a maximum dimension greater than 12 inches, shall not be buried or placed in fill unless location, materials, and placement methods are specifically accepted by the Geotechnical Consultant. Placement operations shall be such that nesting of oversized material does not occur and such that oversize material is completely surrounded by compacted or densified fill. Oversize material shall not be placed within 10 vertical feet of finish grade or within 2 feet of future utilities or underground construction.

3.3 Import: If importing of fill material is required for grading, proposed import material shall meet the requirements of Section 3.1. The potential import source shall be given to the Geotechnical Consultant at least 48 hours (2 working days) before importing begins so that its suitability can be determined and appropriate tests performed.

4.0 Fill Placement and Compaction

4.1 Fill Layers: Approved fill material shall be placed in areas prepared to receive fill (per Section 3.0) in near-horizontal layers not exceeding 8 inches in loose thickness. The Geotechnical Consultant may accept thicker layers if testing indicates the grading procedures can adequately compact the thicker layers. Each layer shall be spread evenly and mixed thoroughly to attain relative uniformity of material and moisture throughout.

4.2 Fill Moisture Conditioning: Fill soils shall be watered, dried back, blended, and/or mixed, as necessary to attain a relatively uniform moisture content at or slightly over optimum. Maximum density and optimum soil moisture content tests shall be performed in accordance with the American Society of Testing and Materials (ASTM Test Method D1557-91).

4.3 Compaction of Fill: After each layer has been moisture-conditioned, mixed, and evenly spread, it shall be uniformly compacted to not less than 90 percent of maximum dry density (ASTM Test Method D1557-91). Compaction equipment shall be adequately sized and be either specifically designed for soil compaction or of proven reliability to efficiently achieve the specified level of compaction with uniformity.

4.4 Compaction of Fill Slopes: In addition to normal compaction procedures specified above, compaction of slopes shall be accomplished by backrolling of slopes with sheepsfoot rollers at increments of 3 to 4 feet in fill elevation, or by other methods producing satisfactory results acceptable to the Geotechnical Consultant. Upon completion of grading, relative compaction of the fill, out to the slope face, shall be at least 90 percent of maximum density per ASTM Test Method D1557-91.

4.5 Compaction Testing: Field tests for moisture content and relative compaction of the fill soils shall be performed by the Geotechnical Consultant. Location and frequency of tests shall be at the Consultant's discretion based on field conditions encountered. Compaction test locations will not necessarily be selected on a random basis. Test locations shall be selected to verify adequacy of compaction levels in areas that are judged to be prone to inadequate compaction (such as close to slope faces and at the fill/bedrock benches).

4.6 Frequency of Compaction Testing: Tests shall be taken at intervals not exceeding 2 feet in vertical rise and/or 1,000 cubic yards of compacted fill soils embankment. In addition, as a guideline, at least one test shall be taken on slope faces for each 5,000 square feet of slope face and/or each 10 feet of vertical height of slope. The Contractor shall assure that fill construction is such that the testing schedule can be accomplished by the Geotechnical Consultant. The Contractor shall stop or slow down the earthwork construction if these minimum standards are not met.

4.7 Compaction Test Locations: The Geotechnical Consultant shall document the approximate elevation and horizontal coordinates of each test location. The Contractor shall coordinate with the project surveyor to assure that sufficient grade stakes are established so that the Geotechnical Consultant can determine the test locations with sufficient accuracy. At a minimum, two grade stakes within a horizontal distance of 100 feet and vertically less than 5 feet apart from potential test locations shall be provided.

5.0 Subdrain Installation

Subdrain systems shall be installed in accordance with the approved geotechnical report(s), the grading plan, and the Standard Details. The Geotechnical Consultant may recommend additional subdrains and/or changes in subdrain extent, location, grade, or material depending on conditions encountered during grading. All subdrains shall be surveyed by a land surveyor/civil engineer for line and grade after installation and prior to burial. Sufficient time should be allowed by the Contractor for these surveys.

6.0 Excavation

Excavations, as well as over-excavation for remedial purposes, shall be evaluated by the Geotechnical Consultant during grading. Remedial removal depths shown on geotechnical plans are estimates only. The actual extent of removal shall be determined by the Geotechnical Consultant based on the field evaluation of exposed conditions during grading. Where fill-over-cut slopes are to be graded, the cut portion of the slope shall be made, evaluated, and accepted by the Geotechnical Consultant prior to placement of materials for construction of the fill portion of the slope, unless otherwise recommended by the Geotechnical Consultant.

7.0 Trench Backfills

7.1 Contractor shall follow all OHSA and Cal/OSHA requirements for safety of trench excavations.

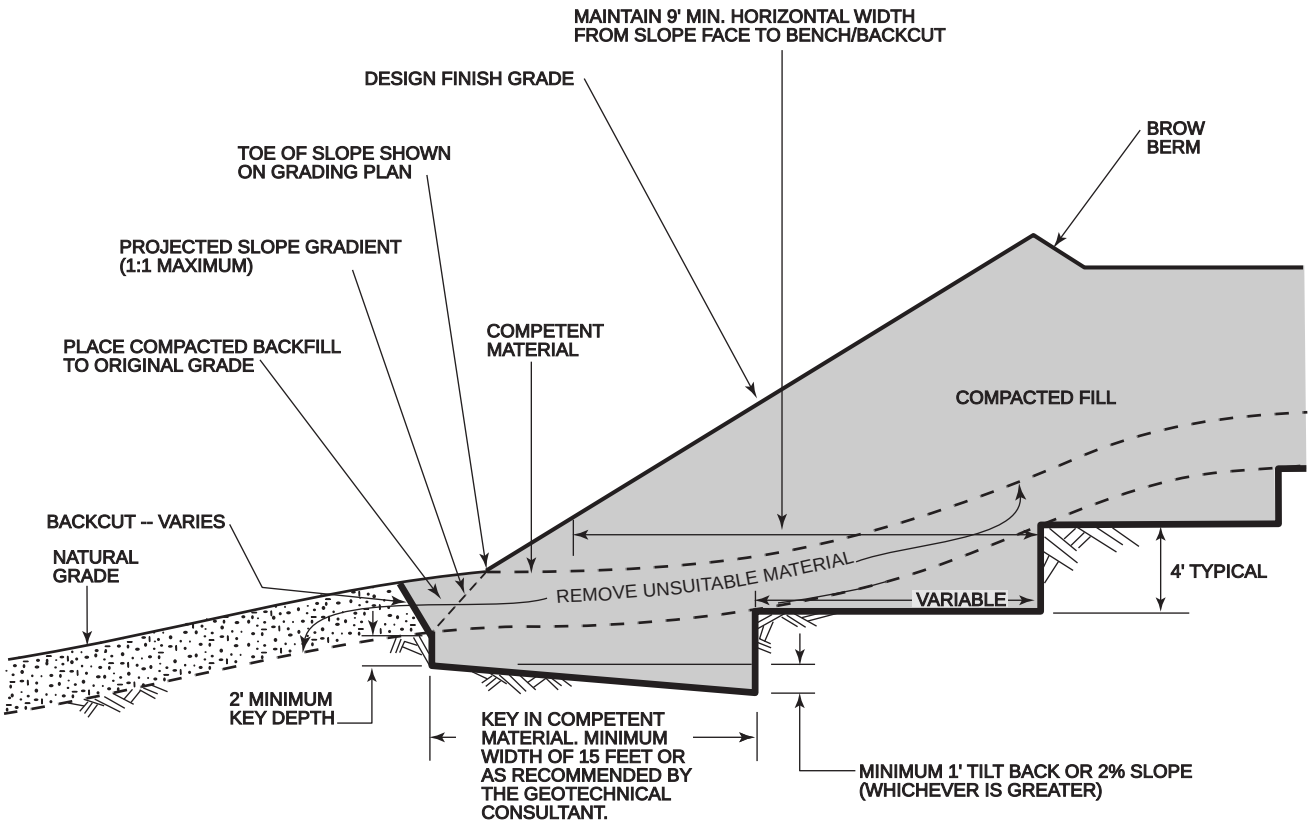
7.2 Bedding and backfill of utility trenches shall be done in accordance with the applicable provisions of Standard Specifications of Public Works Construction. Bedding material shall have a Sand Equivalent greater than 30 (SE>30). The bedding shall be placed to 1 foot over the top of the conduit and densified by jetting. Backfill shall be placed and densified to a minimum 90 percent of maximum from 1 foot above the top of the conduit to the surface, except in traveled ways (see Section 7.6 below).

7.3 Jetting of the bedding around the conduits shall be observed by the Geotechnical Consultant.

7.4 Geotechnical Consultant shall test the trench backfill for relative compaction. At least one test should be made for every 300 feet of trench and 2 feet of fill.

7.5 Lift thickness of trench backfill shall not exceed those allowed in the Standard Specifications of Public Works Construction unless the Contractor can demonstrate to the Geotechnical Consultant that the fill lift can be compacted to the minimum relative compaction by his alternative equipment and method.

7.6 Trench backfill in the upper foot measured from finish grade within existing or future traveled way, shoulder, and other paved areas (or areas to receive pavement) should be placed to a minimum 95 percent relative compaction.

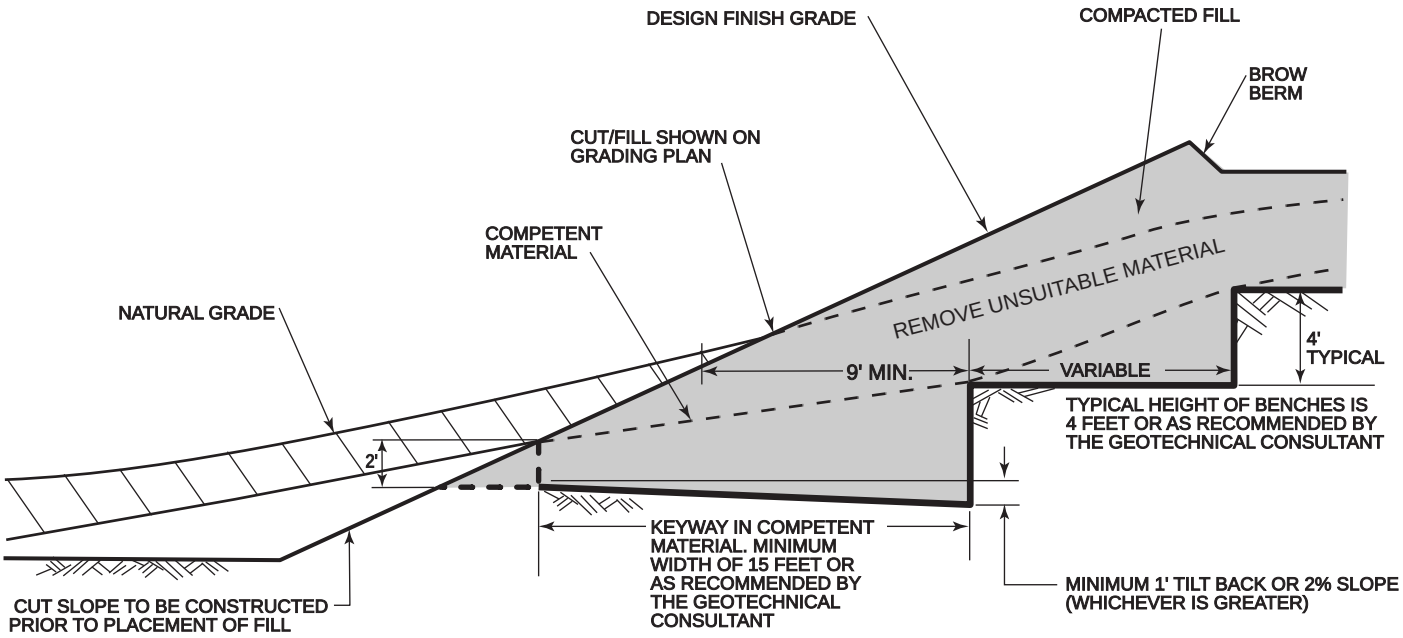


NOTE: BENCHING SHALL BE REQUIRED WHEN NATURAL SLOPES ARE EQUAL TO OR STEEPER THAN 5:1 OR WHEN RECOMMENDED BY THE SOIL ENGINEER. WHERE THE NATURAL SLOPE APPROACHES OR EXCEEDS THE DESIGN SLOPE RATIO, SPECIAL RECOMMENDATIONS WILL BE PROVIDED BY THE GEOTECHNICAL ENGINEER.

FIGURE 1

TYPICAL FILL KEY ABOVE NATURAL SLOPE MINIMUM STANDARD GRADING DETAILS

NMG Geotechnical, Inc.



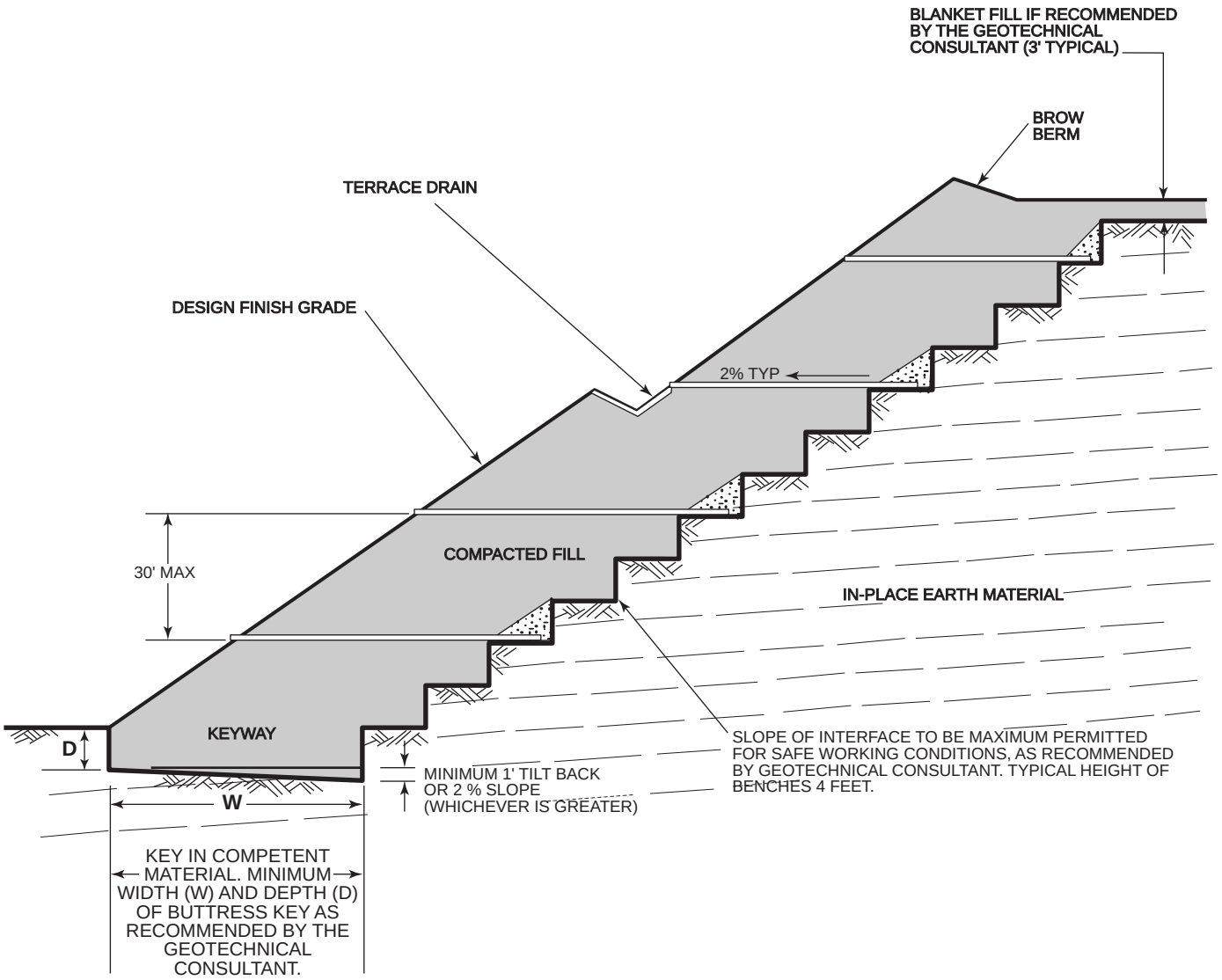
NOTE: THE FILL PORTION OF THE SLOPE SHALL BE COMPACTED AS STATED IN THE PROJECT SPECIFICATIONS.

FIGURE 2

TYPICAL FILL ABOVE CUT SLOPE
MINIMUM STANDARD GRADING DETAILS

NMG Geotechnical, Inc.

