DRAFT

INITIAL STUDY/
MITIGATED NEGATIVE DECLARATION

VALLEY BOULEVARD POTABLE WATER TRANSMISSION PIPELINES PROJECT

MENIFEE AND PERRIS, CALIFORNIA

April 2025

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VALLEY BOULEVARD POTABLE WATER TRANSMISSION PIPELINES PROJECT

MENIFEE AND PERRIS, CALIFORNIA

Prepared for:

Eastern Municipal Water District
2270 Trumble Road
P.O. Box 8300
Perris, CA 92572-8300

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Project No. EWD2101.04

April 2025

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LIST OF ABBREVIATIONS AND ACRONYMS

°F	degrees Fahrenheit
2.1-5 R	2.1-5 du/ac Residential
AAQS	ambient air quality standards
AB	Assembly Bill
ADT	average daily traffic
AFY	acre-feet per year
ALUC	Airport Land Use Commission
amsl	above mean sea level
APN	Assessor's Parcel Number
AQMP	Air Quality Management Plan
Basin	South Coast Air Basin
Basin Plan	Water Quality Control Plan
BMPs	best management practices
Btu	British thermal units
CAGN	coastal California gnatcatcher
CAL FIRE	California Department of Forestry and Fire Protection
CalEEMod	California Emissions Estimator Model version 2022.1
California Register	California Register of Historical Resources
CalRecycle	California Department of Resources Recycling and Recovery
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CATTCH	California Temporary Traffic Control Handbook
CBC	California Building Code
CDFW	California Department of Fish and Wildlife
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
CGP	Construction General Permit

CGS	California Geological Survey
CH_4	methane
City	City of Menifee
CNEL	Community Noise Equivalent Level
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
County	County of Riverside
CTMP	Construction Traffic Management Plan
CWA	Clean Water Act
dB	decibels
dBA	A-weighted decibels
DDT	dichlorodiphenyltrichloroethane
DOC	California Department of Conservation
DPM	diesel exhaust particulate matter
Draft Guidance Document	Draft Guidance Document – Interim CEQA Greenhouse Gas (GHG) Significance Threshold
DTSC	California Department of Toxic Substances Control
du/ac	dwelling units per acre
EFZ	Earthquake Fault Zone
EIR	Environmental Impact Report
EMFAC2021	California Emissions Factor Model, Version 2021
EMWD	Eastern Municipal Water District
EO	Executive Order
EOP	Emergency Operations Plan
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FESA	federal Endangered Species Act
FIRM	Flood Insurance Rate Map
FMMP	Farmland Mapping and Monitoring Program
FTA	Federal Transit Administration

FTA Manual	Federal Transit Administration Transit Noise and Vibration Impact Assessment Manual
GHG	greenhouse gas
GMZ	Groundwater Management Zone
GSAs	Groundwater Sustainability Agencies
GSP	San Jacinto Groundwater Sustainability Plan Public Draft
GWh	gigawatt-hours
GWP	Global Warming Potential
Handbook	Design Handbook for Low Impact Development Best Management Practices
HCP	Habitat Conservation Plan
HFCs	hydrofluorocarbons
I-10	Interstate 10
I-215	Interstate 215
I-5	Interstate 5
in/sec	inches per second
IS/MND	Initial Study/Mitigated Negative Declaration
kWh	kilowatt-hours
L_{dn}	day-night average level
LDR-2	Low Density Residential-2
L_{eq}	equivalent continuous sound level
LID	Low Impact Development
LOS	level of service
LST	localized significance threshold
LUST	leaking underground storage tank
MBTA	Migratory Bird Treaty Act
MJHMP	Multi-Jurisdictional Hazard Mitigation Plan
MLD	Most Likely Descendant
MMRP	Mitigation Monitoring and Reporting Program
MOV	motor-operated valve
mph	miles per hour
MRZ	Mineral Resource Zone

MS4	Municipal Separate Storm Sewer System
MSHCP	Western Riverside County Multiple Species Habitat Conservation Plan
MT	metric tons
MUTCD	Manual on Uniform Traffic Control Devices
MWD	Metropolitan Water District of Southern California
N_2O	nitrous oxide
NAHC	Native American Heritage Commission
NEPSSA	Narrow Endemic Plant Species Survey Area
NIMS	National Incident Management System
NOI	Notice of Intent
NOT	Notice of Termination
NO_X	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
O&M	operation and maintenance
O_3	ozone
OPR	Office of Planning and Research
OSHA	Occupational Safety and Health Administration
Pb	lead
PCBs	polychlorinated biphenyls
PCE	passenger car equivalent
PFCs	perfluorocarbons
PM_{10}	particulate matter less than 10 microns in size
$PM_{2.5}$	particulate matter less than 2.5 microns in size
PPV	peak particle velocity
PRC	Public Resources Code
PRD	Permit Registration Document
PRIMP	Paleontological Resources Impact Mitigation Program
project	Valley Boulevard Potable Water Transmission Pipelines Project
PSE	Participating Special Entity
RMS	root-mean-square

RTA	Riverside Transit Agency
RTP/SCS	Regional Transportation Plan/Sustainable Communities Strategy
RWQCB	Regional Water Quality Control Board
RWRF	regional water reclamation facility
SB	Senate Bill
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SCE	Southern California Edison
SEMS	Standardized Emergency Management System
SF_6	sulfur hexafluoride
SGMA	Sustainable Groundwater Management Act
SKR	Stephens' kangaroo rat
SLIC	Spills, Leaks, Investigations, and Cleanups
SMARA	Surface Mining and Reclamation Act
SMARTs	Stormwater Multiple Application and Report Tracking System
SO_2	sulfur dioxide
SoCalGas	Southern California Gas Company
SO_X	sulfur oxides
SR-243	State Route 243
SR-62	State Route 62
SR-74	State Route 74
SRA	Source Receptor Area
SVP	Society of Vertebrate Paleontology
SWPPP	State Water Project
SWRCB	State Water Resources Control Board
TCP	Traffic Control Plan
TMDL	Total Maximum Daily Load
USACE	United States Army Corps of Engineers
USDOT	United States Department of Transportation
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service

VHFHSZ	Very High Fire Hazard Severity Zone
VMT	vehicle miles traveled
VOCs	volatile organic compounds
WDID	Waste Discharge Identification Number
WEAP	Worker's Environmental Awareness Program
WQMP	Water Quality Management Plan
WSC	Western Science Center

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1.0 PROJECT INFORMATION

1. **Project Title:**

   Valley Boulevard Potable Water Transmission Pipelines Project

2. **Lead Agency Name and Address:**

   Eastern Municipal Water District
   2270 Trumble Road
   P.O. Box 8300
   Perris, CA 92572-8300

3. **Contact Person and Phone Number:**

   Joseph Broadhead, Principal Water Resource Specialist
   (951) 928-3777, ext. 4545

4. **Project Location:**

   The approximately 4.4-linear-mile project site alignment transverses both the cities of Perris and Menifee within Riverside County, California. The project site alignment begins at the existing Eastern Municipal Water District (EMWD) Desalination Complex in Menifee at 29285 Valley Boulevard and extends to existing pipeline infrastructure in Perris at the intersection of McLaughlin Road and Goetz Road. In addition, the project site includes a vacant parcel (Assessor's Parcel Number [APN)] 335-080-067) at the intersection of Valley Boulevard and Thornton Avenue in Menifee.

5. **Project Sponsor's Name and Address:**

   Eastern Municipal Water District
   2270 Trumble Road
   P.O. Box 8300
   Perris, CA 92572-8300

6. **General Plan Designation:**

   The project alignment is located primarily within existing public right-of-way, which does not have a land use designation. The area surrounding the project alignment is designated primarily for residential use. The vacant property at Valley Boulevard and Thornton Avenue is designated as 2.1-5 dwelling units per acre (du/ac) Residential (2.1-5 R) in the City of Menifee General Plan.

7. **Zoning:**

   The project alignment would be located within existing public right-of-way that does not have a zoning designation. The area surrounding the project alignment is zoned primarily for residential use. The vacant property at Valley Boulevard and Thornton Avenue is zoned by the City of Menifee as Low Density Residential-2 (LDR-2) [7,200 square feet].

8. Description of Project:

The EMWD proposes to install 4.4 miles of 36-inch-diameter, 30-inch-diameter, and 18-inch-diameter pipelines along Valley Boulevard from the existing EMWD Desalination Complex at 29285 Valley Boulevard in Menifee to the intersection of McLaughlin Road and Goetz Road. The project includes construction and operation of the new water pipelines to improve operational reliability by providing additional conveyance and redundancy for existing transmission pipelines in the project area and to support operation of the proposed Goetz Road water storage tank. A more detailed description of the proposed project is provided in Chapter 2.0, Project Description.

9. Surrounding Land Uses and Setting:

The project area is generally north of Salt Creek, east of an unnamed mountain range found east of Kabian Park, south of Ethanac Road, and west of Interstate 215 (I-215). Surrounding land uses include residential and commercial use areas to the east.

10. Other Public Agencies Whose Approval is Required (e.g., permits, financial approval, or participation agreements):

Please see Section 2.7, Required Permits and Approvals.

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

EMWD initiated consultation with native tribes that are traditionally and culturally affiliated with the geographic area of a proposed project to identify resources of cultural or spiritual value to the tribe. On February 21, 2024, EMWD sent consultation notification letters to tribes on the District's Master List to establish government-to government consultation. EMWD has conducted consultation with three federally recognized tribes: the Pechanga Band of Luiseño Indians (Soboba), Agua Caliente Band of Cahuilla Indians, and the Rincon Band of Luiseño Indians (Rincon). An additional three tribes were contacted but declined consultation or did not respond, as further described in Section 4.18, Tribal Cultural Resources.

2.0 PROJECT DESCRIPTION

The following describes the proposed Valley Boulevard Potable Water Transmission Pipelines Project (project) that is the subject of this Initial Study/Mitigated Negative Declaration (IS/MND) prepared pursuant to the California Environmental Quality Act (CEQA). Eastern Municipal Water District (EMWD) is both the project proponent and the CEQA lead agency for the proposed project.

2.1 PROJECT OVERVIEW

The EMWD proposes to install 4.4 miles of 36-inch-diameter, 30-inch-diameter, and 18-inch-diameter pipelines along Valley Boulevard from EMWD's existing Desalination Complex at 29285 Valley Boulevard in Menifee to the intersection of McLaughlin Road and Goetz Road. The project includes construction and operation of the new water pipelines to improve operational reliability by providing additional conveyance and redundancy for existing transmission pipelines in the project area and to support operation of the proposed Goetz Road water storage tank. Please refer to Section 2.4, Project Characteristics, for a detailed description of the project components.

2.2 PROJECT PURPOSE

The project aims to improve operation reliability and system redundancy by providing additional conveyance for the existing transmission 27-inch-diameter pipeline in Murrieta Road and interconnections to the 12-inch-diameter Ridgemoor Road pipeline, the 12-inch-diameter Rouse Road pipeline, the 12-inch-diameter McCall Boulevard pipeline, the 18-inch-diameter portion of the suction side of the Goetz booster, and the 36-inch-diameter Desalination Complex pipeline. In addition, the proposed pipelines would support operation of the proposed Goetz Road water storage tank, another pressure zone improvement currently underway, with interconnection to the 30-inch-diameter pipeline off Thornton Avenue.

2.3 PROJECT LOCATION

The approximately 4.4-linear-mile project site alignment transverses both the cities of Perris and Menifee within Riverside County, California. The project site alignment begins at the existing Eastern Municipal Water District (EMWD) Desalination Complex in Menifee at 29285 Valley Boulevard and extends to existing pipeline infrastructure in Perris at the intersection of McLaughlin Road and Goetz Road. In addition, the project site includes a vacant parcel (Assessor's Parcel Number [APN)] 335-080-067) at the intersection of Valley Boulevard and Thornton Avenue in Menifee. **Figure 2-1** shows the regional location of the project site.

Regional access to the project site is provided by Interstate 215 (I-215), via McCall Boulevard. I-215 is east of the project site and travels north/south.

2.4 PROJECT CHARACTERISTICS

Proposed project components are described further below. **Figure 2-2** depicts the project site boundaries. The total area of project disturbance is approximately 23.75 acres.

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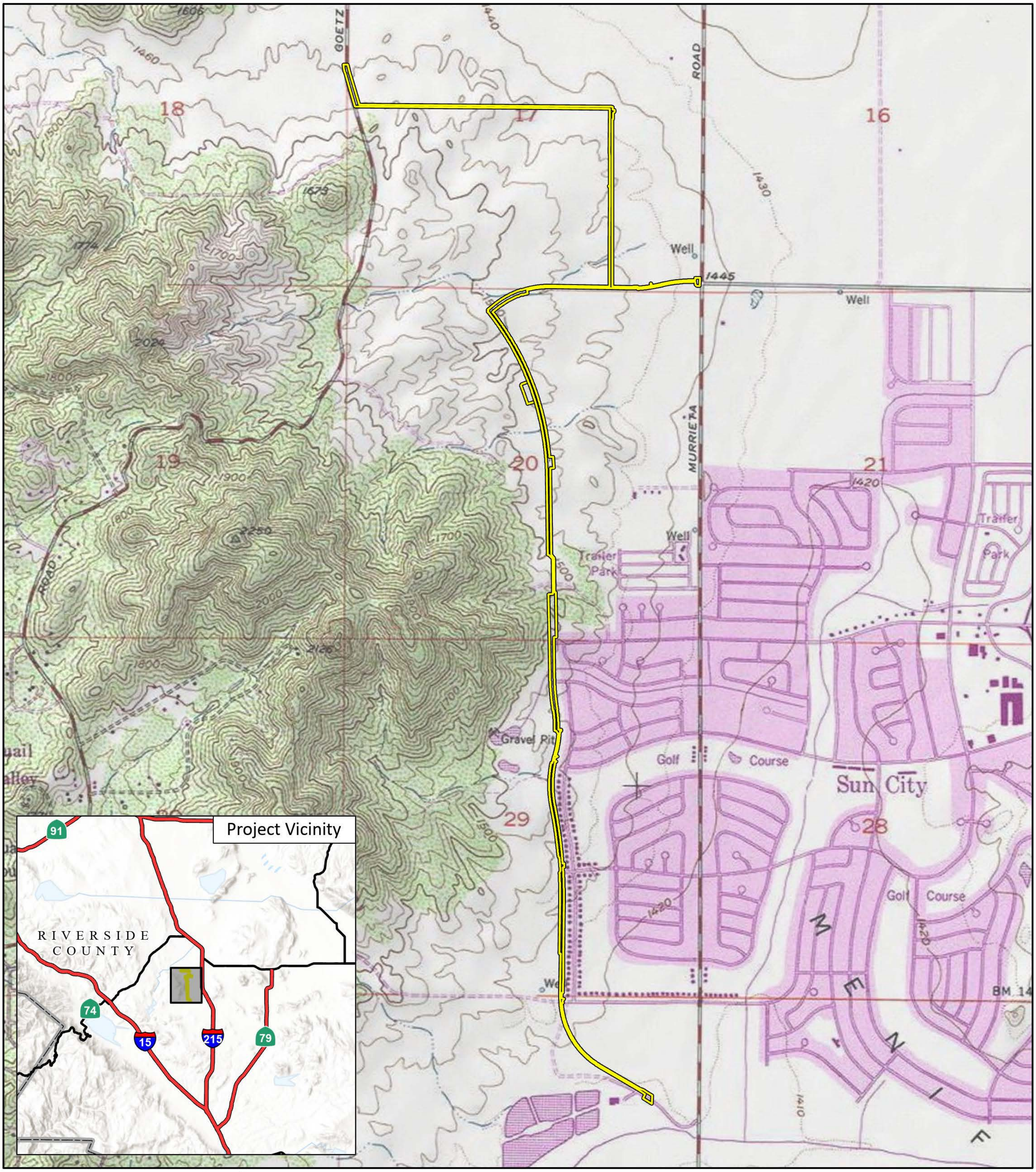

Project Boundary

FIGURE 2-1

0 1000 2000
FEET

SOURCE: USGS 7.5' Quad - *Romoland (1979)*, CA

Valley Boulevard Potable Water Transmission Pipelines Project

Regional Location

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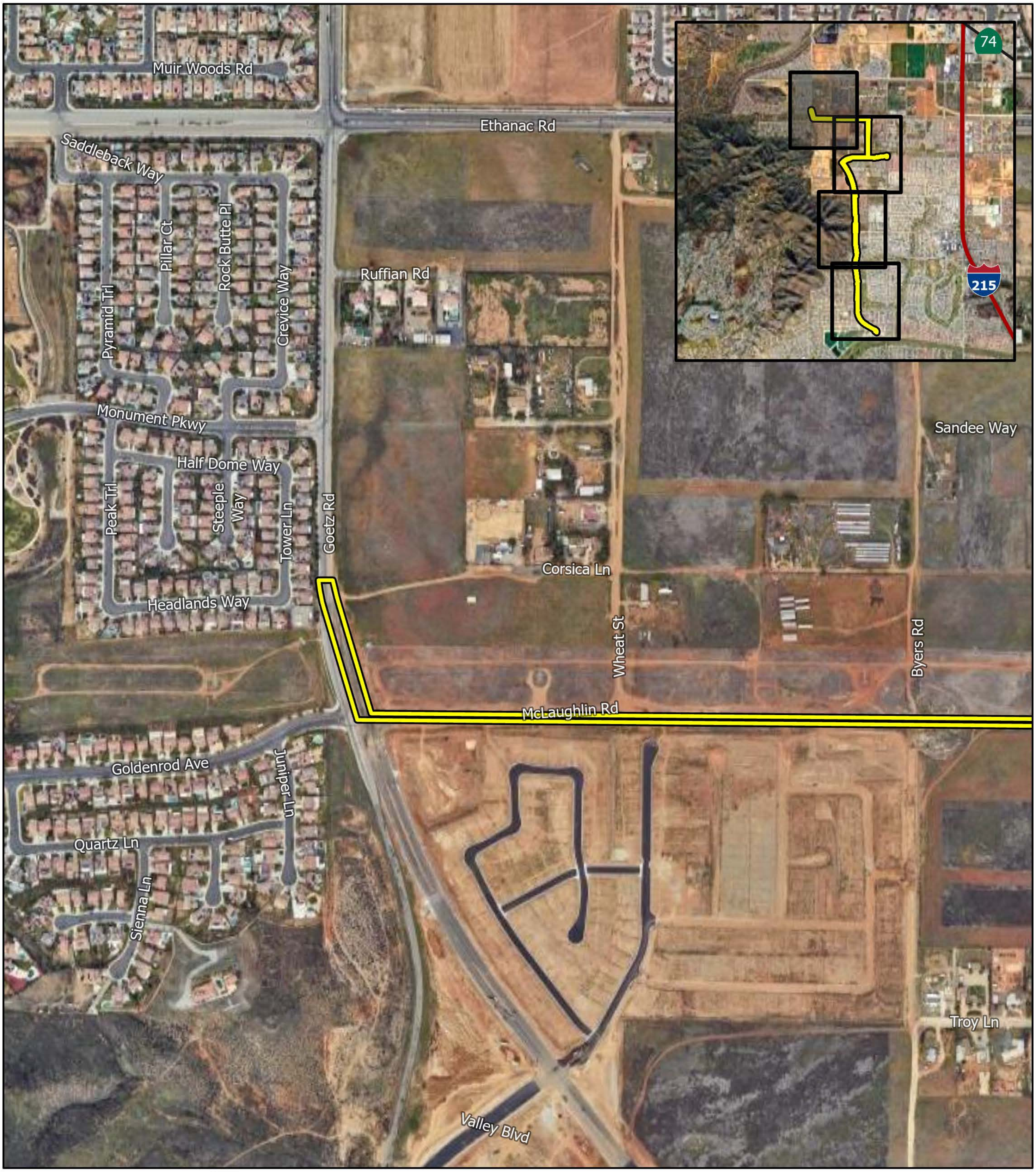

LSA

Project Location

FIGURE 2-2
Sheet 1 of 4

0 300 600
FEET

SOURCE: Google Maps (2023)

Valley Boulevard Potable Water Transmission Pipelines Project
Project Site

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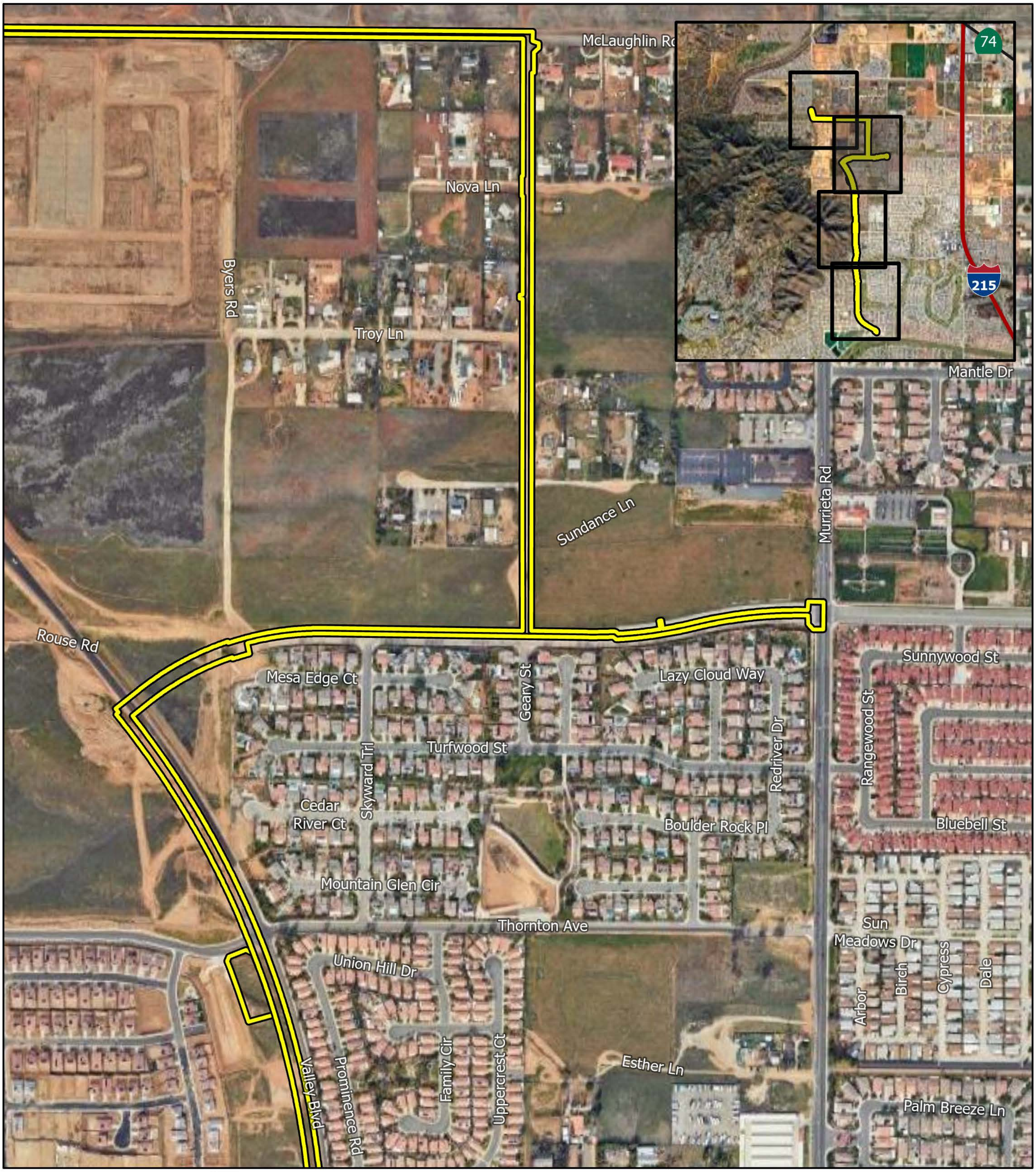

LSA

FIGURE 2-2
Sheet 2 of 4

Valley Boulevard Potable Water Transmission Pipelines Project

Project Site

SOURCE: Google Maps (2023)

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LSA

Project Location

FIGURE 2-2
Sheet 3 of 4

Valley Boulevard Potable Water Transmission Pipelines Project

Project Site

SOURCE: Google Maps (2023)

LSA

Project Location

FIGURE 2-2
Sheet 4 of 4

N

0 300 600
FEET

Valley Boulevard Potable Water Transmission Pipelines Project

Project Site

SOURCE: Google Maps (2023)

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2.4.1 Potable Water Transmission Pipelines

The proposed project would include the installation of the following pipeline segments:

- A 36-inch-diameter pipeline would be installed within Valley Boulevard from the Desalination Complex to connect to an existing 12-inch-diameter pipeline in McCall Boulevard.
- A 30-inch-diameter pipeline would be installed within Valley Boulevard from McCall Boulevard to the proposed valve station at the intersection of Valley Boulevard and Thornton Avenue.
- A 30-inch-diameter pipeline would be installed within Valley Boulevard to the intersection with Rouse Road and then along Rouse Road to the intersection with Murrieta Road, where it would connect to an existing 27-inch-diameter pipeline.
- An 18-inch-diameter pipeline would be installed within Geary Street from Rouse Road to McLaughlin Road, extending along McLaughlin Road to connect to an existing 18-inch-diameter pipeline at the intersection of McLaughlin Road and Goetz Road.

The new pipelines would be fully welded steel installed within the trench with a double pass at the joints. Following installation, the pipe-bedding zone (bottom and 12 inches above the new pipe) would be backfilled with well-graded crushed rock or clean sand to a depth of at least 1 foot over the pipe in accordance with EMWD specifications. Native soil backfill would be placed 12 inches above the top of pipeline to paving subgrade and would comply with the requirements of the respective cities having jurisdiction (e.g., City of Menifee, City of Perris). Backfill would be compacted to minimum density of 90 percent. The upper 3 feet of material beneath the finished surface of the new pavement would be compacted to a dry density of at least 95 percent.

2.4.2 Valve Station

A valve station with a motor-operated valve (MOV) would be constructed on a vacant parcel at the intersection of Valley Boulevard and Thornton Avenue. The facility would include an above-grade MOV on an approximately 640-square-foot concrete pad, ground-mounted remote terminal units, and space allocation for a Southern California Edison (SCE) enclosure, if required by SCE. A new electrical utility service would be required to serve the MOV site equipment. SCE is the utility company serving the project area. Electric service required for the site is anticipated to be 100 amps, 120/240 volts.

Ingress to the proposed facility would be via the eastbound lane on Thornton Avenue, with egress to the southbound lane on Valley Boulevard. The proposed facility would have a 20-foot-wide sliding automated gate entry with key card access at both the Valley Boulevard and the Thornton Avenue access points. The entry from Thornton Avenue would include a concrete-paved parking area for EMWD's 15-ton crane to avoid impacts to Thornton Avenue through traffic.

The site would be enclosed by an 8-foot masonry block wall to be coordinated with the adjacent Cimarron Ridge residential development, which is under construction. On-site security cameras would be provided to detect motion and any intrusion to the site by unauthorized individuals. Site lighting would be installed in compliance with City of Menifee (City) Ordinance No. 2009-24,[1] which requires that projects incorporate "Night Sky" provisions. Proposed lighting would be directed downward and shielded to minimize glare, light spillover and light pollution.

Landscaping would be provided along Valley Boulevard, which would correspond with the planting themes of the Cimarron Ridge development in that area. Stormwater would be discharged to the existing storm drain system in Valley Boulevard.

Alternatively, EMWD may decide to install a buried, manually operated valved connection in the adjacent intersection at Valley Boulevard and Thornton Avenue. A 30-inch diameter pipeline connection with manually operated valve(s) would be constructed below grade.

2.4.3 Easement Acquisition

The proposed project would require acquisition of the following easements to accommodate the project components:

- **APN 335-070-050:** EMWD obtained a 35,070-square-foot easement along the Rouse Road extension east of Valley Boulevard. An additional area north of the Rouse Road Extension has been identified for easement acquisition.

- **APN 335-080-067:** If EMWD proceeds with the valve station, EMWD would obtain a 36,945-square-foot easement for the proposed valve station at the southwest corner of Valley Boulevard and Thornton Avenue. If the buried manual valved connection alternative is selected, no easement would be required.

- **APN 335-080-013:** EMWD obtained an easement along Valley Boulevard, north of McCall Boulevard for an approximate length of 640 feet.

2.5 PROPOSED PROJECT DESCRIPTION

The project includes construction and operation of the new water pipelines, and the associated MOV facility.

2.5.1 Project Construction

Project construction would commence in fall 2025 and is estimated to last 24 months. The proposed pipeline would be constructed as a single-phase project from the connection point north of the Desalination Complex on Valley Boulevard moving north to the pipeline connection at the intersection of McLaughlin Road and Goetz Road. Construction sequencing would be coordinated with the adjacent 30-inch-diameter brackish pipeline project being planned by EMWD, which shares much of the same alignment as the proposed project.

Pipelines would be installed within the existing right-of-way using primarily open-trench construction methods with trenchless technology (e.g., jack and bore) used along Geary Street to

[1] City of Menifee. 2009. Ordinance No. 2009-24. March 3. Website: https://www.cityofmenifee.us/ArchiveCenter/ViewFile/Item/369 (accessed December 2023).

avoid ponded areas. Construction of the proposed pipeline would include demolition and removal of existing asphalt, trenching/trenchless work, fill/compaction activities, pavement reconstruction, landscaping, and concrete flatwork over the length of the project site. Pipeline construction would require a minimum depth of 4 feet to the top of the pipe. The width of each trench would include the outer diameter of each pipe with an additional 2-foot buffer.

Project construction would require exporting an estimated 33,900 cubic yards of soil for grading along unpaved areas of the pipeline alignment, pipeline trenching, and construction at the MOV facility site, and importing 10,500 cubic yards of fill material.

Access to the project site for construction would be via Interstate 215 (I-215) to westbound McCall Boulevard. Work hours would be between 8:30 a.m. and 3:30 p.m. Monday through Friday for work conducted within Menifee. Any extended hours would need to be approved by the City of Menifee as construction progresses. Work hours may be further restricted near Ridgemoor Elementary School to allow for pick-up and drop off. Work hours would be between 7:00 a.m. and 7:00 p.m. for work within Perris. Approximately 80 to 120 linear feet of pipeline would be installed per day. No nighttime construction would take place.

Construction staging areas would be at the following locations subject to City of Perris or City of Menifee approval:

- Unpaved areas along the eastern portion of the Valley Boulevard right-of-way between Ridgemoor Road and Cherry Hills Boulevard
- Unpaved areas along the western portion of the Valley Boulevard right-of-way between the EMWD Desalination Complex and Ridgemoor Road
- Unpaved areas along the northern portion of the Rouse Road right-of-way
- The northern portion of the MOV facility parcel subject to property acquisition

All construction equipment and construction worker vehicles would be staged on the project site, unless determined otherwise by the contractor, for the duration of the construction period. Staging areas would be returned to existing conditions following construction activities.

Construction of the proposed pipeline would employ the use of heavy construction machinery, which would likely include a backhoe, a hydraulic excavator, pick-up and dump trucks, a pavement breaker, a sweeper, a loader, a crane, and a paver. No blasting would be required because no hard rock excavation is anticipated. In some areas, a jackhammer may be needed if a large boulder or similar obstacle is encountered during excavation.

Traffic control plans would be prepared for the recommended project alignment. Traffic control measures would be set up in phases as the work traverses along and across roadways. Traffic through intersections during pipeline construction would generally be managed by using flagging during working hours to maintain two-way traffic. Work at the intersection of Murrieta Road and Rouse Road would require closure of the westbound lane on Rouse Road due to traffic signal operations. The Murrieta Road traffic signal would need to be placed on a four-way flash to maintain one travel lane in each direction.

Groundwater was not encountered at any of the project borings conducted as part of the Geotechnical Investigation,[2] which reached a maximum depth of 21.6 feet. Proposed pipelines would be shallower than 21 feet; thus, groundwater is not anticipated to be encountered during construction. Potable pipeline dewatering would be needed for pipeline connections. Any discharge from potable pipeline dewatering would go into the existing EMWD sewer system.

2.5.2 Project Operation

Operation of the proposed project would be conducted remotely and there would be no full-time dedicated staff at the site. EMWD staff may visit the site occasionally for facility inspections. It is anticipated that project operations would require approximately four 30-minute inspections per month.

2.6 ENVIRONMENTAL COMMITMENTS

The following measures are EMWD construction best management practices (BMPs) that would be implemented as part of the proposed project:

- Groundwater encountered during construction would be discharged to land or storm drains in accordance with applicable permits or discharged to EMWD's sewer for treatment and reuse. If groundwater quality does not meet the permitted discharge requirements for the storm drain, it would be discharged to the sanitary sewer for treatment at EMWD's wastewater treatment plant or would be temporarily stored (on site or at one of the identified staging areas) until it could be properly disposed of in the sewer or at another permitted disposal site.

- A Traffic Control Plan (TCP) would be approved for all construction work within public roadways. The TCP would be prepared in accordance with United States Department of Transportation (USDOT) Manual of Uniform Traffic Control Devices, the California Department of Transportation (Caltrans) Manual of Uniform Traffic Control Devices, and permit requirements by the authority having jurisdiction. Conventional traffic control measures used for a given project could include typical traffic control devices such as traffic cones, K-rails, signs, message boards, flaggers (as needed), and related devices.

- When construction work is not being performed, trenches would be covered with steel plates to restore normal traffic flow.

- All construction work would require the contractor to implement fire hazard reduction measures (e.g., having fire extinguishers located on site, use of spark arrestors on equipment, and using a spotter during welding activities). In addition, all construction work would require the contractor to implement standard fire prevention methods.

[2] Leighton Consulting, Inc. 2023. Desktop Geotechnical/Geology Review Eastern Municipal Water District, Valley Boulevard Potable Water Transmission Pipelines, Menifee, California. April 26.

- Construction would comply with South Coast Air Quality Management District (SCAQMD) Rule 403 Fugitive Dust Control requirements.

- Specifications would require the contractor to prepare a Stormwater Pollution Prevention Plan (SWPPP). Construction would implement BMPs to control water quality of stormwater discharges, according to the SWPPP, such as site management "housekeeping," erosion control, sediment control, trash control, and wind erosion control. BMPs would also include placing drip pans under stationary equipment, using tarps to cover stockpiled soil, and avoiding storing equipment and materials within 50 feet of waterways as appropriate for the site and construction activities.

- The design and construction of facilities would be based on a soils report and geotechnical investigation to minimize geologic risk. Construction and operation would be required to adhere to the recommendations included in the project-specific Geotechnical Investigation.

2.7 REQUIRED PERMITS AND APPROVALS

This Initial Study/Mitigated Negative Declaration (IS/MND) is intended to serve as the CEQA document for all actions associated with the project, including all discretionary approvals requested or required of EMWD to implement the project. In addition, this IS/MND is the reference document for the formulation and implementation of a Mitigation Monitoring and Reporting Program (MMRP) for the proposed project.

The project may require approvals, permits, or authorization from other agencies, classified as "Responsible Agencies" under CEQA. According to Section 15381 of the *State CEQA Guidelines*, a Responsible Agency is defined as a public agency other than the Lead Agency that will have discretionary approval power over the proposed project or some component of the project, including mitigation. Responsible Agencies are identified in **Table 2.A.**

Table 2.A: Required Permits and Approvals

Permit/Approval	Permitting/Approving Agency	Permit/Approval Trigger
National Polluant Discharge Elimination System (NPDES) Construction General Permit	California Regional Water Quality Control Board (RWQCB), Region 8, Santa Ana	Required prior to construction activity, upon completion of Notice of Intent and Stormwater Pollution Prevention Program (SWPPP).
National Pollutant Discharge Elimination System (NPDES) Final Water Quality Management Plan pursuant to the MS4 Permit	California Regional Water Quality Control Board (RWQCB), Region 8, Santa Ana	Required prior to construction activity at the MOV facility site.
Permit to Construct, Dust Control Permits	South Coast Air Quality Management District (SCAQMD)	Required prior to construction activity.
Encroachment Permit	City of Menifee	Required prior to advertising the proposed project, upon completion of the Notice of Intent.
Encroachment Permit	City of Perris	Required prior to advertising the proposed project, upon completion of the Notice of Intent.
Encroachment Permit	Riverside County Flood Control District	Required prior to advertising the proposed project, upon completion of the Notice of Intent.

Table 2.A: Required Permits and Approvals

Permit/Approval	Permitting/Approving Agency	Permit/Approval Trigger
Separation Alternative Request	State Water Resources Control Board Division of Drinking Water	Required prior to construction, if separation requirements cannot be met.
Safety and Health Regulations for Construction, Requirements for Protective Systems (29 CFR 1926.651 and 1926.652)	California Division of Occupational Safety and Health (Cal/OSHA)	Required to be implemented during project construction.

Source: Compiled by LSA (2024).
CFR = Code of Federal Regulations MOV = motor-operated valve MS4 = Municipal Separate Storm Sewer System

3.0 ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact;" however, all of these impacts would be reduced to a less than significant level and are therefore designated as "Less Than Significant with Mitigation Incorporated" as indicated by the checklist in Chapter 4.0.

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

3.1 DETERMINATION

On the basis of this initial evaluation:

☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☒ I find 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.

☐ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find 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.

☐ I find 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 ENVIRONMENTAL IMPACT REPORT or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier ENVIRONMENTAL IMPACT REPORT or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

	5-1-25
Signature	Date

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4.0 CEQA ENVIRONMENTAL CHECKLIST

4.1 AESTHETICS

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Except as provided in Public Resources Code Section 21099, 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 a publicly accessible vantage point.) If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	☐	☐	☒	☐
d. Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☒	☐

*a. Would the project have a substantial effect on a scenic vista? **(Less Than Significant Impact)***

A scenic vista is defined as a viewpoint that provides expansive views of a highly valued landscape for the benefit of the general public. Aesthetic components of a scenic vista generally include: (1) scenic quality, (2) sensitivity level, and (3) view access. The proposed project is in an area characterized by residential and commercial development. Development in the project vicinity includes local roads, residential housing, and commercial uses.

As described in the City of Menifee's (City's) General Plan,[3] scenic features in Menifee include gently sloping alluvial fans, rugged mountains and steep slopes, mountain peaks and ridges, rounded hills with boulder outcrops, farmland, and open space. Scenic views from Menifee include the San Jacinto Mountains to the northeast and east; the San Bernardino Mountains to the north; the San Gabriel Mountains to the northwest; and the Santa Ana Mountains to the west and southwest. The City of Menifee General Plan includes goals and policies to protect the city's undisturbed slopes, hillsides, rock outcroppings, and other natural landforms. Exhibit OSC-2 illustrates Menifee's significant slopes. The nearest significant slopes to the project site are located to the east of the project site. Similarly, scenic vistas identified in Perris include the western, eastern, and northern views of the surrounding foothills, and the view north of the San Bernardino Mountains. Scenic vistas of surrounding hillsides are visible from various locations throughout the project site where there is no intervening development.

3 City of Menifee. 2015. Open Space and Conservation Element. Website: https://www.cityofmenifee.us/874/OSC-3-Natural-Landforms (accessed April 16, 2024).

Upon completion, the proposed pipelines would be located underground and out of view. The only aboveground facilities associated with the proposed project would include the proposed motor-operated valve (MOV) facility surrounded by an 8-foot masonry block wall. These facilities would be visible from adjacent public roadways, including Valley Boulevard and Thornton Avenue. Landscaping would be provided along Valley Boulevard, which would correspond with the planting themes of the Cimarron Ridge development in that area and provide screening of proposed facilities from public vantage points. With the exception of the antenna, proposed structures would be low level (e.g., less than one story) and would not block, impair, or substantially affect views on a permanent basis. Proposed improvements would occur on the flat lands and would not affect surrounding hillsides or significantly block views of such hillsides from publicly accessible vantage points.

During construction of the project, activities such as trucks hauling materials and machinery would be temporarily visible to some viewers along local roadways and from adjacent residential uses. Construction equipment and materials would be staged along the proposed pipeline alignment. The construction period would be temporary; therefore, the presence of construction equipment would result in minor short-term changes in the views from public vantage points. As such, implementation of the proposed project would not result in a substantial adverse effect on a scenic vista. This impact would be **less than significant.**

b. *Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?* ***(No Impact)***

The California Department of Transportation (Caltrans) administers the State Scenic Highway Program, which provides guidance to local government agencies, community organizations, and citizens on the process for officially designating a California State Scenic Highway. In Riverside County, the Banning-Idyllwild Panoramic Highway (State Route 243 [SR-243]) connecting Interstate 10 (I-10) and State Route 74 (SR-74), State Route 62 (SR-62) from I-10 near Whitewater to the Arizona state line, and SR-74 from Interstate 5 (I-5) to the city limits of Palm Desert are officially designated California State Scenic Highways.[4] None of these California State Scenic Highways are near the project site; therefore, the project site would not be directly visible from any of these roadways.

There are three County Eligible Scenic Highways in the City of Menifee: Interstate 215 (I-215) from McCall Boulevard south to the Menifee city limits; McCall Boulevard from I-215 on the west to Menifee Road on the east; and Menifee Road from McCall Boulevard north to the Menifee city limits. None of these scenic corridors are located in proximity to the project site.

No historic buildings or rock outcroppings are located on the project site or in the surrounding vicinity. As described in Section 4.4, Biological Resources, implementation of the proposed project would require minimal tree removal. Therefore, implementation of the proposed project would not

4 California Department of Transportation (Caltrans). 2021. California State Scenic Highway System Map. Website: https://www.arcgis.com/home/item.html?id=f0259b1ad0fe4093a5604c9b838a486a (accessed July 27, 2023).

damage scenic resources within a State or locally designated scenic roadway, and **no impact** would occur.

c. *In non-urbanized areas, would the project 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 a publicly accessible vantage point.) If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?* ***(Less Than Significant Impact)***

The existing visual character in the vicinity of the project consists primarily of residential development and undeveloped areas designated for residential development. Existing development and undeveloped hillsides define the visual character of the immediate project area. The project site is visible from public roadways, including Valley Boulevard, Rouse Road, Geary Street, Thornton Avenue, McLaughlin Road.

The proposed project would install new underground pipelines within Valley Boulevard, Rouse Road, Geary Street, and McLaughlin Road. Upon completion, proposed pipelines would be underground and out of view. The proposed project would also include construction of an MOV facility surrounded by an 8-foot masonry block wall. These facilities would be visible from publicly accessible viewpoints along Valley Boulevard and Thornton Avenue. As part of the proposed project, landscaping would be provided along Valley Boulevard that would provide screening of the MOV facility. In general, the proposed project has been designed to be consistent with the adjacent residential development and includes features (e.g., landscaping) to minimize impacts to the visual quality and character of the surrounding environment.

Construction activities associated with the proposed project would be visible from public roadways and adjacent residential development. However, all temporary construction-related visual impacts such as construction equipment, staging areas, stockpile locations, and construction fencing would be removed following completion of construction. Therefore, implementation of the proposed project would not degrade the existing visual character or quality of the project site and its surroundings. This impact would be **less than significant.**

d. *Would the project create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?* ***(Less Than Significant Impact)***

As described in Section 2.4, Project Characteristics, site lighting would be installed at the MOV facility in compliance with Menifee City Ordinance No. 2009-24,[5] which requires that projects incorporate "Night Sky" provisions. Proposed lighting would be directed downward and shielded to minimize glare, light spillover, and light pollution. As described in Section 2.5.1, Project Construction, no nighttime work would occur; therefore, there would be no temporary

[5] City of Menifee. 2009. Ordinance No. 2009-24. March 3. Website: https://www.cityofmenifee.us/ArchiveCenter/ViewFile/Item/369 (accessed December 2023).

construction-related sources of light associated with the proposed project. The project would not create a new source of substantial light or glare that would adversely affect day or nighttime views in the area. This impact would be **less than significant**.

4.2 AGRICULTURE AND FORESTRY 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) 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 (CAL FIRE) regarding the State's inventory of forest land (including the Forest and Range Assessment Project and the Forest Legacy Assessment Project) and the forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board (CARB).

	Potentially Significant Impact	**Less Than Significant with Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
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?	☐	☐	☐	☒

a. Would the project 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 proposed project would be constructed within the existing previously disturbed right-of-way of the following streets:

- Within Valley Boulevard from the Desalination Complex to the intersection with Rouse Road
- Within Rouse Road from Valley Boulevard to the intersection with Murrieta Road
- Within Geary Street from Rouse Road to McLaughlin Road
- Within McLaughlin Road from Geary Street to Goetz Road

Additionally, the proposed project would include construction of an MOV facility on a vacant parcel at the intersection of Valley Boulevard and Thornton Avenue. Maps prepared by the California Department of Conservation Farmland Mapping and Monitoring Program (FMMP) classify the project area as "Urban and Built-Up Land," "Grazing Land" west of Valley Boulevard at the proposed MOV facility site, and "Farmland of Local Importance" west of Valley Boulevard, north of Rouse Road and around McLaughlin Road.[6] Urban and Built-Up Land is occupied by structures with a building density of at least one unit to 1.5 acres, or approximately six structures to a 10-acre parcel. Common examples include residential, industrial, commercial, institutional facilities, cemeteries, airports, golf courses, sanitary landfills, sewage treatment, and water control structures. Grazing Land is land on which the existing vegetation is suited to the grazing of livestock. Farmland of Local Importance is land of importance to the local agricultural economy as determined by each county's Board of Supervisors and a local advisory committee. These lands contain soils that would be classified as Prime and Statewide farmland but lack available irrigation water.

Although portions of the project site are located on land designated as Farmland of Local Importance, proposed pipelines would be installed within roadway right-of-way and would not impact undisturbed land or land available for agricultural use. Therefore, the project would not convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to a non-agricultural use. **No impact** would occur.

b. *Would the project conflict with existing zoning for agricultural use, or a Williamson Act contract?* ***(No Impact)***

The proposed pipelines would be located primarily within existing public rights-of-way that do not have a land use or zoning designation in either the General Plan or Zoning Maps for Perris or Menifee. The area surrounding the proposed pipelines has a variety of zoning designations, including low-density residential, high-density residential, and public utility corridor. The proposed pipelines would be installed primarily within the roadway right-of-way; however, some pipeline segments would be constructed within unpaved areas and/or would be constructed in conjunction with roadway improvements. Neither the roadway right-of-way nor the adjacent land uses are designated for agricultural use.

A valve station with an MOV and remote terminal units would be constructed on a vacant parcel at the intersection of Valley Boulevard and Thornton Avenue. This parcel is designated 2.1-5 dwelling units per acre (du/ac) Residential (2.1-5 R) in the City of Menifee General Plan and is zoned Low Density Residential-2 (LDR-2) (7,200 square feet) in the City of Menifee Zoning Ordinance, neither of which allow for agricultural use.

Proposed improvements would not impact land zoned for agricultural use or under a Williamson Act contract. Therefore, implementation of the project would not conflict with existing zoning for agricultural use or a Williamson Act contract. **No impact** would occur.

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6 California Department of Conservation (DOC). 2022. California Department of Conservation, Division of Land Resource Protection. California Important Farmland Finder. Website: https://maps.conservation.ca.gov/dlrp/ciff/ (accessed April 19, 2023).

c. Would the project 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)***

As discussed in Sections 4.2.a and 4.2.b above, the General Plan and Zoning Maps for Menifee and Perris do not specify a land use or zoning designation for public right-of-way. The proposed MOV facility would be located on land designated for low-density residential use. Land uses surrounding the project site are primarily residential. The proposed project is not located on forest land or timberland and would not conflict with existing zoning for, or cause rezoning of, forest land, timberland, or timberland zoned as Timberland Production.[7] **No impact** would occur.

d. Would the project result in the loss of forest land or conversion of forestland to non-forest use? ***(No Impact)***

Refer to Section 4.2.c above. The project site is not considered forest land, and the proposed project would not result in the loss of forest land or conversion of forestland to non-forest use. **No impact** would occur.

e. Would the project 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)***

None of the project parcels are currently used as farmland or forest land. The proposed project would not result in the conversion of farmland on or off the project site to non-agricultural uses because there are no agricultural uses on or in the immediate vicinity of the project site. Likewise, the proposed project would not result in impacts related to changes in the existing environment that could result in the conversion of agricultural land to non-agricultural uses. **No impact** would occur.

[7] California Department of Fish and Wildlife (CDFW). n.d. California Forests and Timberlands Map. Website: https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=109917&inline (accessed April 19, 2024).

4.3 AIR QUALITY

Where available, the significance criteria established by the applicable Air Quality Management District or Air Pollution Control District may be relied upon to make the following determinations.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
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?	☐	☐	☒	☐

The project site is located within the South Coast Air Basin (Basin). The South Coast Air Quality Management District (SCAQMD) is the regional government agency that monitors and regulates air pollution within the Basin. The federal Clean Air Act and the California Clean Air Act mandate the control and reduction of specific air pollutants. Under these acts, the United States Environmental Protection Agency (USEPA) and the CARB have established ambient air quality standards (AAQS) for specific "criteria" pollutants that are designed to protect public health and welfare. Primary criteria pollutants include carbon monoxide (CO), volatile organic compounds (VOC), nitrogen oxides (NO_X), particulate matter less than 10 microns in size (PM_{10}), sulfur dioxide (SO_2), and lead (Pb). Secondary criteria pollutants include ozone (O_3), and particulate matter less than 2.5 microns in size ($PM_{2.5}$). The ambient air quality standard for each criteria pollutant represents the level that is considered safe to the public and avoids specific adverse health effects associated with each criteria pollutant.

The Basin is in nonattainment for the federal and State standards for O_3 and $PM_{2.5}$, and nonattainment for the State PM_{10} standard. In addition, the Basin is in attainment/maintenance for the federal PM_{10}, CO, SO_2, and nitrogen dioxide (NO_2) standards. The SCAQMD has established project-level California Environmental Quality Act (CEQA) thresholds for VOCs, NO_X, CO, SO_2, PM_{10}, and $PM_{2.5}$.

The SCAQMD considers any project in the Basin with construction- or operation-related emissions that exceed any of the emission thresholds identified in **Table 4.3.A** to have potentially significant impacts.

Table 4.3.A: SCAQMD CEQA Construction and Operation Thresholds of Significance

Emission Source	Pollutant Emissions Threshold (lbs/day)					
	VOCs	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
Construction Thresholds	75	100	550	150	150	55
Operation Thresholds	55	55	550	150	150	55

Source: South Coast Air Quality Management District (SCAQMD). n.d. Fact Sheet for Applying CalEEMod to Localized Significance Thresholds. Website: http://www.aqmd.gov/docs/default-source/ceqa/handbook/localized-significance-thresholds/caleemod-guidance.pdf (accessed March 2024).

CEQA = California Environmental Quality Act
CO = carbon monoxide
lbs/day = pounds per day
NO_X = nitrogen oxides
$PM_{2.5}$ = particulate matter less than 2.5 microns in size
PM_{10} = particulate matter less than 10 microns in size
SCAQMD = South Coast Air Quality Management District
SO_2 = sulfur dioxide
VOCs = volatile organic compounds

In addition, the SCAQMD published its Final Localized Significance Threshold Methodology in June 2003 (updated July 2008), recommending that all air quality analyses include an assessment of air quality impacts to nearby sensitive receptors.[8] This guidance was used to analyze potential localized air quality impacts associated with construction of the proposed project. Localized significance thresholds (LSTs) are developed based on the size or total area of the emission source, the ambient air quality in the source receptor area, and the distance between the proposed project and the nearest sensitive receptor. The SCAQMD defines structures that house persons (e.g., children, the elderly, persons with pre-existing respiratory or cardiovascular illness, and athletes and others who engage in frequent exercise) or places where they gather as sensitive receptors (i.e., residences, schools, playgrounds, child-care centers, convalescent centers, retirement homes, and athletic fields). The nearest sensitive receptors include single-family residential units located adjacent to the project site along Valley Boulevard.

LSTs are based on the ambient concentrations of that pollutant within the project Source Receptor Area (SRA) and the distance to the nearest sensitive receptor. For the proposed project, the appropriate SRA for the LST is the Perris Valley (SRA 24). SCAQMD provides LST screening tables for 25-, 50-, 100-, 200-, and 500-meter source-receptor distances. As mentioned above, the closest sensitive receptors to the project site are the single-family homes located adjacent to the project site along Valley Boulevard. In cases where receptors may be closer than 82 feet (25 meters), any distances within the 82-foot (25-meter) buffer zone can be used. As such, the minimum distance of 82 feet (25 meters) was used for purposes of the LST assessment.

The total area of project disturbance is approximately 23.75 acres. Therefore, based on the anticipated construction equipment and on the anticipated grading and ground-disturbing activities, it is assumed that the maximum daily disturbed area for the proposed project would be 5 acres.[9] As such, the LSTs for a 5-acre site at 82 feet (25 meters) were derived by interpolation.

8 South Coast Air Quality Management District (SCAQMD). 2008. *Final Localized Significance Threshold Methodology.* July. Website: http://www.aqmd.gov/docs/default-source/ceqa/handbook/localized-significance-thresholds/final-lst-methodology-document.pdf (accessed March 2024).

9 South Coast Air Quality Management District (SCAQMD). n.d. Fact Sheet for Applying CalEEMod to Localized Significance Thresholds. Website: http://www.aqmd.gov/docs/default-source/ceqa/handbook/localized-significance-thresholds/caleemod- guidance.pdf (accessed March 2024).

Table 4.3.B shows the emission thresholds that would apply based on the project size and distance to nearby receptors during project construction and operation.

Table 4.3.B: SCAQMD Localized Significance Thresholds

Emission Source	Pollutant Emissions Threshold (lbs/day)			
	NO_X	CO	PM_{10}	$PM_{2.5}$
Construction	270	1,577	13	8
Operation	270	1,577	4	2

Source: *Final Localized Significance Threshold Methodology.* (SCAQMD 2008).
CO = carbon monoxide
lbs/day = pounds per day
NO_X = nitrogen oxides
PM_{10} = particulate matter less than 10 microns in size
$PM_{2.5}$ = particulate matter less than 2.5 microns in size
SCAQMD = South Coast Air Quality Management District

a. *Would the project conflict with or obstruct implementation of the applicable air quality plan?* ***(Less Than Significant Impact)***

An Air Quality Management Plan (AQMP) describes air pollution control strategies to be undertaken by a city or county in a region classified as a nonattainment area to meet the requirements of the federal Clean Air Act. The main purpose of an AQMP is to bring an area into compliance with the requirements of federal and State AAQS. The Basin is in nonattainment for the federal and State standards for O_3 and $PM_{2.5}$. Therefore, the Basin is classified as a nonattainment area and an AQMP is required. The applicable air quality plan is the SCAQMD's adopted 2022 Air Quality Management Plan (2022 AQMP).[10] The AQMP is based on regional growth projections developed by the Southern California Association of Governments (SCAG).

A consistency determination plays an essential role in local agency project review by linking local planning and unique individual projects to the air quality plans. A consistency determination fulfills the CEQA goal of fully informing local agency decision-makers of the environmental costs of the project under consideration at a stage early enough to ensure that air quality concerns are addressed. Only new or amended General Plan elements, Specific Plans, and significantly unique projects need to undergo a consistency review given that the air quality plan strategy is based on projections from local General Plans.

Both the City of Menifee and City of Perris General Plans are consistent with the SCAQMD 2022 AQMP. Pursuant to the methodology provided in the SCAQMD *CEQA Air Quality Handbook,* consistency with the SCAQMD 2022 AQMP is affirmed when a project: (1) would not increase the frequency or severity of an air quality standards violation or cause a new violation, and (2) is consistent with the growth assumptions in the AQMP. Consistency review is presented as follows:

10 South Coast Air Quality Management District (SCAQMD). 2022. *2022 Air Quality Management Plan.* Adopted December 2, 2022.

1. The proposed project would result in short-term construction and long-term operational pollutant emissions that are all less than the CEQA significance emissions thresholds established by SCAQMD, as demonstrated in Section 4.3.b, below. Therefore, the proposed project would not result in an increase in the frequency or severity of an air quality standards violation or cause a new air quality standards violation.

2. The *CEQA Air Quality Handbook* indicates that consistency with AQMP growth assumptions must be analyzed for new or amended General Plan elements, Specific Plans, and significant projects. Significant projects include airports, electrical generating facilities, petroleum and gas refineries, designation of oil drilling districts, water ports, solid waste disposal sites, and offshore drilling facilities. The proposed project would install 4.4 miles of new water pipelines along Valley Boulevard from EMWD's existing Desalination Complex at 29285 Valley Boulevard in Menifee to the intersection of McLaughlin Road and Goetz Road; therefore, the proposed project is not defined as significant. In addition, the proposed project would not require a change to the General Plan land use designation or the current zoning.

Based on the consistency analysis presented above, the proposed project would not conflict with or obstruct implementation of the applicable air quality plan. Impacts would be **less than significant,** and no mitigation is required.

*b. Would the project 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)***

As identified above, the Basin is currently designated as nonattainment for the federal and State standards for O_3 and $PM_{2.5}$. The Basin's nonattainment status is attributed to the region's development history. Past, present, and future development projects contribute to the region's adverse air quality impacts on a cumulative basis. By its very nature, air pollution is largely a cumulative impact. No single project is sufficient in size to, by itself, result in nonattainment of AAQS. Instead, a project's individual emissions contribute to existing cumulatively significant adverse air quality impacts. If a project's contribution to the cumulative impact is considerable, then the project's impact on air quality would be considered significant.

In developing thresholds of significance for air pollutants, the SCAQMD considered the emission levels for which a project's individual emissions would be cumulatively considerable. If a project exceeds the identified SCAQMD significance thresholds identified above in **Table 4.3.A**, its emissions would be cumulatively considerable, resulting in significant adverse air quality impacts to the region's existing air quality conditions. Therefore, additional analysis to assess cumulative impacts is not necessary. The following analysis assesses the potential project-level air quality impacts associated with construction and operation of the proposed project.

Construction Emissions. During construction, short-term degradation of air quality may occur due to the release of particulate matter emissions (i.e., fugitive dust) generated by site preparation and grading activities. Emissions from construction equipment are also anticipated and would include CO, NO_X, VOC, directly emitted $PM_{2.5}$ or PM_{10}, and toxic air contaminants such as diesel exhaust particulate matter (DPM).

Project construction activities would include demolition and removal of existing asphalt, trenching/ trenchless work, fill/compaction activities, pavement reconstruction, landscaping, and concrete flatwork over the length of the project site. Construction-related effects on air quality from the proposed project would be greatest during the grading and excavation phase due to the disturbance of soils. If not properly controlled, these activities would temporarily generate particulate emissions. Sources of fugitive dust would include disturbed soils at the construction site. Unless properly controlled, vehicles leaving the site would deposit dirt and mud on local streets, which could be an additional source of airborne dust after it dries. PM_{10} emissions would vary from day to day, depending on the nature and magnitude of construction activity and local weather conditions. PM_{10} emissions would depend on soil moisture, silt content of soil, wind speed, and amount of operating equipment. Larger dust particles would settle near the source, whereas fine particles would be dispersed over greater distances from the construction site.

Water or other soil stabilizers can be used to control dust, resulting in emission reductions of 50 percent or more. SCAQMD has established Rule 403: Fugitive Dust, which would require EMWD to implement measures that would reduce the amount of particulate matter generated during the construction period. The Rule 403 measures that were incorporated in this analysis include:

- Water active sites at least three times daily (locations where grading is to occur shall be thoroughly watered prior to earthmoving).
- Cover all trucks hauling dirt, sand, soil, or other loose materials, or maintain at least 2 feet (0.6 meter) of freeboard (vertical space between the top of the load and the top of the trailer) in accordance with the requirements of California Vehicle Code Section 23114.
- Reduce traffic speeds on all unpaved roads to 15 miles per hour (mph) or less.

In addition to dust-related PM_{10} emissions, heavy trucks and construction equipment powered by gasoline and diesel engines would generate CO, sulfur oxides (SO_X), NO_X, VOCs, and some soot particulate ($PM_{2.5}$ and PM_{10}) in exhaust emissions. If construction activities were to increase traffic congestion in the area, CO and other emissions from traffic would increase slightly while those vehicles idle in traffic. These emissions would be temporary in nature and limited to the immediate area surrounding the construction site.

Construction emissions were estimated for the project using the California Emissions Estimator Model version 2022.1 (CalEEMod). The construction schedule assumes that construction would begin in September 2024 and would occur for 24 months, which was included in CalEEMod. The proposed project would include approximately 30,000 to 40,000 square feet of asphalt demolition. The exact demolition quantities have not been determined yet; however, to be conservative, this analysis assumes 40,000 square feet of asphalt demolition, which was included in CalEEMod. In addition, the proposed project would include the export of approximately 33,900 cubic yards of soil and the import of approximately 10,500 cubic yards of soil, which was also included in CalEEMod. This analysis utilized the construction equipment provided by EMWD, which assumes the use of backhoes/loader, a hydraulic excavator, cranes, a utility truck, a water truck, a welder, a compressor, a pump, pick-up trucks, dump trucks, a concrete saw, a concrete pumper, a pavement breaker, a sweeper, a paver, and generators.

This analysis assumes compliance with SCAQMD Rule 403 measures and the use of Tier 2 construction equipment, which was also included in CalEEMod. All other construction details are not yet known; therefore, default assumptions (e.g., construction worker and vendor truck trips and fleet activities) from CalEEMod were used. Construction emissions are summarized in **Table 4.3.C** below. Appendix A provides CalEEMod output sheets.

Table 4.3.C: Short-Term Regional Construction Emissions

Construction Year	Total Daily Regional Pollutant Emissions (lbs/day)							
	VOCs	NOX	CO	SOX	Fugitive PM10	Exhaust PM10	Fugitive PM2.5	Exhaust PM2.5
2024	1.9	54.0	43.1	0.1	2.4	1.7	0.4	1.6
2025	1.9	53.9	53.9	0.1	2.4	1.7	0.4	1.6
2026	1.7	52.9	42.4	0.1	1.8	1.5	0.3	1.4
Peak Daily Emissions	**1.9**	**54.0**	**43.9**	**0.1**	**4.1**		**2.0**	
SCAQMD Threshold	**75.0**	**100.0**	**550.0**	**150.0**	**150.0**		**55.0**	
Significant?	**No**	**No**	**No**	**No**	**No**		**No**	

Source: Compiled by LSA Associates, Inc. (February 2025).
CO = carbon monoxide
lbs/day = pounds per day
NO_X = nitrogen oxides
$PM_{2.5}$ = particulate matter less than 2.5 microns in size
PM_{10} = particulate matter less than 10 microns in size
SCAQMD = South Coast Air Quality Management District
SO_X = sulfur oxides
VOCs = volatile organic compounds

As shown in **Table 4.3.C**, construction emissions associated with the project would not exceed the SCAQMD's thresholds for VOCs, NO_X, CO, SO_X, $PM_{2.5}$, and PM_{10}. Therefore, construction of the proposed project would not result in a cumulatively considerable increase of any criteria pollutant for which the project region is in nonattainment under an applicable federal or State AAQS. Impacts would be **less than significant**.

Operational Emissions. Long-term air pollutant emission impacts are those associated with mobile sources (e.g., vehicle trips), energy sources (e.g., electricity), and area sources (e.g., landscape maintenance equipment use) related to the proposed project.

Based on Section 4.17, Transportation, no additional trips are anticipated due to implementation of the proposed project. As such, the proposed project would not result in a significant increase in the generation of vehicle trips or vehicle miles traveled (VMT) that would increase air pollutant emissions. Although operation of the proposed project would include the use of electricity associated with the MOV facility, the purpose of the proposed project is to improve efficiency of the existing pipelines. Therefore, the proposed project would not result in a substantial source of energy or area source emissions. Therefore, operation of the proposed project would not 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 AAQS. Impacts would be **less than significant,** and no mitigation is required.

*c. Would the project expose sensitive receptors to substantial pollutant concentrations? **(Less Than Significant Impact)***

Sensitive receptors are people who have an increased sensitivity to air pollution or environmental contaminants. The SCAQMD defines structures that house persons (e.g., children, the elderly, persons with pre-existing respiratory or cardiovascular illness, and athletes and others who engage in frequent exercise) or places where they gather (i.e., residences, schools, playgrounds, child-care centers, convalescent centers, retirement homes, and athletic fields) as sensitive receptors.

As previously discussed, LSTs are based on the ambient concentrations of that pollutant within the project SRA and the distance to the nearest sensitive receptor. The closest sensitive receptors to the project site are the single-family homes located adjacent to the project site along Valley Boulevard. For the proposed project, the appropriate SRA for the LST is Perris Valley (SRA 24). Based on the anticipated construction equipment and the anticipated grading and ground-disturbing activities, it is assumed that the maximum daily disturbed area for the proposed project would be 5 acres.[11]

The results of the LST analysis for construction of the proposed project are summarized in **Table 4.3.D** below. As shown in **Table 4.3.D**, the proposed project would not result in an exceedance of a SCAQMD LST during project construction. During construction, construction contractors would be required to implement measures to reduce or eliminate emissions by implementing SCAQMD Rule 403 dust control measures. In addition, the maximum daily emissions associated with project construction emissions are identified in **Table 4.3.C** and indicate the project would not exceed the significance criteria for VOC, NO, CO, SO_x, PM_{10}, or $PM_{2.5}$ emissions. Therefore, the emissions associated with construction of the proposed project would not be expected to exceed the most stringent applicable federal or State ambient air quality standards. It should be noted that the AAQS are developed and represent levels at which the most susceptible persons (children and the elderly) are protected. In other words, the AAQS are purposefully set low to protect children, the elderly, and those with existing respiratory problems. Therefore, given the temporary nature of short-term construction impacts, and the absence of any exceeded threshold of significance related to construction impacts, construction of the proposed project would not exceed SCAQMD thresholds and would not expose nearby sensitive receptors to substantial pollutant concentrations. No significant health risk would occur from project construction emissions. Additionally, as discussed in Section 4.3.b, the proposed project operational activities would not be considered significant. Therefore, the project would not expose sensitive receptors to substantial pollutant concentrations during project construction or operation. Impacts would be **less than significant**.

11 South Coast Air Quality Management District (SCAQMD). n.d. Fact Sheet for Applying CalEEMod to Localized Significance Thresholds. Website: http://www.aqmd.gov/docs/default-source/ceqa/handbook/localized-significance-thresholds/caleemod- guidance.pdf (accessed March 2024).

Table 4.3.D: Project Localized Construction Emissions (in Pounds Per Day)

Source	NO_X	CO	PM_{10}	$PM_{2.5}$
On-Site Project Emissions	52.7	39.3	2.9	1.7
Localized Significance Threshold	270.0	1,577.0	13.0	8.0
Exceeds Threshold?	**No**	**No**	**No**	**No**

Source: Compiled by LSA Associates, Inc (February 2025).
Note: Source Receptor Area 24, based on a 5-acre construction disturbance daily area, at a distance of 25 meters.
CO = carbon monoxide $PM_{2.5}$ = particulate matter less than 2.5 microns in size
NO_X = nitrogen oxides PM_{10} = particulate matter less than 10 microns in size

d. Would the project result in other emissions (such as those leading to odors) adversely affecting a substantial number of people? ***(Less Than Significant Impact)***

Heavy-duty equipment on the project site during construction would emit odors, primarily from equipment exhaust. However, the construction activity would cease after individual construction is completed. No other sources of objectionable odors have been identified for the proposed project.

Additionally, the proposed project would be required to implement standard control measures to limit fugitive dust and construction equipment emissions, which would reduce odor impacts, in accordance with SCAQMD Rules 402, 1103, and 1113. SCAQMD Rule 402 regarding nuisances states:

> A person shall not discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property.

SCAQMD Rule 1113 limits the VOC content of architectural coatings (e.g., paint), and SCAQMD Rule 1108 identifies standards regarding the application of asphalt. Adherence to the standards identified in SCAQMD Rules 1113 and 1108 is required for all construction projects to reduce emissions and the impact of objectionable odors.

Land uses generally associated with long-term objectionable odors include agricultural uses, wastewater treatment plants, food-processing plants, chemical plants, composting operations, refineries, landfills, dairies, and fiberglass molding facilities. As described above, the proposed project would install 4.4 miles of new water pipelines along Valley Boulevard from EMWD's existing Desalination Complex at 29285 Valley Boulevard in Menifee to the intersection of McLaughlin Road and Goetz Road, and the proposed uses are not anticipated to emit any objectionable odors. Therefore, the proposed project would not result in other emissions (such as those leading to odors) adversely affecting a substantial number of people. There would be **no impact**.

4.4 BIOLOGICAL RESOURCES

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
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 Game or 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, regulations or by the California Department of Fish and Game or 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?	☐	☐	☐	☒

The following section is based on the Biological Resources Assessment[12] prepared for the proposed project. This report is included as Appendix B.

Regulatory Framework. The proposed project occurs within the planning boundaries of the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) area. The MSHCP is a comprehensive multi-jurisdictional effort that includes western Riverside County and multiple cities. EMWD is not signatory to the MSHCP. EMWD is not pursuing a Participating Special Entity (PSE) designation for the project site. The MSHCP defines PSE agencies as any regional public facility provider (e.g., a utility company), or public district, or any other agency that owns land or operates a facility within the MSHCP Plan Area. The following MSHCP policies and procedures do not apply to this project and are not addressed in this report: Protection of Species Associated with Riparian/Riverine Areas and Vernal Pools (MSHCP Section 6.1.2), Protection of the Narrow Endemic Plant Species (MSHCP Section 6.1.3), Additional Survey Needs and Procedures (MSHCP Section

[12] LSA Associates, Inc. 2024b. Biological Resources Assessment, Valley Boulevard Potable Water Transmission Pipelines Project, City of Menifee, Riverside County, California (LSA Project No. EWD2101.04). October.

6.3.2), and Urban/Wildland Interface Guidelines (MSHCP Section 6.1.4). The MSHCP allows participating entities to issue take permits for listed species so that individual applicants need not seek their own permits from the USFWS and/or CDFW. In order to obtain MSHCP coverage as a PSE, the project is required to demonstrate MSHCP compliance through specific habitat assessments, applicable biological surveys, and the provision of an MSHCP consistency analysis. Given that the project would not be processed through the MSHCP for covered species, the project is subject to the federal Endangered Species Act (FESA) and/or the California Endangered Species Act (CESA) for threatened, endangered, and/or candidate species.

The proposed project is also located within the planning area of the Stephens' Kangaroo Rat (SKR) Habitat Conservation Plan (HCP); however, as a public agency, the EMWD is exempt from the requirements of the SKR HCP.

Vegetation. Vegetation within the project study area consists primarily of developed, buckwheat scrub, and nonnative grassland, with patches of brittlebush scrub-disturbed, disturbed and barren ground, as well as ornamental landscaping located throughout residential and commercial areas.

Dominant species within nonnative grassland include mouse barley (*Hordeum murinum*), red brome (*Bromus rubens*), and common Mediterranean grass (*Schismus barbatus*). Other species observed within nonnative grassland include Russian thistle (*Salsola tragus*), prickly lettuce (*Lactuca serriola*), Bermuda grass (*Cynodon dactylon*), and wild oat (*Avena fatua*).

Dominant species within buckwheat scrub include California buckwheat (*Eriogonum fasciculatum*). Other species observed within buckwheat scrub include California sagebrush (*Artemisia californica*), Mediterranean grass, valley cholla (*Cylindropuntia bernardina*), and brittlebush (*Encelia farinosa*).

Dominant species within brittlebush scrub-disturbed include brittlebush and stinknet (*Oncosiphon pilulifer).* Other species observed within brittlebush scrub-disturbed include shortpod mustard (*Hirschfeldia incana*), prickly sow thistle (*Sonchus asper*), Mediterranean grass, and California aster (*Corethrogyne filaginifolia*).

There are no other plant communities on the site. Areas mapped as developed consist of lawn, ornamental landscaping, areas containing manmade structures, and paved roads. Areas mapped as disturbed and barren ground consist of well-traveled dirt roads that do not allow for the establishment of vegetation. A complete list of plant species observed on the site is included as Appendix A of the Biological Resources Assessment. **Figure 4.4-1** shows the vegetation and land cover. **Figure 4.4-2** provides photographs of the existing site conditions.