8/03 TYP FILL ABOVE CUT SLOPE.ai



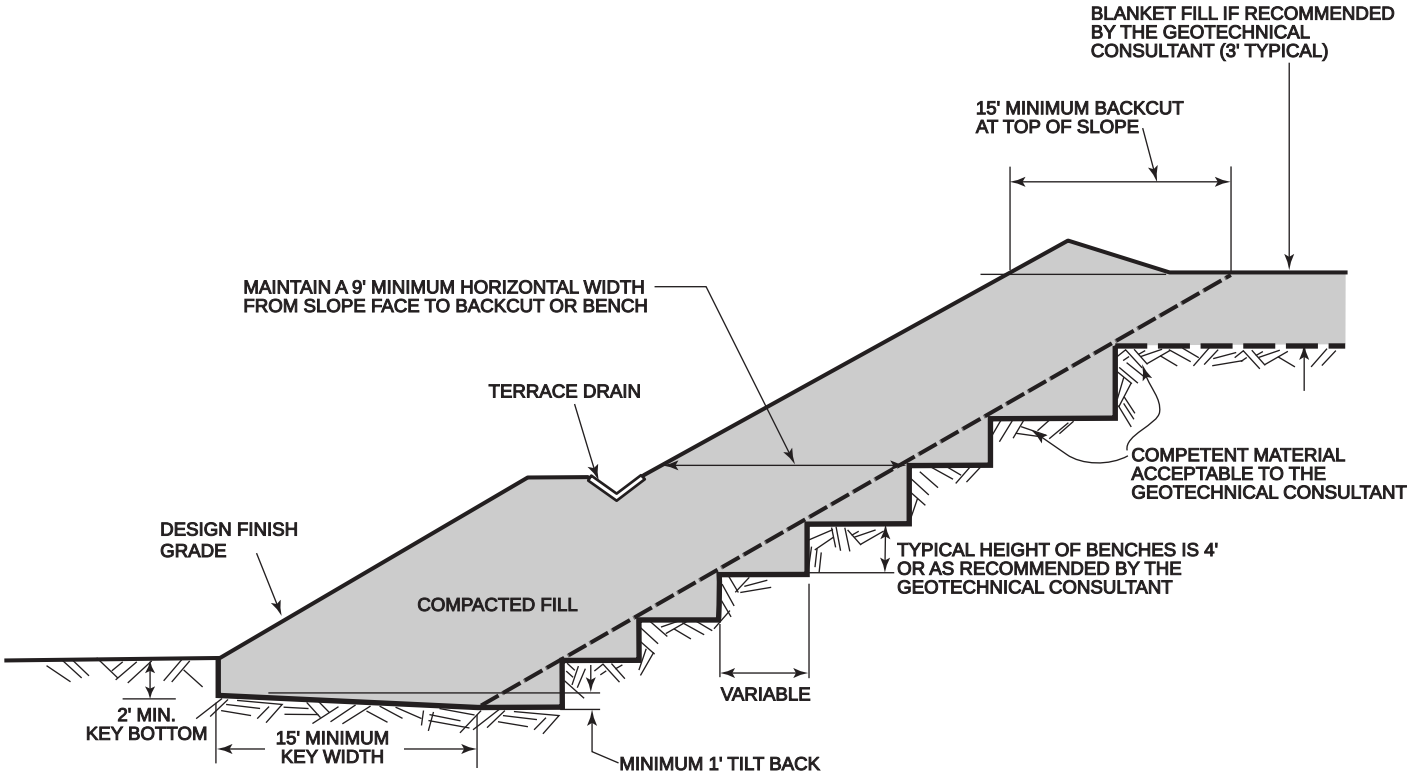
NOTE: SUBDRAIN DETAILS, SEE FIGURE 5.

FIGURE 3

TYPICAL BUTTRESS FILL
MINIMUM STANDARD GRADING DETAILS

NMG Geotechnical, Inc.

1/04 TYP BUTTRESS FILL.ai

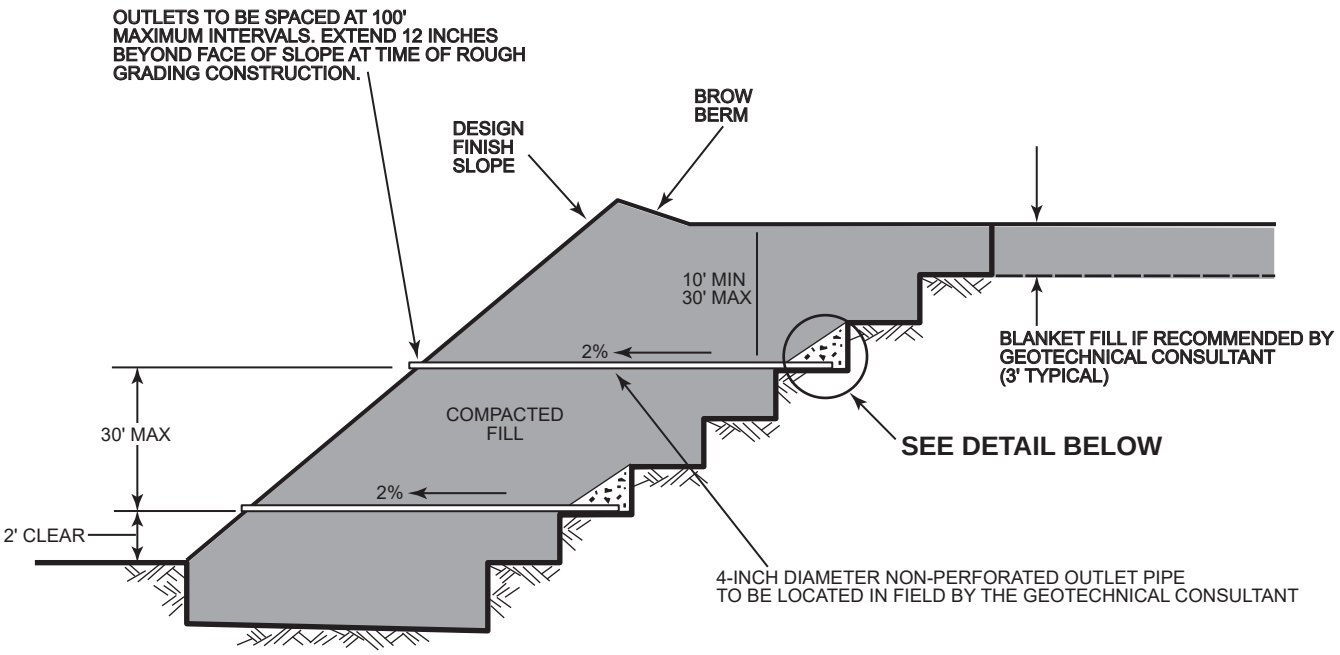


NOTE:
SEE FIGURE 5 FOR TYPICAL SUBDRAIN DETAILS FOR STABILIZATION FILLS

FIGURE 4

TYPICAL STABILIZATION FILL MINIMUM STANDARD GRADING DETAILS

NMG Geotechnical, Inc.



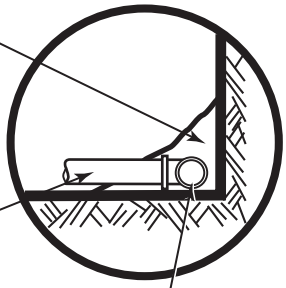
FILTER MATERIAL - MINIMUM OF THREE CUBIC FEET PER FOOT OF PIPE. SEE FILTER MATERIAL SPECIFICATION.

ALTERNATE: IN LIEU OF FILTER MATERIAL, THREE CUBIC FEET OF GRAVEL PER FOOT OF SUBDRAIN (WITHOUT PIPE) MAY BE ENCASED IN FILTER FABRIC. SEE GRAVEL SPECIFICATION, AND FIGURE 6 FOR FILTER FABRIC SPECIFICATION

"GRAVEL" TO CONSIST OF 1/2" TO 1" CRUSHED ROCK PER STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION.

FILTER FABRIC SHALL BE LAPPED A MINIMUM OF 12 INCHES ON ALL JOINTS.

DETAIL



OUTLET PIPE TO BE CONNECTED TO SUBDRAIN PIPE WITH TEE OR ELBOW

MINIMUM 4-INCH DIAMETER SCHEDULE 40 ASTM D1527 OR D1785 OR SDR 35 ASTM D2751 OR D 3034. FOR FILL DEPTH OF 90 FEET OR GREATER, USE ONLY SCHEDULE 40 OR EQUIVALENT. THERE SHALL BE A MINIMUM OF 8 UNIFORMLY SPACED PERFORATIONS PER FOOT OF PIPE INSTALLED WITH PERFORATIONS ON BOTTOM OF PIPE. PROVIDE CAP AT UPSTREAM END OF PIPE. SLOPE AT 2 PERCENT TO OUTLET PIPE.

"FILTER MATERIAL" TO MEET FOLLOWING SPECIFICATION OR APPROVED EQUIVALENT.

SIEVE SIZE	PERCENTAGE PASSING
1"	100
3/4"	90-100
3/8"	40-100
NO. 4	25-40
NO. 8	18-33
NO. 30	5-15
NO. 50	0-7
NO. 200	0-3

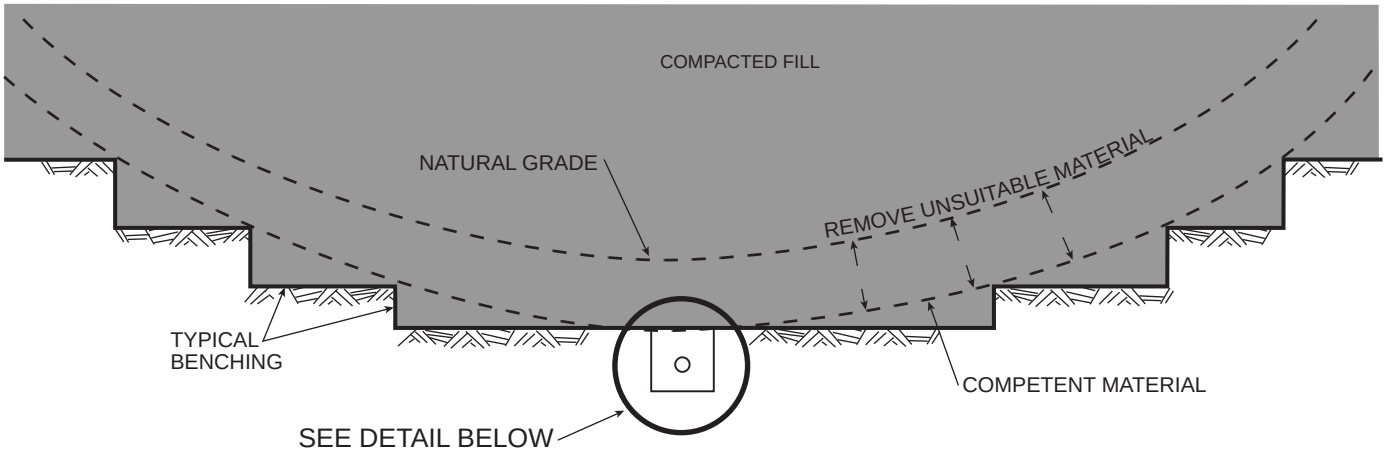
NOTE:
TRENCH FOR OUTLET PIPES TO BE BACKFILLED WITH ON-SITE SOIL.

FIGURE 5

TYPICAL STABILIZATION AND BUTTRESS FILL SUBDRAINS MINIMUM STANDARD GRADING DETAILS

NMG Geotechnical, Inc.

8/96 STAB. BUTTRESS FILL SUBDRAINS.ai



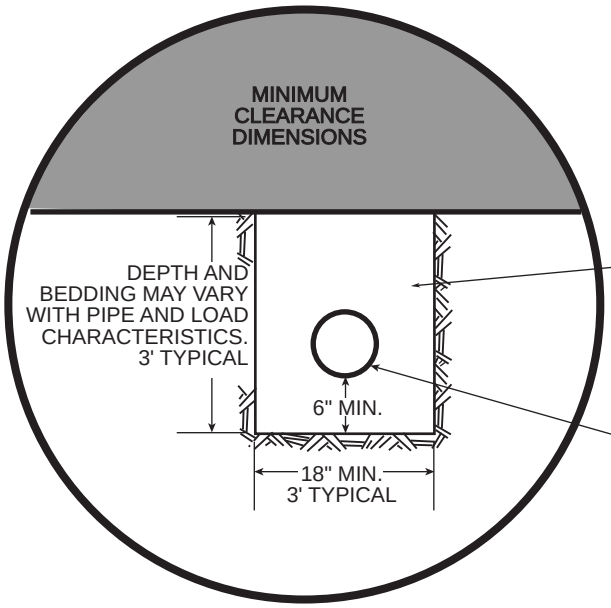
FILTER FABRICS SHALL BE PERMEABLE NON-WOVEN POLYESTER, NYLON, OR POLYPROPYLENE MATERIAL CONFORMING TO THE FOLLOWING:

1) GRAB TENSILE STRENGTH. POUNDS, MIN. ASTM D 4632.....90
2) ELONGATION, AT PEAK LOAD, PERCENT, MIN. ASTM D 4632.....50
3) PUNCTURE STRENGTH, LBS., MIN. ASTM D 3787.....45
4) COEFFICIENT OF WATER PERMITTIVITY, 1/SEC. ASTM D 4491.....>0.7
5) BURST STRENGTH, P.S.I., MIN. ASTM D 3786.....180

NOTES: DOWNSTREAM 20' OF PIPE AT OUTLET SHALL BE NON-PERFORATED AND BACKFILLED WITH FINE-GRAINED MATERIAL

PIPE SHALL BE A MINIMUM OF 4-INCH DIAMETER. FOR RUNS OF 500 FEET OR MORE, USE 6-INCH DIAMETER PIPE, OR AS RECOMMENDED BY THE GEOTECHNICAL CONSULTANT

DETAIL



FILTER MATERIAL - MINIMUM OF NINE CUBIC FEET PER FOOT OF PIPE. SEE FIGURE 5 FOR FILTER MATERIAL SPECIFICATIONS.

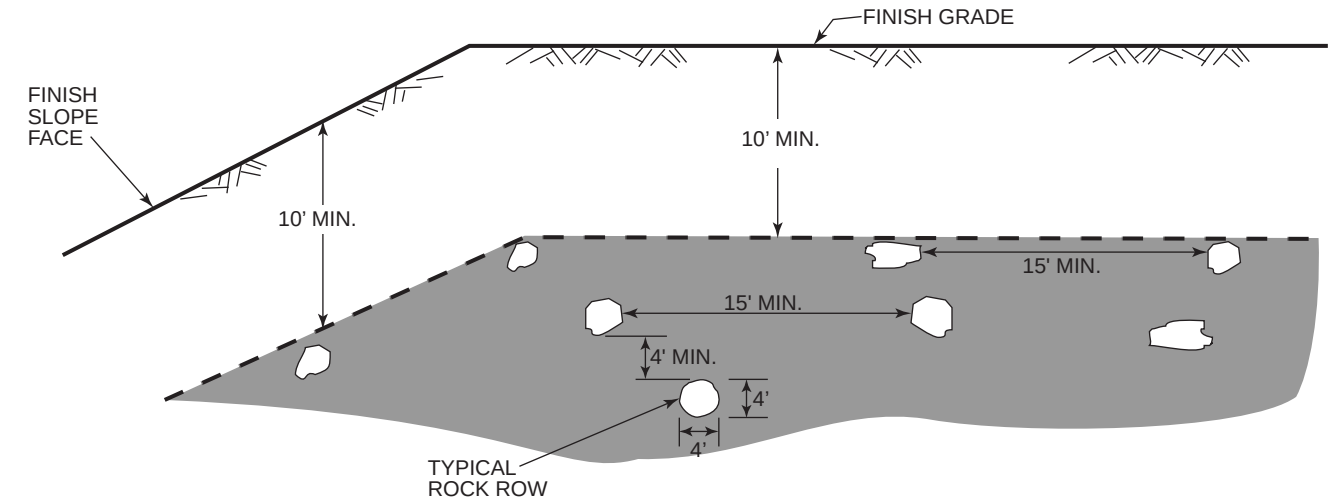
ALTERNATE: IN LIEU OF FILTER MATERIAL, NINE CUBIC FEET OF GRAVEL PER FOOT OF SUBDRAIN (WITHOUT PIPE) MAY BE ENCASED IN FILTER FABRIC. SEE FIGURE 5 TO GRAVEL SPECIFICATION. SEE ABOVE FOR FILTER FABRIC SPECIFICATION. FILTER FABRIC SHALL BE LAPPED MINIMUM OF 12 INCHES ON ALL JOINTS.

MINIMUM 4 INCH DIAMETER SCHEDULE 40 ASTM D 1527, OR D 1785, OR SDR 35 ASTM 2751 OR D 3034. FOR FILL DEPTH OF 90 FEET OR GREATER, USE ONLY SCHEDULE 40 OR APPROVED EQUIVALENT. THERE SHALL BE A MINIMUM OF 8 UNIFORMLY SPACED PERFORATIONS PER FOOT OF PIPE INSTALLED WITH PERFORATIONS ON BOTTOM OF PIPE.

FIGURE 6

TYPICAL CANYON SUBDRAIN MINIMUM STANDARD GRADING DETAILS

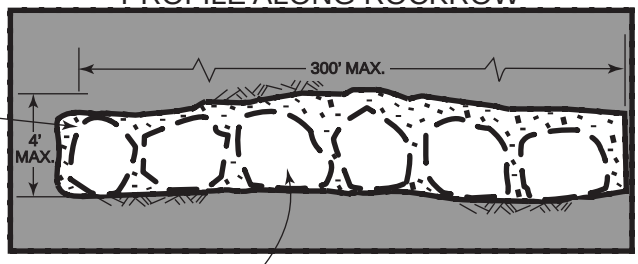
NMG Geotechnical, Inc.



SECTION THROUGH ROCKROW

FILL VOIDS WITH SELECT GRANULAR SOIL PLACED BY WATER DENSIFICATION AND MECHANICAL COMPACTION. NESTING OR STACKING OF OVERSIZE MATERIAL IS NOT ACCEPTABLE.

PROFILE ALONG ROCKROW



PLACE OVERSIZE MATERIAL IN TRENCH. FALSE SLOPE OR CUT SLOT INTO APPROVED MATERIAL. OVERSIZE MATERIAL MAY BE PLACED SIDE BY SIDE IF SIZE PERMITS. (NOT TO EXCEED A WIDTH OF 4 FEET)

NOTES:

A) OVERSIZED ROCK IS DEFINED AS LARGER THAN 12" IN SIZE (IN GREATEST DIMENSION).

B) SPACE BETWEEN ROCKROWS SHOULD BE ONE EQUIPMENT WIDTH OR A MINIMUM OF 15 FEET.

C) THE WIDTH AND HEIGHT OF THE ROCKROW SHALL BE LIMITED TO FOUR FEET AND THE LENGTH LIMITED TO 300 FEET UNLESS APPROVED OTHERWISE BY THE GEOTECHNICAL CONSULTANT. OVERSIZE SHOULD BE PLACED WITH FLATEST SIDE ON THE BOTTOM.

D) OVERSIZE MATERIAL EXCEEDING FOUR FEET MAY BE PLACED ON AN INDIVIDUAL BASIS IF APPROVED BY THE GEOTECHNICAL CONSULTANT.

E) FILLING OF VOIDS WILL REQUIRE SELECT GRANULAR SOIL (SE > 20, OR LESS THAN 20 PERCENT FINES) AS APPROVED BY THE GEOTECHNICAL CONSULTANT. VOIDS IN THE ROCKROW TO BE FILLED BY WATER DENSIFYING GRANULAR SOIL INTO PLACE ALONG WITH MECHANICAL COMPACTION EFFORT.

F) IF APPROVED BY THE GEOTECHNICAL CONSULTANT, ROCKROWS MAY BE PLACED DIRECTLY ON COMPETENT MATERIALS OR BEDROCK, PROVIDED ADEQUATE SPACE IS AVAILABLE FOR COMPACTION.

G) THE FIRST LIFT OF MATERIAL ABOVE THE ROCKROW SHALL CONSIST OF GRANULAR MATERIAL AND SHALL BE PROOF-ROLLED WITH A D-8 OR LARGER DOZER OR EQUIVALENT.

H) ROCKROWS NEAR SLOPES SHOULD BE ORIENTED PARALLEL TO SLOPE FACE.

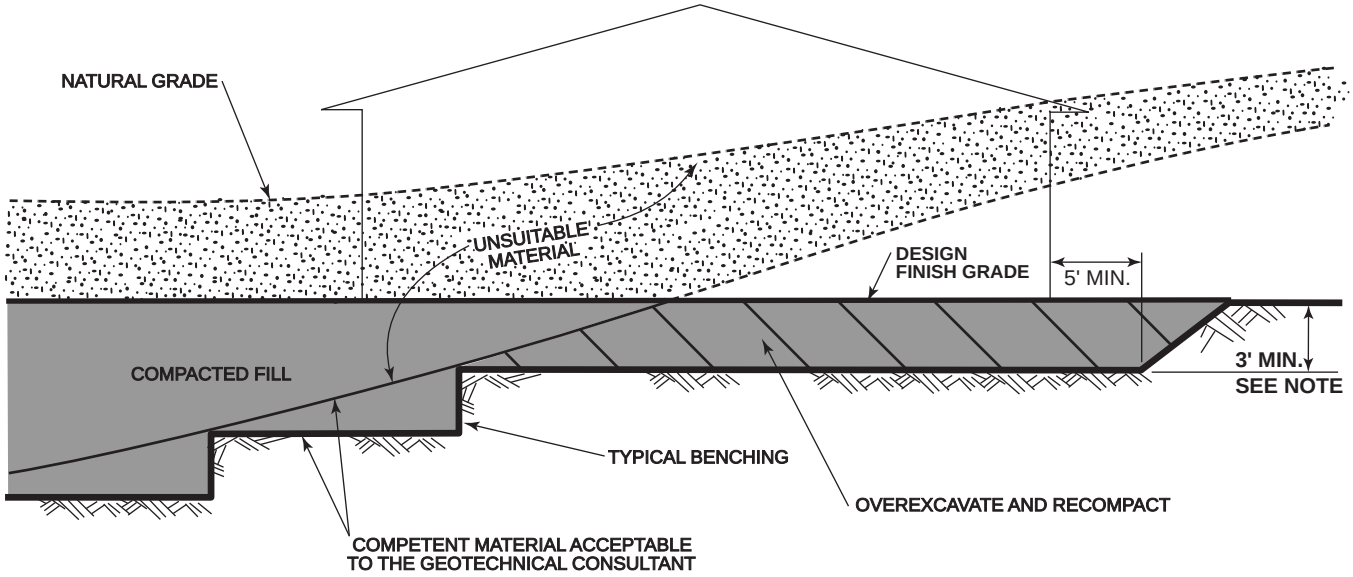
I) NESTING OR STACKING OF ROCKS IS NOT ACCEPTABLE.

FIGURE 7

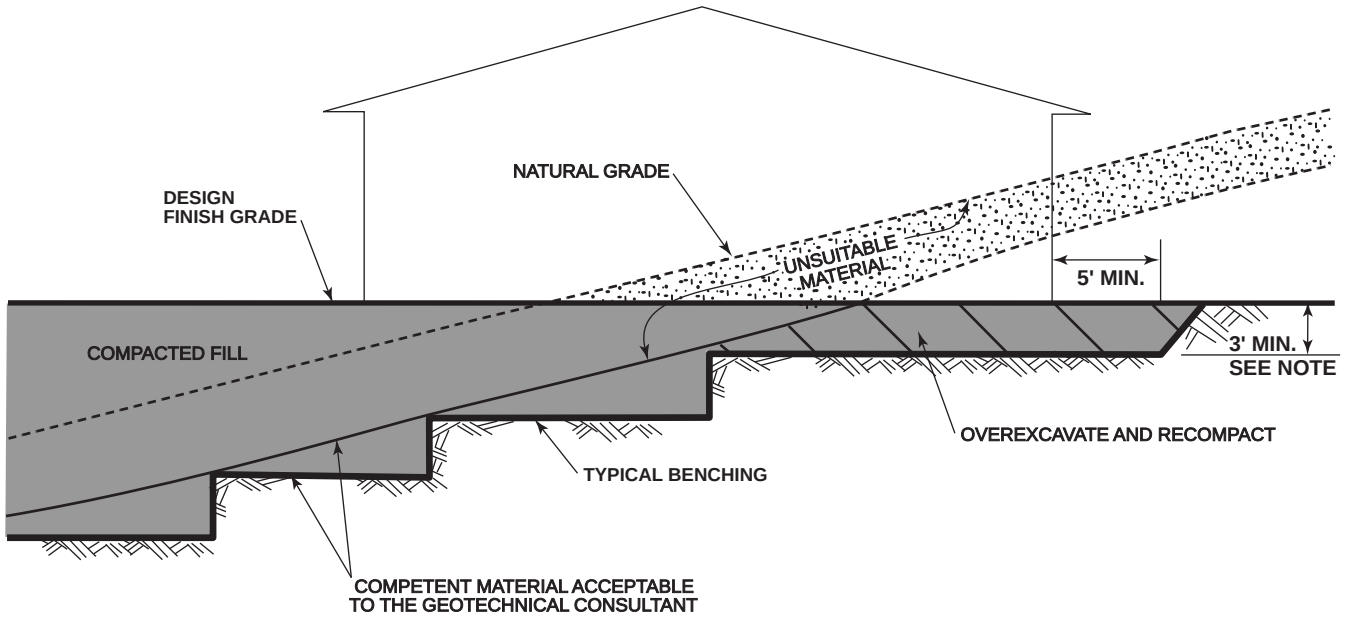
TYPICAL OVERSIZE ROCK PLACEMENT METHOD MINIMUM STANDARD GRADING DETAIL FOR STRUCTURAL FILL

NMG Geotechnical, Inc.

CUT LOT



CUT FILL LOT (TRANSITION)



NOTE: DEEPER THAN THE 3-FOOT OVEREXCAVATION MAY BE RECOMMENDED BY THE GEOTECHNICAL CONSULTANT IN STEEP TRANSITIONS.

FIGURE 8

TYPICAL OVEREXCAVATION OF DAYLIGHT LINE MINIMUM STANDARD GRADING DETAILS

NMG Geotechnical, Inc.

Appendix E: Responses to Public Comments

APPENDIX E: RESPONSES TO PUBLIC COMMENTS

Rialto Habitat Nature Center Project
Initial Study and Mitigated Negative Declaration (IS/MND) and CEQA Plus Documentation
(State Clearinghouse Number 2024020570)

The following are responses to comments received during the public review period for the Initial Study (IS) and Mitigated Negative Declaration (MND), dated February 2024, prepared for the 10 Rialto Habitat Nature Center Project. The Notice of Intent to adopt an IS was circulated for public review from December 27, 2022 through January 26, 2023. One (1) comment letter, Letter A, was received from the California Department of Fish and Wildlife (CDFW).

Comments received did not result in a "substantial revision" to the IS/MND (CEQA Guidelines Section 15073.5(b). Although there are some changes to the IS/MND as a result of comments, no new unavoidable significant effects were identified and mitigation measures were not substantively modified. Pursuant to CEQA Guidelines Section 15073.5(c)(1), recirculation of the IS/MND is not required when "mitigation measures are replaced with equal or more effective measures…."

LETTER A
(CDFW
(March 18, 2024)

The first two pages of the comment letter from the California Department of Fish and Wildlife (Commentor) are mostly introductory in nature and do not raise any project-specific environmental issues for which responses are required, although there are three conclusory statements without specific detail that warrant a response as provided. Specific comments that require a response are annotated and bracketed in the margins of CDFW's letter shown in its entirely on the following 18 pages.

State of California – Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
Inland Deserts Region
3602 Inland Empire Blvd, Suite C-220
Ontario, CA 91764
www.wildlife.ca.gov

GAVIN NEWSOM, Governor
CHARLTON H. BONHAM, Director

March 18, 2024
Sent via e-mail

Daniel Casey
Principal Planner
City of Rialto
150 S. Palm Avenue
Rialto, CA 92376

RIALTO HABITAT NATURE CENTER (PROJECT)
MITIGATED NEGATIVE DECLARATION (MND)
SCH#: 2024020570

Dear Daniel Casey:

The California Department of Fish and Wildlife (CDFW) received a Notice of Intent to Adopt an MND from the City of Rialto (City), for the Rialto Habitat Nature Center (Project) pursuant the California Environmental Quality Act (CEQA) and CEQA Guidelines.[1]

Thank you for the opportunity to provide comments and recommendations regarding those activities involved in the Project that may affect California fish and wildlife. Likewise, we appreciate the opportunity to provide comments regarding those aspects of the Project that CDFW, by law, may be required to carry out or approve through the exercise of its own regulatory authority under the Fish and Game Code.

CDFW ROLE

CDFW is California's **Trustee Agency** for fish and wildlife resources and holds those resources in trust by statute for all the people of the State. (Fish & G. Code, §§ 711.7, subd. (a) & 1802; Pub. Resources Code, § 21070; CEQA Guidelines § 15386, subd. (a).) CDFW, in its trustee capacity, has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and habitat necessary for biologically sustainable populations of those species. (*Id.*, § 1802.) Similarly, for purposes of CEQA, CDFW is charged by law to provide, as available, biological expertise during public agency environmental review efforts, focusing specifically on projects and related activities that have the potential to adversely affect fish and wildlife resources.

CDFW is also submitting comments as a **Responsible Agency** under CEQA. (Pub. Resources Code, § 21069; CEQA Guidelines, § 15381.) CDFW expects that it may need to exercise regulatory authority as provided by the Fish and Game Code. As proposed, for example, the Project may be subject to CDFW's lake and streambed alteration regulatory authority. (Fish & G. Code, § 1600 et seq.) Likewise, to the extent implementation of the Project as proposed may result in "take" as defined by State law of any species protected under the California Endangered Species Act (CESA) (Fish & G. Code, § 2050 et seq.), the project proponent may seek related take authorization as provided by the Fish and Game Code.

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PROJECT DESCRIPTION SUMMARY

Proponent: City of Rialto

Objective: The Project proposes to construct the Rialto Habitat Nature Center (RHNC) located on the southern portion of the Rialto Wastewater Treatment Plant (WWTP) property. The Project would provide an approximately 13-acre outdoor public space including an approximately 10-acre non-contact/non-watercraft lake consisting of two connected lakes, one mile of pedestrian perimeter trails, passive recreation, environmental education programming, and public outreach. The lakes would have depths of approximately 13-feet and 48-feet and would be created by intercepting fully treated

[1] CEQA is codified in the California Public Resources Code in section 21000 et seq. The "CEQA Guidelines" are found in Title 14 of the California Code of Regulations, commencing with section 15000.

(primary, secondary, and tertiary) effluent from the WWTP that is currently discharged into the Rialto Channel. The routed effluent into the proposed lakes would constitute approximately 10 percent of the effluent flow that is currently discharged into the Rialto Channel. The treated water from the WWTP would be reclaimed and temporarily stored in the lakes prior to being discharged back into concrete-lined Rialto channel at the existing discharge outlet pipe. The City currently discharges treated effluent (average flow 7 mgd; minimum flow 6 mgd; maximum flow 8 mgd)[2] into the Rialto Channel that flows downstream and changes into an unlined portion of the channel south of Agua Mansa Road prior to flowing into the Santa Ana River. Agua Mansa Road is located approximately 0.25 miles and the Santa Ana River approximately 0.65 miles down channel from the discharge point. The site is currently an undeveloped dry pit that was formerly used as a receiving basin for partially treated discharge from the WWTP up to the early 1970s.

Drainage for the RHNC site would be accomplished by a network of v-ditches located on the outside of the perimeter trails that encircle the lakes and on the east side of the site approximately 15 to 20 feet above the perimeter trails. The v-ditches would convey off site stormwater flowing onto the site and on-site flow into the lake via down drains located around the lake. In addition, public parking for the proposed project would be constructed on an approximately 0.15-acre vacant site, identified as Accessor's Parcel Number (APN) 805-36-185A, located on the north side of Agua Mansa Road and directly west of the Agua Mansa Road crossing of the Rialto Channel. Development of the parking area would require site preparation, earthwork, and paving. Development of the pedestrian pathway between the parking area and the lake along the existing utility road would require brush clearing, signage, loose rock removal, and tread improvement for drainage.

Location: The proposed Project would be located on an approximately 13-acre site in the southern portion of the approximately 40-acre Rialto WWTP, located at 501 E. Santa Ana Avenue, City of Rialto, San Bernardino County (34.051637, -117.360138). Parking for the proposed RHNC would be located approximately 0.25 miles to the south on Agua Mansa Road, City of Colton, San Bernardino County right-of-way (34.048126, -117.357066). The Project encompasses APN 258-151-25. The RHNC site is bordered by the existing WWTP to the north, the Rialto Channel to the immediate east, and undeveloped/vacant land to the east, south, and west.

Timeframe: Construction is anticipated to take place over 18 months.

COMMENTS AND RECOMMENDATIONS

CDFW has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and habitat necessary for biologically sustainable populations of those species (i.e., biological resources). CDFW offers the comments and recommendations below to assist the City in adequately identifying and/or mitigating the Project's significant, or potentially significant, direct and indirect impacts on fish and wildlife (biological) resources. The MND has not adequately identified and disclosed the Project's impacts (i.e., direct, indirect, and cumulative) to biological resources and whether those impacts are less than significant. 2

CDFW's comments and recommendations on the MND are explained in greater detail below and summarized here. CDFW recommends that additional information and analyses be added to a revised MND, along with avoidance, minimization, and mitigation measures that reduce impacts to less than significant. 3

Project-Related Environmental Impacts

An MND must analyze and disclose all direct and reasonably foreseeable indirect impacts on the environment caused by the proposed Project. An MND must also identify mitigation measures that would avoid or reduce the potentially significant adverse impacts.

Diversion and sale of water

[2] *Rialto Recycled Water Interconnection Preliminary Design Report*, *Draft Report*, Inland Empire Utilities Agency, page 2-2, June 26, 2023.

The MND states (p. 2-1) "*The proposed Project would not change the flow rate or discharge location of effluent into the Rialto Channel and Santa Ana River.*" However, the MND (p. 2-6) indicates that the RHNC "would be created by diverting approximately 10 percent of the treated water from the City's WWTP and temporarily storing the reclaimed water in the lakes to provide passive outdoor and educational experiences and wetland/terrestrial wildlife habitat. … Once the lake has been created and becomes operational, the approximately 10 percent of water diverted and reclaimed from the WWTP into the lakes will be returned to the Rialto Channel and rejoin the majority of effluent flow into the channel." The MND does not appear to disclose the amount of time that the diverted water will be stored in the lakes. In addition, the MND does not address the impacts of temporal loss of flow to the Rialto Channel and Santa Ana River on biological resources. Further, the MND states (p. 2-5) "*The City has recently agreed to sell Inland Empire Utilities Agency (IEUA) 7 mgd of effluent in the first phase and up to 10 mgd in the future. The recycled water interconnect project would include a pump station located north of the RHNC site and within the WWTP property and an interconnection pipeline from the pump station easterly along the northern perimeter of the RHNC site to Rialto Channel. From Rialto Channel, the pipeline would turn north towards Santa Ana Avenue and ultimately to IEUA's Regional Water Recycling Plant No. 4 located at 12811 6th Street in Rancho Cucamonga.*" It is unclear how the flow rate and amount of effluent into the Rialto Channel and Santa Ana River will remain unchanged if the City intends to maintain a 10 percent diversion of the effluent flow that is currently discharged into the Rialto Channel, while also selling 7 mgd and 10 mgd to the Inland Empire Utilities Agency. CDFW recommends a recirculated MND clarify the discrepancy regarding the amount and rate at which water will be diverted/sold for the Project. In addition, a revised MND should indicate the amount of time water will be diverted and stored in the lakes. A revised MND should also include an analysis of impacts to biological resources as a result of the temporal loss of flow into the Rialto Channel and Santa Ana River. Absent this information, the MND likely provides an incomplete assessment of Project-related impacts to biological resources.