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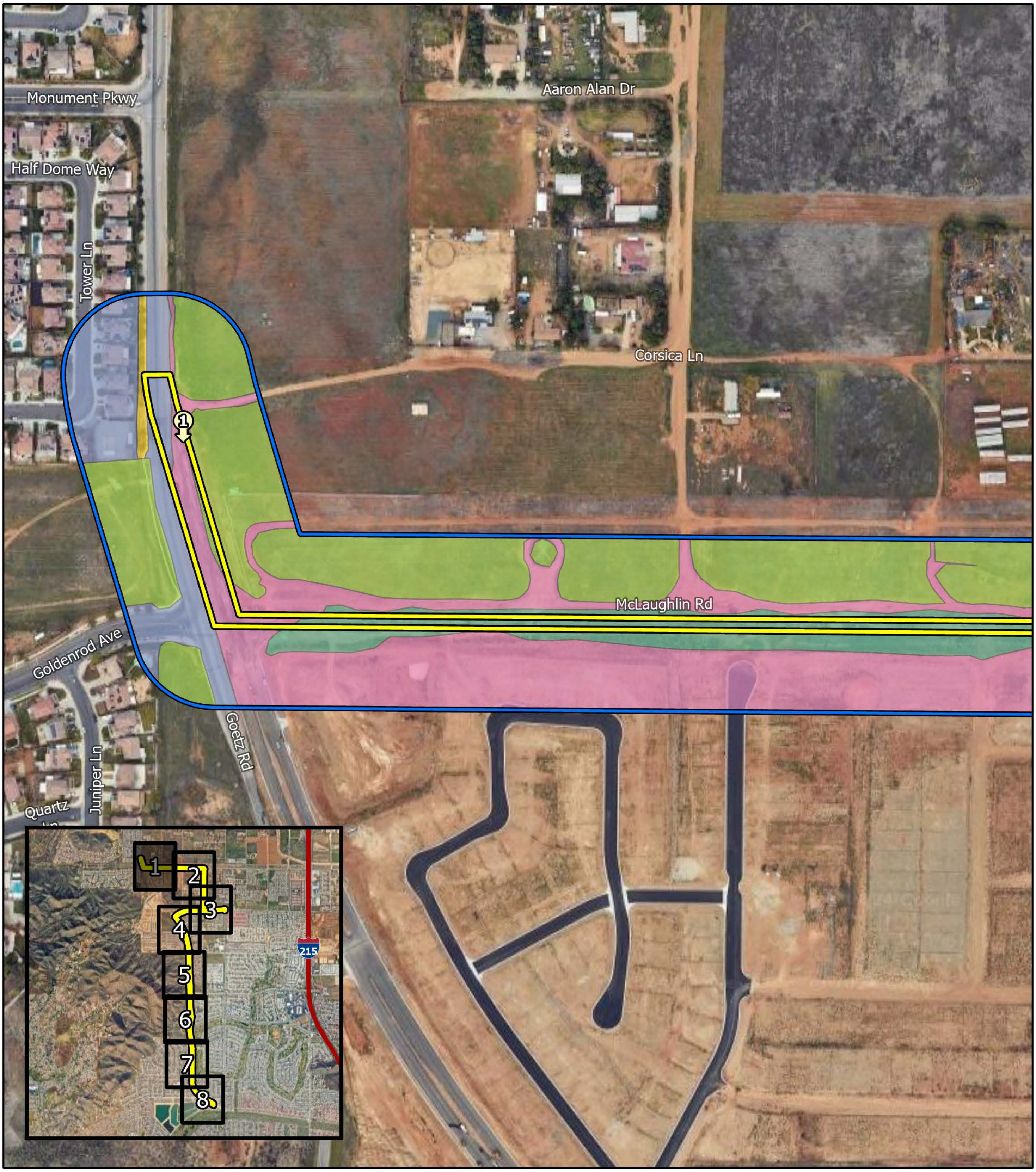

LSA

Project Boundary
Study Area (200-ft Buffer)
Photo Points
Vegetation Communities/Land Use
Brittlebush Scrub - Disturbed (4.83 ac)
Developed (116.05 ac)
Disturbed or Barren (37.37 ac)
Non-native Grassland (47.15 ac)
Ornamental (3.10 ac)

N

0 160 320
FEET

SOURCE: Google Maps (2023)

FIGURE 4.4-1
Sheet 1 of 8

Valley Boulevard Potable Water Transmission Pipelines Project

Vegetation and Land Use

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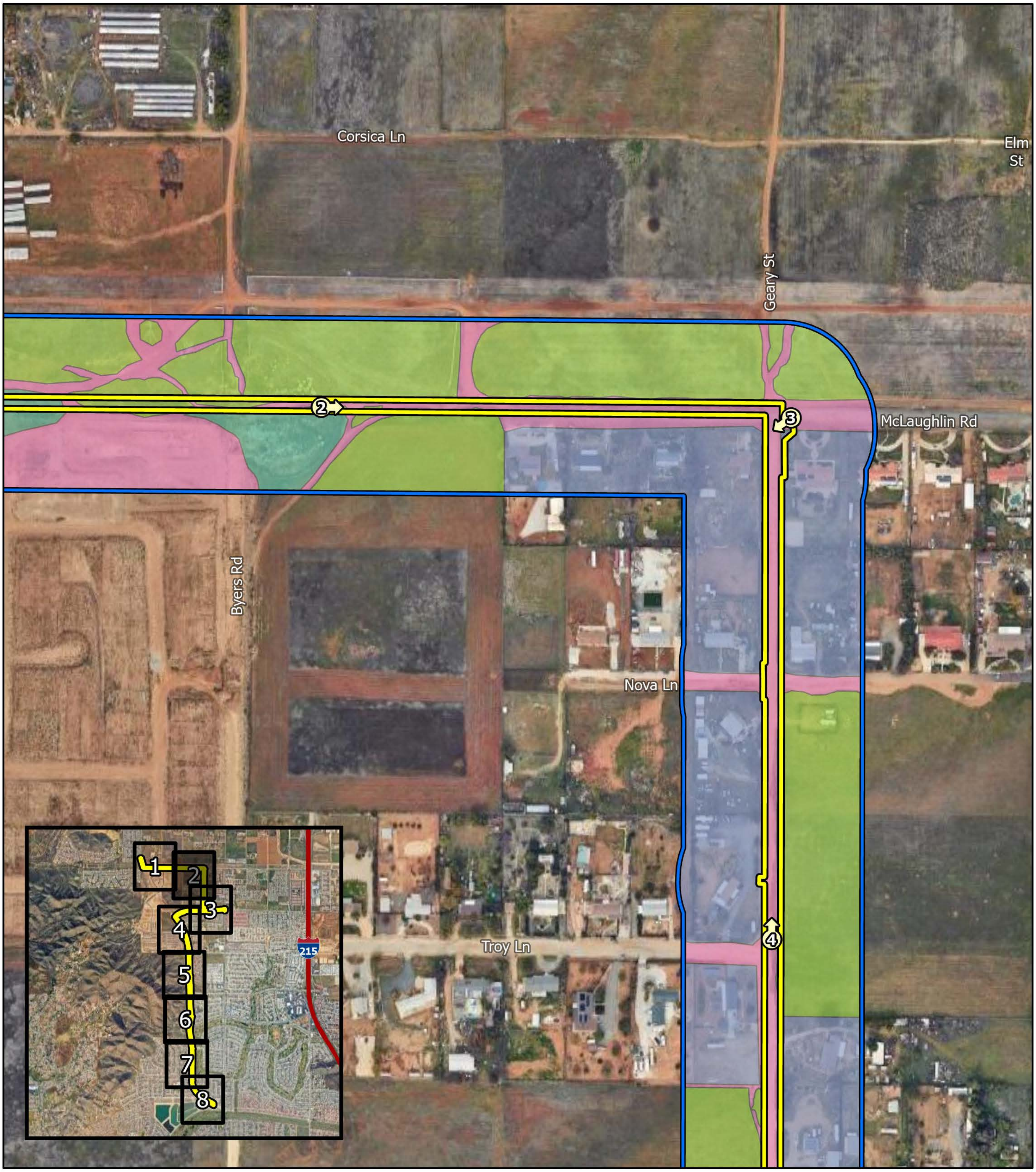

LSA

Project Boundary
Study Area (200-ft Buffer)
Photo Points
Vegetation Communities/Land Use
Brittlebush Scrub - Disturbed (4.83 ac)
Developed (116.05 ac)
Disturbed or Barren (37.37 ac)
Non-native Grassland (47.15 ac)

N

0 160 320
FEET

FIGURE 4.4-1
Sheet 2 of 8

Valley Boulevard Potable Water Transmission Pipelines Project

Vegetation and Land Use

SOURCE: Google Maps (2023)

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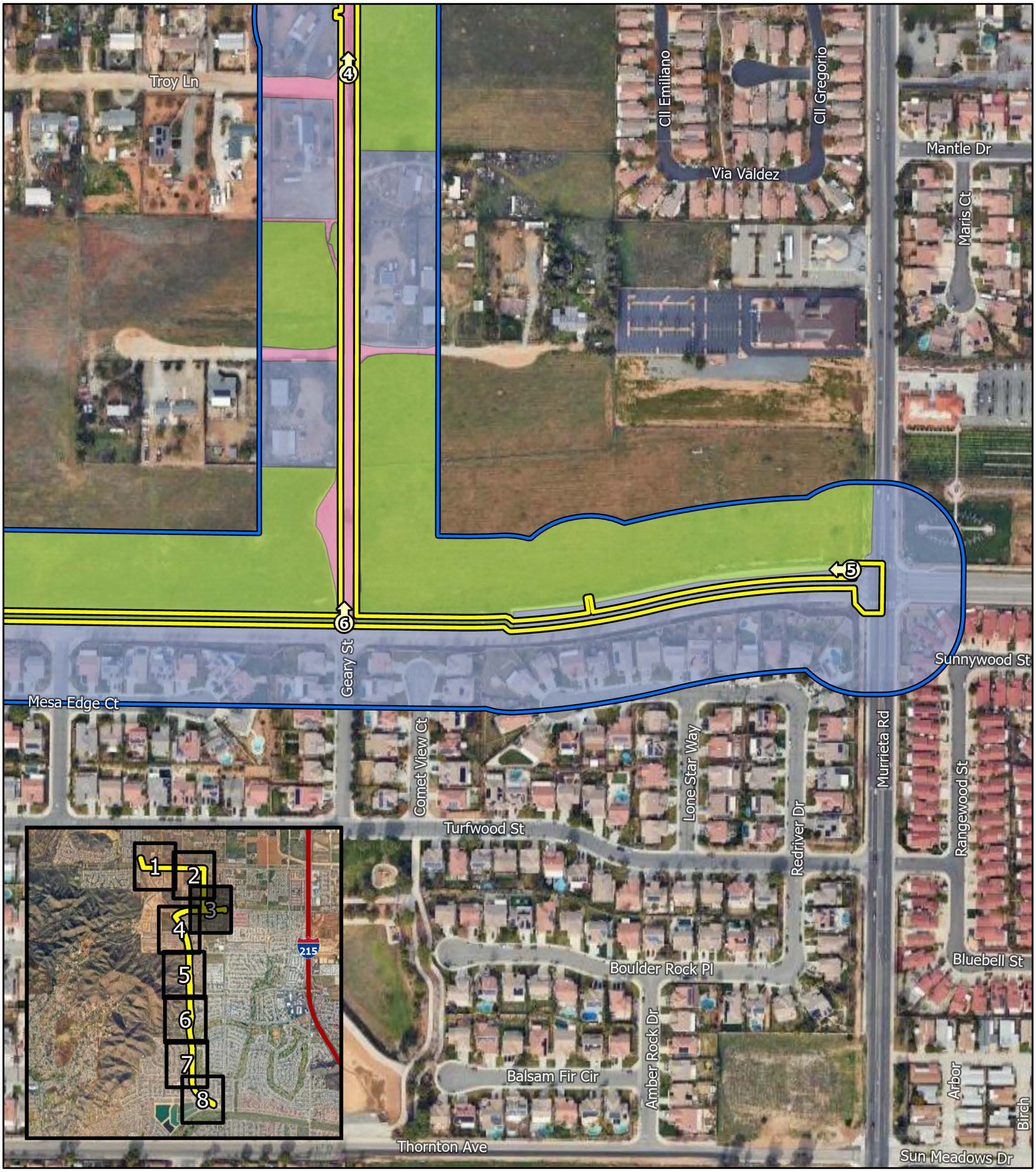

LSA

Project Boundary

Study Area (200-ft Buffer)

Photo Points

Vegetation Communities/Land Use

Developed (116.05 ac)

Disturbed or Barren (37.37 ac)

Non-native Grassland (47.15 ac)

FIGURE 4.4-1

Sheet 3 of 8

0 160 320

FEET

Valley Boulevard Potable Water Transmission Pipelines Project

Vegetation and Land Use

SOURCE: Google Maps (2023)

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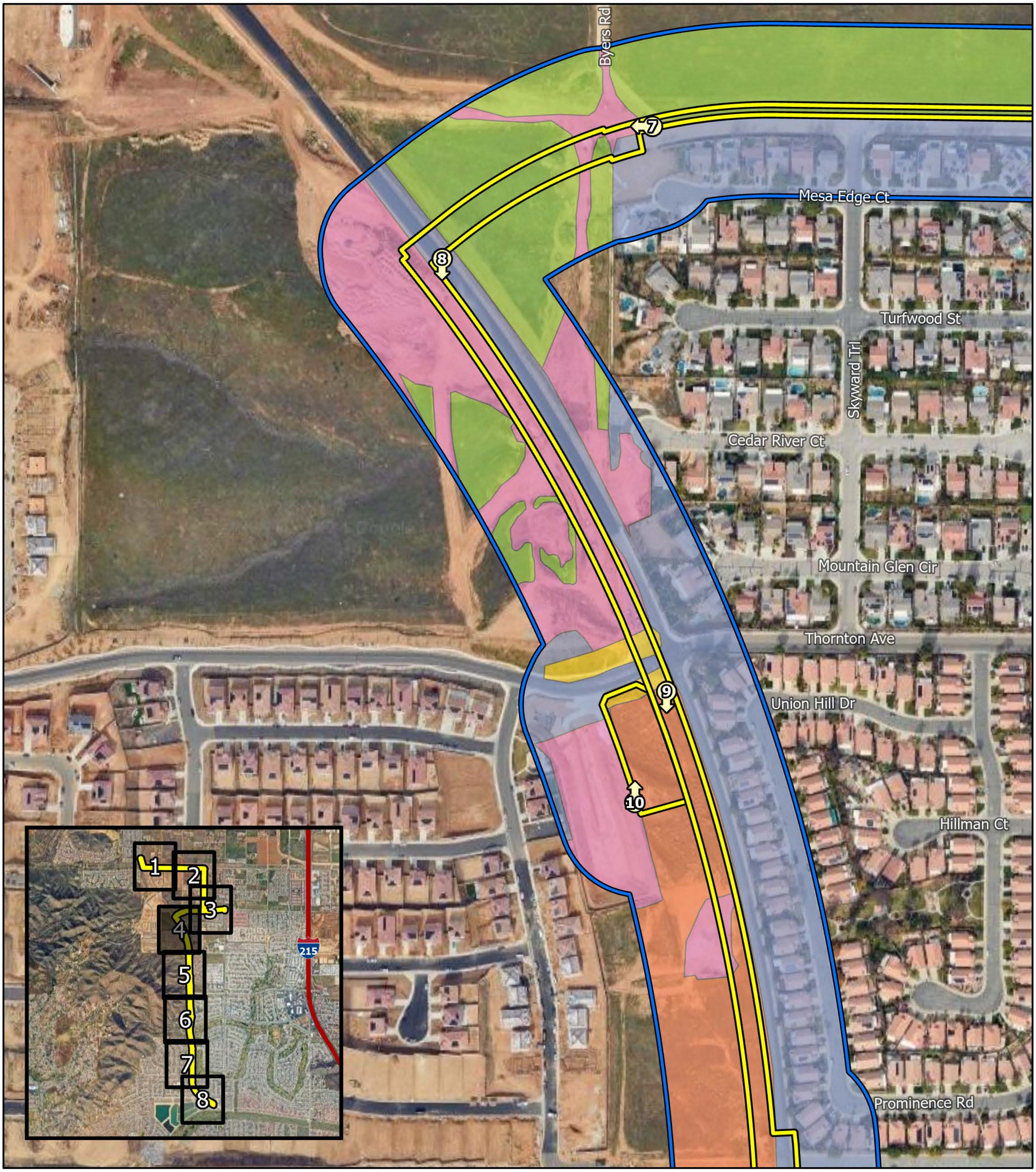

LSA

Project Boundary
Study Area (200-ft Buffer)
Photo Points
Vegetation Communities/Land Use
Buckwheat Scrub (30.20 ac)
Developed (116.05 ac)
Disturbed or Barren (37.37 ac)
Non-native Grassland (47.15 ac)
Ornamental (3.10 ac)

0 160 320
FEET

FIGURE 4.4-1
Sheet 4 of 8

Valley Boulevard Potable Water Transmission Pipelines Project

Vegetation and Land Use

SOURCE: Google Maps (2023)

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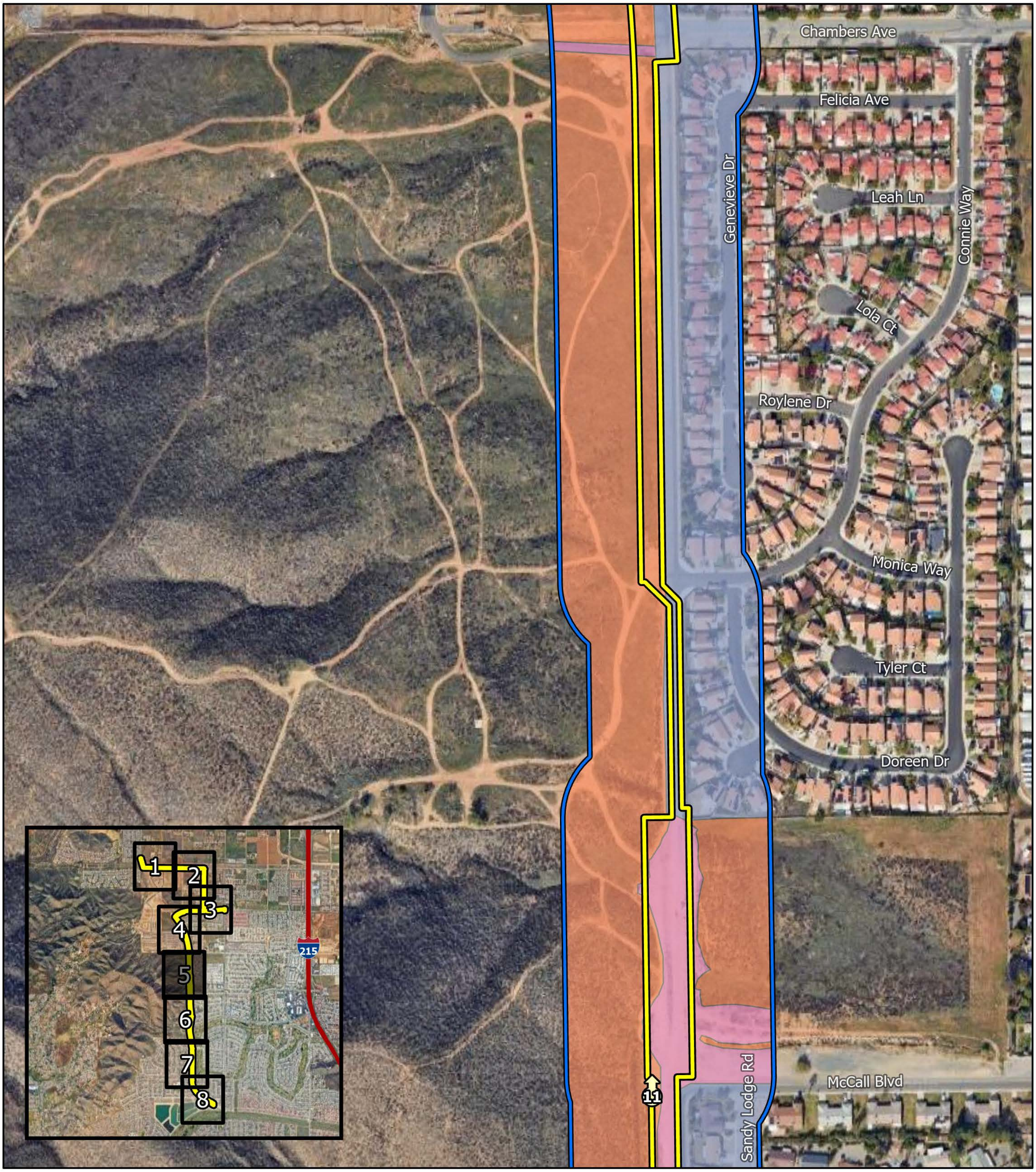

LSA

Project Boundary

Study Area (200-ft Buffer)

Photo Points

Vegetation Communities/Land Use

Buckwheat Scrub (30.20 ac)

Developed (116.05 ac)

Disturbed or Barren (37.37 ac)

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FEET

FIGURE 4.4-1
Sheet 5 of 8

Valley Boulevard Potable Water Transmission Pipelines Project

Vegetation and Land Use

SOURCE: Google Maps (2023)

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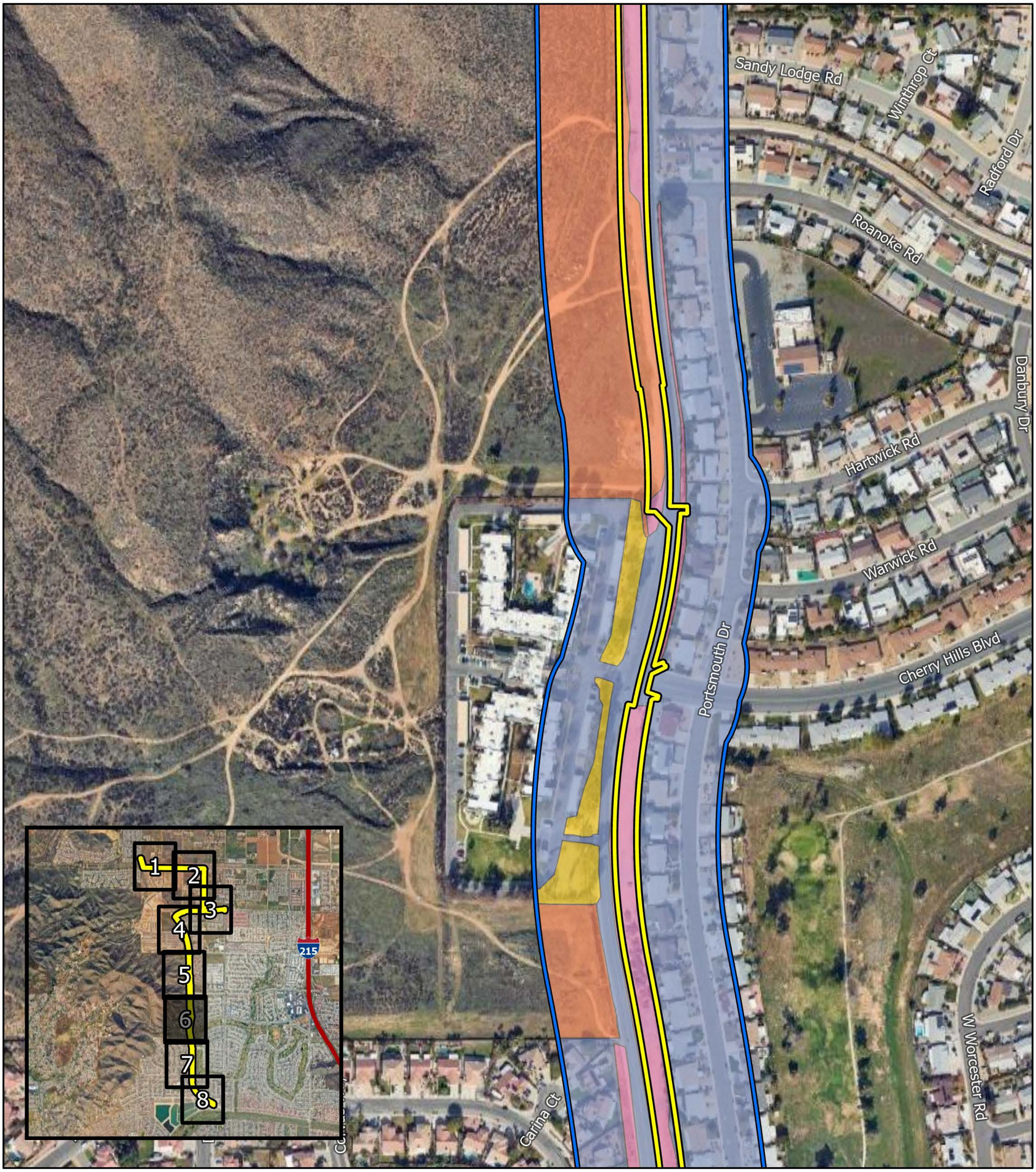

LSA

Project Boundary
Study Area (200-ft Buffer)
Vegetation Communities/Land Use
Buckwheat Scrub (30.20 ac)
Developed (116.05 ac)
Disturbed or Barren (37.37 ac)
Ornamental (3.10 ac)

FIGURE 4.4-1
Sheet 6 of 8

0 160 320
FEET

SOURCE: Google Maps (2023)

Valley Boulevard Potable Water Transmission Pipelines Project

Vegetation and Land Use

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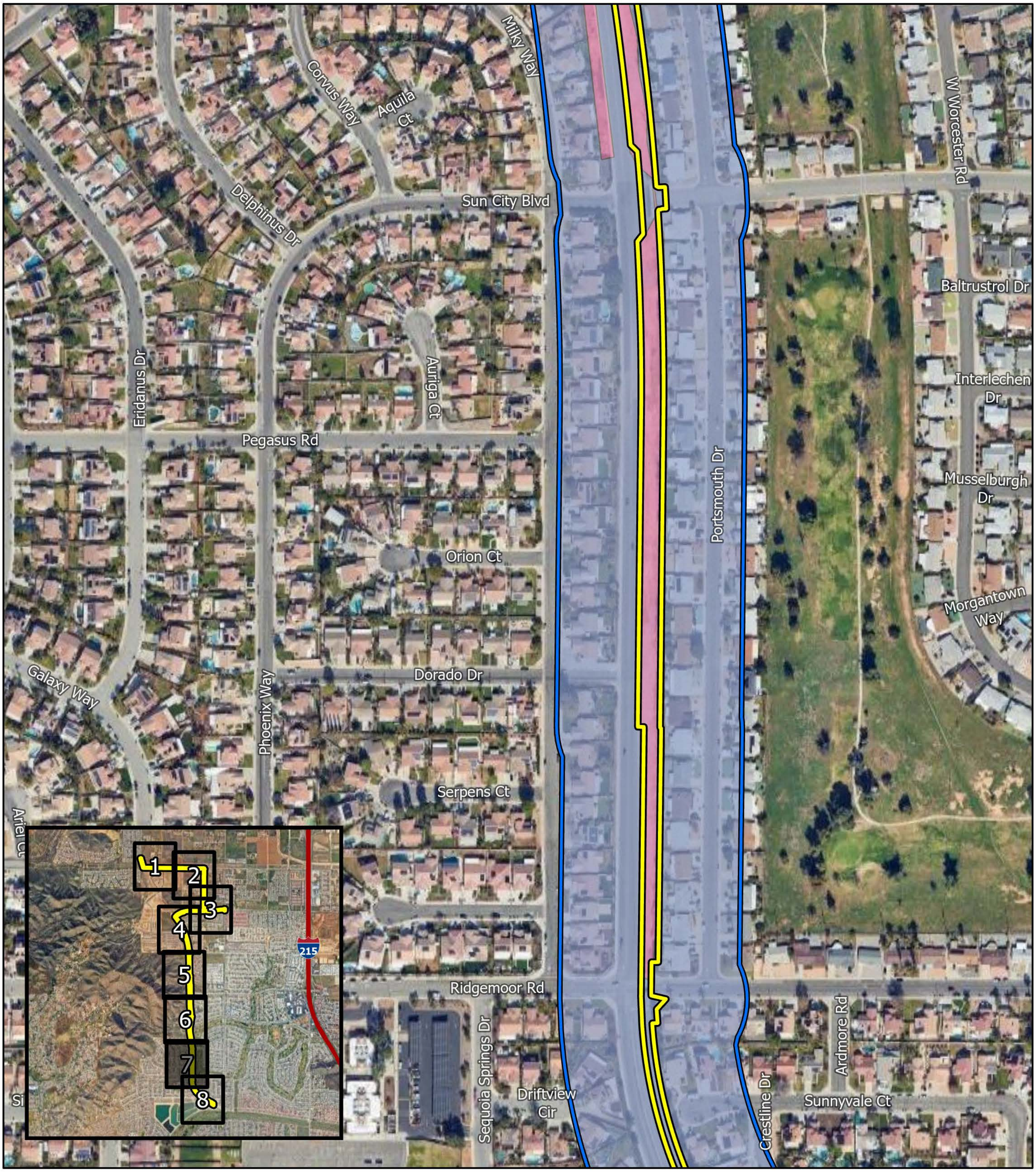

LSA

Project Boundary

Study Area (200-ft Buffer)

Vegetation Communities/Land Use

Developed (116.05 ac)

Disturbed or Barren (37.37 ac)

N

0 160 320
FEET

FIGURE 4.4-1
Sheet 7 of 8

Valley Boulevard Potable Water Transmission Pipelines Project

Vegetation and Land Use

SOURCE: Google Maps (2023)

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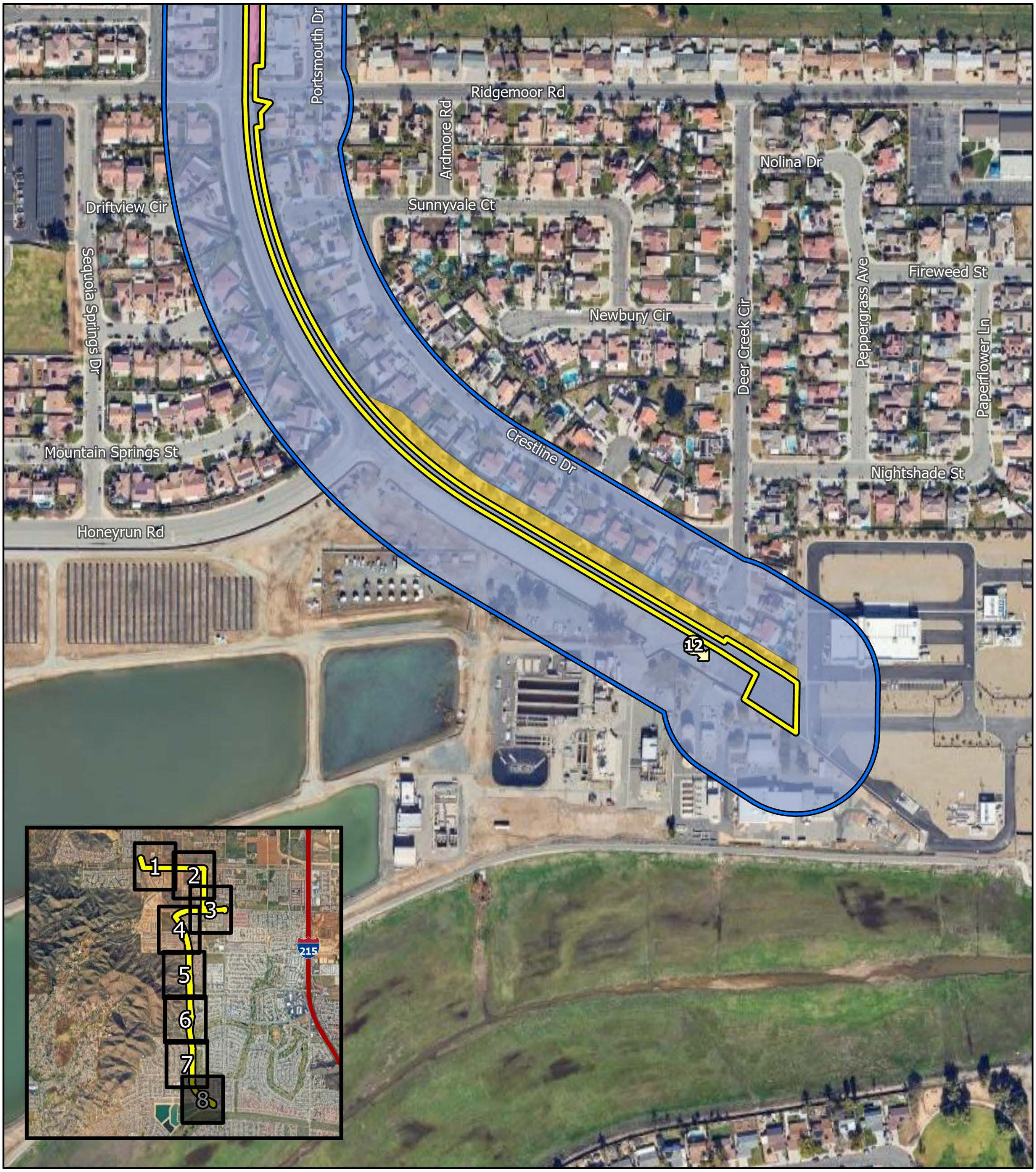

LSA

Project Boundary
Study Area (200-ft Buffer)
Photo Points

Vegetation Communities/Land Use
Developed (116.05 ac)
Disturbed or Barren (37.37 ac)
Ornamental (3.10 ac)

FIGURE 4.4-1
Sheet 8 of 8

0 160 320
FEET

SOURCE: Google Maps (2023)

Valley Boulevard Potable Water Transmission Pipelines Project
Vegetation and Land Use

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Photo 1: View looking south at the northern Project Boundary adjacent to Goetz Road.

Photo 2: View looking east at the Project Boundary along McLaughlin Road.

Photo 3: View looking southwest at the McLaughlin Road and Geary Street intersection.

Photo 4: View looking north at the Project Boundary along Geary Street.

LSA

FIGURE 4.4-2

Valley Boulevard Potable Water Transmission Pipelines Project

Site Photographs

Photo 5: View looking west at the Project Boundary along Rouse Road.

Photo 6: View looking north at the Project Boundary along Geary Street.

Photo 7: View looking west at the Project Boundary along Rouse Road.

Photo 8: View looking south at the Project Boundary along Valley Boulevard.

LSA

FIGURE 4.4-2

Page 2 of 3

Valley Boulevard Potable Water Transmission Pipelines Project

Site Photographs

Photo 9: View looking south at the proposed turnout facility site located adjacent to Valley Boulevard.

Photo 10: View looking north at the proposed turnout facility site located adjacent to Valley Boulevard.

Photo 11: View looking north at the Project Boundary located among disturbed or barren land cover.

Photo 12: View looking southeast at the southern Project Boundary along Valley Boulevard.

LSA

FIGURE 4.4-2

Valley Boulevard Potable Water Transmission Pipelines Project
Site Photographs

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Wildlife. A few wildlife species common to urban and disturbed areas were observed during the field survey. American crow (*Corvus brachyrhynchos*), mourning dove (*Zenaida macroura),* house finch (*Haemorhous mexicanus*), lesser goldfinch (*Spinus psaltria*), Anna's hummingbird (*Calypte anna*), song sparrow (*Melospiza melodia*), black phoebe (*Sayornis nigricans*), western meadowlark (*Sturnella neglecta*), mallard (*Anas platyrhynchos*), rock pigeon (*Columba livia*), red-tailed hawk (*Buteo jamaicensis*), American kestrel (*Falco sparverius*), Say's phoebe (*Sayornis saya*), Cassin's kingbird (*Tyrannus vociferans*), California horned lark (*Eremophila alpestris actia*), white-crowned sparrow (*Zonotrichia leucophrys*), yellow-rumped warbler (*Setophaga coronate*), California ground squirrel (*Spermophilus beecheyi*), Botta's pocket gopher (*Thomomys bottae*), and desert cottontail (*Sylvilagus audubonii*) were observed within the project study area.

a. *Would the project 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 Game or U.S. Fish and Wildlife Service?* ***(Less Than Significant with Mitigation Incorporated)***

The Biological Resources Assessment included a literature review to determine the existence or potential occurrence of special-status plant and animal species within 7 miles of the project alignment. In addition, a field survey was conducted by qualified biologists on February 14, 2024.

The literature review identified 63 special-status species with the potential to occur on the project area, including 24 federally and/or State listed species and 39 non-listed special-status species**.** **Table 4.4.A** provides a list of the 59 identified special-status species within 7 miles of the project alignment and the associated occurrence probability. As provided by **Table 4.4.A**, habitat within the project area is considered unsuitable for 14 of the 24 federally/State-listed species. Low-quality suitable habitat was found to be present within the project area for the following federally/State-listed species: Munz's onion (*Allium munzii*), San Diego ambrosia (*Ambrosia pumila*), thread-leaved brodiaea (*Brodiaea filifolia*), vernal pool fairy shrimp (*Branchinecta lynchi*), San Diego fairy shrimp (*Branchinecta sandiegonensis*), monarch butterfly (*Danaus plexippus*), American bumble bee (*Bombus pensylvanicus*), Riverside fairy shrimp (*Streptocephalus woottoni*), and Stephens' kangaroo rat (*Dipodomys stephensi*). Low to moderately suitable habitat for the following federally/State-listed species: coastal California gnatcatcher (*Polioptila californica californica*) and Crotch's bumble bee (*Bombus crotchii*). Of the 39 other non-listed special-status species, 16 species are not expected to occur based on lack of suitable habitat, 17 species are considered to have a low probability of occurrence, 5 species are considered to have a moderate probability of occurrence, and 1 species is considered to be present within the project site. The following 6 non-listed special-status species have at least a moderate probability to occur within the project study area: Cooper's hawk (*Accipiter cooperii*), Southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*), Bell's sparrow (*Artemisiospiza belli belli*), Parry's spineflower (*Chorizanthe parryi* var. *parryi*), California horned lark (*Eremophila alpestris actia*), and Robinson's pepper-grass (*Lepidium virginicum* var. *robinsonii*).

Table 4.4.A: Special-Status Species Summary

Species	Status	Occurrence Probability
PLANTS		
Abronia villosa var. *aurita* **Chaparral sand-verbena**	US: – CA: 1B	**Not expected to occur.** There is no suitable habitat (sandy areas [generally flats and benches along washes] in chaparral and coastal sage scrub) present within the project site.
Allium munzii **Munz's onion**	US: FE CA: ST/1B.1	**Low potential to occur.** Suitable habitat (seasonally moist sites on clay soils) is present within the project site, specifically on the northern portion of the site. However, these areas are highly disturbed.
Ambrosia pumila **San Diego ambrosia**	US: FE CA: 1B	**Low potential to occur.** Suitable habitat (seasonally wet area on clay) is present within the project site, specifically on the northern portion of the site. However, these areas are highly disturbed.
Atriplex coronata var. *notatior* **San Jacinto Valley crownscale**	US: FE CA: 1B	**Not expected to occur.** There is no suitable habitat present (alkaline flats in playas, chenopod scrub, valley and foothill grasslands, vernal pools) within the project site.
Atriplex parishii **Parish's brittlescale**	US: – CA: 1B	**Not expected to occur.** There is no suitable habitat (alkali soils in meadows, vernal pools, chenopod scrub, and playas) present within the project site.
Atriplex serenana var. davidsonii **Davidson's saltscale**	US: – CA: 1B	**Not expected to occur.** There is no suitable habitat (alkaline soils in scrub and herbaceous communities) present within the project site.
Brodiaea filifolia **Thread-leaved brodiaea**	US: FT CA: SE/1B	**Low potential to occur.** Suitable habitat (seasonally moist sites on clay soils) is present within the project site, specifically on the northern portion of the site. However, these areas are highly disturbed.
Calochortus weedii var. *intermedius* **Intermediate mariposa-lily**	US: – CA: 1B	**Not expected to occur.** There is no suitable habitat (rocky slopes and rock outcrops in chaparral, coastal sage scrub, and grassland) present within the project site.
Caulanthus simulans **Payson's jewel-flower**	US: – CA: 4.2	**Not expected to occur.** There is no suitable habitat (streambeds in chaparral, coastal sage scrub, riparian areas, and grassland) present within the project site.
Centromadia pungens ssp. laevis **Smooth tarplant**	US: – CA: 1B.1	**Not expected to occur.** There is no suitable habitat present (alkaline areas in chenopod scrub, meadows, playas, riparian woodland, valley and foothill grassland) within the project site.
Chorizanthe parryi var. parryi **Parry's spineflower**	US: – CA:1B.1	**Moderate potential to occur.** Potentially suitable habitat (sandy soil in buckwheat scrub) is present within the project site. There are two observations within 1 mile of the project site from prior to 2001.
Chorizanthe polygonoides var. longispina **Long-spined spineflower**	US: – CA:1B.2	**Low potential to occur.** Suitable habitat (clay soils in brittlebush scrub and grassland) is present within the project site, specifically on the northern portion of the site. However, these areas are highly disturbed.
Dodecahema leptoceras **Slender-horned spineflower**	US: FE CA: SE/1B	**Not expected to occur.** No suitable habitat (sandy cobbly riverbed alluvium in alluvial fan sage scrub) is present within the project site.
Dudleya multicaulis **Many-stemmed dudleya**	US: – CA: 1B	**Low potential to occur.** Suitable habitat (clay soils in grassland) is present within the project site, specifically on the northern portion of the site. However, these areas are highly disturbed.
Harpagonella palmeri **Palmer's grapplinghook**	US: – CA: 4.2	**Low potential to occur.** Suitable habitat (clay soils in brittlebush scrub and grassland) is present within the project site, specifically on the northern portion of the site. However, these areas are highly disturbed.

Table 4.4.A: Special-Status Species Summary

Species	Status	Occurrence Probability
Lasthenia glabrata ssp. *coulteri* **Coulter's goldfields**	US: – CA: 1B.1	**Not expected to occur.** No suitable habitat (vernal pools and alkaline soils in marshes, playas, and similar habitats) is present within the project site.
Lepidium virginicum var. robinsonii **Robinson's pepper-grass**	US: – CA: 4.3	**Moderate potential to occur.** Suitable habitat (dry soils in buckwheat scrub) is present within the project site. There is one observation 1.8 miles to the east of the project site from 2008.
Myosurus minimus ssp. apus **Little mousetail**	US: – CA: 3.1	**Not expected to occur.** No suitable habitat (alkaline areas in vernal pools) present within the project site.
Navarretia fossalis **Spreading navarretia**	US: FT CA: 1B	**Not expected to occur.** No suitable habitat (vernal pools, playas, shallow freshwater marshes, and similar sites) present within the project site.
Orcuttia californica **California Orcutt grass**	US: FE CA: SE/1B	**Not expected to occur.** No suitable habitat (vernal pools) present within the project site.
Trichocoronis wrightii var. *wrightii* **Wright's trichocoronis**	US: – CA: 2B	**Not expected to occur.** No suitable habitat (alkali soils in meadows, riverbeds, vernal pools, and lakes) present within the project site.
INVERTEBRATES		
Bombus crotchii **Crotch's bumble bee**	US: – CA: SCE	**Moderate potential to occur.** Suitable habitat (buckwheat scrub) is present within the project site. The unnamed mountain range to the west of Valley Boulevard provides extensive habitat necessary to potentially support this species. One occurrence from 1975 occurs approximately 0.9 mile to the west of the project site.
Bombus pensylvanicus **American bumble bee**	US: – CA: SA	**Moderate potential to occur.** Suitable habitat (buckwheat scrub) is present within the project site. The unnamed mountain range to the west of Valley Boulevard provides extensive habitat necessary to potentially support this species. Two occurrences from 1946 occur approximately 2.11 miles to the north and 2.6 miles east of the project site.
Branchinecta lynchi **Vernal pool fairy shrimp**	US: FT CA: SA	**Low potential to occur.** Shallow depression areas best described as road ruts occur within the project site. Road ruts are disturbed areas on site that may provide suitable habitat.
Branchinecta sandiegonensis **San Diego fairy shrimp**	US: FE CA: SA	**Low potential to occur.** Shallow depression areas best described as road ruts occur within the project site. Road ruts are disturbed areas on site that may provide suitable habitat.
Cicindela senilis frosti **Senile tiger beetle**	US: - CA: SA	**Not expected to occur.** Suitable habitat (shoreline and salt marshes) is not present within the project site. The nearest known location for the species, Lake Elsinore, is located approximately 7 miles to the west of the project site.
Danaus plexippus **Monarch butterfly** (wintering sites)	US: FPE CA: SA	**Low potential to occur.** Suitable habitat (eucalyptus trees) is present adjacent to the project site. Trees near the intersection of Cherry Hills Boulevard and Valley Boulevard may be suitable for roosting. However, to date, this has not been identified as a California overwintering population. Furthermore, the project does not include any direct impacts to these trees.
Euphydryas editha quino **Quino checkerspot butterfly**	US: FE CA: SA	**Not expected to occur.** The project study area does not offer suitable foraging plants (*Plantago erecta* and/or *Orthocarpus purpurascens*) to sustain this species.

Table 4.4.A: Special-Status Species Summary

Species	Status	Occurrence Probability
Socalchemmis icenoglei **Icenogle's socalchemmis spider**	US: - CA: SA	**Not expected to occur.** Suitable habitat (coastal scrub) is present within the project site in the form of buckwheat scrub. However, the nearest known location for the species, Winchester, is located approximately 6 miles to the west of the project site.
Streptocephalus woottoni **Riverside fairy shrimp**	US: FE CA: SA	**Low potential to occur.** Shallow depression areas best described as road ruts occur within the project site. Road ruts are disturbed areas on site that may provide suitable habitat.
REPTILES		
Anniella stebbinsi **Southern California legless lizard**	US: – CA: SSC	**Not expected to occur.** Suitable habitat (sandy or loose loamy soils with high moisture content) is not present within the project site.
Arizona elegans occidentalis **California glossy snake**	US: – CA: SSC	**Low potential to occur.** Suitable habitat (buckwheat scrub and non-native grassland) is present within the project site. However, grasslands are highly disturbed.
Aspidoscelis hyperythra **Orange-throated whiptail**	US: – CA: SA	**Low potential to occur.** Suitable habitat (buckwheat scrub) is present within the project site.
Aspidoscelis tigris stejnegeri **Coastal western whiptail**	US: – CA: SSC	**Low potential to occur.** Suitable habitat (buckwheat scrub and nonnative grassland) is present within the project site. However, grasslands are highly disturbed.
Crotalus ruber **Red diamond rattlesnake**	US: – CA: SSC	**Low potential to occur.** Suitable habitat (nonnative grassland) is present within the project site. However, grasslands are highly disturbed.
Emys marmorata [*Actinemys marmorata*] **Western pond turtle**	US: FPT CA: SSC	**Not expected to occur.** Manmade basins that hold water occur in the project study area. However, these areas are highly disturbed and are currently undergoing development.
Phrynosoma blainvillii coronatum **Coast horned lizard**	US: – CA: SSC	**Not expected to occur.** No suitable sandy soils are on site.
AMPHIBIANS		
Spea hammondii **Western spadefoot**	US: – CA: SSC	**Not expected to occur.** Manmade basins that hold water occur in the project study area. However, these areas are highly disturbed and are currently undergoing development.
BIRDS		
Accipiter cooperii **Cooper's hawk** (nesting)	US: – CA: SA	**Moderate potential to occur.** No suitable nesting habitat is present within the project site but may forage and nest in the vicinity.
Agelaius tricolor **Tricolored blackbird**	US: – CA: ST/SSC	**Not expected to occur.** Marginally suitable nonnative grassland habitat is present that may be suitable for foraging. However, nonnative grassland habitat is isolated and small in size.
Aimophila ruficeps canescens **Southern California rufous-crowned sparrow**	US: – CA: SA	**Moderate potential to occur.** An unnamed mountain range occurs adjacent to the western side of the project site and provides suitable buckwheat scrub habitat.
Aquila chrysaetos **Golden eagle** (nesting & wintering)	US: – CA: SFP BLM: S	**Low potential to occur.** May potentially forage in the area but nesting habitat is absent from the project site.

Table 4.4.A: Special-Status Species Summary

Species	Status	Occurrence Probability
Artemisiospiza belli belli **Bell's sparrow**	US: – CA: SA	**Moderate potential to occur.** Suitable habitat (buckwheat scrub) is present within the project site.
Athene cunicularia **Burrowing owl** (nesting)	US: – CA: SPE/SPT/SSC	**Moderate potential to occur.** The location of the project borders an urban environment and open field of potential burrowing owl habitat within the project study area. California ground squirrels were observed on site and could create potentially suitable burrows for the owls.
Buteo regalis **Ferruginous hawk** (wintering)	US: – CA: SA	**Low potential to occur.** Suitable habitat (nonnative grassland) is present within the project site. However, these areas are highly disturbed.
Charadrius alexandrinus nivosus **Western snowy plover** (nesting)	US: FT (coastal population) CA: SSC	**Not expected to occur.** No suitable habitat (sandy coastal beaches, lakes, alkaline playas) is present within the project site.
Empidonax traillii extimus **Southwestern willow flycatcher**	US: FE CA: SE	**Not expected to occur.** No suitable habitat (riparian areas) is present within the project site.
Eremophila alpestris actia **California horned lark**	US: – CA: SA	**Present**. This species was observed during the February 14, 2024, field survey. Suitable nesting habitat is present within the project site.
Haliaeetus leucocephalus **Bald eagle**	US: – CA: SE/CFP	**Not expected to occur.** Suitable habitat (deep lakes and reservoirs) is not present within the project site.
Icteria virens **Yellow-breasted chat** (nesting)	US: – CA: SSC (breeding)	**Not expected to occur.** Suitable habitat (riparian) is not present within the project site.
Lanius ludovicianus **Loggerhead shrike** (nesting)	US: – CA: SSC	**Low potential to occur.** Suitable habitat (open habitats with scattered small trees) is present to the west of the project site. However, much of the project site is adjacent to developed areas.
Polioptila californica californica **Coastal California gnatcatcher**	US: FT CA: SSC	**Moderate potential to occur.** Suitable habitat (buckwheat scrub) is present within the project site. Additionally, critical habitat for this species is located within 0.5 mile of the project site.
Vireo bellii pusillus **Least Bell's vireo**	US: FE CA: SE	**Not expected to occur.** Suitable habitat (riparian forests and willow thickets) is not present within the project site.
MAMMALS		
Chaetodipus californicus femoralis **Dulzura pocket mouse**	US: – CA: SSC	**Low potential to occur.** Suitable habitat (buckwheat scrub and non-native grasslands) is present within the project site.
Chaetodipus fallax fallax **Northwestern San Diego pocket mouse**	US: – CA: SSC	**Low potential to occur.** Suitable habitat (buckwheat scrub and nonnative grasslands) is present within the project site.
Dipodomys merriami parvus **San Bernardino kangaroo rat**	US: FE CA: SE/SSC	**Not expected to occur.** No suitable habitat (gravelly and sandy soils of alluvial fans, braided river channels, active channels and terraces) is present within the project site.

Table 4.4.A: Special-Status Species Summary

Species	Status	Occurrence Probability
Dipodomys stephensi **Stephens' kangaroo rat**	US: FE CA: ST	**Low potential to occur.** Suitable habitat (buckwheat scrub and nonnative grasslands) is present within the project site. However, the grasslands and scrub present are not associated with each other and both habitat types are surrounded by development.
Eumops perotis californicus **Western mastiff bat**	US: – CA: SSC	**Low potential to occur.** Suitable habitat (buckwheat scrub) is present within the project site. However, the proposed project will not impact roosting habitat for this species.
Lepus californicus bennettii **San Diego black-tailed jackrabbit**	US: – CA: SA	**Low potential to occur.** Suitable habitat (buckwheat scrub, nonnative grassland, brittlebush scrub) is present within the project site. However, grasslands are highly disturbed and are surrounded by development.
Lasiurus xanthinus **Western yellow bat**	US: – CA: SSC	**Not expected to occur.** No suitable habitat (desert and desert riparian areas or nonnative ornamental palms) present on site or within buffer.
Onychomys torridus ramona **Southern grasshopper mouse**	US: – CA: SSC	**Low potential to occur.** Suitable habitat (buckwheat scrub) is present within the project site.
Perognathus longimembris brevinasus **Los Angeles pocket mouse**	US: – CA: SSC	**Low potential to occur.** Suitable habitat (buckwheat scrub) is present within the project site.
Taxidea taxus **American badger**	US: – CA: SSC	**Not expected to occur.** Suitable habitat (nonnative grassland) is present within the project site. However, grasslands are highly disturbed and are surrounded by development.

US: Federal Classifications

- – No applicable classification
- FE Taxa federally listed as Endangered
- FT Taxa federally listed as Threatened
- FPE Taxa federally listed as Proposed Endangered
- FPT Taxa federally listed as Proposed Threatened

CA: State Classifications

- – No applicable classification
- SE Taxa State listed as Endangered
- ST Taxa State listed as Threatened
- SPE Taxa State listed as Proposed Endangered
- SPT Taxa State listed as Proposed Threatened
- SFP Taxa State listed as fully protected
- SSC California Species of Special Concern (refers to animals with vulnerable or seriously declining populations)
- SA Special Animal (refers to any other animal monitored by the California Natural Diversity Database, regardless of its legal or protection status)
- 1B California Rare Plant Rank 1B: Rare, threatened, or endangered in California and elsewhere
- 2B California Rare Plant Rank 2B: Rare, threatened or endangered in California, but more common elsewhere
- 4 California Rare Plant Rank 4: A watch list of plants of limited distribution

Rare Plants. As provided in **Table 4.4.A** above, several special-status species plants have a low to moderate potential to occur on the project site. Additionally, the project site is within an MSHCP Narrow Endemic Plant Species Survey Area (NEPSSA) for six plant species: Munz's onion, San Diego Ambrosia, many-stemmed dudleya, spreading navarretia, California Orcutt grass, and Wright's trichocoronis. Potentially suitable habitat for three of the six NEPSSA species (i.e., Munz's onion, San Diego Ambrosia, and many-stemmed dudleya) is present on site. Therefore, the proposed project has the potential to impact one or more of these species if they are present in the project site, and **Mitigation Measure BIO-1**, which requires a focused survey for sensitive plant species to occur during the seasonally appropriate blooming period to determine the presence of special-status plant species prior to project implementation, is prescribed to reduce potential impacts on rare plants to less than significant levels.

Mitigation Measure BIO-1 **Rare Plant Survey.** A focused plant survey shall be conducted due to the presence of clay soils within the project site. These clay soils may be suitable for special-status plant species such as Mun's onion (*Allium munzii*), San Diego Ambrosia (*Ambrosia pumila*), and thread-leaved brodiaea (*Brodiaea filifolia*) that are known to occur in the project vicinity. Focused efforts will be in areas where suitable soils are present - GaC (Garritson very fine sandy loam), Dv (Domino silt loam), buckwheat and brittlebush scrub, grassland, and ephemeral pools with vegetated areas within the project footprint. The objective of the survey will be to determine presence or absence of special-status plant species and, if present, to quantify and map the distribution of the species on the project site. All plant species detected on the site during the survey shall be identified to the extent necessary to determine rarity and listing status. The survey shall be conducted during the months of April or May to coincide with the appropriate peak flowering season of the target special-status species. If special-status species are identified within the project limits, coordination with the United States Fish and Wildlife Service (USFWS) or the California Department of Fish and Wildlife (CDFW) (depending on the listing status of the species) will be required to determine additional appropriate mitigation measures. This may include the transplant of individual special-status plants, collection and dispersal of special-status plant seeds, and the purchase of compensatory mitigation lands to offset significant impacts.

Crotch's Bumble Bee. There is extensive buckwheat scrub that occurs within the southern portion of the project area. This habitat is considered low to moderate quality suitable habitat for Crotch's bumble bee. Nevertheless, the proposed project is anticipated to impact this buckwheat scrub and, as a result, may impact Crotch's bumble bee, if present. Therefore, **Mitigation Measure BIO-2**, which requires focused surveys for Crotch's bumble bee to determine the presence of Crotch's bumble bee prior to project implementation, is prescribed to reduce potential impacts on Crotch's bumble bee to less than significant levels.

Mitigation Measure BIO-2 **Focused Crotch's Bumble Bee Survey.** Prior to commencing construction activities, a qualified biologist with expertise in surveying for native bumble bees shall conduct a focused survey for Crotch's bumble bee (*Bombus crotchii*) in areas of buckwheat scrub and grassland during the survey season before activities begin. The qualified biologist authorized to survey for Crotch's bumble bee by the CDFW shall conduct the surveys when colonies of this species are active (typically April through August) in accordance with the most recent CDFW guidelines (Survey Considerations for California Endangered Species Act [CESA] Candidate Bumble Bee Species, dated June 6, 2023). At least 14 days prior to the anticipated start date of the surveys, the qualified biologist shall submit a notification of intent to survey to the CDFW. The bumble bee nest survey involves systematically walking through suitable habitat areas (e.g., grassland and scrub) while looking for potential nests and for high levels of bee activity that may signal a nest site. Surveys shall be conducted from the project site and public access areas. If a Crotch's bumble bee nest is found within or adjacent to the project area, CDFW shall be notified within 3 days in accordance with CDFW survey guidelines. The foraging bee survey will shall consist of three site visits, 2 to 4 weeks apart. Visits must be conducted on sunny days with temperatures between 65°F and 90°F and sustained winds of less than 8 miles per hour. Visits must begin at least 1 hour after sunrise and end at least 2 hours before sunset. The surveys are conducted by walking throughout areas of suitable foraging habitat at a rate of no more than 3 acres of suitable habitat per hour to look for bumble bees. Bumble bees encountered during the survey shall be captured with a net, photographed, and released on site. If Crotch's bumble bee is detected, EMWD shall submit an avoidance and minimization plan to CDFW. A 50 ft buffer will be proposed in the plan to CDFW, but this plan will need to be approved and construction activities may not commence prior to CDFW's approval of the plan.

Fairy Shrimp. Road ruts and similar shallow depressions present along the project alignment, which likely result from the continued vehicular use along dirt access roads, provide suitable habitat for fairy shrimp on the project site. During the field survey, water was observed pooling in these areas, and fairy shrimp (*Branchinecta sp*.) were observed in 3 of the 30 ponded areas observed.[13] However, the project area has been highly disturbed, and soils and micro topography have been altered on site due to the use of the existing dirt access roads over the years. Although 10 road ruts and 1 shallow depression occur within the project footprint, the proposed project has been designed to avoid these areas, either by going around these areas or under them utilizing trenchless methods

[13] The fairy shrimp observed were not keyed to the species level because protocol surveys were not conducted.

such as horizontal directional drilling. Therefore, no impacts to fairy shrimp and their habitat are anticipated.

Coastal California Gnatcatcher. The project area also contains low to moderate suitable habitat for coastal California gnatcatcher. In addition, the project area is approximately 0.5 mile from critical habitat for this species. Therefore, **Mitigation Measure BIO-3**, which requires focused coastal California gnatcatcher surveys, is prescribed to determine if this species is present within the project vicinity prior to project implementation. With implementation of **Mitigation Measure BIO-3**, potential impacts on coastal California gnatcatcher would be reduced to less than significant levels.

Mitigation Measure BIO-3 **Focused Protocol Coastal California Gnatcatcher Survey.** Prior to commencing construction activities, a qualified biologist with a Section 10(a)(1)(A) Recovery Permit for the coastal California gnatcatcher (CAGN) shall conduct focused protocol surveys for the species within scrub habitats. The survey shall be conducted in accordance with the latest USFWS survey protocol for this species (August 1997). The USFWS focused survey protocol for CAGN requires 6 survey visits at 1-week intervals if the focused survey is conducted during the breeding season (March 15 to June 30), or 9 survey visits at 2-week intervals if the focused surveys are conducted outside of the breeding season (July 1 - March 14). In the event CAGN is found on or adjacent to the project site, consultation with the USFWS in accordance with Section 7 of the Endangered Species Act will be required to determine appropriate avoidance, minimization and mitigation measures. Alternatively, the District can obtain third party take authorization in compliance with the MSHCP Implementation Agreement, Section 17.

Burrowing Owl. The project site is located within an MSHCP survey area for burrowing owl. However, no suitable burrowing owl burrows were observed within the project area during the field survey. Despite this, California ground squirrels (*Otospermophilus beecheyi*) were observed throughout the project study area and could provide burrows for burrowing owls. In addition, suitable habitat in the form of nonnative grassland, disturbed and barren ground was identified throughout the project site. Therefore, **Mitigation Measure BIO-4**, which requires a pre-construction burrowing owl survey, is prescribed to reduce potential impacts on burrowing owl to less than significant levels.

Mitigation Measure BIO-4 **Pre-Construction Burrowing Owl Survey.** A burrowing owl take avoidance survey shall be performed by a qualified biologist not more than 14 days prior to any site disturbance (grubbing, grading, and construction) in accordance with CDFW guidelines (Staff Report on Burrowing Owl Mitigation, March 7, 2012). If an occupied burrow is found (as indicated by the observation of a burrowing owl or the presence of burrowing owl sign), a 250-foot buffer around the burrow shall be staked and flagged, and no construction activities shall be allowed within the buffer area during the breeding season

(February 1 through August 31). If the burrow is within the project disturbance area, CDFW shall be consulted to coordinate relocation of the owl in accordance with accepted protocols. Determination of the appropriate method of relocation, such as eviction/passive relocation or active relocation, shall be based on the specific site conditions (e.g., distance to nearest suitable habitat and presence of burrows within that habitat) in coordination with the CDFW. Active relocation and eviction/passive relocation require the preservation and maintenance of suitable burrowing owl habitat determined through coordination with the CDFW.

Non-Listed Special-Status Species. The 22 non-listed special-status species identified as having a low to moderate probability of occurrence in the project area have limited population distribution in Southern California, and development is further reducing their ranges and numbers. However, due to the disturbed nature of the project area and surrounding development, impacts from the proposed project are anticipated to have a less than significant effect on these non-listed special-status species.

Nesting Birds. During the bird breeding season (typically February 1 through August 31), the project area may be used by hawks, ravens, or other common or special-status open ground birds for nesting. Shrubs and other vegetation may also provide nest sites for smaller birds. To ensure compliance with the California Fish and Game Code and to avoid potential impacts to nesting birds, **Mitigation Measure BIO-5,** which requires vegetation removal activities to be conducted outside the general bird nesting season (January 15 through August 31) or a pre-construction nesting bird survey by a qualified biologist prior to vegetation removal if vegetation cannot be removed outside the bird nesting season, is prescribed. Direct impacts to sensitive and common avian species from development of the project site would be reduced to less than significant levels with implementation of **Mitigation Measure BIO-5** by ensuring that nesting birds would be protected until the young have fledged.

Mitigation Measure BIO-5

Pre-Construction Nesting Bird Survey. To ensure compliance with California Fish and Game Code and the Migratory Bird Treaty Act (MBTA) and to avoid potential impacts to nesting birds, vegetation removal activities shall be conducted outside the general bird nesting season (January 15 through August 31). Any vegetation removal and/or construction activities that occur during the nesting season will require that all suitable habitats be thoroughly surveyed for the presence of nesting birds by a qualified biologist. Prior to commencement of clearing within each project segment, a qualified biologist shall conduct a pre-construction survey within 3 days prior to ground-disturbing activities. This may warrant various pre-construction surveys to assure that each survey aligns with the start of each segment of the project. Should nesting birds be found, an exclusionary buffer shall be established by the qualified biologist. The buffer may be up to 500 feet in diameter, depending on the species of nesting bird found. This buffer shall be clearly marked in the field by construction personnel under guidance of the qualified biologist, and construction or clearing shall not be conducted within this zone until the qualified biologist determines that the young have fledged or the nest is no longer active. The buffer may be modified and/or other recommendations proposed as determined appropriate by the biologist to minimize impacts. Nesting bird habitat within the project site shall be resurveyed during bird breeding season if there is a lapse in construction activities longer than 7 days.

With implementation of **Mitigation Measures BIO-1 through BIO-5**, impacts to special-status species that could be present in the project vicinity would be reduced to **less than significant with mitigation incorporated. Figure 4.4-3** shows where pre-construction and protocol level surveys are required along the project alignment.

*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 Game or U.S. Fish and Wildlife Service? **(Less Than Significant Impact)***

As previously discussed, vegetation within the project study area consists primarily of developed, buckwheat scrub, and nonnative grassland, with patches of brittlebush scrub-disturbed, disturbed and barren ground, as well as ornamental landscaping located throughout residential and commercial areas. There are no other plant communities on the site, and the project area does not contain any other sensitive natural community. However, the proposed project is found adjacent to undeveloped lands that could result in indirect impacts to special-status species by noise disturbance. The nearest Critical Habitat unit is approximately 0.5 mile east of the project site and is designated as Critical Habitat for the listed coastal California gnatcatcher. However, no portion of the project site is located in or adjacent to this Critical Habitat, or any other Critical Habitat.

As part of the field survey, all potential jurisdictional features within the project area were mapped. It is noted that potential permits and approvals related to aquatic resources are not expected to be required because the proposed project would avoid all potential jurisdictional features by utilizing trenchless methods (e.g., horizontal directional drilling) and would remain within the rights-of-way between the existing EMWD Desalination Complex at 29285 Valley Boulevard in Menifee and the intersection of McLaughlin Road and Goetz Road. The field survey identified six drainages and five detention basins within the project area, as shown on **Figure 4.4-4**. However, all of the drainages were dominated by nonnative grassland, ornamental landscaping, and/or disturbed/barren land. In addition, all of the detention basins are manmade, created to capture flows from nearby roads and development areas, and contain no vegetation. The detention basins are either partially concrete-lined or maintained to be free of vegetation. Therefore, the project area does not contain any riparian habitat.

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LSA

Project Boundary
Study Area (200-ft Buffer)
Nesting Bird and Burrowing Owl Survey Area
Bumble Bee Survey Area
Rare Plant Survey Area
California Gnatcatcher Survey Area

N

0 100 200
FEET

SOURCE: Google Maps (2023)

FIGURE 4.4-3
Sheet 1 of 14

Valley Boulevard Potable Water Transmission Pipelines Project

Focused Survey Map

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LSA

Project Boundary
Study Area (200-ft Buffer)
Nesting Bird and Burrowing Owl Survey Area
Bumble Bee Survey Area
Rare Plant Survey Area
California Gnatcatcher Survey Area

0 100 200
FEET

FIGURE 4.4-3
Sheet 2 of 14

Valley Boulevard Potable Water Transmission Pipelines Project

Focused Survey Map

SOURCE: Google Maps (2023)

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FIGURE 4.4-3
Sheet 2 of 14

Valley Boulevard Potable Water Transmission Pipelines Project

Focused Survey Map

SOURCE: Google Maps (2023)

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Project Boundary
Study Area (200-ft Buffer)
Nesting Bird and Burrowing Owl Survey Area
Bumble Bee Survey Area
Rare Plant Survey Area
California Gnatcatcher Survey Area

N

0 100 200
FEET

FIGURE 4.4-3
Sheet 3 of 14

Valley Boulevard Potable Water Transmission Pipelines Project

Focused Survey Map

SOURCE: Google Maps (2023)

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LSA

Project Boundary
Study Area (200-ft Buffer)
Nesting Bird and Burrowing Owl Survey Area
Bumble Bee Survey Area
Rare Plant Survey Area

N

0 100 200
FEET

SOURCE: Google Maps (2023)

FIGURE 4.4-3
Sheet 4 of 14

Valley Boulevard Potable Water Transmission Pipelines Project

Focused Survey Map

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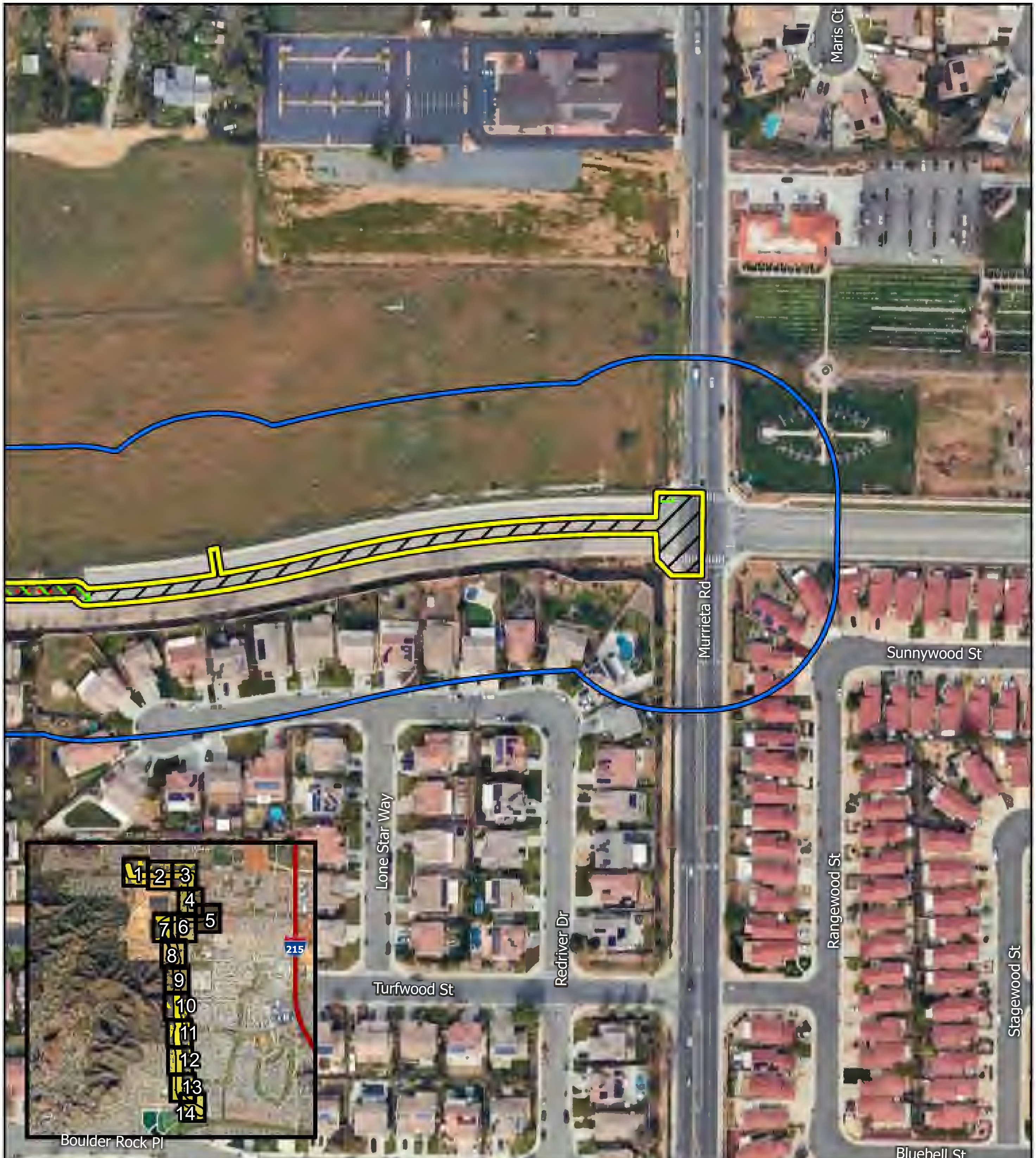

LSA

FIGURE 4.4-3
Sheet 5 of 14

- Project Boundary
- Study Area (200-ft Buffer)
- Nesting Bird and Burrowing Owl Survey Area
- Bumble Bee Survey Area
- Rare Plant Survey Area

0 100 200
FEET

Valley Boulevard Potable Water Transmission Pipelines Project

Focused Survey Map

SOURCE: Google Maps (2023)

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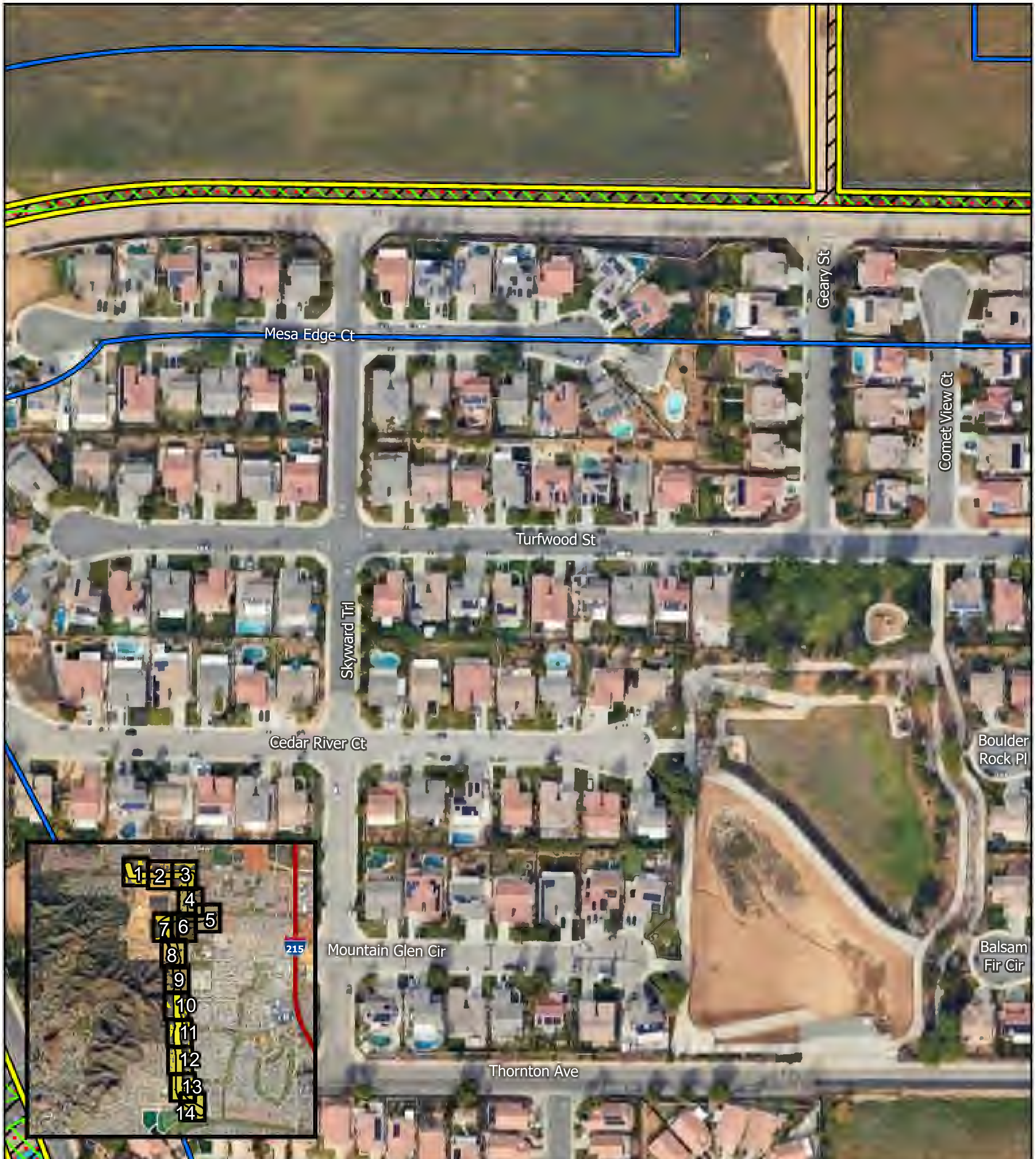

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FIGURE 4.4-3
Sheet 6 of 14

Project Boundary
Study Area (200-ft Buffer)
Nesting Bird and Burrowing Owl Survey Area
Bumble Bee Survey Area
Rare Plant Survey Area
California Gnatcatcher Survey Area

N

0 100 200
FEET

Valley Boulevard Potable Water Transmission Pipelines Project

Focused Survey Map

SOURCE: Google Maps (2023)

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Project Boundary
Study Area (200-ft Buffer)
Nesting Bird and Burrowing Owl Survey Area
Bumble Bee Survey Area
Rare Plant Survey Area
California Gnatcatcher Survey Area

0 100 200
FEET

SOURCE: Google Maps (2023)

FIGURE 4.4-3
Sheet 7 of 14

Valley Boulevard Potable Water Transmission Pipelines Project

Focused Survey Map

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LSA

Project Boundary
Study Area (200-ft Buffer)
Nesting Bird and Burrowing Owl Survey Area
Bumble Bee Survey Area
Rare Plant Survey Area
California Gnatcatcher Survey Area

0 100 200
FEET

SOURCE: Google Maps (2023)

FIGURE 4.4-3
Sheet 8 of 14

Valley Boulevard Potable Water Transmission Pipelines Project

Focused Survey Map

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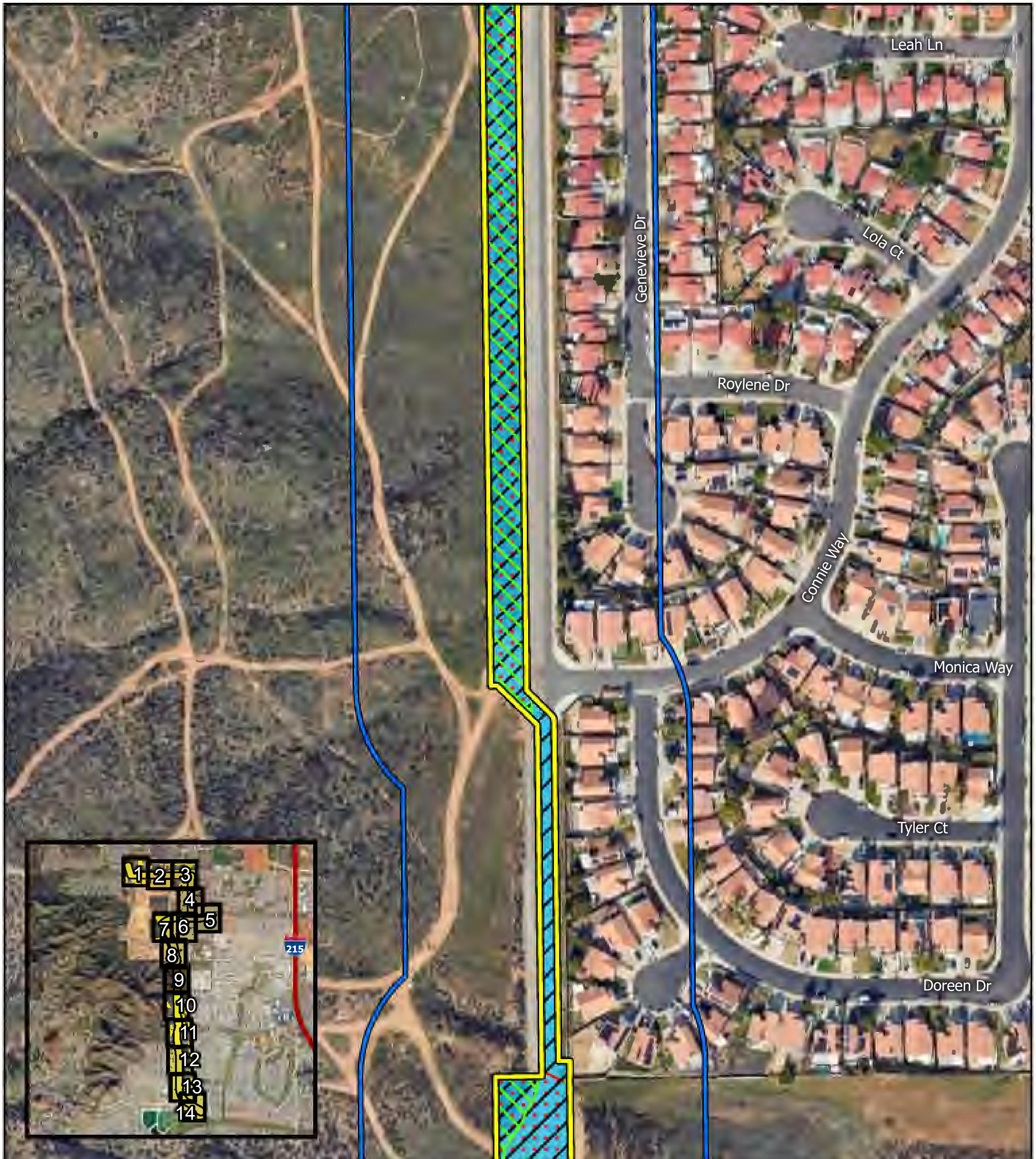

LSA

Project Boundary
Study Area (200-ft Buffer)
Nesting Bird and Burrowing Owl Survey Area
Bumble Bee Survey Area
Rare Plant Survey Area
California Gnatcatcher Survey Area

N

0 100 200
FEET

SOURCE: Google Maps (2023)

FIGURE 4.4-3
Sheet 9 of 14

Valley Boulevard Potable Water Transmission Pipelines Project

Focused Survey Map

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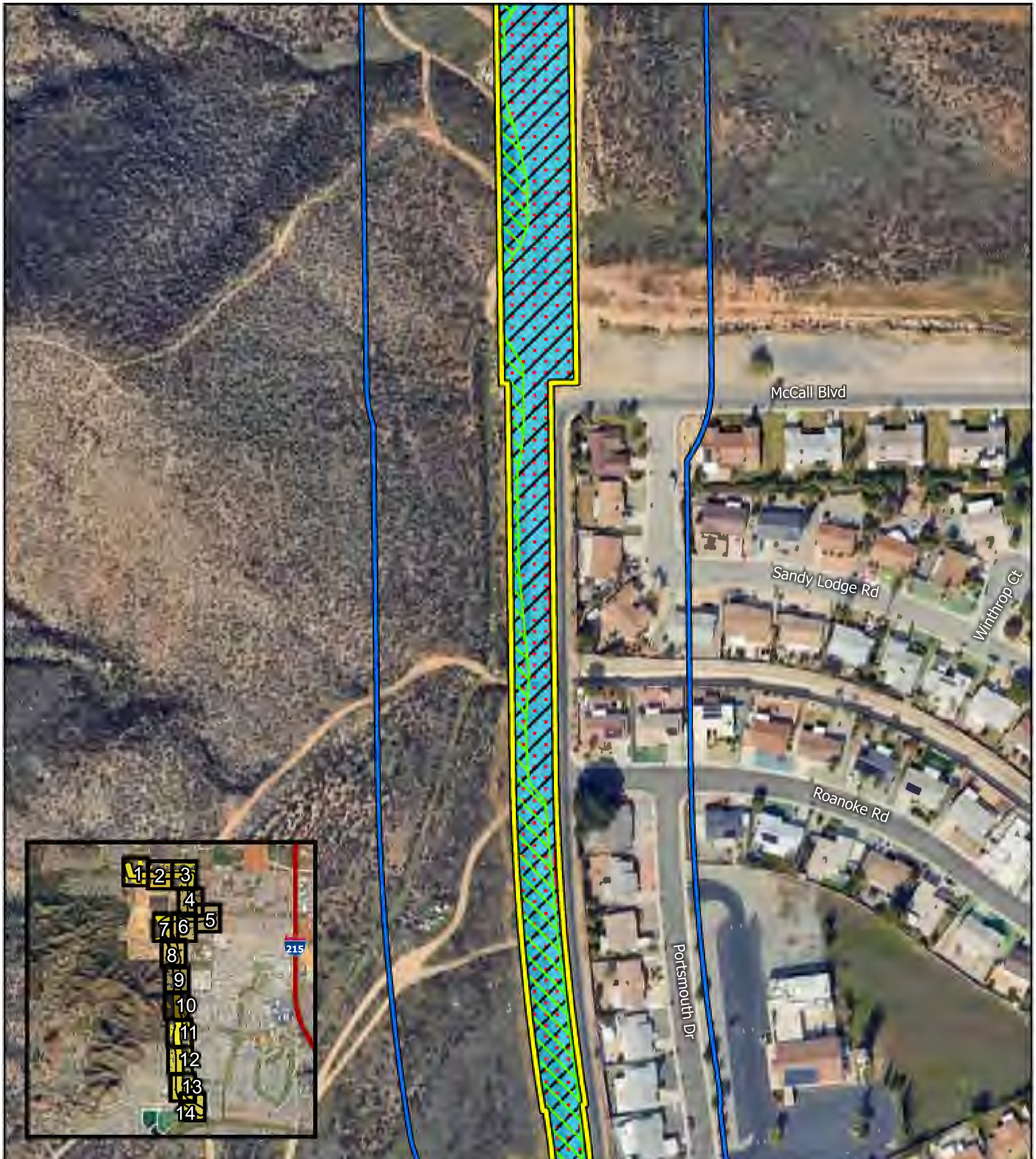

LSA

Project Boundary
Study Area (200-ft Buffer)
Nesting Bird and Burrowing Owl Survey Area
Bumble Bee Survey Area
Rare Plant Survey Area
California Gnatcatcher Survey Area

0 100 200
FEET

FIGURE 4.4-3
Sheet 10 of 14

Valley Boulevard Potable Water Transmission Pipelines Project

Focused Survey Map

SOURCE: Google Maps (2023)

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LSA

Project Boundary
Study Area (200-ft Buffer)
Nesting Bird and Burrowing Owl Survey Area
Bumble Bee Survey Area
Rare Plant Survey Area
California Gnatcatcher Survey Area

0 100 200
FEET

SOURCE: Google Maps (2023)

FIGURE 4.4-3
Sheet 11 of 14

Valley Boulevard Potable Water Transmission Pipelines Project

Focused Survey Map

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LSA

Project Boundary

Study Area (200-ft Buffer)

Nesting Bird and Burrowing Owl Survey Area

Rare Plant Survey Area

FIGURE 4.4-3
Sheet 12 of 14

N

0 100 200
FEET

Valley Boulevard Potable Water Transmission Pipelines Project

Focused Survey Map

SOURCE: Google Maps (2023)

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LSA

Project Boundary
Study Area (200-ft Buffer)
Nesting Bird and Burrowing Owl Survey Area
Bumble Bee Survey Area
Rare Plant Survey Area

FIGURE 4.4-3
Sheet 13 of 14

0 100 200
FEET

Valley Boulevard Potable Water Transmission Pipelines Project

Focused Survey Map

SOURCE: Google Maps (2023)

I:\E\EWD2101.04\GIS\Pro\Valley Boulevard Potable Water Transmission Pipelines Project\Valley Boulevard Potable Water Transmission Pipelines Project.aprx (2/20/2025)

LSA

Project Boundary
Study Area (200-ft Buffer)
Nesting Bird and Burrowing Owl Survey Area
Bumble Bee Survey Area
Rare Plant Survey Area

0 100 200
FEET

FIGURE 4.4-3
Sheet 14 of 14

SOURCE: Google Maps (2023)

Valley Boulevard Potable Water Transmission Pipelines Project

Focused Survey Map

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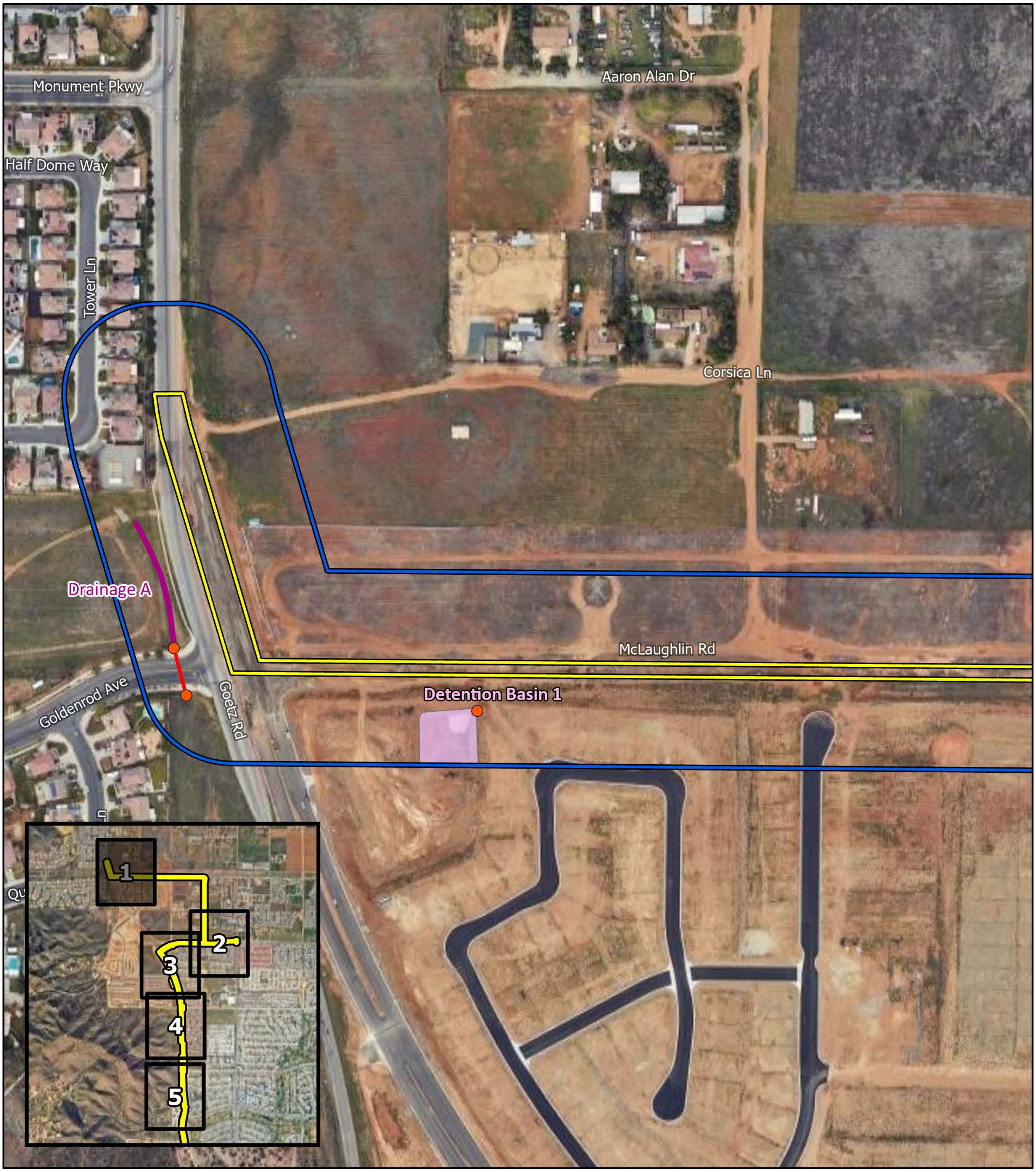


LSA

Project Site
Study Area (200-ft Buffer)
Culvert
Culvert Connection
Potential Jurisdictional Features
Drainage
Detention Basin