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The MND states (p. 2-1), "*It should be noted that the City has the ability and capacity to choose not to divert any water into the lakes post construction, for the purposes of regulating flows into Rialto Channel or effectively concluding the existence of the lakes. Reasons for temporarily or permanently stopping the diverting and storage of the water could be for maintenance of the lined and unlined portions of Rialto Channel, the cost of maintenance and repairs to the lakes, or overall operations of the lakes. The Rialto Habitat Nature Center Project is fully autonomous to the overall system, and should budget decline in the City, the City reserves the right to stop diverting water into the lakes and return to pre-project conditions.*" CDFW is concerned that the lead agency has not considered the adverse environmental impacts that could result from temporary or permanent changes in water flow and frequency to the lakes once they are established. The MND indicates the Project would create 3-4 acres of wetland and terrestrial habitat and cites (p. 3-20) "creation of the lakes and adjacent habitats" as supporting evidence that the Project would have a less than significant impact on biological resources. However, if water is no longer supplied to the lakes, potential impacts to these habitats and the species that will utilize these habitats may occur. The MND does not analyze the potential impacts to biological resources if the newly created habitat is not maintained. In addition, the MND does not address how these areas will be designed, maintained, and managed over the life of the Project (i.e., species selection, vegetation management, erosion, invasives, movement of water). Many studies have shown that improper management of constructed wetlands can potentially result in poor-quality ecosystems if not adequately planned and under strict technical management and supervision (Wright et al. 2022, Liu et al. 2024). CEQA is predicated on a complete and accurate description of the proposed Project. Without a complete and accurate project description, the MND likely provides an incomplete assessment of Project-related impacts to biological resources. CDFW recommends a recirculated MND include an analysis of any cumulative impacts that could result from temporarily or permanently ceasing diversion and storage of water to the Project. These impacts should include any adverse effects to adjacent riparian habitat and any adverse effects to downstream water sources (i.e., Rialto Channel and Santa Ana River). The MND

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should also address how the lead agency plans to create and maintain these habitats over the life of the Project. **9 cont'd**

Water Quality

The MND (p. 3-52) states the RHNC would provide the City with *"water quality benefits*"; however, no further information is provided regarding this statement. It is unclear how and the process by which the City intends to improve water quality. Many studies have linked effluent from wastewater plants to physiological and reproductive abnormalities in fish species (Jenkins et al. 2009, Fuzzen et al. 2015, McCallum et al. 2019, Hamdhani et al. 2020). Wastewater effluent often contains high levels of nutrients and reduced dissolved oxygen levels. Contaminants such as pharmaceuticals, personal care products, plastic by-products, and pesticides may not be adequately removed by wastewater treatment processes (McCallum et al. 2019). Estrogenic and other contaminants that occur in wastewater are known to disrupt the hormone systems of fish (Johnson and Sumpter 2001, Jenkins et al. 2009, Fuzzen et al. 2015, Hicks et al. 2017, Marjan et al. 2018, McCallum et al. 2019, Hamdhani et al. 2020). One of the most widely reported consequences is "intersex," a condition in which both male and female characteristics exist in the same fish. This condition can result in lower reproductive success (Jenkins et al. 2009, Fuzzen et al. 2015, Hicks et al. 2017). Thus, CDFW recommends a recirculated MND provide information regarding the "water quality benefits" that are proposed for the Project. Information should include: (1) Data on the chemical characteristics of the water to be used for the Project, including contaminants likely to result in hormone disruption of fish species, as well as other contaminants; (2) Data on the physical characteristics of the water that are likely to impact fish species, such as water temperature, dissolved oxygen, and pH; (3) A comparison of the pre-Project water quality profile versus the estimated water quality profile following Project implementation; and (4) A provision for ongoing monitoring of water quality before it is discharged to the Rialto Channel. Absent this information, the MND likely provides an incomplete assessment of Project-related impacts to biological resources. **10**

Santa Ana Sucker (*Catostomus santaanae*) and Arroyo Chub (*Gila orcutti*)

Santa Ana sucker is a threatened species pursuant to the federal Endangered Species Act and is a California Species of Special Concern. Santa Ana sucker rely on flows with suitable water quality and substrate to support breeding, feeding, and sheltering[3]. Furthermore, the Rialto Channel is an important water source for the species as one of its remaining populations occupies the Santa Ana River. Ongoing threats to the species are caused by halting and altering water releases critical to maintaining surface flows of the Santa Ana River, and degradation associated with significant changes in the hydrology of the tributaries to the River. Arroyo chub is a California Species of Special Concern and its numbers have also declined drastically in the Santa Ana River due to water extraction/addition (O'Brien and Barabe 2022). Thus, it is vital to maintain the required discharge to the River as changes could result in significant impacts to fish downstream, including Santa Ana sucker and arroyo chub. CDFW is concerned about the inconsistencies in information regarding the amount and rate at which water will be diverted from the Rialto Channel, the amount time the water will be diverted and stored in the lakes, and the lack of analyses regarding subsequent impacts to sensitive fish species downstream. Absent this information, the MND likely provides an incomplete assessment of the potentially significant impacts to special-status fish that would be affected by this Project. **11**

In addition, the MND (p. 5-1) states that with a no Project alternative (i.e., not continuing with the Project), "*The current impacts to the threatened Santa Ana Sucker and Arroyo Chub would continue to increase resulting in further impacts from the current warm flows into the Rialto Channel form the WWTP.*" However, no further information regarding this statement is provided making it unclear how the Project would improve conditions for Santa Ana sucker and arroyo chub. As stated above, CDFW recommends a recirculated **12**

[3] USFWS. FWS Focus: Santa Ana Sucker. https://www.fws.gov/species/santa-ana-sucker-catostomus-santaanae

MND include an analysis of any cumulative impacts that could result from the Project, specifically related to Santa Ana sucker and arroyo chub. **12 cont'd**

Impacts to the Vegetation Community

According to the MND (p. 3-18 and 3-19), "*Direct impacts to the 8.72 acres of tamarisk thicket, non-native grasslands, ruderal, disturbed and developed communities onsite from Project implementation, are not significant because these areas consist of built environment and non-native vegetation communities. Further, the species found within these vegetation communities include common plant species which are present in large numbers throughout the region and the removal is not considered significant. Direct impacts to 2.57 acres of native vegetation communities (brittlebush scrub, disturbed brittlebush scrub, disturbed California buckwheat scrub, and mulefat thicket) from Project implementation is not considered significant because while native, the limited area does not contain any sensitive species, plants or wildlife, or represent sensitive habitats identified through CNDDB or CDFW sensitive plant communities. The species found within these communities includes common plant species which are present in large numbers throughout the region and the removal is not considered significant*." Vegetation type (i.e., native versus non-native) or regional abundance does not necessarily determine habitat value or the use of these areas by wildlife, including special-status species. CDFW is concerned that the MND has trivialized the significance of the Project's potential impacts on wildlife that utilize disturbed areas and non-native or common vegetation communities. For instance, special-status species, such as southwestern willow flycatcher (*Empidonax traillii extimus*), often utilize tamarisk thickets as breeding habitat (Daw 2013, Sogge et al. 2008) and could be directly and/or indirectly impacted by the Project. In addition, concluding that sensitive species are not present based on California Natural Diversity Database (CNDDB) is not an accurate use of this database. CNDDB is a positive detection database. Records in the database exist only where surveys have been conducted and data have been reported. There are no organized inventory or survey efforts designed specifically to populate the database. Places that are empty or have limited information in the database often signify that little survey work has been done there. You should not conclude that species are absent due to lack of information. In addition, the general biological field survey conducted for the MND was not adequate in timing and scope to detect special-status species that could occur on-site. Losses of habitat that could be utilized by special-status species would constitute a significant impact under CEQA that must be mitigated. Impacts to special-status species, regardless of habitat quality, abundance, or location, must be identified, evaluated, and mitigated to a level below significance. Even though the MND (p. 3-20) states "*implementation of the RHNC would include creation of new coastal sage scrub and riparian habitats. The creation of the lakes and adjacent habitats provides superior habitat than the vegetation communities being impacted,*" impacts that could result from vegetation removal must be considered. Replacement of vegetation does not offset Project-induced qualitative and quantitative losses of biological values if these areas are utilized by special-status species.

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Introducing Non-native Species

The MND does not address potential non-native species introduction (i.e., bull frog, sport fish) and management strategies if such species are identified. Amphibians, whether accidentally or intentionally introduced to the system, have potential adverse impacts that could include displacement, reduction, or extinction of native species[4]. With regard to sport fish, if introduced to the system, such species could have potential adverse impacts including competition with native species for food and habitat, reduction of natives by predation, transmission of diseases or parasites, and habitat alteration[5]. Non-native species disrupt the complex native ecological communities and the natural evolution of those communities, degrading native habitats and polluting gene pools by hybridization. The presence of nonnative species can also alter water, nutrient cycles, and food chains[6]. All these impacts could directly affect the Project site if non-native introduction occurs, and indirectly affect downstream habitat in the Santa Ana River if non-natives are not properly

[4] USGS. Nonindigenous Aquatic Species: Amphibians. https://nas.er.usgs.gov/taxgroup/amphibians/
[5] USGS. Nonindigenous Aquatic Species: Fishes. https://nas.er.usgs.gov/taxgroup/fish/default.aspx
[6] NPS. Environmental Factors: Nonnative Species. https://www.nps.gov/glca/learn/nature/nonnativespecies.htm

considered and managed. A recirculated MND should include a comprehensive plan stating how the Project intends to manage non-native species that could potentially be introduced to the system. **16 cont'd**

Assessment of Biological Resources

The MND does not adequately identify the Project's significant, or potentially significant, impacts to biological resources. The MND bases its analysis of impacts to biological resources on a general biological field survey conducted by Carlson Strategic Land Solutions, Inc. on January 27, 2023, and a focused survey for Delhi Sands flower-loving fly by Osborne Biological Consulting on February 15 and March 2, 2023. No focused or protocol-level surveys were performed for the detection of other special-status species, and the general biological field survey was not conducted at the appropriate time(s) of year to detect such species. CDFW is concerned about the potential for special-status species to occur on or near the Project site. The Project area encompasses open and disturbed areas, shrubs and grasslands, and waterbodies, and there is high potential for special-status species to be impacted directly, indirectly, and cumulatively by Project activities. The California Natural Diversity Database (CNDDB) and Biogeographic Information and Observation System (BIOS) indicate that occurrences of ESA-listed, CESA-listed, Fully Protected, and other special-status species have been reported near the Project area including, but not limited to, the following:

> **Plants:** Los Angeles sunflower (*Helianthus nuttallii* ssp. *parishii*), marsh sandwort (*Arenaria paludicola*), mesa horkelia (*Horkelia cuneata* var. *puberula*), Parish's bush-mallow (*Malacothamnus parishii*), Parry's spineflower (*Chorizanthe parryi* var. *parryi*), Pringle's monardella (*Monardella pringlei*), salt marsh bird's-beak (*Chloropyron maritimum* ssp. *maritimum*), Santa Ana River woollystar (*Eriastrum densifolium* ssp. *sanctorum*), slender-horned spineflower (*Dodecahema leptoceras*), bristly sedge (*Carex comosa*),
>
> **Birds:** burrowing owl (*Athene cunicularia*), tricolored blackbird (*Agelaius tricolor*), southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*), Bell's sparrow (*Artemisiospiza belli*), Swainson's hawk (*Buteo swainsoni*), western yellow-billed cuckoo (*Coccyzus americanus occidentalis*), California black rail (*Laterallus jamaicensis coturniculus*), coastal California gnatcatcher (*Polioptila californica californica*), least Bell's vireo (*Vireo bellii pusillus*), yellow warbler (*Setophaga petechia*),
>
> **Fish:** arroyo chub (*Gila orcuttii*), Santa Ana sucker (*Catostomus santaanae*), steelhead – southern California DPS (*Oncorhynchus mykiss irideus* pop. 10),
>
> **Invertebrates:** Crotch's bumble bee (*Bombus crotchii*), Delhi Sands flower-loving fly (*Rhaphiomidas terminatus abdominalis*),
>
> **Reptiles:** California glossy snake (*Arizona elegans occidentalis*), coast horned lizard (*Phrynosoma blainvillii*), coastal whiptail (*Aspidoscelis tigris stejnegeri*), orange-throated whiptail (*Aspidoscelis hyperythra*), San Diego banded gecko (*Coleonyx variegatus abbotti*), Southern California legless lizard (*Anniella stebbinsi*),
>
> **Mammals:** Los Angeles pocket mouse (*Perognathus longimembris brevinasus*), pocketed free-tailed bat (*Nyctinomops femorosaccus*), western mastiff bat (*Eumops perotis californicus*), and western yellow bat (*Lasiurus xanthinus*).

Recent surveys during the appropriate times of the year are needed to identify potential impacts to biological resources; inform appropriate avoidance, minimization, and mitigation measures; and determine whether impacts to biological resources have been mitigated to a level that is less than significant. CDFW generally considers field assessments for wildlife to be valid for a one-year period, and assessments for rare plants may be considered valid for a period of up to three years. **17**

Compliance with CEQA is predicated on a complete and accurate description of the environmental setting that may be affected by the proposed Project. CDFW is concerned that the assessment of the existing environmental setting with respect to biological resources has not been adequately analyzed in the MND. CDFW is concerned that without a complete and accurate description of the existing environmental setting, the MND likely provides an incomplete or inaccurate analysis of Project-related environmental impacts and whether those impacts have been mitigated to a level that is less than significant. Section 15125(c) of the CEQA Guidelines states that knowledge of the regional setting of a project is critical to the assessment of environmental impacts, that special emphasis should be placed on environmental resources that are rare or unique to the region, and that significant environmental impacts of the proposed Project are adequately investigated and discussed. The California Rare Plant Rank 1B indicates plants that are rare, threatened, or endangered in California and elsewhere, and California Rare Plant Rank 2B indicates plants that are rare, threatened, or endangered in California but more common elsewhere. Impacts to these species must be analyzed during preparation of environmental documents relating to CEQA because they meet the definition of rare or endangered under CEQA Guidelines §15125 (c) and/or §15380.

To establish the existing environmental setting with respect to biological resources, CDFW recommends that a revised MND include the results of recent biological surveys, at the appropriate time(s) of year, as described in the following mitigation measure as well as any necessary mitigation measures:

MM BIO-[A]: Assessment of Biological Resources

Prior to adoption of the CEQA document, a complete and recent inventory of rare, threatened, endangered, and other sensitive species located within the Project footprint and within offsite areas with the potential to be affected, including California Species of Special Concern (CSSC) and California Fully Protected Species (Fish and Game Code § 3511), will be completed. Species to be addressed should include all those which meet the CEQA definition (CEQA Guidelines § 15380). The inventory should address seasonal variations in use of the Project area and should not be limited to resident species. Focused species-specific surveys, completed by a qualified biologist and conducted at the appropriate time of year and time of day when the sensitive species are active or otherwise identifiable are required. Acceptable species-specific survey procedures should be developed in consultation with CDFW and the U.S. Fish and Wildlife Service, where necessary. Note that CDFW generally considers biological field assessments for wildlife to be valid for a one-year period, and assessments for rare plants may be considered valid for a period of up to three years. Some aspects of the proposed Project may warrant periodic updated surveys for certain sensitive taxa, particularly if the Project is proposed to occur over a protracted time frame, or in phases, or if surveys are completed during periods of drought.

17 cont'd

Pursuant to the CEQA Guidelines, section 15097(f), CDFW has prepared a draft mitigation monitoring and reporting program (MMRP) for revised MM-BIO 1, and CDFW-recommended MM-BIO [A] through [F] (see Attachment 1).

Nesting Birds

CDFW is concerned that the MND does not sufficiently identify Project impacts to nesting birds or ensure that impacts are mitigated to a level less than significant. Fourteen avian species were observed on-site during the biological assessment (p. 3-19), and the MND states "*the Project site has nesting and foraging habitat for avian species due to the location, surrounding land uses, and the built nature of the Project site*." The MND (Appendix B, sub-Appendix D) also states the Project site has potential to support the following special-status species: tricolored blackbird (*Agelaius tricolor*), southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*), Bell's sparrow (*Artemisiospiza belli*), Swainson's hawk (*Buteo swainsoni*), western yellow-billed cuckoo (*Coccyzus americanus occidentalis*), California black rail (*Laterallus jamaicensis coturniculus*), and coastal California gnatcatcher (*Polioptila californica californica*). CDFW is concerned about

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the impacts to nesting birds including loss of nesting/foraging habitat and potential take from ground-disturbing activities and construction. Conducting work outside the peak breeding season is an important avoidance and minimization measure. CDFW also recommends the completion of nesting bird surveys *regardless* of the time of year to ensure that impacts to nesting birds are avoided. The timing of the nesting season varies greatly depending on several factors, such as bird species, weather conditions in any given year, and long-term climate changes (e.g., drought, warming, etc.). In response to warming, birds have been reported to breed earlier, thereby reducing temperatures that nests are exposed to during breeding and tracking shifts in availability of resources (Socolar et al. 2017). CDFW staff have observed that climate change conditions may result in nesting bird season occurring earlier and later in the year than historical nesting season dates. CDFW recommends that disturbance of occupied nests of migratory birds and raptors within the Project site and surrounding area be avoided any time birds are nesting on-site. CDFW therefore recommends the completion of nesting bird surveys *regardless of the time of year* to ensure compliance with all applicable laws pertaining to nesting and migratory birds.

It is the Project proponent's responsibility to comply with all applicable laws related to nesting birds and birds of prey. Fish and Game Code sections 3503, 3503.5, and 3513 afford protective measures as follows: Fish and Game Code section 3503 states that it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by Fish and Game Code or any regulation made pursuant thereto. Fish and Game Code section 3503.5 makes it unlawful to take, possess, or destroy any birds in the orders Falconiformes or Strigiformes (birds-of-prey) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by Fish and Game Code or any regulation adopted pursuant thereto. Fish and Game Code section 3513 makes it unlawful to take or possess any migratory nongame bird except as provided by rules and regulations adopted by the Secretary of the Interior under provisions of the Migratory Bird Treaty Act of 1918, as amended (16 U.S.C. § 703 et seq.).

CDFW appreciates the inclusion of MM BIO-1; however, the measure is insufficient in scope and timing to reduce impacts to nesting birds to a level less than significant. Project-specific avoidance and minimization measures for nesting birds may include, but are not limited to, Project phasing and timing, monitoring of Project-related noise (where applicable), sound walls, and buffers, where appropriate. CDFW recommends that disturbance of occupied nests of migratory birds and raptors within the Project site be avoided **any time birds are nesting on-site.** Preconstruction nesting bird surveys shall be performed within 3 days prior to Project activities to determine the presence and location of nesting birds. CDFW recommends the City revise Mitigation Measure BIO-1 as follows:

18 cont'd

MM BIO-1: Nesting Bird Surveys

Regardless of the time of year, nesting bird surveys shall be performed by a qualified avian biologist no more than 3 days prior to vegetation removal or ground-disturbing activities for each phase of construction. Pre-construction surveys shall focus on both direct and indirect evidence of nesting, including nest locations and nesting behavior. The qualified avian biologist will make every effort to avoid potential nest predation as a result of survey and monitoring efforts. If active nests are found during the pre-construction nesting bird surveys, a qualified biologist shall establish an appropriate nest buffer to be marked on the ground. Nest buffers are species specific and shall be at least 300 feet for passerines and 500 feet for raptors. A smaller or larger buffer may be determined by the qualified biologist familiar with the nesting phenology of the nesting species and based on nest and buffer monitoring results. Construction activities may not occur inside the established buffers, which shall remain on site until a qualified biologist determines the young have fledged or the nest is no longer active. Active nests and adequacy of the established buffer distance shall be monitored daily by the qualified biologist until the qualified biologist has determined the young have fledged or the Project has been completed. The qualified biologist has the authority to stop work if nesting pairs exhibit signs of disturbance. ~~If grading, site disturbance, or operational vegetation maintenance is to~~

~~occur between January 1 through August 15 for raptors and February 15 through August 31 for all other avian species, a nesting bird survey shall be conducted within all suitable habitat, on-site and within 300-feet surrounding the site (as feasible), by a qualified biologist within no more than 5 days of scheduled vegetation removal or start of ground disturbing activities, to determine the presence of nests or nesting birds. If active nests are identified, the biologist shall establish buffers around the vegetation (500 feet for raptors and sensitive species, 200 feet for non-raptors/non-sensitive species). All work within these buffers shall be halted until the nesting effort is finished (i.e. the juveniles are surviving independent from the nest). The on-site biologist shall review and verify compliance with the no-work buffers and verify the nesting effort has finished. Work can resume when no other active nests are found on site or within the surrounding buffer area. Alternatively, a qualified biologist may determine that construction can be permitted within the buffer areas of an active nest with preparation and implementation of a monitoring plan to prevent any impacts while the nest continues to be active (eggs, chicks, etc.). Upon completion of the survey and any follow-up construction avoidance management, a report shall be prepared documenting mitigation monitoring compliance. If ground disturbances have not commenced within 5 days of a negative survey or if construction activities have stopped for 5 days or longer, the nesting survey must be repeated to confirm the absence of nesting birds.~~

18 cont'd

Burrowing Owl

CDFW is concerned that the MND does not sufficiently identify Project impacts to burrowing owl (*Athene cunicularia*) or ensure that impacts are mitigated to a level less than significant. CDFW notes that in California, preferred habitat for burrowing owl is generally typified by short, sparse vegetation with few shrubs (Haug et al. 1993), and that burrowing owls may occur in ruderal grassy fields, vacant lots, and pastures if the vegetation structure is suitable and there are useable burrows and foraging habitat proximity (Gervais et al. 2003). In addition, burrowing owls frequently move into disturbed areas prior to and during construction activities since they are adapted to highly modified habitats (Chipman et al. 2008; Coulombe 1971). The Project site contains suitable habitat for burrowing owl.

The MND (Appendix B, p. 36) states "*During the field survey, the biologist paid special attention to any mammal burrows suitable for burrowing owl. It is determined the Project site does not contain any suitable sized burrows for the species*.". However, the MND also states (p. 3-19) that California ground squirrels have been observed on the Project site and are active, which indicates the potential for establishment of suitable burrows for burrowing owl since the time of the field survey. Additionally, CNDDB/BIOS report occurrences of several burrowing owls 1.5 miles north of the Project site. Suitable burrowing owl habitat has been confirmed on-site and there is a potential for suitable burrows to be established on-site before and during construction. Impacts to burrowing owl from the Project could include take of burrowing owls, their nests, or eggs or destroying nesting, foraging, or over-wintering habitat, thus impacting burrowing owl populations. Impacts can result from grading, earthmoving, burrow blockage, heavy equipment compaction and crushing of burrows, general Project disturbance that has the potential to harass owls at occupied burrows or to cause nest abandonment or failure, and other activities.

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Burrowing owl is a California Species of Special Concern. Take of individual burrowing owls and their nests is defined by Fish and Game Code section 86, and prohibited by sections 3503, 3503.5, and 3513. Take is defined in Fish and Game Code section 86 as "hunt, pursue, catch, capture or kill, or attempt to hunt, pursue, catch, capture or kill." Fish and Game Code sections 3503, 3503.5, and 3513 afford protective measures as follows: section 3503 states that it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by Fish and Game Code or any regulation made pursuant thereto. Fish and Game Code section 3503.5 makes it unlawful to take, possess, or destroy any birds in the orders Falconiformes or Strigiformes (birds-of-prey) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by Fish and Game Code or any regulation adopted pursuant thereto. Fish and Game Code section 3513 makes it unlawful to take or possess any migratory nongame bird except as provided by rules and regulations adopted by the Secretary of the Interior

under provisions of the Migratory Bird Treaty Act of 1918, as amended (16 U.S.C. § 703 et seq.).

CDFW recommends focused surveys for burrowing owl be conducted for the entirety of the Project site by a qualified biologist in accordance with the *Staff Report on Burrowing Owl Mitigation* (CDFG 2012 or most recent version) and that results be included in a revised MND. CDFW recommends the City include the following additional mitigation measure in a revised MND:

MM BIO-[B]: Focused and Pre-Construction Burrowing Owl Surveys

Suitable burrowing owl habitat has been confirmed on the site; therefore, focused burrowing owl surveys shall be conducted in accordance with the *Staff Report on Burrowing Owl Mitigation* (2012 or most recent version) prior to vegetation removal or ground-disturbing activities. If burrowing owls are detected during the focused surveys, the qualified biologist and Project proponent shall prepare a Burrowing Owl Plan that shall be submitted to CDFW for review and approval prior to commencing Project activities. The Burrowing Owl Plan shall describe proposed avoidance, monitoring, relocation, minimization, and/or mitigation actions. The Burrowing Owl Plan shall include the number and location of occupied burrow sites, acres of burrowing owl habitat that will be impacted, details of site monitoring, and details on proposed buffers and other avoidance measures if avoidance is proposed. If impacts to occupied burrowing owl habitat or burrow cannot be avoided, the Burrowing Owl Plan shall also describe minimization and compensatory mitigation actions that will be implemented. Proposed implementation of burrow exclusion and closure should only be considered as a last resort, after all other options have been evaluated as exclusion is not in itself an avoidance, minimization, or mitigation method and has the possibility to result in take. The Burrowing Owl Plan shall identify compensatory mitigation for the temporary or permanent loss of occupied burrow(s) and habitat consistent with the "Mitigation Impacts" section of the 2012 Staff Report and shall implement CDFW-approved mitigation prior to initiation of Project activities. If impacts to occupied burrows cannot be avoided, information shall be provided regarding adjacent or nearby suitable habitat available to owls. If no suitable habitat is available nearby, 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 Project proponent shall implement the Burrowing Owl Plan following CDFW and USFWS review and approval.

Preconstruction burrowing owl surveys shall be conducted no less than 14 days prior to the start of Project-related activities and within 24 hours prior to ground disturbance, in accordance with the *Staff Report on Burrowing Owl Mitigation* (2012 or most recent version). Preconstruction surveys should be performed by a qualified biologist following the recommendations and guidelines provided in the *Staff Report on Burrowing Owl Mitigation*. If the preconstruction surveys confirm occupied burrowing owl habitat, Project activities shall be immediately halted. The qualified biologist shall coordinate with CDFW and prepare a Burrowing Owl Plan that shall be submitted to CDFW and USFWS for review and approval prior to commencing Project activities.

19 cont'd

Least Bell's Vireo

Least Bell's vireo is an endangered species pursuant to the California Endangered Species Act (Fish & G. Code, § 2050 et seq.) and the federal Endangered Species Act and is additionally afforded protection under Fish and Game Code sections 3503, 3503.5, 3513. The MND (Appendix B, p. 39) states no suitable habitat occurs onsite, but acknowledges that the species "*uses habitat which is limited to the immediate vicinity of water courses,*" which is in proximity to the Project site. Because San Bernardino and Riverside Counties have lost much of the native riparian habitat, the Santa Ana Watershed and Prado Basin provide the best suitable habitat and happen to have the largest

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concentration/density of least Bell's vireo in the region. CNDDB/BIOS report recent occurrences of several least Bell's vireo approximately 0.5 miles south of the Project at the Rialto Channel/Santa Ana River outlet. Additionally, the Project site is within 6 miles of the USFWS designated Final Critical Habitat for least Bell's vireo. CDFW is concerned about the impacts to least Bell's vireo including loss of foraging habitat and potential take from ground-disturbing activities and construction noise (see "Construction Noise" section below).

Impacts to birds, their nests, or their habitat would be considered a significant impact under CEQA. Therefore, CDFW recommends focused surveys for least Bell's vireo be conducted for the entirety of the Project site and buffer by a qualified biologist in accordance with the *Least Bell's Vireo Survey Guidelines* (USFWS, January 2001) prior to commencing project-related activities. CDFW recommends the City include the following additional mitigation measure in a revised MND:

MM BIO-[C]: Least Bell's Vireo Surveys

Prior to commencement of Project activities, a CDFW-approved qualified biologist shall complete necessary surveys, impact assessments, and associated reports within all locations subject to Project activities and a 500-foot buffer following the protocols provided within the *Least Bell's Vireo Survey Guidelines* (USFWS, January 2001) to ensure avoidance of impacts. All potential least Bell's vireo habitat should be surveyed at least eight times during the period from April 10 through July 31. CDFW and USFWS should be notified of survey findings, including negative findings, within 45 calendar days following the completion of protocol-level surveys. If least Bell's vireos are identified within 500 linear feet of Project site activities, the City shall develop a plan to completely avoid impacts to the species. The City shall not conduct any project activities within 1000 linear feet of occupied least Bell's vireo habitat from March 1 through July 15. The City shall not conduct any project activities within 500 linear feet of occupied least Bell's vireo habitat from July 15 to September 15. If full avoidance cannot be accomplished, the City shall postpone the Project until appropriate CESA authorization is obtained. This may include an incidental take permit (ITP) or a consistency determination.

20 cont'd

CDFW Lake and Streambed Alteration (LSA) Program

The MND (p. 2-6) acknowledges that "*Drainage for the RHNC site would be accomplished by a network of v-ditches located on the outside of the perimeter trails that encircle the lakes and on the east side of the site approximately 15 to 20 feet above the perimeter trails. The v-ditches would convey off site stormwater flowing onto the site and on-site flow into the lake via down drains located around the lake.*" Also, the MND (p. 3-20) indicates the Project vicinity includes the Rialto Channel located on the eastern portion of the Project boundary, but states "*the channel is a concrete lined channel with no riparian habitat or other sensitive natural community.*" Canals and ditches, regardless of whether they are concrete lined, may provide suitable habitat for biological resources. Additionally, CDFW review of aerial imagery confirms the location of the West Riverside Canal that borders the Project area to the south. Thus, impacts to resources subject to Fish and Game Code section 1602 are likely to occur. Depending on how the Project is designed and constructed, it is likely that potential direct and indirect impacts to streams and to associated fish and wildlife resources, such as burrowing owl and nesting birds, would result from Project construction.

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Fish and Game Code section 1602 requires an entity to notify CDFW prior to commencing any activity that may do one or more of the following: substantially divert or obstruct the natural flow of any river, stream, or lake; substantially change or use any material from the bed, channel or bank of any river, stream, or lake; or deposit debris, waste or other materials that could pass into any river, stream or lake. Note that "any river, stream or lake" includes those that are episodic (i.e., those that are dry for periods of time) as well as those that are perennial (i.e., those that flow year-round). This includes ephemeral streams, desert washes, and watercourses with a subsurface flow. It may also apply to

work undertaken within the flood plain of a body of water. Upon receipt of a complete notification, CDFW determines if the proposed Project activities may substantially adversely affect existing fish and wildlife resources and whether a Lake and Streambed Alteration (LSA) Agreement is required. An LSA Agreement includes measures necessary to protect existing fish and wildlife resources. CDFW may suggest ways to modify the Project that would eliminate or reduce harmful impacts to fish and wildlife resources. CDFW's issuance of an LSA Agreement is a "project" subject to CEQA (see Pub. Resources Code § 21065). Early consultation with CDFW is recommended since modification of the proposed Project may be required to avoid or reduce impacts to fish and wildlife resources. To submit a Lake or Streambed Alteration notification, visit: https://wildlife.ca.gov/Conservation/Environmental-Review/LSA. **21 cont'd**

Because of the potential for impacts to resources subject to Fish and Game Code section 1602, CDFW recommends the City include the following additional mitigation measure in a revised MND:

> **MM BIO-[D]: CDFW Lake and Streambed Alteration Program**
>
> **Prior to construction and issuance of any grading permit, the Project Sponsor shall obtain written correspondence from the California Department of Fish and Wildlife (CDFW) stating that notification under section 1602 of the Fish and Game Code is not required for the Project, *or* the Project Sponsor should obtain a CDFW-executed Lake and Streambed Alteration Agreement, authorizing impacts to Fish and Game Code section 1602 resources associated with the Project.**

Construction Noise

The MND does not include an assessment of impacts to biological resources resulting from construction noise or mitigation measures to avoid or reduce impacts to a level less than significant. The MND (p. 3-47) states "*it is expected that noise levels during construction at the off-site receiver located significantly farther than 50 feet to the north would not exceed the FTAs 80 dBA Leq threshold,*" and states noise levels for a grader are expected to be approximately 84 dBA and approximately 80 dBA for a front-end loader. However, the MND includes no noise impact assessment or an analysis of the impacts of construction noise on biological resources. Noise levels are expected to exceed exposure levels that may adversely affect wildlife species at 55 to 60 dBA.

Construction may result in substantial noise through road use, equipment, and other Project-related activities. This may adversely affect wildlife species in several ways as wildlife responses to noise can occur at exposure levels of only 55 to 60 dB (Barber et al. 2009). Anthropogenic noise can disrupt the communication of many wildlife species including frogs, birds, and bats (Sun and Narins 2005, Patricelli and Blickley 2006, Gillam and McCracken 2007, Slabbekoorn and Ripmeester 2008). Noise can also affect predator-prey relationships as many nocturnal animals such as bats and owls primarily use auditory cures (i.e., hearing) to hunt. Additionally, many prey species increase their vigilance behavior when exposed to noise because they need to rely more on visual detection of predators when auditory cues may be masked by noise (Rabin et al. 2006, Quinn et al. 2017). Noise has also been shown to reduce the density of nesting birds (Francis et al. 2009) and cause increased stress that results in decreased immune responses (Kight and Swaddle 2011).