0 150 300
FEET

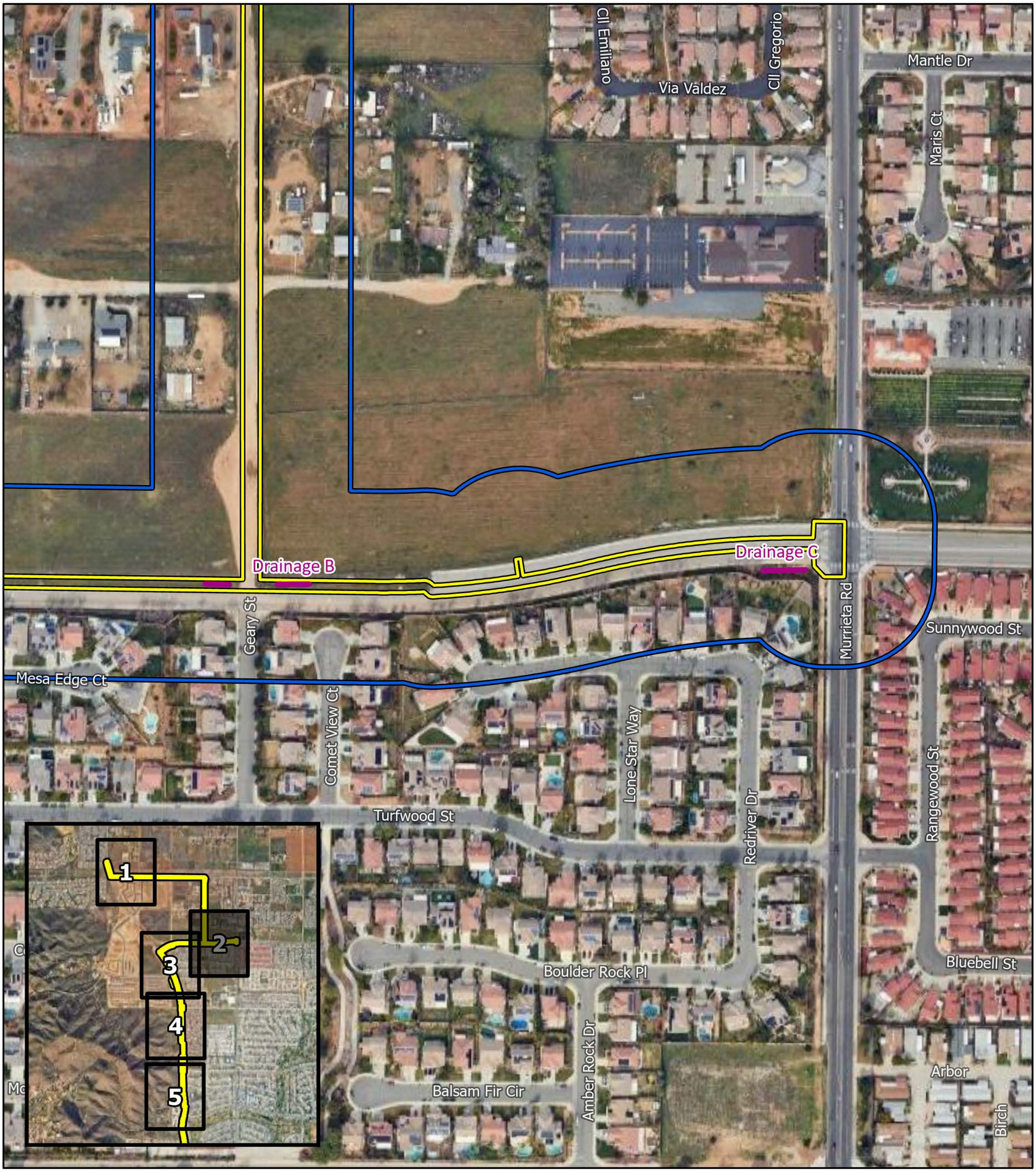
FIGURE 4.4-4
Sheet 1 of 5

Valley Boulevard Potable Water Transmission Pipelines Project

Potential Jurisdictional Features

SOURCE: Google Maps (2023)

I:\E\EWD2101.04\GIS\Pro\Valley Boulevard Potable Water Transmission Pipelines Project\Valley Boulevard Potable Water Transmission Pipelines Project.aprx (10/29/2024)



LSA

Project Site

Study Area (200-ft Buffer)

Potential Jurisdictional Features

Drainage

0 150 300
FEET

SOURCE: Google Maps (2023)

FIGURE 4.4-4
Sheet 2 of 5

Valley Boulevard Potable Water Transmission Pipelines Project

Potential Jurisdictional Features

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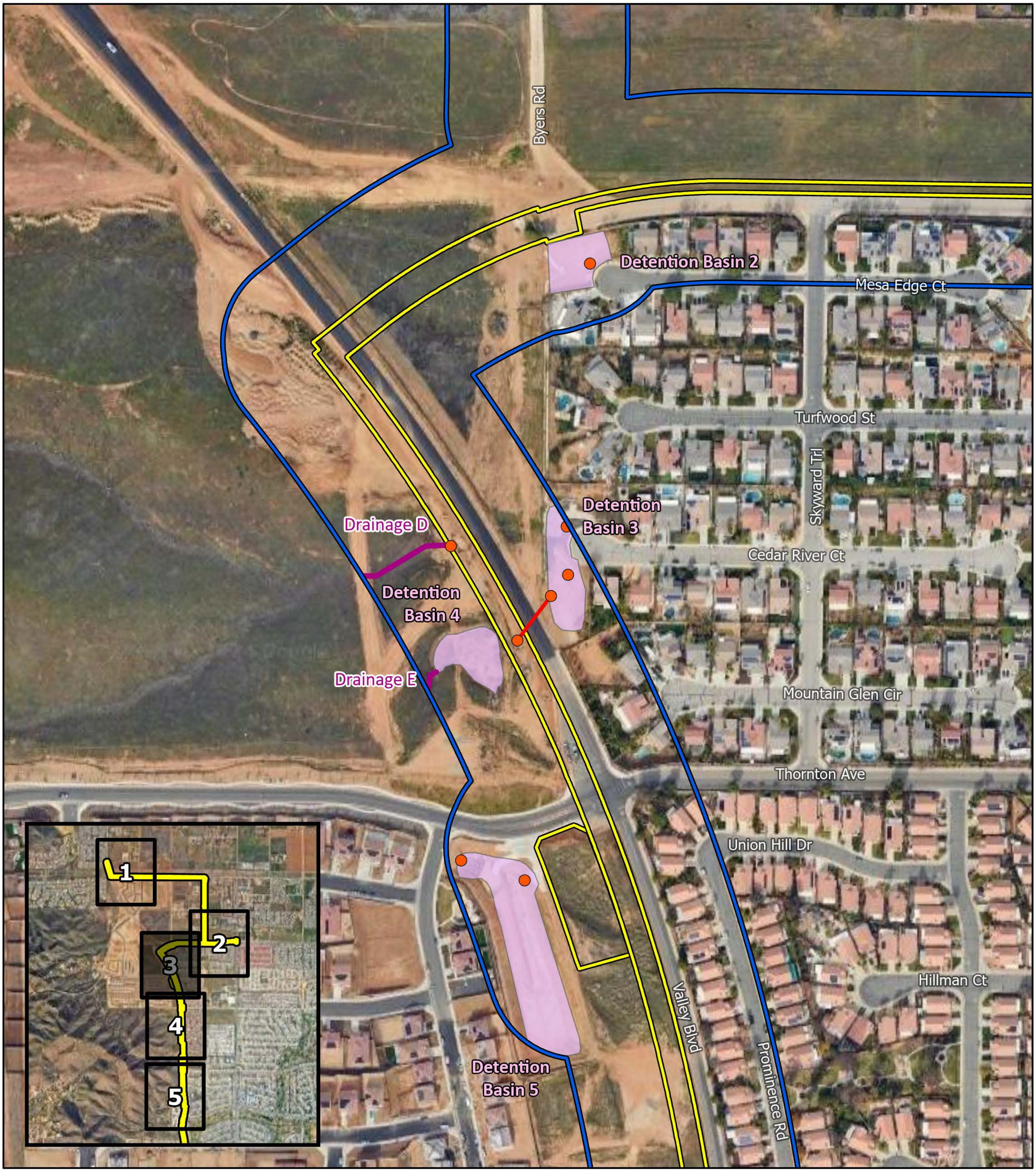

LSA

Project Site
Study Area (200-ft Buffer)
Culvert
Culvert Connection
Potential Jurisdictional Features
Drainage
Detention Basin

FIGURE 4.4-4
Sheet 3 of 5

0 150 300
FEET

Valley Boulevard Potable Water Transmission Pipelines Project

Potential Jurisdictional Features

SOURCE: Google Maps (2023)

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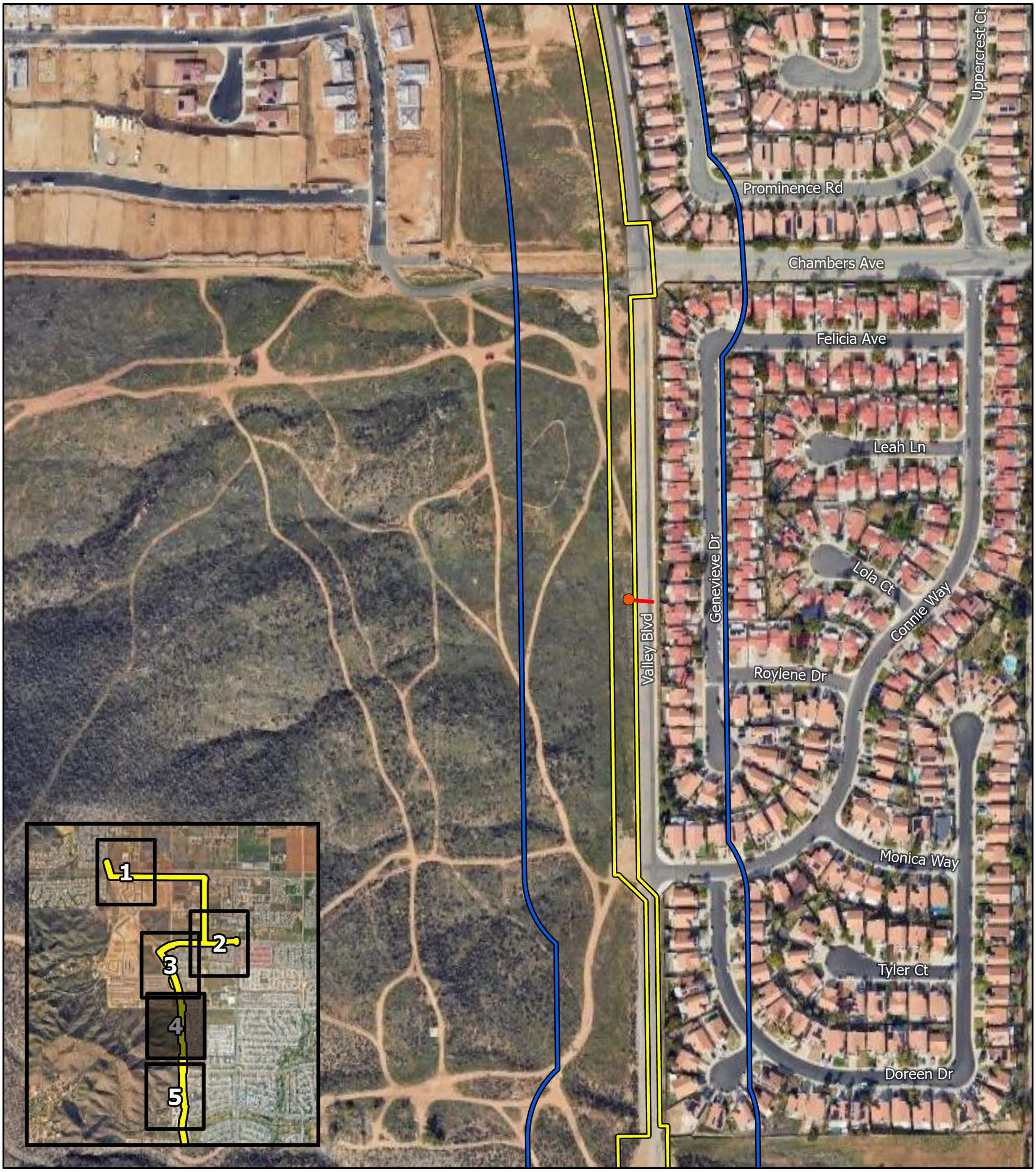

LSA

Project Site

Study Area (200-ft Buffer)

Culvert

Culvert Connection

0 150 300
FEET

SOURCE: Google Maps (2023)

FIGURE 4.4-4
Sheet 4 of 5

Valley Boulevard Potable Water Transmission Pipelines Project

Potential Jurisdictional Features

LSA

Project Site

Study Area (200-ft Buffer)

Culvert

Culvert Connection

Potential Jurisdictional Features

Concrete Channel

Drainage

N

0 150 300
FEET

FIGURE 4.4-4
Sheet 5 of 5

Valley Boulevard Potable Water Transmission Pipelines Project

Potential Jurisdictional Features

SOURCE: Google Maps (2023)

I:\E\EWD2101.04\GIS\Pro\Valley Boulevard Potable Water Transmission Pipelines Project\Valley Boulevard Potable Water Transmission Pipelines Project.aprx (10/29/2024)

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It should be noted that a handful of culverts not connected to a drainage or detention basin were identified during the field survey but do not relate or connect to a potential jurisdictional water. Due to the absence of defined bed and bank and ordinary high-water mark, these isolated culverts and adjacent areas are not considered potentially jurisdictional waters. Additionally, 11 road ruts and 1 shallow depression were observed within the project boundary with several other road ruts and shallow depressions occurring outside of the project boundary but within the overall project area. The road ruts were classified as such due to their presence and creation by vehicles within dirt roadways. The shallow depressions appear to be naturally or semi-naturally occurring low spots in the topography. The road ruts are expected to be non-jurisdictional as they lack a defined bed and bank, riparian vegetation, freshwater flow, and are mostly devoid of vegetation. The shallow depressions may be subject to the regulatory authority of the Regional Water Quality Control Board (RWQCB) but are expected to be non-jurisdictional under CDFW and United States Army Corps of Engineers (USACE) regulations due to their ephemeral nature and lack of defined bed and bank and riparian habitat.

Therefore, implementation of the proposed project would have **no impact** on any riparian habitat or other sensitive natural community identified in local or regional plans (i.e., MSHCP), policies, regulations, or by the CDFW or USFWS.

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?* ***(Less Than Significant)***

No known federally or State-protected wetlands are present on the project site as seen on the National Wetlands Inventory Wetlands Mapper.[14] As discussed above, all potential jurisdictional features within the project area were mapped during the field survey of the project area. The field survey identified six drainages and five detention basins within the project area, as shown on **Figure 4.4-2**. However, all of the drainages were dominated by nonnative grassland, ornamental landscaping, and/or disturbed/barren land. In addition, all of the detention basins are manmade, created to capture flows from nearby roads and development areas, and contain no vegetation. The field survey also identified several shallow depressions (road ruts); however, these road ruts are expected to be non-jurisdictional because they mostly lack riparian vegetation, lack freshwater flow, and are mostly devoid of vegetation.

Although some of these features occur within the project footprint, the proposed project has been designed to avoid impacts to these features. This would be accomplished by going around the potential jurisdictional waters or by going under them through trenchless methods such as horizontal directional drilling. Therefore, approvals related to aquatic resources are not expected to be required because the proposed project would remain within the rights-of-way between the existing EMWD Desalination Complex at 29285 Valley Boulevard in Menifee and the intersection of

14 United States Fish and Wildlife Service (USFWS). n.d. National Wetlands Inventory Surface Waters and Wetlands*.* Website: https://fwsprimary.wim.usgs.gov/wetlands/apps/wetlands-mapper/ (accessed April 26, 2024).

McLaughlin Road and Goetz Road. Impacts on potentially jurisdictional features, including State or federally protected wetlands, present in the project vicinity would be **less than significant.**

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)***

Habitat fragmentation occurs when a single, contiguous habitat area is divided into two or more areas, or where an action isolates the two or more new areas from each other. Isolation of habitat occurs when wildlife cannot move freely from one portion of the habitat to another or to/from one habitat type to another. An example is the fragmentation of habitats within and around "checkerboard" residential development. Habitat fragmentation may also occur when a portion of one or more habitats is converted to another habitat, as when scrub habitats are converted into annual grassland habitat because of frequent burning. Wildlife movement includes seasonal migration along corridors, as well as daily movements for foraging. Examples of migration corridors may include areas of unobstructed movement for deer, riparian corridors providing cover for migrating birds, routes between breeding waters and upland habitat for amphibians, and between roosting and feeding areas for birds.

The project site is located within the rights-of-way between the existing EMWD Desalination Complex at 29285 Valley Boulevard in Menifee and the intersection of McLaughlin Road and Goetz Road. The project site does not correspond to any natural landscape blocks, small natural areas, interstate connections, essential connectivity areas or potential riparian connections, as documented in the California Essential Habitat Connectivity Project: A Strategy for Conserving a Connected California report.[15] Wildlife movement of species such as coyote (*Canis latrans*) is expected within the majority of the project area given the project's proximity to vacant undeveloped lands such as the unnamed mountain range west of Valley Boulevard. However, there are a variety of structural barriers throughout the project area under existing conditions, and the proposed project would occur within or adjacent to busy roadways (e.g., Valley Boulevard, Rouse Road, Goetz Road, McLaughlin Road, and Geary Street).

In addition, the wildlife species that occur in the vicinity of the project site are likely adapted to the urban-wildland interface, and implementation of the proposed project would not introduce new effects to the area. Potential noise, vibration, light, dust, or human disturbance associated with project activities would only temporarily deter wildlife from using areas in the immediate vicinity. These indirect effects could temporarily alter migration behaviors, territories, or foraging habitats in select areas; however, because these are temporary effects and the project vicinity is partially developed, it is likely that wildlife already living and moving close to the project site would alter their normal functions for the duration of land use changes and development and then re-establish these functions once all temporary effects have been removed. Project activities would not place

15 Spencer, W.D., P. Beier, K. Penrod, K. Winters, C. Paulman, H. Rustigian-Romsos, J. Strittholt, M. Parisi, and A. Pettler. 2010. California Essential Habitat Connectivity Project: A Strategy for Conserving a Connected California. Prepared for California Department of Transportation, California Department of Fish and Game, and Federal Highway Administration.

any permanent barriers within any known wildlife movement corridors or interfere with habitat connectivity. Therefore, the proposed project would not substantially limit wildlife movement.

Nevertheless, implementation of **Mitigation Measure BIO-6,** which requires the implementation of standard best management practices (BMPs) to avoid project impacts to natural resources, would be prescribed to ensure that potential impacts on the movement of any native resident or migratory wildlife species would be less than significant.

Mitigation Measure BIO-6 **Standard Best Management Practices.** The following best management practices (BMPs), taken directly from the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) Appendix C, shall be implemented to the extent feasible during construction activities to reduce impacts to wildlife resources in the project vicinity:

- A qualified biologist shall conduct a training session for project personnel prior to grading. The training shall include a description of the species of concern and its habitats, the general provisions of the Endangered Species Act (Act) and the MSHCP, the need to adhere to the provisions of the Act and the MSHCP, the penalties associated with violating the provisions of the Act, the general measures that are being implemented to conserve the species of concern as they relate to the project, and the access routes to and project site boundaries within which the project activities must be accomplished.

- Water pollution and erosion control plans shall be developed and implemented in accordance with Regional Water Quality Control Board (RWQCB) requirements.

- The footprint of disturbance shall be minimized to the maximum extent feasible. Access to sites shall be via pre-existing access routes to the greatest extent possible.

- Projects should be designed to avoid the placement of equipment and personnel within the stream channel or on sand and gravel bars, banks, and adjacent upland habitats used by target species of concern.

- Projects that cannot be conducted without placing equipment or personnel in sensitive habitats should be timed to avoid the breeding season of riparian species identified in MSHCP Global Species Objective No. 7.

- Equipment storage, fueling, and staging areas shall be located on upland sites with minimal risks of direct drainage into riparian areas or other sensitive habitats. These designated areas shall be located in such a manner as to prevent any runoff from entering sensitive habitat. Necessary precautions shall be taken to prevent the release of cement or other toxic substances into surface waters. Project-related spills of hazardous materials shall be reported to the appropriate entities, including but not limited to the applicable jurisdictional city, USFWS, CDFW, and RWQCB, and shall be cleaned up immediately and contaminated soils removed to approved disposal areas.

- Erodible fill material shall not be deposited into water courses. Brush, loose soils, or other similar debris material shall not be stockpiled within the stream channel or on its banks.

- The qualified project biologist shall monitor construction activities for the duration of the project to ensure that practicable measures are being employed to avoid incidental disturbance of habitat and species of concern outside the project footprint.

- The removal of native vegetation (e.g., scrub habitat such as buckwheat and brittlebush) shall be avoided and minimized to the maximum extent practicable. Temporary impacts shall be returned to pre-existing contours and revegetated with appropriate native species.

- Exotic species that prey upon or displace target species of concern should be permanently removed from the site to the extent feasible.

- To avoid attracting predators of the species of concern, the project site shall be kept as clean of debris as possible. All food-related trash items shall be enclosed in sealed containers and regularly removed from the site(s).

- Construction employees shall strictly limit their activities, vehicles, equipment, and construction materials to the proposed project footprint and designated staging areas and routes of travel. The construction area(s) shall be the minimal area necessary to complete the project and shall be specified in the construction plans. Construction limits will be fenced with orange snow screen. Exclusion fencing should be maintained until the completion of all construction activities. Employees shall be instructed that their activities are restricted to the construction areas.

- The Eastern Municipal Water District (EMWD) shall have the right to access and inspect any sites of approved projects, including any restoration/enhancement area, for compliance with project approval conditions and these BMPs.

In addition, most birds and their active nests are protected from "take" (meaning destruction, pursuit, possession, etc.) under the Migratory Bird Treaty Act (MBTA) and/or Sections 3503–3801 of the California Fish and Game Code. Activities that cause destruction of active nests or that cause nest abandonment and subsequent death of eggs or young may constitute violations of one or both of these laws. To avoid potential effects to fully protected raptors, special-status bird species, and other nesting birds protected by the California Fish and Game Code, and for compliance with MSHCP Incidental Take Permit Condition 5, State regulations require a nesting bird pre-construction survey to be conducted by a qualified biologist 3 days prior to ground-disturbing activities. Should nesting birds be found, an exclusionary buffer would be established by the qualified biologist. The buffer may be up to 500 feet in diameter depending on the species of nesting bird found. This buffer would be clearly marked in the field by construction personnel under guidance of the qualified biologist, and construction or clearing would not be conducted within this zone until the qualified biologist determines that the young have fledged or the nest is no longer active. Nesting bird habitat within the project site would be resurveyed during bird breeding season if there is a lapse in construction activities longer than 7 days. The nesting bird pre-construction survey would be satisfied through **Mitigation Measure BIO-5** as described above.

With implementation of **Mitigation Measures BIO-5 and BIO-6**, potential impacts on the movement of any native resident or migratory wildlife species would be reduced to **less than significant with mitigation incorporated.**

*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 City of Menifee's Tree Preservation Regulations (Section 9.205.030 of the City of Menifee's Municipal Code) establishes requirements for tree protection and removal in Menifee. Section 9.205.030 outlines its purpose to protecting mature trees that are in good health, do not pose safety threats, are not nuisance trees, and those categorized as heritage trees.

The proposed project would result in the removal of one nonnative tree (i.e., Jerusalem thorn [*Parkinsonia aculeata*]). Pursuant to California Code Section 53090, the proposed project would not be subject to the City's tree removal ordinance. Therefore, implementation of the proposed project would not conflict with any local policies or ordinances protecting biological resources, and **no impact** would occur.

*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? **(No Impact)***

The proposed project is located within the MSHCP. However, because EMWD is not a signatory, the proposed project is not subject to applicable provisions of the MSHCP as specified in Section 4.4.a above. EMWD is not pursuing a PSE designation for the project site, and the project would not be subject to MSHCP policies and procedures (e.g., Protection of Species Associated with Riparian/Riverine Areas and Vernal Pools [MSHCP Section 6.1.2], Protection of the Narrow Endemic Plant Species [MSHCP Section 6.1.3], Additional Survey Needs and Procedures [MSHCP Section 6.3.2], and Urban/Wildland Interface Guidelines [MSHCP Section 6.1.4]).

As noted above, the proposed project is within the SKR HCP fee area. However, EMWD is exempt from this requirement; therefore, no further action is necessary to comply with the SKR HCP and obtain coverage for the species. If SKR is found in the survey area, EMWD may opt in to obtain coverage.

Since the proposed project is not signatory to the MSHCP and is exempt from payment of the SKR HCP fee, **no impact** to any local policies or ordinances protecting biological resources would occur.

4.5 CULTURAL RESOURCES

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

*a. Would the project cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5? **(Less Than Significant with Mitigation Incorporated)***

For a cultural resource to be considered a historical resource (i.e., eligible for listing in the California Register of Historical Resources [California Register]), it generally must be 50 years or older. Under CEQA, historical resources can include precontact (i.e., Native American) archaeological deposits, historic-period archaeological deposits, historic buildings, and historic districts. To identify cultural resources at the project site and evaluate the proposed project's potential to adversely impact a cultural resource, including historic resources, an Archaeological Resources Assessment[16] was prepared for the proposed project. This report is included as Appendix C.

As part of the Archaeological Resources Assessment, the following tasks were completed: (1) a records search at the Eastern Information Center of the California Historical Resources Information System, and (2) a field survey of the project site by a qualified archaeologist. The EMWD also undertook consultation outreach with California Tribal organizations pursuant to the requirements of Assembly Bill (AB) 52 (refer to Section 4.18, Tribal Cultural Resources).

Records Search. Data from the records search conducted at the Eastern Information Center indicate there have been 61 previous studies within 0.5 mile of the project site, 12 of which included portions of the project area. A total of 5 resources have been recorded within 0.5 mile, including 3 prehistoric resources and 2 historic period resources. The nearest resource is located approximately 75 meters (0.05 mile) north of the project alignment on Rouse Road, while the nearest prehistoric resource is located approximately 525 meters (0.33 mile) northwest of the Valley Boulevard portion of the project alignment.

Field Survey. On October 1, 2024, a combination windshield and intensive pedestrian survey of the project alignment was conducted. Visibility was variable but overall poor, at approximately 30 percent, with the surface obscured by vegetation (e.g., Russian thistle, mustard, telegraph weed, hare oat, etc.), construction debris, and other materials (e.g., dirt, asphalt, and concrete). Because the project alignment is located in and along segments of road rights-of-way in suburban

16 LSA Associates, Inc. 2024a. Archaeological Resources Assessment for the Valley Boulevard Pipeline Project in Menifee, Riverside County, California (LSA Project No. EWD2101.04). October 16.

neighborhoods, the pedestrian portion of the survey focused on the unpaved and unlandscaped portions of the project alignment. Areas of exposed soil were examined for surface artifacts and features, and rodent burrow holes and aprons were inspected for evidence of subsurface resources. The project alignment has been subjected to severe disturbance from road construction and previous and ongoing grading, earth-moving, and weed-abatement activities. Modern construction-related and miscellaneous refuse was noted within and beyond the project alignment. During the field survey, no cultural resources were identified.

Summary of Results. A cultural resources records search and a field survey were conducted for the project area. The majority of the project alignment has sustained substantial, protracted disturbances from road construction and other activities, and overall sensitivity for in situ undocumented resources appears generally low. However, due to the proximity of multiple prehistoric resources and poor surface visibility during the field survey, the alignment retains some potential for non-in situ, undocumented resources that may be of local interest. Therefore, part-time archaeological monitoring and Worker's Environmental Awareness Program (WEAP) training is recommended.

Despite the negative results of the field survey, should archaeological deposits be encountered during project ground disturbance, a substantial adverse change in the significance of a historical resource would occur from its demolition, destruction, relocation, or alteration such that the significance of the resource would be materially impaired (*State CEQA Guidelines* Section 15064.5(b)(1)). To mitigate this potential impact, the EMWD would be required to implement **Mitigation Measures CULT-1 and CULT-2**, below. With implementation of **Mitigation Measures CULT-1 and CULT-2**, potential impacts to historical resources would be reduced to less than significant.

Mitigation Measure CULT-1 Prior to grading activities, a Cultural Resources Monitoring Plan (Plan) shall be prepared by a qualified archaeologist in consultation with the consulting Tribe(s). The Plan shall also identify the location and timing of cultural resources monitoring. The Plan shall contain an allowance for the qualified archaeologist, based on observations of subsurface soil stratigraphy or other factors during initial grading and in consultation with the Native American monitor and the lead agency, to reduce or discontinue monitoring as warranted if the archaeologist determines that the possibility of encountering archaeological deposits is low. The Plan shall outline the appropriate measures to be followed in the event of unanticipated discovery of cultural resources during project implementation (including the survey to occur following vegetation removal and monitoring during ground-disturbing activities). The Plan shall identify avoidance as the preferred manner of mitigating impacts to cultural resources. The Plan shall establish the criteria utilized to evaluate the historic significance of the discoveries (per the California Environmental Quality Act [CEQA]) and the methods of avoidance consistent with *State CEQA Guidelines* Section

15126.4(b)(3), as well as to identify the appropriate data recovery methods and procedures to mitigate the effect of the project if avoidance of significant historical or unique archaeological resources is determined to be infeasible. The Plan shall also include reporting of monitoring results within a timely manner, disposition of artifacts, curation of data, and dissemination of reports to local and State repositories, libraries, and interested professionals. A qualified archaeologist and consulting Tribe(s) tribal monitor shall attend a pre-grade meeting with EMWD staff, the contractor, and appropriate subcontractors to discuss the monitoring program, including protocols to be followed in the event that cultural material is encountered.

Mitigation Measure CULT-2 Artifacts discovered at the development site shall be inventoried and analyzed by the project archaeologist and Tribal monitor(s). A monitoring report will be prepared, detailing the methods and results of the monitoring program, as well as the disposition of cultural material encountered. If no cultural material is encountered, a brief letter report will be sufficient to document monitoring activities.

Mitigation Measure CULT-1 requires the preparation of a Cultural Resources Monitoring Plan; and **Mitigation** and **Mitigation Measure CUL-2** requires an evaluation of discovered artifacts. With implementation of these mitigation measures, potential impacts to archaeological historical resources would be reduced to a **less than significant level with mitigation incorporated**.

b. Would the project cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5? ***(Less Than Significant with Mitigation Incorporated)***

According to the *State CEQA Guidelines*, "When a project will impact an archaeological site, a lead agency shall first determine whether the site is an historical resource" (*State CEQA Guidelines* Section 15064.5(c)(1)). Those archaeological sites that do not qualify as historical resources shall be assessed to determine if these qualify as "unique archaeological resources" (California Public Resources Code [PRC] Section 21083.2).

Archaeological deposits identified during project construction shall be treated by the EMWD—in consultation with a qualified archaeologist meeting the Secretary of the Interior's Professional Qualifications Standards for Archaeology—in accordance with **Mitigation Measures CULT-1 and CULT-2**. With implementation of **Mitigation Measures CULT-1 and CULT-2**, identified above, impacts to archaeological resources would be **less than significant with mitigation incorporated**.

c. Would the project disturb any humans remains, including those interred outside of formal cemeteries? ***(Less Than Significant with Mitigation Incorporated)***

Based on the Archaeological Resources Assessment prepared for the proposed project, there is a low potential for the disturbance of archaeological cultural resources or human remains at the project site. However, if human remains are encountered at the project site, implementation of **Mitigation Measure CULT-3** would ensure compliance with Section 7050.5 of the California Health and Safety Code and PRC Section 5097.98 regarding the treatment of human remains. State Health and Safety Code Section 7050.5 and *State CEQA Guidelines* Section 15064.5(e)(1) state that no further disturbance shall occur to the area of the find until the County Coroner has made a determination of origin and disposition of the human bone(s) pursuant to PRC Section 5097.98. The County Coroner must be notified of the find immediately and shall make a determination within 2 working days of being notified. If the remains are determined to be Native American, the County Coroner shall notify the Native American Heritage Commission (NAHC) by phone within 24 hours, and the NAHC shall then immediately 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 and make recommendations or preferences for treatment of the remains within 48 hours of being granted access to the site. The MLD's recommendations may include scientific removal and nondestructive analysis of human remains and items associated with Native American burials, preservation of Native American human remains and associated items in place, relinquishment of Native American human remains and associated items to the descendants for treatment, or any other culturally appropriate treatment.

Mitigation Measure CULT-3 If Native American human remains are encountered, Public Resources Code (PRC) Section 5097.98 and California Health and Safety Code Section 7050.5 will be followed. If human remains are encountered, no further disturbance shall occur until the Riverside County Coroner has made the necessary findings as to the origin. Further, pursuant to California PRC Section 5097.98(b), the remains shall be left in place and free from disturbance until a final decision as to the treatment and disposition has been made. If the Riverside County Coroner determines the remains to be Native American, the coroner shall contact the Native American Heritage Commission (NAHC) within 24 hours. Subsequently, the NAHC shall identify the person or persons it believes to be the Most Likely Descendant (MLD). The MLD shall then make recommendations and engage in consultations concerning the treatment of the remains as provided in PRC Section 5097.98.

With implementation of **Mitigation Measure CULT-3,** which requires compliance with Section 7050.5 of the California Health and Safety Code and PRC Section 5097.98 regarding the treatment of human remains, impacts to human remains would be **less than significant with mitigation incorporated**.

4.6 ENERGY

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a. Result in a 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?	☐	☐	☒	☐

The project site is within the service territory of Southern California Edison (SCE). SCE provides electricity to more than 15 million people in a 50,000-square-mile area of Central, Coastal, and Southern California.[17] According to the California Energy Commission (CEC), total electricity consumption in the SCE service area in 2022 was 85,870 gigawatt-hours (GWh) (31,604 GWh for the residential sector and 54,266 GWh for the non-residential sector). Total electricity consumption in Riverside County in 2022 was 17,780.6 GWh (17,780,573,271 kilowatt-hours [kWh]).[18]

Gasoline is the most used transportation fuel in California, with 97 percent of all gasoline being consumed by light-duty cars, pickup trucks, and sport utility vehicles. According to the most recent data available, total gasoline consumption in California was 316,425 thousand barrels or 1,597.6 trillion British thermal units (Btu) in 2022.[19] Of the total gasoline consumption, 299,304 thousand barrels or 1,597.6 trillion Btu were consumed for transportation.[20] Based on fuel consumption obtained from CARB's California Emissions Factor Model, Version 2021 (EMFAC2021), approximately 744.5 million gallons of gasoline and approximately 301.2 million gallons of diesel will be consumed from vehicle trips in Riverside County in 2024.

*a. Would the project result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources during project construction or operation? **(Less Than Significant Impact)***

The discussion and analysis provided below is based on the data included in the CalEEMod output, which is included in Appendix A.

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17 Southern California Edison (SCE). 2020. About Us. Website: https://www.sce.com/about-us/who-we-are (accessed March 2024).

18 California Energy Commission (CEC). 2020. Electricity Consumption by County and Entity. Website: http://www.ecdms.energy.ca.gov/elecbycounty.aspx and http://www.ecdms.energy.ca.gov/elecbyutil.aspx (accessed March 2024).

19 A British thermal unit is defined as the amount of heat required to raise the temperature of one pound of water by one degree Fahrenheit.

20 United States Energy Information Administration. 2021. California State Profile and Energy Estimates. Table F3: Motor gasoline consumption, price, and expenditure estimates, 2020. Website: eia.gov/state/seds/data.php?incfile=/state/seds/sep_fuel/html/fuel_mg.html&sid=CA (accessed March 2024).

Construction-Period Energy Use. The anticipated construction schedule assumes that the proposed project would be built over approximately 24 months. Project construction activities would include demolition and removal of existing asphalt, trenching/trenchless work, fill/compaction activities, pavement reconstruction, landscaping, and concrete flatwork over the length of the project site.

Construction of the proposed project would require energy for the manufacture and transportation of building materials and for preparation of the site for grading activities and construction. Petroleum fuels (e.g., diesel and gasoline) would be the primary sources of energy for these activities.

Construction activities are not anticipated to result in an inefficient use of energy because gasoline and diesel fuel would be supplied by construction contractors who would conserve the use of their supplies to minimize their costs on the proposed project. Energy usage on the project site during construction would be temporary in nature and would be relatively small in comparison to the State's available energy sources. Therefore, construction energy impacts would be **less than significant**.

Operational Energy Use. Operational energy use is typically associated with natural gas use, electricity consumption, and fuel used for vehicle trips associated with the project.

The proposed project would install 4.4 miles of new water pipelines along Valley Boulevard from the existing EMWD Desalination Complex at 29285 Valley Boulevard in Menifee to the intersection of McLaughlin Road and Goetz Road. In addition, the proposed project would also construct a valve station with an MOV. The facility would include an above-grade MOV on an approximately 640-square-foot concrete pad, ground-mounted remote terminal units, and space allocation for an SCE enclosure, if required by SCE. Electric service required for the site is anticipated to be 100 amps, 120/240 volts, 1 phase.

The project aims to improve operation reliability and system redundancy by providing additional conveyance for the existing transmission pipelines in the project area and to support operation of the proposed Goetz Road water storage tank. Upon completion of construction activities, operation of the proposed project would be conducted remotely and there would be no full-time dedicated staff at the site. EMWD staff may visit the site occasionally for facility inspections. It is anticipated that project operations would require approximately four 30-minute inspections per month. As described in Section 4.17, Transportation, no additional trips are anticipated due to implementation of the proposed project. As such, the proposed project would not result in an increase in the generation of vehicle trips or VMT that would generate a substantial increase in fuel used for vehicle trips. Although operation of the proposed project would include the use of electricity, the purpose of the proposed project is to improve efficiency of the existing pipelines. Therefore, implementation of the proposed project would not result in additional energy consumption. Therefore, the proposed project would not result in the wasteful, inefficient, or unnecessary consumption of energy resources. Impacts would be **less than significant**.

b. *Conflict with or obstruct a state or local plan for renewable energy or energy efficiency? **(Less Than Significant Impact)***

The CEC recently adopted the 2023 Integrated Energy Policy Report.[21] The 2023 Integrated Energy Policy Report provides the results of the CEC's assessments of a variety of energy issues facing California. Many of these issues will require action if the State is to meet its climate, energy, air quality, and other environmental goals while maintaining energy reliability and controlling costs. The 2023 Integrated Energy Policy Report covers a broad range of topics, including decarbonizing buildings, integrating renewables, energy efficiency, energy equity, integrating renewable energy, updates on Southern California electricity reliability, climate adaptation activities for the energy sector, natural gas assessment, transportation energy demand forecasts, and the California Energy Demand Forecast.

As indicated above, energy usage on the project site during construction would be temporary in nature. In addition, once operational, the proposed project would not result in additional energy consumption. As such, the proposed project would not conflict with California's energy conservation plans as described in the CEC's 2023 Integrated Energy Policy Report. Thus, as shown above, the proposed project would avoid or reduce the inefficient, wasteful, and unnecessary consumption of energy and would not result in any irreversible or irretrievable commitments of energy. Therefore, the proposed project would not result in the wasteful, inefficient, or unnecessary consumption of energy resources during project construction or operation. Impacts would be **less than significant**.

21 California Energy Commission (CEC). 2023. 2023 Integrated Energy Policy Report. Docket Number: 23-IEPR-01.

4.7 GEOLOGY AND SOILS

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

a. Would the project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:

i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42. ***(No Impact)***

Surface rupture occurs when the ground surface is broken due to fault movement during an earthquake. The location of surface rupture generally can be assumed to be along an active or potentially active major fault trace.

The State of California enacted the Alquist-Priolo Fault Zoning Act in 1972, requiring the State Geologist to delineate Earthquake Fault Zones (EFZs) along known active faults that have high potential for fault rupture. The project site is not located within a designated EFZ.[22] Therefore,

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[22] California Geological Survey (CGS). 2016. California Earthquake Hazards Zone Application. Website: https://maps.conservation.ca.gov/cgs/EQZApp/app/ (accessed January 5, 2024).

the proposed project would not expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving the rupture of a known earthquake fault. **No impact** would occur.

ii. Strong seismic ground shaking? ***(Less Than Significant Impact)***

Ground shaking is a general term referring to all aspects of motion of the earth's surface resulting from an earthquake and is normally the major cause of damage in seismic events. The extent of ground shaking is controlled by the magnitude and intensity of the earthquake, distance from the epicenter, and local geologic conditions. The magnitude of a seismic event is a measure of the energy released by an earthquake; it is assessed by seismographs that measure the amplitude of seismic waves.

Buried pipelines are generally less susceptible to damage from strong ground shaking than aboveground structures since underground pipelines are typically embedded in compacted backfill that can tolerate more seismic movement. However, the proposed project would also include construction of aboveground facilities associated with the MOV facility. Accepted procedures for placement of the water lines and construction measures necessary to minimize potential adverse effects have been incorporated into the project design. The proposed project would be required to comply with the most current California Building Code (CBC) standards, which stipulate appropriate seismic design provisions that shall be implemented with project design and construction. Compliance with the CBC, the EMWD standards, the recommendations in the Desktop Geotechnical/Geological Review (Appendix D),[23] the Geophysical Evaluation (Appendix E),[24] and the latest edition of the Standard Specifications for Public Works Construction[25] would reduce any potential impacts related to on-site seismic ground shaking to a less than significant level. While the project site would be exposed to seismic ground shaking, the proposed project would not cause or exacerbate strong seismic ground shaking that would expose people or structures to significant risk of injury or loss of property. Therefore, this impact would be **less than significant**.

iii. Seismic-related ground failure, including liquefaction? ***(No Impact)***

Liquefaction is the transformation of saturated, loose, fine-grained sediment to a fluid-like state because of earthquake shaking or other rapid loading. Soils most susceptible to liquefaction are loose to medium dense, saturated sands, silty sands, sandy silts, non-plastic silts and gravels with poor drainage, or those capped by or containing seams of impermeable sediment.

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23 Leighton Consulting, Inc. 2023. Desktop Geotechnical/Geology Review Eastern Municipal Water District, Valley Boulevard Potable Water Transmission Pipelines, Menifee, California. April 26.

24 Atlas Technical Consultants LLC. 2023. Geophysical Evaluation, EMWD Valley Boulevard Transmission Pipeline, Menifee, California. May 22.

25 Public Works Standards, Inc. 2021. "Greenbook" Standard Specifications for Public Works Construction, published by BNI Building News.

Per the Desktop Geotechnical/Geological Review,[26] the proposed project is planned to be installed in dense older alluvium or granitic rock, which are not prone to liquefaction. Therefore, the proposed project would not expose people or structures to substantial effects related to liquefaction. **No impact** would occur.

*iv. Landslides? (**No Impact**)*

The project site is mostly flat, located within a developed urban area, and is not located within an earthquake-induced or rainfall-induced landslide zone.[27] Additionally, the geotechnical investigation found that no landslides were recorded along the proposed alignment. Therefore, the proposed project would not expose people or structures to substantial effects related to landslides. **No impact** would occur.

*b. Would the project result in substantial soil erosion or the loss of topsoil? **(Less Than Significant Impact)***

During construction activities, excavated soil would be exposed, and there would be an increased potential for soil erosion and sedimentation compared to existing conditions during the period of earthwork activities, and between the time when earthwork is completed and new vegetation is established or hardscape is installed. Exposed soils could be entrained in stormwater runoff and transported off the project site. As part of construction activities, a total of approximately 23 acres of soil would be disturbed during site grading. Due to the fact that the project would disturb more than 1 acre of soil, the proposed project would be subject to the requirements of the State Water Resources Control Board (SWRCB) National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharge Associated with Construction and Land Disturbance Activities (Order No. 2009-0009-DWQ, as amended by Orders No. 2010-0014-DWQ and 2012-0006-DWQ, NPDES No. CAS000002) (CGP). Therefore, preparation of a Stormwater Pollution Prevention Plan (SWPPP) and implementation of Erosion Control and Sediment Control BMPs would be required. The SWPPP would provide the details of the erosion control measures to be applied on the project site during the construction period, including BMPs for erosion control that are recognized by the RWQCB. Implementation of a SWPPP as required by the Construction General Permit and as specified in Section 2.6, Environmental Commitments, would ensure that potential impacts related to soil erosion and loss of topsoil associated with project construction would be reduced to a **less than significant** level.

Operation of the project would be similar to the existing condition and would not result in a significant increase in impervious surface area or an associated increase in the rate and volume of stormwater runoff. Therefore, implementation of the project would not result in any long-term operational impacts related to soil erosion or loss of topsoil. This impact would be **less than significant.**

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[26] Leighton Consulting, Inc. 2023. Desktop Geotechnical/Geology Review Eastern Municipal Water District, Valley Boulevard Potable Water Transmission Pipelines, Menifee, California. April 26.

[27] California Geological Survey. 2021. Earthquake Zones of Required Investigation. Website: https://maps.conservation.ca.gov/cgs/EQZApp/app/ (accessed January 5, 2024).

c. Would the project 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)***

Please refer to Section 4.7.a. As previously described, the project site is located on relatively level terrain and is largely developed. Proposed pipelines and other facilities would be designed and constructed with adequate foundations and bedding in accordance with the CBC, standard engineering practices, and the recommendations of the geotechnical investigation. The project site is not anticipated to become unstable as a result of the proposed project or potentially result in on- or off-site landslides or liquefaction.

Lateral spreading typically occurs as a form of horizontal displacement of relatively flat-lying alluvial material toward an open or "free" face such as an open body of water, channel, or excavation. In soils, this movement is generally due to failure along a weak plane and may often be associated with liquefaction. As cracks develop within the weakened material, blocks of soil displace laterally towards the open face. Cracking and lateral movement may gradually propagate away from the face as blocks continue to break free. Generally, failure in this mode is analytically unpredictable since it is difficult to evaluate where the first tension crack will occur. Per the Desktop Geotechnical/ Geological Review,[28] lateral spreading is not considered a geological hazard for the proposed pipeline.

The proposed project would be designed and constructed with adequate foundations and bedding in accordance with the CBC, standard engineering practices, and the recommendations of the geotechnical investigations prepared for the proposed project. The project site is not anticipated to become unstable as a result of the proposed project or potentially result in on- or off-site landslides, liquefaction, or lateral spreading. Therefore, the proposed project would not result in a geologic hazard from landslide, lateral spreading, subsidence, liquefaction, or collapse, and the impact would be **less than significant**.

d. Would the project be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property? ***(No Impact)***

Expansion and contraction of volume can occur when expansive soils undergo alternating cycles of wetting (swelling) and drying (shrinking). During these cycles, the volume of the soil changes markedly. Changes in soil volume could result in significant expansion pressure on any structures proposed as part of future development of the project site. Expansive soils are common throughout California and can cause damage to foundations and slabs unless properly treated during construction.

28 Leighton Consulting, Inc. 2023. Desktop Geotechnical/Geology Review Eastern Municipal Water District, Valley Boulevard Potable Water Transmission Pipelines, Menifee, California. April 26.

According to the Desktop Geotechnical/Geological Review,[29] the proposed project would not be located in areas with highly expansive soils. Therefore, **no impact** associated with expansive soils would occur.

*e. Would the project have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of waste water? **(No Impact)***

Implementation of the project would not include installation of septic tanks or alternative wastewater disposal systems. Therefore, there would be **no impact** to soils and wastewater disposal.

*f. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature? **(Less Than Significant with Mitigation Incorporated)***

According to the City's General Plan Environmental Impact Report (EIR), the majority of the project area is within an area of high paleontological sensitivity.[30] As such, construction activities associated with the proposed project have the potential to impact scientifically significant paleontological resources, and a Paleontological Resources Assessment[31] was prepared for the proposed project. This report is included as Appendix F.

The Paleontological Resources Assessment included literature review, a fossil locality search conducted by the Western Science Center (WSC), and an intensive pedestrian investigation performed on April 19, 2024. According to the locality search conducted by the WSC, no records of fossil localities were identified within the boundaries of the project site or within a 1-mile radius of the project site. However, localities in similarly mapped units across Southern California were identified. Approximately 9 miles southeast of the project area, thousands of Pleistocene fossils were recovered during the development of Diamond Valley Lake. These fossils include ground sloths (*Megalonyx jeffersonii*), sabre-toothed cat (*Smilodon fatalis*), camel (*Camelops hesternus*), bison (*Bison antiquus*, *Bison latifrons*), horses (*Equus conversidens*, *Equus occidentalis*), mastodon (*Mammut pacificus*), dire wolf (*Canis dirus*), and mammoth (*Mammuthus columbi*). No paleontological resources were observed during the pedestrian survey.

The project site contains Artificial Fill; Gabbro, Undifferentiated; and quartz-rich rocks of Menifee Valley, which have no paleontological sensitivity. The Old Alluvial Fan Deposits, Very Old Alluvial Fan Deposits, and the Very Old Axial Channel Deposits all have high paleontological sensitivity. **Figure 4.7-1** shows the geology of the project site. Excavation for the various project components will extend to depths of 7 to 22.5 feet across the project site.

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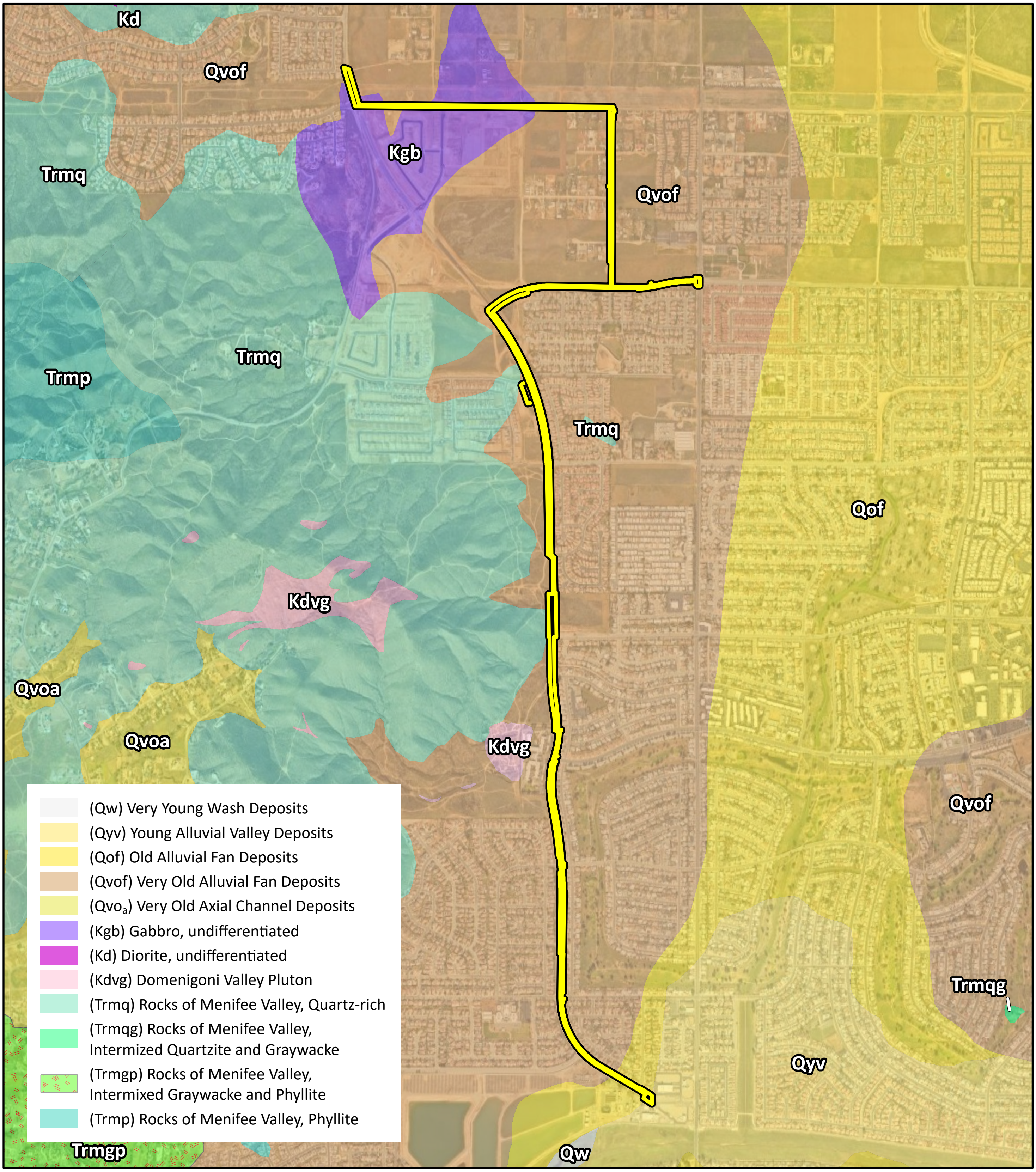
29 Leighton Consulting, Inc. 2023. Desktop Geotechnical/Geology Review Eastern Municipal Water District, Valley Boulevard Potable Water Transmission Pipelines, Menifee, California. April 26.

30 City of Menifee. 2013a. City of Menifee General Plan, Section 5.5 Cultural Resources, Figure 5.5-1: Paleontological Resources Sensitivity. September.

31 LSA Associates, Inc. 2024c. Paleontological Resources Assessment for the Valley Boulevard Pipeline Project, City of Menifee, Riverside County, California (LSA Project No. EWD2101.04). October 22.



LSA

Project Boundary

FIGURE 4.7-1

N

0 1000 2000

FEET

Valley Boulevard Potable Water Transmission Pipelines Project

Geology Map

SOURCE: Google Imagery (2023); Morton and Miller (2006)

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Development of this project is expected to extend into paleontologically sensitive sediments and has the potential to impact scientifically significant paleontological resources. Therefore, **Mitigation Measures GEO-1 through GEO-3** would be required in order to reduce project impacts on paleontological resources to less than significant.

Mitigation Measure GEO-1 A paleontologist who meets the qualifications established by the Society of Vertebrate Paleontology (SVP) shall be retained to develop a Paleontological Resources Impact Mitigation Program (PRIMP) for this project. The PRIMP shall be consistent with the standards of the SVP and include the methods that will be used to protect paleontological resources that may exist within the project site, as well as procedures for monitoring, fossil preparation and identification, curation into a repository, and preparation of a report at the conclusion of grading.

Mitigation Measure GEO-2 Excavation and grading activities in deposits with high paleontological sensitivity (i.e., Old Alluvial Fan Deposits, Very Old Alluvial Fan Deposits, and Very Old Axial Channel Deposits) shall be monitored full time by a qualified paleontological monitor following a PRIMP. No monitoring is required for excavations in deposits with no or low paleontological sensitivity (i.e., Artificial Fill and Rocks of Menifee Valley, Phyllite). If paleontological resources are encountered during the course of ground disturbance, the paleontological monitor shall have the authority to temporarily redirect construction away from the area of the find. In the event that paleontological resources are encountered when a paleontological monitor is not present, work in the immediate area of the find shall be redirected, and the paleontologist or paleontological monitor shall be contacted to assess the find for scientific significance. If determined to be scientifically significant, the fossil shall be collected from the field.

Mitigation Measure GEO-3 Collected resources shall be prepared to the point of identification, identified to the lowest taxonomic level possible, catalogued, and curated into the permanent collections of a museum repository. At the conclusion of the monitoring program, a report of findings shall be prepared to document the results of the monitoring program.

Implementation of **Mitigation Measures GEO-1 through GEO-3** would reduce the level of the potential impact through monitoring during excavation in paleontologically sensitive formations; identification of paleontological resources during construction; the evaluation of unanticipated discoveries; and the recovery of significant paleontological data from those resources that warrant such investigation. This process would recover scientifically consequential information from at-risk resources to offset their potential loss. Therefore, with implementation of **Mitigation Measures GEO-1 through GEO-3,** this impact would be **less than significant with mitigation incorporated**.

4.8 GREENHOUSE GAS EMISSIONS

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☒	☐
b. Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☒	☐

Greenhouse gases (GHGs) are present in the atmosphere naturally, are released by natural sources, or are formed from secondary reactions taking place in the atmosphere. The gases that are widely seen as the principal contributors to human-induced global climate change are:

- Carbon dioxide (CO_2)
- Methane (CH_4)
- Nitrous oxide (N_2O)
- Hydrofluorocarbons (HFCs)
- Perfluorocarbons (PFCs)
- Sulfur hexafluoride (SF_6)

Over the last 200 years, humans have caused substantial quantities of GHGs to be released into the atmosphere. These extra emissions are increasing GHG concentrations in the atmosphere and enhancing the natural greenhouse effect, believed to be causing global warming. While manmade GHGs include naturally occurring GHGs such as CO_2, CH_4, and N_2O, some gases, like HFCs, PFCs, and SF_6 are completely new to the atmosphere.

Certain gases, such as water vapor, are short-lived in the atmosphere. Others remain in the atmosphere for significant periods of time, contributing to climate change in the long term. Water vapor is excluded from the list of GHGs above because it is short-lived in the atmosphere and its atmospheric concentrations are largely determined by natural processes, such as oceanic evaporation.

These gases vary considerably in terms of Global Warming Potential (GWP), which is a concept developed to compare the ability of each GHG to trap heat in the atmosphere relative to another gas. The GWP is based on several factors, including the relative effectiveness of a gas to absorb infrared radiation and length of time that the gas remains in the atmosphere ("atmospheric lifetime"). The GWP of each gas is measured relative to CO_2, the most abundant GHG; the definition of GWP for a particular GHG is the ratio of heat trapped by one unit mass of the GHG to the ratio of heat trapped by one unit mass of CO_2 over a specified time period. GHG emissions are typically measured in terms of pounds or tons of "CO_2 equivalents" (CO_2e).

*a. Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment? **(Less Than Significant Impact)***

In October 2008, the SCAQMD released a Draft Guidance Document – Interim CEQA Greenhouse Gas (GHG) Significance Threshold (Draft Guidance Document) that suggested a tiered approach to analyzing GHG emissions in a project-level analysis. In the Draft Guidance Document, the SCAQMD provided numerical thresholds that can be applied to smaller projects (like the proposed project). The operational interim GHG significance threshold is 3,000 metric tons (MT) per year of CO_2e for residential and commercial land uses. If emissions exceed the numerical screening threshold, a more detailed review of the project's GHG emissions is warranted. The SCAQMD has not addressed emission thresholds for construction; however, the SCAQMD requires quantification and disclosure.

This section discusses the project's impacts related to the release of GHG emissions for the construction and operational phases of the project. Construction and operational GHG emissions were estimated using CalEEMod and the same methodology for the criteria pollutants described in Section 4.3, Air Quality.

Construction Activities. Construction activities associated with the proposed project would produce combustion emissions from various sources. During construction, GHGs would be emitted through the operation of construction equipment and from worker and builder supply vendor vehicles, each of which typically use fossil-based fuels to operate. The combustion of fossil-based fuels creates GHGs such as CO_2, CH_4, and N_2O. Furthermore, CH_4 is emitted during the fueling of heavy equipment. Exhaust emissions from on-site construction activities would vary daily as construction activity levels change.

SCAQMD does not provide a separate GHG significance threshold for construction emissions; rather, applicable guidance specifies that construction emissions should be amortized over 30 years (a typical project lifetime), added to the project operational emissions, and that total compared to the GHG significance threshold. As shown in **Table 4.8.A**, the construction emissions associated with the proposed project would be 1,711.1 MT CO_2e per year. Based on the 30-year lifespan of the proposed project, the proposed project would result in GHG emissions of 57.0 MT CO_2e per year (see the CalEEMod output in Appendix A for details).

Table 4.8.A: Construction Greenhouse Gas Emissions

Construction Year	Total Emissions per Year (MT)			Total Emissions per Year (MT CO_2e)
	CO_2	CH_4	N_2O	
2024	189.0	<1.0	<1.0	191.3
2025	1,051.9	<1.0	<1.0	1,063.0
2026	454.7	<1.0	<1.0	456.8
Total Emissions for the Entire Construction Process				**2,711.1**
Total Construction Emissions Amortized over 30 Years				**57.0**

Source: Compiled by LSA Associates, Inc. (February 2025).

CH_4 = methane
CO_2 = carbon dioxide
CO_2e = carbon dioxide equivalent
MT = metric tons
MT CO_2e = metric tons of carbon dioxide equivalent
N_2O = nitrous oxide

As further discussed below, the operational activities associated with the proposed project would not be expected to increase over the baseline existing levels of activity. In addition, construction emissions are temporary and would cease to occur after the construction period; therefore, the project would not result in the generation of substantial GHG emissions during construction. Since there is no separate GHG significance threshold for construction emissions, project level and cumulative GHG emissions during construction activities alone would be **less than significant**.

Operational GHG Emissions. Long-term GHG emissions are typically generated from mobile sources (e.g., cars, trucks, and buses), area sources (e.g., maintenance activities and landscaping), indirect emissions from sources associated with energy consumption, waste sources (land filling and waste disposal), and water sources (water supply and conveyance, treatment, and distribution). Mobile-source GHG emissions would include project-generated vehicle and truck trips to and from the project site. Area-source emissions would be associated with activities such as landscaping and maintenance on the project site. Waste source emissions are typically generated by the energy generated by landfilling and other methods of disposal related to transporting and managing project-generated waste.

As discussed in Section 4.3, Air Quality, the proposed project would install 4.4 miles of new water pipelines along Valley Boulevard from the existing EMWD Desalination Complex at 29285 Valley Boulevard in Menifee to the intersection of McLaughlin Road and Goetz Road. The proposed project would also construct a valve station with an MOV. The project aims to improve operation reliability and system redundancy by providing additional conveyance for the existing transmission pipelines in the project area and to support operation of the proposed Goetz Road water storage tank. Upon completion of construction activities, operation of the proposed project would be conducted remotely and there would be no full-time dedicated staff at the site. EMWD staff may visit the site occasionally for facility inspections. It is anticipated that project operations would require approximately four 30-minute inspections per month. As described in Section 4.17, Transportation, no additional trips are anticipated due to implementation of the proposed project. As such, the project would not result in an increase in the generation of vehicle trips or VMT that would increase GHG emissions. Although operation of the proposed project would include the use of electricity for the MOV facility, the purpose of the proposed project is to improve efficiency of the existing pipelines. Therefore, the project would also not be a substantial source of energy, area, waste, or water source emissions. Therefore, the proposed project would not generate GHG emissions that would have a significant impact on the environment. Therefore, impacts would be **less than significant**.

b. *Would the project conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?* ***(Less Than Significant Impact)***

The proposed project was analyzed for consistency with the goals of the 2022 Scoping Plan and the 2020–2045 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS).

2022 Scoping Plan. The following discussion evaluates the proposed project according to the goals of the 2022 Scoping Plan, Executive Order (EO) B-30-15, Senate Bill (SB) 32, AB 197, and AB 1279.

EO B-30-15 added the immediate target of reducing GHG emissions to 40 percent below 1990 levels by 2030. CARB released a second update to the Scoping Plan, the 2017 Scoping Plan,[32] to reflect the 2030 target set by EO B-30-15 and codified by SB 32. SB 32 affirms the importance of addressing climate change by codifying into statute the GHG emissions reductions target of at least 40 percent below 1990 levels by 2030 contained in EO B-30-15. SB 32 builds on AB 32 and keeps us on the path toward achieving the State's 2050 objective of reducing emissions to 80 percent below 1990 levels. The companion bill to SB 32, AB 197, provides additional direction to the CARB related to the adoption of strategies to reduce GHG emissions. Additional direction in AB 197 intended to provide easier public access to air emissions data that are collected by CARB was posted in December 2016.

In addition, the 2022 Scoping Plan assesses progress toward the statutory 2030 target, while laying out a path to achieving carbon neutrality no later than 2045. The 2022 Scoping Plan focuses on outcomes needed to achieve carbon neutrality by assessing paths for clean technology, energy deployment, natural and working lands, and others, and is designed to meet the State's long-term climate objectives and support a range of economic, environmental, energy security, environmental justice, and public health priorities.

The 2022 Scoping Plan focuses on building clean energy production and distribution infrastructure for a carbon-neutral future, including transitioning existing energy production and transmission infrastructure to produce zero-carbon electricity and hydrogen, and utilizing biogas resulting from wildfire management or landfill and dairy operations, among other substitutes. The 2022 Scoping Plan states that in almost all sectors, electrification will play an important role. The 2022 Scoping Plan evaluates clean energy and technology options and the transition away from fossil fuels, including adding four times the solar and wind capacity by 2045 and about 1,700 times the amount of current hydrogen supply. As discussed in the 2022 Scoping Plan, EO N-79-20 requires that all new passenger vehicles sold in California will be zero-emission by 2035, and all other fleets will have transitioned to zero-emission as fully possible by 2045, which will reduce the percentage of fossil fuel combustion vehicles.

Energy efficient measures are intended to maximize energy efficiency building and appliance standards, pursue additional efficiency efforts (including new technologies and new policy and implementation mechanisms), and pursue comparable investment in energy efficiency from all retail providers of electricity in California. In addition, these measures are designed to expand the use of green building practices to reduce the carbon footprint of California's new and existing inventory of buildings. As described in the preceding section, the proposed project would install 4.4 miles of new water pipelines along Valley Boulevard from the existing EMWD Desalination Complex at 29285 Valley Boulevard in Menifee to the intersection of McLaughlin Road and Goetz Road. The proposed project would also include an MOV facility; however, this energy use is expected to be minimal during the operational period and similar to existing conditions. Therefore, the proposed project would not conflict with applicable energy measures.

Water conservation and efficiency measures are intended to continue efficiency programs and use cleaner energy sources to move and treat water. Increasing the efficiency of water transport and reducing water use would reduce GHG emissions. The project would not be a substantial source of

[32] California Air Resources Board (CARB). 2017. California's 2017 Climate Change Scoping Plan. November.

water source emissions. Therefore, the proposed project would not conflict with any of the water conservation and efficiency measures.

The goal of transportation and motor vehicle measures is to develop regional GHG emissions reduction targets for passenger vehicles. Specific regional emission targets for transportation emissions would not directly apply to the proposed project. The second phase of Pavley standards will reduce GHG emissions from new cars by 34 percent from 2016 levels by 2025. As identified above, no additional trips are anticipated due to implementation of the proposed project. Therefore, the proposed project would not conflict with the identified transportation and motor vehicle measures.

2020–2045 RTP/SCS. SCAG's RTP/SCS identifies that land use strategies that focus on new housing and job growth in areas served by high-quality transit and other opportunity areas would be consistent with a land use development pattern that supports and complements the proposed transportation network. The core vision in the 2020–2045 RTP/SCS is to better manage the existing transportation system through design management strategies, integrate land use decisions and technological advancements, create complete streets that are safe to all roadway users, preserve the transportation system, and expand transit and foster development in transit-oriented communities. The 2020–2045 RTP/SCS contains transportation projects to help more efficiently distribute population, housing, and employment growth, as well as forecast development that is generally consistent with regional-level general plan data. The forecasted development pattern, when integrated with the financially constrained transportation investments identified in the 2020–2045 RTP/SCS, would reach the regional target of reducing GHG emissions from autos and light-duty trucks by 19 percent by 2035 (compared to 2005 levels). The 2020–2045 RTP/SCS does not require that local General Plans, Specific Plans, or zoning be consistent with the 2020–2045 RTP/SCS, but provides incentives for consistency for governments and developers.

Implementing SCAG's RTP/SCS will greatly reduce the regional GHG emissions from transportation, helping to achieve statewide emissions reduction targets. The proposed project does not meet the criteria identified in *State CEQA Guidelines* Section 15205.b.2 for projects of statewide, regional, or areawide significance. In addition, the proposed project would not require a change to any General Plan land use designations or the current zoning for any of the jurisdictions the project traverses. As such, the proposed project would not interfere with SCAG's ability to achieve the region's GHG reduction target of 19 percent below 2005 per capita emissions levels by 2035. Furthermore, the proposed project is not regionally significant per *State CEQA Guidelines* Section 15206 and as such, it would not conflict with the SCAG RTP/SCS targets since those targets were established and are applicable on a regional level.

Based on the nature of the proposed project, it is anticipated that implementation of the proposed project would not interfere with SCAG's ability to implement the regional strategies outlined in the RTP/SCS.

The proposed project would be determined to have a less than significant individual and cumulative impact related to GHG emissions. Therefore, the proposed project would not generate GHG emissions that would have a significant impact on the environment, nor would the project conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs. Associated impacts would be **less than significant**.

4.9 HAZARDS AND HAZARDOUS MATERIALS

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
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 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 2 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?	☐	☐	☒	☐

*a. Would the project create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials? **(Less Than Significant Impact)***

Hazardous materials are chemicals that could potentially cause harm during an accidental release or mishap, and are defined as being toxic, corrosive, flammable, reactive, and irritant, or a strong sensitizer.[33] Hazardous substances include all chemicals regulated under the United States Department of Transportation (USDOT) "hazardous materials" regulations and the United States Environmental Protection Agency (USEPA) "hazardous waste" regulations. Hazardous wastes require special handling and disposal because of their potential to damage public health and the environment. The probable frequency and severity of consequences from the routine transport, use, or disposal of hazardous materials is affected by the type of substance, the quantity used or managed, and the nature of the activities and operations.

Construction. The proposed project would install 4.4 miles of 36-inch-diameter, 30-inch-diameter, and 18-inch-diameter pipelines along Valley Boulevard from the existing EMWD Desalination

[33] A "sensitizer" is a chemical that can cause a substantial proportion of people or animals to develop an allergic reaction in normal tissue after repeated exposure to a chemical.

Complex at 29285 Valley Boulevard in Menifee to the intersection of McLaughlin Road and Goetz Road. The project also includes construction and operation of a valve station with an MOV on a vacant parcel at the intersection of Valley Boulevard and Thornton Avenue. Construction activities associated with the proposed project would use a limited amount of hazardous and flammable substances (e.g., oils) during heavy equipment operation for site excavation and construction. Potentially hazardous substances (e.g., chemical agents, solvents, and paints) would also be used during construction. However, the amount of hazardous chemicals present during construction is limited and would be used in compliance with existing government regulations, including implementation of BMPs to protect water quality. In addition, the potential for the release of hazardous materials during project construction is low. Even if a release of hazardous materials would occur, it would not result in a significant hazard to the public, surrounding land uses, or environment due to the small quantities of these materials associated with construction vehicles.

Operation. Operation of the proposed project would be conducted remotely, and there would be no full-time dedicated staff at the site. EMWD staff may visit the site occasionally for routine maintenance activities. During operation and maintenance (O&M), no hazardous materials would be routinely transported, used, or disposed of. As currently occurs, the EMWD would be required to comply with existing government regulations in the use and disposal of any hazardous materials necessary for maintenance of the proposed pipelines and other facilities, and such materials would not be used in sufficient strength or quantity to create a substantial risk to human or environmental health. Therefore, the proposed project would have a **less than significant impact** related to the routine transport, use, or disposal of hazardous materials.

*b. Would the project create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment? **(Less Than Significant Impact)***

As described in Section 4.9.a above, operation of the project would not require the routine use of hazardous materials; therefore, no hazards or hazardous materials impacts related to long-term operation of the project are anticipated.

Hazardous materials most likely to be used during construction include typical construction materials (e.g., gasoline, diesel, motor oil, lubricants, solvents, and adhesives). Such materials would be kept at construction staging areas and would be secured when not in use. In the unlikely event of a spill, fuels would be controlled and disposed of in accordance with applicable regulations. Drips and small spills would be the most likely potential hazardous material releases to occur; however, any release that occurs close to a stream or drainage channel could have a significant impact on the environment if it is not properly controlled. The EMWD would be required to prepare and implement a SWPPP for the proposed project in accordance with the CGP permitting requirements, which would reduce the potential for hazardous material releases to occur during construction and would reduce the potential for spills to impact sensitive habitat or human health to a less than significant level. Therefore, development of the proposed project would not create a significant hazard to the public or environment. This impact would be **less than significant**.

*c. Would the project emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?**(Less Than Significant Impact)***

Schools in the project area include: Ridgemoor Elementary School, which is located less than 0.1 mile west of the project site; Kathryn Newport Middle School, which is approximately 1.0 mile southwest of the project site; Hans Middle School, which is 2.2 miles east of the project site; and Romoland Elementary School, which is approximately 3.0 miles east of the project site. The proposed project would install water pipelines largely within the public right-of-way and construct an MOV facility on an existing vacant parcel. Due to the nature of the proposed project, the proposed project is not the type that would emit hazardous emissions or handle hazardous or acutely hazardous materials or substances, as described above in Sections 4.9.a and 4.9.b. Therefore, the proposed project would not emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school. This impact would be **less than significant**.

*d. Would the project be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment? **(Less Than Significant Impact)***

Government Code Section 65962.5 states that the California Department of Toxic Substances Control (DTSC) shall annually compile and maintain a list of hazardous waste facilities subject to corrective action as part of the Health and Safety Code. This list is commonly referred to as the Cortese List. The project site is not located on the RWQCB Leaking Underground Storage Tank (LUST) Cleanup Site or any other Cleanup Program Sites (formerly known as Spills, Leaks, Investigations, and Cleanups or SLIC). These two components comprise the State Cortese List of known hazardous materials sites compiled pursuant to Government Code Section 65962.5.

According to the SWRCB Geotracker website,[34] no State-listed hazardous materials Cleanup Sites are located within 1,000 feet of the project site. Four sites, located approximately 1 mile east of the project site, are listed as LUST sites. These sites are designated "closed." A closed site indicates that regulatory requirements for response actions (e.g., site assessment and remediation) have either been completed or were not necessary. Therefore, potential migration of residual contaminants in groundwater beneath the project site (if any) does not likely pose a risk to human health and the environment.

The project site is not included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5. Since the project would not be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and would not create a significant hazard to the public or the environment, impacts would be **less than significant**.

[34] State Water Resources Control Board (SWRCB). 2021. Geotracker Website Application. Website: https://geotracker.waterboards.ca.gov/map/?CMD=runreport&myaddress=Sacramento (accessed July 17, 2023).

*e. Would the project be located within an airport land use plan or, where such a plan has not been adopted, within 2 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 northernmost portion of the project site is located approximately 1.8 miles south of the Perris Valley Airport. This portion of the project site is located in Airport Compatibility Zone E in the Airport Land Use Plan for Perris Valley Airport issued by the Riverside County Airport Land Use Commission.[35] Land uses that attract very high concentrations of people in confined areas (e.g., sports stadiums, amphitheaters, and concert halls) are discouraged in Zone E beneath principal flight paths. About 80 percent of airport operations to the south of the airport use one of three general traffic patterns. Two of these patterns extend over Menifee; the third turns northward and does not pass over Menifee. The northwest corner of Menifee is in a zone where the heights of structures are limited pursuant to Part 77 regulations of the Federal Aviation Administration (FAA). Height limits range from about 1,580 feet above mean sea level (amsl)—or 160 feet above ground level—on the north Menifee boundary about 0.4 mile east of Goetz Road, to 1,750 feet amsl about 0.7 mile south of the north Menifee boundary.[36] The proposed project would install underground pipelines; no aboveground structures would be constructed within Zone E of the Airport Land Use Plan for the Perris Valley Airport. Therefore, the project would not result in a safety hazard for people residing or working in the project area. **No impact** would occur.

*f. Would the project impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan? **(Less Than Significant Impact)***

The Riverside County Emergency Management Department is responsible for creating and maintaining the Riverside County Emergency Operations Plan (EOP). The plan establishes a management organization and assigns functions and tasks consistent with California's Standardized Emergency Management System (SEMS) and the National Incident Management System (NIMS). The EOP provides for the integration and coordination of planning efforts of Riverside County, and its intent is to provide direction on how to respond for an emergency from the onset through extended response and into the recovery process.[37] The Riverside County Emergency Management Department also prepares and maintains the Riverside County Multi-Jurisdictional Hazard Mitigation Plan (MJHMP), which identifies risks and ways to minimize damage from natural and manmade disasters.[38] Neither of these plans identify specific evacuation routes within Riverside County.

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[35] Mead & Hunt. 2011. Riverside County Airport Land Use Compatibility Plan, Volume 1 Policy Document. Perris Valley Airport. March. Website: https://rcaluc.org/sites/g/files/aldnop421/files/migrated/Portals-13-19-20--20Vol.-201-20Perris-20Valley-20-Final-Mar.2011-.pdf (accessed April 22, 2024).

[36] The Planning Center|DC&E. 2013a. Draft City of Menifee General Plan Environmental Impact Report. Section 5.8 Hazards and Hazardous Materials. September. Website: https://www.cityofmenifee.us/DocumentCenter/View/1108/Ch-05-08-HAZ?bidId= (accessed April 22, 2024).

[37] County of Riverside, Emergency Management Department. 2019. Riverside County Emergency Operations Plan (EOP). Website: http://riversidecountyca.iqm2.com/Citizens/Detail_LegiFile.aspx?Frame=&MeetingID=2048&MediaPosition=3715.315&ID=10490&CssClass= (accessed August 15, 2023).

[38] County of Riverside, Emergency Management Department. 2023. County of Riverside Multi-Jurisdictional Local Hazard Mitigation Plan. April. Website: https://rivcoready.org/sites/g/files/aldnop181/files/2023-08/MJLHMP%208.7.23.pdf (accessed August 15, 2023).

Roads used as response corridors/evacuation routes usually follow the most direct path to or from various parts of a community. For the project site and the surrounding areas, the main corridors anticipated to be used by emergency service providers are Valley Boulevard, Goetz Road, I-215, and other arterials and freeways in this part of Riverside County.

Construction. Construction of the proposed project would not result in substantial temporary traffic delays because traffic flow would largely be maintained even though temporary lane closures may be required. Temporary lane closures would be implemented consistent with the recommendations of the current California Temporary Traffic Control Handbook (CATTCH) (previously known as the California Joint Utility Traffic Control Manual). The CATTCH provides basic standards for the safe movement of all road users (including emergency responders) through construction zones in accordance with Section 21400 of the California Vehicle Code and the Caltrans (Manual on Uniform Traffic Control Devices) MUTCD. As identified in Section 2.6, Environmental Commitments, the EMWD prepares a Construction Traffic Management Plan (CTMP) based on the recommendations of the CATTCH. The CTMP would further ensure that the proposed project would not inhibit an emergency response plan or an emergency evacuation plan. Adherence to applicable emergency access codes and ordinances and preparation of the CTMP would ensure that construction and operation of the proposed project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. Therefore, the proposed project would not physically interfere with the implementation of an adopted emergency response plan or evacuation plan. This impact would be **less than significant**.

Operation. The proposed project would result in installation of new water pipelines within the existing/planned Valley Boulevard, Rouse Road, Geary Street, and McLaughlin Road rights-of-way and construction of an MOV facility on an existing vacant parcel at the corner of Valley Boulevard and Thornton Avenue. The proposed project would be required to comply with all applicable codes and ordinances for emergency vehicle access, which would ensure adequate access to, from, and on site for emergency vehicles. Further, the proposed project would not reconfigure any existing roadways, result in road closures during operation of the project, or include features that would otherwise hinder emergency response or evacuation. Therefore, operation of the proposed project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. Potential project impacts would be **less than significant**.

g. *Would the project expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?* ***(Less Than Significant Impact)***

The project site is located within a developed urban area; however, according to CAL FIRE, areas just east of Valley Boulevard and just south of Cherry Hills Boulevard to Thornton Avenue are located in a Very High Fire Hazard Severity Zone (VHFHSZ).[39] Additionally, the northernmost portion of the project site, including the pipeline alignments along McLaughlin Road, Geary Street, and Rouse Road are located in a High Fire Hazard Severity Zone.[40] Construction of the proposed pipelines would

39 California Department of Fire and Forestry Protection (CAL FIRE). 2024. Fire Hazard Severity Zone Viewer. Website: https://experience.arcgis.com/experience/03beab8511814e79a0e4eabf0d3e7247/ (accessed April 24, 2024).

40 Ibid.

occur within existing and proposed roadway rights-of-way consisting primarily of impervious surface; therefore, there would be a low fire hazard risk. Likewise, the proposed MOV facility site consists of a currently vacant parcel surrounded by lands currently under development for residential use.

Project construction and operation would not change the characteristics of the project site in a way that would make the project site more susceptible to wildland fires. During construction, the most likely source of ignition would be by mechanical activities such as operation of backhoes, mini excavators, or rolled compactors. However, the potential for ignition can be greatly reduced through equipment features, fuel treatment, and management of behavior. Additionally, all construction work would require the contractor to implement fire hazard reduction measures (e.g., having fire extinguishers located on site, use of spark arrestors on equipment, and using a spotter during welding activities). All construction work would require the contractor to implement standard fire prevention methods. Therefore, impacts associated with exposing people or structures to a significant risk of loss, injury, or death involving wildland fires would be **less than significant**.

4.10 HYDROLOGY AND WATER QUALITY

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
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 erosion or siltation on- or off-site;	☐	☐	☒	☐
ii. Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;	☐	☐	☒	☐
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?	☐	☐	☒	☐

*a. Would the project violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality? **(Less Than Significant Impact)***

The SWRCB and nine RWQCBs regulate the quality of surface water and groundwater bodies throughout California. In western Riverside County, including the cities of Menifee and Perris, the Santa Ana RWQCB is responsible for implementation of the Water Quality Control Plan (Basin Plan). The Basin Plan establishes beneficial water uses and water quality objectives for waterways and waterbodies within the region. Section 303(d) of the federal Clean Water Act (CWA) requires that states identify waterbodies, including bays, rivers, streams, creeks, and coastal areas, that do not meet water quality standards and the pollutants that are causing the impairment. Total Maximum Daily Loads (TMDLs) describe the maximum amount of a pollutant that a waterbody can receive while still meeting established water quality standards. A TMDL establishes limits for pollutant discharges into impaired waterbodies.