Because of the potential for construction noise to negatively impact wildlife, CDFW recommends a revised MND include a noise impact assessment and an analysis of impacts to biological resources accompanied by specific avoidance and minimization measures to ensure that impacts to wildlife are avoided or reduced to less than significant. CDFW recommends adding the following mitigation measure to a revised MND:

> **MM BIO-[E]: Construction Noise Impacts to Biological Resources**
>
> **During all Project construction, the City shall restrict use of equipment to hours least likely to disrupt wildlife (e.g., not at night or in early morning) and restrict**

use of generators except for temporary use in emergencies. Power to sites can be provided by solar PV (photovoltaic) systems, cogeneration systems (natural gas generator), small micro-hydroelectric systems, or small wind turbine systems. The City shall ensure the use of noise suppression devices such as mufflers or enclosures for generators. Sounds generated from any means must be below the 55-60 dB range within 50-feet from the source.

Artificial Nighttime Light

The MND does not analyze impacts to biological resources from artificial nighttime lighting and includes no mitigation measures to avoid or reduce impacts to biological resources to a level less than significant. The MND includes contradictory statements, stating (p. 3-33) the proposed Project would include "*possible lighting for security and safety of the perimeter trails*," while also stating (Appendix B, p. 8) "*no lighting is planned on the trail system around the lakes.*" The MND should correct the discrepancy in the lighting information provided. Designs for artificial nighttime lighting to be used during operation of the Project should be included in a revised MND. The direct and indirect impacts of artificial nighttime lighting on biological resources including migratory birds that fly at night, bats, and other nocturnal and crepuscular wildlife should be analyzed, and appropriate avoidance and minimization measures to reduce impacts to less than significant should be included in a revised MND.

Artificial nighttime lighting often results in light pollution, which has the potential to significantly and adversely affect fish and wildlife. Artificial lighting alters ecological processes including, but not limited to, the temporal niches of species; the repair and recovery of physiological function; the measurement of time through interference with the detection of circadian and lunar and seasonal cycles; the detection of resources and natural enemies; and navigation (Gatson et al. 2013). Many species use photoperiod cues for communication (e.g., bird song; Miller 2006), determining when to begin foraging (Stone et al. 2009), behavior thermoregulation (Beiswenger 1977), and migration (Longcore and Rich 2004). Phototaxis, a phenomenon which results in attraction and movement towards light, can disorient, entrap, and temporarily blind wildlife species that experience it (Longcore and Rich 2004). 23

Because of the potential for artificial nighttime light to negatively impact wildlife, CDFW recommends a revised MND include details of the use of artificial nighttime lighting proposed for the operation of the Project and an analysis of impacts to biological resources, as well as specific avoidance and minimization measures to ensure that impacts to wildlife are reduced to less than significant. CDFW recommends the City include the following mitigation measure in a revised MND:

MM BIO-[F]: Artificial Nighttime Light

During Project construction and operation, the City shall eliminate all nonessential lighting throughout the Project area and avoid or limit the use of artificial light during the hours of dawn and dusk when many wildlife species are most active. The City shall ensure that lighting for Project activities is shielded, cast downward, and does not spill over onto other properties or upward into the night sky (see the International Dark-Sky Association standards at http://darksky.org/). The City shall ensure use of LED lighting with a correlated color temperature of 3,000 Kelvins or less, proper disposal of hazardous waste, and recycling of lighting that contains toxic compounds with a qualified recycler.

ENVIRONMENTAL DATA

CEQA requires that information developed in environmental impact reports and negative declarations be incorporated into a database which may be used to make subsequent or supplemental environmental determinations. (Pub. Resources Code, § 21003, subd. (e).) Accordingly, please report any special status species and natural communities detected during Project surveys to the California Natural Diversity Database (CNDDB). The CNNDB field survey form can be filled out and submitted online at the following link:

https://wildlife.ca.gov/Data/CNDDB/Submitting-Data. The types of information reported to CNDDB can be found at the following link: https://www.wildlife.ca.gov/Data/CNDDB/Plants-and-Animals. 24 cont'd

ENVIRONMENTAL DOCUMENT FILING FEES

The Project, as proposed, would have an impact on fish and/or wildlife, and assessment of environmental document filing fees is necessary. Fees are payable upon filing of the Notice of Determination by the Lead Agency and serve to help defray the cost of environmental review by CDFW. Payment of the environmental document filing fee is required in order for the underlying project approval to be operative, vested, and final. (Cal. Code Regs, tit. 14, § 753.5; Fish & G. Code, § 711.4; Pub. Resources Code, § 21089.) 25

CONCLUSION

CDFW appreciates the opportunity to comment on the MND to assist the City of Rialto in identifying and mitigating Project impacts on biological resources. CDFW concludes that the MND does not adequately identify or mitigate the Project's significant, or potentially significant impacts on biological resources. The CEQA Guidelines indicate that recirculation is required when insufficient information in the MND precludes a meaningful review (§ 15088.5) or when a new significant effect is identified and additional mitigation measures are necessary (§ 15073.5). CDFW recommends that a revised MND with a recent and complete assessment of impacts to biological resources, as well as mitigation to avoid and reduce those impacts to less than significant, be recirculated for public comment. If the revised MND cannot demonstrate that impacts to biological resources are mitigated to a level that is less than significant, CDFW recommends that an Environmental Impact Report be prepared by the City of Rialto for the Project. 26

CDFW personnel are available for consultation regarding biological resources and strategies to minimize impacts. Questions regarding this letter or further coordination should be directed to Alyssa Hockaday, Senior Environmental Scientist (Specialist) at (760) 920-8252 or Alyssa.Hockaday@wildlife.ca.gov.

Sincerely,

DocuSigned by:
Kim Freeburn
84F92FFEEFD24C8...

Kim Freeburn
Environmental Program Manager

Attachment 1: MMRP for CDFW-Proposed Mitigation Measures

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REFERENCES

Barber, J. R., K. R. Crooks, and K. M. Fristrup. 2009. The costs of chronic noise exposure for terrestrial organisms. Trends in Ecology and Evolution 25:180-189.

Beiswenger, R. E. 1977. Diet patterns of aggregative behavior in tadpoles of *Bufo americanus*, in relation to light and temperature. Ecology 58:98–108.

Chipman, E. D., N. E. McIntyre, R. E. Strauss, M. C. Wallace, J. D. Ray, and C. W. Boal. 2008. Effects of human land use on western burrowing owl foraging and activity budgets. Journal of Raptor Research 42(2): 87-98.

Coulombe, H. N. 1971. Behavior and population ecology of the Burrowing Owl, Speotyto cunicularia, in the Imperial Valley of California. Condor 73:162–176.

Daw, S. 2013. Southwestern Willow Flycatcher: National Park Service, Southern Colorado Plateau Network I&M Program. https://www.nps.gov/articles/southwestern-willow-flycatcher.htm#:~:text=The%20replacement%20of%20native%20riparian,do%20successfully%20nest%20in%20tamarisk.

Francis, C. D., C. P. Ortega, and A. Cruz. 2009. Noise pollution changes avian communities and species interactions. Current Biology 19:1415–1419.

Fuzzen, M. L., Bennett, C. J., Tetreault, G. R., McMaster, M. E., & Servos, M. R. 2015. Severe intersex is predictive of poor fertilization success in populations of rainbow darter (*Etheostoma caeruleum*). Aquatic Toxicology 160:106–116.

Gatson, K. J., Bennie, J., Davies, T., Hopkins, J. 2013. The ecological impacts of nighttime light pollution: a mechanistic appraisal. Biological Reviews.

Gervais, J. A., D. K. Rosenberg, R. G. Anthony. 2003. Space use and pesticide exposure risk of male burrowing owls in an agricultural landscape. Journal of Wildlife Management 67: 155-164.

Gillam, E. H., and G. F. McCracken. 2007. Variability in the echolocation of *Tadarida brasiliensis*: effects of geography and local acoustic environment. Animal Behaviour 74:277–286.

Hamdhani, H., Eppehimer, D. E., & Bogan, M. T. 2020. Release of treated effluent into streams: A global review of ecological impacts with a consideration of its potential use for environmental flows. Freshwater Biology 65(9):1657–1670.

Haug, E. A., B. A. Millsap, and M. S. Martell. 1993. Burrowing owl (*Speotyto cunicularia*), in A. Poole and F. Gill, editors, The Birds of North America, The Academy of Natural Sciences, Philadelphia, Pennsylvania, and The American Ornithologists' Union, Washington, D.C., USA.

Hicks, K. A., Fuzzen, M. L., McCann, E. K., Arlos, M. J., Bragg, L. M., Kleywegt, S., & Servos, M. R. 2017. Reduction of intersex in a wild fish population in response to major municipal wastewater treatment plant upgrades. Environmental Science & Technology 51(3):1811–1819.

Jenkins, J. A., Goodbred, S. L., Sobiech, S. A., Olivier, H. M., Draugelis-Dale, R. O., & Alvarez, D. A. 2009. Effects of wastewater discharges on endocrine and reproductive function of western mosquitofish (*Gambusia* spp.) and implications for the threatened Santa Ana sucker (*Catostomus santaanae*). US Geological Survey, Reston, VA.

Johnson, A. C., & Sumpter, J. P. 2001. Removal of endocrine-disrupting chemicals in activated sludge treatment works. Environmental Science & Technology 35(24):4697–4703.

Kight, C. R., and J. P. Swaddle. 2011. How and why environmental noise impacts animals: An integrative, mechanistic review. Ecology Letters 14:1052–1061.

Liu S., Y. Zhang, X. Feng, S. Pyo. 2024. Current problems and countermeasures of constructed wetland for wastewater treatment: A review, Journal of Water Process Engineering, Volume 57:104569.

Longcore, T., and C. Rich. 2004. Ecological light pollution – Review. Frontiers in Ecology and the Environment 2:191–198.

Marjan, P., Van Der Kraak, G. J., MacLatchy, D. L., Fuzzen, M. L., Bragg, L. M., McMaster, M. E., & Servos, M. R. 2018. Assessing recovery of in vitro steroid production in male rainbow darter (*Etheostoma caeruleum*) in response to municipal wastewater treatment plant infrastructure changes. Environmental Toxicology and Chemistry 37(2):501–514.

McCallum, E. S., Nikel, K. E., Mehdi, H., Du, S. N., Bowman, J. E., Midwood, J. D., & Balshine, S. 2019. Municipal wastewater effluent affects fish communities: A multi-year study involving two wastewater treatment plants. Environmental Pollution 252:1730–1741.

Miller, M. W. 2006. Apparent effects of light pollution on singing behavior of American robins. The Condor 108:130–139.

O'Brien, J. W., and R. M. Barabe. 2022. Status and distribution of Arroyo Chub within its native range. California Fish and Wildlife Journal 108:e5.

Patricelli, G., and J. J. L. Blickley. 2006. Avian communication in urban noise: causes and consequences of vocal adjustment. Auk 123:639–649.

Quinn, J. L., M. J. Whittingham, S. J. Butler, W. Cresswell, J. L. Quinn, M. J. Whittingham, S. J. Butler, W. Cresswell, and W. Noise. 2017. Noise, predation risk compensation and vigilance in the chaffinch Fringilla coelebs. Journal of Avian Biology 37:601–608.

Rabin, L. A., R. G. Coss, and D. H. Owings. 2006. The effects of wind turbines on antipredator behavior in California ground squirrels (*Spermophilus beecheyi*). Biological Conservation 131:410–420.

Socolar JB, Epanchin PN, Beissinger SR and Tingley MW. 2017. Phenological shifts conserve thermal niches. Proceedings of the National Academy of Sciences 114(49): 12976-12981.

Sogge, M.K., S.J. Sferra, and E.H. Paxton. 2008. *Tamarix* as Habitat for Birds: Implications for Riparian Restoration in the Southwestern United States. *Restoration Ecology,* 16:1, pp.146–154.

Slabbekoorn, H., and E. A. P. Ripmeester. 2008. Birdsong and anthropogenic noise: Implications and applications for conservation. Molecular Ecology 17:72–83.

Stone, E. L., G. Jones, and S. Harris. 2009. Street lighting disturbs commuting bats. Current Biology 19:1123–1127. Elsevier Ltd.

Sun, J. W. C., and P. M. Narins. 2005. Anthropogenic sounds differentially affect amphibian call rate. Biological Conservation 121:419–427.

Wright, A.S., M.A. Doblin, and P.R. Scanes. 2022. Improper Maintenance Activities Alter Benefits of Urban Stormwater Treatment in a Temperate Constructed Wetland in NSW, Australia. Front. Environ. Chem., vol 3.

ATTACHMENT 1: MITIGATION MONITORING AND REPORTING PROGRAM (MMRP)

Biological Resources (BIO)		
Mitigation Measure (MM) Description	**Implementation Schedule**	**Responsible Parties**
MM BIO-[A]: Assessment of Biological Resources Prior to adoption of the CEQA document, a complete and recent inventory of rare, threatened, endangered, and other sensitive species located within the Project footprint and within offsite areas with the potential to be affected, including California Species of Special Concern (CSSC) and California Fully Protected Species (Fish and Game Code § 3511), will be completed. Species to be addressed should include all those which meet the CEQA definition (CEQA Guidelines § 15380). The inventory should address seasonal variations in use of the Project area and should not be limited to resident species. Focused species-specific surveys, completed by a qualified biologist and conducted at the appropriate time of year and time of day when the sensitive species are active or otherwise identifiable are required. Acceptable species-specific survey procedures should be developed in consultation with CDFW and the U.S. Fish and Wildlife Service, where necessary. Note that CDFW generally considers biological field assessments for wildlife to be valid for a one-year period, and assessments for rare plants may be considered valid for a period of up to three years. Some aspects of the proposed Project may warrant periodic updated surveys for certain sensitive taxa, particularly if the Project is proposed to occur over a protracted time frame, or in phases, or if surveys are completed during periods of drought.	Prior to adoption of the CEQA document.	City of Rialto
MM BIO-1: Nesting Bird Surveys Regardless of the time of year, nesting bird surveys shall be performed by a qualified avian biologist no more than 3 days prior to vegetation removal or ground-disturbing activities for each phase of construction. Pre-construction surveys shall focus on both direct and indirect evidence of nesting, including nest locations and nesting behavior. The qualified avian biologist will make every effort to avoid potential nest predation as a result of survey and monitoring efforts. If active nests are found during the pre-construction nesting bird surveys, a qualified biologist shall establish an appropriate nest buffer to be marked on the ground. Nest buffers are species specific and shall be at least 300 feet for passerines and 500 feet for raptors. A smaller or larger buffer may be determined by the qualified biologist familiar with the nesting phenology of the nesting species and based on nest and buffer monitoring results. Construction activities may not occur inside the established buffers, which shall remain on site until a qualified biologist determines the young have fledged or the nest is no longer active. Active nests and adequacy of the established buffer distance shall be monitored daily by the qualified biologist until the qualified biologist has determined the young have fledged or the Project has been completed. The qualified biologist has the authority to stop work if nesting pairs exhibit signs of disturbance.	No more than three (3) days prior to vegetation clearing or ground-disturbing activities for each phase of construction.	City of Rialto
MM BIO-[B]: Focused and Pre-Construction Burrowing Owl Surveys Suitable burrowing owl habitat has been confirmed on the site; therefore, focused burrowing owl surveys shall be conducted in accordance with the *Staff Report on Burrowing Owl Mitigation* (2012 or most recent version)	**Focused surveys:** Prior to the start of Project-related activities.	City of Rialto

prior to vegetation removal or ground-disturbing activities. If burrowing owls are detected during the focused surveys, the qualified biologist and Project proponent shall prepare a Burrowing Owl Plan that shall be submitted to CDFW for review and approval prior to commencing Project activities. The Burrowing Owl Plan shall describe proposed avoidance, monitoring, relocation, minimization, and/or mitigation actions. The Burrowing Owl Plan shall include the number and location of occupied burrow sites, acres of burrowing owl habitat that will be impacted, details of site monitoring, and details on proposed buffers and other avoidance measures if avoidance is proposed. If impacts to occupied burrowing owl habitat or burrow cannot be avoided, the Burrowing Owl Plan shall also describe minimization and compensatory mitigation actions that will be implemented. Proposed implementation of burrow exclusion and closure should only be considered as a last resort, after all other options have been evaluated as exclusion is not in itself an avoidance, minimization, or mitigation method and has the possibility to result in take. The Burrowing Owl Plan shall identify compensatory mitigation for the temporary or permanent loss of occupied burrow(s) and habitat consistent with the "Mitigation Impacts" section of the 2012 Staff Report and shall implement CDFW-approved mitigation prior to initiation of Project activities. If impacts to occupied burrows cannot be avoided, information shall be provided regarding adjacent or nearby suitable habitat available to owls. If no suitable habitat is available nearby, 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 Project proponent shall implement the Burrowing Owl Plan following CDFW and USFWS review and approval. Preconstruction burrowing owl surveys shall be conducted no less than 14 days prior to the start of Project-related activities and within 24 hours prior to ground disturbance, in accordance with the Staff Report on Burrowing Owl Mitigation (2012 or most recent version). Preconstruction surveys should be performed by a qualified biologist following the recommendations and guidelines provided in the Staff Report on Burrowing Owl Mitigation. If the preconstruction surveys confirm occupied burrowing owl habitat, Project activities shall be immediately halted. The qualified biologist shall coordinate with CDFW and prepare a Burrowing Owl Plan that shall be submitted to CDFW and USFWS for review and approval prior to commencing Project activities.	**Pre-construction surveys:** No less than 14 days prior to start of Project-related activities and within 24 hours prior to ground disturbance.	
MM BIO-[C]: Least Bell's Vireo Surveys Prior to commencement of Project activities, a CDFW-approved qualified biologist shall complete necessary surveys, impact assessments, and associated reports within all locations subject to Project activities and a 500-foot buffer following the protocols provided within the *Least Bell's Vireo Survey Guidelines* (USFWS, January 2001) to ensure avoidance of impacts. All potential least Bell's vireo habitat should be surveyed at least eight times during the period from April 10 through July 31. CDFW and USFWS should be notified of survey findings, including negative findings, within 45 calendar days following the completion of protocol-level surveys. If least Bell's vireos are identified within 500 linear feet of project site activities, the City shall develop a plan to completely avoid impacts to the species. The City shall not conduct any project activities within 1000 linear feet of occupied least Bell's vireo habitat from	No more than three (3) days prior to vegetation clearing or ground-disturbing activities for each phase of construction.	City of Rialto

March 1 through July 15. The City shall not conduct any project activities within 500 linear feet of occupied least Bell's vireo habitat from July 15 to September 15. If full avoidance cannot be accomplished, the City shall postpone the Project until appropriate CESA authorization is obtained. This may include an incidental take permit (ITP) or a consistency determination.		
MM BIO-[D]: CDFW Lake and Streambed Alteration Program Prior to construction and issuance of any grading permit, the Project Sponsor shall obtain written correspondence from the California Department of Fish and Wildlife (CDFW) stating that notification under section 1602 of the Fish and Game Code is not required for the Project, *or* the Project Sponsor should obtain a CDFW-executed Lake and Streambed Alteration Agreement, authorizing impacts to Fish and Game Code section 1602 resources associated with the Project.	Prior to construction and issuance of any grading permit.	City of Rialto
MM BIO-[E]: Construction Noise Impacts to Biological Resources During all Project construction, the City shall restrict use of equipment to hours least likely to disrupt wildlife (e.g., not at night or in early morning) and restrict use of generators except for temporary use in emergencies. Power to sites can be provided by solar PV (photovoltaic) systems, cogeneration systems (natural gas generator), small micro-hydroelectric systems, or small wind turbine systems. The City shall ensure the use of noise suppression devices such as mufflers or enclosures for generators. Sounds generated from any means must be below the 55-60 dB range within 50-feet from the source.	During Project activities.	City of Rialto
MM BIO-[F]: Artificial Nighttime Light During Project construction and operation, the City shall eliminate all nonessential lighting throughout the Project area and avoid or limit the use of artificial light during the hours of dawn and dusk when many wildlife species are most active. The City shall ensure that lighting for Project activities is shielded, cast downward, and does not spill over onto other properties or upward into the night sky (see the International Dark-Sky Association standards at http://darksky.org/). The City shall ensure use of LED lighting with a correlated color temperature of 3,000 Kelvins or less, proper disposal of hazardous waste, and recycling of lighting that contains toxic compounds with a qualified recycler.	During Project construction activities and operation.	City of Rialto

Response to Comment A-1:

Commentor explains their role as a Trustee Agency responsible for stewardship of fish and wildlife resources in California. The Commentor also states they are a Responsible Agency regarding the proposed Project based on an expectation the proposed Project will require regulatory approval as part of the Lake and Streambed Alteration Agreement (LSAA) program as well as approval of a take permit pursuant to the California Endangered Species Act (CESA). As discussed in responses to subsequent comments, there is no evidence that either an LSAA or a CESA take permit would be required to approve or implement the proposed Project.

Response to Comment A-2:

The Commentor suggests the City has not adequately identified and disclosed impacts to biological resources and whether those impacts are less than significant, and for this reason offers comments and recommendations to assist the City in adequately identifying and/or mitigating the Project's significant or potentially significant impacts on biological resources. As discussed in responses below to subsequent comments, the Commentor appears to have misinterpreted the Project objectives and goals. Based on the information, data, analysis and conclusions contained in the IS/MND plus the minor text additions to address the Commentor's comments, the City believes some comments and recommendations result in an inaccurate depiction of the Project and speculative conclusions regarding impacts. The City believes the IS/MND as circulated provides a comprehensive analysis of direct, indirect and cumulative impacts associated with the proposed Project. In order to further clarify the proposed Project, the City has made minor changes to the IS/MND and associated impact analyses to provide the Commentor clarification of the extent of impacts associated with the proposed Project.

Response to Comment A-3:

The Commentor recommends additional information and analyses be added to a revised (and recirculated) IS/MND, along with additional mitigation measures to reduce impacts to less than significant. The comments and mitigation measures as recommended by the Commentor appear to be based on an inaccurate depiction of the Project goals, objectives and conclusions regarding speculative impacts as discussed in Response to Comment A-2. As noted above, the City has made minor text additions to the IS/MND to further clarify and describe the proposed Project and associated impact analyses to assist the Commentor in understanding the extent of impacts associated with the proposed Project. The minor text additions provide clarification language and do not constitute a substantial revision and therefore the IS/MND does not require recirculation.

Response to Comment A-4:

The Commentor correctly notes the proposed lakes would be created by temporarily utilizing fully treated effluent generated by the City's wastewater treatment plant (WWTP). Treated effluent generated by the City's WWTP will be utilized to fill the lakes and filling operations will be managed to ensure that effluent discharges to the Rialto Channel are within the historical daily and seasonal variability as planned. Additional detail regarding existing daily and seasonal WWTP flow into the Rialto Channel are described in Section 2.4.3 of the IS/MND – revised to provide the Commentor with additional information regarding existing flow conditions. When the lakes are full and at operating level, approximately ten (10) percent of the WWTP effluent flow will be routed through the lakes to maintain water quality and habitat. Effluent routed through the lakes will then comingle with the remaining ninety (90) percent of the WWTP effluent before being discharged to the concrete lined Rialto Channel. The added text in revised Section 2.4.3 of the IS/MND is shown as follows:

2.4.3 Wastewater Treatment Plant Effluent Flows

The existing wastewater system for the City encompasses approximately 25 square miles and collects and treats wastewater from domestic, commercial, and industrial customers at the City's WWTP located in the southeast portion of the WWTP service area. The WWTP property occupies approximately 25 acres inclusive of the proposed 13-acre RHNC site and has a maximum treatment capacity of 11.7 million gallons per day (mgd). The WWTP provides secondary and tertiary treatment prior to discharging the treated effluent into the concrete-lined Rialto Channel, which is a tributary to the Santa Ana River Watershed. Rialto Channel is concrete-lined for approximately 0.50 miles along the east property boundary of the WWTP and extends to Agua Mansa Road, and the channel is unlined from Agua Mansa Road south approximately 0.30 miles before discharging into the Santa Ana River. The WWTP discharges 100 percent of its treated effluent into the concrete-lined Rialto Channel via a 36-inch diameter effluent pipeline at a location adjacent to the southeast portion of the proposed eastern lake.

Effluent discharged into the channel has varied over the years. To assist with characterizing existing effluent conditions at the WWTP, the most recent 5-year historical period has been used, October 2019 thru October 2024. Based on the last 5 years, the average monthly effluent flow to the Rialto Channel was 6.9 mgd, with a minimum average monthly flow of 5.74 mgd and maximum monthly flow of 7.62 mgd. The high variability of effluent flows to the Rialto Channel is expected and will likely continue as a result of the natural daily variability from high to low demand times of the day, seasonal variability from wet to dry periods of the year and resulting rainfall infiltration, ongoing water use efficiency and conservation efforts, the COVID pandemic, and increases from new growth and development within the City's service area and adjacent Sphere of Influence. Figures 2-3 and 2-4 present historical effluent flows to the Rialto Channel and resulting seasonal variability.

Figure 2-3: 1-Year Historical Effluent Flows to the Rialto Channel

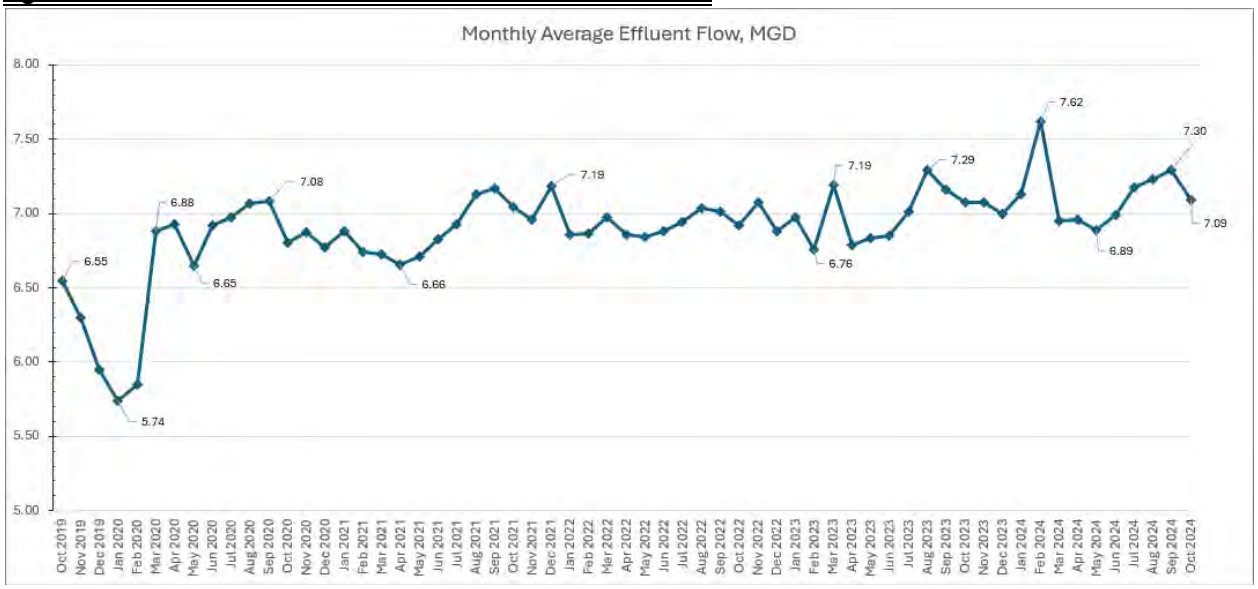
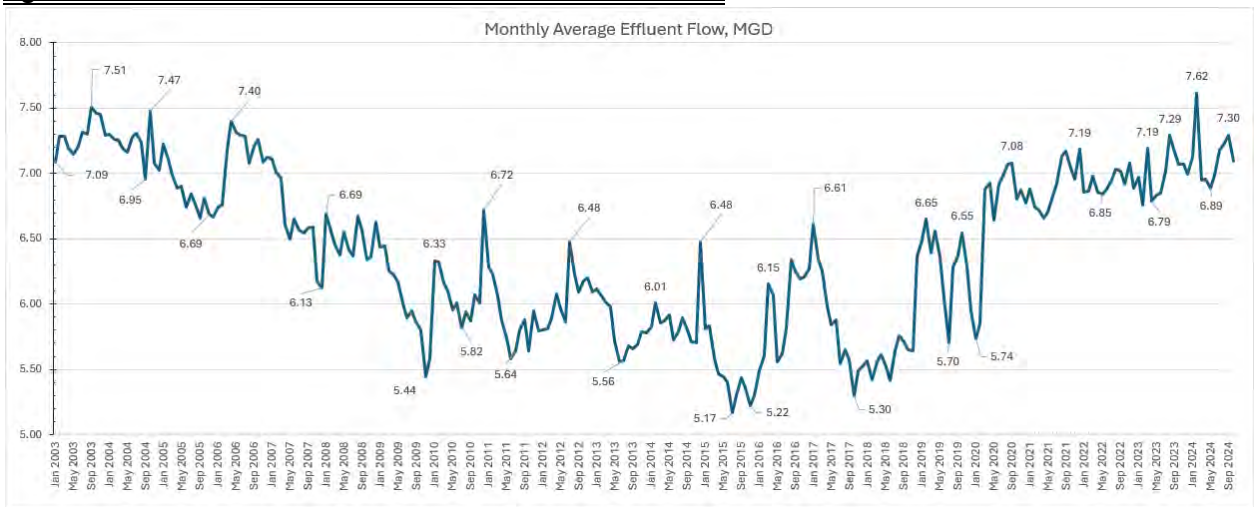


Figure 2-4: 20-Year Historical Effluent Flows to the Rialto Channel



The Commentor also notes the IS/MND does not disclose the amount of time the effluent would be "stored" in the lakes and does not address potential impacts to biological resources from this temporary storage. To address this comment, the first paragraph on page 2-6 in Section 2.5 of the IS/MND has been modified to provide further clarification regarding the temporal nature of effluent flow in/out of the lake:

> *RHNC would provide the citizens of Rialto and the region with an approximately 13-acre outdoor public natural space including a 10-acre lake consisting of two connected lakes that would hold approximately 39.5 million gallons or 121 acre-feet of water, one mile of pedestrian perimeter trails, passive recreation, environmental education programming, and public outreach (Figure 2-5~~3~~, Grading Plan). The* filling of the lakes for the *RHNC would be* accomplished ~~*created*~~ *by* temporarily *diverting approximately 10 percent of the treated* effluent ~~*water*~~ *from the City's WWTP and temporarily storing the* ~~*reclaimed*~~ *water in the lakes to provide passive outdoor and educational experiences and wetland/terrestrial wildlife habitat.* While the lakes are being filled, the~~*The*~~ *remaining 90 percent of treated* effluent ~~*waters*~~ *would continue to be discharged into the Rialto Channel* ~~*to maintain the minimum 7 cfs requirement*~~. The temporary reduction in effluent flow from the WWTP will be managed to ensure that effluent discharged to the Rialto Channel remains above the historical minimum discharge flows described in revised Section 2.4.3 and managed to be within daily and seasonal historical variability. During this time, the effluent flow into Rialto Channel would temporarily be reduced by approximately ten percent. This slight reduction in flow is within the daily and seasonal effluent flow variation generated by the WWTP and would remain at 6.57 MGD or above (7.3 MGD existing – 0.73 MGD = 6.57 MGD). *Once the lake* ~~*has been created and*~~ *becomes* filled~~*operational*~~, a steady-state condition will be obtained and the amount of effluent into the lake will equal the amount of effluent out from the lake and back into ~~*the approximately 10 percent of water diverted and reclaimed from the WWTP into the lakes will be returned to the*~~ *Rialto Channel* ~~*and rejoin the majority of effluent flow into the channel*~~.

Regarding the proposed Project's effects from potential changes to effluent flow on biological resources, the following text has been added to page 3-19 within 3.4.2a between **Wildlife** and **Critical Habitat**. These changes clarify the proposed Project would have no impact or a less than significant impact on biological resources associated with flow rate changes to the Rialto Channel and Santa Ana River.

Effluent Flow into Rialto Channel

As indicated in the Project Description on page 2-6 and further clarified in response to CDFW comments, the proposed Project will have no effect on the effluent flow into Rialto Channel. Although the flow rate would be temporarily reduced during the time in which the lakes are filled, this reduction of effluent discharged to the Rialto Channel will be within the historical daily and seasonal variability as shown in previously referenced Figures 2-3 and 2-4. Based on current average flow of 7.3 MGD and a temporary reduction of 10 percent during filling, average flow into the channel would remain at 6.57 MGD during initial lake filling (7.3 MGD existing – 0.73 MGD = 6.57 MGD). For this reason, the flow reduction into Rialto Channel that would occur during filling of the lakes would not result in impacts to biological resources because the temporary change is within existing baseline conditions and normal fluctuations of the effluent flows. Once the lakes are filled, the quantity of flow in and out of the lakes would equalize and no change in flow would occur from the original baseline resulting in less than significant impacts to biological resources located downstream.

Response to Comment A-5:

The Commentor correctly notes the City has intensions to sell reclaimed water from its WWTP to the Inland Empire Utilities Agency (IEUA) in the future, and comments that it is unclear how flow would remain unchanged upon implementation of the agreement with IEUA. The agreement with IEUA is an unrelated project, and ultimate implementation of the City/IEUA project will be subject to CEQA environmental review, approval, and any required Resource Agency permits. The purpose of noting this unrelated project, as well as the Habitat Conservation Plan (HCP) for the Upper Santa Ana River (SAR) watershed in Section 2.4.3 on page 2-5 of the IS/MND as revised in response to comments from the Commenter, is to disclose other factors are in play that may have an effect on flow rates in the Rialto Channel and the Santa Ana River outside of the temporary filling of the lakes associated with the proposed Project. The following clarifications regarding the IEUA agreement have been added to the last paragraph on page 2-5 as follows:

Currently, the WWTP discharges 100 percent of its treated effluent flows (average flow 7 mgd; minimum flow 6 mgd; maximum flow 8 mgd) into the concrete-lined Rialto Channel via a 36-inch diameter effluent pipeline. Existing effluent discharge exceeds the 7 cfs or 3.8 mgd flow the City has previously *agreed to provide into Rialto Channel as part of prior agreements coordinated with other agencies for the benefit of the Santa Ana River.*

The City has recently agreed in concept *to sell Inland Empire Utilities Agency (IEUA) 7 mgd of effluent in the first phase and up to 10 mgd in the future*, subject to future CEQA analysis and potentially Resource Agency permits*. The recycled water interconnect project would include a pump station located north of the RHNC site and within the WWTP property and an interconnection pipeline from the pump station easterly along the northern perimeter of the RHNC site to Rialto Channel. From Rialto Channel, the pipeline would turn north towards Santa Ana Avenue and ultimately to IEUA's Regional Water Recycling Plant No. 4 located at 12811 6th Street in Rancho Cucamonga.* The City/IEUA project will be subject to its own environmental review including assessment of potential impacts to biological resources associated with effluent flow changes into the Rialto Channel and Santa Ana River associated with the reclaimed water project.