Under existing conditions, stormwater from the project alignment and MOV facility site likely discharges into surrounding stormwater infrastructure adjacent to roadways (if present) and tributaries that flow into the San Jacinto River. The San Jacinto River discharges into Canyon Lake, which ultimately discharges into Lake Elsinore. The SWRCB Surface Water Quality Assessment 2020-

2022 Integrated Report for Clean Water Act Sections 303(d) and 305(b) does not list any impairments for the San Jacinto River. Canyon Lake is listed as an impaired waterbody for nutrients, and Lake Elsinore is listed as an impaired waterbody for dichlorodiphenyltrichloroethane (DDT), nutrients, organic enrichment/low dissolved oxygen, polychlorinated biphenyls (PCBs), and toxicity.[41]

Runoff water quality is regulated by the NPDES Program (established through the federal CWA). The NPDES program objective is to control and reduce pollutant discharges to surface waterbodies. Compliance with NPDES permits is mandated by State and federal statutes and regulations. Locally, the NPDES Program is administered by the Santa Ana RWQCB.

Construction activities are subject to the SWRCB NPDES General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities (CGP), Order No. 2022-0057-DWQ, NPDES No. CAS000002. Any construction activity, including grading, that would result in the disturbance of 1 acre or more would require compliance with SWRCB's CGP, which requires preparation of a SWPPP and implementation of Construction BMPs during construction activities. Construction BMPs would include, but not be limited to, Erosion Control and Sediment Control BMPs designed to minimize erosion and retain sediment on site, and Good Housekeeping BMPs to prevent spills, leaks, and discharge of construction debris and waste into receiving waters.

Project operations are subject to the NPDES Permit and Waste Discharge Requirements for the Riverside County Flood Control and Water Conservation District, the County of Riverside, and the Incorporated Cities of Riverside County Within the Santa Ana Region, Order No. R8-2010-0033, NPDES No. CAS 618033 as amended by Order No. R8-2013-0024 (Municipal Separate Storm Sewer System [MS4] Permit). Any "Significant Redevelopment" projects that add or replace 5,000 or more square feet of impervious surface on an already developed site or "New Development" projects that create 10,000 square feet or more of impervious surface must comply with the requirements of the MS4 Permit. The MS4 Permit prohibits discharges, sets limits on pollutants being discharged into receiving waters, and requires implementation of technology-based standards. The MS4 Permit requires co-permittees to develop and implement standard design and post-development BMP guidance to guide application of Low Impact Development (LID) BMPs to the maximum extent practicable. The MS4 Permit requires that a Final Water Quality Management Plan (WQMP) be prepared for new development within its jurisdiction. The Riverside County Flood Control and Water Conservation District prepared and approved the Design Handbook for Low Impact Development Best Management Practices (Handbook) in September 2011.[42] The Handbook supplements the Riverside County WQMP by providing guidance for the planning, design, and maintenance of LID BMPs that may be used to mitigate the water quality impacts of developments within Riverside County. The Handbook contains detailed information and designs for seven LID BMPs that are

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41 State Water Resources Control Board (SWRCB). 2023. 2020-2022 California Integrated Report (Clean Water Act Section 303(d) List and 305(b) Report). Website: https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fwww.waterboards.ca.gov%2Fwater_issues%2Fprograms%2Ftmdl%2F2020_2022state_ir_reports_revised_final%2Fapx-a-303d-list.xlsx&wdOrigin=BROWSELINK (accessed April 23, 2024).

42 Riverside County Flood Control and Water Conservation District. September 2011. Design Handbook for Low Impact Development Best Management Practices.

designed to encourage replication of the site's natural hydrologic processes and includes detailed guidance for infiltration testing and basin considerations.

Construction. The proposed project would result in the installation of 4.4 miles of 36-inch-diameter, 30-inch-diameter, and 18-inch-diameter pipelines along Valley Boulevard from the existing EMWD Desalination Complex at 29285 Valley Boulevard in Menifee to the intersection of McLaughlin Road and Goetz Road. In addition, a valve station with an MOV and remote terminal units would be constructed on a vacant parcel at the intersection of Valley Boulevard and Thornton Avenue. Pipelines would be installed within the existing right-of-way using open-trench construction methods with trenchless technology (e.g., jack and bore) used along Geary Street to avoid ponded areas. Construction of the proposed pipeline would include demolition and removal of existing asphalt, trenching/trenchless work, fill/compaction activities, pavement reconstruction, landscaping, and concrete flatwork over the length of the project site. Project construction would require export of an estimated 8,060 cubic yards of soil for grading along unpaved areas of the pipeline alignment and at the MOV facility site, and import of 25,810 cubic yards of fill material. Pollutants of concern during construction include sediments, trash, petroleum products, concrete waste (dry and wet), sanitary waste, and chemicals. Each of these pollutants on its own or in combination with other pollutants can have a detrimental effect on water quality. During construction activities, excavated soil would be exposed, and there would be an increased potential for soil erosion and sedimentation compared to existing conditions. In addition, chemicals, liquid products, petroleum products (e.g., paints, solvents, and fuels), and concrete-related waste may be spilled or leaked, and they have the potential to be transported via storm water runoff into receiving waters.

Because construction of the proposed project would disturb greater than 1 acre of soil, the project is subject to the requirements of the Construction General Permit. As specified in Section 2.6, Environmental Commitments, the Construction Contractor would be required to prepare a SWPPP and implement construction BMPs detailed in the SWPPP during construction activities. Construction BMPs would include, but are not limited to, Erosion Control and Sediment Control BMPs designed to minimize erosion and retain sediment on site as well as Good Housekeeping BMPs to prevent spills, leaks, and discharge of construction debris and waste into receiving waters.

As discussed in Section 2.5.1, Project Construction, groundwater was not encountered at any of the project borings conducted as part of the Geotechnical Investigation, which reached a maximum depth of 21.6 feet. Proposed pipelines would be shallower than 21 feet; thus, groundwater is not anticipated to be encountered during project constriction. However, if groundwater dewatering is deemed necessary during project construction, groundwater dewatering activities could affect surface water quality through the discharge of polluted groundwater to surface waterbodies. If groundwater is encountered during construction, it would be discharged to land, storm drain, or to the EMWD sewer for treatment and reuse. If groundwater quality does not meet permitted discharge requirements for the storm drain, it would be discharged to the sanitary sewer for treatment at the EMWD wastewater treatment plant or would be temporarily stored (on site or at one of the identified staging areas) until it could be properly disposed of to the sewer or other permitted disposal site. If groundwater is discharged to land, groundwater dewatering activities would be required to comply with the General Waste Discharge Requirements for Discharges to

Surface Waters That Pose an Insignificant (De Minimis) Threat to Water Quality (Groundwater Discharge Permit), Order No. R8-2020-0006, NPDES No. CAG998001. If groundwater is discharged to storm drains, groundwater dewatering activities would be required to comply with the Groundwater Discharge Permit. In compliance with the requirements of the Groundwater Discharge Permit, groundwater would be tested and treated (if necessary) prior to discharge to surface water.

Compliance with the Construction General Permit and the Groundwater Discharge Permit (if necessary), would ensure that construction impacts related to surface water quality standards, waste discharge requirements, and surface water quality would be **less than significant,** and no mitigation is required.

Operation. The proposed project includes construction and operation of the new water pipeline to improve operation reliability and system redundancy by providing additional conveyance and would support operation of the proposed Goetz Road water storage tank. The new pipeline would be installed within the existing right-of-way, would not result in an increase in impervious surfaces, and would not require any structures. Therefore, the proposed pipeline would not result in any changes to the physical environment that would impact drainage patterns or water quality.

In addition, the proposed project would construct an MOV facility on an undeveloped parcel at the intersection of Valley Boulevard and Thornton Avenue. Overall, development of the MOV facility would result in approximately 17,000 square feet of new impervious surface area at the MOV facility site. As previously discussed, any "Significant Redevelopment" projects that add or replace 5,000 or more square feet of impervious surface on an already developed site or "New Development" projects that create 10,000 square feet or more of impervious surface must comply with the requirements of the MS4 Permit. Because the proposed MOV facility would create more than 10,000 square feet of impervious surface, the proposed project would be subject to the requirements of the MS4 Permit and would require preparation of a Final WQMP. The Final WQMP will detail the project-specific BMPs (on-site and/or watershed-based) that would be incorporated into the project design to address stormwater runoff, including Site Design, Source Control, Low-Impact Development (LID), and Treatment Control BMPs that would be implemented to capture, treat, and reduce pollutants of concern in storm water runoff. Site Design BMPs are storm water management strategies that emphasize conservation and use of existing site features to reduce the amount of runoff and pollutant loading generated from a site. Source Control BMPs are preventative measures that are implemented to prevent the introduction of pollutants into storm water. LID BMPs mimic a project site's natural hydrology by using design measures that capture, filter, store, evaporate, detain, and infiltrate runoff rather than allowing runoff to flow directly to piped or impervious storm drains. Treatment Control BMPs are structural BMPs designed to treat and reduce pollutants in storm water runoff prior to releasing it to receiving waters.

With preparation of a Final WQMP and implementation of project-specific BMPs to address pollutants of concern in storm water runoff, in compliance with the MS4 Permit, operational impacts related to surface water quality standards, waste discharge requirements, and surface water quality would be less than significant.

Overall, because the proposed project would be required to comply with existing regulations, including the Construction General Permit, Groundwater Discharge Permit (if necessary), and the

MS4 Permit, the proposed project would not violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality. Impacts would be **less than significant**.

b. *Would the project 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 project site is located within the San Jacinto Groundwater Basin,[43] which underlies San Jacinto, Perris, Moreno, and Menifee Valleys in western Riverside County. Approximately 39 percent of the basin is adjudicated under three separate adjudications, 2 percent of the basin is under the jurisdiction of the federal government, and the remaining 59 percent of the basin lies within the jurisdictional boundaries of the EMWD. The surface area of the basin is approximately 158,500 acres or 248 square miles, with average annual rainfall over the basin ranging from approximately 10 to 12 inches. The basin boundaries are formed by the San Jacinto Mountains on the east, the San Timoteo Badlands on the northeast, the Box Springs Mountains on the north, lower-relief hills on the west (e.g., Gavilan Peak and Steele Peak), and the Santa Rosa Hills and Bell Mountain on the south. The bedrock hills surrounding the basin prevent hydraulic connection with other nearby groundwater basins; therefore, there is no significant groundwater flow between other nearby groundwater basins.[44]

The estimated groundwater storage capacity of the San Jacinto Groundwater Basin is 3,070,000 acre-feet, and in 1975 the calculated groundwater in storage was 2,700,000 acre-feet.[45] EMWD's groundwater model estimates the groundwater in storage increased by an average rate of approximately 15,600 acre-feet per year (AFY) between water years 1985 and 2012.[46] Natural recharge to the basin is primarily from percolation of flow in the San Jacinto River and its tributary streams, with some minimal recharge from infiltration of rainfall on the valley floor. Natural recharge is augmented by the spreading of State Water Project (SWP) and reclaimed water through infiltration ponds in the upper reaches of the San Jacinto River. Percolation of water stored in Lake Perris has been an additional source of recharge since construction of the lake in the 1970s, and reclaimed water percolates through several storage ponds distributed throughout the valley. In some years, artificial recharge exceeds natural recharge, particularly in years with low precipitation.[47]

43 California Department of Water Resources. n.d. Groundwater Basin Boundary Assessment Tool. Website: https://gis.water.ca.gov/app/bbat/ (accessed April 23, 2024).

44 Eastern Municipal Water District (EMWD). 2021b. Groundwater Sustainability Plan for the San Jacinto Groundwater Basin. September.

45 State Water Resources Control Board, Division of Water Rights. 2006. *San Jacinto Groundwater Basin Bulletin 118*. January 20.

46 Eastern Municipal Water District (EMWD). 2021b. Groundwater Sustainability Plan for the San Jacinto Groundwater Basin. September.

47 State Water Resources Control Board, Division of Water Rights. 2006. *San Jacinto Groundwater Basin Bulletin 118*. January 20.

Construction. As discussed in Section 4.10.a above, groundwater was not encountered at any of the project borings conducted as part of the Geotechnical Investigation, which reached a maximum depth of 21.6 feet. Proposed pipelines would be shallower than 21 feet; thus, groundwater is not anticipated to be encountered during project constriction. Any dewatering would be temporary and affect only the uppermost water-bearing zone. Such dewatering would be localized and would not result in the lowering of surrounding groundwater levels or substantially contribute to depletion of groundwater supplies.

Operation. The project includes construction and operation of a new water pipeline to improve operation reliability and system redundancy by providing additional conveyance. The new pipeline would be installed within the existing right-of-way and would not result in an increase in impervious surfaces. In addition, the project purpose is to support operation of the proposed Goetz Road water storage tank, another pressure zone improvement currently underway. The project would not result in an increase in the amount of water that is distributed, and new or expanded water supply entitlements would not be required to serve the project. Therefore, operation of the proposed project would not substantially decrease groundwater supplies or interfere substantially with groundwater recharge.

For the reasons listed above, impacts related to the decrease of groundwater supplies or interference with groundwater recharge would be **less than significant**.

c. *Would the project 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:*

Under existing conditions, stormwater from the project alignment and MOV facility site likely discharges into surrounding stormwater infrastructure (if present) and tributaries that flow into the San Jacinto River. The San Jacinto River discharges into Canyon Lake, which ultimately discharges into Lake Elsinore. With implementation of the proposed project, stormwater from the project alignment would discharge into stormwater infrastructure (if present) and tributaries that flow into the San Jacinto River, similar to the existing conditions. Stormwater from the MOV facility site would be treated by project-specific BMPs detailed in the Final WQMP in accordance with the MS4 Permit, before discharging to the existing storm drain system in Valley Boulevard. Operational BMPs at the MOV facility site would include Site Design, Source Control, LID, and Treatment Control BMPs to capture, treat, and reduce pollutants of concern in storm water runoff. In addition, pursuant to the MS4 Permit, the operational BMPs would also be required to infiltrate, harvest and use, evapotranspire and/or bio-treat the 85th percentile storm event (Design Capture Volume [DCV]) for the MOV facility site, which would minimize the rate and volume stormwater runoff.

i. *Result in substantial erosion or siltation on- or off-site;* ***(Less Than Significant Impact)***

During construction activities, more than 1 acre of soil would be disturbed. During grading and other construction activities, soil would be exposed, drainage patterns would be temporarily altered, and there would be an increased potential for soil erosion and siltation compared to existing conditions. Additionally, during a storm event, soil erosion and siltation could occur at an accelerated rate. The proposed project would be required to comply with the Construction

General Permit, which requires the preparation of a SWPPP to identify construction BMPs to be implemented during construction of the proposed project to reduce impacts on water quality, including those impacts associated with soil erosion and siltation. Compliance with the requirements in the Construction General Permit, including implementation of construction BMPs, would ensure that construction impacts related to on- or off-site erosion or siltation would be **less than significant**.

After the completion of project construction, the proposed project would not significantly alter the existing drainage pattern of the site. The new pipeline would be installed within the existing right-of-way and would not result in an increase in impervious surfaces. In addition, development of the MOV facility site, which would increase the amount of impervious surface area at the site, would include the installation of project-specific BMPs detailed in the Final WQMP, as required by the MS4 Permit to minimize the rate and volume stormwater runoff, thereby minimizing on-site erosion and siltation. With adherence to the requirements of the MS4 Permit, operational impacts related to on- or off-site erosion or siltation would be **less than significant**.

ii. Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite; ***(Less Than Significant Impact)***

Project construction would comply with the requirements of the Construction General Permit and would include the preparation and implementation of a SWPPP. The SWPPP would include construction BMPs (e.g., soil binders, straw mulch, non-vegetative stabilization, fiber rolls, sandbag barrier, straw bale barrier, stabilized construction entrance/exit, stabilized construction roadway, and entrance/outlet tire wash) to control the rate and amount of on-site surface runoff and to direct flows to ensure that stormwater runoff from the construction site does not result in on- or off-site flooding. With adherence to the Construction General Permit, construction impacts related to a substantial increase in the rate or amount of surface runoff that would result in flooding and impede or redirect flood waters would be less than significant, and no mitigation is required.

After the completion of project construction, the new pipeline would be installed within the existing right-of-way and would not result in an increase in impervious surfaces. In addition, development of the MOV facility site, which would increase the amount of impervious surface area at the site, would include the installation of project-specific BMPs detailed in the Final WQMP, as required by the MS4 Permit,to minimize the rate and volume of storm water runoff to ensure that storm water runoff from the MOV facility site does not result in on- or off-site flooding. With adherence to the MS4 Permit, the proposed project would not substantially increase the rate or amount of surface runoff during operation in a manner that would result in flooding on or off site. Impacts would be **less than significant**.

*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 **(Less Than Significant Impact)***

Stormwater Drainage System Capacity. The proposed pipeline would not alter the existing drainage pattern of the site or result in an increase in impervious surfaces on the project site during project construction or operation. In addition, development of the MOV facility site, which would increase the amount of impervious surface area at the site, would include the installation of project-specific BMPs detailed in the Final WQMP, as required for compliance with the MS4 Permit. The project-specific BMPs would be required to infiltrate, harvest and use, evapotranspire and/or bio-treat the DCV for the MOV facility site before discharging to the existing storm drain system in Valley Boulevard. Overall, because the proposed project would be required to comply with existing regulations, including the Construction General Permit, and the MS4 Permit,, the proposed project would not contribute runoff that would exceed the capacity of existing or planned stormwater drainage systems, and impacts would be **less than significant**.

Polluted Runoff. As discussed in Section 4.10.a, pollutants of concern during construction include sediments, trash, petroleum products, concrete waste (dry and wet), sanitary waste, and chemicals. Each of these pollutants on its own or in combination with other pollutants can have a detrimental effect on water quality. Drainage patterns would be temporarily altered during construction activities, and construction-related pollutants could be spilled, leaked, or transported via storm runoff into adjacent drainages and downstream receiving waters. However, as previously discussed, the proposed project would be required to comply with the requirements set forth by the Construction General Permit, including preparation of an SWPPP, which would specify BMPs to be implemented to control the discharge of pollutants in stormwater runoff as a result of construction activities. Operation of the proposed project would not result in the generation of any pollutants of concern or impacts to water quality. After the completion of construction, the new pipeline would be installed within the existing right-of-way and would not result in an increase in impervious surfaces. In addition, development of the MOV facility site, which would increase the amount of impervious surface area at the site, would include the installation of project-specific BMPs detailed in the Final WQMP) that would address pollutants of concern before discharging to the existing storm drain system in Valley Boulevard. Because the proposed project would be required to comply with existing regulations, including the Construction General Permit, and the MS4 Permit,, the proposed project would not provide substantial additional sources of polluted runoff and impacts would be **less than significant**.

*iv. Impede or redirect flood flows? **(No Impact)***

According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) No. 06065C2055H, the project alignment and MOV facility site are located in Zone X, which is identified as an area of minimal flood hazard.[48] The project site is not located within a

[48] Federal Emergency Management Agency (FEMA). 2017. Flood Insurance Rate Map No. 065C2055H. Map Effective August 18, 2014. Website: https://msc.fema.gov/portal/search?AddressQuery=27005%20Goetz%20Rd%20Sun%20City%2C%20CA%2092585 (accessed April 23, 2024).

100-year floodplain. Therefore, the proposed project would not impede or redirect flood flows, and there would be **no impact**.

*d. In flood hazard, tsunami, or seiche zones, would the project risk release of pollutants due to project inundation? **(Less Than Significant Impact)***

Flooding. As discussed above, according to FEMA FIRM No. 06065C2055H, the project alignment and MOV facility site are located in Zone X, which is identified as an area of minimal flood hazard. During construction, BMPs would be implemented to ensure that during a rain event, pollutants would be retained on site and would be prevented from reaching downstream receiving waters in accordance with the Construction General Permit. During operation, the proposed pipeline would not alter the existing drainage pattern of the site, and development of the MOV facility site would include the installation of project-specific BMPs detailed in the Final WQMP that would ensure that pollutants would be treated and prevented from reaching downstream receiving waters.

In addition, according to the California Department of Water Resources Division of Safety of Dams, the project site is not located within the dam inundation area.[49] Therefore, the proposed project would not result in the release of pollutants due to flooding cause by a dam failure.

Tsunami. The project site is more than 31 miles northeast of the Pacific Ocean. Based on the distance from the Pacific Ocean, the project site is not in a tsunami hazard zone and would not result in the release of pollutants due to inundation caused by a tsunami.

Seiches. Seiches are waves that are created in an enclosed body of water (e.g., a bay, lake, or harbor) and go up and down or oscillate and do not progress forward like standard ocean waves. The nearest sizeable, enclosed body of water to the project site is Canyon Lake, which is located approximately 3.7 miles southwest of the project site. Because impacts from seiches are very localized and the project site is located miles from enclosed bodies of water, implementation of the proposed project would not result in the release of pollutants due to inundation cause by a seiche.

Because the proposed project would be required to comply with existing regulations, including the Construction General Permit, and the MS4 Permit,, and because the project site is not within a tsunami or seiche zone, implementation of the proposed project would not result in the release of pollutants from a flood, dam inundation, tsunami, or seiche, and impacts would be **less than significant**.

*e. Would the project conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan? **(Less Than Significant Impact)***

The proposed project is within the jurisdiction of the Santa Ana RWQCB. The Santa Ana RWQCB adopted a Basin Plan (January 1995, with amendments effective on or before June 2019) that designates beneficial uses for all surface and groundwater within their jurisdiction and establishes

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49 California Department of Water Resources, Division of Safety of Dams. n.d. Dam Breach Inundation Map Web Publisher. Website: https://fmds.water.ca.gov/webgis/?appid=dam_prototype_v2 (accessed April 24, 2024).

the water quality objectives and standards necessary to protect those beneficial uses. As previously discussed, the proposed project would comply with existing NPDES permit requirements, including the Construction General Permit, Groundwater Discharge Permit (if necessary), and MS4 Permit, and would implement construction and operational BMPs as necessary to reduce pollutants of concern in stormwater runoff. Compliance with these regulatory requirements would ensure that the proposed project would not degrade or alter water quality, which would cause the receiving waters to exceed the water quality objectives, or impair the beneficial use of receiving waters. As such, the proposed project would not result in water quality impacts that would conflict with the Basin Plan. Construction and operational impacts related to a conflict with the Basin Plan would be **less than significant**, and no mitigation is required.

The Sustainable Groundwater Management Act (SGMA), which was enacted in September 2014, requires governments and water agencies of high- and medium-priority basins to halt overdraft of groundwater basins. The SGMA requires the formation of local Groundwater Sustainability Agencies (GSAs), which are required to adopt Groundwater Sustainability Plans to manage the sustainability of the groundwater basins. The project site is in the San Jacinto Groundwater Basin, which the California Department of Water Resources designates as a high priority basin.[50] The GSA identified for the San Jacinto Groundwater Basin is the EMWD.

The San Jacinto Groundwater Sustainability Plan Public Draft (GSP) was finalized in September 2021. The SGMA does not apply to adjudicated basins. Therefore, the sustainability goal and sustainability management criteria defined in the GSP apply only to the GSP area, which is the non-adjudicated part of the San Jacinto Groundwater Basin, because the remaining areas of the San Jacinto Groundwater Basin are under the oversight of a Court-appointed watermaster. The GSP indicates that groundwater levels within the San Jacinto Groundwater Basin have been rising, and that groundwater recharge has likely exceeded groundwater production since the mid-1970s. The sustainability goal for the GSP area is to manage groundwater resources in a way that facilitates long-term sustainable use of groundwater in the San Jacinto Groundwater Basin.[51] Long-term sustainable management includes:

1. Maintaining sufficient groundwater in storage to allow for ongoing groundwater production that meets the operational demands of groundwater users in the GSP Area.

2. Protecting fresh groundwater resources in the Lakeview and Perris North Groundwater Management Zones (GMZs) to the extent possible by minimizing the northward and eastward migration of brackish groundwater from the Perris South GMZ.

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[50] Eastern Municipal Water District (EMWD). 2021b. Groundwater Sustainability Plan for the San Jacinto Groundwater Basin. September.

[51] Ibid.

3. Avoiding subsidence related to groundwater production that substantially interferes with surface land uses.

4. Ensuring that groundwater production does not result in significant and unreasonable loss of Groundwater Dependent Ecosystems.

The GSP identifies four projects and three management actions to support implementation efforts of the GSP. Management actions include adjusting groundwater production as needed to meet water level and/or water quality objectives, imposing a recharge or imported water purchase/ pumping offset fee, and developing a groundwater allocation. Projects include assessing feasibility of recycled water delivery to private producers in the Menifee production area, conducting additional investigations and/or technical studies, constructing additional dedicated monitoring wells, and determining the location and status of domestic wells in the Plan Area.[52]

As previously discussed, groundwater was not encountered at any of the project borings conducted as part of the Geotechnical Investigation, which reached a maximum depth of 21.6 feet. Proposed pipelines would be shallower than 21 feet; thus, groundwater is not anticipated to be encountered during project constriction. Any dewatering deemed necessary would be temporary and affect only the uppermost water-bearing zone. Such dewatering would be localized and would not result in the lowering of surrounding groundwater levels or substantially contribute to depletion of groundwater supplies. Therefore, construction of the proposed project would not conflict with or obstruct implementation of the GSP.

As previously discussed in Section 4.10.b above, the project includes construction and operation of a new water pipeline to improve operation reliability and system redundancy by providing additional conveyance. The new pipeline would be installed within the existing right-of-way and would not result in an increase in impervious surfaces. In addition, the project purpose is to support operation of the proposed Goetz Road water storage tank, another pressure zone improvement currently underway. The project would not result in an increase in the amount of water that is distributed, and new or expanded water supply entitlements would not be required to serve the project. Therefore, operation of the proposed project would not substantially decrease groundwater supplies or interfere substantially with groundwater recharge. In addition, the project would not provide substantial additional sources of polluted runoff as detailed in Section 4.10.c.iii. Therefore, the proposed project would not conflict with or obstruct the implementation of a sustainable groundwater management plan, and this impact would be **less than significant**.

52 Eastern Municipal Water District (EMWD). 2021b. Groundwater Sustainability Plan for the San Jacinto Groundwater Basin. September.

4.11 LAND USE AND PLANNING

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
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?	☐	☐	☐	☒

a. Would the project physically divide an established community? ***(No Impact)***

The physical division of an established community typically refers to the construction of a physical feature (e.g., an interstate highway or railroad tracks) or removal of a means of access (e.g., a local road or bridge) that would impair mobility within an existing community, or between a community and an outlying area. For instance, the construction of an interstate highway through an existing community may constrain travel from one side of the community to another; similarly, such construction may also impair travel to areas outside the community.

The proposed pipeline would be installed primarily within the roadway right-of-way; however, some pipeline segments would be constructed within unpaved areas and/or would be constructed in conjunction with roadway improvements. The entirety of the proposed pipelines would be placed underground. Additionally, a valve station with an MOV and remote terminal units would be constructed on a vacant parcel at the intersection of Valley Boulevard and Thornton Avenue. Neither of these project components would physically divide an established community, and **no impact** would occur.

b. Would the project 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 City of Menifee General Plan and the City of Perris General Plan are the primary land use plans containing policies and regulations applicable to the project. The proposed pipeline alignments would be located within existing public rights-of-way that do not have a land use or zoning designation in either the General Plan or Zoning Maps for the cities of Perris or Menifee. The area surrounding the proposed pipeline alignments has a variety of zoning designations, including low-density residential, high-density residential, and public utility corridor. The proposed pipelines would be installed primarily within the roadway rights-of-way; however, some pipeline segments would be constructed within unpaved areas and/or would be constructed in conjunction with roadway improvements. A valve station with an MOV and remote terminal units would be constructed on a vacant parcel at the intersection of Valley Boulevard and Thornton Avenue that is designated for low-density residential use. Public utilities are a conditionally permitted use in this zoning district. Therefore, the proposed project would not change existing land use within the project area and would not result in the conversion of adjacent land uses or conflicts with applicable City of Menifee or City of Perris land use designations or zoning standards. The proposed project would not conflict with any applicable land use plan, policy, or regulation with jurisdiction over the project.

The City of Menifee General Plan and City of Perris General Plan outline relevant policies and regulations applicable to the proposed project, including policies to preserve visual, cultural, and natural resources and to protect the health and safety of their citizens. Consistent with the goals and policies of these relevant planning documents, the project has been designed to minimize impacts to natural and cultural resources. Project conformance and/or potential conflicts with these ordinances are described in the relevant resource sections of this IS/MND. Where potentially significant environmental impacts have been identified in this IS/MND, they have been mitigated to less than significant with implementation of appropriate mitigation measures. Therefore, the project would be consistent with applicable land use plans, policies, and regulations. **No impact** would occur.

4.12 MINERAL RESOURCES

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
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?	☐	☐	☐	☒

a. *Would the project result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?* ***(No Impact)***

Minerals are any naturally occurring chemical element or compound, or groups of elements and compounds formed from inorganic processes and organic substances, including but not limited to coal, peat, and oil-bearing rock, but excluding geothermal resources, natural gas, and petroleum. In 1975, the California Legislature enacted the Surface Mining and Reclamation Act (SMARA), which, among other things, provided guidelines for the classification and designation of mineral lands. Areas are classified on the basis of geologic factors without regard to existing land use and land ownership. The areas are categorized into four Mineral Resource Zones (MRZs):

- **MRZ-1:** An area where adequate information indicates that no significant mineral deposits are present, or where it is judged that little likelihood exists for their presence.
- **MRZ-2:** An area where adequate information indicates that significant mineral deposits are present, or where it is judged that a high likelihood exists for their presence.
- **MRZ-3:** An area containing mineral deposits, the significance of which cannot be evaluated.
- **MRZ-4:** An area where available information is inadequate for assignment to any other MRZ.

Of the four categories, lands classified as MRZ-2 are of the greatest importance. Such areas are underlain by demonstrated mineral resources or are located where geologic data indicate that significant measured or indicated resources are present. MRZ-2 areas are designated by the Mining and Geology Board as being “regionally significant”. Such designations require that a Lead Agency’s land use decisions involving designated areas be made in accordance with its mineral resource management policies and that it consider the importance of the mineral resource to the region or the State as a whole, not just to the Lead Agency’s jurisdiction.

The County of Riverside has extensive deposits of clay, limestone, iron, sand, and aggregates. The California Geological Survey and acting State Geologist have not classified any areas in the project area as containing mineral deposits that are either of Statewide significance or the significance of which requires further evaluation. The project site has been classified as being in either an “urban area" that contains no mineral resource designation or MRZ-3, indicating that the project is in an area that contains known or inferred construction aggregate resources of undetermined mineral resource significance.[53] Additionally, the project site is not designated or zoned for the extraction of mineral deposits. Therefore, the proposed project would not result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the State. **No impact** would occur.

b. Would the project 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)***

Please refer to Response 4.12.a. The project site is not located within an area known to contain locally important mineral resources. Therefore, the proposed project would not 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** would occur.

53 The Planning Center|DC&E. 2013b. Draft City of Menifee General Plan Environmental Impact Report. Section 5.11 Mineral Resources. September. Website: https://www.cityofmenifee.us/DocumentCenter/View/1111/Ch-05-11-MIN?bidId= (accessed April 22, 2024).

4.13 NOISE

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project result in:				
a. Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☒	☐	☐
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 2 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?	☐	☐	☐	☒

The following provides an overview of the characteristics of sound and vibration as well as the regulatory framework that applies to noise within the vicinity of the project site. The existing noise environment in and around the project site is also described.

Characteristics of Sound. Noise is usually defined as unwanted sound. Noise consists of any sound that may produce physiological or psychological damage and/or interfere with communication, work, rest, recreation, or sleep.

Several noise measurement scales exist that are used to describe noise in a particular location. A decibel (dB) is a unit of measurement that indicates the relative intensity of a sound. Sound levels in dB are calculated on a logarithmic basis. An increase of 10 dB represents a 10-fold increase in acoustic energy, while 20 dB is 100 times more intense, and 30 dB is 1,000 times more intense. Each 10 dB increase in sound level is perceived as approximately a doubling of loudness; and similarly, each 10 dB decrease in sound level is perceived as half as loud.

Sound intensity is normally measured through the A-weighted decibels (dBA). This scale gives greater weight to the frequencies of sound to which the human ear is most sensitive. The A-weighted sound level is the basis for 24-hour sound measurements that better represent human sensitivity to sound at night. As noise spreads from a source, it loses energy so that the farther away the noise receiver is from the noise source, the lower the perceived noise level would be. Geometric spreading causes the sound level to attenuate or be reduced, resulting in a 6 dB reduction in the noise level for each doubling of distance from a single point source of noise to the noise sensitive receptor of concern.

There are many ways to rate noise for various time periods, but an appropriate rating of ambient noise affecting humans also accounts for the annoying effects of sound. Equivalent continuous sound level (L_{eq}) is the total sound energy of time varying noise over a sample period. However, the predominant rating scales for human communities in the State of California are the L_{eq}, the Community Noise Equivalent Level (CNEL), and the day-night average level (L_{dn}) based on dBA.

L_{dn}, sometimes denoted as DNL, represents the time varying noise over a 24-hour period, with a 10 dBA weighting factor applied to noise occurring from 10:00 p.m. to 7:00 a.m. (defined as sleeping hours). L_{dn} is similar to the CNEL scale, but without the adjustment for events occurring during the evening relaxation hours of 7:00 p.m. to 10:00 p.m.

Characteristics of Vibration. Vibration refers to ground-borne noise and perceptible motion. Ground-borne vibration is almost exclusively a concern inside buildings and is rarely perceived as a problem outdoors, where the motion may not be discernible. Typically, there is more adverse reaction to effects associated with the shaking of a building. Vibration energy propagates from a source through intervening soil and rock layers to the foundations of nearby buildings. The vibration then propagates from the foundation throughout the remainder of the structure. Building vibration may be perceived by occupants as the motion of building surfaces, the rattling of items on shelves or hanging on walls, or a low-frequency rumbling noise. The rumbling noise is caused by the vibration of walls, floors, and ceilings that radiate sound waves. Annoyance from vibration often occurs when the vibration exceeds the threshold of perception by 10 dB or less. This is an order of magnitude below the damage threshold for normal buildings.

Typical sources of ground-borne vibration are construction activities (e.g., blasting, pile driving, and operating heavy-duty earthmoving equipment), steel-wheeled trains, and occasional traffic on rough roads. Problems with both ground-borne vibration and noise from these sources are usually localized to areas within approximately 100 feet from the vibration source, although there are examples of ground-borne vibration causing interference out to distances greater than 200 feet.[54] When roadways are smooth, vibration from traffic, even heavy trucks, is rarely perceptible. It is assumed for most projects that the roadway surface will be smooth enough that ground-borne vibration from street traffic will not exceed the impact criteria; however, both the construction of the project could result in ground-borne vibration that may be damaging.

Ground-borne vibration has the potential to damage buildings. Although it is very rare for typical construction activities to cause even cosmetic building damage, it is not uncommon for construction processes such as blasting and pile driving to cause vibration of sufficient amplitudes to damage nearby buildings. Ground-borne vibration is usually measured in terms of vibration velocity, either the root-mean-square (RMS) velocity or peak particle velocity (PPV). The PPV is used to characterize potential for damage.

Regulatory Framework. A project would have a significant noise effect if it would substantially increase the ambient noise levels for adjoining areas or conflict with adopted environmental plans and goals of applicable regulatory agencies. The following analysis compares the potential impacts to the criteria within the City of Perris and the City of Menifee Noise Elements of their respective General Plans and Municipal Codes. Because the cities do not provide vibration assessment criteria

[54] California Department of Transportation (Caltrans). 2013. Caltrans Transportation and Construction Vibration Guidance Manual. September.

for damage related to construction, the guidelines within the Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment Manual (FTA Manual)[55] have been used.

City of Perris Noise Element. There are no goals or policies in the Noise Element applicable to the project.

City of Perris Municipal Code. Chapter 7.34 of the City of Perris Municipal Code regulates noise. According to Section 7.34.050 (General Prohibition) of the City of Perris Municipal Code, it is unlawful for any loud excessive or offensive noises or sounds to be created that would unreasonably disturb the peace and quiet of any residential neighborhood or be physically annoying to persons of ordinary sensitivity. To ensure that Section 7.34.050 would be complied with, the City of Perris established the noise standards shown in **Table 4.13.A**. In addition, a noise violation would also result when a loud excessive or offensive noise level is generated that results in an increase in ambient noise levels of more than 1.0 dBA at the property line.

Table 4.13.A: City of Perris Noise Level Standards

Time Period	Maximum Noise Level (dBA)
10:01 p.m. – 7:00 a.m.	60
7:01 a.m. – 10:00 p.m.	80

Source: City of Perris Ordinance (2023).
dBA = A-weighted decibel.

Furthermore, Section 7.34.050 states that the characteristics and conditions that should be considered in determining whether a noise violation has occurred should include, but not be limited to, the following:

- The level of the noise
- Whether the nature of the noise is usual or unusual
- Whether the origin of the noise is natural or unnatural
- The level of the ambient noise
- The proximity of the noise to sleeping facilities
- The nature and zoning of the area from which the noise emanates and the area where it is received.
- The time of day the noise occurs
- The duration of the noise
- Whether the noise is recurrent, intermittent, or constant

With respect to construction noise in Perris, Section 7.34.060 stipulates that it would be unlawful for any person between the hours of 7:00 p.m. of any day and 7:00 a.m. of the following day, or on a legal holiday, with the exception of Columbus Day and Washington's Birthday, or on Sundays, to erect, construct, demolish, excavate, alter, or repair any building or

55 Federal Transit Administration (FTA). 2018. Transit Noise and Vibration Impact Assessment Manual, FTA Report No. 0123. September.

structure in such a manner as to create disturbing, excessive, or offensive noise. Additionally, construction activity is prohibited from exceeding 80 dBA in residential zones in the city between the hours of 7:00 a.m. and 7:00 p.m.

City of Menifee Noise Element. The City of Menifee General Plan Noise Element (2013) establishes the following policies applicable to the proposed project:

- **Goal N-1**: Noise-sensitive land uses are protected from excessive noise and vibration exposure.
  - **Policy N-1.7**: Mitigate exterior and interior noises to the levels listed in the table below (**Table 4.13.B**) to the extent feasible, for stationary (permanent) sources adjacent to sensitive receptors.
  - **Policy N-1.13**: Require new development to minimize vibration impacts to adjacent uses during demolition and construction.

Table 4.13.B: City of Menifee Stationary (Permanent) Source Noise Standards

Residential Land Use	Interior Standards	Exterior Standards
10:00 p.m. – 7:00 a.m.	40 dB L_{eq} (10 minute)	45 dB L_{eq} (10 minute)
7:00 a.m. – 10:00 p.m.	55 dB L_{eq} (10 minute)	65 dB L_{eq} (10 minute)

Source: City of Menifee Noise Element (2013).
dB = decibels
L_{eq} = equivalent continuous sound level

The above goal and policies are applicable to the proposed project's operational stationary noise sources. There are no other goals or policies in the Noise Element applicable to the project.

City of Menifee Municipal Code. When the City of Menifee incorporated, it adopted the County of Riverside Noise Ordinance (Ordinance No. 847). The City of Menifee is in the process of updating its Municipal Code to adopt the stationary noise standards into Chapter 9.09 of the City of Menifee Municipal Code, which are consistent with the standards in the County of Riverside Municipal Code.

Allowable hours of construction are regulated in Chapter 8.01 of the City of Menifee Municipal Code. Section 8.01.010 states that any construction within the city that is located within 0.25 mile from an occupied residence shall be permitted Monday through Saturday, except on nationally recognized holidays, from 6:30 a.m. to 7:00 p.m. Construction activities on Sundays and national holidays are prohibited unless approval is obtained from the City of Menifee Building Official or Engineer.

Chapter 9.09 of the City of Menifee Municipal Code regulates noise. It codifies the levels listed in **Table 4.13.B**. Section 9.09.030 of the City of Menifee Municipal Code includes a provision for construction-related exceptions. The code allows for application of an exception for construction activities if construction activities occur more than 0.25 mile from an inhabited dwelling or if construction occurs within 0.25 mile of an inhabited dwelling and construction does not occur between 6:00 p.m. and 6:00 a.m. from June through September and between 6:00 p.m. and 7:00 a.m. from October through May. Section 9.09.030(C) provides exceptions, which state that a construction-related exception shall be considered either a minor temporary use or a major temporary use as defined in Chapter 9.06 of the code (see Section 9.09.020 of the City of Menifee Municipal Code) and an application for a construction-related exception shall be made using the temporary use application provided by the Community Development Director. For construction activities on Sunday or nationally recognized holidays, Section 8.01.010 of the City of Menifee Municipal Code shall prevail.

Because the City of Menifee Municipal Code does not establish construction noise thresholds, for the purposes of analyzing significance under CEQA, the FTA's criteria[56] are used. The general assessment criteria for construction noise identifies a 1-hour noise level of 90 dBA L_{eq} for residential uses during daytime hours. This provides reasonable criteria for assessing construction noise impacts based on the potential for adverse community reaction when the noise criteria are exceeded.

Additionally, the City of Menifee's Noise Element and Municipal Code do not provide specific noise level requirements or vibration impact criteria associated with construction activities; therefore, the FTA criteria will be used in this analysis.

Federal Transit Administration. The criteria for environmental impacts resulting from ground-borne vibration are based on the maximum levels for a single event. The guidelines within the FTA Manual have been used to determine vibration impacts (refer to **Table 4.13.C**).

Table 4.13.C: Construction Vibration Damage Criteria

Building Category	PPV (in/sec)
Reinforced concrete, steel, or timber (no plaster)	0.50
Engineered concrete and masonry (no plaster)	0.30
Non-engineered timber and masonry buildings	0.20
Buildings extremely susceptible to vibration damage	0.12

Source: Table 12-3, Transit Noise and Vibration Impact Assessment Manual (FTA 2018).
FTA = Federal Transit Administration
in/sec = inches per second
PPV = peak particle velocity

The FTA Manual guidelines show that a vibration level of up to 0.2 inch per second (in/sec) PPV is considered safe for non-engineered timber and masonry buildings and would not result in any construction vibration damage. Therefore, in order to be conservative, the 0.2 in/sec PPV threshold has been used when evaluating vibration impacts at the nearest structures to the site.

56 Federal Transit Administration (FTA). 2018. Transit Noise and Vibration Impact Assessment Manual, FTA Report No. 0123. September.

Thresholds of Significance. A project would normally have a significant effect on the environment related to noise and vibration if it would substantially increase the ambient noise levels for adjoining areas or conflict with the adopted environmental plans and the goals of the community in which the project is located. The applicable noise standards governing this project site are the criteria in the County's Noise Ordinance and the 2018 FTA Manual.[57]

Existing Noise Environment. The project site is surrounded by residential uses, including the single-family homes to the east and west of the project site. In order to assess the existing noise environment surrounding the project site, long-term measurements were gathered around the perimeter of the project site. LSA conducted three long-term 24-hour measurements from March 18, 2024 to March 19, 2024. The locations of the noise measurements are shown on **Figure 4.13-1**, with the results shown in **Table 4.13.D**. Daytime traffic noise levels range from 45.4 to 65.6 dBA L_{eq}. Noise monitoring sheets are included in Appendix G.

Table 4.13.D: Existing Noise Level Measurements

Location	Date	Noise Levels (dBA L_{eq})	
		Daytime[1]	Nighttime[2]
LT-1: 29137 Crestline Drive, Menifee, CA 92584. On a tree near the southern property line of a home.	3/18/24 to 3/19/24	45.4–58.5	41.4–56.6
LT-2: 28477 Portsmouth Dr, Menifee, CA 92586. On a light pole near the southwestern property line of a home.	3/18/24 to 3/19/24	56.6–65.6	51.3–62.2
LT-3: 27663 Genevieve Dr, Menifee, CA 92586. On a light pole near the southwestern property line of a home.	3/18/24 to 3/19/24	52.8–60.0	42.1–55.4

Source: Compiled by LSA (2024).
1 Daytime noise levels were measured from 7:00 a.m. to 10:00 p.m.
2 Nighttime noise levels were measured from 10:00 p.m. to 7:00 a.m.
dBA = A-weighted decibels
L_{eq} = equivalent continuous sound level
LT = long-term measurement

Sensitive Land Uses in the Vicinity. Certain land uses are considered more sensitive to noise than others. Examples of these include residential areas, educational facilities, hospitals, childcare facilities, and senior housing. The closest sensitive receptors to the project site are existing residential properties located 20 feet from proposed construction activities as shown on **Figure 4.13-1**.

57 Federal Transit Administration (FTA). 2018. Transit Noise and Vibration Impact Assessment Manual, FTA Report No. 0123. September.

LSA

LEGEND

Project Site Boundary

LT-1 Long-term Noise Monitoring Location

N

0 750 1500
FEET

SOURCE: Google Earth 2024

FIGURE 4.13-1

VALLEY BOULEVARD POTABLE WATER TRANSMISSION PIPELINES PROJECT

Noise Monitoring Locations

I:\EWD2101.04\G\Noise_Locs.ai (4/8/2024)

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a. Would the project result in generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies? ***(Less Than Significant with Mitigation Incorporated)***

Noise impacts from the proposed project would be associated with construction activities. The project would consist of installing 4.4 miles of 36-inch-diameter, 30-inch-diameter, and 18-inch-diameter pipelines along Valley Boulevard from the existing EMWD Desalination Complex at 29285 Valley Boulevard in Menifee to the intersection of McLaughlin Road and Goetz Road in Riverside County.

Construction Noise Impacts. Construction-related noise levels would be higher than existing ambient noise levels in the project area but would no longer occur once construction of the project is completed.

Two types of potential short-term noise impacts could occur during construction of the proposed project: (1) noise impacts related to construction crew commutes and the transportation of construction equipment and materials to the site; and (2) noise impacts associated with grubbing and land cleaning, grading and excavation, drainage, utilities and sub-grade, and paving.

Construction crew commutes and the transport of construction equipment and materials to the project site will result in a maximum of 148 trips per day during the phase with the highest construction activity, which would incrementally increase noise levels on access roads leading to the site. Although there would be a relatively high single-event noise exposure from heavy trucks, potentially causing intermittent noise nuisance (passing pickup trucks at 50 feet would generate up to a maximum of 75 dBA), the effect on longer-term (hourly or daily) ambient noise levels would be small (i.e., less than 0.1 dBA) given that the traffic volume increase on adjacent roadways is at most 148 trips. Therefore, construction-related impacts associated with worker commutes and equipment transport to the project site would be less than significant.

The second type of potential short-term noise impact is related to noise generated during grubbing and land cleaning, grading and excavation, drainage, utilities and sub-grade, and paving. Construction is completed in discrete steps, each of which has its own mix of equipment and consequently its own noise characteristics. These various sequential phases would change the character of the noise generated on the site and therefore the noise levels surrounding the site as construction progresses. Despite the variety in the type and size of construction equipment, similarities in the dominant noise sources and patterns of operation allow construction-related noise ranges to be categorized by work phase. Typical operating cycles for these types of construction equipment may involve 1 or 2 minutes of full-power operation followed by 3 or 4 minutes at lower power settings.

Once the composite reference maximum noise level is calculated for each phase, the usage factor provided in **Table 4.13.E,** below, is utilized to calculate the hourly noise level impact for each piece of equipment based on the following equation:

$$L_{eq}(equip) = E.L. + 10\log(U.F.) - 20\log\left(\frac{D}{50}\right)$$

where: $L_{eq}(equip)$ = L_{eq} at a receiver resulting from the operation of a single piece of equipment over a specified time period

E.L. = noise emission level of the particular piece of equipment at a reference distance of 50 feet

U.F. = usage factor that accounts for the fraction of time that the equipment is in use over the specified period of time

D = distance from the receiver to the piece of equipment

Table 4.13.E: Typical Maximum Construction Equipment Noise Levels (L_{max})

Type of Equipment	Acoustical Usage Factor	Suggested Maximum Sound Levels for Analysis (dBA L_{max} at 50 ft)
Air Compressor	40	80
Backhoe	40	80
Cement Mixer	40	85
Concrete/Industrial Saw	20	90
Crane	16	85
Excavator	40	85
Generator	50	82
Grader	40	85
Loader	40	80
Paver	50	85
Roller	20	85
Rubber Tire Dozer	40	85
Scraper	40	85
Tractor	40	84
Truck	40	84
Welder	40	73

Source: Roadway Construction Noise Model (FHWA 2006).
dBA = A-weighted decibels
ft = feet
L_{max} = maximum noise level

Each piece of construction equipment operates as an individual point source. Utilizing the following equation, a composite noise level can be calculated when multiple sources of noise operate simultaneously:

$$Leq\ (composite) = 10 * \log_{10}\left(\sum_{1}^{n} 10^{\frac{Ln}{10}}\right)$$

Using the equations from the methodology above and the reference information in **Tables 4.13.E and 4.13.F**, the composite noise level would be 89 dBA L_{eq} at a distance of 50 feet from the construction area. This noise level would be the same for the loudest phase at each project location. **Table 4.13.F** provides a summary of the reference noise levels during construction by phase.

Table 4.13.F: Noise Levels By Construction Phase

Phase	Composite Reference Level at 50 ft	
	dBA L_{max}	dBA L_{eq}
Linear, Grubbing and Land Cleaning	86	81
Linear, Grading and Excavation	91	89
Linear, Drainage, Utilities and Sub-Grade	91	89
Linear, Paving	88	84

Source: Compiled by LSA (2024).
dBA = A-weighted decibels — L_{eq} = average noise level
ft = feet — L_{max} = maximum noise level

The nearest sensitive receptor would be the single-family homes located within approximately 20 feet of the water line. It is expected that noise levels during construction at the nearest residences would approach 97 dBA L_{eq}. All other sensitive receptors are located farther from areas of construction and therefore would experience lower noise levels.

While construction-related, short-term construction noise levels have the potential to be higher than existing ambient noise levels, which range from 45.4 to 65.6 dBA L_{eq} during daytime hours in the vicinity of the proposed project, the noise impacts would no longer occur once project construction is completed.

Compliance with the City's General Plan Policies and Noise Ordinance would ensure that construction noise does not disturb the residential uses during hours when ambient noise levels are likely to be lower (i.e., at night). **Mitigation Measure NOI-1** would limit construction hours and require the implementation of noise-reducing measures during construction. Therefore, with implementation of **Mitigation Measure NOI-1**, construction activity noise impacts would be less than significant.

Mitigation Measure NOI-1 **Construction Noise.** Prior to commencement of construction activities, the Eastern Municipal Water District (EMWD) shall verify that grading and construction plans include the following requirements to ensure that the greatest distance between noise sources and sensitive receptors during construction activities has been achieved:

- Construction activities occurring as part of the project shall be subject to the limitations and requirements of the City of Menifee Municipal Code, which states that construction activities are prohibited between the hours of 6:00 p.m. and 6:00 a.m. during the months of June through September and between the hours of 6:00 p.m. and 7 a.m. during the months of October through May.

- During all project area excavation and on-site grading, the project contractors shall equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers consistent with manufacturers' standards.
- To the best extent possible, the project contractor shall place all stationary construction equipment so that emitted noise is directed away from sensitive receptors nearest the project area.
- Construction staging areas shall be located as far away from sensitive receptors as possible during all phases of construction.

Operational Noise Impacts. The proposed project would consist of installing 4.4 miles of 36-inch-diameter, 30-inch-diameter, and 18-inch-diameter pipelines along Valley Boulevard from the existing EMWD Desalination Complex at 29285 Valley Boulevard in Menifee to the intersection of McLaughlin Road and Goetz Road in Riverside County. Operation of the proposed project would be conducted remotely and there would be no full-time dedicated staff at the site. EMWD staff may conduct site visits approximately four times per month for facility inspections, which would have a negligible noise impact compared to ambient noise caused by existing traffic volumes. Thus, no operational noise would be associated with the new pipeline.

As described above, with the incorporation of **Mitigation Measure NOI-1**, the project would not result in generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the proposed project in excess of standards established in the local general plan or noise ordinance, or any other applicable standards. Therefore, this impact would be **less than significant with mitigation incorporated.**

*b. Would the project result in generation of excessive groundborne vibration or groundborne noise levels? **(Less Than Significant with Mitigation Incorporated)***

Construction of the proposed project could result in the generation of ground-borne vibration. This construction vibration impact analysis assesses the potential for building damages using vibration levels in PPV (in/sec). The FTA Manual guidelines indicate that a vibration level up to 0.2 in/sec PPV is considered safe for non-engineered timber and masonry buildings.

Table 4.13.G shows the PPV values at 25 feet from a construction vibration source. As shown in **Table 4.13.G**, bulldozers and other heavy-tracked construction equipment (except for vibratory rollers) generate approximately 0.089 in/sec PPV of ground-borne vibration when measured at 25 feet.

Table 4.13.G: Vibration Source Amplitudes for Construction Equipment

Equipment	Reference PPV (in/sec) at 25 feet
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: Transit Noise and Vibration Impact Assessment Manual (FTA 2018).
in/sec = inches per second
PPV = peak particle velocity

Construction vibration, similar to vibration from other sources, would not have any significant effects on outdoor activities (e.g., those outside of residential buildings in the project vicinity). The proposed project is expected to include the use of heavy equipment similar to a large bulldozer. The distance to the nearest buildings for vibration impact analysis is measured between the nearest off-site buildings and the project disturbance areas because vibration impacts occur normally within the buildings. The formula for vibration transmission is provided below.

$$PPV_{equip} = PPV_{ref} \times (25/D)^{1.5}$$

As identified above, residential structures are located 20 feet away from the proposed trenching activities and would experience vibration levels approaching 0.124 in/sec PPV. Although the proposed construction activities are located 20 feet from existing structures based on preliminary plans, construction vibration levels at these structures could exceed the FTA threshold of 0.2 in/sec PPV for non-engineered timber and masonry building damage if heavy equipment were to operate within 15 feet of the structures. For example, vibration levels at a distance of 14 feet would be 0.212 in/sec PPV. Therefore, construction that would occur within 15 feet of existing homes would exceed the FTA vibration damage thresholds, resulting in a potentially significant impact. Implementation of **Mitigation Measure NOI-2** would be required to maintain a minimum distance of 15 feet between the heavy construction equipment and the adjacent structures. Implementation of **Mitigation Measure NOI-2** would ensure that construction vibration levels would be below the FTA threshold of 0.2 in/sec PPV for building damage, thereby reducing potential vibration impacts to less than significant. In addition, due to the linear nature of the project, construction activities at any one receptor location would occur for a limited duration.

Mitigation Measure NOI-2: The use of heavy construction equipment, such as large bulldozers or excavators, within 15 feet of existing buildings shall be prohibited.

Construction vibration associated with the project would be less than significant with implementation of **Mitigation Measure NOI-2**. Therefore, construction of the proposed project would not result in the generation of excessive ground-borne vibration or ground-borne noise levels. This impact would be **less than significant with mitigation incorporated.**

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 2 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)***

The nearest airport to the project site is the Perris Valley Airport, which is located 1.52 miles north of the project site. Based on the Riverside County Airport Land Use Compatibility Plan,[58] the project site is located outside the 55 CNEL noise contours of Perris Valley Airport. Additionally, there are no private helicopter pads or airstrips located within 2 miles of the project site. Therefore, the proposed project would not result in the exposure of people residing or working in the project area to excessive noise levels. **No impact** would occur.

[58] Riverside County Airport Land Use Commission (ALUC). 2010. Riverside County Airport Land Use Compatibility Plan. October. Website: https://rcaluc.org/current-compatibility-plans (accessed March 2024).

4.14 POPULATION AND HOUSING

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
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?	☐	☐	☐	☒

a. Would the project 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 proposed pipelines would be installed primarily within roadway rights-of-way; however, some pipeline segments would be constructed within unpaved areas and/or would be constructed in conjunction with roadway improvements. Additionally, a valve station with an MOV and remote terminal units would be constructed on a vacant parcel at the intersection of Valley Boulevard and Thornton Avenue.

Construction of the proposed project would provide short-term jobs over an approximately 24-month period, starting in fall of 2024. Many of the construction jobs would be temporary or seasonal and specific to the variety of construction activities. The workforce would include a variety of craftspeople (e.g., cement finishers, ironworkers, welders, carpenters, electricians, painters, and laborers). Generally, construction workers are only at a job site for the time frame in which their specific skills are needed to complete that phase of construction. Although the proposed project would generate employees at the project site during construction activities, it is expected that local and regional construction workers would be available to serve the proposed project's construction needs. Project-related construction workers would not be expected to relocate their household's place of residence as a result of working on the proposed project; therefore, project construction would not be expected to increase the population of the cities of Menifee or Perris or surrounding communities.

Operation of the proposed project would be conducted remotely and there would be no full-time dedicated staff at the site. EMWD staff may visit the site occasionally for facility inspections. It is anticipated that project operations would require approximately four 30-minute inspections per month.

The proposed project is intended to improve operation reliability and system redundancy by providing additional conveyance for the existing transmission 27-inch-diameter pipeline in Murrieta Road and interconnections to the 12-inch-diameter Ridgemoor Road pipeline, the 12-inch-diameter Rouse Road pipeline, the 12-inch-diameter McCall Boulevard pipeline, the 18-inch-diameter portion of the suction side of the Goetz Road booster, and the 36-inch-diameter Desalination Complex pipeline. In addition, the proposed pipelines would support operation of the proposed Goetz Road water storage tank, another pressure zone improvement currently underway, with interconnection to the 30-inch-diameter pipeline off Thornton Avenue. It would not increase the capacity of the existing water system to accommodate new development, nor would the project extend or expand infrastructure or services to existing undeveloped areas in the vicinity of the proposed pipeline alignments. Since the proposed water lines would be installed to serve the existing water system and not anticipated demand for future development around the project site, it would not substantially induce growth. The project would not expand the capacity of the current water system or provide additional major infrastructure so as to encourage population growth or new development. The project would not include any new housing, commercial, or industrial space. Therefore, the project would not directly or indirectly induce substantial population growth, and **no impact** would occur.

b. Would the project displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere? ***(No Impact)***

Proposed pipelines would be constructed primarily within roadway right-of-way; however, some pipeline segments would be constructed within unpaved areas and/or would be constructed in conjunction with roadway improvements. Although existing residences are located adjacent to the project boundary, no housing or people would be displaced as a result of project implementation. The proposed MOV facility would be constructed on a vacant parcel at the intersection of Valley Boulevard and Thornton Avenue and would not displace any existing people or housing. Therefore, implementation of the proposed project would not result in an impact related to the displacement of substantial numbers of existing housing or people, thereby necessitating the construction of replacement housing elsewhere. **No impact** would occur.

4.15 PUBLIC SERVICES

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a. Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
i. Fire protection?	☐	☐	☐	☒
ii. Police protection?	☐	☐	☐	☒
iii. Schools?	☐	☐	☐	☒
iv. Parks?	☐	☐	☐	☒
v. Other public facilities?	☐	☐	☐	☒

a. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:

i. Fire protection?
ii. Police protection?
iii. Schools?
iv. Parks?
v. Other public facilities? ***(No Impact)***

The project site is located in a developed urban area served by existing public services, as described below.

- **Fire Protection:** Fire protection and emergency response services in the Menifee and Perris are provided by Riverside County Fire Department. Riverside County's fire department serves all of Riverside County and many neighboring cities. The closest fire stations to the project site are Station #7 at 28349 Bradley Road in Menifee and Fire Station #1 at 210 West San Jacinto Avenue in Perris.

- **Police Protection:** Police protection in Menifee is provided by the Menifee Police Department. The closest police station to the project site is located at 29714 Haun Road in Menifee. Police protection in Perris is provided by the Riverside County Sheriff's Department. The closest Sheriff's station to the project site is 137 North Perris Boulevard in Perris.

- **Schools:** Twenty-two school districts serve Riverside County, and the project site is located within the Menifee Union School District, Perris Union High School District, and the Val Verde Unified School District. Schools in the project area include: Ridgemoor Elementary School, which is located less than 0.1 mile west of the project site; Kathryn Newport Middle School, which is located approximately 1.0 mile southwest of the project site; Hans Middle School, which is located 2.2 miles east of the project site; and Romoland Elementary School, which is located approximately 3.0 miles east of the project site.

- **Parks:** Refer to Section 4.16, Recreation, for a discussion about parks.

The proposed project does not include the construction of structures that would increase the population in the area or that would generate a higher demand for fire or police protection, schools, parks, or other public services. Therefore, the demand for public services for the project would be the same as under existing conditions, and **no impact** would occur.

4.16 RECREATION

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Would the project 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. Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☐	☒

*a. Would the project 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)***

There are currently 641 acres of parks and recreation uses in the city of Menifee,[59] including active and passive recreation facilities. The largest active recreation facility is the Menifee Recreation Center/Wheatfield Park at the southwest corner of Menifee Road and La Piedra Road. The recreation center and park provide a gymnasium, baseball fields, basketball courts, tennis courts, volleyball courts, horseshoe pits, and a picnic area. Overall, 16 of Menifee's existing parks have playground facilities, and 14 have sports fields/courts. In addition to its active and passive recreational facilities, Menifee has four 18-hole golf courses.[60]

As discussed in Section 4.14, Population and Housing, and Section 4.15, Public Services, development of the project would install new water pipelines to improve operational reliability by providing additional conveyance and redundancy for existing transmission pipelines. No housing would be constructed as part of the project, and operation of the proposed project would not change the number of employees on site or increase the number of residents in Menifee or Perris or the surrounding communities. Therefore, implementation of the proposed project would not increase the use of existing neighborhood or regional parks in the project vicinity. Implementation of the project would not have an adverse effect on existing park facilities and would not generate a demand for additional recreational facilities. Therefore, **no impact** would occur.

*b. Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment? **(No Impact)***

Refer to Section 4.16.a. above. The proposed project does not include recreational facilities and would not change the number of employees on site or increase the number of residents in Menifee or Perris or the surrounding communities. Therefore, the proposed project would not result in the

59 The Planning Center|DC&E. 2013c. Draft City of Menifee General Plan Environmental Impact Report. Section 5.15 Recreation. September. Website: https://www.cityofmenifee.us/DocumentCenter/View/1115/Ch-05-15-REC?bidId= (accessed April 22, 2024).

60 Ibid.

increased use of existing neighborhood or regional parks or other recreational facilities or create a demand for the construction or expansion of parks and recreational facilities beyond what currently exists. Therefore, there would be **no impact** to parks or recreation resources.

4.17 TRANSPORTATION

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
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 Guidelines §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?	☐	☐	☒	☐

a. Would the project conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities? ***(Less Than Significant Impact)***

The proposed project would install 4.4 miles of 36-inch-diameter, 30-inch-diameter, and 18-inch-diameter pipelines along Valley Boulevard from the existing EMWD Desalination Complex at 29285 Valley Boulevard in Menifee to the intersection of McLaughlin Road and Goetz Road. In addition, a valve station with an MOV and remote terminal units would be constructed on a vacant parcel at the intersection of Valley Boulevard and Thornton Avenue. Regional access to the project site is provided by I-215, via McCall Boulevard. I-215 is east of the project site and runs north/south.

Upon completion of construction, negligible additional daily or peak-hour trips are anticipated to be attracted to or generated by the project site. Operation of the proposed project would be conducted remotely and there would be no full-time dedicated staff at the site. EMWD staff may visit the site occasionally for facility inspections. It is anticipated that project operations would require approximately four 30-minute inspections per month. The proposed project would not generate vehicle trips for normal day-to-day operations.

As outlined in Chapter 2.0, Project Description, project construction would commence in fall 2024 and is estimated to last 24 months. The proposed pipeline would be constructed as a single-phase project from the connection point north of the Desalination Complex on Valley Boulevard moving north to the pipeline connection at the intersection of McLaughlin Road and Goetz Road. Construction sequencing would be coordinated with the adjacent 30-inch-diameter brackish pipeline project being planned by EMWD, which shares much of the same alignment as the proposed project.

Access to the project site for construction would be via I-215 to westbound McCall Boulevard. Work hours would be between 8:30 a.m. and 3:30 p.m., Monday through Friday, for work conducted within Menifee. Any extended hours would need to be approved by the City of Menifee as construction progresses. Work hours may be further restricted near Ridgemoor Elementary School to allow for pick-up and drop-off. Work hours would be between 7:00 a.m. and 7:00 p.m. for work within Perris. Approximately 80 to 120 linear feet of pipeline would be installed per day. No nighttime construction would take place.

The contractor would employ the use of heavy construction machinery, likely including the following: a wheel-mounted/track-mounted drill rig, a horizontal drilling machine, an excavator, a backhoe, and a roller compactor. All of the material excavated during the pipeline installation would be used to fill in the access pits following the pipeline's installation. No import or export of soils would be required, but asphalt demolition and delivery is anticipated. The equipment would likely be delivered when the construction begins and removed when it ends. Therefore, on a typical day, heavy equipment related to construction activities would be limited to asphalt demolition and delivery.

Project construction would require the export of an estimated 8,060 cubic yards of soil for grading along unpaved areas of the pipeline alignment and at the MOV facility site and the import of 25,810 cubic yards of fill material. A total of 448 truckloads would be required to haul the export material (8,060 cubic yards ÷ 18 cubic yards per truck = 448 truckloads) and 1,434 truckloads would be required to haul the fill material (25,810 cubic yards ÷ 18 cubic yards per truck = 1,434 truckloads). According to the project description, the proposed pipeline would be constructed as a single-phase project. Therefore, export and fill trips may occur simultaneously. Approximately 7 one-way trips per day are anticipated over the 24-month construction duration ([1,882 total truckloads ÷ 520 days] x 2 truck trips per truckload = 7.2 truck trips). Heavy-duty trucks could have a passenger car equivalent (PCE), so 22 PCE trips could be generated each day of asphalt demolition (7.2 truck trips x 3 PCE per truck = 21.6 PCE). The CalEEMod worksheets show that an estimated 14 construction workers per day are required for the proposed pipeline project.

Based on the anticipated construction needs, the following travel patterns are possible:

- 14 inbound passenger vehicle trips during the a.m. peak hour
- 14 outbound passenger vehicle trips during the p.m. peak hour
- 7 daily truck trips (for approximately one during a.m. and p.m. peak hours)

The anticipated 14 inbound worker trips in the a.m. peak hour and 14 outbound worker trips in the p.m. peak hour would equate to 28 daily passenger vehicle trips. Heavy-duty trucks could have a PCE of 3.0 so the 1 a.m. peak-hour and 1 p.m. peak-hour truck trips could result in an additional 3 PCE trips. This level of traffic volume (17 PCE total) is less than the 50 or more peak-hour trips necessary to be included in the study area according to thresholds provided in the County of Riverside Transportation Analysis Guidelines for Level of Service Vehicle Miles Traveled (County Guidelines).[61]

61 County of Riverside. 2020. Transportation Analysis Guidelines for Level of Service Vehicle Miles Traveled. December 15. Website: https://trans.rctlma.org/sites/g/files/aldnop401/files/migrated/Portals-7-2020-12-15-20--20Transportation-20Analysis-20Guidelines.pdf (accessed August 2023).

This 50 peak-hour trip threshold is also identified in the City of Menifee LOS Traffic Study Guidelines[62] and the City of Perris Transportation Impact Analysis Guidelines for CEQA.[63]

Therefore, the proposed project is not anticipated to contribute to any level of service (LOS) or operational deficiencies to the surrounding circulation system based on its low number of trips for a temporary duration.

Although the proposed project would generate construction (temporary) vehicles/trucks, it would not preclude alternative modes of transportation or facilities (e.g., transit, bicycle, or pedestrian). The Riverside Transit Agency (RTA) provides fixed route and Dial-a-Ride bus service within the cities of Menifee and Perris. No transit service is currently provided along any of the roadways within the project site.

According to the City of Menifee General Plan,[64] Class II bicycle lanes are proposed along the entire length of Valley Boulevard within the project alignment as well as McLaughlin Road, Goetz Road, and Rouse Road. However, these facilities are not currently provided throughout the entire project site because some of these roadways are still being built out. As described in Section 2.6, Environmental Commitments, a Traffic Control Plan (TCP) would be approved for all construction work within public roadways. The TCP would be prepared in accordance with the USDOT MUTCD, the Caltrans MUTCD, and permit requirements by the authority having jurisdiction. Any temporary closure of bicycle lanes within the project area would be addressed in the TCP.

The proposed project is consistent with the City of Menifee General Plan Circulation Element[65] and the City of Perris General Plan Circulation Element.[66] The proposed project would not make any permanent changes to the public right-of-way in the project vicinity and would not conflict with existing or planned transit, roadway, bicycle, or pedestrian facilities. Therefore, the proposed project would not conflict with a program plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities. This impact would be **less than significant**.

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62 City of Menifee. 2020. LOS Traffic Study Guidelines. October. Website: https://www.cityofmenifee.us/DocumentCenter/View/12099/LOS-Traffic-Study-Guidelines-October-2020 (accessed November 2024).

63 City of Perris. 2020. Transportation Impact Analysis Guidelines for CEQA. May 12.

64 City of Menifee. 2013c. City of Menifee General Plan EIR, Exhibit C-4 Proposed Bikeway and Community Pedestrian Network. July 26. Website: https://www.cityofmenifee.us/DocumentCenter/View/1021/C-4-Bikeways_HD0913?bidId= (accessed November 2024).

65 City of Menifee. 2013b. City of Menifee General Plan, Circulation Element. Website: https://cityofmenifee.us/863/Circulation-Element (accessed November 2024).

66 City of Perris. 2022. City of Perris General Plan Circulation Element. August 26. Website: https://www.cityofperris.org/home/showpublisheddocument/447/637974757046500000 (accessed November 2024).

*b. Would the project conflict or be inconsistent with CEQA Guidelines §15064.3, subdivision (b)? **(Less Than Significant Impact)***

State CEQA Guidelines Section 15064.3, subdivision (b), states that transportation impacts for land use projects are to be measured by evaluating the project's VMT as outlined in the following:

> Vehicle miles traveled exceeding an applicable threshold of significance may indicate a significant impact. Generally, projects within one-half mile of either an existing major transit stop or a stop along an existing high-quality transit corridor should be presumed to cause a less than significant transportation impact. Projects that decrease vehicle miles traveled in the project area compared to existing conditions should be presumed to have a less than significant transportation impact.

VMT is the amount and distance of automobile travel attributable to a project. According to the OPR Technical Advisory on Evaluating Transportation Impacts in CEQA,[67] "automobile" refers to "on-road passenger vehicles, specifically cars and light trucks." Thus, construction trucks do not need to be included in the project VMT assessment.

Additionally, the OPR technical advisory recommends VMT screening thresholds for smaller projects. The footnote on page 12 of the OPR technical advisory states the following:

> **Screening Thresholds for Small Projects**
>
> Many local agencies have developed screening thresholds to indicate when detailed analysis is needed. Absent substantial evidence indicating that a project would generate a potentially significant level of VMT, or inconsistency with a Sustainable Communities Strategy (SCS) or general plan, projects that generate or attract fewer than 110 trips per day generally may be assumed to cause a less-than-significant transportation impact.

The OPR technical advisory recommends that projects generating fewer than 110 trips would be assumed to cause a less than significant transportation impact. Additionally, the recommendation of a small project screening threshold is included in the County of Riverside Transportation Analysis Guidelines[68] as well as those of the City of Menifee and City of Perris.

The 14 daily workers would generate 28 daily trips from cars and light trucks. The proposed project is estimated to generate nominal average daily traffic (ADT) and peak-hour trips on a temporary basis for construction, and it would generate negligible new vehicle trips during day-to-day operations since the project is addressing infrastructure needs and would not require any on-site staff. As such, it is considered a small project and assumed to have a less than significant impact on

67 Office of Planning and Research (OPR). 2018. Technical Advisory on Evaluating Transportation Impacts in CEQA. December. Website: http://opr.ca.gov/docs/20190122-743_Technical_Advisory.pdf (accessed May 2023).

68 County of Riverside. 2020. Transportation Analysis Guidelines for Level of Service Vehicle Miles Traveled. December 15. Website: https://trans.rctlma.org/sites/g/files/aldnop401/files/migrated/Portals-7-2020-12-15-20--20Transportation-20Analysis-20Guidelines.pdf (accessed August 2023).

transportation. Therefore, the proposed project is not subject to a VMT analysis. Potential impacts would be **less than significant**.

c. *Would the project 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 proposed project would not change the existing roadway design. Temporary contractor laydown areas would be identified prior to construction activities. Potential construction staging areas would be at the following locations:

- Unpaved areas along the eastern portion of the Valley Boulevard right-of-way between Ridgemoor Road and Cherry Hills Boulevard
- Unpaved areas along the western portion of the Valley Boulevard right-of-way between Cherry Hills Boulevard and Chambers Avenue
- The proposed easement along Rouse Road
- Unpaved areas along the northern portion of the Rouse Road right-of-way
- The northern portion of the MOV facility parcel

All construction equipment and construction worker vehicles would be staged on the project site, unless determined otherwise by the contractor, for the duration of the construction period. Staging areas would be returned to existing conditions following construction activities. Additional heavy vehicles may travel along major arterials and I-215 during construction.

Traffic control plans would be prepared for the recommended project alignment. Traffic control measures would be set up in phases as the work traverses along and across roadways. Traffic through intersections during pipeline construction would generally be managed by using flagging during working hours to maintain two-way traffic. Work at the intersection of Murrieta Road and Rouse Road would require closure of the westbound lane on Rouse Road due to traffic signal operations. The Murrieta Road traffic signal would need to be placed on a four-way flash to maintain one travel lane in each direction.

As described in Section 2.6, Environmental Commitments, a TCP would be approved for all construction work within public roadways. The TCP would be prepared in accordance with the USDOT Manual of Uniform Traffic Control Devices, the Caltrans Manual of Uniform Traffic Control Devices, and permit requirements by the authority having jurisdiction. Implementation of the TCP would facilitate safe passage of both construction vehicles and private vehicles. As a result, the proposed project would not substantially increase hazards for vehicles due to a design feature or incompatible uses. This impact would be **less than significant**.

*d. Would the project result in inadequate emergency access? **(Less Than Significant Impact)***

Effects of the proposed project on emergency access would be largely limited to construction and would be temporary in nature. As described above in Section 4.17.c, traffic control measures would be set up in phases as the work traverses along and across roadways. In general, two-way traffic would be maintained through the use of flagging during working hours and, if needed, modifications to the existing traffic signal.

Ingress to the proposed facility would be via the eastbound lane on Thornton Avenue, with egress to the southbound lane on Valley Boulevard. The design, construction, and maintenance of the MOV access locations would be in compliance with relevant municipal codes and would meet all emergency access standards.

Therefore, the proposed project would not result in inadequate emergency access. Impacts associated with emergency access would be **less than significant**.

4.18 TRIBAL CULTURAL RESOURCES

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

Chapter 532, Statutes of 2014 (i.e., AB 52), requires that Lead Agencies evaluate a project's potential to impact "tribal cultural resources," which are:

- Sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe and are one of the following:
  - Included or determined to be eligible for inclusion in the California Register.
  - Included in a local register of historical resources as defined in subdivision (k) of PRC 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 subdivisions (c) of PRC Section 5024.1. In applying the criteria set forth in subdivision (c) of PRC Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.

A "historical resource" (PRC Section 21084.1), a "unique archaeological resource" (PRC Section 21083.2(g)), or a "nonunique archaeological resource" (PRC Section 21083.2 (h)) may also be a tribal cultural resource if it is included or determined to be eligible for inclusion in the California Register. AB 52 also gives lead agencies the discretion to determine, supported by substantial evidence, whether a resource qualifies as a "tribal cultural resource".

Public Resources Code 21080.3.1 establishes a formal consultation process between the lead agency, EMWD, and all California Native American tribes within the area regarding tribal cultural resource evaluation. AB 52 mandates that the lead agency must provide formal written notification to the designated contact of traditionally and culturally affiliated California Native American tribes that have previously requested notice. Native American tribes are notified early in the project review phase by written notification that includes a brief description of the proposed project, location, and the lead agency's contact information. The tribal contact then has 30 days to request project-specific consultation pursuant to this section (Public Resources Code §21080.1).

As a part of the consultation pursuant Public Resources Code §21080.3.1(b), both parties may suggest mitigation measures (Public Resources Code §21082.3) that can avoid or substantially lessen potential significant impacts to tribal cultural resources or provide alternatives that would avoid significant impacts to a tribal cultural resource. The California Native American tribe may request consultation on mitigation measures, alternatives to the project, or significant effects. The consultation may also include discussion on the environmental review, the significance of tribal cultural resources, the significance of the project's impact on the tribal cultural resources, project alternatives, or the measures planned to preserve or mitigate impacts on resources. Consultation shall end when either (1) both parties agree on the mitigation measures to avoid or mitigate significant effects on a tribal cultural resource, or (2) a party, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached.

a. *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:*

   i. *Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k)? Or*
   ii. *A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1? In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.* ***(Less Than Significant with Mitigation Incorporated)***

   As described in Section 4.5, Cultural Resources, data from the records search conducted at the Eastern Information Center indicate there have been 61 previous studies within 0.5 mile of the project site, 12 of which included portions of the project area. A total of 5 resources have been recorded within 0.5 mile, including 3 prehistoric resources and 2 historic period resources. The nearest resource is located approximately 75 meters (246 feet) north of the project alignment on Rouse Road, while the nearest prehistoric resource is located approximately 525 meters (0.34 mile) northwest of the Valley Boulevard portion of the project alignment. During the combination windshield and intensive pedestrian survey of the project alignment conducted on October 1, 2024, no cultural resources, including tribal cultural resources, were identified.

   Per AB 52, EMWD initiated consultation with Native American tribes that are traditionally and culturally affiliated with the geographic area of the proposed project to identify resources of cultural or spiritual value to the Tribe. On February 21, 2024, EMWD sent consultation notification letters to Native tribes on the District's Master List to establish government-to government consultation. Table 4.18.A summarizes the District's consultation efforts. EMWD has conducted consultation with three federally recognized Native tribes: the Pechanga Band of Luiseño Indians (Soboba), Agua Caliente Band of Cahuilla Indians, and the Rincon Band of Luiseño Indians (Rincon). An additional three Native tribes were contacted but declined consultation or did not respond, as noted in Table 4.18.A.

Table 4.18.A: Summary of Tribal Consultation

Tribe	Individual Contact	Date Letter Mailed	Consultation Held
Soboba	Joe Ontiveros	February 21, 2024	Did not respond
Pechanga	Ebru Ozdil	February 21, 2024	April 18, 2024
Rincon	Cheryl Madrigal	February 21, 2024	April 17, 2024
Agua Caliente	Pattie Garcia	February 21, 2024	April 13, 2024
San Manuel	Alexandra McCleary	February 21, 2024	Did not respond
Morongo	Larua Chatterton	February 21, 2024	Did not respond

Source: Eastern Municipal Water District (April 11, 2025)

During consultation meetings, the responding tribes highlighted concerns for the general area noting findings close to the project site. The consulting tribes stated that there is the potential to uncover unknown artifacts while grading the site and recommended tribal monitoring. Based on the cultural sensitivity of the area, tribal cultural resources may potentially be present within the project's proposed footprint. Therefore, the project may have the potential to affect tribal cultural resources during ground-disturbing activities, such as grading and trenching. Implementation of **Mitigation Measures TCR-1 through TCR-4** would satisfy the agreement between EMWD and tribal representatives under AB 52 and reduce potential impacts from the proposed project to a less than significant level.

Mitigation Measure TCR-1 **Tribal Resources Monitoring Agreement.** At least 30 days prior to the start of ground-disturbing activities, Eastern Municipal Water District (EMWD) shall contact the Consulting Tribe(s) to develop Cultural Resources Treatment Monitoring Agreement (Agreement). The Agreement shall address the treatment of archaeological resources that may be Tribal cultural resources inadvertently discovered on the project site; project grading; ground disturbance and development scheduling; the designation, responsibilities, and participation of tribal monitor(s) during grading, excavation, and ground disturbing activities; and compensation for the tribal monitors, including overtime, weekend rates, and mileage reimbursement.

Mitigation Measure TCR-2 **Tribal Monitoring.** Prior to the start of ground-disturbing activities, a Tribal monitor may participate in the construction workers archaeological resources sensitivity training, conducted by the project archaeologist. At least seven business days prior to ground-disturbing activities, EMWD shall notify the Tribe of the grading/excavation schedule and coordinate the tribal monitoring schedule.

A tribal monitor shall be present for ground-disturbing activities associated with the project. Both the project archaeologist and tribal monitor working together will determine the areas with a potential for encountering potential Tribal cultural resources. Both the archaeologist and tribal monitor shall have the authority to stop and redirect grading activities to evaluate the nature and significance of any archaeological resources discovered within the project limits. Such evaluation shall include culturally appropriate temporary and permanent treatment pursuant to the Cultural Resources Treatment and Monitoring Agreement, which may include avoidance of tribal cultural resources, in-place preservation, data recovery, and/or reburial so the resources are not subject to further disturbance in perpetuity. Any reburial shall take place at a location determined between the EMWD and the consulting tribe as described in TCR-4. Treatment may also include curation of the resources at a tribal curation facility or an archaeological curation facility, as determined in discussion among the EMWD, the tribe and the project archaeologist as addressed in the Cultural Resources Treatment and Monitoring Agreement. The on-site tribal monitoring shall end when all ground disturbing activities on the project site are completed, or when the tribal representatives and tribal monitor have indicated that the project site has little or no potential for impacting Tribal Cultural Resources.

Mitigation Measure TCR-3

Disposition of Inadvertent Discoveries. In the event that Tribal Cultural Resources are recovered during the course of grading, the EMWD shall relinquish ownership of all cultural resources, including sacred items, burial goods, archaeological artifacts, and non-human remains. The EMWD will coordinate with the project archaeologist and the tribe to conduct analysis of recovered resources. If it is determined that the resource is a Native American resource and thus significant under CEQA, avoidance of the resource will be explored as the preferred option and on-site reburial will be evaluated as the second option. If avoidance and on-site reburial are not possible, a treatment plan shall be prepared with State guidelines and in consultation with the tribe. The treatment plan may include, but would not be limited to capping in place, excavation and removal of the resource, interpretive displays, sensitive area signage, or other mutually agreed upon measures. Treatment may also include curation of the cultural resources at a tribal curation facility, as determined by the EMWD and the consulting tribe.

Mitigation Measure TCR-4 **Non-Disclosure of Reburial Locations.** It is understood by all parties that, unless otherwise required by law, the site of any reburial of culturally sensitive resources shall not be disclosed and shall not be governed by public disclosure requirements of the California Public Records Act. The coroner, pursuant to the specific exemption set forth in California Government Code 6254(r), parties, and Lead Agencies will be asked to withhold public disclosure information related to such reburial.

Mitigation Measures TCR-1 through TCR-4 would ensure that a Cultural Resources Treatment Monitoring Agreement is developed in consultation with the Consulting Tribe(s), a Tribal Monitor is present during ground-disturbing activities, and that if tribal cultural resources are identified during these activities, these resources would be evaluated, documented, and studied in accordance with standard archaeological practice and under the supervision of the Consulting Tribe(s). As such, with implementation of these mitigation measures the project's potential impacts to tribal cultural resources would be **less than significant with mitigation incorporated**.

4.19 UTILITIES AND SERVICE SYSTEMS

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a. Require or result in the relocation or construction of new or expanded water, wastewater treatment or stormwater drainage, electric power, natural gas, or telecommunications 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 which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☒	☐
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?	☐	☐	☒	☐

a. Would the project require or result in the relocation or construction of new or expanded water, wastewater treatment or stormwater drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects? ***(Less Than Significant Impact)***

A variety of local and regional purveyors in this area provide and maintain utility and service system facilities associated with electricity, water, stormwater, wastewater, solid waste, communications, and natural gas. Several of these utilities run parallel to the water pipeline route in the form of sewer pipes, storm drains, power lines, gas mains, and telephone lines.

Water Supply. The EMWD has jurisdiction over the water service lines within a 558-square-mile service area in western Riverside County.[69] The EMWD has four sources of water supply: imported water from the Metropolitan Water District of Southern California (MWD), local groundwater, desalinated groundwater, and recycled water. Potable imported water is treated and delivered to the EMWD directly from MWD's two large filtration plants: Henry J. Mills (Mills) Water Treatment Plant and the Robert F. Skinner (Skinner) Water Treatment Plant. The EMWD owns and operates two microfiltration plants that filter raw imported water delivered through MWD, removing particulate contaminants to achieve potable water standards. The two treatment plants, Perris Water Filtration Plant and Hemet Water Filtration Plant, are located in Perris and Hemet, respectively.

69 Eastern Municipal Water District (EMWD). n.d.-b. Who We Are. Website: https://www.emwd.org/who-we-are (accessed August 2023).

The EMWD also produces potable and brackish groundwater from the San Jacinto Groundwater Basin that underlies the EMWD service area. The EMWD's groundwater wells pump primarily from the eastern portion of the EMWD, with the largest amount of production taking place around the cities of Hemet and San Jacinto. The EMWD owns and operates three desalination plants in Sun City (i.e., the Menifee Desalter, the Perris I Desalter, and the Perris II Desalter), which treat brackish groundwater through reverse osmosis to achieve potable water standards. In addition to the potable water system, the EMWD maintains a regional recycled water system that provides tertiary-treated recycled water to customers for agricultural, landscape irrigation, environmental, and industrial use. The EMWD's recycled water system consists of four regional water reclamation facilities (RWRFs) that treat municipal sewage and produce water for recycling. The four RWRFs (i.e., San Jacinto Valley RWRF, Moreno Valley RWRF, Temecula Valley RWRF, and Perris Valley RWRF) are spread throughout the EMWD service area. A network of pipelines connects the four RWRFs, as well as several distribution storage ponds, to manage the delivery of recycled water.[70]

The project would not result in the construction of new water treatment facilities or the expansion of such facilities. The project aims to improve operation reliability and system redundancy by providing additional conveyance for the existing transmission 27-inch-diameter pipeline in Murrieta Road and interconnections to the 12-inch-diameter Ridgemoor Road pipeline, the 12-inch-diameter Rouse Road pipeline, the 12-inch-diameter McCall Boulevard pipeline, the 18-inch-diameter portion of the suction side of the Goetz booster, and the 36-inch-diameter Desalination Complex pipeline. In addition, the proposed pipelines would support operation of the proposed Goetz Road water storage tank, another pressure zone improvement currently underway, with an interconnection to the 30-inch-diameter pipeline off Thornton Avenue. Although the proposed project itself includes the installation of new water pipelines, measures (e.g., BMPs, Best Available Control Technologies) have been incorporated into the project design along with conformance with appropriate guidelines and policies to reduce possible environmental impacts to the extent practicable. Additionally, as described in Section 2.5.2, Project Operation, O&M activities associated with the proposed project would be similar to existing EMWD operations and maintenance for other water pipelines within its jurisdiction. Further, overall water demands would remain similar to existing conditions, and any increase in water demand during project construction or operation would be minimal and incidental to the overall EMWD system. Therefore, a **less than significant impact** would occur.

Wastewater. The EMWD provides wastewater services to approximately 268,000 customers within its service area and currently treats approximately 49 million gallons per day of wastewater at its four active regional water reclamation facilities through 1,813 miles of sewer pipelines.[71]

Implementation of the project would not require or result in the relocation or construction of new or expanded wastewater treatment facilities. The project entails installation of a new water pipeline within the public right-of-way. Project construction could result in the discharge of potable and non-potable water. Discharge of potable and non-potable water would be in compliance with NPDES

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70 Eastern Municipal Water District (EMWD). 2021a. 2020 Urban Water Management Plan. July 1. Website: https://www.emwd.org/sites/main/files/file-attachments/urbanwatermanagementplan_0.pdf?1625160721 (accessed August 2023).

71 Eastern Municipal Water District (EMWD). n.d.-a. Wastewater Service. Website: https://www.emwd.org/wastewater-service (accessed August 2023).

Municipal Regional Permit requirements. Dewatering of the work area may be necessary in areas where groundwater is encountered within the planned depth of excavation, depending on surface and groundwater levels at the time of construction. This discharge would be consistent with RWQCB requirements and would not require or result in the relocation of construction of new or expanded wastewater treatment facilities. Therefore, this impact would be **less than significant**.

Stormwater. As described in Section 4.10, Hydrology and Water Quality, stormwater from the project site discharges to the French Valley Channel and an unnamed tributary to Warm Springs Creek, which flows into Murrieta Creek, which flows into Santa Margarita River, which discharges to the Pacific Ocean.

The project would entail construction of water pipelines that would be located underground and an aboveground MOV facility on an existing vacant parcel at the corner of Valley Boulevard and Thornton Avenue. Stormwater from the MOV facility would be treated by project-specific BMPs detailed in the Final WQMP in accordance with the MS4 Permit, before discharging to the existing storm drain system in Valley Boulevard, which would be appropriately sized to detain the DCV so that storm water runoff does not exceed the capacity of the existing storm water drainage system. Therefore, operational impacts related to creation or contribution of storm water runoff that would exceed the capacity of existing or planned storm water drainage systems would be less than significant, and no mitigation is required.

The project-specific BMPs would be appropriately sized to detain the DCV so that storm water runoff would not exceed the capacity of the existing stormwater drainage system. Therefore, operational impacts related to creation or contribution of stormwater runoff that would exceed the capacity of existing or planned storm water drainage systems would be less than significant, and no mitigation is required. Implementation of the proposed project would not require the expansion of off-site stormwater facilities. Therefore, this impact would be **less than significant**.

Gas, Electricity, and Telecommunications. SCE provides electricity in Riverside County. The Southern California Gas Company (SoCalGas) provides natural gas service. Traditional telephone service is provided by AT&T and its various precursor companies. A variety of cellular and wireless service companies operate in Riverside County.

The project would entail construction of water pipelines that would be located underground. Additionally, an MOV facility would be constructed on a vacant parcel at the intersection of Valley Boulevard and Thornton Avenue. The facility would include an above-grade MOV on an approximately 640-square-foot concrete pad, ground-mounted remote terminal units, and space allocation for an SCE enclosure, if required by SCE. A new electrical utility service would be required to serve the MOV site equipment. Electric service required for the site is anticipated to be 100 amps, 120/240 volts, 1 phase. Although the proposed project itself includes the installation of new electric service, measures (e.g., BMPs, Best Available Control Technologies) have been incorporated into the project design along with conformance with appropriate guidelines and policies to reduce possible environmental impacts to the extent practicable. Additionally, proposed electric utility facilities would be constructed in accordance with SCE requirements and would require approval from SCE prior to construction. Therefore, a **less than significant impact** would occur.

b. Would the project 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 project would not result in an increase in the amount of water that currently is distributed to the site. New or expanded water supply entitlements would not be required to serve the project. During pipeline installation, water would be used for dust suppression; however, water would be provided via a water truck during construction activities. The amount of water required would be relatively small and would only be needed during the construction period. Therefore, the proposed project would result in a **less than significant impact** related to water supplies.

c. Would the project result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments? ***(Less Than Significant Impact)***

Refer to Section 4.19.a above. Implementation of the project would not result in a change in the wastewater treatment needed. Impacts related to wastewater treatment would be **less than significant**.

d. Would the project 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)***

Implementation of the project would generate solid waste associated with construction activities, including construction materials and general refuse. As outlined in Chapter 2.0, Project Description, the proposed project would require approximately 25,810 cubic yards of soil import and 8,060 cubic yards of soil export during project construction. In addition, the proposed project is anticipated to require between 30,000 and 40,000 square feet of asphalt demolition. Following construction, the proposed project would not generate any solid waste.

The closest landfill to the project site is El Sobrante Landfill (approximately 23 miles northwest). As of April 2018, the El Sobrante Landfill had a remaining capacity of approximately 143 million cubic yards, with a total capacity of 209 million cubic yards.[72] The quantity of solid waste materials associated with construction would be limited to the construction period and would not pose a significant impact upon existing landfills. No additional solid waste would be generated by long-term operations of the proposed project. Impacts related to solid waste disposal are considered **less than significant**.

72 California Department of Resources Recycling and Recovery (CalRecycle). 2019. SWIS Facility/Site Activity Details, El Sobrante Landfill (33-AA-0217). Website: https://www2.calrecycle.ca.gov/SolidWaste/SiteActivity/Details/2280?siteID=2402 (accessed April 24, 2024).

e. *Would the project comply with federal, state, and local management and reduction statutes and regulations related to solid waste?* ***(Less Than Significant Impact)***

As described in Section 4.19.d, implementation of the project would generate solid waste associated with construction activities. To the extent possible, solid waste would be recycled either on site or transported to a local disposal center for recycling. Solid waste generation would be limited to the construction period; no solid waste would be generated from long-term operation of the proposed project. The proposed project would comply with federal, State, and local statutes and regulations related to solid waste. This impact would be **less than significant**.

4.20 WILDFIRE

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
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 or 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?	☐	☐	☒	☐

*a. Would the project substantially impair an adopted emergency response plan or emergency evacuation plan? **(Less Than Significant Impact)***

As described in Section 4.9.g., the project site is within a developed urban area; however, according to CAL FIRE, areas just east of Valley Boulevard just south of Cherry Hills Boulevard to Thornton Avenue are located in a VHFHSZ.[73] Additionally, the northernmost portion of the project site, including the pipeline alignments along McLaughlin Road, Geary Street, and Rouse Road, are located in a High Fire Hazard Severity Zone.[74] As discussed in Section 4.17.d., operation of the proposed project would be the same or similar to the O&M of existing EMWD facilities and would not impair or physically interfere with emergency response or evacuation plans. The proposed project would be required to comply with all applicable codes and ordinances for emergency vehicle access, which would ensure adequate access to, from, and on site for emergency vehicles. Adherence to these codes and ordinances would ensure that construction and operation of the proposed project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. Therefore, the proposed project would not inhibit an emergency response plan or an emergency evacuation plan during construction. This impact would be **less than significant**.

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[73] California Department of Fire and Forestry Protection (CAL FIRE). 2024. Fire Hazard Severity Zone Viewer. Website: https://experience.arcgis.com/experience/03beab8511814e79a0e4eabf0d3e7247/ (accessed April 24, 2024).

[74] Ibid.

*b. Would the project, 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? **(Less Than Significant Impact)***

The climate of Riverside County is typical of a Mediterranean area, with warm, dry summers and cold, wet winters. Annual temperatures in the project site vicinity range from 65 degrees Fahrenheit (°F) and 92°F. Precipitation averages less than 12 inches and typically occurs between December and March. The prevailing wind is an onshore flow between 7 and 11 mph from the Pacific Ocean. Winds may push wildfire smoke into the area of the proposed project; however, these conditions would be temporary and, if conditions warranted, the local air quality management district (i.e., SCAQMD) would warn residents of potential impacts due to wildfire smoke.

The proposed project is located in a developed area with some undeveloped hillsides to the west; however, the project site itself consists of existing/proposed roadway rights-of-way and an existing flat, vacant parcel. Implementation of the project would not increase exposure to wildfires because the majority of the built infrastructure would be underground, with the MOV facility as the only aboveground structure. Additionally, operation of the proposed project would be conducted remotely, and there would be no full-time dedicated staff at the MOV facility.

As described in Section 4.9.g, during construction, the most likely source of ignition would be by mechanical activities such as the operation of backhoes, mini excavators, or rolled compactors. However, the potential for ignition can be greatly reduced through equipment features, fuel treatment, and management of behavior. The project would be required to comply with Occupational Safety and Health Administration (OSHA) requirements, including 29 Code of Federal Regulations (CFR) 1926.150, Fire Protection and Prevention. As specified in 29 CFR 1926.150, all construction work would require the contractor to implement fire hazard reduction measures (e.g., having fire extinguishers located on site, use of spark arrestors on equipment, and using a spotter during welding activities).

Project construction and operation would not change the characteristics of the project site in a way that would make the project site more susceptible to wildland fires. Therefore, impacts associated with exposing people or structures to a significant risk of loss, injury, or death involving wildland fires would be **less than significant**.

*c. Would the project require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment? **(Less Than Significant Impact)***

The proposed project would install underground water pipelines primarily within the roadway right-of-way; however, some pipeline segments would be constructed within unpaved areas and/or would be constructed in conjunction with roadway improvements. Additionally, a valve station with an MOV and remote terminal units would be constructed on a vacant parcel at the intersection of Valley Boulevard and Thornton Avenue. Although a new electrical utility service would be required to serve the MOV site equipment, this service would consist of a new SCE enclosure (e.g,. meter pedestal) with connections to existing power lines. No new infrastructure (e.g., roads, fuel breaks, emergency water sources, or power lines) would be required to serve the proposed pipelines or MOV facility. Therefore, the proposed project would not require the installation or maintenance of associated infrastructure. This impact would be **less than significant**.

d. *Would the project 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? **(Less Than Significant Impact)***

The Riverside County Floodplain Map indicates that a small portion of the project is located within a FEMA flood zone.[75] However, BMPs would be implemented during construction to ensure that pollutants would be retained on site and would be prevented from reaching downstream receiving waters during a rain event. During operation, the proposed project would not place any improvements within a floodplain or generate any pollutants. Additionally, according to the City of Menifee general plan EIR, the project site is not located within a landslide zone.[76] Therefore, downslope flooding as a result of runoff, post-fire slope instability, or drainage changes are unlikely to occur at the site. Furthermore, due to the developed nature of the majority of the project site, risks associated with wildfires are considered less than significant. The proposed project would not 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, and impacts would be **less than significant**.

75 Riverside County Flood Control. n.d. Riverside County Floodplain Map. Website: https://content.rcflood.org/floodplainmap/ (accessed July 2023).

76 California Geological Survey (CGS). 2021. Earthquake Zones of Required Investigation. Website: https://maps.conservation.ca.gov/cgs/EQZApp/app/ (accessed January 5, 2024).

4.21 MANDATORY FINDINGS OF SIGNIFICANCE

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
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 a rare or endangered plant or animal 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 which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☒	☐	☐

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 a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory? ***(Less Than Significant with Mitigation Incorporated)***

The EMWD proposes to install 4.4 miles of 36-inch-diameter, 30-inch-diameter, and 18-inch-diameter pipelines along Valley Boulevard from the existing EMWD Desalination Complex at 29285 Valley Boulevard in Menifee to the intersection of McLaughlin Road and Goetz Road. The project includes construction and operation of the new water pipelines to improve operational reliability by providing additional conveyance and redundancy for existing transmission pipelines in the project area and to support operation of the proposed Goetz Road water storage tank. As described in Section 4.4, Biological Resources, Section 4.5, Cultural Resources, and Section 4.18, Tribal Cultural Resources, with the incorporation of the identified mitigation measures and the environmental commitments identified in Section 2.6, implementation of the proposed project: (a) would not degrade the quality of the environment; (b) would not substantially reduce the habitats of fish or wildlife species; (c) would not cause a fish or wildlife population to drop below self-sustaining levels; (d) would not threaten to eliminate a plant or animal; and (e) would not eliminate important examples of major periods of California history or prehistory. With respect to the quality of the environment, the project would not preclude the ability to achieve long-term environmental goals. This impact 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 with Mitigation Incorporated)***

The *State CEQA Guidelines* require a discussion of significant environmental impacts that would result from project-related actions in combination with "closely related past, present, and probably future projects located in the immediate vicinity" (*State CEQA Guidelines* Section 15130[b][1][A]). Cumulative environmental impacts are those impacts that by themselves are not significant, but when considered with impacts occurring from other projects in the vicinity would result in a cumulative impact. Related projects considered to have the potential of creating cumulative impacts in association with the proposed project consist of projects that are reasonably foreseeable and that would be constructed or operated during the life of the proposed project. According to EMWD staff, there are two pending or approved projects in proximity to the project site that, when combined with the proposed project, could result in cumulative impacts. These projects are:

- The Cimarron Ridge Specific Plan establishes a land use plan, a circulation plan, and design standards and guidelines for approximately 240 acres in the northwestern portion of Menifee, located south of McLaughlin Road, north of Chambers Avenue, east of Goetz Road, and west of Byers Road and Valley Boulevard. Implementation of the Cimarron Ridge Specific Plan would include development of up to 756 residential units, 10.9 acres of open space/recreation land, and 2.1 acres of open space/conservation land. The Specific Plan was approved by the City of Menifee in November 2015, and portions of the Specific Plan area are currently under construction.

- The EMWD Brackish Water Pipeline includes construction of approximately 4 miles of 30-inch diameter brackish water transmission pipelines located along Valley Boulevard between the EMWD Desalination Complex and Rouse Road, along Rouse Road between Valley Boulevard and Byers Road, along Byers Road between Rouse Road and McLaughlin Road, along McLauglin Road between Byers Road and Murrieta Road, along McCall Boulevard between Valley Boulevard and Murrieta Road, and along Chambers Avenue between Valley Boulevard and Murrieta Road. As described in Section 2.5.1, construction sequencing would be coordinated with the adjacent 30-inch-diameter brackish pipeline project being planned by EMWD that shares much of the same alignment as the proposed project. This project is currently in the planning stage.

The proposed project's impacts would be individually limited and not cumulatively considerable. The potentially significant impacts that can be reduced to a less than significant level with implementation of recommended mitigation measures include the topics of biological resources, cultural resources, geology and soils, and noise. These impacts would primarily be related to construction-period activities, would be temporary in nature, and would not substantially contribute to any potential cumulative impacts associated with these topics. For the topic of biological resources, implementation of **Mitigation Measures BIO-1 through BIO-6** would ensure that impacts to special-status species, including rare plants, Crotch's bumble bee, coastal California gnatcatcher, burrowing owl, and nesting birds and wildlife movement corridors are reduced to a less than significant level. For the topic of cultural resources, potentially significant impacts to archaeological and cultural resources would be reduced to less than significant levels with implementation of **Mitigation Measures CULT-1 and CULT-2.** For the topic of geology and soils, implementation of **Mitigation Measures GEO-1 through GEO-3** would ensure that impacts related to paleontological resources are reduced to less than significant levels. For the topic of noise, implementation of **Mitigation Measures NOI-1 and NOI-2** would ensure that impacts related to construction noise and vibration are reduced to less than significant levels. For the topic of tribal cultural resources, implementation of **Mitigation Measures TCR-1 through TCR-4** would satisfy the agreement between EMWD and tribal representatives under AB 52 and reduce potential impacts from the proposed project to a less than significant level.

For the topics of aesthetics, agricultural and forestry resources, air quality, energy, GHG emissions, hazards and hazardous materials, hydrology and water quality, land use and planning, mineral resources, population and housing, public services, recreation, transportation, utilities and service systems, and wildfire, the project would have either no impacts or less than significant impacts; therefore, the proposed project would not substantially contribute to any potential cumulative impacts for these topics. All environmental impacts that could occur as a result of the proposed project would be reduced to a less than significant level through implementation of the mitigation measures recommended in this document.

Implementation of these measures would ensure that the impacts of the project would be below established thresholds of significance and that these impacts would not combine with the impacts of other cumulative projects to result in a cumulatively considerable impact on the environment as a result of project development. Therefore, this impact would be **less than significant with mitigation incorporated.**

c. *Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?* ***(Less Than Significant with Mitigation Incorporated)***

The EMWD proposes to install 4.4 miles of 36-inch-diameter, 30-inch-diameter, and 18-inch-diameter pipelines along Valley Boulevard from the existing EMWD Desalination Complex at 29285 Valley Boulevard in Menifee to the intersection of McLaughlin Road and Goetz Road. Based on the analysis in Chapter 4.0, CEQA Environmental Checklist, development of the proposed project would not cause substantial adverse effects to human beings because all impacts would be less than significant or, as described in Section 4.13, Noise, can be mitigated to a less than significant level. This impact would be **less than significant with mitigation incorporated**.

5.0 LIST OF PREPARERS

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APPENDIX A

CALEEMOD OUTPUT SHEETS

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Valley Boulevard Potable Water Transmission Pipeline Project Custom Report

Table of Contents

1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	Valley Boulevard Potable Water Transmission Pipeline Project
Construction Start Date	9/2/2024
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	2.50
Precipitation (days)	0.20
Location	29285 Valley Blvd, Menifee, CA 92584, USA
County	Riverside-South Coast
City	Menifee
Air District	South Coast AQMD
Air Basin	South Coast
TAZ	5509
EDFZ	11
Electric Utility	Southern California Edison
Gas Utility	Southern California Gas
App Version	2022.1.1.29

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
Road Construction	4.40	Mile	23.8	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.	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1.87	53.7	43.9	0.08	1.73	2.42	4.16	1.59	0.43	2.02	—	9,350	9,350	0.34	0.37	9,477
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1.89	54.0	43.1	0.08	1.73	2.42	4.16	1.59	0.43	2.02	—	9,338	9,338	0.34	0.39	9,462
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1.29	38.3	30.5	0.05	1.19	1.57	2.76	1.09	0.27	1.36	—	6,353	6,353	0.24	0.20	6,421
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.24	6.99	5.56	0.01	0.22	0.29	0.50	0.20	0.05	0.25	—	1,052	1,052	0.04	0.03	1,063

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	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.48	11.5	10.6	0.01	0.36	0.57	0.93	0.33	0.11	0.44	—	1,879	1,879	0.08	0.03	1,891

2025	1.87	53.7	43.9	0.08	1.73	2.42	4.16	1.59	0.43	2.02	—	9,350	9,350	0.34	0.37	9,477
2026	1.72	52.9	42.4	0.07	1.54	1.75	3.29	1.40	0.28	1.68	—	8,116	8,116	0.33	0.09	8,152
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	1.89	54.0	43.1	0.08	1.73	2.42	4.16	1.59	0.43	2.02	—	9,338	9,338	0.34	0.39	9,462
2025	1.85	53.9	42.9	0.08	1.73	2.42	4.16	1.59	0.43	2.02	—	9,292	9,292	0.34	0.37	9,412
2026	1.70	52.9	41.5	0.07	1.54	1.75	3.29	1.40	0.28	1.68	—	8,055	8,055	0.31	0.09	8,089
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.24	6.71	5.51	0.01	0.21	0.31	0.52	0.20	0.06	0.25	—	1,142	1,142	0.04	0.04	1,155
2025	1.29	38.3	30.5	0.05	1.19	1.57	2.76	1.09	0.27	1.36	—	6,353	6,353	0.24	0.20	6,421
2026	0.66	18.2	15.0	0.02	0.60	0.60	1.20	0.55	0.11	0.66	—	2,746	2,746	0.10	0.03	2,759
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.04	1.22	1.01	< 0.005	0.04	0.06	0.10	0.04	0.01	0.05	—	189	189	0.01	0.01	191
2025	0.24	6.99	5.56	0.01	0.22	0.29	0.50	0.20	0.05	0.25	—	1,052	1,052	0.04	0.03	1,063
2026	0.12	3.32	2.73	< 0.005	0.11	0.11	0.22	0.10	0.02	0.12	—	455	455	0.02	0.01	457

3. Construction Emissions Details

3.1. Linear, Grubbing & Land Clearing (2024) - Unmitigated

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

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.33	11.4	8.31	0.01	0.36	—	0.36	0.33	—	0.33	—	1,481	1,481	0.06	0.01	1,486

Dust From Material Movement	—	—	—	—	—	0.21	0.21	—	0.02	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
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.33	11.4	8.31	0.01	0.36	—	0.36	0.33	—	0.33	—	1,481	1,481	0.06	0.01	1,486
Dust From Material Movement	—	—	—	—	—	0.21	0.21	—	0.02	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
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.05	1.62	1.18	< 0.005	0.05	—	0.05	0.05	—	0.05	—	211	211	0.01	< 0.005	212
Dust From Material Movement	—	—	—	—	—	0.03	0.03	—	< 0.005	< 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
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.30	0.22	< 0.005	0.01	—	0.01	0.01	—	0.01	—	34.9	34.9	< 0.005	< 0.005	35.0
Dust From Material Movement	—	—	—	—	—	0.01	0.01	—	< 0.005	< 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
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.14	0.13	2.30	0.00	0.00	0.36	0.36	0.00	0.08	0.08	—	396	396	0.02	0.01	402
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
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
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.13	0.16	1.74	0.00	0.00	0.36	0.36	0.00	0.08	0.08	—	364	364	0.02	0.01	368
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
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
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.26	0.00	0.00	0.05	0.05	0.00	0.01	0.01	—	52.5	52.5	< 0.005	< 0.005	53.2
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
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
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.05	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	8.69	8.69	< 0.005	< 0.005	8.81
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
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

3.3. Linear, Grading & Excavation (2024) - Unmitigated

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

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.61	51.4	39.3	0.06	1.70	—	1.70	1.56	—	1.56	—	6,740	6,740	0.27	0.05	6,763
Dust From Material Movement	—	—	—	—	—	1.25	1.25	—	0.13	0.13	—	—	—	—	—	—
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
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.15	4.83	3.69	0.01	0.16	—	0.16	0.15	—	0.15	—	633	633	0.03	0.01	635
Dust From Material Movement	—	—	—	—	—	0.12	0.12	—	0.01	0.01	—	—	—	—	—	—
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
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.88	0.67	< 0.005	0.03	—	0.03	0.03	—	0.03	—	105	105	< 0.005	< 0.005	105
Dust From Material Movement	—	—	—	—	—	0.02	0.02	—	< 0.005	< 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
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	0.25	0.30	3.31	0.00	0.00	0.69	0.69	0.00	0.16	0.16	—	694	694	0.03	0.03	703
Vendor	< 0.005	0.04	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	31.1	31.1	< 0.005	< 0.005	32.5
Hauling	0.03	2.20	0.52	0.01	0.04	0.48	0.52	0.04	0.14	0.17	—	1,870	1,870	0.03	0.30	1,960
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.03	0.33	0.00	0.00	0.06	0.06	0.00	0.02	0.02	—	66.1	66.1	< 0.005	< 0.005	67.0
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	2.92	2.92	< 0.005	< 0.005	3.05
Hauling	< 0.005	0.21	0.05	< 0.005	< 0.005	0.05	0.05	< 0.005	0.01	0.02	—	176	176	< 0.005	0.03	184
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	0.01	0.06	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	10.9	10.9	< 0.005	< 0.005	11.1
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.48	0.48	< 0.005	< 0.005	0.51
Hauling	< 0.005	0.04	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	29.1	29.1	< 0.005	< 0.005	30.5

3.5. Linear, Grading & Excavation (2025) - Unmitigated

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

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.61	51.4	39.3	0.06	1.70	—	1.70	1.56	—	1.56	—	6,740	6,740	0.27	0.05	6,763
Dust From Material Movement	—	—	—	—	—	1.25	1.25	—	0.13	0.13	—	—	—	—	—	—
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
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	1.61	51.4	39.3	0.06	1.70	—	1.70	1.56	—	1.56	—	6,740	6,740	0.27	0.05	6,763
Dust From Material Movement	—	—	—	—	—	1.25	1.25	—	0.13	0.13	—	—	—	—	—	—
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
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.77	24.6	18.8	0.03	0.81	—	0.81	0.74	—	0.74	—	3,218	3,218	0.13	0.03	3,229
Dust From Material Movement	—	—	—	—	—	0.59	0.59	—	0.06	0.06	—	—	—	—	—	—
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
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.14	4.48	3.42	0.01	0.15	—	0.15	0.14	—	0.14	—	533	533	0.02	< 0.005	535
Dust From Material Movement	—	—	—	—	—	0.11	0.11	—	0.01	0.01	—	—	—	—	—	—
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
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.23	0.23	4.05	0.00	0.00	0.69	0.69	0.00	0.16	0.16	—	740	740	0.03	0.03	751
Vendor	< 0.005	0.03	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	30.6	30.6	< 0.005	< 0.005	32.1
Hauling	0.03	2.04	0.50	0.01	0.04	0.48	0.52	0.04	0.14	0.17	—	1,839	1,839	0.03	0.29	1,930

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.22	0.25	3.06	0.00	0.00	0.69	0.69	0.00	0.16	0.16	—	680	680	0.03	0.03	689
Vendor	< 0.005	0.04	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	30.6	30.6	< 0.005	< 0.005	32.0
Hauling	0.03	2.13	0.51	0.01	0.04	0.48	0.52	0.04	0.14	0.17	—	1,840	1,840	0.03	0.29	1,927
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.10	0.13	1.55	0.00	0.00	0.33	0.33	0.00	0.08	0.08	—	329	329	0.02	0.01	334
Vendor	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	14.6	14.6	< 0.005	< 0.005	15.3
Hauling	0.01	1.03	0.24	0.01	0.02	0.23	0.25	0.02	0.06	0.08	—	878	878	0.02	0.14	921
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.28	0.00	0.00	0.06	0.06	0.00	0.01	0.01	—	54.5	54.5	< 0.005	< 0.005	55.2
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	2.42	2.42	< 0.005	< 0.005	2.53
Hauling	< 0.005	0.19	0.04	< 0.005	< 0.005	0.04	0.05	< 0.005	0.01	0.01	—	145	145	< 0.005	0.02	152

3.7. Linear, Drainage, Utilities, & Sub-Grade (2025) - Unmitigated

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

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.48	52.7	38.5	0.07	1.54	—	1.54	1.40	—	1.40	—	7,356	7,356	0.30	0.06	7,381
Dust From Material Movement	—	—	—	—	—	1.03	1.03	—	0.11	0.11	—	—	—	—	—	—
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

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.48	52.7	38.5	0.07	1.54	—	1.54	1.40	—	1.40	—	7,356	7,356	0.30	0.06	7,381
Dust From Material Movement	—	—	—	—	—	1.03	1.03	—	0.11	0.11	—	—	—	—	—	—
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
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.35	12.5	9.11	0.02	0.36	—	0.36	0.33	—	0.33	—	1,742	1,742	0.07	0.01	1,748
Dust From Material Movement	—	—	—	—	—	0.24	0.24	—	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
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.06	2.28	1.66	< 0.005	0.07	—	0.07	0.06	—	0.06	—	288	288	0.01	< 0.005	289
Dust From Material Movement	—	—	—	—	—	0.04	0.04	—	< 0.005	< 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
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.25	0.24	4.25	0.00	0.00	0.72	0.72	0.00	0.17	0.17	—	775	775	0.03	0.03	787
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

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
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.23	0.27	3.21	0.00	0.00	0.72	0.72	0.00	0.17	0.17	—	713	713	0.03	0.03	722
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
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
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.05	0.07	0.80	0.00	0.00	0.17	0.17	0.00	0.04	0.04	—	171	171	0.01	0.01	173
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
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
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.15	0.00	0.00	0.03	0.03	0.00	0.01	0.01	—	28.3	28.3	< 0.005	< 0.005	28.7
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
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

3.9. Linear, Drainage, Utilities, & Sub-Grade (2026) - Unmitigated

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

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.48	52.7	38.5	0.07	1.54	—	1.54	1.40	—	1.40	—	7,356	7,356	0.30	0.06	7,381
Dust From Material Movement	—	—	—	—	—	1.03	1.03	—	0.11	0.11	—	—	—	—	—	—
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

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.48	52.7	38.5	0.07	1.54	—	1.54	1.40	—	1.40	—	7,356	7,356	0.30	0.06	7,381
Dust From Material Movement	—	—	—	—	—	1.03	1.03	—	0.11	0.11	—	—	—	—	—	—
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
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.39	13.8	10.1	0.02	0.40	—	0.40	0.37	—	0.37	—	1,929	1,929	0.08	0.02	1,936
Dust From Material Movement	—	—	—	—	—	0.27	0.27	—	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
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.07	2.52	1.84	< 0.005	0.07	—	0.07	0.07	—	0.07	—	319	319	0.01	< 0.005	320
Dust From Material Movement	—	—	—	—	—	0.05	0.05	—	0.01	0.01	—	—	—	—	—	—
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
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.23	0.22	3.95	0.00	0.00	0.72	0.72	0.00	0.17	0.17	—	759	759	0.03	0.03	770
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

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
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.22	0.24	2.99	0.00	0.00	0.72	0.72	0.00	0.17	0.17	—	697	697	0.01	0.03	706
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
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
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.07	0.82	0.00	0.00	0.19	0.19	0.00	0.04	0.04	—	185	185	< 0.005	0.01	188
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
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
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.15	0.00	0.00	0.03	0.03	0.00	0.01	0.01	—	30.7	30.7	< 0.005	< 0.005	31.1
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
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

3.11. Linear, Paving (2026) - Unmitigated

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

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.61	15.4	12.5	0.02	0.71	—	0.71	0.67	—	0.67	—	1,791	1,791	0.07	0.01	1,797
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
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.61	15.4	12.5	0.02	0.71	—	0.71	0.67	—	0.67	—	1,791	1,791	0.07	0.01	1,797
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
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.17	4.23	3.43	< 0.005	0.20	—	0.20	0.18	—	0.18	—	491	491	0.02	< 0.005	492
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
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.77	0.63	< 0.005	0.04	—	0.04	0.03	—	0.03	—	81.2	81.2	< 0.005	< 0.005	81.5
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
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.17	0.16	2.87	0.00	0.00	0.52	0.52	0.00	0.12	0.12	—	552	552	0.02	0.02	560
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
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
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.16	0.18	2.18	0.00	0.00	0.52	0.52	0.00	0.12	0.12	—	507	507	0.01	0.02	513
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
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
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04	0.05	0.62	0.00	0.00	0.14	0.14	0.00	0.03	0.03	—	141	141	< 0.005	0.01	143
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
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

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.11	0.00	0.00	0.03	0.03	0.00	0.01	0.01	—	23.3	23.3	< 0.005	< 0.005	23.6
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
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

4. Operations Emissions Details

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	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	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	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	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	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	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
Linear, Grubbing & Land Clearing	Linear, Grubbing & Land Clearing	9/2/2024	11/13/2024	5.00	52.0	—
Linear, Grading & Excavation	Linear, Grading & Excavation	11/14/2024	9/1/2025	5.00	208	—
Linear, Drainage, Utilities, & Sub-Grade	Linear, Drainage, Utilities, & Sub-Grade	9/2/2025	5/14/2026	5.00	182	—
Linear, Paving	Linear, Paving	5/15/2026	10/1/2026	5.00	100	—

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
Linear, Grubbing & Land Clearing	Signal Boards	Electric	Average	8.00	8.00	6.00	0.82

Linear, Grubbing & Land Clearing	Crawler Tractors	Diesel	Tier 2	1.00	8.00	87.0	0.43
Linear, Grubbing & Land Clearing	Excavators	Diesel	Tier 2	1.00	8.00	36.0	0.38
Linear, Grubbing & Land Clearing	Cranes	Diesel	Tier 2	1.00	8.00	367	0.29
Linear, Grading & Excavation	Excavators	Diesel	Tier 2	3.00	8.00	36.0	0.38
Linear, Grading & Excavation	Crawler Tractors	Diesel	Tier 2	1.00	8.00	87.0	0.43
Linear, Grading & Excavation	Graders	Diesel	Tier 2	1.00	8.00	148	0.41
Linear, Grading & Excavation	Rollers	Diesel	Tier 2	2.00	8.00	36.0	0.38
Linear, Grading & Excavation	Tractors/Loaders/Backhoes	Diesel	Tier 2	2.00	8.00	84.0	0.37
Linear, Grading & Excavation	Signal Boards	Electric	Average	8.00	8.00	6.00	0.82
Linear, Grading & Excavation	Rubber Tired Loaders	Diesel	Tier 2	1.00	8.00	150	0.36
Linear, Grading & Excavation	Scrapers	Diesel	Tier 2	2.00	8.00	423	0.48
Linear, Grading & Excavation	Concrete/Industrial Saws	Diesel	Tier 2	1.00	8.00	33.0	0.73
Linear, Drainage, Utilities, & Sub-Grade	Scrapers	Diesel	Tier 2	2.00	8.00	423	0.48
Linear, Drainage, Utilities, & Sub-Grade	Rough Terrain Forklifts	Diesel	Tier 2	1.00	8.00	96.0	0.40
Linear, Drainage, Utilities, & Sub-Grade	Signal Boards	Electric	Average	8.00	8.00	6.00	0.82
Linear, Drainage, Utilities, & Sub-Grade	Tractors/Loaders/Backhoes	Diesel	Tier 2	2.00	8.00	84.0	0.37
Linear, Drainage, Utilities, & Sub-Grade	Graders	Diesel	Tier 2	1.00	8.00	148	0.41

Linear, Drainage, Utilities, & Sub-Grade	Plate Compactors	Diesel	Tier 2	1.00	8.00	8.00	0.43
Linear, Drainage, Utilities, & Sub-Grade	Pumps	Diesel	Tier 2	1.00	8.00	11.0	0.74
Linear, Drainage, Utilities, & Sub-Grade	Air Compressors	Diesel	Tier 2	1.00	8.00	37.0	0.48
Linear, Drainage, Utilities, & Sub-Grade	Generator Sets	Diesel	Tier 2	1.00	8.00	14.0	0.74
Linear, Drainage, Utilities, & Sub-Grade	Off-Highway Trucks	Diesel	Tier 2	1.00	8.00	376	0.38
Linear, Drainage, Utilities, & Sub-Grade	Dumpers/Tenders	Diesel	Tier 2	2.00	8.00	16.0	0.38
Linear, Drainage, Utilities, & Sub-Grade	Welders	Diesel	Tier 2	1.00	8.00	46.0	0.45
Linear, Paving	Rollers	Diesel	Tier 2	3.00	8.00	36.0	0.38
Linear, Paving	Paving Equipment	Diesel	Tier 2	1.00	8.00	89.0	0.36
Linear, Paving	Pavers	Diesel	Tier 2	1.00	8.00	81.0	0.42
Linear, Paving	Signal Boards	Electric	Average	8.00	8.00	6.00	0.82
Linear, Paving	Tractors/Loaders/Backhoes	Diesel	Tier 2	2.00	8.00	84.0	0.37
Linear, Paving	Sweepers/Scrubbers	Diesel	Tier 2	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
Linear, Grubbing & Land Clearing	—	—	—	—
Linear, Grubbing & Land Clearing	Worker	27.5	18.5	LDA,LDT1,LDT2
Linear, Grubbing & Land Clearing	Vendor	0.00	10.2	HHDT,MHDT
Linear, Grubbing & Land Clearing	Hauling	0.00	20.0	HHDT
Linear, Grubbing & Land Clearing	Onsite truck	—	—	HHDT

Linear, Grading & Excavation	—	—	—	—
Linear, Grading & Excavation	Worker	52.5	18.5	LDA,LDT1,LDT2
Linear, Grading & Excavation	Vendor	1.00	10.2	HHDT,MHDT
Linear, Grading & Excavation	Hauling	26.7	20.0	HHDT
Linear, Grading & Excavation	Onsite truck	—	—	HHDT
Linear, Drainage, Utilities, & Sub-Grade	—	—	—	—
Linear, Drainage, Utilities, & Sub-Grade	Worker	55.0	18.5	LDA,LDT1,LDT2
Linear, Drainage, Utilities, & Sub-Grade	Vendor	0.00	10.2	HHDT,MHDT
Linear, Drainage, Utilities, & Sub-Grade	Hauling	0.00	20.0	HHDT
Linear, Drainage, Utilities, & Sub-Grade	Onsite truck	—	—	HHDT
Linear, Paving	—	—	—	—
Linear, Paving	Worker	40.0	18.5	LDA,LDT1,LDT2
Linear, Paving	Vendor	0.00	10.2	HHDT,MHDT
Linear, Paving	Hauling	0.00	20.0	HHDT
Linear, Paving	Onsite truck	—	—	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Control Strategies Applied	PM10 Reduction	PM2.5 Reduction
Water unpaved roads twice daily	55%	55%
Limit vehicle speeds on unpaved roads to 25 mph	44%	44%

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 (Cubic Yards)	Material Exported (Cubic Yards)	Acres Graded (acres)	Material Demolished (sq. ft.)	Acres Paved (acres)
Linear, Grubbing & Land Clearing	0.00	0.00	6.28	0.00	—
Linear, Grading & Excavation	10,500	33,900	6.28	0.00	—
Linear, Drainage, Utilities, & Sub-Grade	0.00	0.00	6.28	0.00	—

5.6.2. Construction Earthmoving Control Strategies

Control Strategies Applied	Frequency (per day)	PM10 Reduction	PM2.5 Reduction
Water Exposed Area	2	61%	61%
Water Demolished Area	2	36%	36%

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt
Road Construction	23.8	100%

5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

Year	kWh per Year	CO2	CH4	N2O
2024	470	532	0.03	< 0.005
2025	470	532	0.03	< 0.005

2026	470	532	0.03	< 0.005

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)

8. User Changes to Default Data

Screen	Justification
Construction: Construction Phases	Extended paving phase to account for the 640 sf motor operated valve facility. Construction is anticipated to occur for approximately 24 months, beginning in the fall of 2024.
Construction: Off-Road Equipment	Construction equipment provided by the applicant includes: backhoe, hydraulic excavator, pick up and dump trucks, pavement breaker, sweeper, loader, crane, welder, concrete saw, generator, pump, compressor, and paver. Assuming tier 2 construction engine.
Construction: Dust From Material Movement	Proposed project would require approximately 10,500 CY of soil import and 33,900 CY of soil export

Construction: Demolition	The proposed project is anticipated to demolish between 30,000-40,000 sf of asphalt demolition. Exact quantities have not been determined yet; however, this analysis will assume 40,000 sf of demolition to be conservative.

APPENDIX B

BIOLOGICAL RESOURCES ASSESSMENT

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BIOLOGICAL RESOURCES ASSESSMENT

VALLEY BOULEVARD POTABLE WATER TRANSMISSION PIPELINES PROJECT

CITY OF MENIFEE

RIVERSIDE COUNTY, CALIFORNIA

November 2024

BIOLOGICAL RESOURCES ASSESSMENT

VALLEY BOULEVARD POTABLE WATER TRANSMISSION PIPELINES PROJECT

CITY OF MENIFEE

RIVERSIDE COUNTY, CALIFORNIA

Prepared for:

Eastern Municipal Water District
2270 Trumble Road
Perris, California 92572-8300

Prepared by:

LSA Associates, Inc.
1500 Iowa Avenue, Suite 200
Riverside, California 92507
(951) 781-9310

LSA Project No. EWD2101.04

November 2024

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FIGURES

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LIST OF ABBREVIATIONS AND ACRONYMS

ALMU	Munz's onion (*Allium munzii*)
AMPU	San Diego ambrosia (*Ambrosia pumila*)
ATCON	San Jacinto Valley crownscale (*Atriplex coronata* var. *notatior*)
BAEA	Bald eagle (*Haliaeetus leucocephalus*)
BESP	Bell's sparrow (*Artemisiospiza belli belli*)
BMPs	best management practices
BRFI	Thread-leaved brodiaea (*Brodiaea filifolia*)
BUOW	Burrowing owl (*Athene cunicularia*)
CAGN	Coastal California gnatcatcher (*Polioptila californica californica*)
CBB	Crotch bumble bee (*Bombus crotchii*)
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CHPAP	Parry's spineflower (*Chorizanthe parryi* var. *parryi*)
City	City of Menifee
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
COHA	Cooper’s hawk (*Accipiter cooperii*)
County	Riverside County
CRPR	California Rare Plant Rank
CWA	Clean Water Act
DOLE	Slender-horned spineflower (*Dodecahema leptoceras*)
EMWD	Eastern Municipal Water District
FESA	Federal Endangered Species Act
GOEA	Golden eagle (*Aquila chrysaetos*)
HCP	Habitat Conservation Plan
HOLA	California horned lark (*Eremophila alpestris actia*)
I-215	Interstate 215
IPaC	USFWS’s Information for Planning and Consultation

ISA	International Society of Arboriculture
LBVI	Least Bell's vireo (*Vireo bellii pusillus*)
LEVIR	Robinson's pepper-grass (*Lepidium virginicum* var. *robinsonii*)
LSA	LSA Associates, Inc.
MBTA	Migratory Bird Treaty Act
MM	Mitigation Measure
MOV	motor-operated valve
MSHCP	Western Riverside County Multiple Species Habitat Conservation Plan
NAFO	Spreading navarretia (*Navarretia fossalis*)
NEPSSA	Narrow Endemic Plant Species Survey Area
NRCS	Natural Resources Conservation Service
OHWM	ordinary high water mark
ORCA	California Orcutt grass (*Orcuttia californica*)
project	Valley Boulevard Potable Water Transmission Pipelines Project
PSE	Participating Special Entity
QCB	Quino checkerspot butterfly (*Euphydryas editha quino*)
RCHCA	Riverside County Habitat Conservation Authority
RCSP	Southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*)
RFS	Riverside fairy shrimp (*Streptocephalus woottoni*)
RWQCB	Regional Water Quality Control Board
SBKR	San Bernardino kangaroo rat (*Dipodomys merriami parvus*)
SDFS	San Diego fairy shrimp (*Branchinecta sandiegonensis*)
SKR	Stephens' kangaroo rat (*Dipodomys stephensi*)
SKR HCP	Stephens' Kangaroo Rat Habitat Conservation Plan
SNPL	Western snowy plover (*Charadrius alexandrinus nivosus*)
SWFL	Southwestern willow flycatcher (*Empidonax traillii extimus*)
SWRCB	State Water Resources Control Board
TRBL	Tricolored blackbird (*Agelaius tricolor*)
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service

USGS	United States Geological Survey
VPFS	Vernal pool fairy shrimp (*Branchinecta lynchi*)
WPT	Western pond turtle (*Emys marmorata* [*Actinemys marmorata*])

1.0 EXECUTIVE SUMMARY

LSA Associates, Inc. (LSA) was retained by the Eastern Municipal Water District (EMWD) to prepare a Biological Resources Assessment. This report has been prepared for compliance with the California Environmental Quality Act (CEQA) and Federal and California Endangered Species Acts.

The study area lies within the planning boundaries of the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) area. The MSHCP is a comprehensive multi-jurisdictional effort that includes western Riverside County and multiple cities. EMWD is the lead agency but is not signatory to the MSHCP. EMWD is not pursuing a Participating Special Entity (PSE) designation for the project site.

The project site is within an MSHCP Narrow Endemic Plant Species Survey Area (NEPSSA) for six plant species: Munz's onion (*Allium munzii*), San Diego Ambrosia (*Ambrosia pumila*), many-stemmed dudleya (*Dudleya multicaulis*), spreading navarretia (*Navarretia fossalis*), California Orcutt grass (*Orcuttia californica*), and Wright's trichocoronis (*Trichocoronis wrightii* var. *wrightii*). Potentially suitable habitat for three of these species is present on site; therefore, a rare plant survey is required to identify whether these special-status plants are present on the project site.

The project site contains suitable habitat for Crotch bumble bee (*Bombus crotchii*), in the form of buckwheat scrub. Therefore, focused Crotch bumble bee surveys are required to determine if Crotch bumble bee is present on the project site.

The site contains suitable fairy shrimp habitat in the form of road ruts and shallow depressions. Additionally, unknown fairy shrimp species (*Branchinecta* sp.) were observed in three separate road ruts. All road ruts and shallow depressions will be avoided by project activities. Therefore, fairy shrimp will not be impacted, and focused wet and dry season fairy shrimp surveys will not be required.

The site contains suitable habitat for coastal California gnatcatcher (*Polioptila californica californica*) in the form of buckwheat scrub. Therefore, focused coastal California gnatcatcher surveys are required to determine if coastal California gnatcatcher is present on the project site.

The project study area contains suitable habitat for the burrowing owl (*Athene cunicularia hypugaea*) and other nesting birds protected by the Migratory Bird Treaty Act (MBTA) and the California Fish and Game Code. A burrowing owl pre-construction survey will be required to ensure any direct impacts to this species will be avoided. In addition, it is recommended that vegetation removal be conducted between September 1 and January 15 (outside the general bird nesting season) to avoid impacts to nesting birds. If vegetation cannot be removed outside the bird nesting season, a pre-construction nesting bird survey by a qualified biologist is required prior to vegetation removal. Additionally, standard best management practices (BMPs) shall be implemented during construction activities to reduce impacts to wildlife resources in the project vicinity.

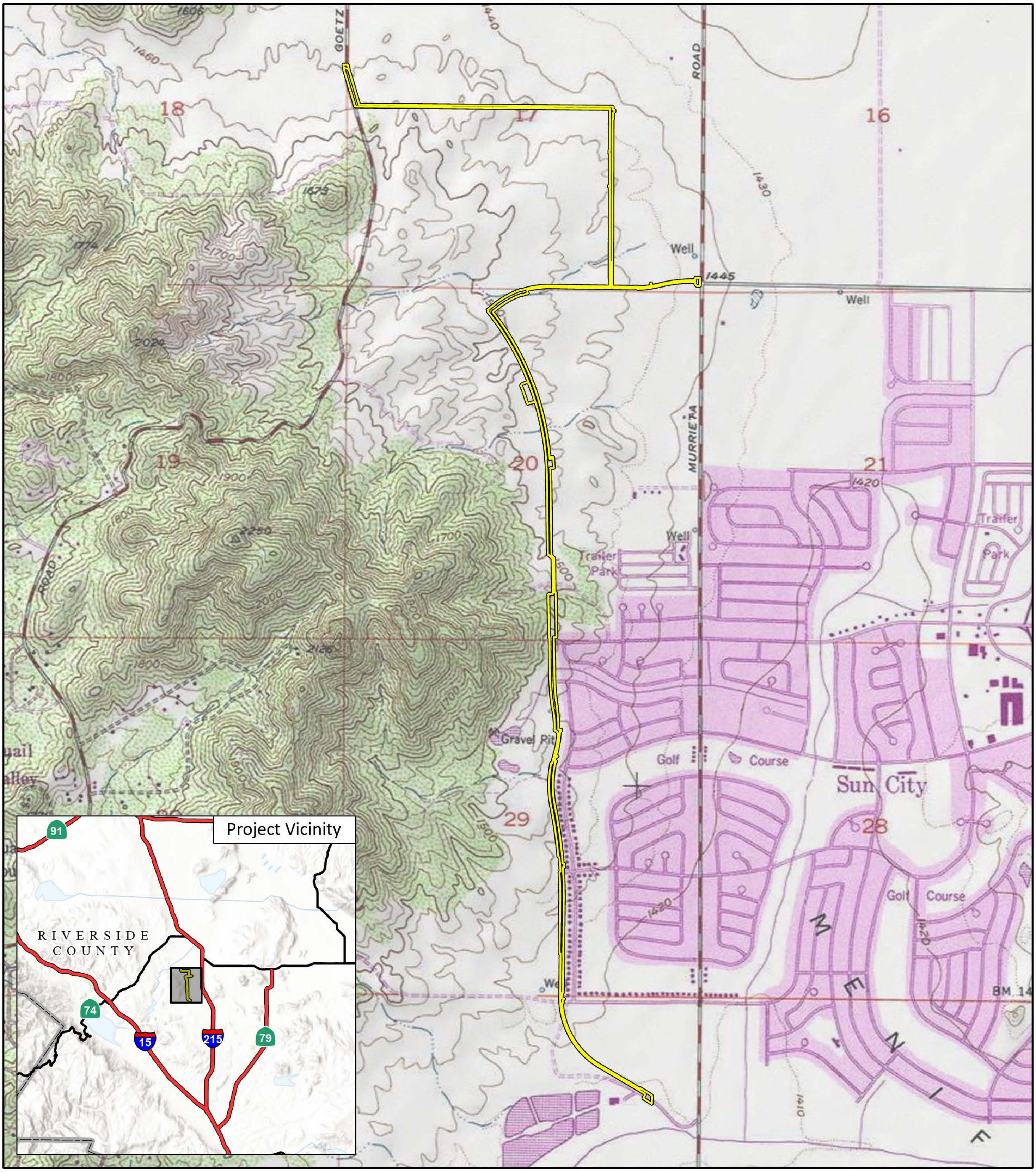
An official jurisdictional delineation was not conducted as part of the biological resources assessment for this project. There were six drainage features and five detention basins identified within the project study area, which includes a 200-foot buffer from the project site, which are considered potential jurisdictional waters that may be subject to the regulatory authority of the United States Army Corps of Engineers (USACE), the California Department of Fish and Wildlife (CDFW), or the Regional Water Quality Control Board (RWQCB). In addition, there were a number of shallow depressions and road ruts observed within the project study area. The shallow depressions are considered potential jurisdictional waters that may be subject to the regulatory authority of the RWQCB. The road ruts are not considered potential jurisdictional waters. A jurisdictional delineation would be required to determine any project effects to these potential jurisdictional waters if project activities were proposed within these features.

2.0 INTRODUCTION

LSA was retained by Eastern Municipal Water District (EMWD) to prepare a Biological Resources Assessment. This report evaluates the proposed 4.4-mile-long, 36-inch, 30-inch, and 18-inch diameter pipelines along Valley Boulevard, Rouse Road, Geary Street, McLaughlin Road, and Goetz Road in the City of Menifee (City), County of Riverside (County), California. The project site is depicted on the United States Geological Survey (USGS) *Romoland, California* 7.5-minute topographic quadrangles in Sections 17, 20, 29 and 32, Township 5 South, Range 3 West (see Figure 1, Project Location and Vicinity).

2.1 PROJECT DESCRIPTION

The proposed project involves the installation of 4.4 miles of 36-inch diameter, 30-inch diameter, and 18-inch diameter pipelines along Valley Boulevard from EMWD's existing Desalination Complex at 29285 Valley Boulevard in Menifee to McLaughlin Road/Goetz Road. The project includes construction and operation of the new water pipelines to improve operational reliability by providing additional conveyance and redundancy for existing transmission pipelines in the project area and to support operation of the proposed Goetz Road water storage tank. In addition, a turnout facility with a motor-operated valve (MOV), antenna, and remote terminal units would be constructed on a vacant parcel at the intersection of Valley Boulevard and Thornton Avenue.



LSA

Project Boundary

FIGURE 1

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Valley Boulevard Potable Water Transmission Pipelines Project

Project Location and Vicinity

SOURCE: USGS 7.5' Quad - *Romoland (1979)*, CA

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3.0 METHODS

3.1 LITERATURE REVIEW

A literature review was conducted to assist in determining the existence or potential occurrence of special-status plant and animal species within the project site and the project study area (200-foot buffer on either side of the alignment). A records search of the California Department of Fish and Wildlife's (CDFW) California Natural Diversity Data Base (CNDDB) *Rarefind 5* (Version 5.3.0), the United States Fish and Wildlife Service's (USFWS) Information for Planning and Consultation (IPaC) system, and the California Native Plant Society's *Online Inventory of Rare and Endangered Plants* (CNPS v9.5) for the *Romoland, California* United States Geological Survey (USGS) 7.5-minute quadrangle and surrounding quadrangles within a 7-mile radius of the project site were searched on March 12, 2024, and updated on October 29, 2024. Soil types were determined using the WebSoil Survey (NRCS 2019; available at http://websoilsurvey.sc.egov.usda.gov).

Geographic Information System software was used to map the project location, habitat types, and land uses, etc.

3.2 FIELD SURVEY

The general biological resources assessment included a site visit on February 14, 2024, by LSA biologists Carla Cervantes and Julia Lung between 7:30 a.m. and 1:00 p.m. Notes were taken on general site conditions, vegetation, and suitability of habitat for various special-status elements. Weather conditions started as cloudy skies and ended with clear skies (0–100 percent cloud cover), cool temperatures (44–60 degrees Fahrenheit), and 1–3 mile per hour (mph) winds during the site survey. The entire project study area, which includes a 200-foot buffer from the project site, was surveyed on foot. Binoculars were used as needed. All plant and animal species observed or otherwise detected during this field survey were noted and are listed in Appendix A. Appendix B summarizes the special-status plant and animal species potentially present within the project study area.

4.0 RESULTS

4.1 EXISTING SITE CONDITIONS

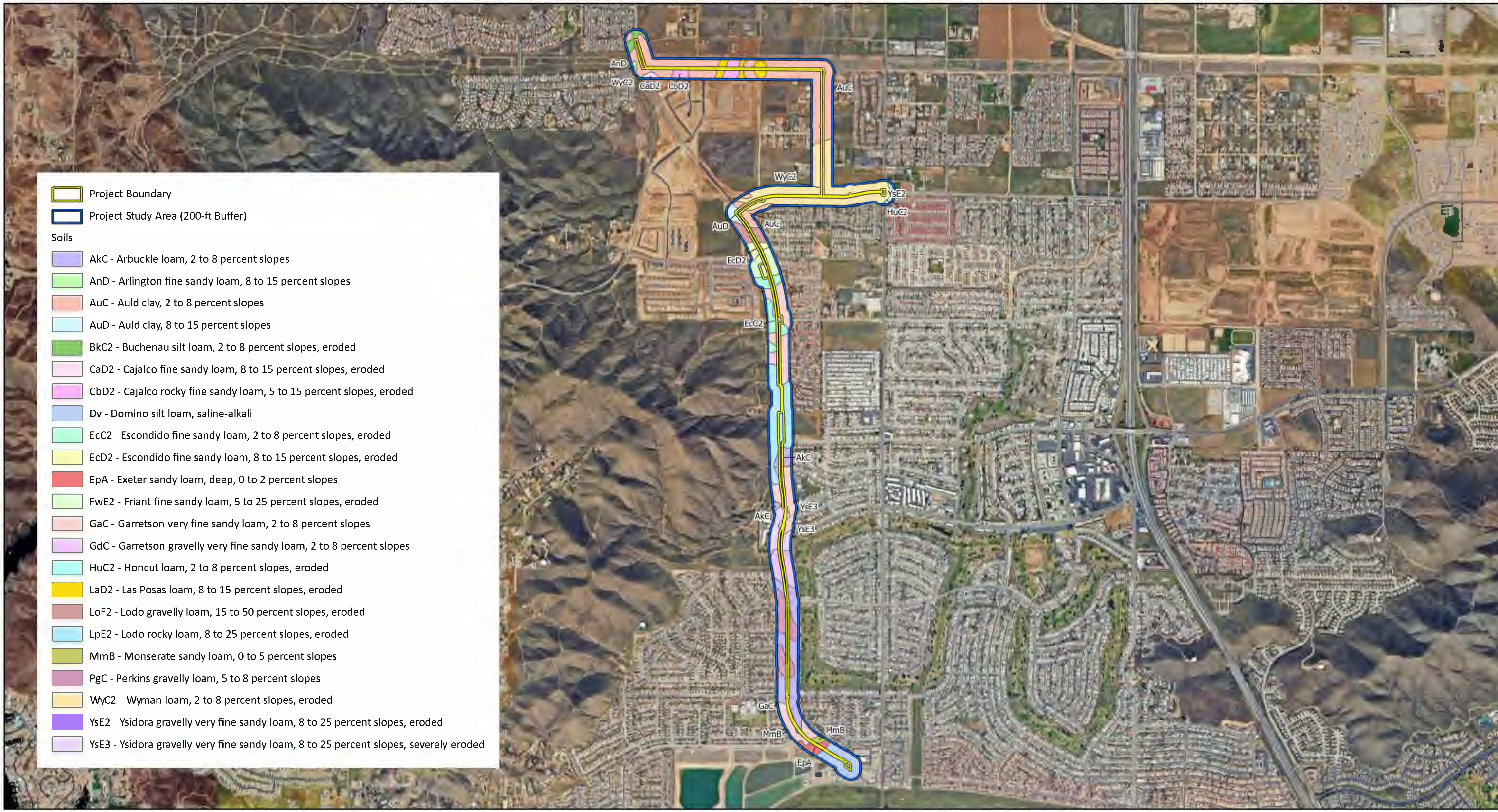
The project study area is generally located north of Salt Creek, east of an unnamed mountain range found east of Kabian Park, south of Ethanac Road, and west of Interstate 215 (I-215). Other surrounding land uses include residential and commercial use areas to the east. The project falls within the boundaries of the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP), as discussed in further detail below.

4.1.1 Topography and Soils

The project site is situated on relatively flat land within elevations ranging from approximately 1,410 feet to 1,520 feet above mean sea level. A variety of soil types occurs within the project site; the soil types are mapped by the *Natural Resource Conservation Service Soil Survey Geographic Database SSURGO metadata and GIS maps* as the following types:

- Arbuckle loam, 2 to 8 percent slopes
- Arlington fine sandy loam, 8 to 15 percent slopes
- Auld clay, 2 to 8 percent slopes
- Auld clay, 8 to 15 percent slopes
- Buchenau silt loam, 2 to 8 percent slopes, eroded
- Cajalco fine sandy loam, 8 to 15 percent slopes, eroded
- Cajalco rocky fine sandy loam, 5 to 15 percent slopes, eroded
- Domino silt loam, saline-alkali
- Escondido fine sandy loam, 2 to 8 percent slopes, eroded
- Escondido fine sandy loam, 8 to 15 percent slopes, eroded
- Exeter sandy loam, deep, 0 to 2 percent slopes
- Friant fine sandy loam, 5 to 25 percent slopes, eroded
- Garretson gravelly very fine sandy loam, 2 to 8 percent slopes
- Garretson very fine sandy loam, 2 to 8 percent slopes
- Honcut loam, 2 to 8 percent slopes, eroded
- Las Posas loam, 8 to 15 percent slopes, eroded
- Lodo gravelly loam, 15 to 50 percent slopes, eroded
- Lodo rocky loam, 8 to 25 percent slopes, eroded
- Monserate sandy loam, 0 to 5 percent slopes
- Perkins gravelly loam, 5 to 8 percent slopes
- Wyman loam, 2 to 8 percent slopes, eroded
- Ysidora gravelly very fine sandy loam, 8 to 25 percent slopes, eroded
- Ysidora gravelly very fine sandy loam. 8 to 25 percent slopes, severely eroded

Soils observed in undeveloped portions of the project study area appear to be consistent with these designations. Figure 2, Soils, shows the soils mapped within the project study area.



LSA

FIGURE 2

N

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SOURCE: Google Maps (2023); Soil Survey Geographic Database (SSURGO) (2023)

Valley Boulevard Potable Water Transmission Pipelines Project

Soils

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4.1.2 Vegetation

Vegetation within the project study area consists primarily of developed, buckwheat scrub, and non-native grassland, with patches of brittlebush scrub-disturbed, disturbed and barren ground, as well as ornamental landscaping located throughout residential and commercial areas.

Dominant species within non-native grassland include mouse barley (*Hordeum murinum*), red brome (*Bromus rubens*) and common Mediterranean grass (*Schismus barbatus*). Other species observed within non-native grassland include Russian thistle (*Salsola tragus*), prickly lettuce (*Lactuca serriola*), Bermuda grass (*Cynodon dactylon*), and wild oat (*Avena fatua*).

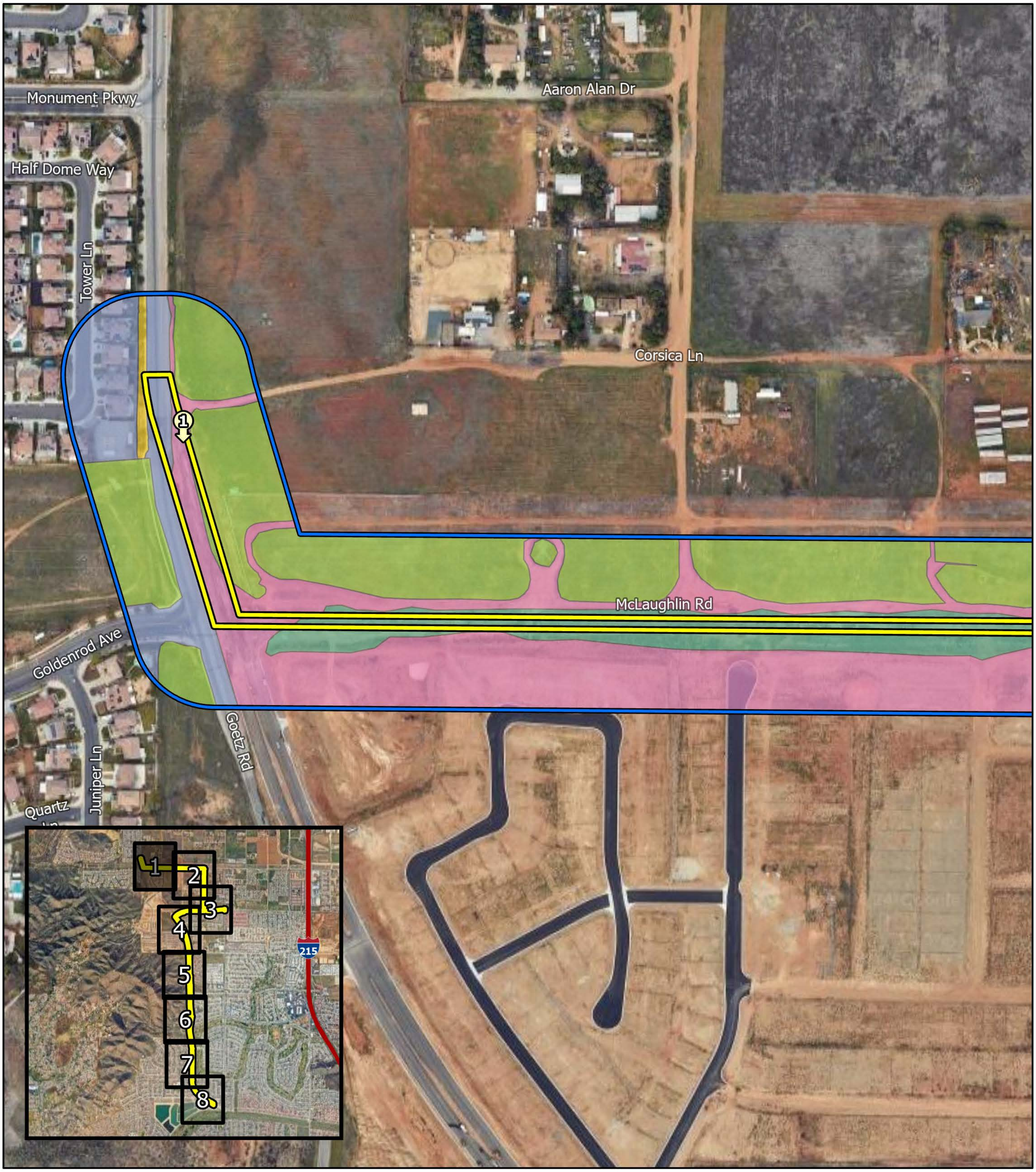
Dominant species within buckwheat scrub include California buckwheat (*Eriogonum fasciculatum*). Other species observed within buckwheat scrub include California sagebrush (*Artemisia californica*), Mediterranean grass, valley cholla (*Cylindropuntia bernardina*), and brittlebush (*Encelia farinosa*).

Dominant species within brittlebush scrub - disturbed include brittlebush and stinknet (*Oncosiphon pilulifer).* Other species observed within brittlebush scrub-disturbed include shortpod mustard (*Hirschfeldia incana*), prickly sow thistle (*Sonchus asper*), Mediterranean grass, and California aster (*Corethrogyne filaginifolia*).

There are no other plant communities on the site. Areas mapped as developed consist of lawn, ornamental landscaping, areas containing manmade structures, and paved roads. Areas mapped as disturbed and barren ground consist of well-traveled dirt roads that do not allow for the establishment of vegetation. A complete list of plant species observed on the site is included in Appendix A. Figure 3, Vegetation, Land Use, and Photo Locations, shows the vegetation and land cover, and site photographs are provided in Figure 4, Site Photographs.

4.1.3 Wildlife

A few wildlife species common to urban and disturbed areas were observed during the field survey. American crow (*Corvus brachyrhynchos*), mourning dove (*Zenaida macroura),* house finch (*Haemorhous mexicanus*), lesser goldfinch (*Spinus psaltria*), Anna's hummingbird (*Calypte anna*), song sparrow (*Melospiza melodia*), black phoebe (*Sayornis nigricans*), western meadowlark (*Sturnella neglecta*), mallard (*Anas platyrhynchos*), rock pigeon (*Columba livia*), red-tailed hawk (*Buteo jamaicensis*), American kestrel (*Falco sparverius*), Say's phoebe (*Sayornis saya*), Cassin's kingbird (*Tyrannus vociferans*), California horned lark (*Eremophila alpestris actia*), white-crowned sparrow (*Zonotrichia leucophrys*), yellow-rumped warbler (*Setophaga coronate*), California ground squirrel (*Spermophilus beecheyi*), Botta's pocket gopher (*Thomomys bottae*), and desert cottontail (*Sylvilagus audubonii*) were observed within the project study area. A complete list of wildlife species observed is provided as Appendix A.