Response to Comment A-6:

The Commentor suggests the City recirculate the IS/MND to clarify the discrepancy regarding the amount and rate of flow to be diverted/sold for the Project. As noted in response to comment A-5, the City/IEUA project is not part of the proposed Project, has not been approved, is in concept phase only, and will be subject to its own environmental review as a separate Project per CEQA. As noted in response to comment A-4 and in revised IS/MND Section 3.4.2a, regarding the proposed Project no impact to biological resources would occur during the temporary period of time the lakes are filled because the quantity of flow used to fill the lakes would fall within the range of the current daily and seasonal variations typical of the system. Once the lakes are filled, the quantity of flow in and out of the lakes would equalize and no change in flow would occur from the original baseline therefore resulting in no impact to biological resources downstream.

Response to Comment A-7:

The Commentor correctly notes the City has the ability and capacity to regulate flow into the lake for the purposes of lake maintenance regulating flow into Rialto Channel for the benefit of downstream habitat. The Commentor notes that the IS/MND should address potential impacts to any future habitat created by the proposed Project if the lakes are terminated in the future. Page 2-1 of the IS/MND has been clarified to eliminate references to termination of the lakes as follows:

> *It should be noted that the City has the ability and capacity to choose not to divert ~~any~~ water into the lakes post construction, for the purposes of regulating flows into Rialto Channel or* maintenance of the lakes *~~effectively concluding the existence of the lakes~~. Reasons for temporarily or permanently stopping the diverting and storage of the water* from the lakes *could be for maintenance of the lined and unlined portions of Rialto Channel, ~~the cost of maintenance and repairs to the lakes,~~ or overall operations of the lakes. ~~The Rialto Habitat Nature Center Project is fully autonomous to the overall system, and should budget decline in the City, the City reserves the right to stop diverting water into the lakes and return to pre-project conditions.~~*

The City recognizes that filling of the lakes would create riparian habitat and open water areas subject to CDFW jurisdiction. The City would prepare an Operation and Maintenance (O&M) plan for the lakes that would be subject of a Long- Term Maintenance Agreement (LTMA) with CDFW. The O&M plan would address the temporary maintenance of the lakes, including the reduction or stoppage of discharge for a short duration. The O&M Plan would include project design features to off-set impacts, such as avoiding nesting bird season or conducting maintenance in cooler weather to minimize stress on downstream aquatic resources. Furthermore, the City is committed to perpetual operation and maintenance of the lakes. Should that change, a separate Environmental Document and Analysis would be required to decommission the lakes and appropriate Jurisdictional Permits would be obtained.

Response to Comment A-8:

The Commentor states the IS/MND does not address how the newly created habitat associated with the proposed Project would be designed, maintained, and managed over the life of the Project. It should be noted that the City will prepare an Operation & Maintenance (O&M) manual regarding all aspects of the Project. As part of the O&M document preparation, the City will apply for and obtain a CDFW Long-Term Maintenance Agreement (LTMA) addressing maintenance of the newly created biological resources associated with the Project in perpetuity.

Response to Comment A-9:

The Commentor recommends the City recirculate the IS/MND to address potential impacts associated with termination of the Project. As noted in responses to comments A-7 and A-8, the City does not plan to

terminate the Project. However, an LTMA and O&M would be submitted to CDFW and obtained prior to the lake operations, which addresses maintenance of any newly created biological resources associated with the Project in perpetuity. Currently no riparian habitat/wetlands exist onsite. Recirculation of the IS/MND is not required.

Response to Comment A-10:

The Commentor correctly notes on page 3-52 of the IS/MND that the Project would provide the City and surrounding area with water quality benefits. The Commentor notes that there is not supporting analysis of this statement and provides further comment that effluent from WWTPs contains high level of various contaminants, in the existing baseline condition. The effluent discharged from the WWTP is routinely tested and meets all Regional Water Quality Control Board standards for discharge. Therefore, there is no contaminant release in the baseline condition that exceeds required standards. The Commentor's suggestion that the Project would cause an increase in contaminant release means the addition of open water lakes and riparian vegetation would increase the contaminant levels. There is no evidence to support this comment. The Project, as designed, included extensive research of operations and water quality benefits at two similar projects in the area, the Mill Creek Wetlands and Irvine Ranch Water District San Joaquin Marsh Wildlife Sanctuary. Furthermore, using Mill Creek Wetlands and San Joaquin Marsh as models, both of these wetlands are historically known to improve water quality with the removal of total dissolved solids, decrease of harmful nutrients and bacteria, and increase in dissolved oxygen. The known positive effects of the wetlands would have no impact on water quality within Rialto Channel and at most a positive benefit. Regardless no impact to water quality would occur and recirculation of the IS/MND is not required.

Response to Comment A-11:

The Commentor expresses concerns about the "inconsistencies in information regarding the amount and rate at which water will be diverted from the Rialto Channel, the amount time the water will be diverted and stored in the lakes, and the lack of analyses regarding subsequent impacts to sensitive fish species downstream. Absent this information, the MND likely provides an incomplete assessment of the potentially significant impacts to special-status fish that would be affected by this Project." As noted in responses to comments A-4 through A-10, the proposed Project will have no effect on flow rates in the unlined portion of Rialto Channel and the Santa Ana River. Impacts to associated habitat and species including the Santa Ana sucker located downstream would not occur.

Response to Comment A-12:

The Commentor provides comment on the alternative analysis contained in Chapter 5 of the IS/MND. This chapter is included in the IS/MND as a "CEQA Plus" addition to satisfy NEPA compliance for federal agency grant applications. The text of the IS/MND has been revised to clarify the effects of the "No Project" alternative. The No Project Alternative would have no change of conditions to downstream arroyo chub or Santa Ana sucker and operations, including water quality, since flows would continue as in the existing baseline condition. In the No Project Alternative, the potential impacts to Arroyo Chub and Santa Ana Sucker would not come from the Project, since there would be no change to existing conditions, but could come from other external forces unrelated to the proposed Project. Furthermore, one benefit of the Project is to improve water quality, which would not occur in the No Project Alternative condition. Therefore, in the No Project Alternative there would be a lost opportunity to improve water quality, which could have offset impacts from other external forces. Recirculation of the IS/MND is not required.

Response to Comment A-13:

The Commentor disagrees with conclusions found on pages 3-18 through 3-19 of the IS/MND regarding impacts to vegetation communities, because vegetation type or regional abundance does not necessarily determine habitat value or the use of these areas by wildlife, including special-status species. CDFW states that the IS/MND "has trivialized the significance of the Project's potential impacts on wildlife that

utilize disturbed areas and non-native or common vegetation communities." Furthermore, the Commentor stated, "southwestern willow flycatcher may utilize tamarisk thickets as breeding habitats." Primary Constituent Elements (PCE) include habitat components that are essential for the primary biological needs of foraging, sheltering, and reproduction. As identified in the Biological Resource Assessment (Appendix B of the IS/MND) a tamarisk stand occurs onsite. The PCEs for southwestern willow flycatchers (SWFL) include dense riparian vegetation along rivers or lakeside, typically including willow and cottonwood trees, but may utilize tamarisk. SWFL nests are usually built close to water sources and often within the floodplain. The Project site does not currently include any water onsite, and specifically does not include any water near the tamarisk stand. The closest water source is the Rialto Channel located to the east of the Project site. The Channel is concrete lined and contains no riparian habitat. Therefore, while tamarisk occurs onsite, the Project site lacks the necessary PCEs for the Southwestern willow flycatcher. Furthermore, the Biological Resource Assessment includes a comprehensive and adequate evaluation of impacts to vegetation communities and species.

Response to Comment A-14:

The Commentor states the general biological field survey conducted for the MND was not adequate in timing and scope to detect special-status species that could occur on-site. The Biological Resource Assessment was prepared in accordance with industry standards. Since the comment does not provide specificity, no further response is required.

Response to Comment A-15:

The Commentor states the IS/MND should address impacts to the future habitat that would be created as part of the lakes including vegetation removal. The newly created habitat associated with the proposed Project is not an existing condition. Therefore, analysis of the removal of such newly created habitat would be speculative and expressly not required as part of CEQA. However, as noted in response to comment A-8, the City will prepare an O&M manual detailing the maintenance and operations activities associated with the Project, including best management practices designed to minimize maintenance impacts, such as avoiding nesting bird season for vegetation maintenance. As part of the O&M document preparation, the City will submit and obtain a Long-Term Maintenance Agreement addressing maintenance of newly created biological resources associated with the Project.

Response to Comment A-16:

The Commentor states the IS/MND does not address the introduction of non-native species and management strategies if such species are identified. These are topics that are not part of the existing condition and are speculative. However, as noted in response to comment A-8, the City will prepare an O&M manual detailing the maintenance and operations activities associated with the Project, including addressing the introduction and management of non-native species. . Recirculation of the IS/MND is not required.

Response to Comment A-17:

The Commentor states the IS/MND does not adequately address impacts to biological resources because no focused or protocol-level surveys were performed for any species other than the Delhi Sands flower-loving fly, suggesting there is high potential for special-status species to be impacted onsite either directly, indirectly, and cumulatively by Project activities. The Project site is a heavily used disturbed area that is currently operating as a wastewater treatment plant. The area of the proposed Project is currently used as a storage site and staging area at various times throughout the year, with extensive truck and equipment traffic across the entirety of the Project site. As such, the Project site is extensively disturbed

and lacks suitable habitat for sensitive species. The IS/MND provides a brief summary of the comprehensive Biological Resource Assessment contained in its entirety as Appendix B to the IS/MND. As contained in Biological Resource Assessment, a comprehensive and adequate evaluation of impacts to vegetation communities, wildlife, and critical habitat has been conducted. Due to the existing Delhi sand soils mapped onsite and known occurs in the surrounding undisturbed area, a focused habitat assessment for the Delhi sands flower-loving fly was conducted and it was concluded that the site does not contain any suitable habitat for the species. A complete assessment of the potential for sensitive plants and animals to occur onsite was included within Appendix C and D of the Biological Resources Assessment, which was included as Appendix B of the IS/MND. Additional surveys are not required due to the lack of suitable habitat or soils that occur onsite.

Response to Comment A-18:

The Commentor expresses concerns that the IS/MND does not accurately assess impacts to nesting birds and recommended Mitigation Measure MM BIO-1 on page 3-20 does not adequately prohibit construction activities during peak breeding season. The Commentor offers a revised mitigation measure to replace MM BIO-1. The City concurs and will update MM BIO-1 on page 3-20 of the IS/MND in accordance with the Commentor's suggested language and require pre-construction breeding bird surveys throughout the year.

Response to Comment A-19:

The Commentor expresses concerns that the IS/MND does not accurately assess impacts to burrowing owl. The Commentor contends the Project site contains suitable burrowing owl habitat due to the presence of California ground squirrels observed onsite. The Commentor offers a mitigation measure requiring a protocol level burrowing owl survey and pre-construction survey. As identified within the Biological Resource Assessment, the Project site is dominated by steep sides and the bottom of the pit dug out years ago. Furthermore, the Project site is a heavily used disturbed area that is currently operating as a wastewater treatment plant. The area of the proposed Project is the location of truck and equipment traffic that is used as a storage site and staging area at various times throughout the year. These conditions and activities are not favored by burrowing owl. Although California ground squirrel was observed onsite, the lack of suitable habitat and satellite burrows is not conducive for the species to be present and therefore protocol level surveys are not required. The City concurs with the pre-construction survey for burrowing owl and will incorporate the text into MM BIO-1 on page 3-20 of the IS/MND.

Response to Comment A-20:

The Commentor expresses concerns that the IS/MND does not accurately assess impacts to least Bell's vireo. The Commentor acknowledges the Project site contains no suitable habitat, but contends suitable habitat exists in close proximity in the form of water courses near the Project site. The Commentor notes least Bell's vireo has been observed approximately 0.50 miles to the south of the site at the Santa Ana River and the site is within 6 miles of the USFWS designated Final Critical Habitat for least Bell's vireo. The Commentor contends the Project site contains foraging habitat for the least Bell's vireo offers a mitigation measure requiring protocol level least Bell's vireo surveys, impact assessments, and related reports. The Project site does not include any PCE for least Bell's vireo in the form of water source onsite or suitable nesting habitat. The section of Rialto Channel bordering the Project site is concrete lined and does not contain riparian habitat. Furthermore, the Project site is a heavily used disturbed area that is currently operating as a wastewater treatment plant. The area of the proposed Project is the location of truck and equipment traffic that is used as a storage site and staging area at various times throughout the year. Impacts to least Bell's vireo are less than significant and no mitigation is required consistent with the IS/MND conclusions.

Response to Comment A-21:

The Commentor notes potential jurisdictional features that may be subject to the Lake and Streambed Alteration (LSA) Program occurs onsite. Specifically, the Commentor states the West Riverside Canal borders the Project to the south. West Riverside Canal is a historical canal that extends through the City of Riverside and adjacent Cities. The commentor suggests impacts to these features are likely to occur and would be subject to Fish and Game Code section 1602, and CDFW suggests the City include an additional mitigation measure in a revised MND that would require review and approval of an LSAA. As included within the Biological Resource Assessment, no features were identified within the Project site that meet the definition of waters of the State as defined in Fish and Game Code section 1602, nor was West Riverside Canal identified to occur on the Project site. The Rialto Channel located to the east of the Project is a concrete lined channel and was identified in the Biological Resource Assessment as Waters of State. The concrete lined channel is maintained by the San Bernardino County Flood Control District for the purposes of conveying storm water to the Santa Ana River. The Project is not anticipated to impact Rialto Channel.

The future proposed onsite lakes are part of the Project construction and are not existing features requiring an LSA. As indicated in the Project Description on page 2-6 and further clarified in response to comments, the proposed Project will have no effect on the effluent flow into Rialto Channel. Although the flow rate would be temporarily reduced during the time in which the lakes are filled, the flow rate reduction is expected to be approximately ten percent of existing flow and well within the amount of variation that occurs on a daily and seasonal basis. For this reason, the flow reduction into Rialto Channel that will occur during the filling of the lakes would not result in impact to biological resources downstream because the temporary change is within existing baseline conditions and normal fluctuations of the flows. Once the lakes are filled, the quantity of flow in and out of the lakes would equalize and no change in flow would occur from existing baseline resulting in no impacts to biological resources located downstream. In addition, operation and maintenance of the future onsite lakes and the balance of the proposed Project will be subject to a forthcoming O&M manual and a LTMA to be reviewed and approved by CDFW.

Therefore, the City acknowledges the construction and operation of the Project will be subject to the CDFW regulation for the operation and maintenance procedures to be part of a forthcoming LTMA.

Response to Comment A-22:

The Commentor notes the IS/MND does not include an analysis of construction noise impacts to biological resources, correctly states the construction noise levels estimated from Project construction as contained in in the noise analysis, suggests such noise creates an impact requiring mitigation, and offers recommended mitigation to reduce expected construction noise impacts to a less than significant level. Construction noise is temporary in nature and no sensitive wildlife was determined to occur onsite. Impacts may occur if construction is anticipated to occur during breeding season. Mitigation Measure BIO-1 outlines a pre-construction survey is to be performed prior to any ground disturbances, mitigating any noise impacts to breeding species. Furthermore, the Project site and surrounding area is an urbanized industrial area. The wastewater treatment plant has active operations and the area of the proposed Project occurs in the location of truck and equipment traffic that is used as a storage site and staging area at various times throughout the year. Furthermore, the City restricts construction activities to daylight hours during the week plus Saturday, with no nighttime construction allowed. The O&M will outline the RHNC hours of operation that will likely close at sundown. Therefore, the suggested construction mitigation measure is not required.

Response to Comment A-23:

The Commentor notes the IS/MND does not include an analysis of artificial nighttime lighting impacts to biological resources. The Commentor offers recommended mitigation to reduce expected nighttime lighting impacts to biological resources to a less than significant level. The Commentor notes inconsistencies in the IS/MND regarding whether or not lighting will be included within the Project. To clarify, the intent of the Project is to provide a minimal amount of nighttime lighting for safety to ensure police, fire response, and maintenance personal have a reasonable minimum level of night lighting to perform their duties. Such lighting would occur on and around the lakes may include minimal lighting along the access trail on the adjacent Rialto Channel utility road and would be determined during the O&M document. Furthermore, the WWTP is an operational plant and includes existing nighttime lighting, in additional to the surrounding developed areas. In addition, the City restricts construction activities to daylight hours during the week plus Saturday, with no nighttime construction allowed. The O&M will outline the RHNC hours of operation that will likely close at sundown. Therefore, the suggested construction mitigation measure is not required.

Response to Comment A-24:

The Commentor notes certain biological data is required to be reported to applicable databases including the CNDDB. Comment noted.

Response to Comment A-25:

The Commentor notes certain filing fees are required. Comment noted.

Response to Comment A-26:

This comment is a summary statement suggesting the IS/MND should be recirculated based on the need to include data/information/analysis to address the prior comments. As detailed within the response to comments, recirculation of the IS/MND is not required.