LSA

Project Boundary
Study Area (200-ft Buffer)
Photo Points
Vegetation Communities/Land Use
Brittlebush Scrub - Disturbed (4.83 ac)
Developed (116.05 ac)
Disturbed or Barren (37.37 ac)
Non-native Grassland (47.15 ac)
Ornamental (3.10 ac)

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FIGURE 3
Sheet 1 of 8

Valley Boulevard Potable Water Transmission Pipelines Project

Vegetation and Land Use

SOURCE: Google Maps (2023)

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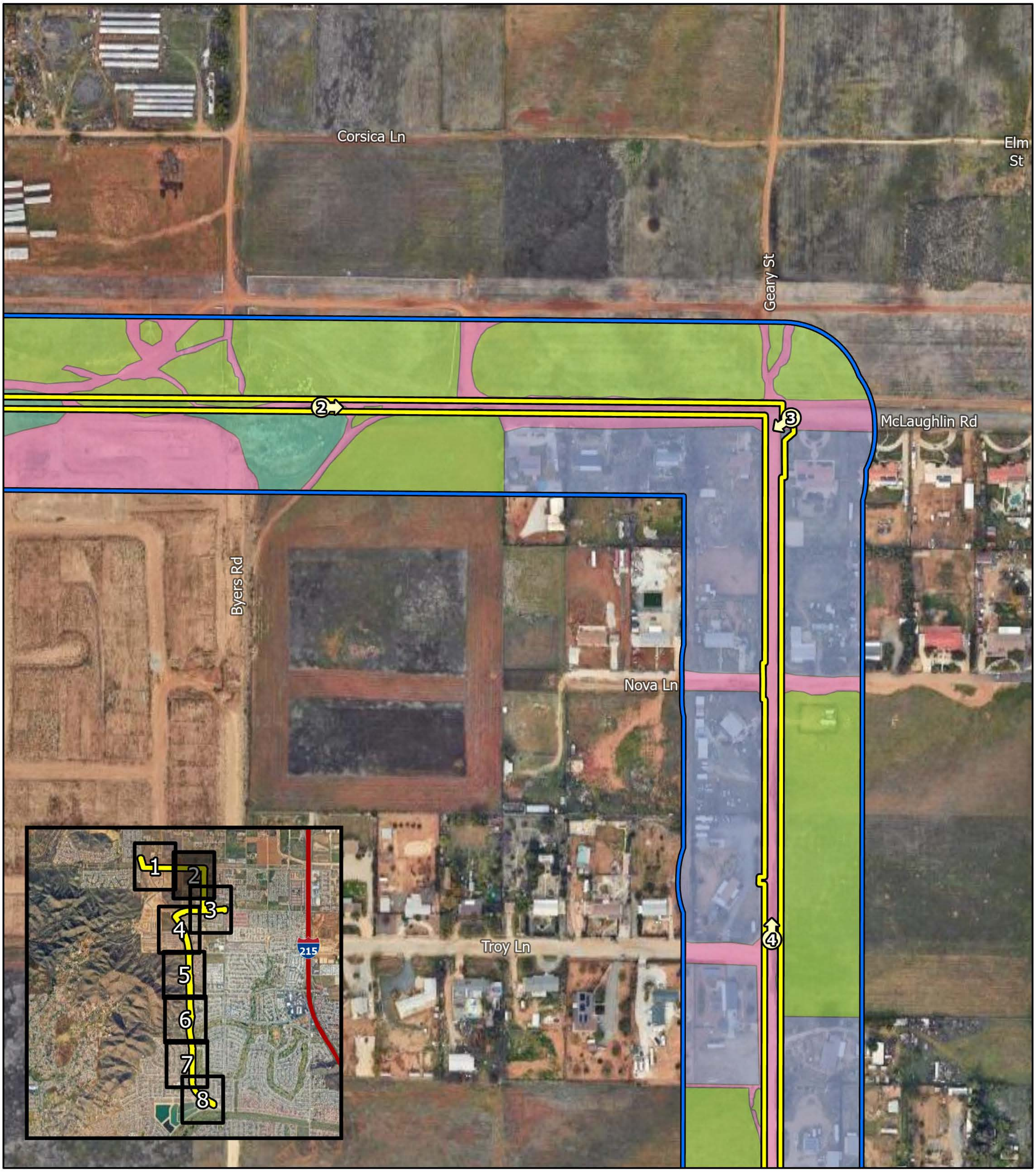

LSA

Project Boundary
Study Area (200-ft Buffer)
Photo Points
Vegetation Communities/Land Use
Brittlebush Scrub - Disturbed (4.83 ac)
Developed (116.05 ac)
Disturbed or Barren (37.37 ac)
Non-native Grassland (47.15 ac)

0 160 320
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SOURCE: Google Maps (2023)

FIGURE 3
Sheet 2 of 8

Valley Boulevard Potable Water Transmission Pipelines Project

Vegetation and Land Use

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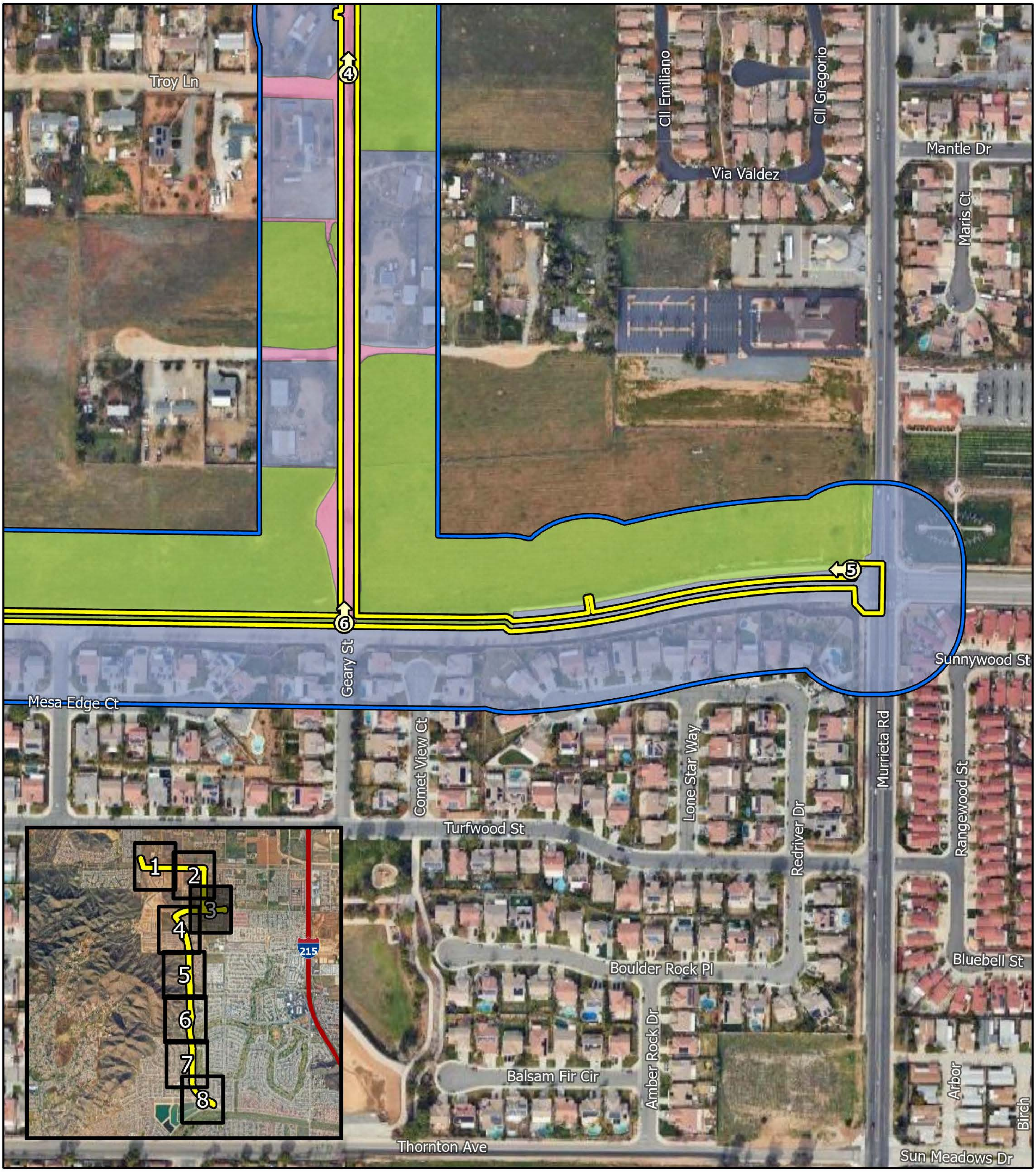

LSA

Project Boundary

Study Area (200-ft Buffer)

Photo Points

Vegetation Communities/Land Use

Developed (116.05 ac)

Disturbed or Barren (37.37 ac)

Non-native Grassland (47.15 ac)

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FEET

SOURCE: Google Maps (2023)

FIGURE 3

Sheet 3 of 8

Valley Boulevard Potable Water Transmission Pipelines Project

Vegetation and Land Use

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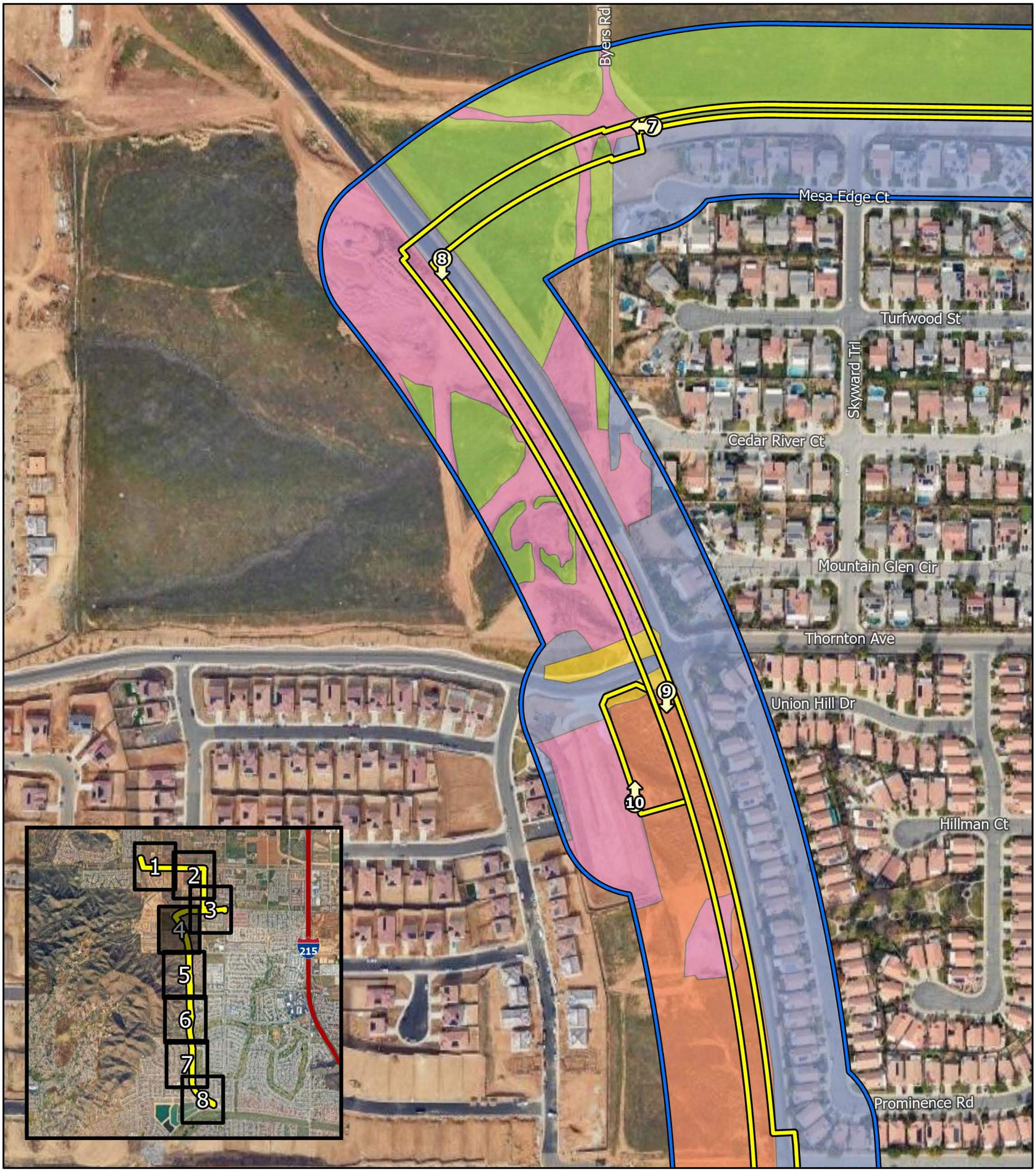

LSA

Project Boundary
Study Area (200-ft Buffer)
Photo Points
Vegetation Communities/Land Use
Buckwheat Scrub (30.20 ac)
Developed (116.05 ac)
Disturbed or Barren (37.37 ac)
Non-native Grassland (47.15 ac)
Ornamental (3.10 ac)

0 160 320
FEET

SOURCE: Google Maps (2023)

FIGURE 3
Sheet 4 of 8

Valley Boulevard Potable Water Transmission Pipelines Project

Vegetation and Land Use

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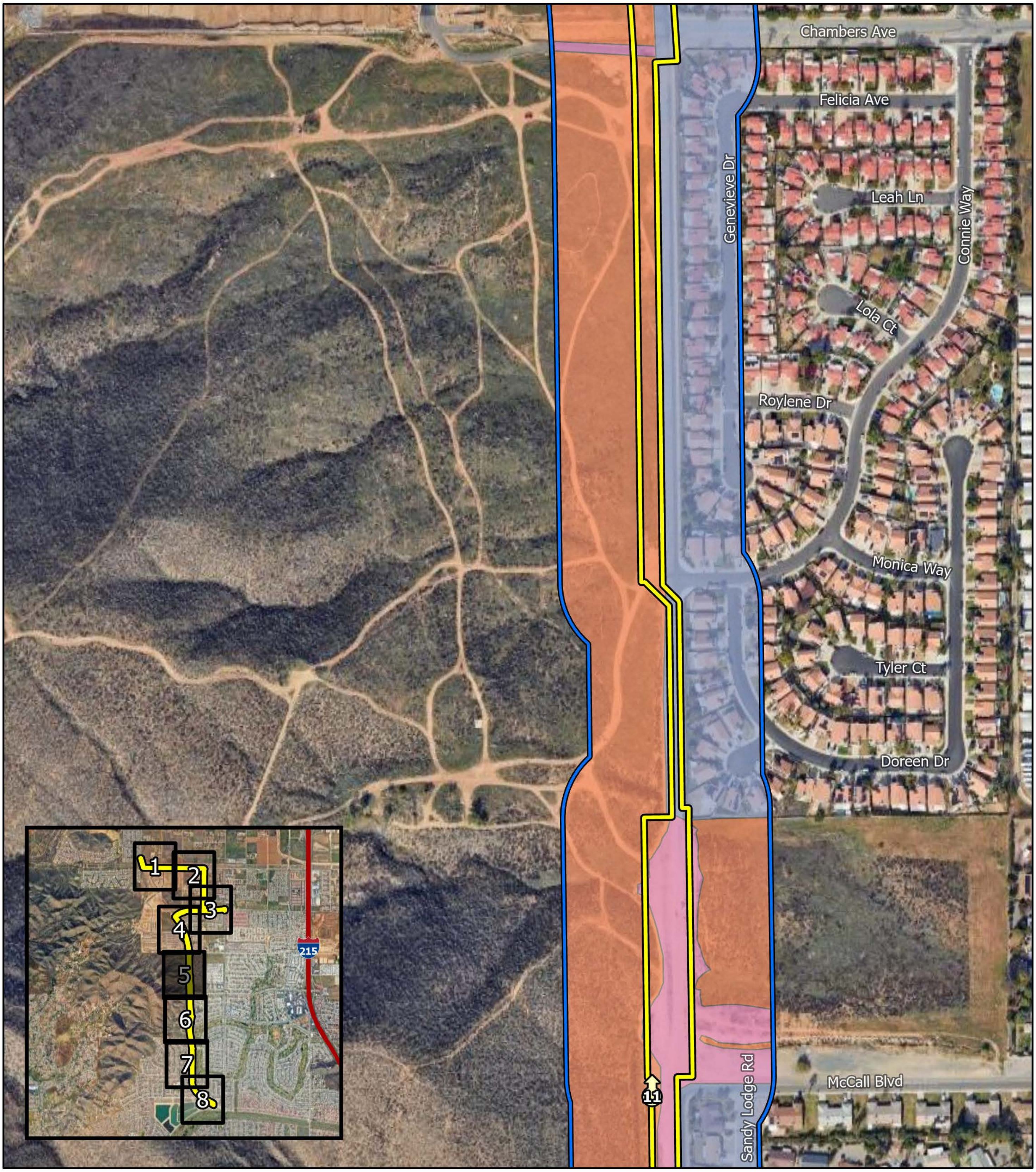

LSA

Project Boundary
Study Area (200-ft Buffer)
Photo Points

Vegetation Communities/Land Use
Buckwheat Scrub (30.20 ac)
Developed (116.05 ac)
Disturbed or Barren (37.37 ac)

FIGURE 3
Sheet 5 of 8

0 160 320
FEET

SOURCE: Google Maps (2023)

Valley Boulevard Potable Water Transmission Pipelines Project

Vegetation and Land Use

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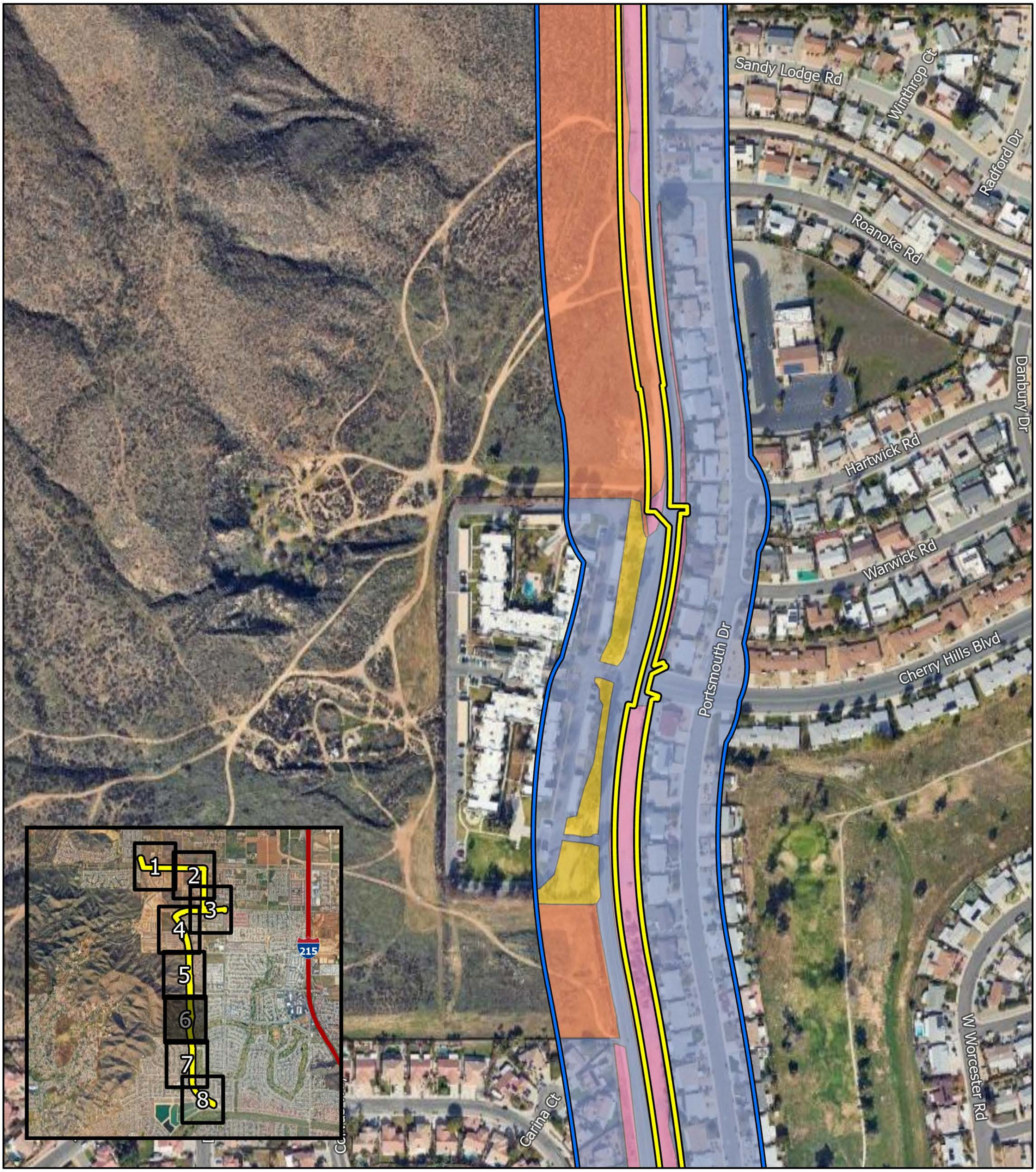

LSA

Project Boundary

Study Area (200-ft Buffer)

Vegetation Communities/Land Use

Buckwheat Scrub (30.20 ac)

Developed (116.05 ac)

Disturbed or Barren (37.37 ac)

Ornamental (3.10 ac)

N

0 160 320

FEET

SOURCE: Google Maps (2023)

FIGURE 3
Sheet 6 of 8

Valley Boulevard Potable Water Transmission Pipelines Project

Vegetation and Land Use

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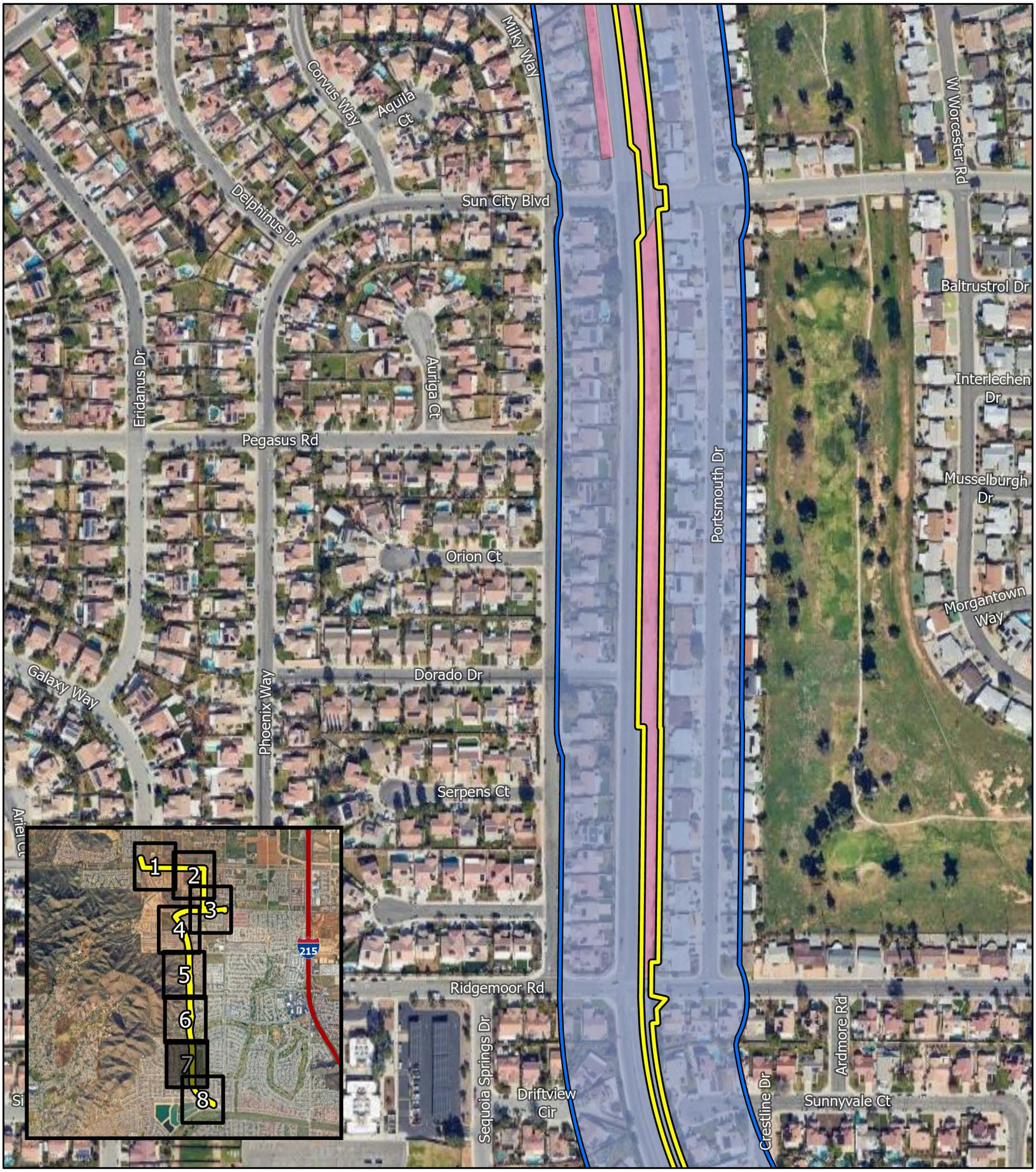

LSA

Project Boundary

Study Area (200-ft Buffer)

Vegetation Communities/Land Use

Developed (116.05 ac)

Disturbed or Barren (37.37 ac)

N

0 160 320

FEET

SOURCE: Google Maps (2023)

FIGURE 3

Sheet 7 of 8

Valley Boulevard Potable Water Transmission Pipelines Project

Vegetation and Land Use

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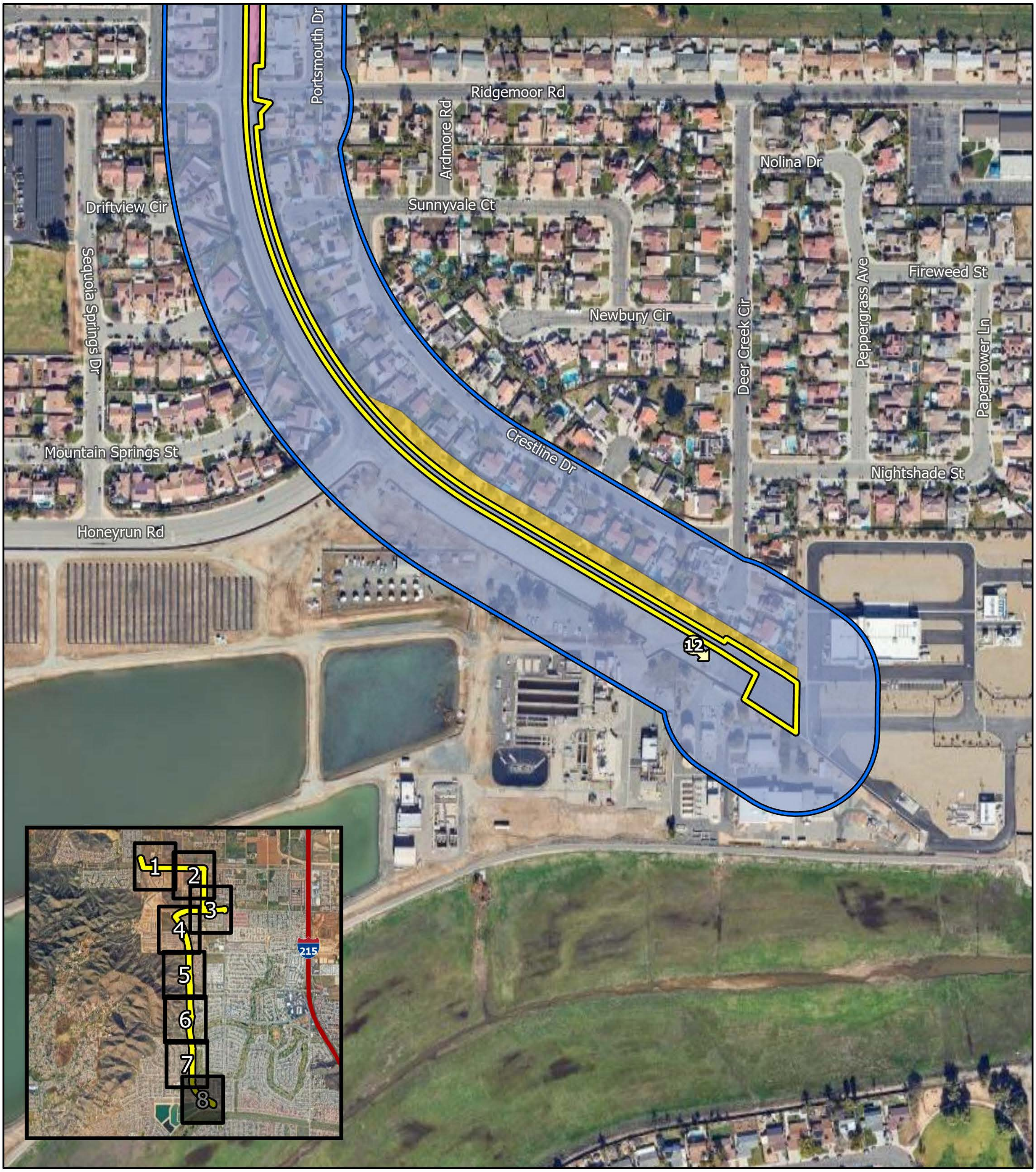

LSA

Project Boundary

Study Area (200-ft Buffer)

Photo Points

Vegetation Communities/Land Use

Developed (116.05 ac)

Disturbed or Barren (37.37 ac)

Ornamental (3.10 ac)

FIGURE 3

Sheet 8 of 8

0 160 320

FEET

Valley Boulevard Potable Water Transmission Pipelines Project

Vegetation and Land Use

SOURCE: Google Maps (2023)

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Photo 1: View looking south at the northern Project Boundary adjacent to Goetz Road.

Photo 2: View looking east at the Project Boundary along McLaughlin Road.

Photo 3: View looking southwest at the McLaughlin Road and Geary Street intersection.

Photo 4: View looking north at the Project Boundary along Geary Street.

LSA

FIGURE 4

Valley Boulevard Potable Water Transmission Pipelines Project
Site Photographs

Photo 5: View looking west at the Project Boundary along Rouse Road.

Photo 6: View looking north at the Project Boundary along Geary Street.

Photo 7: View looking west at the Project Boundary along Rouse Road.

Photo 8: View looking south at the Project Boundary along Valley Boulevard.

LSA

FIGURE 4

Photo 9: View looking south at the proposed turnout facility site located adjacent to Valley Boulevard.

Photo 10: View looking north at the proposed turnout facility site located adjacent to Valley Boulevard.

Photo 11: View looking north at the Project Boundary located among disturbed or barren land cover.

Photo 12: View looking southeast at the southern Project Boundary along Valley Boulevard.

LSA

FIGURE 4

Valley Boulevard Potable Water Transmission Pipelines Project

Site Photographs

4.1.4 Western Riverside County Multiple Species Habitat Conservation Plan

The proposed project occurs within the Western Riverside County MSHCP area. The MSHCP is a comprehensive multi-jurisdictional effort that includes western Riverside County and multiple cities. The EMWD is the lead agency but is not signatory to the MSHCP. The EMWD is not pursuing a Participating Special Entity (PSE) designation for the project site. The MSHCP defines PSE agencies as any regional public facility provider, such as a utility company, or public district, or any other agency that owns land or operates a facility within the MSHCP plan area. The following MSHCP policies and procedures do not apply to this project and are not addressed in this report: Protection of Species Associated with Riparian/Riverine Areas and Vernal Pools (MSHCP Section 6.1.2), Protection of the Narrow Endemic Plant Species (MSHCP Section 6.1.3), Additional Survey Needs and procedures (MSHCP Section 6.3.2), and Urban/Wildland Interface Guidelines (MSHCP Section 6.1.4). The MSHCP allows participating entities to issue take permits for listed species so that individual applicants need not seek their own permits from the USFWS and/or CDFW. In order to obtain MSHCP coverage as a PSE, the project is required to demonstrate MSHCP compliance through specific habitat assessments, applicable biological surveys, and the provision of an MSHCP consistency analysis. Due to the project not being processed through the MSHCP for covered species, the project is subject to the Federal Endangered Species Act (FESA) and/or the California Endangered Species Act (CESA) for threatened, endangered, and/or candidate species.

4.1.5 Stephens' Kangaroo Rat (SKR) Habitat Conservation Plan (HCP)

The MSHCP and the SKR HCP are the principal habitat conservation plans in western Riverside County. Riverside County established a boundary in 1996 for protecting the Stephens' kangaroo rat, a federally and State threatened species. As described in the HCP Implementation Agreement, a Section 10(a) Permit, and California Fish and Game Code Section 2081 Management Authorization were issued to the Riverside County Habitat Conservation Agency (RCHCA) for the Long-Term SKR HCP and was approved by the USFWS and CDFW in August 1990. Relevant terms of the SKR HCP have been incorporated into the MSHCP and its Implementation Agreement. The SKR HCP will continue to be implemented as a separate HCP; however, to provide the greatest conservation for the largest number of Covered Species, the Core Reserves established by the SKR HCP are managed as part of the MSHCP Conservation Area consistent with the SKR HCP. Actions shall not be taken as part of the implementation of the SKR HCP that will significantly affect other Covered Species. Take of Stephens' kangaroo rat outside of the boundaries but within the MSHCP area is authorized under the MSHCP and the associated permits.

The proposed project is within the planning area of the SKR HCP; however, as a public agency, the EMWD is exempt from the requirements of the SKR HCP.

4.1.6 Special-Status Species

This section discusses special-status species observed or potentially occurring within a 7-mile radius of the project site. Legal protection for special-status species varies widely, from the comprehensive protection extended to listed threatened/endangered species, to no legal interest at present. The CDFW, USFWS, local agencies, and special-status groups such as the CNPS, publish watch lists of declining species. Species on watch lists can be included as part of the special-status species assessment. Species that are candidates for State and/or federal listing and species on watch lists are included in the special-status species list. Inclusion of species described in the special-status species analysis is based on the following criteria:

- Direct observation of the species or its sign in the study area or immediate vicinity during previous biological studies;
- Sighting by other qualified observers;
- Record reported by the CNDDB, published by the CDFW;
- Presence or location information for specific species provided by private groups (e.g., CNPS); and/or
- Study area lies within known distribution of a given species and contains appropriate habitat.

The special-status species analysis revealed 63 special-status species with the potential to occur within the project study area. Appendix B lists these species with a data summary and determination of the likelihood of each species occurring within the project study area.

4.1.7 Threatened/Endangered Species

The following 24 federally/State listed species were identified as potentially present (Appendix B) in the project vicinity:

- Munz's onion (*Allium munzii* [ALMU]): Federally listed endangered, State listed threatened, and State plant rank 1B.1;
- San Diego ambrosia (*Ambrosia pumila* [AMPU]); Federally listed endangered and State plant rank 1B;
- San Jacinto Valley crownscale (*Atriplex coronata* var. *notatior* [ATCON]): Federally listed endangered and State plant rank 1B;
- Thread-leaved brodiaea (*Brodiaea filifolia* [BRFI]): Federally listed threatened, State listed endangered, and State plant rank 1B;
- Slender-horned spineflower (*Dodecahema leptoceras* [DOLE]): Federally listed endangered, State listed endangered, and State plant rank 1B;
- Spreading navarretia (*Navarretia fossalis* [NAFO]): Federally listed threatened and State plant rank 1B;
- California Orcutt grass (*Orcuttia californica* [ORCA]): Federally listed endangered, State listed endangered, and State plant rank 1B;
- Crotch bumble bee (*Bombus crotchii* [CBB]): State candidate for listing as endangered;

- American bumble bee (*Bombus pensylvanicus*): State candidate for listing as endangered;
- Vernal pool fairy shrimp (*Branchinecta lynchi* [VPFS]): Federally listed as threatened and State Special Animal;
- San Diego fairy shrimp (*Branchinecta sandiegonensis* [SDFS]): Federally listed as endangered and State Special Animal;
- Monarch butterfly (*Danaus plexippus*): Federal candidate for listing as endangered;
- Quino checkerspot butterfly (*Euphydryas editha quino* [QCB]): Federally listed as endangered and State Special Animal;
- Riverside fairy shrimp (*Streptocephalus woottoni* [RFS]): Federally listed as endangered and State Special Animal;
- Western pond turtle (*Emys marmorata* [*Actinemys marmorata*, WPT]): Federal candidate for listing as threatened and State Species of Special Concern;
- Tricolored blackbird (*Agelaius tricolor* [TRBL]): State listed as threatened and State Species of Special Concern;
- Burrowing owl (*Athene cunicularia* [BUOW]); State candidate for listing as endangered/ threatened;
- Western snowy plover (*Charadrius alexandrinus nivosus* [SNPL]): Federally listed as threatened and State Species of Special Concern;
- Southwestern willow flycatcher (*Empidonax traillii extimus* [SWFL]): Federally listed as endangered and State listed endangered;
- Bald eagle (*Haliaeetus leucocephalus* [BAEA]): State listed as endangered and State Fully Protected species;
- Coastal California gnatcatcher (*Polioptila californica californica* [CAGN]): Federally listed as threatened and State Species of Special Concern;
- Least Bell's vireo (*Vireo bellii pusillus* [LBVI]) Federally listed as endangered and State listed as endangered;
- San Bernardino kangaroo rat (*Dipodomys merriami parvus* [SBKR]): Federally listed as endangered, State listed endangered, and State Species of Special Concern; and
- Stephens' kangaroo rat (*Dipodomys stephensi* [SKR]): Federally listed as endangered and State listed as threatened.

Habitat within the study area is considered unsuitable for 14 of the 24 species identified above. Low quality suitable habitat for ALMU, AMPU, BRFI, VPFS, SDFS, monarch butterfly, American bumble bee, RFS, and SKR was found to be present within the project study area. Low to moderately suitable habitat for CAGN and CBB was found to be present within the project study area.

4.1.8 Non-Listed Special-Status Species

Of the 39 other non-listed special-status species identified and discussed in Appendix B, 16 species are not expected to occur based on lack of suitable habitat, 17 species are considered to have a low probability of occurrence, five species are considered to have a moderate probability of occurrence, and one species is considered present within the project site. The following non-listed special-status species have at least a moderate probability to occur within the project study area:

- Cooper's hawk (*Accipiter cooperii* [COHA]);
- Southern California rufous-crowned sparrow (*Aimophila ruficeps canescens* [RCSP]);
- Bell's sparrow (*Artemisiospiza belli belli* [BESP]);
- Parry's spineflower (*Chorizanthe parryi* var. *parryi* [CHPAP]);
- California horned lark (*Eremophila alpestris actia* [HOLA]); and
- Robinson's pepper-grass (*Lepidium virginicum* var. *robinsonii* [LEVIR]).

Nesting bird species, including special-status species identified in Appendix B, with potential to occur are protected by California Fish and Game Code Sections 3503, 3503.5, and 3800, and by the Migratory Bird Treaty Act (MBTA) (16 United States Code 703–711). These laws regulate the take, possession, or destruction of the nest or eggs of any migratory bird or bird of prey. However, the USFWS has recently determined that the MBTA should apply only to "…affirmative actions that have as their purpose the taking or killing of migratory birds, their nests, or their eggs" and will not be applied to incidental take of migratory birds pursuant to otherwise lawful activities.

4.1.9 Critical Habitat

The project study area does not lie within federally designated critical habitat.

4.1.10 Potential Jurisdictional Waters

The United States Army Corps of Engineers (USACE), under Section 404 of the Federal Clean Water Act (CWA), regulates discharges of dredged or fill material into "waters of the United States." These waters include wetlands and non-wetland bodies of water that meet specific criteria, including a connection to interstate commerce. This connection may be direct (through a tributary system linking a stream channel with traditional navigable waters used in interstate or foreign commerce) or it may be indirect (through a connection identified in USACE regulations). The USACE typically regulates as non-wetland waters of the United States any body of water displaying an "ordinary high water mark" (OHWM). In order to be considered a "jurisdictional wetland" under Section 404, an area must possess hydrophytic vegetation, hydric soils, and wetland hydrology. The CDFW, under Sections 1600 et seq. of the California Fish and Game Code, regulates alterations to lakes, rivers, and streams. A stream is defined by the presence of a channel bed and banks and at least an occasional flow of water. The Regional Water Quality Control Board (RWQCB) is responsible for the administration of Section 401 of the CWA, through water quality certification of any activity that may result in a discharge to jurisdictional waters of the United States. The RWQCB may also regulate discharges to "waters of the State," including wetlands, under the California Porter-Cologne Water Quality Control Act.

There are six drainage features within the project study area (see Figure 5, Potential Jurisdictional Features), and they are identified as Drainages A, B, C, D, E, and F for purposes of this analysis. Additionally, five detention basins exist adjacent to Valley Boulevard and McLaughlin Road. Although an official jurisdictional delineation was not conducted as part of the biological resources assessment for this project, the preliminary results of these drainage features and detention basins are discussed below.

Drainage A is located parallel to the west of Goetz Road and perpendicular to Goldenrod Road. It originates from an open field to the north and travels south into a concrete culvert beneath Goldenrod Avenue to the south. This drainage is an ephemeral, earthen bottom drainage created to carry stormwater. Vegetation within Drainage A consist of non-native grassland.

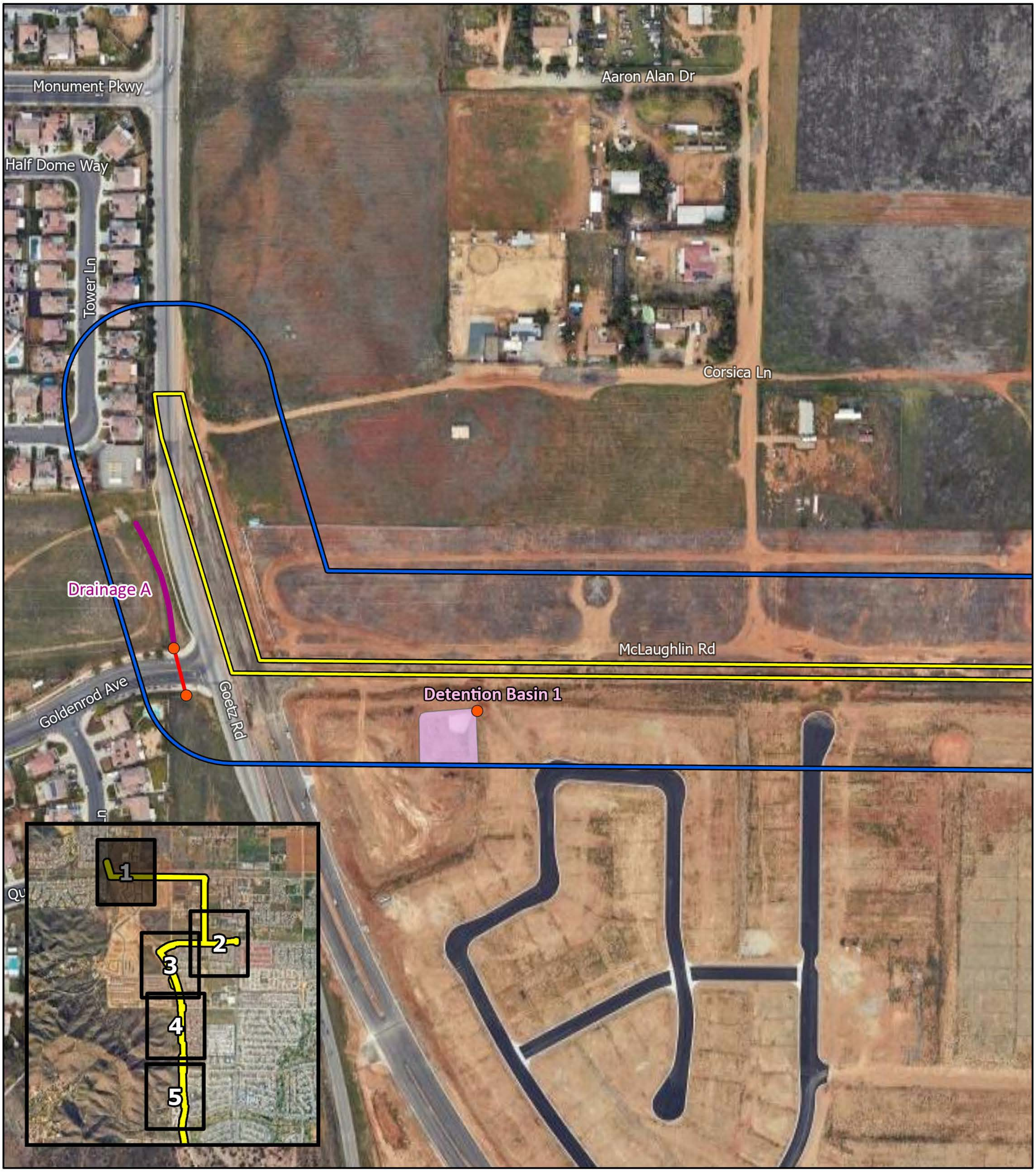
Drainage B is an ephemeral drainage that flows across Geary Street, along the north side of Rouse Road. This earthen bottom drainage carries stormwater and disperses in a west-to-east direction and disperses into the adjacent land with no direct end. Vegetation within Drainage B is dominated by non-native grassland species.

Drainage C is a drainage along developed landscaping and runs parallel to the southern side of Rouse Road adjacent to Murrieta Road. It enters a concrete drain that seems to redirect water flow underground to the east. It receives flow from the landscape irrigation and is an ephemeral, earthen bottom drainage. Vegetation within Drainage C is dominated ornamental landscaping.

Drainage D is a natural drainage feature that is located to the west of Valley Boulevard. This feature appears to flow in a southwest-to-east direction. A newly installed concrete culvert located at the east end of Drainage D leads direct water flow into Detention Basin 3 on the east side of Valley Boulevard. Vegetation within Drainage D is dominated by turkey-mullein (*Croton setiger*) with a very small patch of mule fat (*Baccharis salicifolia*).

Drainage E is a drainage feature that is located on the west side of Valley Boulevard and to the north of Thornton Avenue. This drainage receives stormwater runoff from a concrete lined v-ditch located parallel to the north of Thornton Avenue. Stormwater from the concrete lined v-ditch travels northeast into Detention Basin 4. A newly installed concrete culvert located to the east of Detention Basin 4 appears to have been placed in that location for stormwater runoff as well as in case of overflow of Detention Basin 4. Vegetation within Drainage E is a mix of non-native grassland species and disturbed or barren land.

Drainage F is a drainage feature that is located on the west side of Valley Boulevard, across and just north of Roanoke Road. It appears to be a natural drainage originating from the southwest and flowing east. A concrete culvert located at the east end of Drainage E leads direct water flow into a concrete channel to the east side of Valley Boulevard into the neighborhood. Vegetation within Drainage D is best characterized as disturbed or barren.



LSA

Project Site

Study Area (200-ft Buffer)

Culvert

Culvert Connection

Potential Jurisdictional Features

Drainage

Detention Basin

FIGURE 5
Sheet 1 of 5

0 150 300
FEET

Valley Boulevard Potable Water Transmission Pipelines Project

Potential Jurisdictional Features

SOURCE: Google Maps (2023)

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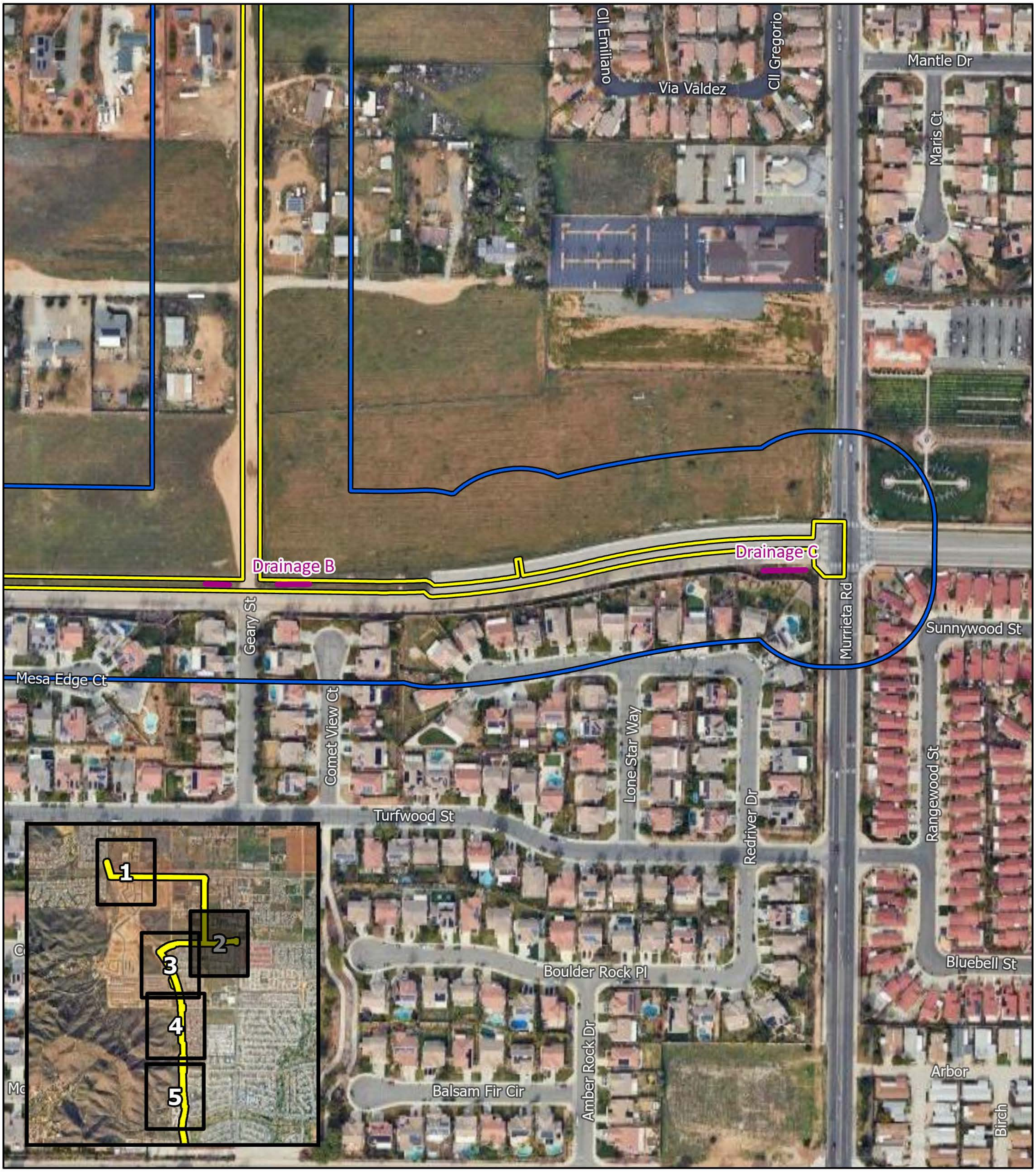


LSA

Project Site

Study Area (200-ft Buffer)

Potential Jurisdictional Features

Drainage

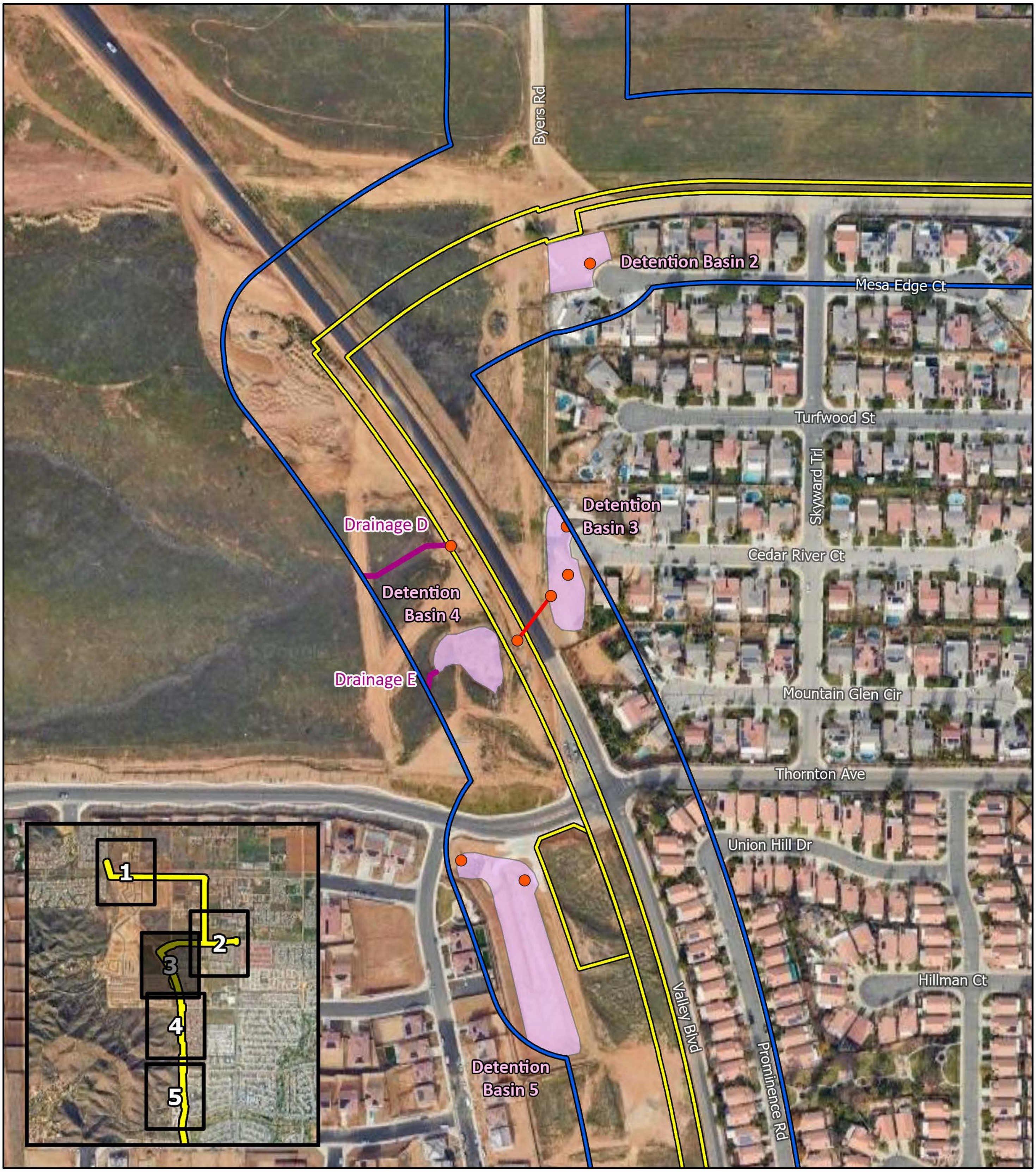
0 150 300
FEET

SOURCE: Google Maps (2023)

FIGURE 5
Sheet 2 of 5

Valley Boulevard Potable Water Transmission Pipelines Project

Potential Jurisdictional Features



LSA

Project Site

Study Area (200-ft Buffer)

Culvert

Culvert Connection

Potential Jurisdictional Features

Drainage

Detention Basin

FIGURE 5
Sheet 3 of 5

0 150 300
FEET

SOURCE: Google Maps (2023)

Valley Boulevard Potable Water Transmission Pipelines Project

Potential Jurisdictional Features

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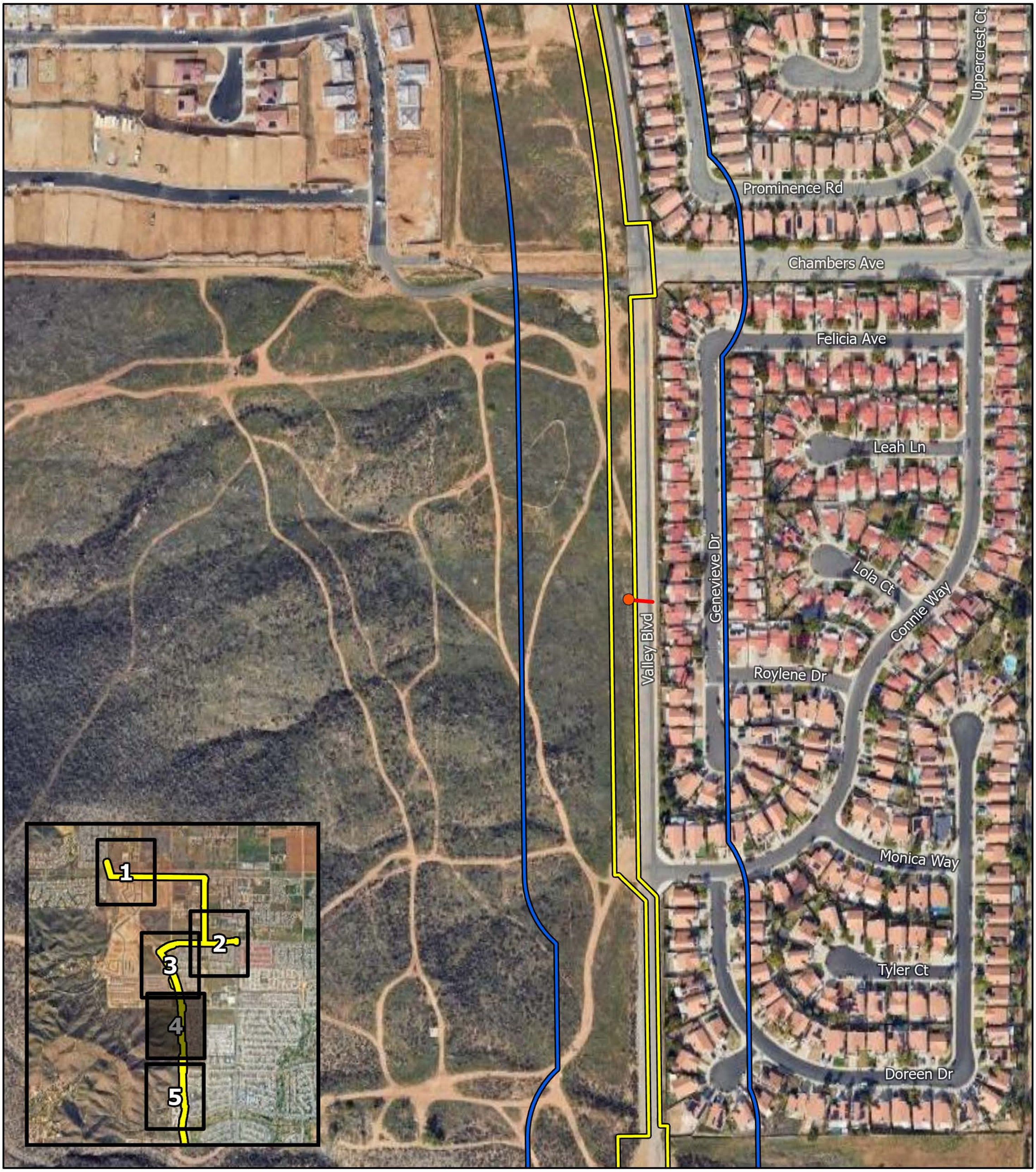

LSA

Project Site

Study Area (200-ft Buffer)

Culvert

Culvert Connection

0 150 300

FEET

SOURCE: Google Maps (2023)

FIGURE 5

Sheet 4 of 5

Valley Boulevard Potable Water Transmission Pipelines Project

Potential Jurisdictional Features

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LSA

Project Site
Study Area (200-ft Buffer)
Culvert
Culvert Connection
Potential Jurisdictional Features
Concrete Channel
Drainage

0 150 300
FEET

FIGURE 5
Sheet 5 of 5

Valley Boulevard Potable Water Transmission Pipelines Project

Potential Jurisdictional Features

SOURCE: Google Maps (2023)

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Five detention basins (Detention Basin 1 through Detention Basin 5; Figure 5) were observed during the field survey and are best described as manmade basins created to capture flows from nearby roads and development areas. The detention basins are located adjacent to McLaughlin Road, Rouse Road, and Valley Boulevard. Detention Basins 2 and 3 are nestled within residential areas and are bordered by a chain-link fence. Land cover within Detention Basins 2 and 3 is considered developed. Detention Basins 1, 4, and 5 are concave areas located to the west of Valley Boulevard and to the south of McLaughlin Road. Detention Basins 1, 4, and 5 are all earthen bottom, with Detention Basins 1 and 5 containing some concrete structures. All detention basins lack vegetation as they are either partially concrete-lined or maintained to be free of vegetation.

It should be noted that a handful of culverts not connected to a drainage or detention basin are present within the project study area but do not relate or connect to a potential jurisdictional water. This includes the isolated culverts displayed on Figure 5, Sheets 4 and 5. Due to the absence of defined bed and bank and OHWM, these isolated culverts and adjacent areas are not considered potentially jurisdictional waters.

These six drainage features and five detention basins are considered potential jurisdiction waters that may be subject to the regulatory authority of the USACE, CDFW, or RWQCB. A jurisdictional delineation would be required to determine any project effects to these potential jurisdictional waters if project activities were proposed within these features.

Additionally, eleven road ruts and one shallow depression were observed within the project boundary with several other road ruts and shallow depressions occurring outside of the project boundary but within the overall project study area (see Figure 6, Shallow Depressions). The road ruts are classified as such due to their presence and creation by vehicles within dirt roadways. The shallow depressions appear to be naturally or semi-naturally occurring low spots in the topography. The road ruts are expected to be non-jurisdictional as they lack a defined bed and bank, riparian vegetation, freshwater flow, and are mostly devoid of vegetation. The shallow depressions may be subject to the regulatory authority of RWQCB but are expected to be non-jurisdictional under CDFW and USACE regulations due to their ephemeral nature and lack of defined bed and bank and riparian habitat.

LSA

Project Boundary

Study Area (200-ft Buffer)

Road Rut

FIGURE 6

Sheet 1 of 11

0 50 100

FEET

Valley Boulevard Potable Water Transmission Pipelines Project

Shallow Depressions

SOURCE: Google Maps (2023)

LSA

Project Boundary

Study Area (200-ft Buffer)

Road Rut

Shallow Depression

0 50 100
FEET

SOURCE: Google Maps (2023)

FIGURE 6
Sheet 2 of 11

Valley Boulevard Potable Water Transmission Pipelines Project

Shallow Depressions

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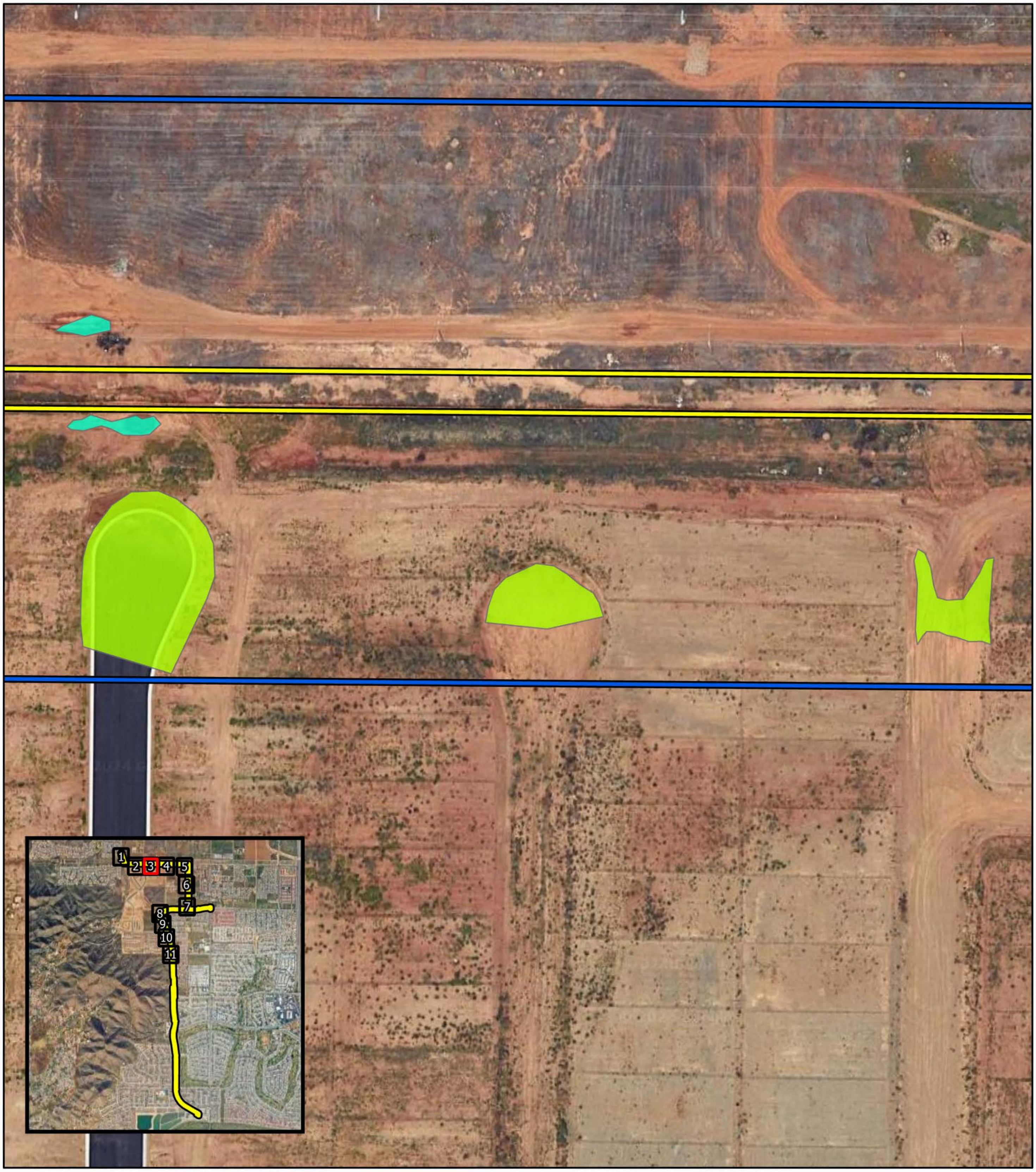

LSA

Project Boundary

Study Area (200-ft Buffer)

Road Rut

Shallow Depression

N

0 50 100
FEET

SOURCE: Google Maps (2023)

FIGURE 6
Sheet 3 of 11

Valley Boulevard Potable Water Transmission Pipelines Project

Shallow Depressions

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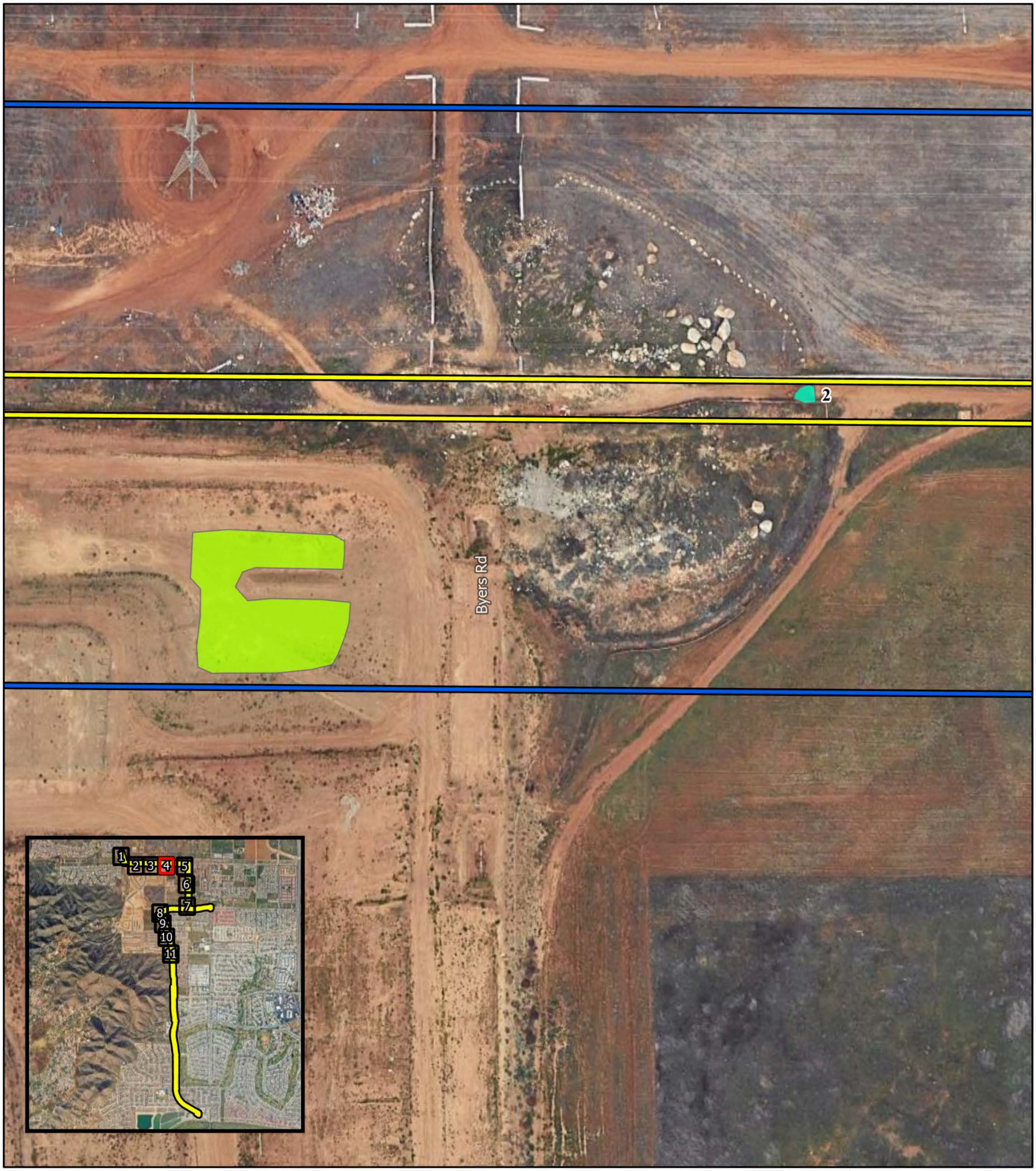

LSA

Project Boundary
Study Area (200-ft Buffer)
Road Rut
Shallow Depression

0 50 100
FEET

SOURCE: Google Maps (2023)

FIGURE 6
Sheet 4 of 11

Valley Boulevard Potable Water Transmission Pipelines Project

Shallow Depressions

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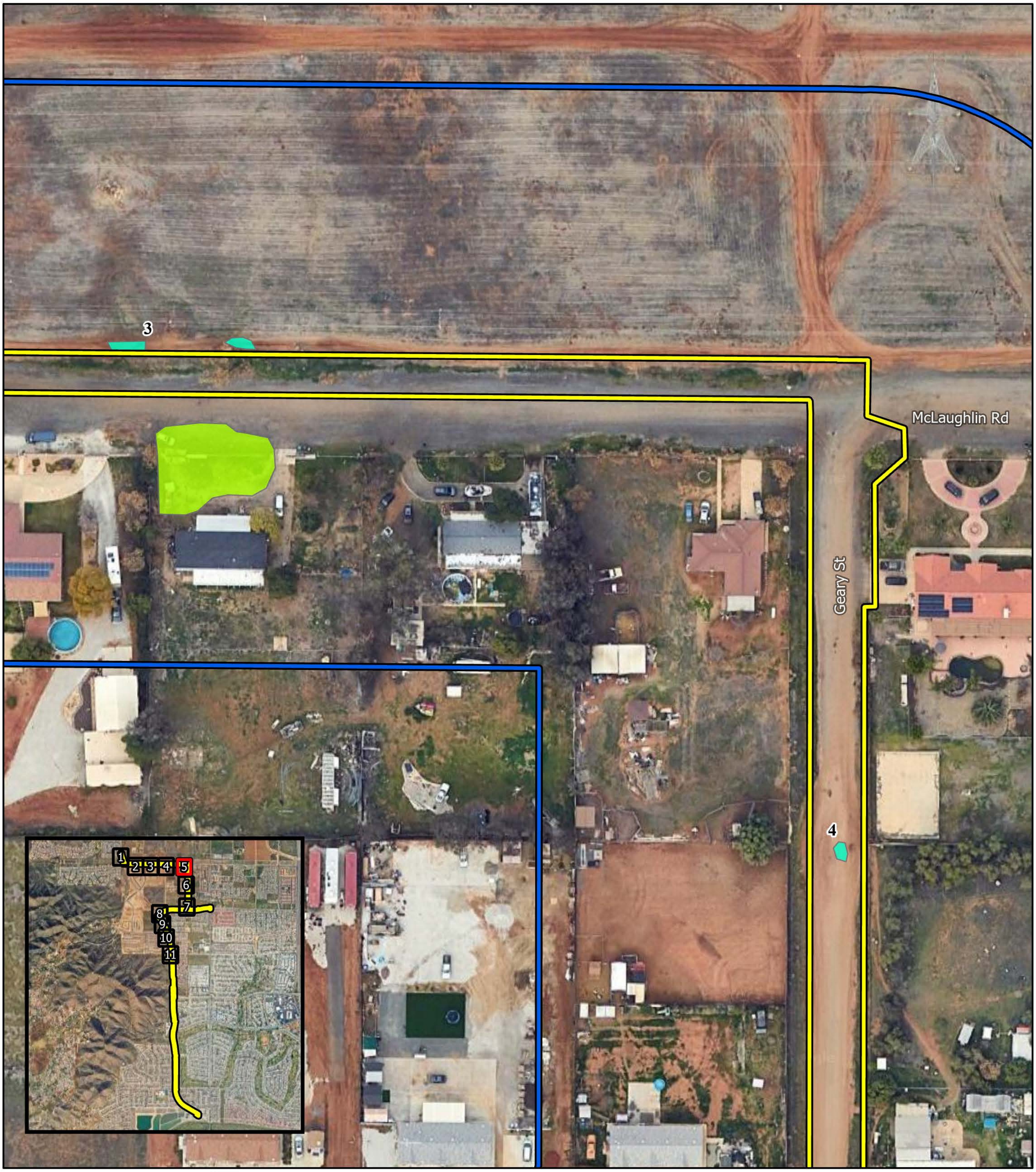

LSA

Project Boundary

Study Area (200-ft Buffer)

Road Rut

Shallow Depression

N

0 50 100
FEET

SOURCE: Google Maps (2023)

FIGURE 6
Sheet 5 of 11

Valley Boulevard Potable Water Transmission Pipelines Project

Shallow Depressions

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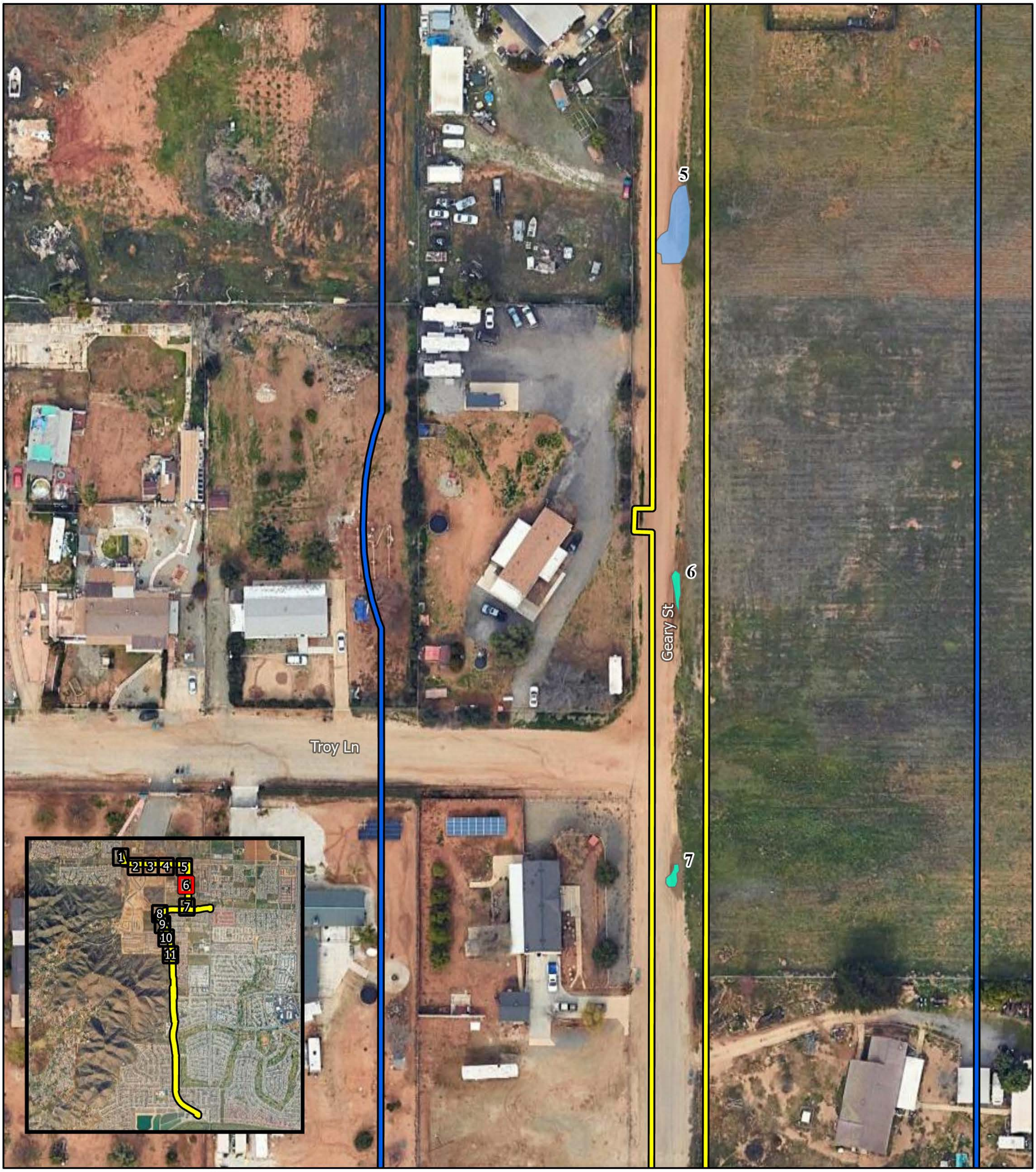

LSA

Project Boundary

Study Area (200-ft Buffer)

Road Rut

Road Rut with Fairy Shrimp (Branchinecta sp.)

FIGURE 6

Sheet 6 of 11

0 50 100

FEET

Valley Boulevard Potable Water Transmission Pipelines Project

Shallow Depressions

SOURCE: Google Maps (2023)

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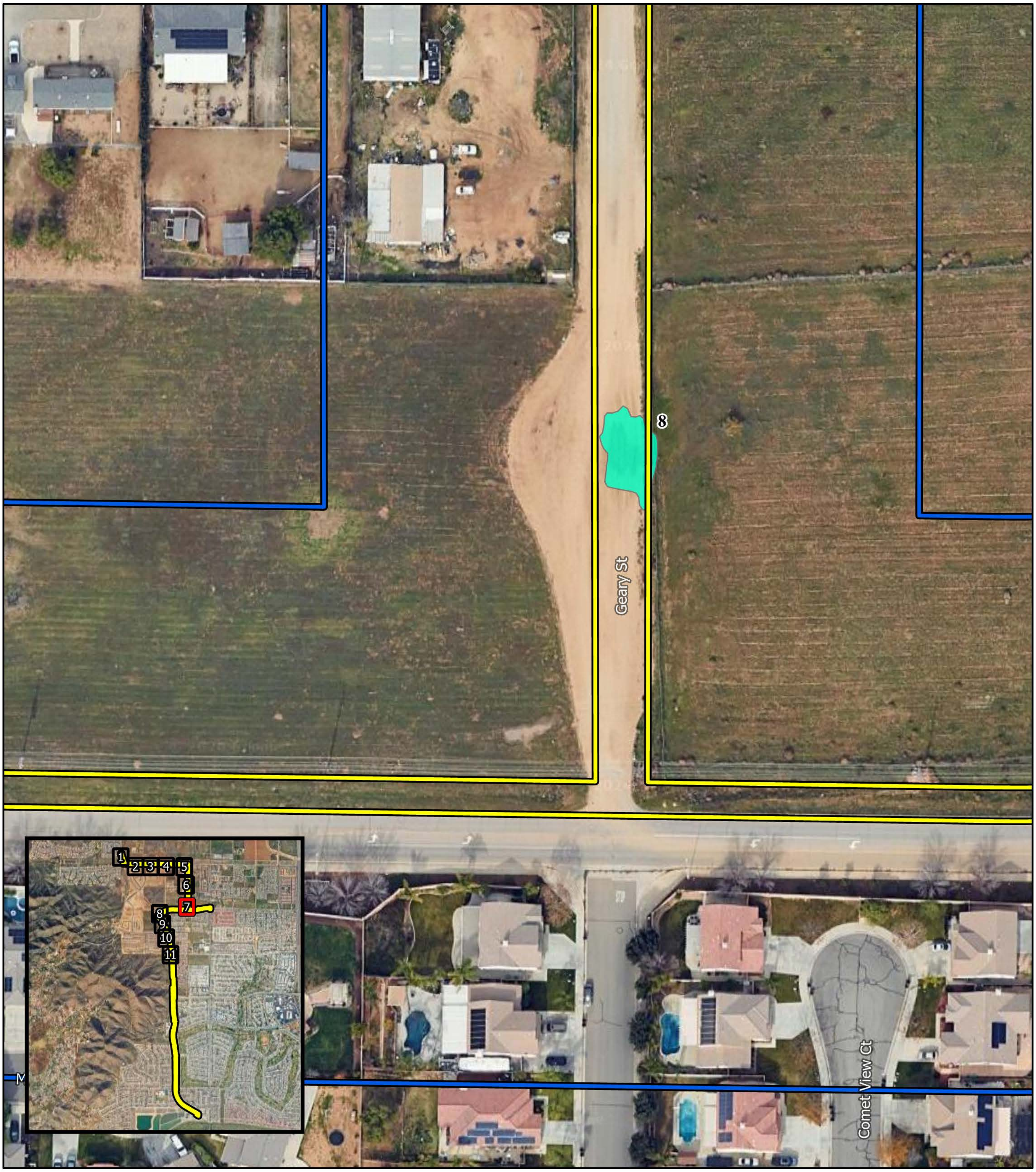

LSA

Project Boundary

Study Area (200-ft Buffer)

Road Rut

FIGURE 6

Sheet 7 of 11

0 50 100

FEET

SOURCE: Google Maps (2023)

Valley Boulevard Potable Water Transmission Pipelines Project

Shallow Depressions

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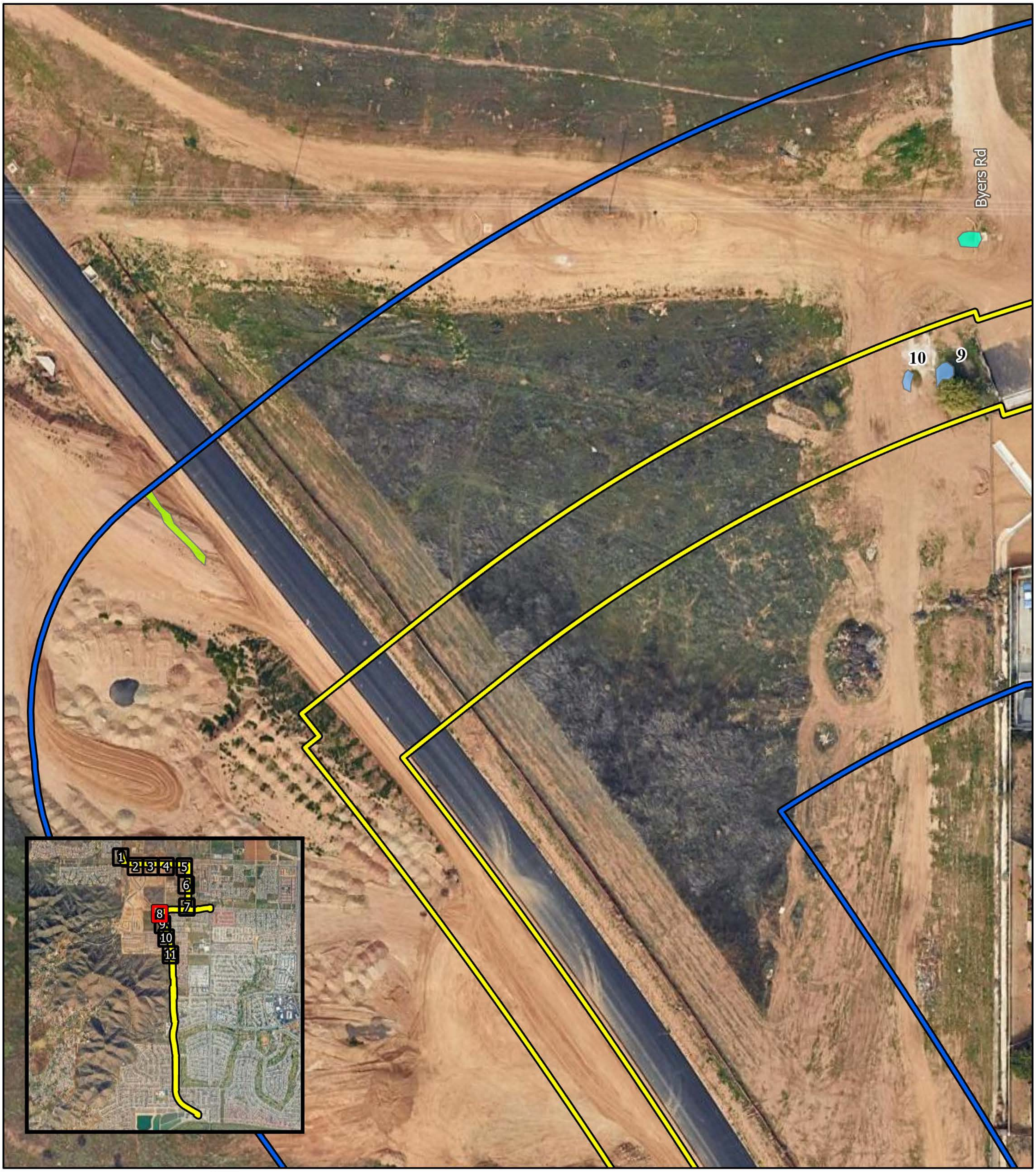

LSA

Project Boundary
Study Area (200-ft Buffer)
Road Rut
Road Rut with Fairy Shrimp (Branchinecta sp.)
Shallow Depression

0 50 100
FEET

SOURCE: Google Maps (2023)

FIGURE 6
Sheet 8 of 11

Valley Boulevard Potable Water Transmission Pipelines Project

Shallow Depressions

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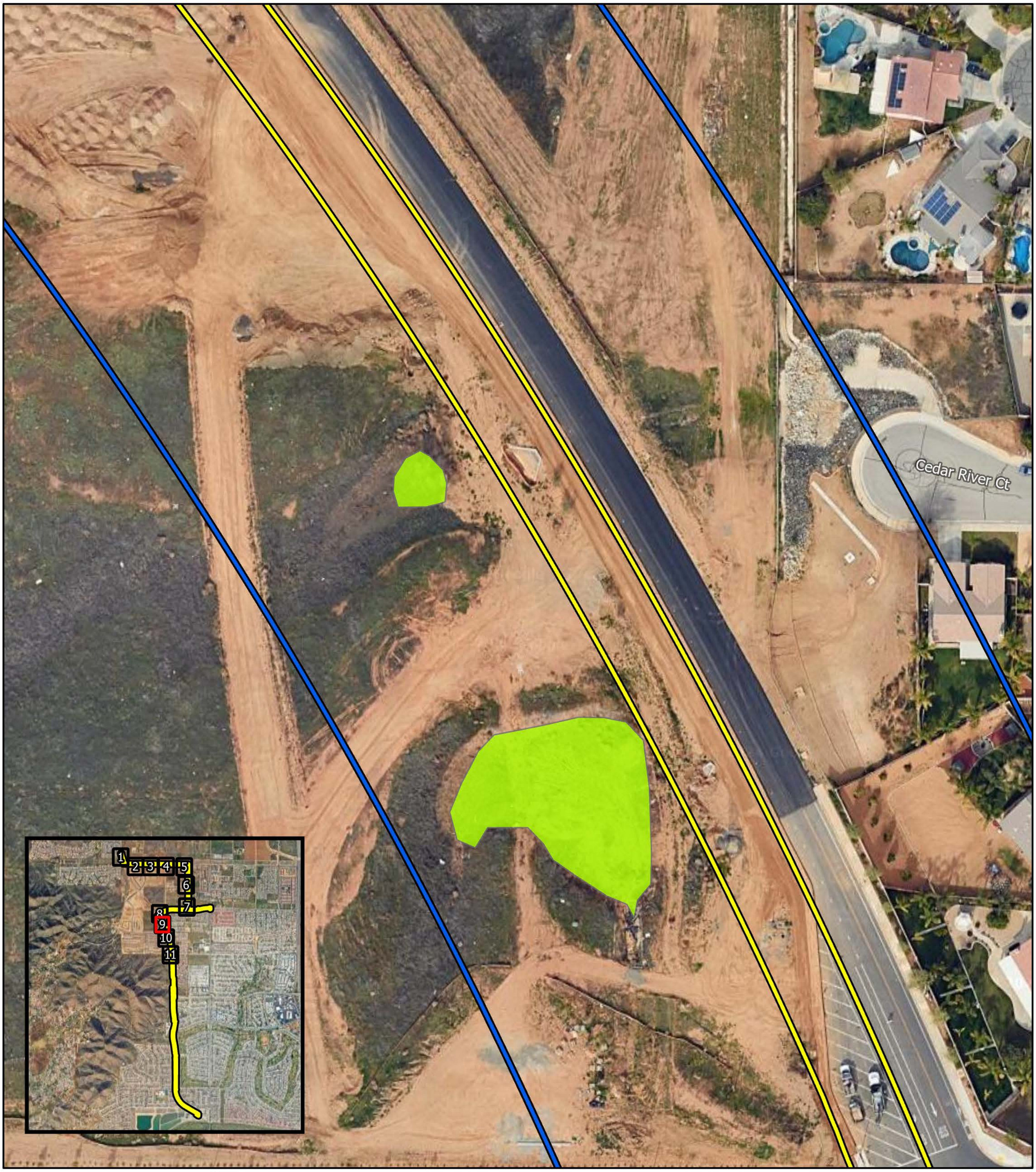

LSA

Project Boundary

Study Area (200-ft Buffer)

Shallow Depression

FIGURE 6

Sheet 9 of 11

N

0 50 100

FEET

SOURCE: Google Maps (2023)

Valley Boulevard Potable Water Transmission Pipelines Project

Shallow Depressions

LSA

Project Boundary

Study Area (200-ft Buffer)

Shallow Depression

0 50 100
FEET

SOURCE: Google Maps (2023)

FIGURE 6

Sheet 10 of 11

Valley Boulevard Potable Water Transmission Pipelines Project

Shallow Depressions

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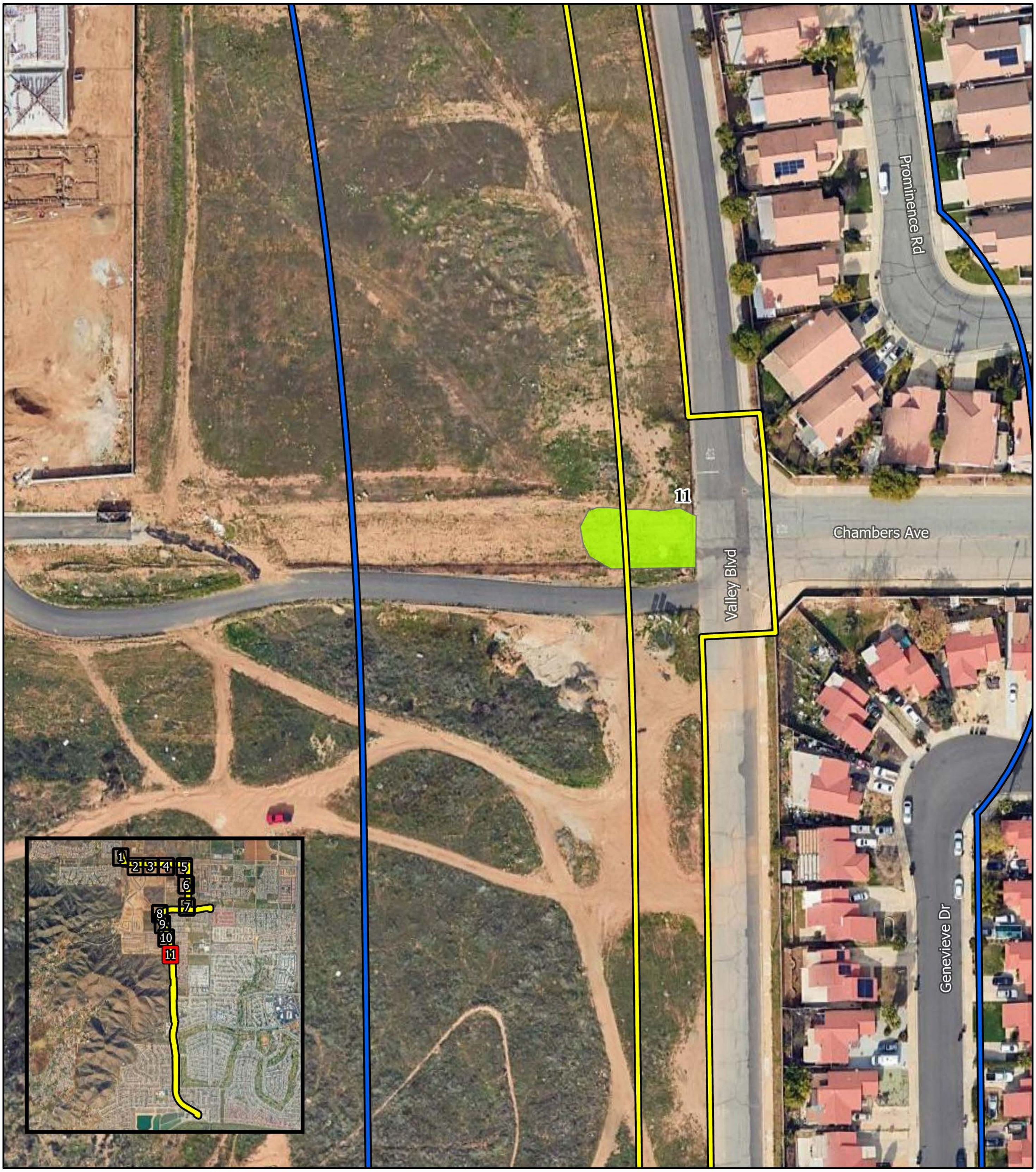

LSA

Project Boundary

Study Area (200-ft Buffer)

Shallow Depression

0 50 100
FEET

FIGURE 6
Sheet 11 of 11

Valley Boulevard Potable Water Transmission Pipelines Project

Shallow Depressions

SOURCE: Google Maps (2023)

5.0 IMPACTS AND RECOMMENDATIONS

Following is a discussion of potential disturbances and recommendations for avoidance, minimization, and mitigation measures per applicable local, State, and federal policy.

5.1 THREATENED AND ENDANGERED SPECIES

5.1.1 Rare Plants

Several special-status species plants have a low to moderate potential to occur on site (Appendix B). Additionally, the project site is within an MSHCP Narrow Endemic Plant Species Survey Area (NEPSSA) for six plant species: ALMU , AMPU , many-stemmed dudleya, NAFO , ORCA , and Wright's trichocoronis. Potentially suitable habitat for three of the six NEPSSA species, ALMU, AMPU, and many-stemmed dudleya, is present on site. The project has potential to impact one or more of these species if present. As noted below, Mitigation Measure (MM) BIO-1 would require a focused survey for sensitive plant species to occur during the seasonally appropriate blooming period to determine the presence of special-status plant species prior to project implementation.

5.1.2 Crotch Bumble Bee

There is extensive buckwheat scrub that occurs within the southern portion of the project site. This habitat is considered low to moderate quality suitable habitat for CBB. The project is anticipated to impact buckwheat scrub and as a result may impact CBB, if present. MM BIO-2 would require focused surveys for CBB to determine the presence of CBB prior to project implementation.

5.1.3 Fairy Shrimp

As noted above, there are road ruts and similar shallow depressions that provide suitable habitat for fairy shrimp on the project site. Water was observed pooling in these areas, which resulted from the continued vehicular use along dirt access roads present and natural or semi-natural topographical depressions for those located outside of dirt access roads present, as observed on seasonally appropriate aerial photographs (Google Earth: 12/2003, 12/2005, 1/2006, 3/2011, 12/2018, 2/2022, 1/2023 and 4/2023). As noted in Figure 6, fairy shrimp (*Branchinecta* sp.) were observed in three of the thirty ponded areas observed during the February 14, 2024, field survey. The fairy shrimp observed were not keyed to the species level as protocol surveys were not conducted. However, the site has been highly disturbed, and soils and micro topography have been altered on site due to decades long use of the existing dirt access roads.

Although ten road ruts and one shallow depression occur within the project footprint, the project design has been updated to either go around these areas or go under them utilizing trenchless methods such as horizontal directional drilling. Therefore, no impacts to fairy shrimp and their habitat are anticipated.

5.1.4 Coastal California Gnatcatcher

The project site contains low to moderate suitable habitat for CAGN and occurs within 0.50 mile of critical habitat for this species. Focused surveys for CAGN shall be conducted according to MM BIO-4, to determine if this species is present within the project vicinity prior to project implementation.

5.1.5 Burrowing Owl

The project site is located within an MSHCP Survey Area for burrowing owl. However, no suitable burrowing owl burrows were observed within the project site during the field survey. Despite this, California ground squirrels (*Otospermophilus beecheyi*) were observed throughout the project study area. Suitable habitat in the form of non-native grassland, disturbed, and barren ground is found throughout the project site. MM BIO-5 requires a pre-construction burrowing owl survey using an accepted protocol (CDFW guidelines).

5.1.6 Critical Habitat

No federally designated critical habitat is present within the study area; thus, there will be no project-related effects to critical habitat.

5.2 NON-LISTED SPECIAL-STATUS SPECIES

The 22 non-listed, special-status species identified in Appendix B as having a low to moderate probability of occurrence in the project study area have limited population distribution in Southern California, and development is further reducing their ranges and numbers. These species have no official State or federal protection status, but they merit consideration under CEQA. Due to the disturbed nature of the site and surrounding development, impacts from the project are anticipated to have a less than significant effect on these non-listed special-status species.

5.3 NESTING BIRDS

To ensure compliance with the California Fish and Game Code and to avoid potential impacts to nesting birds, MM BIO-6 requires that the vegetation removal activities be conducted outside the general bird nesting season (January 15 through August 31). If vegetation cannot be removed outside the bird nesting season, a pre-construction nesting bird survey by a qualified biologist is required prior to vegetation removal.

5.4 JURISDICTIONAL WATERS

Potential jurisdictional waters of the United States regulated by the USACE or RWQCB, or CDFW jurisdictional lakes, rivers, or streams are present within the proposed project site. This includes six drainage features, five detention basins, and a number of shallow depressions. Although some of these features occur within the project footprint, the project has been designed to avoid impacts to each of these features. This will be accomplished by going around the potential jurisdictional waters or by going under them through trenchless methods such as horizontal directional drilling. Thus, there will be no project-related effects to jurisdictional waters. If the project proposes impacts to these aquatic resources, MM BIO-7 shall be implemented which requires a formal jurisdictional delineation to determine impacts.

5.5 HABITAT FRAGMENTATION AND WILDLIFE MOVEMENT

Wildlife movement and habitat fragmentation are important issues in assessing effects to wildlife. Habitat fragmentation occurs when a proposed action results in a single, unified habitat area being divided into two or more areas such that the division isolates the two new areas from each other. Isolation of habitat occurs when wildlife cannot move freely from one portion of the habitat to another or from one habitat type to another. An example is the fragmentation of habitats within and around “checkerboard” residential development. Habitat fragmentation can also occur when a portion of one or more habitats is converted into another habitat, as when scrub habitats are converted into annual grassland habitat because of frequent burning.

The project site does not correspond to any natural landscape blocks, small natural areas, interstate connections, essential connectivity areas or potential riparian connections, as documented in the California Essential Habitat Connectivity Project: A Strategy for Conserving a Connected California report (Spencer et al. 2010). Wildlife movement of species such as coyote (*Canis latrans*) is expected within the majority of the project given the project’s proximity to vacant undeveloped lands such as the unnamed mountain range to the west of Valley Boulevard. There are a variety of structural barriers throughout the project study area and the proposed project will occur within or adjacent to busy roadways (e.g., Valley Boulevard, Rouse Road, Goetz Road, McLaughlin Road, and Geary Street).

The wildlife species that occur in the vicinity of the project site are likely adapted to the urban-wildland interface, and the project would not introduce new effects to the area. Potential noise, vibration, light, dust, or human disturbance associated with project activities would only temporarily deter wildlife from using areas in the immediate vicinity. These indirect effects could temporarily alter migration behaviors, territories, or foraging habitats in select areas. However, because these are temporary effects and the project vicinity is partially developed, it is likely that wildlife already living and moving close to the project site would alter their normal functions for the duration of land use changes and development and then re-establish these functions once all temporary effects have been removed. Nonetheless, implementation of MM BIO-8 requires the implementation of standard best management practices (BMPs) to avoid project impacts to natural resources. Project activities would not place any permanent barriers within any known wildlife movement corridors or interfere with habitat connectivity. Therefore, the proposed project would not substantially limit wildlife movement.

5.6 LOCAL POLICIES AND ORDINANCES

The City of Menifee and Riverside County General Plans and development ordinances may include regulations or policies governing biological resources. For example, policies may include tree preservation, locally designated species survey areas, local species of interest, and significant ecological areas. Pursuant to California Code Section 53090 Section D and Section E, the EMWD is exempt from local land use policies, plans, and zoning ordinances.

5.6.1 City of Menifee Municipal Code

Menifee Landscape Standards (Section 9.2 of the City of Menifee Municipal Code) consists of Section 9.205.030 of the City Municipal Code, which establishes Tree Preservation Regulations that are described below.

Section 9.205.030 (Tree Preservation Regulations). This section serves to outlines its purpose to protecting mature trees that are in good health, do not pose safety threats, are not nuisance trees, and those categorized as heritage trees. Application of a tree removal permit is required despite the status of existing trees.

Project impacts to protected trees shall follow this guideline: Existing healthy trees with a 6-inch or larger trunk diameter measured at 4 feet from the surrounding grade shall be replaced at a three-to-one ratio if removed, in addition to any other new tree installation required. Existing healthy trees, with a 6-inch or larger trunk diameter measured at 4 feet from the surrounding grade, which are retained on site shall be credited toward the tree installation requirements of this chapter at a one-to-two ratio (one tree saved equals a two-tree credit toward the installation of new trees required).

In the event that a heritage tree is removed, replacement is required with the largest nursery-grown tree(s) available as determined by the approval authority. To determine adequate replacement values for heritage trees, the applicant may be required to submit an independent appraisal prepared by a horticulturist, International Society of Arboriculture (ISA)-certified arborist, or licensed landscape architect to determine the replacement value of the tree(s) to be removed.

All trees that are to remain on site are to be enclosed by an appropriate construction barrier, such as a chain-link fence or other means, prior to the issuance of a grading permit or building permit, or before commencement of work, whichever occurs first. Fences are to remain in place during all phases of construction and may not be removed until construction is complete. Protection of trees, their roots, and drip lines is also required. Compaction of soil within any part of the tree, including its drip line, is not permitted.

The proposed project would result in the removal of one non-native tree, Jerusalem thorn (*Parkinsonia aculeata*). Pursuant to California Code Section 53090, the project would not be subject to the City's tree removal ordinance. Implementation of the proposed project would not conflict with any local policies or ordinances protecting biological resources.

5.6.2 Western Riverside Multiple Species Habitat Conservation Plan

The project study area lies within the planning area of the MSHCP; however, the EMWD is not pursuing a PSE designation for the project site and is not seeking to obtain MSHCP coverage. Therefore, the proposed project is not subject to the requirements of the MSHCP (e.g., development fees and MSHCP consistency analysis).

5.6.3 Stephens' Kangaroo Rat Habitat Conservation Plan

The project study area lies within the planning area of the SKR HCP; however, as a water utility agency, the EMWD is exempt from the requirements of the SKR HCP (e.g., development fees).

6.0 MITIGATION MEASURES

MM BIO-1 **Rare Plant Survey.** A focused plant survey shall be conducted due to the presence of clay soils within the project site. These clay soils may be suitable for special-status plant species such as Mun's onion (*Allium munzii*), San Diego Ambrosia (*Ambrosia pumila*), and thread-leaved brodiaea (*Brodiaea filifolia*) that are known to occur in the project vicinity. The objective of the survey will be to determine presence or absence of special-status plant species and, if present, to quantify and map the distribution of the species on the project site. All plant species detected on the site during the survey will be identified to the extent necessary to determine rarity and listing status. The survey shall be conducted during the months of April or May to coincide with the appropriate peak flowering season of the target special-status species. If special-status species are identified within the project limits and project impacts to the species would be significant, coordination with the United States Fish and Wildlife Service (USFWS) or the California Department of Fish and Wildlife (CDFW) (depending on the listing status of the species) will be required to determine additional appropriate mitigation measures. This may include the transplant of individual special-status plants, collection and dispersal of special-status plant seeds, and the purchase of compensatory mitigation lands to off-site significant impacts.

MM BIO-2 **Focused Crotch Bumble Bee Survey.** Prior to commencing construction activities, a qualified biologist with expertise in surveying for native bumble bees shall conduct a focused survey for Crotch bumble bee (*Bombus crotchii* [CBB]) in areas of buckwheat scrub and grassland during the survey season before activities begin. The qualified biologist authorized to survey for CBB by the California Department of Fish and Wildlife (CDFW) shall conduct the surveys when colonies of this species are active (typically April through August) in accordance with the most recent CDFW guidelines (*Survey Considerations for California Endangered Species Act [CESA] Candidate Bumble Bee Species*, dated June 6, 2023). At least 14 days prior to the anticipated start date of the surveys, the qualified biologist shall submit a notification of intent to survey to the CDFW. The bumble bee nest survey involves systematically walking through suitable habitat areas (grassland and scrub) while looking for potential nests and for high levels of bee activity that may signal a nest site. If a CBB nest is found within or adjacent to the project area, CDFW will be notified within 3 days in accordance with CDFW survey guidelines. The foraging bee survey will consist of three site visits, 2 to 4 weeks apart. Visits must be conducted on sunny days with temperatures between 65°F and 90°F and sustained winds of less than 8 miles per hour. Visits must begin at least 1 hour after sunrise and end at least 2 hours before sunset. The surveys are conducted by walking throughout areas of suitable foraging habitat at a rate of no more than 3 acres of suitable habitat per hour to look for bumble bees. Bumble bees encountered during the survey will be captured with a net, photographed, and released on site. If CBB is detected, Eastern Municipal Water District (EMWD) shall submit an avoidance and minimization plan to CDFW. A 50-ft buffer will be proposed in the plan to CDFW, but this plan will need to be approved and construction activities may not commence prior to CDFW's approval of the plan.

MM BIO-3 **Focused Protocol Coastal California Gnatcatcher Survey.** Prior to commencing construction activities, a qualified biologist with a Section 10(a)(1)(A) Recovery Permit for the Coastal California Gnatcatcher (CAGN) shall conduct focused protocol surveys for the species within scrub habitats. The survey shall be conducted in accordance with the latest United States Fish and Wildlife Service (USFWS) survey protocol for this species (August 1997). The USFWS focused survey protocol for CAGN requires 6 survey visits at 1-week intervals if the focused survey is conducted during the breeding season (March 15 to June 30), or 9 survey visits at 2-week intervals if the focused surveys are conducted outside of the breeding season (July 1 – March 14). In the event that CAGN is found on or adjacent to the project site, consultation with the USFWS in accordance with Section 7 of the Endangered Species Act will be required to determine appropriate avoidance, minimization and mitigation measures. Alternatively, EMWD can obtain third party take authorization in compliance with the MSHCP Implementation Agreement, Section 17.

MM BIO-4 **Pre-Construction Burrowing Owl Survey.** A burrowing owl take avoidance survey shall be performed by a qualified biologist not more than 14 days prior to any site disturbance (grubbing, grading, and construction) in accordance with California Department of Fish and Wildlife (CDFW) guidelines (*Staff Report on Burrowing Owl Mitigation*, March 7, 2012). If an occupied burrow is found (as indicated by the observation of a burrowing owl or the presence of burrowing owl sign), a 250-foot buffer around the burrow will be staked and flagged, and no construction activities will be allowed within the buffer area during the breeding season (February 1 through August 31). If the burrow is within the project disturbance area, CDFW will be consulted to coordinate relocation of the owl in accordance with accepted protocols. Determination of the appropriate method of relocation, such as eviction/ passive relocation or active relocation, shall be based on the specific site conditions (e.g., distance to nearest suitable habitat and presence of burrows within that habitat) in coordination with the CDFW. Active relocation and eviction/passive relocation require the preservation and maintenance of suitable burrowing owl habitat determined through coordination with the CDFW.

MM BIO-5 **Pre-construction Nesting Bird Survey.** To ensure compliance with California Fish and Game Code and the Migratory Bird Treaty Act (MBTA) and to avoid potential impacts to nesting birds, vegetation removal activities shall be conducted outside the general bird nesting season (January 15 through August 31). Any vegetation removal and/or construction activities that occur during the nesting season will require that all suitable habitats be thoroughly surveyed for the presence of nesting birds by a qualified biologist. Prior to commencement of clearing within each project segment, a qualified biologist shall conduct a pre-construction survey within 3 days prior to ground-disturbing activities. This may warrant various pre-construction surveys to assure that each survey aligns with the start of each segment of the project. Should nesting birds be found, an exclusionary buffer will be established by the qualified biologist. The buffer may be up to 500 feet in diameter, depending on the species of nesting bird found. This buffer will be clearly marked in the field by construction personnel under guidance of the qualified biologist, and construction or clearing will not be conducted within this zone until the qualified biologist determines that the young have fledged or the nest is no longer active. The buffer may be modified and/or other recommendations proposed as determined appropriate by the biologist to minimize impacts. Nesting bird habitat within the project site will be resurveyed during bird breeding season if there is a lapse in construction activities longer than 7 days.

MM BIO-6 **Jurisdictional Delineation.** Prior to commencing construction activities, a jurisdictional delineation shall be conducted if impacts to any aquatic resources within the project site are expected. A three parameter delineation shall be conducted according to the CDFW's *Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (Regional Supplement) and the 1987 Corps Wetland Delineation Manual, and to delineate the jurisdictional limit of non- wetland waters of the United States following the procedures set forth in 33 Code of Federal Regulations (CFR) 328.3(e). If impacts to identified aquatic resources are expected to occur, appropriate permits will need to be acquired from the appropriate agencies. This includes the issuance of a Streambed Alteration Agreement as issued by CDFW under Section 1602 of the Fish and Game Code and Waste Discharge Requirements as issued by the RWQCB under the Porter-Cologne Water Quality Control Act. A verification, in the form of a jurisdictional determination, will also need to be requested from the USACE on the regulatory conclusions made in the jurisdictional delineation for USACE jurisdiction. Should the USACE determine aquatic resources under their jurisdiction are present within the project site and are proposed for impacts, a Section 404 permit will need to be acquired from the USACE.

MM BIO-7 **Standard Best Management Practices.** The following best management practices (BMPs), taken directly from the MSHCP Appendix C, shall be implemented to the extent feasible during construction activities to reduce impacts to wildlife resources in the project vicinity.

1. A qualified biologist shall conduct a training session for project personnel prior to grading. The training shall include a description of the species of concern and its habitats, the general provisions of the Endangered Species Act (Act) and the MSHCP, the need to adhere to the provisions of the Act and the MSHCP, the penalties associated with violating the provisions of the Act, the general measures that are being implemented to conserve the species of concern as they relate to the project, and the access routes to and project site boundaries within which the project activities must be accomplished.

2. Water pollution and erosion control plans shall be developed and implemented in accordance with RWQCB requirements.

3. The footprint of disturbance shall be minimized to the maximum extent feasible. Access to sites shall be via pre-existing access routes to the greatest extent possible.

4. Projects should be designed to avoid the placement of equipment and personnel within the stream channel or on sand and gravel bars, banks, and adjacent upland habitats used by target species of concern.

5. Projects that cannot be conducted without placing equipment or personnel in sensitive habitats should be timed to avoid the breeding season of riparian species identified in MSHCP Global Species Objective No. 7.

6. Equipment storage, fueling, and staging areas shall be located on upland sites with minimal risks of direct drainage into riparian areas or other sensitive habitats. These designated areas shall be located in such a manner as to prevent any runoff from entering sensitive habitat. Necessary precautions shall be taken to prevent the release of cement or other toxic substances into surface waters. Project-related spills of hazardous materials shall be reported to appropriate entities, including but not limited to, applicable jurisdictional city, USFWS, CDFW, and RWQCB, and shall be cleaned up immediately and contaminated soils removed to approved disposal areas.

7. Erodible fill material shall not be deposited into water courses. Brush, loose soils, or other similar debris material shall not be stockpiled within the stream channel or on its banks.

8. The qualified project biologist shall monitor construction activities for the duration of the project to ensure that practicable measures are being employed to avoid incidental disturbance of habitat and species of concern outside the project footprint.

9. The removal of native vegetation shall be avoided and minimized to the maximum extent practicable. Temporary impacts shall be returned to pre-existing contours and revegetated with appropriate native species.

10. Exotic species that prey upon or displace target species of concern should be permanently removed from the site to the extent feasible.

11. To avoid attracting predators of the species of concern, the project site shall be kept as clean of debris as possible. All food related trash items shall be enclosed in sealed containers and regularly removed from the site(s).

12. Construction employees shall strictly limit their activities, vehicles, equipment, and construction materials to the proposed project footprint and designated staging areas and routes of travel. The construction area(s) shall be the minimal area necessary to complete the project and shall be specified in the

construction plans. Construction limits will be fenced with orange snow screen. Exclusion fencing should be maintained until the completion of all construction activities. Employees shall be instructed that their activities are restricted to the construction areas.

13. The Permittee shall have the right to access and inspect any sites of approved projects including any restoration/enhancement area for compliance with project approval conditions including these BMPs.

7.0 CUMULATIVE IMPACTS

According to Section 15130 of the *State CEQA Guidelines*, "cumulative impacts" refers to incremental effects of an individual project when viewed in connection with the effects of past projects, current projects, and probable future projects. Due to the relatively disturbed nature of the project study area and its proximity to residential development, impacts are not considered to be cumulatively significant.

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APPENDIX A

PLANT AND ANIMAL SPECIES OBSERVED

Plant Species Observed

Scientific Name	Common Name
CONIFERS	
Cupressaceae	**Cypress family**
*Cupressus sempervirens**	Italian cypress
EUDICOT FLOWERING PLANTS	
Asteraceae	**Sunflower family**
Artemisia californica	California sagebrush
Baccharis salicifolia	Mule fat
Baccharis sp.	Baccharis
*Centaurea melitensis**	Maltese star-thistle
Corethrogyne filaginifolia	Common sandaster
Encelia farinosa	Brittlebush
Ericameria palmeri var. *pachylepis*	Box Springs goldenbush
Heterotheca grandiflora	Telegraph weed
*Lactuca serriola**	Prickly lettuce
Lasthenia gracilis	Needle goldfields
Layia platyglossa	Coastal tidytips
Logfia filaginoides	California cottonrose
*Oncosiphon pilulifer**	Stinknet
*Sonchus asper**	Prickly sow thistle
Boraginaceae	**Borage family**
Amsinckia menziesii	Menzies' fiddleneck
Brassicaceae	**Mustard family**
*Hirschfeldia incana**	Shortpod mustard
Lepidium nitidum	Shining peppergrass
*Sisymbrium orientale**	Indian hedgemustard
Cactaceae	**Cactus family**
Cylindropuntia bernardina	Valley cholla
Chenopodiaceae	**Saltbush family**
*Salsola tragus**	Russian thistle
Convolvulaceae	**Morning-glory family**
Cuscuta californica	Chaparral dodder
Euphorbiaceae	**Spurge family**
Croton setigerus	Dove weed
Euphorbia polycarpa	Smallseed sandmat
Fabaceae	**Pea family**
*Medicago polymorpha**	Bur-clover
*Parkinsonia aculeata**	Jerusalem thorn
Malvaceae	**Mallow family**
*Malva parviflora**	Cheeseweed mallow
Myrtaceae	**Myrtle family**
Eucalyptus sp.*	Eucalyptus
Nyctaginaceae	**Four-o'clock family**
Mirabilis laevis	Wishbone bush
Oleaceae	**Olive family**
*Olea europaea**	Olive
Polygonaceae	**Buckwheat family**
Eriogonum fasciculatum	California buckwheat
Solanaceae	**Nightshade family**
*Nicotiana glauca**	Tree tobacco

Plant Species Observed

Scientific Name	Common Name
MONOCOT FLOWERING PLANTS	
Agavaceae	**Agave family**
*Agave americana**	American century plant
Alliaceae	**Onion family**
Allium vineale	Wild garlic
Arecaceae	**Palm family**
Washingtonia filifera	California fan palm
*Washingtonia robusta**	Mexican fan palm
Poaceae	**Grass family**
*Avena fatua**	Wild oat
*Bromus rubens**	Red brome
*Cynodon dactylon**	Bermuda grass
*Hordeum murinum**	Mouse barley
*Schismus barbatus**	Common Mediterranean grass
Asclepiadaceae (see Apocynaceae)	**Milkweed family**
Helianthus annuus	Common sunflower
Opuntia sp.	Pricklypear
Ericaceae	**Blueberry family**
Acmispon strigosus	Strigose lotus
Helianthus annuus	Common sunflower

Wildlife Species Observed

Scientific Name	Common Name
BIRDS	
Anatidae	**Swans, Geese. And Ducks**
Anas platyrhynchos	Mallard
Columbidae	**Pigeons and Doves**
*Columba livia**	Rock pigeon
Zenaida macroura	Mourning dove
Trochilidae	**Hummingbirds**
Calypte anna	Anna’s hummingbird
Accipitridae	**Kites, Hawks, and Eagles**
Buteo jamaicensis	Red-tailed hawk
Falconidae	**Falcons**
Falco sparverius	American kestrel
Tyrannidae	**Tyrant Flycatchers**
Sayornis nigricans	Black phoebe
Sayornis saya	Say’s phoebe
Tyrannus vociferans	Cassin’s kingbird
Corvidae	**Crows and Ravens**
Corvus brachyrhynchos	American crow
Alaudidae	**Larks**
Eremophila alpestris actia	California horned lark
Fringillidae	**Finches**
Haemorhous mexicanus	House finch
Spinus psaltria	Lesser goldfinch
Passerellidae	**New World Sparrows**
Melospiza melodia	Song sparrow
Zonotrichia leucophrys	White-crowned sparrow

Wildlife Species Observed

Scientific Name	Common Name
Icteridae	**Blackbirds, Orioles and Allies**
Sturnella neglecta	Western meadowlark
Parulidae	**Wood Warblers**
Setophaga coronata	Yellow-rumped warbler
MAMMALS	
Sciuridae	**Squirrels**
Spermophilus beecheyi	California ground squirrel
Geomyidae	**Pocket Gophers**
Thomomys bottae	Botta's pocket gopher
Leporidae	**Rabbits and Hares**
Sylvilagus audubonii	Desert cottontail

APPENDIX B

SPECIAL-STATUS SPECIES SUMMARY

Special-Status Species Summary

Species	Status	Habitat and Distribution	Activity Period	Occurrence Probability
PLANTS				
Abronia villosa var. aurita **chaparral sand-verbena**	US: – CA: 1B	Sandy areas (generally flats and benches along washes) in chaparral and coastal sage scrub, and improbably in desert dunes or other sandy areas, below 1,600 meters (5,300 feet) elevation. In California, reported from Riverside, San Diego, Imperial, Los Angeles, and Ventura Counties. Believed extirpated from Orange County. Also reported from Arizona and Mexico (Baja California). Plants reported from desert communities are likely misidentified.	Blooms mostly March through August	**Not expected to occur.** There is no suitable habitat (sandy areas [generally flats and benches along washes] in chaparral and coastal sage scrub) present within the project site.
Allium munzii **Munz's onion**	US: FE CA: ST/1B.1	Seasonally moist sites on clay soils (generally) or within rocky outcrops (pyroxenite) on rocky-sandy loams (such as Cajalco, Las Posas, and Vallecitos) with clay subsoils, in openings within coastal sage scrub, pinyon juniper woodland, and grassland, at 300 to 1,070 meters (1,000 to 3,500 feet) elevation. Known only from western Riverside County in the greater Perris Basin (Temescal Canyon-Gavilan Hills/Plateau, Murrieta-Hot Springs areas) and within the Elsinore Peak (Santa Ana Mountains) and Domenigoni Hills regions.	Blooms March to May	**Low potential to occur.** Suitable habitat (seasonally moist sites on clay soils) is present within the project site, specifically on the northern portion of the site. However, these areas are highly disturbed.
Ambrosia pumila **San Diego ambrosia**	US: FE CA: 1B	Open, seasonally wet, generally low areas in floodplains or at edges of vernal pools or playas, usually in sandy loam or on clay (including upland clay slopes), at 20 to 487 meters (70 to 1,600 feet) elevation. Known from western Riverside and western San Diego Counties. Also occurs in Mexico.	Generally non-flowering	**Low potential to occur.** Suitable habitat (seasonally wet area on clay) is present within the project site, specifically on the northern portion of the site. However, these areas are highly disturbed.
Atriplex coronata var. *notatior* **San Jacinto Valley crownscale**	US: FE CA: 1B	Alkaline flats in playas, chenopod scrub, valley and foothill grasslands, vernal pools at 365 to 520 meters (1,200 to 1,700 feet) elevation. Endemic to the San Jacinto River Valley area of western Riverside County.	Blooms April through May	**Not expected to occur.** There is no suitable habitat present (alkaline flats in playas, chenopod scrub, valley and foothill grasslands, vernal pools) within the project site.

Special-Status Species Summary

Species	Status	Habitat and Distribution	Activity Period	Occurrence Probability
Atriplex parishii **Parish's brittlescale**	US: – CA: 1B	Alkali soils in meadows, vernal pools, chenopod scrub, and playas. Usually on drying alkali flats with fine soils. In California, known from Riverside and San Diego Counties. Also occurs in Mexico. Believed extirpated from Los Angeles, Orange, and San Bernardino Counties.	Blooms June through October	**Not expected to occur.** There is no suitable habitat (alkali soils in meadows, vernal pools, chenopod scrub, and playas) present within the project site.
Atriplex serenana var. davidsonii **Davidson's saltscale**	US: – CA: 1B	Alkaline soils in scrub and herbaceous communities from 10 to 460 meters (30 to 1,500 feet) elevation. In California, known only from Los Angeles, Orange, Riverside, San Diego, San Luis Obispo, and Ventura Counties. Believed extirpated from Santa Barbara and perhaps Los Angeles Counties. Also occurs in Mexico.	Blooms April through October	**Not expected to occur.** There is no suitable habitat (alkaline soils in scrub and herbaceous communities) present within the project site.
Brodiaea filifolia **thread-leaved brodiaea**	US: FT CA: SE/1B	Usually on clay or associated with vernal pools or alkaline flats; occasionally in vernally moist sites in fine soils (clay loam, silt loam, fine sandy loam, loam, loamy fine sand). Typically associated with needlegrass or alkali grassland or vernal pools. Occurs from 25 to 1,120 meters (80 to 3,700 feet) elevation. Known only from Los Angeles, Orange, Riverside, San Bernardino, San Diego, and San Luis Obispo Counties, California.	Blooms March through June	**Low potential to occur.** Suitable habitat (seasonally moist sites on clay soils) is present within the project site, specifically on the northern portion of the site. However, these areas are highly disturbed.
Calochortus weedii var. intermedius **intermediate mariposa-lily**	US: – CA: 1B	Dry, open rocky slopes and rock outcrops in chaparral, coastal sage scrub, and grassland, at 105 to 855 meters (340 to 2,800 feet) elevation. Known only from Los Angeles, Orange, Riverside, and San Bernardino Counties, California. In the western Riverside County area, this species is known from the hills and valleys west of Lake Skinner and Vail Lake (The Vascular Plants of Western Riverside County, California. F.M. Roberts et al., 2004). Appears to intergrade with *Calochortus plummerae*, which is mostly east and north of Santa Ana Mountains.	Blooms May through July (perennial herb)	**Not expected to occur.** There is no suitable habitat (rocky slopes and rock outcrops in chaparral, coastal sage scrub, and grassland) present within the project site.

Special-Status Species Summary

Species	Status	Habitat and Distribution	Activity Period	Occurrence Probability
Caulanthus simulans **Payson's jewel-flower**	US: – CA: 4.2	Recently burned areas or disturbed sites such as streambeds in chaparral, coastal sage scrub, riparian areas, and grassland at 60 to 2,200 meters (200 to 7,200 feet) elevation. Known from San Diego County (Collections in western Riverside County misidentified, are C. heterophyllus var. pseudosimulans).	Blooms (Feb) March through May (June)	**Not expected to occur.** There is no suitable habitat (streambeds in chaparral, coastal sage scrub, riparian areas, and grassland) present within the project site.
Centromadia pungens ssp. laevis **smooth tarplant**	US: – CA: 1B.1	Generally alkaline areas in chenopod scrub, meadows, playas, riparian woodland, valley and foothill grassland below 480 meters (1,600 feet) elevation. Known from Riverside and San Bernardino Counties, extirpated from San Diego County.	Blooms April through September	**Not expected to occur.** There is no suitable habitat present (alkaline areas in chenopod scrub, meadows, playas, riparian woodland, valley and foothill grassland) within the project site.
Chorizanthe parryi var. parryi **Parry's spineflower**	US: – CA:1B.1	Sandy or rocky soils in chaparral, coastal scrub, oak woodlands, and grassland at 40 to 1,705 meters (100 to 5,600 feet) elevation. Known only from Los Angeles, Riverside, and San Bernardino Counties.	Blooms April through June	**Moderate potential to occur.** Potentially suitable habitat (sandy soil in buckwheat scrub) is present within the project site. There are 2 observations within 1 mile of the project site, from prior to 2001 (CDFW 2024).
Chorizanthe polygonoides var. longispina **long-spined spineflower**	US: – CA:1B.2	Generally clay soils in chaparral, coastal sage scrub, and grassland at 30 to 1,530 meters (100 to 5,000 feet) elevation. In California, known only from Orange, Riverside, Santa Barbara, and San Diego Counties. Also occurs in Mexico.	Blooms April through July	**Low potential to occur.** Suitable habitat (clay soils in brittlebush scrub and grassland) is present within the project site, specifically on the northern portion of the site. However, these areas are highly disturbed.

Special-Status Species Summary

Species	Status	Habitat and Distribution	Activity Period	Occurrence Probability
Dodecahema leptoceras **slender-horned spineflower**	US: FE CA: SE/1B	In the Vail Lake area, occurs in gravel soils of Temecula arkose deposits in openings in chamise chaparral. In other areas, occurs in sandy cobbly riverbed alluvium in alluvial fan sage scrub (usually late seral stage), on floodplain terraces and benches that receive infrequent overbank deposits from generally large washes or rivers, where it is most often found in shallow silty depressions dominated by leather spineflower (Lastarriaea coriacea) and other native annual species, and is often associated with cryptogamic soil crusts composed of bryophytes, algae and/or lichens. Occurs at 200 to 760 meters (600 to 2,500 feet) elevation. Known only from Los Angeles, Riverside, and San Bernardino Counties, California.	Blooms April through June	**Not expected to occur.** No suitable habitat (sandy cobbly riverbed alluvium in alluvial fan sage scrub) is present within the project site.
Dudleya multicaulis **many-stemmed dudleya**	US: – CA: 1B	Heavy, often clay soils or around granitic outcrops in chaparral, coastal sage scrub, and grassland below 790 meters (2,600 feet) elevation. Known only from Los Angeles, Orange, Riverside, San Bernardino, and San Diego Counties.	Blooms April through July (perennial herb)	**Low potential to occur.** Suitable habitat (clay soils in grassland) is present within the project site, specifically on the northern portion of the site. However, these areas are highly disturbed.
Harpagonella palmeri **Palmer's grapplinghook**	US: – CA: 4.2	Clay soils in openings in coastal sage scrub, juniper woodland, and grassland below 830 meters (2,700 feet) elevation. In California, known only from Orange, Riverside, and San Diego Counties and the Channel Islands. Also occurs in Arizona and Mexico.	Blooms March through May	**Low potential to occur.** Suitable habitat (clay soils in brittlebush scrub and grassland) is present within the project site, specifically on the northern portion of the site. However, these areas are highly disturbed.

Special-Status Species Summary

Species	Status	Habitat and Distribution	Activity Period	Occurrence Probability
Lasthenia glabrata ssp. coulteri **Coulter's goldfields**	US: – CA: 1B.1	Vernal pools and alkaline soils in marshes, playas, and similar habitats below 1,220 meters (4,000 feet) elevation. Known from Colusa, Merced, Tulare, Orange, Riverside, Santa Barbara, San Diego, San Luis Obispo, Tehama, Ventura, and Yolo Counties. Believed extirpated from Kern, Los Angeles, and San Bernardino Counties, and possibly also from Tulare County. Also occurs in Mexico.	Blooms February through June	**Not expected to occur.** No suitable habitat (vernal pools and alkaline soils in marshes, playas, and similar habitats) is present within the project site.
Lepidium virginicum var. robinsonii **Robinson's pepper-grass**	US: – CA: 4.3	Dry soils in coastal sage scrub and chaparral below 885 meters (2,900 feet) elevation. In California, known only from Los Angeles, Orange, Riverside, Santa Barbara, San Bernardino and San Diego Counties, and Santa Cruz Island. Also occurs in Mexico.	Blooms January through July	**Moderate potential to occur.** Suitable habitat (dry soils in buckwheat scrub) is present within the project site. There is one observation 1.8 miles to the east of the project site, from 2008 (CDFW 2024).
Myosurus minimus ssp. apus **little mousetail**	US: – CA: 3.1	Alkaline areas in vernal pools at 20 to 640 meters (70 to 2,100 feet) elevation. In California, known only from the Central Valley of the coastal and inland areas of Southern California. Also occurs in Oregon and Mexico.	Blooms March through June (annual herb)	**Not expected to occur.** No suitable habitat (alkaline areas in vernal pools) present within the project site.
Navarretia fossalis **spreading navarretia**	US: FT CA: 1B	In vernal pools, playas, shallow freshwater marshes, and similar sites at 15 to 820 meters (50 to 2,700 feet) elevation. In California, known only from Los Angeles, San Luis Obispo, Riverside, and San Diego Counties. Also occurs in Mexico.	Blooms April through June	**Not expected to occur.** No suitable habitat (vernal pools, playas, shallow freshwater marshes, and similar sites) present within the project site.
Orcuttia californica **California Orcutt grass**	US: FE CA: SE/1B	Vernal pools from 15 to 660 meters (50 to 2,200 feet) elevation. In California, known from Los Angeles, Ventura, Riverside, and San Diego Counties. Also occurs in Mexico.	Blooms April through August	**Not expected to occur.** No suitable habitat (vernal pools) present within the project site.
Trichocoronis wrightii var. wrightii **Wright's trichocoronis**	US: – CA: 2B	Alkali soils in meadows, riverbeds, vernal pools, and lakes at 5 to 435 meters (20 to 1,430 feet) elevation. In California, known from the Central Valley and Riverside County. Also occurs in Texas and Baja California.	Blooms May through September	**Not expected to occur.** No suitable habitat (alkali soils in meadows, riverbeds, vernal pools, and lakes) present within the project site.

Special-Status Species Summary

Species	Status	Habitat and Distribution	Activity Period	Occurrence Probability
INVERTEBRATES				
Bombus crotchii **Crotch bumble bee**	US: – CA: SCE	Inhabits open scrub and grassland from coastal California to crest of Sierra-Cascade and in desert edge areas, south into Mexico. Primarily nests underground. Suitable bumble bee habitat requires the continuous availability of flowers on which to forage throughout the duration of the colony (spring through fall), colony nest sites, and overwintering sites for the queens. Nectars on Antirrhinum, Phacelia, Clarkia, Dendromecon, Eschscholzia, and Eriogonum in coastal California east to the Sierra-Cascade crest and south into Mexico.	Spring and summer	**Moderate potential to occur.** Suitable habitat (buckwheat scrub) is present within the project site. The unnamed mountain range to the west of Valley Boulevard provides extensive habitat necessary to potentially support this species. One occurrence from 1975 occurs approximately 0.9 mile to the west of the project site (CDFW 2024).
Bombus pensylvanicus **American bumble bee**	US: – CA: SC	Inhabits open farmland and fields throughout the U.S. Also occurs in Canada and Mexico. Primarily nests at the ground surface in tall grass, but occasionally underground. Suitable bumble bee habitat requires the continuous availability of flowers on which to forage throughout the duration of the colony (spring through fall), colony nest sites, and overwintering sites for the queens.	Spring and summer	**Moderate potential to occur.** Suitable habitat (buckwheat scrub) is present within the project site. The unnamed mountain range to the west of Valley Boulevard provides extensive habitat necessary to potentially support this species. Two occurrences from 1946 occur approximately 2.11 miles to the north and 2.6 miles to the east of the project site (CDFW 2024).

Special-Status Species Summary

Species	Status	Habitat and Distribution	Activity Period	Occurrence Probability
Branchinecta lynchi **vernal pool fairy shrimp**	US: FT CA: SA	Vernal pools and similar features in unplowed grassland areas. Pools must contain water continuously for at least 18 days in all but the driest years to allow for reproduction. Known from the Central Valley and adjacent foothill areas, the central coast and south coast ranges, from the transverse ranges near Santa Clarita, from the Santa Rosa Plateau, Skunk Hollow, and the Stowe Road vernal pool west of Hemet in Riverside County, and from northwest San Diego County. May also occur in Orange County. Occurs at up to about 2,300 feet elevation in areas north of Kern County and at up to 5,600 feet elevation in areas to the south.	Seasonally following rains; typically January through April	**Low potential to occur.** Shallow depression areas best described as road ruts occur within the project site. Road ruts are disturbed areas on site that may provide suitable habitat.
Branchinecta sandiegonensis **San Diego fairy shrimp**	US: FE CA: SA	Small, shallow (usually less than 30 centimeters deep), relatively clear but unpredictable vernal pools on coastal terraces. Pools must retain water for a minimum of 13 days for this species to reproduce (3 to 8 days for hatching, and 10 to 20 days to reach reproductive maturity). Known from Orange and San Diego Counties, and Baja California.	Seasonally following rains in late fall, winter and spring	**Low potential to occur.** Shallow depression areas best described as road ruts occur within the project site. Road ruts are disturbed areas on site that may provide suitable habitat.
Cicindela senilis frosti **Senile tiger beetle**	US: - CA: SA	Inhabits marine shoreline, from central California coast south to salt marshes of San Diego, also found at Lake Elsinore. Inhabits dark-colored mud in the lower zone and dried salt pans in the upper zone.	Presumed spring through fall	**Not expected to occur.** Suitable habitat (shoreline and salt marshes) is not present within the project site. The nearest known location for the species, Lake Elsinore, is located approximately 7 miles to the west of the project site.

Special-Status Species Summary

Species	Status	Habitat and Distribution	Activity Period	Occurrence Probability
Danaus plexippus **monarch butterfly** (wintering sites)	US: FPE CA: SA	Winter roosts are located in wind-protected tree groves (Eucalyptus, Monterey Pine, Cypress) with nectar and water sources nearby.	September through March	**Low potential to occur.** Suitable habitat (eucalyptus trees) is present adjacent to the project site. Trees near the Cherry Hill Boulevard and Valley Boulevard intersection may be suitable for roosting. However, to date, this has not been identified as a California overwintering population. Furthermore, the project does not propose any direct impacts to these trees.
Euphydryas editha quino **quino checkerspot butterfly**	US: FE CA: SA	Meadows or openings within coastal sage scrub or chaparral below about 5,000 feet where food plants (*Plantago erecta* and/or *Orthocarpus purpurascens*) are present. Historically known from Santa Monica Mountains to northwest Baja California; currently known only from southwestern Riverside County, southern San Diego County, and northern Baja California.	January through late April	**Not expected to occur.** The project study area does not offer suitable foraging plants (*Plantago erecta* and/or *Orthocarpus purpurascens*) to sustain this species.
Socalchemmis icenoglei **Icenogle's socalchemmis spider**	US: - CA: SA	Coastal scrub. Known only from the type locality in the vicinity of Winchester, Riverside County.	Secretive year-round.	**Not expected to occur.** Suitable habitat (coastal scrub) is present within the project site in the form of buckwheat scrub. However, the nearest known location for the species, Winchester, is located approximately 6 miles to the west of the project site.

Special-Status Species Summary

Species	Status	Habitat and Distribution	Activity Period	Occurrence Probability
*Streptocephalus wootton*i **Riverside fairy shrimp**	US: FE CA: SA	Warm-water vernal pools (i.e., large, deep pools that retain water into the warm season) with low to moderate dissolved solids, in annual grassland areas interspersed through chaparral or coastal sage scrub vegetation. Suitable habitat includes some artificially created or enhanced pools, such as some stock ponds, that have vernal pool like hydrology and vegetation. Known from areas within about 50 miles of the coast from Ventura County south to San Diego County and Baja California.	Seasonally following rains; typically, January through April	**Low potential to occur.** Shallow depression areas best described as road ruts occur within the project site. Road ruts are disturbed areas on site that may provide suitable habitat.
REPTILES				
Anniella stebbinsi **Southern California legless lizard**	US: – CA: SSC	Inhabits sandy or loose loamy soils with high moisture content under sparse vegetation in Southern California.	Nearly year round, at least in southern areas	**Not expected to occur.** Suitable habitat (sandy or loose loamy soils with high moisture content) is not present within the project site.
Arizona elegans occidentalis **California glossy snake**	US: – CA: SSC	Scrub and grassland habitats, often with loose or sandy soils. Patchily distributed from the eastern portion of San Francisco Bay to southern San Joaquin Valley and in non-desert areas of southern California. Also occurs in Baja California, Mexico.	Most active March through June (nocturnal)	**Low potential to occur.** Suitable habitat (buckwheat scrub and non-native grassland) is present within the project site. However, grasslands are highly disturbed.
Aspidoscelis hyperythra **orange-throated whiptail**	US: – CA: SA	Prefers washes and other sandy areas with patches of brush and rocks, in chaparral, coastal sage scrub, juniper woodland, and oak woodland from sea level to 915 meters (3,000 feet) elevation. Perennial plants required. Occurs in Riverside, Orange, San Diego Counties west of the crest of the Peninsular Ranges, in extreme southern San Bernardino County near Colton, and in Baja California.	Year-round	**Low potential to occur.** Suitable habitat (buckwheat scrub) is present within the project site.
Aspidoscelis tigris stejnegeri **coastal western whiptail**	US: – CA: SSC	Woodlands, riparian areas, and sparsely vegetated areas in a wide variety of habitats including coastal sage scrub and sparse grassland. Occurs in valleys and foothills from Ventura County to Baja California.	April through August	**Low potential to occur,** Suitable habitat (buckwheat scrub and non-native grassland) is present within the project site. However, grasslands are highly disturbed.

Special-Status Species Summary

Species	Status	Habitat and Distribution	Activity Period	Occurrence Probability
Crotalus ruber **red diamond rattlesnake**	US: – CA: SSC	Desert scrub, thornscrub, open chaparral and woodland; occasional in grassland and cultivated areas. Prefers rocky areas and dense vegetation. Morongo Valley in San Bernardino and Riverside Counties to the west and south into Mexico.	Mid-spring through mid-fall	**Low potential to occur.** Suitable habitat (non-native grassland) is present within the project site. However, grasslands are highly disturbed.
Emys marmorata [*Actinemys marmorata*] **western pond turtle**	US: FPT CA: SSC	Inhabits permanent or nearly permanent water. Absent from desert regions, except in the Mojave Desert along the Mojave River and its tributaries. Requires basking sites such as partially submerged logs, rocks, or open mud banks.	Year-round	**Not expected to occur.** Manmade basins that hold water occur in the project study area. However, these areas are highly disturbed and are currently undergoing development.
Phrynosoma blainvillii coronatum **coast horned lizard**	US: – CA: SSC	Primarily in sandy soil in open areas, especially washes and floodplains, in many plant communities. Requires open areas for sunning, bushes for cover, patches of loose soil for burial, and an abundant supply of ants or other insects. Occurs west of the deserts from northern Baja California north to Shasta County below 2,400 meters (8,000 feet) elevation.	April through July with reduced activity August through October	**Not expected to occur.** No suitable sandy soils are on site.
AMPHIBIANS				
Spea hammondii **western spadefoot**	US: – CA: SSC	Grasslands and occasionally hardwood woodlands; largely terrestrial but requires rain pools or other ponded water persisting at least three weeks for breeding; burrows in loose soils during dry season. Occurs in the Central Valley and adjacent foothills, the non-desert areas of southern California, and Baja California.	Year-round, nocturnal	**Not expected to occur.** Manmade basins that hold water occur in the project study area. However, these areas are highly disturbed and are currently undergoing development.
BIRDS				
Accipiter cooperii **Cooper's hawk** (nesting)	US: – CA: SA	Forages in a wide range of habitats, but primarily in forests and woodlands. These include natural areas as well as human-created habitats such as plantations and ornamental trees in urban landscapes. Usually nests in tall trees (20 to 60 feet) in extensive forested areas (generally woodlots of 4 to 8 hectares with canopy closure of greater than 60 percent).	Year-round	**Moderate potential to occur.** No suitable nesting habitat is present within the project site but may forage and nest in the vicinity.

Special-Status Species Summary

Species	Status	Habitat and Distribution	Activity Period	Occurrence Probability
		Occasionally nests in isolated trees in more open areas.		
Agelaius tricolor **tricolored blackbird**	US: – CA: ST/SSC	Open country. Forages in grassland and cropland habitats. Nests in large groups near fresh water, preferably in emergent wetland with tall, dense cattails or tules, but also in thickets of willow, blackberry, wild rose, or tall herbs. Seeks cover for roosting in emergent wetland vegetation, especially cattails and tules, and also in trees and shrubs. Occurs in western Oregon, California, and northwestern Baja California.	Year-round	**Not expected to occur.** Marginally suitable non-native grassland habitat is present that may be suitable for foraging. However, non-native grassland habitat is isolated and small in size.
Aimophila ruficeps canescens **southern California rufous-crowned sparrow**	US: – CA: SA	Steep, rocky coastal sage scrub and open chaparral habitats, particularly scrubby areas mixed with grasslands. From Santa Barbara County to northwestern Baja California.	Year-round	**Moderate potential to occur.** An unnamed mountain range occurs adjacent to the western side of the project site and provides suitable buckwheat scrub habitat.
Aquila chrysaetos **golden eagle** (nesting & wintering)	US: – CA: SFP BLM: S	Generally open country of the Temperate Zone worldwide. Nesting primarily in rugged mountainous country. Uncommon resident in Southern California.	Year-round diurnal	**Low potential to occur.** May potentially forage in the area but nesting habitat is absent from the project site.
Artemisiospiza belli belli **Bell's sparrow**	US: – CA: SA	Occupies chaparral and coastal sage scrub from west central California to northwestern Baja California.	Year-round, diurnal activity	**Moderate potential to occur.** Suitable habitat (buckwheat scrub) is present within the project site.
Athene cunicularia **burrowing owl** (nesting)	US: – CA: SPE/SPT/SSC	Open country in much of North and South America. Usually occupies ground squirrel burrows in open, dry grasslands, agricultural and range lands, railroad rights-of-way, and margins of highways, golf courses, and airports. Often utilizes man-made structures, such as earthen berms, cement culverts, cement, asphalt, rock, or wood debris piles. They avoid thick, tall vegetation, brush, and trees, but may occur in areas where brush or tree cover is less than 30 percent.	Year-round	**Moderate potential to occur.** The location of the project borders an urban environment and open field of potential burrowing owl habitat within the project study area. California ground squirrels were observed on site and could create potentially suitable burrows for the owls.

Special-Status Species Summary

Species	Status	Habitat and Distribution	Activity Period	Occurrence Probability
Buteo regalis **ferruginous hawk** (wintering)	US: – CA: SA	Forages in open fields, grasslands and agricultural areas, sagebrush flats, desert scrub, fringes of pinyon-juniper habitats, and other open country in western North America. Not known to breed in California.	Mid-September through mid-April	**Low potential to occur.** Suitable habitat (non-native grassland) is present within the project site. However, these areas are highly disturbed.
Charadrius alexandrinus nivosus **western snowy plover** (nesting)	US: FT (coastal population) CA: SSC	Sandy coastal beaches, lakes, alkaline playas. Scattered locations along coastal California and Channel Islands, inland at Salton Sea and at various alkaline lakes.	Coast: Year-round Inland lakes: April through September	**Not expected to occur.** No suitable habitat (sandy coastal beaches, lakes, alkaline playas) is present within the project site.
Empidonax traillii extimus **southwestern willow flycatcher**	US: FE CA: SE	Rare and local breeder in extensive riparian areas of dense willows or (rarely) tamarisk, usually with standing water, in the southwestern U.S. and possibly extreme northwestern Mexico. Winters in Central and South America. Below 6,000 feet elevation.	May through September	**Not expected to occur.** No suitable habitat (riparian areas) is present within the project site.
Eremophila alpestris actia **California horned lark**	US: – CA: SA	Open grasslands and fields, agricultural area, open montane grasslands. This subspecies is resident from northern Baja California northward throughout non-desert areas to Humboldt County, including the San Joaquin Valley and the western foothills of the Sierra Nevada (north to Calaveras County). Prefers bare ground such as plowed or fall-planted fields for nesting, but may also nest in marshy soil. During the breeding season, this is the only subspecies of horned lark in non-desert southern California; however, from September through April or early May, other subspecies visit the area.	Year-round interior (inland areas)	**Present**. This species was observed during the February 14, 2024, field survey. Suitable nesting habitat is present within the project site.
Haliaeetus leucocephalus **bald eagle**	US: – CA: SE/CFP	Winters locally at deep lakes and reservoirs feeding on fish and waterfowl. Locally rare throughout North America.	November through February	**Not expected to occur.** Suitable habitat (deep lakes and reservoirs) is not present within the project site.

Special-Status Species Summary

Species	Status	Habitat and Distribution	Activity Period	Occurrence Probability
Icteria virens **yellow-breasted chat** (nesting)	US: – CA: SSC (breeding)	Riparian thickets of willow, brushy tangles near watercourses. Nests in riparian woodland throughout much of western North America. Winters in Central America.	April through September	**Not expected to occur.** Suitable habitat (riparian) is not present within the project site.
Lanius ludovicianus **loggerhead shrike** (nesting)	US: – CA: SSC	Prefers open habitats with scattered small trees and with fences, utility lines, or other perches. Inhabits open country with short vegetation, pastures, old orchards, cemeteries, golf courses, riparian areas, and open woodlands. Highest density occurs in open-canopied valley foothill hardwood, valley foothill hardwood-conifer, valley foothill riparian, pinyon-juniper, juniper, desert riparian, and Joshua tree habitats. Occurs only rarely in heavily urbanized areas, but often found in open cropland. Found in open country in much of North America.	Year-round	**Low potential to occur.** Suitable habitat (open habitats with scattered small trees) is present to the west of the project site. However, much of the project site is adjacent to developed areas.
Polioptila californica californica **coastal California gnatcatcher**	US: FT CA: SSC	Inhabits coastal sage scrub in low-lying foothills and valleys up to about 500 meters (1,640 feet) elevation in cismontane southwestern California and Baja California.	Year-round	**Moderate potential to occur.** Suitable habitat (buckwheat scrub) is present within the project site. Additionally, critical habitat for this species is located within 0.50 mile of the project site.
Vireo bellii pusillus **least Bell's vireo**	US: FE CA: SE	Riparian forests and willow thickets. The most critical structural component of least Bell's Vireo habitat in California is a dense shrub layer 0.6–3.0 meters (2–10 feet) (above ground. Willows usually dominant. Nests from central California to northern Baja California. Winters in southern Baja California.	April through September	**Not expected to occur.** Suitable habitat (riparian forests and willow thickets) is not present within the project site.
MAMMALS				
Chaetodipus californicus femoralis **Dulzura pocket mouse**	US: – CA: SSC	Found in a variety of habitats including coastal sage scrub, chaparral and grassland in northern Baja California, San Diego and extreme southwestern and western Riverside Counties. Limit of range to northwest (at interface with C.c. dispar) unclear.	Year-round	**Low potential to occur.** Suitable habitat (buckwheat scrub and non-native grasslands) is present within the project site.

Special-Status Species Summary

Species	Status	Habitat and Distribution	Activity Period	Occurrence Probability
Chaetodipus fallax fallax **northwestern San Diego pocket mouse**	US: – CA: SSC	Found in sandy herbaceous areas, usually associated with rocks or coarse gravel in coastal scrub, chaparral, grasslands, and sagebrush, from Los Angeles County through southwestern San Bernardino, western Riverside, and San Diego Counties to northern Baja California.	Year-round	**Low potential to occur.** Suitable habitat (buckwheat scrub and non-native grasslands) is present within the project site.
Dipodomys merriami parvus **San Bernardino kangaroo rat**	US: FE CA: SE/SSC	Gravelly and sandy soils of alluvial fans, braided river channels, active channels and terraces; San Bernardino Valley (San Bernardino County) and San Jacinto Valley (Riverside County). In San Bernardino County, this species occurs primarily in the Santa Ana River and its tributaries north of Interstate 10, with small remnant populations in the Etiwanda alluvial fan, the northern portion of the Jurupa Mountains in the south Bloomington area, and in Reche Canyon. In Riverside County, this species occurs along the San Jacinto River east of approximately Sanderson Avenue, and along Bautista Creek. Remnant populations may also occur within Riverside County in Reche Canyon, San Timoteo Canyon, Laborde Canyon, the Jurupa Mountains, and the Santa Ana River Wash north of State Route 60.	Nocturnal, active year-round	**Not expected to occur.** No suitable habitat (gravelly and sandy soils of alluvial fans, braided river channels, active channels and terraces) is present within the project site.
Dipodomys stephensi **Stephens' kangaroo rat**	US: FE CA: ST	Found in plant communities transitional between grassland and coastal sage scrub, with perennial vegetation cover of less than 50%. Most commonly associated with Artemisia tridentata, Eriogonum fasciculatum, and Erodium. Requires well-drained soils with compaction characteristics suitable for burrow construction (neither sandy nor too hard). Not found in soils that are highly rocky or sandy, less than 20 inches deep, or heavily alkaline or clay, or in areas exceeding 25% slope. Occurs only in western Riverside County, northern San Diego County, and extreme southern San Bernardino County, below 915	Year-round, nocturnal	**Low potential to occur.** Suitable habitat (buckwheat scrub and non-native grasslands) is present within the project site. However, the grasslands and scrub present are not associated with each other and both habitat types are surrounded by development.

Special-Status Species Summary

Species	Status	Habitat and Distribution	Activity Period	Occurrence Probability
		meters (3,000 feet) elevation. In northwestern Riverside County, known only from east of Interstate 15. Reaches its northwest limit in south Norco, southeast Riverside, and in the Reche Canyon area of Riverside and extreme southern San Bernardino Counties.		
Eumops perotis californicus **Western mastiff bat**	US: – CA: SSC	Occurs in many open, semi-arid to arid habitats, including conifer and deciduous woodlands, coastal scrub, grasslands, chaparral, etc.; roosts in crevices in vertical cliff faces, high buildings, and tunnels, and travels widely when foraging.	Year-round, nocturnal	**Low potential to occur.** Suitable habitat (buckwheat scrub) is present within the project site. However, the proposed project will not impact roosting habitat for this species.
Lepus californicus bennettii **San Diego black-tailed jackrabbit**	US: – CA: SA	Variety of habitats including herbaceous and desert scrub areas, early stages of open forest and chaparral. Most common in relatively open habitats. Restricted to the cismontane areas of Southern California, extending from the coast to the Santa Monica, San Gabriel, San Bernardino, and Santa Rosa Mountain ranges.	Year-round, diurnal and crepuscular activity	**Low potential to occur.** Suitable habitat (buckwheat scrub, non-native grassland, brittlebush scrub) is present within the project site. However, grasslands are highly disturbed and are surrounded by development.
Lasiurus xanthinus **Western yellow bat**	US: – CA: SSC	Found mostly in desert and desert riparian areas of the southwest US, but also expanding its range with the increased usage of native and non-native ornamental palms in landscaping. Individuals typically roost amid dead fronds of palms in desert oases, but have also been documented roosting in cottonwood trees. Forage over many habitats.	Year-round, nocturnal	**Not expected to occur.** No suitable habitat (desert and desert riparian areas or non-native ornamental palms) present on site or within buffer.
Onychomys torridus ramona **Southern grasshopper mouse**	US: – CA: SSC	Believed to inhabit sandy or gravelly valley floor habitats with friable soils in open and semi-open scrub, including coastal sage scrub, mixed chaparral, low sagebrush, riparian scrub, and annual grassland with scattered shrubs, preferring low to moderate shrub cover. More susceptible to small- and large-scale habitat loss and fragmentation than most other rodents, due to its low fecundity, low population density,	Nocturnal, active year-round	**Low potential to occur.** Suitable habitat (buckwheat scrub) is present within the project site.

Special-Status Species Summary

Species	Status	Habitat and Distribution	Activity Period	Occurrence Probability
		and large home range size. Arid portions of southwestern California and northwestern Baja California.		
Perognathus longimembris brevinasus **Los Angeles pocket mouse**	US: – CA: SSC	Prefers sandy soil for burrowing, but has been found on gravel washes and stony soils. Found in coastal sage scrub in Los Angeles, Riverside, and San Bernardino Counties.	Nocturnal, active late spring to early fall	**Low potential to occur.** Suitable habitat (buckwheat scrub) is present within the project site.
Taxidea taxus **American badger**	US: – CA: SSC	Primary habitat requirements seem to be sufficient food and friable soils in relatively open uncultivated ground in grasslands, woodlands, and desert. Widely distributed in North America.	Year-round	**Not expected to occur.** Suitable habitat (non-native grassland) is present within the project site. However, grasslands are highly disturbed and are surrounded by development.

US: Federal Classifications
– No applicable classification.
FE Taxa federally listed as Endangered.
FT Taxa federally listed as Threatened.
FPE Taxa federally listed as Proposed Endangered.
FPT Taxa federally listed as Proposed Threatened.
CA: State Classifications
– No applicable classification
SE Taxa State listed as Endangered.
ST Taxa State listed as Threatened.
SPE Taxa State listed as Proposed Endangered.
SPT Taxa State listed as Proposed Threatened.
SFP Taxa State listed as fully protected.
SSC California Species of Special Concern. Refers to animals with vulnerable or seriously declining populations.
SA Special Animal. Refers to any other animal monitored by the Natural Diversity Database, regardless of its legal or protection status.
1B California Rare Plant Rank 1B: Rare, threatened, or endangered in California and elsewhere.
2B California Rare Plant Rank 2B: Rare, threatened or endangered in California, but more common elsewhere.
4 California Rare Plant Rank 4: A watch list of plants of limited distribution.

APPENDIX C

ARCHAEOLOGICAL RESOURCES ASSESSMENT

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LSA

CARLSBAD
CLOVIS
IRVINE
LOS ANGELES
PALM SPRINGS
POINT RICHMOND
RIVERSIDE
ROSEVILLE
SAN LUIS OBISPO

October 16, 2024

Joseph Broadhead
Principal Water Resource Specialist
Eastern Municipal Water District
2270 Trumble Road
P.O. Box 8300
Perris, CA 92572-8300

Subject: Archaeological Resources Assessment for the Valley Boulevard Pipeline Project in Menifee, Riverside County, California (LSA Project No. EWD2101.04)

Dear Mr. Broadhead:

LSA is under contract to the Eastern Municipal Water District (EMWD) to conduct an archaeological resource assessment for the Valley Boulevard Pipeline Project (project) in Menifee (see Figure 1 provided in Attachment A). The project proposes to install 4.4 miles of 36-inch diameter, 30-inch diameter, and 18-inch diameter pipelines along Valley Boulevard from EMWD's existing Desalination Complex at 29285 Valley Boulevard to McLaughlin Road/Goetz Road in Menifee. The project alignment is depicted on the United States Geological Survey *Romoland, California* 7.5-minute topographic quadrangle map in Township 5 South, Range 3 West, Sections 17, 20, 29, and 32, San Bernardino Baseline and Meridian (see Figure 1).

RECORD SEARCH

Data from the record search conducted at the Eastern Information Center indicate there have been 61 previous studies within 0.5 mile of the project site, 12 of which (RI-00802, RI-02805, RI-02808, RI-03354, RI-04375, RI-06081, RI-06888, RI-07119, RI-09093, RI-09247, RI-09758, and RI-10161) included portions of the project area (see Records Search Results, provided in Attachment B). A total of five resources have been recorded within 0.5 mile, including three prehistoric resources (33-004223, bedrock milling and artifact scatter; 33-004486, a habitation site; and 33-012339, bedrock milling) and two historic period resources (P-33-015354, remnants of a historic period water conveyance system, and 33-028521, an extant church). The nearest resource (P-33-015354, a historic period water conveyance system) is approximately 75 meters north of the project alignment on Rouse Road. The nearest prehistoric resource is 33-012339, approximately 525 meters or 0.34 mile northwest of the Valley Boulevard portion of the project alignment.

ARCHAEOLOGICAL FIELD SURVEY

On October 1, 2024, LSA Archaeologist Chris Morgan conducted a combination windshield and intensive pedestrian survey of the project alignment. Visibility was variable but overall poor, at approximately 30 percent, with the surface obscured by vegetation (e.g., Russian thistle, mustard, telegraph weed, hare oat, etc.), construction debris, and other materials (e.g., dirt, asphalt, and concrete). Because the project alignment is located in and along segments of road rights-of-way in suburban neighborhoods, the pedestrian portion of the survey focused on the unpaved and unlandscaped portions of the project alignment. Areas of exposed soil were examined for surface artifacts and features, and rodent aprons were inspected for evidence of subsurface resources. The project alignment has been subjected to severe disturbance from road construction and previous and on-going grading, earth-moving, and weed-abatement activities. Modern construction-related and miscellaneous refuse was noted within and beyond the project alignment. Soils were alluvial sands and gravels, imported gravels, and partially compacted fill (in graded areas). No cultural resources were identified.

FINDINGS AND RECOMMENDATIONS

A cultural resources records search and a field survey were conducted for the project area. The majority of the project alignment has sustained severe, protracted disturbances from road construction and other activities, and overall sensitivity for *in situ* undocumented resources appears generally low. However, due to the proximity of multiple prehistoric resources (particularly a habitation site) and poor surface visibility, the alignment retains some potential for non-*in situ* undocumented resources that may be of local interest. Therefore, part-time archaeological monitoring and Worker's Environmental Awareness Program (WEAP) training may be considered.

If buried cultural materials are encountered during earthmoving operations associated with the project, all work in that area should be halted or diverted until a qualified archaeologist can evaluate the nature and significance of the finds and determine appropriate treatment.

In the event human remains are encountered, State Health and Safety Code Section 7050.5 states that no further disturbance shall take place 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 Native American, the County Coroner will notify the Native American Heritage Commission (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 will have the opportunity to offer recommendations for the disposition of the remains.

If you have any questions regarding this information, please contact me at rory.goodwin@lsa.net.

Sincerely,

LSA Associates, Inc.

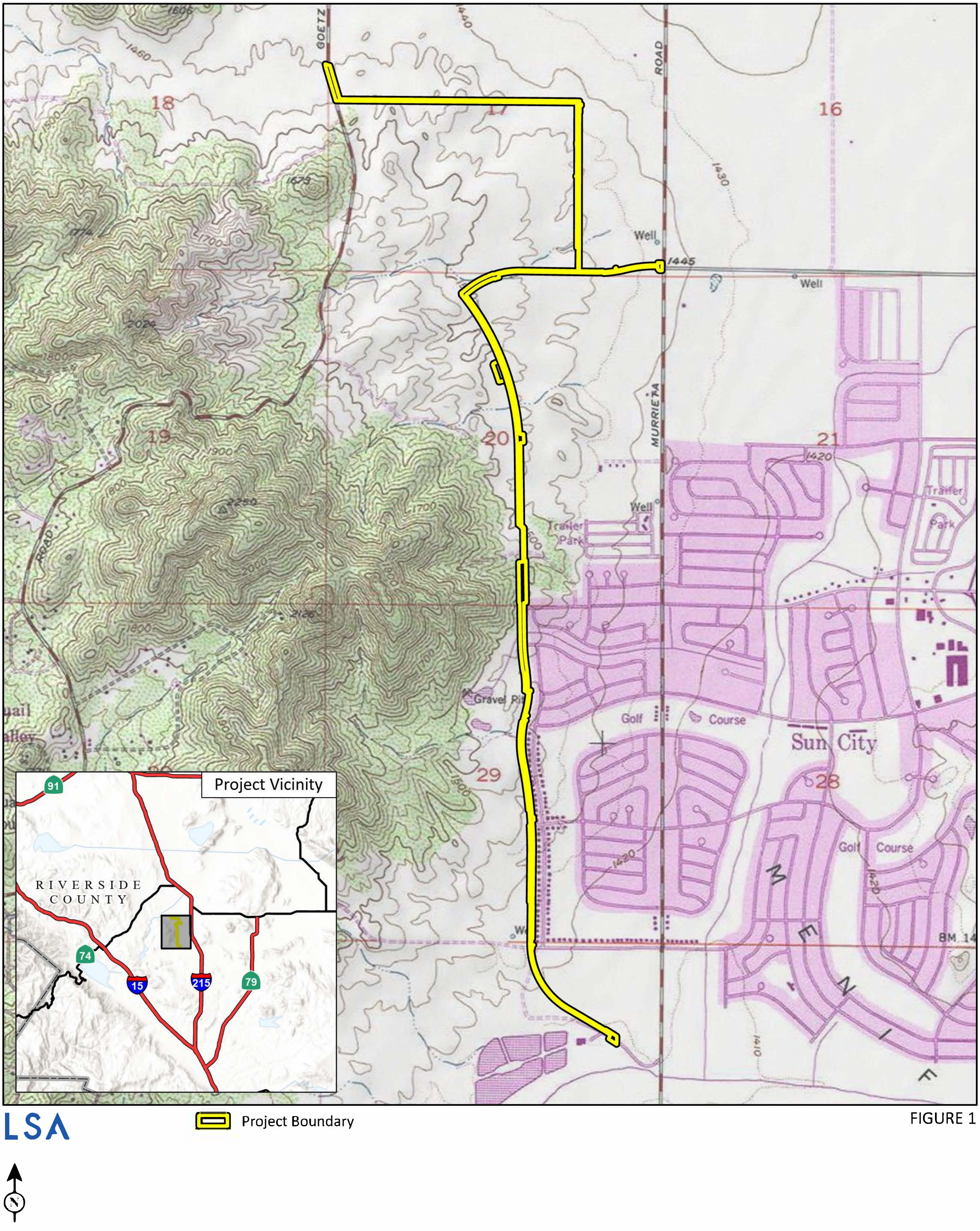
Riordan Goodwin

Riordan Goodwin, RA
Associate/Archaeologist Historian

Attachments: A – Figure 1: Project Location and Vicinity
B – Records Search Results

ATTACHMENT A

FIGURE 1: PROJECT LOCATION AND VICINITY



LSA

FIGURE 1

Valley Boulevard Potable Water Transmission Pipelines Project

Project Location and Vicinity

SOURCE: USGS 7.5' Quad - *Romoland (1979)*, CA

I:\E\EWD2101.04\GIS\Pro\Valley Boulevard Potable Water Transmission Pipelines Project\Valley Boulevard Potable Water Transmission Pipelines Project.aprx (10/15/2024)

ATTACHMENT B

RECORDS SEARCH RESULTS

Report List

Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
RI-00076	NADB-R - 1080090; Voided - MF-0069	1978	La Verna A. Brown	An Archaeological, Historical and Cultural Resources Assessment For Tract 12738, Sun-City Perris Area	Brown and Associates, Eigemont, CA	
RI-00390	NADB-R - 1080437; Voided - MF-0341	1979	Christopher E. Dover	A Spatial Evaluation of Prehistoric Resources: A Proposed Subdivision--Tentative Parcel Map 13384 Goetz Road North of Quail Valley, Riverside County, Califonia	Esgate, Lansing & Associatesm San Bernadino, CA	33-001557
RI-00592	NADB-R - 1080634; Submitter - 476; Voided - MF-0518	1979	Ken Daly	Environmental Impact Evaluation: An Archaeological Assessment of Tentative Parcel 14619, Western Riverside County, California	Archaeological Research Unit, U.C. Riveside	
RI-00759	NADB-R - 1080811; Other - 776; Voided - MF-0681	1980	Stephen Bouscaren	Cultural Resources Assessment Parcel Map 15131, Riverside County	San Bernardino County Museum Association, Redlands, CA	
RI-00760	NADB-R - 1080812; Voided - MF-0682	1980	Stephen Bouscaren	Cultural Resources Assessment Parcel Map No. 15080 Riverside County	San Bernardino County Museum Association, Redlands, CA	
RI-00802	NADB-R - 1080854; Voided - MF-0723	1980	Larry L. Bowles and Jean A. Salpas	An Archaeological Assessment of Parcel 16265	Archaeological Consultant	
RI-01237	NADB-R - 1081398; Voided - MF-1231	1980	Robert J. Wlodarski and John M. Foster	Cultural Resource Overview for The Devers Substation to Serrano Substation Transmission Route Alternatives Corridor Right-of-Way	Greenwood and Associates, Pacific Palisades, CA	33-001836, 33-001837
RI-02184	NADB-R - 1082611; Submitter - 918; Voided - MF-2370	1987	MCCARTHY, DANIEL F.	AN ARCHAEOLOGICAL ASSESSMENT OF TENTATIVE PARCEL 22745 LOCATED SOUTH OF SUN CITY IN WESTERN RIVERSIDE COUNTY, CALIFORNIA	ARCHAEOLOGICAL RESEARCH UNIT, U.C. RIVERSIDE	
RI-02284	NADB-R - 1082721; Voided - MF-2477	1987	DEL CHARIO, KATHLEEN C.	ARCHAEOLOGICAL ASSESSMENT OF TT 22488, NEAR SUN CITY, RIVERSIDE COUNTY, CALIFORNIA	ARCHAEOLOGICAL RESOURCE MANAGEMENT CORPORATION	33-004223
RI-02468	NADB-R - 1082961; Voided - MF-2700	1989	ROMANO, MELINDA	AN ARCHAEOLOGICAL ASSESSMENT OF APPROXIMATELY 160 ACRES OF LAND, PROPOSED BY THE GARY COOK CORPORATION, LOCATED SOUTH OF THE CITY OF PERRIS, RIVERSIDE COUNTY, CALIFORNIA	HATHEWAY AND MCKENNA	

Report List

Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
RI-02802	NADB-R - 1083409; Voided - MF-3003	1990	DROVER, CHRISTOPHER E.	AN ARCHAEOLOGICAL ASSESSMENT OF TENTATIVE TRACT 24617 SUN CITY, RIVERSIDE COUNTY, CALIFORNIA	AUTHOR	
RI-02803	NADB-R - 1083410; Voided - MF-3004	1990	DROVER, CHRISTOPHER E.	AN ARCHAEOLOGICAL ASSESSMENT OF TENTATIVE TRACT 25529 SUN CITY, RIVERSIDE COUNTY, CALIFORNIA	AUTHOR	
RI-02804	NADB-R - 1083411; Voided - MF-3005	1990	DROVER, CHRISTOPHER E.	AN ARCHAEOLOGICAL ASSESSMENT OF TENTATIVE TRACT 25530 SUN CITY, RIVERSIDE COUNTY, CALIFORNIA	Consulting Archaeologist, Tustin, CA	
RI-02805	NADB-R - 1083412; Voided - MF-3006	1990	DROVER, CHRISTOPHER E.	AN ARCHAEOLOGICAL ASSESSMENT OF TENTATIVE TRACT 25316 RIVERSIDE COUNTY, CALIFORNIA	AUTHOR	
RI-03189	NADB-R - 1083751; Other - 89-90; Voided - MF-3408	1990	PEAK AND ASSOCIATES and Brian F. Mooney Associates	CULTURAL RESOURCES ASSESSMENT OF AT&T'S PROPOSED SAN BERNARDINO TO SAN DIEGO FIBER OPTIC CABLE, SAN BERNARDINO, RIVERSIDE AND SAN DIEGO COUNTIES, CALIFORNIA	PEAK AND ASSOCIATES & BRIAN F. MOONEY ASSOCIATES	
RI-03259	NADB-R - 1083850; Voided - MF-3491	1991	WHITE, ROBERT S.	AN ARCHAEOLOGICAL ASSESSMENT OF TENTATIVE TRACT 26482, A 5.0-ACRE PARCEL LOCATED ADJACENT TO HULL STREET IN SUN CITY, RIVERSIDE COUNTY	ARCHAEOLOGICAL ASSOCIATES, LTD.	
RI-03346	NADB-R - 1083964; Voided - MF-3585	1991	KELLER, JEAN A.	AN ARCHAEOLOGICAL ASSESSMENT OF TENTATIVE TRACT MAP 26781, 4.8 ACRES OF LAND NEAR SUN CITY, RIVERSIDE COUNTY, CALIFORNIA, USGS ROMOLAND, CALIFORNIA QUADRANGLE, 7.5' SERIES	AUTHOR	
RI-03354	NADB-R - 1083982; Voided - MF-3593	1991	Christopher E. Drover, PhD.	A Cultural Resource Inventory: Goetz Road Project, Tract 25745, Riverside County, California	Christopher E. Drover, PhD.	33-004486
RI-04223	NADB-R - 1085430; Voided - MF-4695	1998	GRENDA, DONN R.	PHASE I CULTURAL RESOURCES INVESTIGATIONS OF MENIFEE MEMORIAL PARK, SUN CITY, CALIFORNIA.	STATISTICAL RESEARCH INC.	
RI-04375	NADB-R - 1085687; Voided - MF-4872	1999	WHITE, ROBERT S. and LAURIE S. WHITE	AN ARCHAEOLOGICAL ASSESSMENT OF THE EASTERN MUNICIPAL WATER DISTRICT MENIFEE DESALTER PROJECT, SUN CITY AND MENIFEE, RIVERSIDE COUNTY.	L & L ENVIRONMENTAL, INC., Corona, CA	33-001029

Report List

Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
RI-04404	NADB-R - 1085736; Voided - MF-4913	2000	JONES AND STOKES ASSOCIATES, INC.	FINAL CULTURAL RESOURCES INVENTORY REPORT FOR THE WILLIAMS COMMUNICATIONS, INC., FIBER OPTIC CABLE SYSTEM INSTALLATION PROJECT, RIVERSIDE TO SAN DIEGO, CALIFORNIA VOL I-IV.	JONES AND STOKES ASSOCIATES, INC.	33-000816, 33-000817, 33-000862, 33-001845, 33-002970, 33-003081, 33-003839, 33-004202, 33-004624, 33-004744, 33-004768, 33-007587, 33-007601, 33-008105, 33-008172, 33-009772, 33-009773, 33-009774, 33-009775, 33-009776
RI-04422	NADB-R - 1085770; Submitter - ADV-02-100; Voided - MF-4931	2002	DICE, MICHAEL and LESLIE NAY IRISH	A PHASE I ARCHAEOLOGICAL RESOURCE SURVEY REPORT FOR APN #331-040-042, LOCATED NORTH OF SUN CITY, COUNTY OF RIVERSIDE, CALIFORNIA	L&L ENVIRONMENTAL, INC.	
RI-04920	NADB-R - 1086282; Submitter - EHI-04-476	2004	HOOVER, ANNA M, KRISTIE R. BLEVINS, and HUGH WAGNER	A PHASE I ARCHAEOLOGICAL AND PALEONTOLOGICAL SURVEY REPORT FOR TRACT 32314, LOCATED SOUTH OF THORNTON ROAD, SUN CITY, COUNTY OF RIVERSIDE, CALIFORNIA	L&L ENVIRONMENTAL, INC.	
RI-05241	NADB-R - 1086604	2004	DICE, MICHAEL, and MARNIE VIANNA	AN ARCHAEOLOGICAL SURVEY AND PALEONTOLOGICAL RECORDS SEARCH ON APN #330-210-003, -008 AND #300-210-004, -005, NORTH SUN CITY, COUNTY OF RIVERSIDE, CA	MICHAEL BRANDMAN ASSOCIATES	
RI-05404	NADB-R - 1086767; Submitter - CRM TECH Contract #704	2001	LOVE, BRUCE, BAI TOM TANG, DANIEL BALLESTER, and MELISSA HERNANDEZ	HISTORICAL/ARCHAEOLOGICAL RESOURCES SURVEY REPORT, SUN CITY ASSISTED LIVING COMMUNITY, VALLEY BOULEVARD, SUN CITY, RIVERSIDE COUNTY, CA	CRM TECH, Riverside, CA	
RI-06018	NADB-R - 1087381; Submitter - 1104	2003	Bai Tang, Michael Hogan, Mariam Dahdul, and Daniel Ballester	Historical/Archaeological Resources Survey Report: Menifee Valley North Drainage Facilities Project, In and Near the Communities of Romoland and Homeland, Riverside County, California	CRM TECH	
RI-06470	NADB-R - 1087835; Submitter - CONTRACT #1659	2005	TANG, BAI, MICHAEL HOGAN, CASEY TIBBET, and DANIEL BALLESTER	HISTORICAL/ARCHAEOLOGICAL RESOURCES SURVEY REPORT, THE EAGLE CREST PROJECT, TENTATIVE TRACT MAP 34037, NEAR THE CITY OF PERRIS, RIVERSIDE COUNTY, CA	CRM TECH	
RI-06581	NADB-R - 1087948; Submitter - CRM TECH Contract #1891	2006	Michael Hogan	Letter Report: Addendum to Historical/Archaeological Resources Survey Report, The Eagle Crest Project, Tentative Tract Map 34037, Near the City of Perris, Riverside County, California	CRM TECH	

Report List

Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
RI-06582	NADB-R - 1087949; Submitter - CRM TECH Contract #1659	2005	Michael Hogan	Letter Report: Addendum to Historical/Archaeological Resources Survey Report, The Eagle Crest Project, Tentative Tract Map 34037, Near the City of Perris, Riverside County, California	CRM TECH	
RI-06888	Submitter - 06-63	2006	Lerch, Michael K. and Gray, Marlesa A.	Cultural Resources Assessment of the Valley-Ivyglen Transmission Line Project, Riverside County, California	Statistical Research, Inc.	33-015346, 33-015347, 33-015348, 33-015349, 33-015350, 33-015351, 33-015352, 33-015353, 33-015354, 33-015355, 33-015356, 33-015357, 33-015358, 33-015359, 33-015360, 33-015361, 33-015362, 33-015363, 33-015364, 33-015365, 33-015375, 33-015376, 33-015377, 33-015378, 33-015379, 33-015380, 33-015416, 33-015417, 33-015418, 33-015419, 33-015420, 33-015422, 33-015423, 33-015424, 33-015425, 33-015427
RI-06988		2006	Glenn, Brian K.	Cultural Resources Assessment: 12.54-Acre Jacaranda Park Project Area, Community of Sun City, Riverside County, California	BonTerra Consulting, Costa Mesa, CA	
RI-07119		2007	Kyle, Carolyn E.	Cultural Resource Survey for the Murrieta Road Widening Project, Riverside County, California	Kyle Consulting	
RI-08065		2009	Wayne H. Bonner and Arabesque Said	Letter Report:Cultural Resource Records Search and Site Visit Results for Royal Street Communications California, LLC Candidate LA3148A (Sun City Bible), 26815 Murietta Road, Romoland, Riverside County, California	Michael Brandman Associates, Irvine and San Bernardino	
RI-08101	Submitter - 1364	2006	McCormick, Steven and Sherri Gust	Archaeological and Paleotolgical Resources Assessment Report For The Green Valley Project, Perris, California	Cogstone Resource Management Inc.	33-007705
RI-08396		2010	Joan George and Dennid McDougall	Cultural Resources Report for the Sun City Force Main and Recycled Water Project, Riverside County, California.	Applied EarthWorks, Inc.	
RI-08699	Submitter - IE24256-B	2011	Wayne H. Bonner and Sarah A. Williams	Cultural Resources Record Search and Site Visit Results for T-Mobile USA Candidate IE24256-B	Michael Brandman Associates	

Report List

Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
RI-08887	Submitter - Contract No. 2637A	2012	Bai "Tom" Tang, Michael Hogan, Terri Jacquemain, Jay K. Sander, Daniel Ballester, and Nina Gallardo	The Van Daele Project	CRM TECH	
RI-09093		2014	Michael Hotgan	Addendum to Phase I Cultural Resources Assessment: Tentative Tract Map No. 36658 (Off-site Improvements) City of Menifee, Riverside County, California CRM TECH Contract No. 2802	CRM TECH	
RI-09136		2013	Robert Ramirez and Kevin Hunt	Archaeological Resources Study for the Santiara Development Project, City of Menifee, Riverside County, California	Rincon Consultants	
RI-09247		2014	B. Tom Tang	Second Addendum to Phase I Cultural Resources Assessment Tentative Tract Map No. 36658 (Off-site Improvements) Ciy of Menifee, Riverside County, California CRM TECH Contract No. 2867A	CRM TECH	
RI-09565		2015	Gabriel Ocampo	Del Monte/ Ensite #25659 (290556)	EBI Consulting	
RI-09758		2015	Hannah Haas, Robert Ramirez, and Kevin Hunt	Eastern Municipal Water District Perris II Brackish Groundwater Desalter Project	Rincon Consultants	
RI-09929		2005	Wayne H. Bonner and Marnie Aislin-Kay	Cultural Resource Records Search and Site Visit Results for Cingular Telecommunications Facility Candidate RS-0153-02 (Mardin), 26510 Murrieta Road, Sun City, Riverside County, California	Michael Brandman Associates	
RI-10161		2016	Tria Maria Belcourt	Phase 1 Cultural Resources Assesment: Tadis Homes 21 Lot Residential Development Project City of Menifee, Riverside County, California	Material Culture Consulting	
RI-10237		2015	Heather Puckett	Cultural Resources Summary for the Proposed Verizon Wireless, Inc., Property at the Faith Site, 28200 Portsmouth Drive, Sun City, Riverside County, California 92586	Tetra Tech	
RI-10288		2017	TRACY A. STROPES and BRIAN F. SMITH	A CLASS III ARCHAEOLOGICAL STUDY FOR THE TRACT 28859 PROJECT FOR SECTION 106 COMPLIANCE, RIVERSIDE COUNTY, CALIFORNIA	BRIAN F. SMITH AND ASSOCIATES, INC.	

Report List

Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
RI-10297		2017	Carrie D. Wills and Sarah A. Williams	Cultural Resource Records Search and Site Visit Results for TowerCom, LLC Candidate 'Goetz', 26704 Murrieta Road, Romoland, Riverside County, California	Helix Environmental Planning	
RI-10308	Submitter - BRIAN F. SMITH AND ASSOCIATES	2017	TRACY A. STROPES and BRIAN F. SMITH	A CLASS III ARCHAEOLOGICAL STUDY FOR THE TRACT 28859 PROJECT FOR SECTION 106 COMPLIANCE	BRIAN F. SMITH & ASSOCIATES, INC.	
RI-10656		2015	Don C. Perez	Cultural Resources Survey Goetz/ Ensite #23080 (283473)	EBI Consuling	
RI-10665	Other - IE25527B	2010	Wayne H. Bonner and Arabesque Said	Culltural Resource Records Search and Site Visit Results for T-Mobile USA candidate IE25527B (Re-Science), 26805 Murrieta Road, Sun City Riverside County, California	Michael Brandman Associates	
RI-10810		2019	Andrew J. Garrison and Brian F. Smith	A PHASE 1 CULTURAL RESOURCES ASSESSMENT FOR THE NAVARRO APARTMENTS PROJECT	Brian F. Smith and Associates, Inc.	
RI-10909		2023	David Brunzell, Doug Kazmier, and Timothey Blood	Phase I Cultural Resources Assessment for the Northen Gateway Commerce Center III Project, City of Menifee, Riverside County, California	BCR Consulting LLC	
RI-10914		2022	David Brunzell	Phase 1 Cultural Resources Assessment Coronado Condos Project City of Meniee, Riverside County, California	BCR Consutling LLC	
RI-10916		2023	David Brunzell and Joseph Orozco	Phase 1 Cultural Resources Assessment Wheat Street Project (APN: 330-180-012) City of Menifee, Riverside County, California	BCR Consutling LLC	
RI-10919		2022	David Brunzell	Phase 1 Cultural Resources Assessment CADO Project City of Menifee, Riverside County, California	BCR Consulting LLC	
RI-10937		2023	David Brunzell and Joesph Orozco	Phase I Cultural Resources Assessment for the Corsca Project (APNS: 330-180-006; 010; 029; and 046), City of Menifee, Riverside County, California	BCR Consulting LLC	
RI-10967	Other - KIM2123	2022	David Brunzell	Phase 1 Cultural Resources Assessment Northern Gateway Commerce Centers I & II Project City of Menifee, Riverside County, California	BCR Consulting LLC	

Report List

Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
RI-11050		2018	Bai Tang and Michael Hogan	Historic-Period Building Evaluation, Kingdom Hall of Jehovah's Witnesses, 29101 Del Monte Drive, City of Menifee, Riverside County, California	CRM Tech	
RI-11227		2010	John J. Killeen	Cultural Resources Survey of a New Alignment for the Water Supply Desalination Infrastructure, South Perris I Brine Line Project		
RI-11228		2007	John J. Killeen	Cultural Resources Survey for the Water Supply Desalination Infrastructure, South Perris, I Brine Line Project		
RI-11281		2020	Todd A. Wirths and Brian F. Smith	Results of Archaeological and Paleontological Monitoring at the Oak Hills 161/Sky View Project (Tract No. 28859), City of Menifee, County of Riverside, California (Negative Cultural Resources Monitoring Report)	Brian F. Smith and Associates, Inc.	

APPENDIX D

DESKTOP GEOTECHNICAL/GEOLOGICAL REVIEW

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DESKTOP GEOTECHNICAL/GEOLOGY REVIEW EASTERN MUNICIPAL WATER DISTRICT VALLEY BOULEVARD POTABLE WATER TRANSMISSION PIPELINES MENIFEE, CALIFORNIA

Prepared For

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Project No. 13822.001

April 26, 2023

April 26, 2023

Project No. 13822.001

STANTEC CONSULTING SERVICES INC.
9797 Aero Drive, Suite 310
San Diego, CA 92123-1898

Attention: Ms. Nita Kazi

Subject: Desktop Geotechnical/Geology Review
Eastern Municipal Water District (EMWD)
Valley Boulevard Potable Water Transmission Pipelines
Menifee, California

In accordance with your authorization and per our proposal dated September 22, 2022, we completed our geotechnical/geology review of the proposed alignments. This report summarizes our findings and presents our preliminary opinions regarding the potential geotechnical/geologic constraints associated with this project. The results of our review indicate that the constructability of the proposed pipeline is considered feasible from a geotechnical perspective and comparable to similar pipeline construction projects in this area. However, our preliminary findings and conclusions included in this report will be further verified and confirmed during the planned geotechnical exploration.

If you have any questions regarding this report, please do not hesitate to contact the undersigned. We appreciate this opportunity to be of service on this project.

Respectfully submitted,

LEIGHTON CONSULTING, INC.

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1.0 EXECUTIVE SUMMARY

Based on our review of published geologic hazard maps and in-house data, combined with our field observations from a limited site reconnaissance, the constructability of the proposed pipeline is considered feasible from a geotechnical perspective. A summary of the main geologic/geotechnical findings or factors that may affect the design and constructability of the proposed pipelines is as follows:

- Trench excavation should generally be feasible with heavy-duty conventional excavators in good working condition. However, locally difficult to very difficult excavation may be encountered along some portions of the alignment due to shallow granitic and metamorphic rock (generally near the intersection of Valley Boulevard and McLaughlin Road and along Valley Boulevard near McCall) depending on depth of pipeline or proposed excavation.
- Groundwater is not expected along most of the alignment within the anticipated depth of pipeline (shallower than 10 feet). However, groundwater seepage or saturated alluvium may be encountered crossing local drainage areas and bedrock formation.
- Existing alluvial soils and/or artificial fill along alignment should be considered as OSHA soil Type C unless shallow bedrock is encountered. Shored excavation should be anticipated.
- Actual subsurface exploration is currently underway to confirm our preliminary findings in this report and provide pertinent geotechnical/geologic information for proper design and construction of the proposed pipeline.

2.0 INTRODUCTION

2.1 Purpose and Scope

The purpose of this desktop review was to evaluate the geotechnical/geologic conditions based on our in-house and published data and discuss potential geotechnical/geologic concerns and factors that may impact the design and constructability of the proposed pipeline. The scope of work included the following activities:

- ***Desktop Review:*** Review of relevant published geologic reports/maps (see references.).
- ***Site Reconnaissance:*** Perform a limited site reconnaissance along critical portions of the alignment to observe surface/geologic conditions.
- ***Report*:** Preparation of this report presenting overall geologic conditions within the proposal alignment limit such as site geology, anticipated groundwater depth, active faulting, etc.

2.2 Pipeline Location and Project Description

Based on information provided, we understand that the project will improve pipeline conveyance capacity north of the District's Desalination Complex along the western side of the Perris Valley 1627 Pressure Zone and will support the future Goetz Road Tank operation. The proposed potable water transmission pipeline is generally located within the Rights-Of-Way's (ROW) of Valley Boulevard, Byers Road, McLaughlin Road, Rouse Road and Geary Street as depicted on Figure 1, *Site Location Map*. The surrounding areas along the proposed pipeline generally consist of residential homes and commercial developments. The pipeline begins at EMWD Desalter II site and runs northerly within Valley Boulevard ROW to Rouse Road then east on Rouse Road to a tie in point along Murrieta Road. The pipeline will also continue north from Rouse Road to McLaughlin Road along either Byers Road or Geary Street, then continue west along McLaughlin Road to a tie in point along Goetz Road. The pipeline alignment is located mostly within the City of Menifee, California, with a small segment on Goetz Road located within the City of Perris, California (See Figure 1). Site topography is generally sloping to the south toward Salt Creek in the southern portion of the alignment and relatively flat north of McCall Boulevard. Valley Boulevard is fully developed along most of the alignment (2 lanes in each direction) and narrows to one lane in each direction north of McCall Boulevard. Rouse Road is also fully developed residential street. McLaughlin Road is a residential dirt road along most of the alignment being paved east of Calle Emiliano. Geary Street is an unimproved dirt road.

2.3 Site Geology

As shown on Figure 2, *Regional Geology Map*, the proposed alignment is generally underlain by the following geologic units, which are briefly described below in increasing geologic age:

- **Artificial Fill (not a mapped unit):** Artificial fills are generally referred to as undocumented fills or engineered (documented) fills. Undocumented fills are typically those fills that were placed without the review and testing of a geotechnical consultant. Engineered fills are those fills that were observed and tested by a geotechnical consultant. Most artificial fills along the alignment are expected to be documented, relatively shallow, and placed during construction of existing public roads and recent grading for Tract 36658 (Cimarron Ridge). The engineering characteristics and vertical or horizontal extent of these fills may vary and will require actual field verification.

- **Older Fan Deposits (map symbol Qof):** As indicated on Figure 2, these alluvial valley deposits are expected within the southern portion of the alignment or within the desalter complex. These deposits generally consist of sandy, silty, or clay-bearing alluvium. The engineering characteristics and vertical or horizontal extent of these materials will be verified during our planned subsurface exploration.

- **Very Old Fan Deposits (map symbol Qvof):** These very older alluvial fan deposits are anticipated to be encountered along most of the alignment. The older fan deposits are late to middle Pleistocene in age and generally consist of silty and clayey sands with varying amounts of gravel. These deposits are generally medium dense to dense, indurated and may contain thin younger alluvial deposits near the surface.

- **Cretaceous-Aged Granitic Rock (map symbol gr):** Granitic bedrock will be encountered in the northern portion of the alignment; especially at the intersection of Valley Boulevard and McLaughlin Road. This overall granitic rock unit in this area is relatively uniform, massive granodiorite grading into tonalite. This granitic bedrock will vary in hardness and density depending on depth. However, it is expected to be highly weathered in the upper 5 to 10 feet BGS. The rock hardness will be further verified during our planned geotechnical exploration. Due to recent grading within Tract 36658, granitic rock is expected to be exposed or at very shallow depth along the norther portion of Valley Boulevard.

- ***Metamorphic bedrock***: The metasedimentary rocks are expected along relatively small portions of Valley Boulevard, especially near the intersection with McCall Boulevard. This rock typically consist of fine to medium-grained, highly fractured, thinly foliated quartzite, schists and phyllites. The metamorphic bedrock also contains resistant layered quartzite units that formed the ridge lines and outcroppings. The metamorphic rock is locally intruded by granitic rock. More resistant quartzite will require heavy ripping and possible local rock breaking/chipping at depth and should be verified further during our planned geotechnical exploration.

2.4 Groundwater

Groundwater is not expected to be encountered along the alignment within planned shallow pipeline depths. However, depending on rainfall and seasonal variation, shallow groundwater (20 feet or shallower BGS) may exist within the alluvial valley deposits at the desalter complex. Historic groundwater data recorded in a nearby EMWD well #11141 (California DWR, 2020) indicates groundwater to exist at elevation 1365.2 msl. In addition, a recent geotechnical study for the Murrieta Road Transmission Pipeline (Leighton, 2020) groundwater was encountered at depth of approximately 22 feet BGS, north of the Salt Creek Channel.

3.0 SEISMIC CONDITIONS / FAULTING

3.1 General

The proposed alignment, like the rest of Southern California, is located within a seismically active region as a result of being located near the active margin between the North American and Pacific tectonic plates. Based on published data, the most significant known active Fault Zones that are capable of seismic ground shaking and can impact the proposed pipelines are the adjacent Elsinore Fault Zones.

3.2 Fault Rupture

The proposed pipeline alignment is not located within a County and State designated fault hazard zone.

3.3 Ground Shaking

The intensity of earthquake ground shaking along the alignment will vary from one location to another depending primarily upon the distance to the fault, the magnitude of the earthquake, and the site-specific geology. The effect of seismic shaking along the alignment will be further evaluated based on our planned geotechnical exploration.

3.4 Secondary Seismic Hazards

Ground shaking can induce “secondary” seismic hazards such as liquefaction and/or dynamic settlement, lateral spreading, landslides, and rock falls.

3.4.1 Dynamic Settlement / Liquefaction

Liquefaction of saturated cohesionless soils can be caused by strong ground motion resulting from earthquakes. Soil liquefaction is a phenomenon in which saturated, cohesionless soils lose their strength due to the build-up of excess pore water pressure during cyclic loading such as that induced by earthquakes. The primary factors affecting the liquefaction potential of deposit are: 1) intensity and duration of earthquake shaking, 2) soil type and relative density, 3) overburden pressures, and 4) depth to groundwater. Soils most susceptible to liquefaction are clean, loose, uniformly graded, fine-grained sands, and non-plastic silts that are saturated. As such, saturated sandy alluvial deposits in the vicinity of the Desalter plant may be susceptible to liquefaction hazard. Appropriate mitigation measures such as flexible joints and shut-off valves are typically implemented to reduce pipeline damage in the event of liquefaction.

3.4.2 Lateral Spreading

The phenomenon of liquefaction may also produce lateral spreading of soils adjacent to a body of water or slopes. Lateral spreading is therefore considered as a liquefaction-induced ground failure whereby block(s) of surficial intact natural or artificial fill soils displace laterally downslope or towards a free face along a shear zone that has formed within the liquefied sediment. To reduce the effects or magnitude of lateral spreading, remedial grading measures or ground improvement techniques are normally implemented. This potential for this hazard is considered very low along the proposed alignment.

3.4.3 Landslides

Based on limited site review and published geologic maps, this hazard is considered non-existent along the proposed alignment.

3.4.4 Rock Fall Hazards

Based on our site review, this hazard is also considered non-existent along the proposed alignment.

4.0 GENERAL CONCLUSIONS AND RECOMMENDATIONS

The results of our review indicate that the construction of the proposed pipelines is considered feasible from a geotechnical perspective provided the findings and conclusions presented in this report are further evaluated and verified in our next phase of our geotechnical exploration. The main geotechnical concern related to constructability of this pipeline is the presence of granitic and metamorphic rocks along portions of the alignment. These rock formations will vary in hardness and density depending on depth and location. However, they are expected to be highly weathered and generally excavatable within the upper 5 to 10 feet BGS, excluding any resistant, non-weathered core-stones exist within this shallow depth. Harder excavation is expected along Valley Boulevard north of McCall Boulevard based on conversations with contractor installing another pipeline. In summary, the following should be considered from excavation characteristics and constructability viewpoint:

- **Valley Blvd to McLaughlin Rd**: Shallow granitic rock should be expected north of McCall Boulevard and north of Rouse Blvd, especially in cut areas resulting from recent grading as part of Tract 36658.
- **Byers Rd, Geary St and Rouse Rd**: These alignments are likely to avoid excavation in shallow granitic rock.
- **McLaughlin Rd:** Shallow granitic rock should be expected near the intersection and west of Byers Road both below existing fill and in deeper cut areas.

4.1 Temporary Excavations

Existing alluvial soils and or artificial fill along portions of the alignment should be considered as OSHA soil Type C. Therefore, unshored temporary cut slopes should be no steeper than 1½:1 (horizontal:vertical), for a height no-greater-than (≤) 20 feet (*California Construction Safety Orders*, Subchapter 4, Section 1541.1). During construction, exposed earth material conditions should be regularly evaluated to verify that conditions are as anticipated. The contractor should be responsible for providing the "competent person" required by OSHA standards to evaluate soil conditions. Close coordination between the competent person and geotechnical consultant should be maintained to facilitate construction while providing safe excavations.

4.2 Temporary Shoring

If open cut excavation is not feasible based on requirements above and due to existing structures, excavations for the proposed pipelines should be supported by a temporary shoring system such as cross-braced hydraulic shoring, conventional shields, sheet piles, soldier piles and wood lagging. The choice should be left to the contractor's judgment since economic considerations and/or the individual contractor's construction experience may determine which method is more economical and/or appropriate. The contractor and shoring designer should also perform additional geotechnical studies as necessary to refine the means-and-methods of shoring construction.

4.3 Dewatering during Trenching and Pipeline Construction

Based on the results of this limited review, groundwater may be encountered at shallow depth within onsite alluvium, mainly at the south end of project (at ~23 feet or shallower near connection with desalter complex). This condition will be further evaluated and verified in our next phase of geotechnical exploration. If encountered, dewatering will be required to limit instability of the pipeline trench. Dewatering or any other suitable method for stabilizing excavation bottom may be selected by the contractor based on actual groundwater conditions encountered and based on the contractor's chosen means-and-methods of construction. The selected method by the contractor should be able to effectively mitigate for bottom heave or stabilize subgrade soils during construction/ backfilling.

4.4 Trenchless Excavation / Bore-and Jack

Trenchless excavation and/or jack-and-bore operation is feasible from a geotechnical perspective along the alignment. Difficult boring conditions should be expected in areas of granitic and metamorphic bedrock. However, further studies should be performed to verify geologic conditions at such locations.

4.5 Additional Geotechnical Services

As discussed previously in this report, additional studies (site-specific borings) will be required to further verify the general findings in this report and provide pertinent geotechnical/geologic information for proper design and construction of the proposed pipelines. These additional studies are expected to include a site-specific field explorations (geotechnical borings), and appropriate laboratory testing on representative soils samples to generate basis for design and construction recommendations.

5.0 LIMITATIONS

This report was based primarily upon data obtained from a review of available published date and limited information and observations. Such information is necessarily incomplete. It is understood that site-specific subsurface geotechnical data is necessary for future phases of development. The nature of many sites is such that differing characteristics can be experienced within small distances and under various climatic conditions. This report was prepared in accordance with generally accepted geologic and geotechnical engineering practices at this time in California. No warranty is expressed or implied.

This report was prepared solely for our client for the proposed pipeline alignment. This report is not authorized for use by, and is not to be relied upon by any party except our client with whom Leighton Consulting, Inc. has contracted for the work. Use of or reliance on this report by any other party is at that party's risk. Unauthorized use of or reliance on this report constitutes an agreement to defend and indemnify Leighton Consulting, Inc. from and against any liability which may arise as a result of such use or reliance, regardless of any fault, negligence, or strict liability of Leighton Consulting, Inc.

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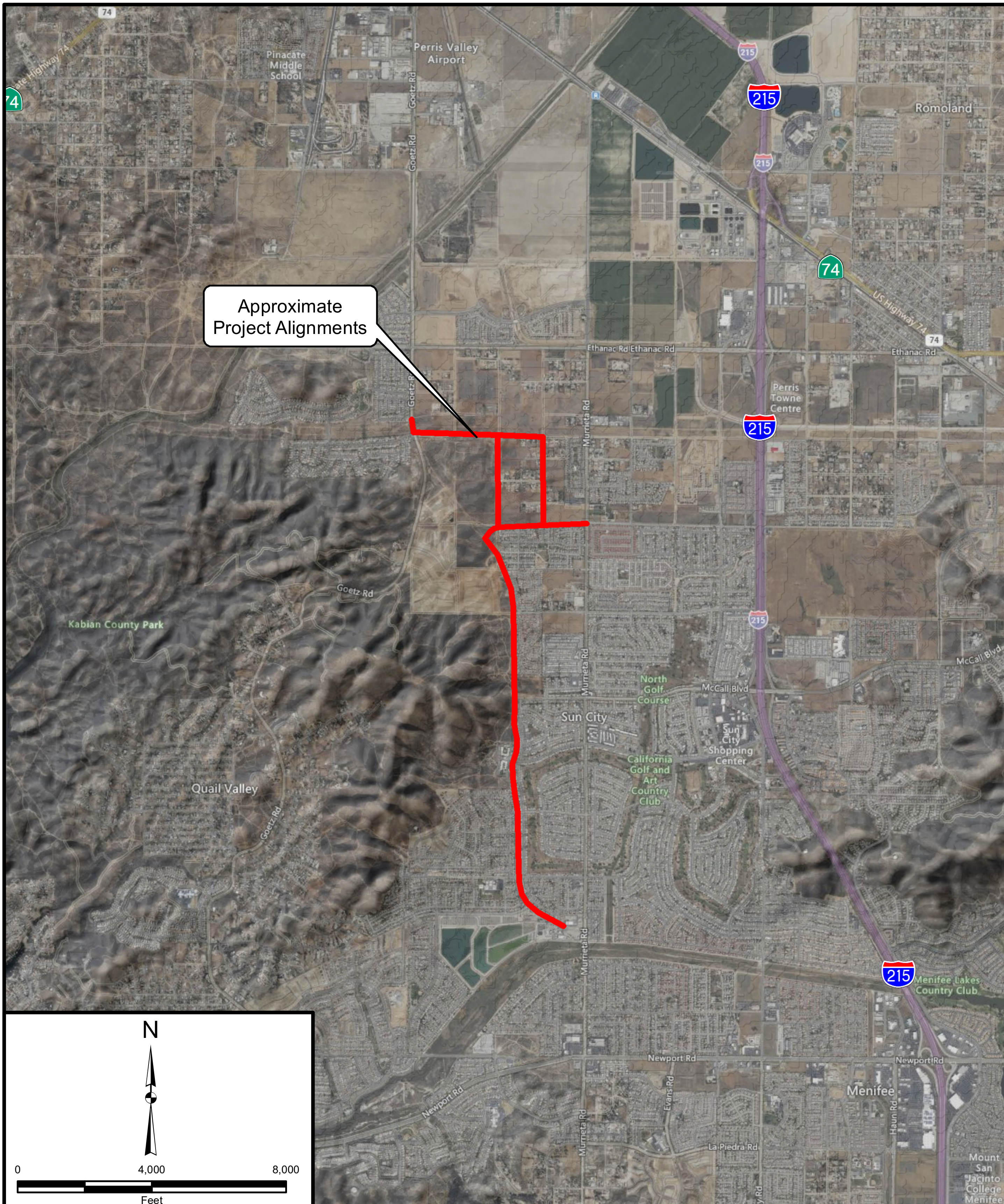

Project: 13822.001	Eng/Geol: SIS/JTD
Scale: 1 " = 4,000 '	Date: August 2023

Base Map: ESRI ArcGIS Online 2023

Author: Leighton Geomatics (btran)

SITE LOCATION MAP

Valley Boulevard Potable Water
Transmission Pipelines
Menifee, California

FIGURE 1

Leighton

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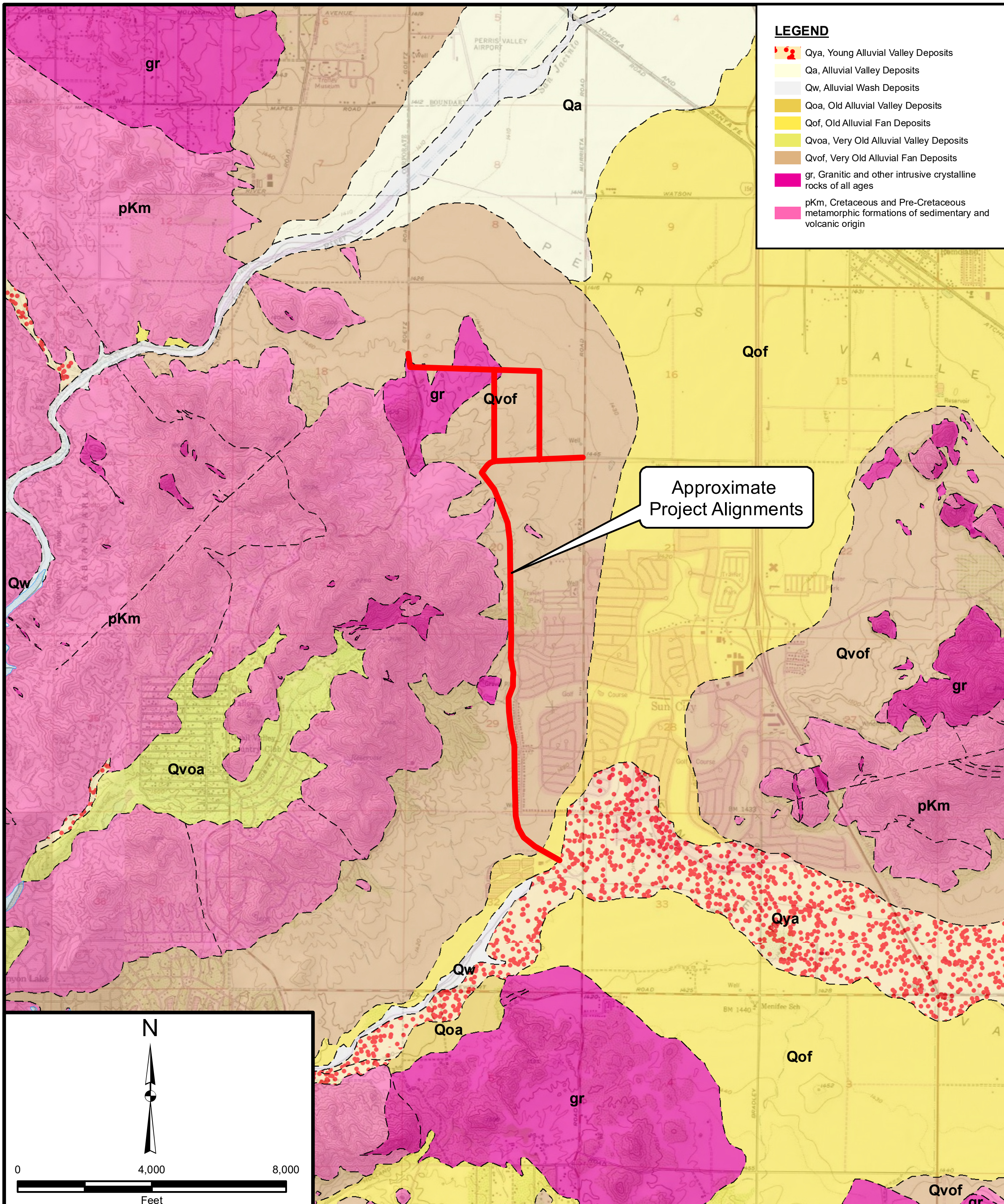

Project: 13822.001	Eng/Geol: SIS/JTD
Scale: 1 " = 4,000 '	Date: August 2023

Reference:
Geologic Map of The San Bernardino and Santa Ana Quadrangles, California by Douglas M. Morton and Fred K. Miller, 2006

REGIONAL GEOLOGY MAP

Valley Boulevard Potable Water Transmission Pipelines
Menifee, California

FIGURE 2

Leighton

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GEOTECHNICAL DESIGN REPORT VALLEY BOULEVARD POTABLE WATER TRANSMISSION PIPELINES

EASTERN MUNICIPAL WATER DISTRICT (EMWD) MENIFEE, CALIFORNIA

Prepared For

STANTEC CONSULTING SERVICES, INC.
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Project Number 13822.001

June 14, 2023

June 14, 2023

Project No. 13822.001

Stantec Consulting Services, Inc.
9797 Aero Drive, Suite 310
San Diego, California 92123

Attention: Ms. Nita Kazi, PE

Subject: Geotechnical Design Report
Valley Boulevard Potable Water Transmission Pipelines
Eastern Municipal Water District (EMWD)
Menifee, California

In accordance with your authorization, we performed a geotechnical exploration for the subject project located in the City of Menifee, California. Based on the results of this exploration, the subsurface soils conditions along the proposed pipeline alignment vary depending on location and depth. The major geologic units are artificial fill associated with existing roads, alluvial deposits, and granitic bedrock within shallow depth at various locations. Groundwater was not encountered in any of our explorations to a maximum depth explored of approximately 21 feet below ground surface. A summary of our findings and our geotechnical recommendations for the design and construction of the proposed pipeline are provided in this report.

The opportunity to be of service is sincerely appreciated. If you should have any questions, please do not hesitate to call our office.

Respectfully submitted,
LEIGHTON CONSULTING, INC.

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Distribution: (1) Addressee (PDF copy via email)

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1.0 INTRODUCTION

1.1 Site/Alignment Description

The proposed potable water transmission pipeline is generally located within the Rights-Of-Way's (ROW) of Valley Boulevard, Byers Road, McLaughlin Road, Rouse Road and Geary Street as depicted on Figure 1, *Site Location Map*. The surrounding areas along the proposed pipeline generally consist of residential homes and commercial developments. The pipeline begins at EMWD Desalter II site and runs northerly within Valley Boulevard ROW to Rouse Road then east on Rouse Road to a tie in point along Murrieta Road. The pipeline will also continue north from Rouse Road to McLaughlin Road along either Byers Road or Geary Street, then continue west along McLaughlin Road to a tie in point along Goetz Road. The pipeline alignment is located mostly within the City of Menifee, California, with a small segment on Goetz Road located within the City of Perris, California (See Figure 1). Site topography is generally sloping to the south toward Salt Creek in the southern portion of the alignment and relatively flat north of McCall Boulevard. Valley Boulevard is fully developed along most of the alignment (2 lanes in each direction) and narrows to one lane in each direction north of McCall Boulevard. Rouse Road is also fully developed residential street. McLaughlin Road is a residential dirt road along most of the alignment being paved east of Calle Emiliano. Geary Street is an unimproved dirt road. This exploration was performed in conjunction with another EMWD project (Valley Brackish Transmission Pipeline project) as they generally share same alignment. Geotechnical information gathered from that exploration is also used in this report.

1.2 Project Description

Based on information provided, we understand that the project will improve pipeline conveyance capacity north of the District's Desalination Complex along the western side of the Perris Valley 1627 Pressure Zone and will support the future Goetz Road Tank operation. The project includes approximately 7,400 lineal feet (LF) of 36-inch diameter pipeline from the Desalination Complex to McCall Boulevard, 8,300 LF of 30-inch diameter pipeline from McCall Boulevard to Murrieta Road, and 7,000 LF of 18-inch diameter pipeline north of Rouse Road to the Goetz Road tie-in. We anticipate this pipeline to be located within existing street right-of-way (ROW) and installed at depth of 5 to 10 feet below existing ground surface (BGS).

1.3 Purpose and Scope of Exploration

The purpose of our exploration is to (1) evaluate geotechnical engineering characteristics of the earth materials along the proposed alignment, and (2) provide geotechnical recommendations for design and construction of the proposed project. As described in our proposal, the scope of our evaluation included the following tasks:

- Field Exploration: Our field exploration consisted of nine (9) hollow stem auger borings drilled along the proposed alignments to provide field data for geotechnical evaluation. In addition, twenty-four (24) borings and two (2) seismic refraction traverses performed by Leighton during previous studies are also incorporated into this study.
- Geotechnical Laboratory Tests: Geotechnical laboratory tests were performed on selected soil samples collected during our field exploration. This laboratory-testing program was designed to evaluate general physical and engineering characteristics of soil along the proposed alignment.
- Engineering Analysis: Data obtained from our background review, field exploration, and geotechnical laboratory testing program was evaluated to develop geotechnical conclusions and recommendations for the proposed pipeline design and construction.
- Report Preparation: Results of this evaluation have been summarized in this report, presenting our findings and geotechnical recommendations for the proposed pipeline.

This report does not address the potential for encountering hazardous materials along this alignment. Important information about limitations of geotechnical reports, in general, is presented in Appendix D.

1.4 Field Exploration

As indicated above, our field exploration consisted of the excavation of nine (9) hollow stem auger borings in accessible areas along the proposed alignment to supplement previous borings performed by Leighton along this alignment. Prior to drilling, we located and marked boring locations for coordination with DigAlert and obtained an encroachment permit from the City of Menifee. Approximate locations of the borings are depicted on the Boring Location Map (*Plate 1*). Borings along Murrieta Road could not be performed due to existing utility conflicts and were relocated to adjacent streets (Lancaster Drive and Brandywine Drive) as close to Murrieta Road as possible. The exploratory borings were excavated utilizing a truck-mounted, CME 75 drill rig using 8-inch hollow-stem flight augers. During the drilling operation, bulk and relatively undisturbed samples were obtained from the borings for laboratory testing and evaluation. Sampling of the borings was conducted by a staff geologist from our office. The collected samples were transported to our laboratory for testing. Borings were drilled in existing street shoulders to minimize impact on existing traffic and backfilled with native soils. The logs of borings are presented in Appendix A including those from previous explorations performed by Leighton.

Atlas Technical Consultants, LLC performed a seismic refraction survey consisting of two (2) seismic traverses in areas where shallow bedrock was encountered in our exploratory borings. The seismic refraction report is presented in Appendix D.

1.5 Laboratory Testing

Laboratory tests were performed on representative samples to provide a basis for development of geotechnical design parameters. Selected samples were tested to determine the following parameters: insitu moisture and density, maximum dry density and optimum moisture content, sieve analysis (gradation), sand equivalent, soluble sulfate content and chloride, pH and resistivity. The results of our laboratory testing are presented in Appendix B.

2.0 SUMMARY OF GEOTECHNICAL FINDINGS

A summary of our findings from research of pertinent literature, site-specific field exploration, laboratory testing and engineering analysis, is discussed in this section.

2.1 Regional Geology

As shown on Figure 2, *Regional Geology Map*, the proposed pipeline alignment is generally underlain by older fan deposits (Qof), very old fan deposits (Qvof) and granitic bedrock (gr).

2.2 Alignment Subsurface Conditions

The subsurface soils conditions along the proposed alignment vary depending on location and depth. Detailed descriptions of the earth materials encountered are provided in Appendix A.

2.2.1. Artificial Fill

Artificial fill was encountered in most of our borings as typical embankment fill associated with existing roadways. The fill thickness generally extended from a few inches to as much as 7.5 feet in LB-2 and LB-18 (Leighton, 2023). The encountered artificial fill generally consisted of silty and clayey sand (SM/SC) to sandy clay (CL). This fill is expected to possess an Expansion Index (EI) of less than 50. Where our borings penetrated existing asphalt, the measured thickness of asphaltic concrete and aggregate base layers are listed in Table 1 below.

Table 1. Existing Pavement Thickness

Boring #	Location (see Plate 1)	Approx. AC Thickness (Inch)	Approx. Aggregate Base Thickness (Inch)
LB-1	Rouse Road	5.0	6.0
LB-3	Rouse Road	4.5	5.0
LB-1 (previous)	Valley Boulevard	5.0	10.0
LB-2 (previous)	Valley Boulevard	4.5	7.0
LB-3 (previous)	Valley Boulevard	4.0	7.0
LB-9 (previous)	McCall Boulevard	5.0	None
LB-10 (previous)	McCall Boulevard	4.0	None
LB-12 (previous)	Valley Boulevard	5.0	5.0
LB-13 (previous)	Valley Boulevard	3.5	None
LB-14 (previous)	Valley Boulevard	5.0	4.0
LB-15 (previous)	Chambers Avenue	3.0	4.0
LB-22 (previous)	McLaughlin Road	5.0	3.0
LB-23 (Brackish)	Brandywine Drive	3.5	4.0 (Class 1)
LB-24 (Brackish)	Lancaster Drive	4.0	5.0

2.2.2. Young Alluvium (Qya)

Young alluvial deposits were encountered in LB-2, LB-3, LB-4, LB-6 through LB-9 (this study) and LB-16 and LB-17 (Leighton, 2023) at the surface and above the older alluvium. As encountered, this alluvium generally consists of silty and clayey sands with varying amounts of gravel (SC-SM).

2.2.3. Older Alluvium (Qalo)

Older alluvial materials were encountered beneath the artificial fill and younger alluvial deposits in most of the borings. The older alluvium is generally medium dense to dense/hard and consist of silty/clayey (SC/SM), sandy clays (CL) sand and poorly- to well-graded sand (SP/SW) with varying amounts of gravel. The Expansion index (EI) is expected to vary from very low to medium (0<EI<91). Our field geologist noted “possible small size cobbles” at depth of 7 feet in LB-13 (Leighton, 2023) due to difficult excavation or higher resistance to the advancing 8-inch auger. No actual cobbles were visually noted in any of the soils cuttings at ground surface. Large cobbles and boulders cannot be detected at depth unless existed at the tip of auger. In such case, the auger will typically stop from advancing further or experience very difficult drilling condition. Based on this observation, scattered cobbles should be anticipated in this older alluvium.

2.2.4. Granitic Bedrock (gr)

Sallow granitic bedrock (within 7 feet BGS) was generally encountered in borings LB-9 (this study), LB-7, LB-8, LB-11 and LB-18 (Leighton, 2023) as shown on Plate 1. Depths to bedrock may vary depending on location. As encountered, the bedrock was severely to highly weathered and generally excavates into well-graded sand with varying amounts of silt and gravel during our drilling operation. Bedrock hardness or rippability characteristics are discussed further in Appendix C.

2.3 Surface and Groundwater

No surface or groundwater was observed or encountered at the time of our field exploration along the proposed alignment. However, groundwater conditions can fluctuate seasonally and also be directly-impacted by other factors not observed at the time of our field explorations.

2.4 Faulting and Seismicity

The subject site, like the rest of Southern California, is located within a seismically active region as a result of being located near the active margin between the North American and Pacific tectonic plates. The principal source of seismic activity on this site is movement along the northwest-trending regional fault systems such as the Lake Elsinore, San Andreas, and San Jacinto faults. Based on our review of published geologic map (see Figure 2), the proposed alignment is not located within an Alquist-Priolo Earthquake Fault Zoning Act or County mapped fault zones. For the purpose of structural design, seismic coefficients based on the 2022 California Building Code (CBC) are provided below (see Table 2).

Table 2. 2022 CBC Site Categorization and Seismic Coefficients

Parameters	Central Alignment
Site Longitude (decimal degrees)	-117.21309
Site Latitude (decimal degrees)	33.71418
Site Class Definition	**C**
Mapped Spectral Response Acceleration at 0.2s Period, S_s	1.42
Mapped Spectral Response Acceleration at 1s Period, S_1	0.52
Short Period Site Coefficient at 0.2s Period, F_a	1.20
Long Period Site Coefficient at 1s Period, F_v	1.48
Adjusted Spectral Response Acceleration at 0.2s Period, S_{MS}	1.70
Adjusted Spectral Response Acceleration at 1s Period, S_{M1}	0.77
Design Spectral Response Acceleration at 0.2s Period, S_{DS}	**1.14**
Design Spectral Response Acceleration at 1s Period, S_{D1}	**0.52**

2.5 Secondary Seismic Hazards

Secondary seismic hazards such as ground rupture, landsliding, liquefaction, and lateral spreading are discussed below.

2.5.1. Ground Rupture

As indicated above, the site is not located in any designated earthquake hazard zone per the Alquist Priolo Act or Riverside County Hazard Maps. Chance of ground rupture along the proposed alignment is considered low.

2.5.2. Dynamic Settlement / Liquefaction

The proposed pipeline is generally planned to be installed in dense older alluvium or granitic rock, which are not prone to liquefaction.

2.5.3. Lateral Spreading

Based on Section 2.6.2 above, lateral spreading is not considered a geologic hazard for this pipeline.

2.5.4. Landslides

Based on our site review and published geologic maps, no landslides were noted along the proposed alignment.

3.0 RECOMMENDATIONS

3.1 General

The proposed potable water transmission pipeline appears feasible from a geotechnical viewpoint. However, the main geotechnical/geologic constraint is the presence of shallow granitic bedrock along portions of the alignment (see Plate 1) and deeper excavations may require special considerations. This granitic bedrock will vary in hardness and density depending on depth and location. Very difficult excavation will likely be encountered within the new cut area north of McCall Boulevard (LB-11). The rock hardness is further discussed in Section 4.2 and Appendix D (Seismic Refraction Survey). A contractor was installing a water line in this portion of the alignment during our field exploration and indicated very difficult excavation in this area.

3.2 Earthwork Considerations

Earthwork associated with the proposed pipelines should be performed in accordance with applicable EMWD Specifications, "Standard Specifications for Public Works Construction" (Greenbook, latest edition) and the recommendations included in the text of this report.

3.2.1. General

Trench excavation should be performed in accordance with the project plans, specifications, and all applicable OSHA requirements. The contractor should be responsible for providing the "competent person" required by OSHA standards. Contractors should be advised that onsite sandy soils could make excavations particularly unsafe and hence necessary safety precautions should be taken at all times.

3.2.2. Excavation Characteristics

Based on the results of our exploratory borings and seismic refraction survey, the encountered artificial fill, alluvium, and shallow granitic rock (upper 5 to 10 feet) should generally be excavatable with conventional heavy duty earthmoving/excavation equipment in good working conditions. Oversized materials (i.e. greater than 6 inches) might be generated where encountering granitic rock. However, as discussed above and further in Section 4.2, very dense granitic rock may be locally encountered requiring specialized excavation/rock reduction equipment, such as in the vicinity of Boring LB-11.

3.2.3. Pipe Subgrade

Prior to pipe installation, the subgrade should be firm, uniform, and free of standing water, loose materials and then properly compacted to provide uniform seating and support to the entire section of the pipe placed on bedding material. Oversize particles larger than 2-inches in largest dimension should be removed from the trench subgrade and replaced with compacted uniform bedding materials. Where groundwater or very moist soils are encountered or the subgrade become disturbed due to localized seepage/surface water or caused by the removal of dense core-stones, the contractor should excavate the disturbed or saturated soils to a maximum depth of 12 inches (or depth of disturbed soils/bedrock) and replace with suitable materials to provide a stable trench bottom. Crushed rock (½-inch maximum size) may be used if found necessary to stabilize bottom of trench/pit prior to placing bedding materials. It is not anticipated that placement of filter fabric separation layer will be required due to the dense and granular nature of onsite soils.

3.2.4. Backfill

Prior to backfilling, pipes should be bedded in and covered with a uniform, granular material that has a Sand Equivalent (SE) of 30 or greater, and a gradation meeting requirements of the pipe manufacturer. Approved pipe bedding material may be mechanically compacted or water-densified in-place provided appropriate water evacuation is utilized. Most onsite soils are expected to be too silty/clayey to be considered for bedding material. A minimum cover of 12 inches of bedding material should be provided above the top of the pipe. As an alternative, crushed rock per EMWD Standards (SB-157) can be used as pipe bedding and pipe zone backfill.

Native soils are generally considered suitable as backfill materials over the pipe bedding zone. These materials should be placed in thin lifts moisture conditioned (or dried back) as necessary, and mechanically compacted to a minimum of 90 percent relative compaction per ASTM D 1557 or as required per EMWD standard specifications. The actual lift thickness should depend on the compaction equipment used. For hand-directed mechanical equipment such as vibratory plates or tampers, the maximum lift thickness should not exceed 4 inches. The contractor should not use jetting to compact trench backfill unless approved by EMWD and the jetting procedures and soils requirements comply with the “GreenBook”. Screening may be required along portions of the alignment if oversized materials (i.e. > 3 inches) are generated during excavation.

3.3 Bearing Capacity and Earth Pressures

3.3.1. Bearing Capacity

A net allowable bearing capacity of 2,500 pounds-per-square-foot (psf) or a modulus of subgrade reaction of 150 pounds-per-cubic-inch (pci) may be used for design of footings of appurtenant structures founded into a minimum of 2 feet of compacted fill or dense older alluvium. A net allowable bearing capacity of 4,000 psf or a modulus of subgrade reaction of 250 pci may be used if footings are founded into dense granitic rock. A minimum base width of 18 inches for continuous footings and a minimum bearing area of 3 square feet (1.75 ft by 1.75 ft) for pad foundations should be used. Additionally, an increase of one-third may be applied when considering short-term live loads (e.g. seismic and wind).

3.3.2. Earth Pressures

Lateral loads on thrust blocks and other appurtenant structures may be resisted by passive soil pressure and friction, in combination. An allowable passive pressure based on an equivalent fluid pressure of 300 pounds-per-cubic-foot (pcf), not to exceed 3,500 pounds per square foot (psf) can be used if the pipe is embedded in the dense alluvium or granitic rock (minimum 2 feet embedment). This equivalent fluid pressure may be doubled for isolated thrust blocks. We have not applied a factor-of-safety to these values. A soil-pipeline surface friction of 0.20 for PVC pipes may be applied.

A modulus of soil reaction (E') of 1,200 psi can be used to estimate the stiffness of the soil bedding backfill at the sides and below buried flexible pipelines, if applicable, for the purpose of evaluating deflection caused by weight of the backfill over the pipe. An E' of 1,800 psi or higher can be used where pipeline is underlain by dense granitic rock or older alluvium.

3.4 Pipeline Design

3.4.1. Soils Parameters

Structural design of pipes requires proper evaluation of possible loads acting on the pipe, including dead and live or transient loads. Stresses and strains induced on a buried pipe depend on many factors, including the type of pipe, depth and width of trench, bedding and embedment conditions, soil density, angle of internal friction, coefficient of passive earth pressure, and coefficient of friction at the interface between the backfill and in-situ soils. We recommend the following soil parameters for the proposed pipe design:

Table 3. Soil Parameters for Pipe Design

Soil Parameters	Recommended Values
Average Compacted fill moist unit weight, (pcf)	115 to 135
Angle of internal friction of soils (degrees)	30 to 34
Soil cohesion, c (psf)	200
Sliding friction between pipe and native soils	0.20
Coefficient of friction between backfill and native soils	0.45

3.4.2. External Loads on Flexible Pipe by Soil

Structural design of pipes requires proper evaluation of possible loads acting on the pipe, including dead and live or transient loads. Stresses and strains induced on a buried flexible pipe depend on many factors. The magnitude of the load supported depends on the amount of backfill, type of soil, and pipe stiffness. The approximate dead load per unit length can be calculated from the following formula:

$$W = C\gamma\ BD$$

Where,

W	External soil load on pipe: (pounds per foot of pipe)
C	Unitless load coefficient (C = 1.5 for 6 feet deep trench, and 2.0 for 10 feet or deeper trench, assuming a trench width of 3 to 6 feet just above the pipe)
γ	Total unit weight of soil above pipe (pounds-per-cubic-foot)
B	Width of the trench (width just above top of the pipe, in feet)
D	Pipe diameter (feet)

In addition to the load from backfill (above equation), loads due to embankments (if applicable) and other loads (live loads) should be considered.

3.5 Corrosivity Evaluation

Sulfate ions in the soil can lower soil resistivity and can be highly aggressive to Portland cement concrete by combining chemically with certain constituents of the concrete, principally tricalcium aluminate. This reaction is accompanied by expansion and eventual disruption of the concrete matrix. Potentially high sulfate content could also cause corrosion of the reinforcing steel in concrete. Table 4 below summarizes current standards for concrete exposed to sulfate-containing solutions.

Table 4. Sulfate Concentration and Sulfate Exposure

Sulfate In Water (parts-per-million)	Water-Soluble Sulfate (SO_4) in soil (percentage by weight)	Sulfate Exposure
0-150	0.00 - 0.10	Negligible
150-1,500	0.10 - 0.20	Moderate (Seawater)
1,500-10,000	0.20 - 2.00	Severe
>10,000	Over 2.00	Very Severe

The sulfate content was determined in the laboratory for representative onsite soil samples. The results indicate that the water soluble sulfate range is considered **negligible** for most alignment, except for soils in the vicinity of LB-1 (more than 0.2 percent by weight, which is considered **severe** per Table 4 above.

Many factors can affect corrosion potential of soil including soil moisture content, resistivity, permeability and pH, as well as chloride and sulfate concentration. In general, soil resistivity, which is a measure of how easily electrical current flows through soils, is the most influential factor. Based on the findings of studies presented in ASTM STP 1013 titled "Effects of Soil Characteristics on Corrosion" (February, 1989), the approximate relationship between soil resistivity and soil corrosiveness was developed as shown in Table 5 below.

Table 5. Relationship between Soil Resistivity and Soil Corrosivity

Soil Resistivity (ohm-cm)	Classification of Soil Corrosiveness
0 to 900	Very Severely Corrosive
900 to 2,300	Severely Corrosive
2,300 to 5,000	Moderately Corrosive
5,000 to 10,000	Mildly Corrosive
10,000 to >100,000	Very Mildly Corrosive

Acidity is an important factor of soil corrosivity. The lower the pH (the more acidic the environment), the higher the soil corrosivity will be with respect to buried metallic structures and utilities. As soil pH increases above 7 (the neutral value), the soil is increasingly more alkaline and less corrosive to buried steel structures, due to protective surface films, which form on steel in high pH environments. The pH of site soils on representative samples vary from 7.30 to 7.80 which is generally considered less active from a corrosion standpoint. Chloride and sulfate ion concentrations, and pH appear to play secondary roles in affecting corrosion potential. High chloride levels tend to reduce soil resistivity and break down otherwise protective surface deposits, which can result in corrosion of buried steel or reinforced concrete structures.

Based on minimum resistivity laboratory test results (see Table 6 below), **the onsite soil is considered severely to moderately corrosive**. Ferrous pipe can be protected by polyethylene bags, tape or coatings, di-electric fittings, concrete encasement or other means to separate the pipe from wet onsite soils. We understand that further testing and/or soil corrosivity evaluation is being performed by others and specific recommendations for corrosion protection is provided by the corrosion engineer.

Table 6. Corrosion Sample Results

Boring #	Sample Depth (ft)	Sulfate Content (ppm)	Chloride Content (ppm)	pH	Minimum Resistivity (ohm-cm)
LB-1	0.0-5.0	198	60	8.50	1,600
LB-5	5.0	152	40	7.70	2,100
LB-9	0.0-5.0	160	20	7.60	4,800
LB-1 (previous)	0.0-5.0	3276	100	7.50	1,000
LB-6 (previous)	5.0-10.0	325	40	7.30	2,400
LB-11 (previous)	0.0-5.0	185	40	7.80	5,600
LB-15 (previous)	5.0-10.0	177	20	7.30	2,050
LB-21 (previous)	0.0-5.0	206	80	7.30	1,000

3.6 Temporary Slopes/Excavations

The contractor is responsible for all temporary slopes and trenches excavated at the site and the design of any required temporary shoring. Shoring, bracing and benching should be performed by the contractor in accordance with the current edition of the *California Construction Safety Orders*, see:

http://www.dir.ca.gov/title8/sb4a6.html

During construction, exposed earth material conditions should be regularly evaluated to verify that conditions are as anticipated. The contractor is responsible for providing the "competent person" required by OSHA standards to evaluate soil conditions. Close coordination between the competent person and geotechnical consultant should be maintained to facilitate construction while providing safe excavations. Existing artificial fill and alluvial soils encountered are classified as OSHA soil Type C. Therefore, unshored temporary cut slopes should be no steeper than 1½:1 (horizontal:vertical), for a height no-greater-than (≤) 20 feet (*California Construction Safety Orders*, Appendix B to Section 1541.1, Table B-1). Encountered granitic rock may be classified as OSHA soil Type B. Therefore, unshored temporary cut slopes should be no steeper than 1:1, for a height no-greater-than (≤) 20 feet. These recommended temporary cut slopes assume a level ground surface for a distance equal to one-and-a-half (x1.5) the depth of excavation. For steeper temporary slopes, deeper excavations, and/or where sloped terrain exists within close proximity to excavation (<1.5xdepth), appropriate shoring methods or flatter slopes may be required to protect the workers in the excavation and adjacent improvements. Such methods should be implemented by the contractor and approved by the geotechnical consultant.

3.7 Temporary Shoring

3.7.1. Trench Excavation

If the sloped open cut excavation is not feasible based on requirements above and due to existing structures, excavations for the proposed pipeline should be supported by a temporary shoring system such as cross-braced hydraulic shoring, conventional shields, sheet piles, soldier piles and wood lagging. The choice should be left to the contractor's judgment since economic considerations and/or the individual contractor's construction experience may determine which method is more economical and/or appropriate. However, the contractor and shoring designer should also consider the presence of groundwater and perform additional geotechnical studies as necessary to select the proper method.

The support of all adjacent existing structures during excavation and construction (including pavements) without distress is the contractor's responsibility. In addition, it should be the contractor's responsibility to undertake a pre-construction survey with benchmarks and photographs of the adjacent properties. Shoring systems should be designed by a California licensed civil or structural engineer. As preliminary design guidelines, we present the following geotechnical parameters for shoring design. The following lateral earth pressures are recommended for temporary shoring supporting encountered alignment soils with level ground behind the shoring. Passive pressure also may be used to compute lateral soil resistance, if necessary, for sheet piles. Earth pressures provided are ultimate values and a safety factor should be applied as appropriate.

Table 7. Static Lateral Earth Pressures

Conditions[1]	Static Equivalent Fluid Weight (pcf)
Active (cantilever)	33
At-Rest (braced)	52
Passive[2]	300

1. For temporary excavations only, with level backfill, not including surcharges
2. Passive equivalent fluid pressure may be doubled for isolated soldier piles spaced at least 2½ diameters on-center. Passive resistance should not exceed 3,000 pounds-per-square-foot (psf)

Determination of appropriate design conditions (active or at-rest) depends on shoring flexibility. If a rotation of more than 0.001 radian (0.06 degrees) is allowed, active pressure conditions apply; otherwise, at-rest condition governs.

Surcharge loads (dead or live) should be added to the indicated lateral earth pressures and should be applied uniformly, if such loads are within a horizontal distance that is less-than the exposed shoring height. The corresponding lateral earth pressure will approximately be 33-percent of the vertical surcharge for active conditions, and 50-percent for at-rest conditions. Surcharge pressures from concentrated loads should be evaluated after geometric constraints and loading conditions are determined on an individual basis.

3.7.2. Temporary Shafts for Trenchless Methods

If braced shoring is used for the deep shafts (i.e. soldier beams with struts), then a uniform distribution of lateral earth pressure of 24***H*** (psf) plus any surcharge loadings occurring as a result of traffic and adjacent foundations should be used. In addition, the contractor/designer should consider the presence of the groundwater in designing the shoring system to resist lateral hydrostatic pressures along the sides and the bottom of the shafts if dewatering is not allowed.

3.8 Pavement Considerations

Where applicable, the upper 8 inches of trench backfill and pavement areas should be scarified, moisture conditioned and recompacted to a minimum of 95 percent relative compaction. Aggregate base should also be compacted to 95-percent of the ASTM D1557 laboratory maximum dry density. If needed, pavement patching should at least match existing pavement section or be design based on actual R-value testing of subgrade soils during construction and appropriate Traffic Index (TI) selected by Engineer and/or City standards.

4.0 CONSTRUCTION CONSIDERATIONS

4.1 Pre-excavation Survey and Settlement Monitoring

A very important geotechnical concern is to avoid damaging any existing improvements adjacent to excavations. It is recommended that the contractor provide settlement monitoring and contingency plans when excavating near existing settlement-sensitive structures or underground utilities.

4.2 Rippability

As indicated on Plate 1, granitic bedrock materials were encountered in borings located near the intersection of Valley Boulevard and McCall Boulevard (Borings LB-7, LB-8, LB-11 and previous borings LB-1 and LB-2) and near the intersection of Byers Road and McLaughlin Road (Boring LB-18 and previous borings B-8 and B-9), with rock outcrops observed within the alignment vicinity. Depths to bedrock were observed to vary from 2.5 to 10.0 feet below the ground surface. Based on seismic refraction survey data performed by Atlas and Southwest Geophysics (Appendix D), easy to moderate ripping (weathered rock with less than 4,000 ft/sec P-waves) using Caterpillar D-9 dozer with a single shank is expected in the upper 5 feet to 10 feet of bedrock along most alignment with very difficult ripping (less weathered rock with more than 8,000 ft/sec P-waves) expected along the newly cut area for Valley Boulevard north of McCall Boulevard. This classification is based on published information from the Caterpillar Performance Handbook (Caterpillar, 2011). Although no similar correlations are published for typical trench excavation equipment, a cut-off velocity of ±3,800 ft/sec may be used as a basis for non-rippable trenching using Cat 235 trackhoe (hydraulic excavator with rock bucket). Difficult to very difficult ripping/trenching or possible blasting (or other rock reducing techniques) may be required as shallow as 5 feet BGS at this location as presented within the "Tomography Model" for seismic line SL-1. As previously indicated, numerous boulder outcrops were observed throughout the site and should likewise be anticipated below the surface.

Trench excavation characteristics using conventional excavators may vary based on the specific equipment used. It is important that a contractor with excavation experience in similar conditions should be consulted for the proper excavation methodology, equipment, and production rate based on the findings of this report.

4.3 Dewatering during Open Trench Excavation

If encountered during trench excavation, groundwater control, such as dewatering, will be required to limit instability of the pipeline trench and aid in foundation construction and soil backfill. Dewatering or any other suitable method for stabilizing excavation bottom may be selected by the contractor based on actual groundwater conditions encountered and based on the contractor's chosen means-and-methods of construction. The selected method by the contractor should be able to effectively mitigate for bottom heave or stabilize subgrade soils during construction/backfilling. However, deep groundwater drawdown should be avoided, to reduce the potential for damaging adjacent structures, if applicable. Dewatering flow/volume will vary significantly based on the specific geologic conditions described in our report and actual depth and geometry of excavated trench or pit. Contractors should be responsible for estimating dewatering quantities and verify subsurface conditions prior to construction.

4.4 Additional Geotechnical Services

Recommendations are based on information available at the time our report was prepared and may change as plans are developed, or if supplemental subsurface exploration is authorized. Leighton Consulting, Inc. should review site, grading and foundation plans, when available, and comment further on geotechnical aspects of the project. Geotechnical observation and testing should be conducted during excavation and all phases of grading. Geotechnical conclusions and preliminary recommendations should be reviewed and verified by us (Leighton Consulting, Inc.) during construction, and revised accordingly if geotechnical conditions encountered vary from our findings and interpretations. Geotechnical observation and testing should be provided:

- During over-excavation of unsuitable soil,
- During compaction of all fill materials,
- During trench backfilling and compaction,
- During pavement subgrade and base and/or sub-base preparation, and
- When any unusual conditions are encountered.

5.0 LIMITATIONS

This report was necessarily based in part upon data obtained from a limited number of observances, site visits, soil samples, tests, analyses, histories of occurrences, spaced subsurface explorations and limited information on historical events and observations. Such information is necessarily incomplete. The nature of many sites is such that differing characteristics can be experienced within small distances and under various climatic conditions. Changes in subsurface conditions can and do occur over time. This exploration was performed with the understanding that the project as described in Section 1.2 of this report.

This report was prepared for Stantec Consulting Services, Inc. based on Stantec Consulting Services, Inc.' needs, directions, and requirements at the time of our investigation. This report is not authorized for use by, and is not to be relied upon by any party except Stantec Consulting Services, Inc., and its successors and assigns as owner of the property, with whom Leighton Consulting, Inc. has contracted for the work. Use of or reliance on this report by any other party is at that party's risk. Unauthorized use of or reliance on this report constitutes an agreement to defend and indemnify Leighton Consulting, Inc. from and against any liability which may arise as a result of such use or reliance, regardless of any fault, negligence, or strict liability of Leighton Consulting, Inc.

The client is referred to Appendix D regarding important information provided by the Geoprofessional Business Association (GBA) on geotechnical engineering studies and report and their applicability.

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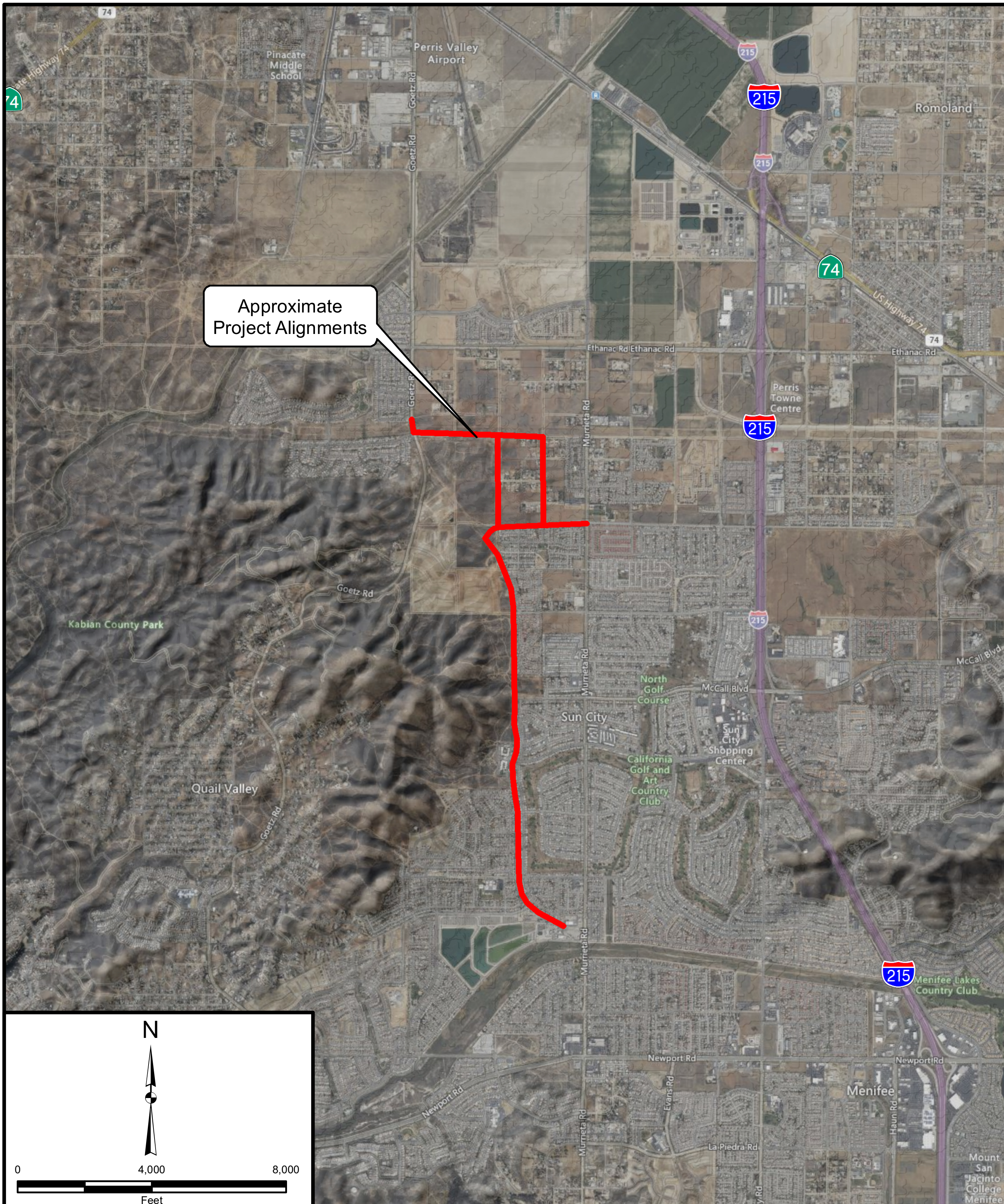

Project: 13822.001	Eng/Geol: SIS/JTD
Scale: 1 " = 4,000 '	Date: August 2023

Base Map: ESRI ArcGIS Online 2023

Author: Leighton Geomatics (btran)

SITE LOCATION MAP

Valley Boulevard Potable Water Transmission Pipelines
Menifee, California

FIGURE 1

Leighton

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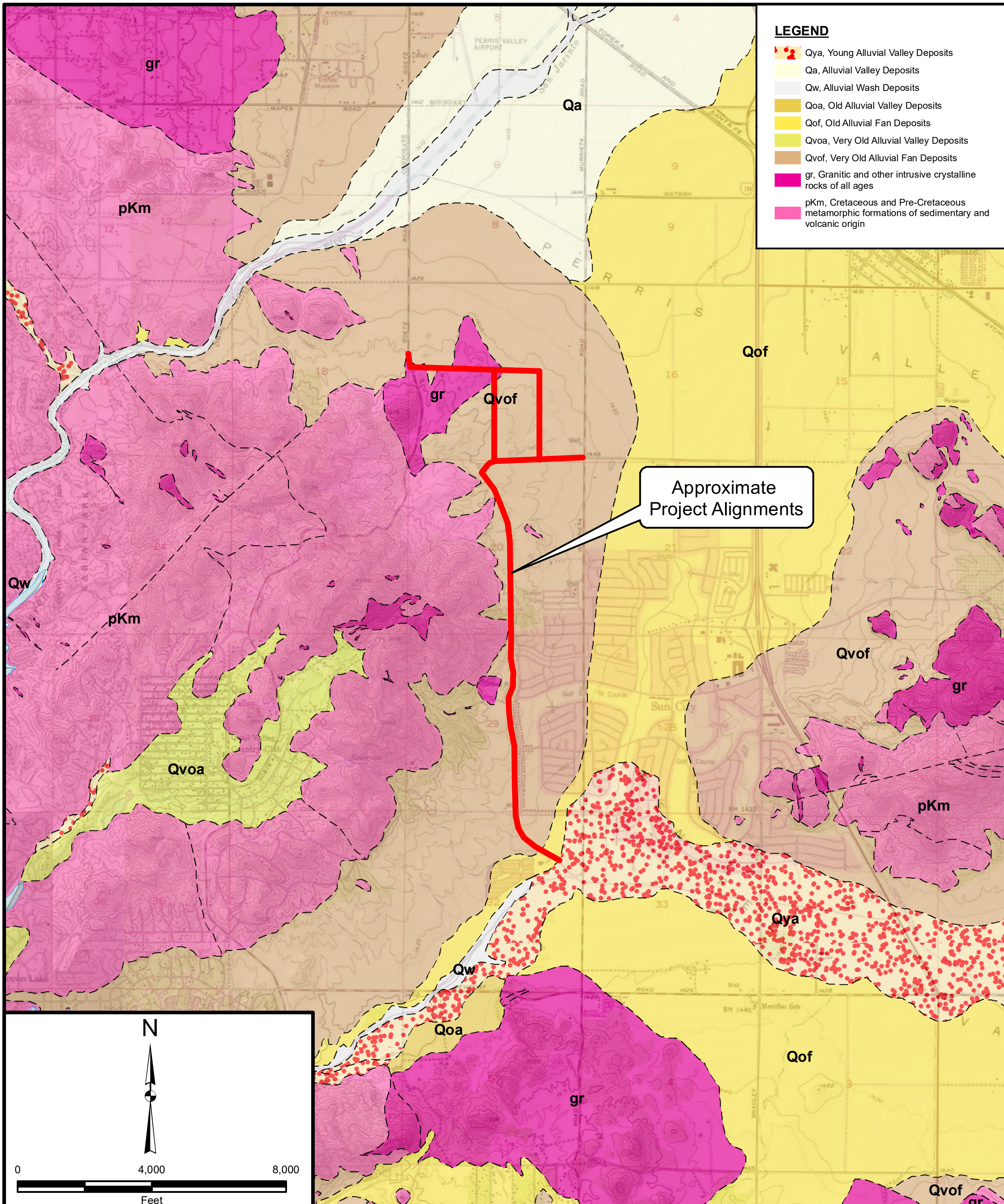

Project: 13822.001	Eng/Geol: SIS/JTD
Scale: 1 " = 4,000 '	Date: August 2023

Reference:
Geologic Map of The San Bernardino and Santa Ana Quadrangles, California by Douglas M. Morton and Fred K. Miller, 2006

REGIONAL GEOLOGY MAP

Valley Boulevard Potable Water Transmission Pipelines
Menifee, California

FIGURE 2

Leighton

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PLATE 1	**BORING LOCATION MAP**
Scale: 1 " = 500 feet	Valley Boulevard Potable Water Transmission Pipelines
Date: August 2023	Menifee, California
Proj: 13822.001	Leighton
Eng/Geol: SIS/JTD	

Base Map:

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APPENDIX A

FIELD EXPLORATION / LOGS OR EXPLORATORY BORINGS

Our field exploration consisted of a site reconnaissance and a subsurface exploration program consisting of hollow-stem auger soil borings. Approximate locations of the borings are depicted on the Boring Location Map (*Plate 1*). Encountered soils were continuously logged in the field by our representative and described in accordance with the Unified Soil Classification System (ASTM D 2488). Logs of these subsurface explorations, as well as a key to the classification of the soil, are included as part of this appendix.

Relatively undisturbed soil samples were obtained at selected intervals within the borings using a California ring sampler, with 2.42-inch inside diameter brass rings, driven into the soil with a 140-pound hammer free falling 30-inches in general accordance with ASTM Test Method D3550. The numbers of blows required for each 6 inches of drive penetration were noted in the field and are recorded on the boring logs. Unless otherwise indicated, the blows per foot recorded on the boring logs represent the number of blows required to drive 18 inches in 6 inch increments. In addition, disturbed bag (or bulk) samples were also obtained from soil cuttings. Types of samples obtained from each location are shown on the boring logs at corresponding depths. Our borings were backfilled with soil cuttings obtained during the drilling. Representative earth-material samples obtained from these subsurface explorations were transported to our Temecula geotechnical laboratory for evaluation and appropriate testing.

The attached subsurface exploration logs and related information depict subsurface conditions only at the locations indicated and at the particular date designated on the logs. Subsurface conditions at other locations may differ from conditions occurring at these locations. The passage of time may result in altered subsurface conditions due to environmental changes. In addition, any stratification lines on the logs represent the approximate boundary between soil types and the transition may be gradual.

GEOTECHNICAL BORING LOG LB-1

Project No.	13822.001	**Date Drilled**	4-20-23
Project	EMWD Valley Boulevard Transmission Pipeline	**Logged By**	JTD
Drilling Co.	2R Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	'
Location	See Boring Location Map	**Sampled By**	JTD

This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
	0								@ Surface: 5" AC / 6" AB	
				B-1				SC	**Artificial Fil (Af)**; CLAYEY SAND, reddish brown, slightly moist, fine to coarse grained sand, EI = 14, 44% -200	EI, -200, AL, CR
				R-1	7 22 26	116	14	SC	**Older Alluvium (Qalo)**; CLAYEY SAND, medium dense, dark reddish brown, moist, fine to medium grained sand	
	5			R-2	20 50	120	13		CLAYEY SAND, very dense, light reddish brown, moist, fine to medium grained sand	
				R-3	23 30 25				CLAYEY SAND, dense, dark reddish brown, moist, fine to medium grained sand	
	10			R-4	12 20 29				CLAYEY SAND, medium dense, dark reddish brown, moist, fine to medium grained sand	
	15			R-5	50/5"			SC-SM	SILTY, CLAYEY SAND, very dense, dark reddish brown, moist, fine to medium grained sand	
									Total Depth = 15.42', no groundwater encountered, backfilled with cuttings and capped with cold patch asphalt on 04-20-23	
	20									
	25									
	30									

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:

-200	% FINES PASSING	DS	DIRECT SHEAR	SA	SIEVE ANALYSIS
AL	ATTERBERG LIMITS	EI	EXPANSION INDEX	SE	SAND EQUIVALENT
CN	CONSOLIDATION	H	HYDROMETER	SG	SPECIFIC GRAVITY
CO	COLLAPSE	MD	MAXIMUM DENSITY	UC	UNCONFINED COMPRESSIVE STRENGTH
CR	CORROSION	PP	POCKET PENETROMETER		
CU	UNDRAINED TRIAXIAL	RV	R VALUE		

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GEOTECHNICAL BORING LOG LB-2

Project No.	13822.001	**Date Drilled**	4-20-23
Project	EMWD Valley Boulevard Transmission Pipeline	**Logged By**	JTD
Drilling Co.	2R Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	'
Location	See Boring Location Map	**Sampled By**	JTD

SOIL DESCRIPTION

This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	Soil Description	Type of Tests
	0							SM	**Quaternary Alluvium (Qal)**; SILTY SAND with GRAVEL, light grayish brown, moist, fine to coarse grained sand with subrounded gravel to 1"	
				R-1	12 15 15	125	2	SM	**Older Alluvium (Qalo)**; SILTY SAND with GRAVEL, medium dense, light grayish brown, slightly moist, fine to coarse grained sand with abundant subangular gravel to 2"	
	5			R-2 B-1	25 50/4"				SILTY SAND with GRAVEL, very dense, light reddish brown, moist, fine to coarse grained sand with subangular gravel to 2"	
				R-3	50/5"				SILTY SAND with GRAVEL, very dense, light reddish brown, moist, fine to coarse grained sand with subangular gravel to 2"	
	10			R-4	40 50/4"				SILTY SAND with GRAVEL, very dense, light reddish brown, moist, fine to coarse grained sand with fine gravel	
	15			R-5	37 50/4"			SC-SM	SILTY, CLAYEY SAND with GRAVEL, very dense, reddish brown, moist, fine to coarse grained sand with fine gravel	
									Total Depth = 15.42', no groundwater encountered, backfilled with cuttings on 04-20-23	
	20									
	25									
	30									

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

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GEOTECHNICAL BORING LOG LB-3

Project No.	13822.001	**Date Drilled**	4-20-23
Project	EMWD Valley Boulevard Transmission Pipeline	**Logged By**	JTD
Drilling Co.	2R Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	'
Location	See Boring Location Map	**Sampled By**	JTD

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION *This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.*	Type of Tests
	0								@ Surface: 4.5" AC / 5" AB	
				B-1				SM	**Quaternary Alluvium (Qal)**; SILTY SAND with GRAVEL, light grayish brown, slightly moist, fine to coarse grained sand with subrounded gravel to 1"	
				R-1	14 14 10				SILTY SAND with GRAVEL, medium dense, dark grayish brown, moist, fine to coarse grained sand with fine gravel	
	5			R-2	13 27 27	122	7	SM	**Older Alluvium (Qalo)**; SILTY SAND with GRAVEL, dense, dark grayish brown, moist, fine to coarse grained sand with abundant subangular gravel to 2"	
				R-3	50/5"				No Recovery, abundant gravel and cobble from 6'-8'	
	10								Auger Refusal on Cobbles @ 8' BGS, no groundwater encountered, backfilled with cuttings and capped with cold patch AC on 4-20-23	
	15									
	20									
	25									
	30									

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

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GEOTECHNICAL BORING LOG LB-4

Project No.	13822.001	**Date Drilled**	4-20-23
Project	EMWD Valley Boulevard Transmission Pipeline	**Logged By**	JTD
Drilling Co.	2R Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	'
Location	See Boring Location Map	**Sampled By**	JTD

SOIL DESCRIPTION

This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	Soil Description	Type of Tests
	0			B-1				CL	**Quaternary Alluvium (Qal)**; SANDY Lean CLAY with GRAVEL, light grayish brown, slightly moist, fine to coarse grained sand with subrounded gravel to 2", SE = 8	SE, SA
				R-1	6 25 35	99	23		SANDY Lean CLAY, stiff, dark brown, moist, fine to medium grained sand	
								CL	**Older Alluvium (Qalo)**; SANDY Lean CLAY, stiff, reddish brown, moist, fine to medium grained sand	
	5			R-2	50/6"	98	22		SANDY Lean CLAY, hard, dark reddish brown, moist, fine to medium grained sand	
				R-3	50/6"			SC	CLAYEY SAND, very dense, dark reddish brown, moist, fine to medium grained sand	
	10			R-4	50/5"				CLAYEY SAND, very dense, dark reddish brown, moist, fine to medium grained sand	
	15			R-5	15 50				CLAYEY SAND with GRAVEL, very dense, reddish brown, moist, fine to coarse grained sand with fine gravel	
									Total Depth = 16', no groundwater encountered, backfilled with cuttings on 04-20-23	
	20									
	25									
	30									

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

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GEOTECHNICAL BORING LOG LB-5

Project No.	13822.001	**Date Drilled**	4-21-23
Project	EMWD Valley Boulevard Transmission Pipeline	**Logged By**	JTD
Drilling Co.	2R Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	'
Location	See Boring Location Map	**Sampled By**	JTD

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
	0							SC-SM	**Artificial Fill (Af)**; SILTY, CLAYEY SAND with GRAVEL and COBBLE, light brown, slightly moist, fine to coarse grained sand wtih abuntant clasts to 8"	
				R-1	7 6 6	120	11	SC	CLAYEY SAND with GRAVEL, loose, dark brown, moist, fine to medium grained sand with fine gravel	
	5			R-2 B-1	37 50/5"	102	5	SM	**Older Alluvium (Qalo)**; SILTY SAND with GRAVEL, very dense, brown, slightly moist, fine to coarse grained sand with subangular gravel to 1.5"	CR
				R-3	30 50				SILTY SAND with GRAVEL, very dense, brown, slightly moist, fine to coarse grained sand with subangular gravel to 1.5"	
	10			R-4	50/6"				SILTY SAND with GRAVEL, dense, yellow brown, moist, fine to coarse grained sand with subrounded gravel to 1"	
	15			R-5	50/6"				SILTY SAND with GRAVEL, very dense, dark yellowish brown, moist, fine to coarse grained sand with subrounded gravel to 1" Total Depth = 15.5', no groundwater encountered, backfilled with cuttings on 04-20-23	
	20									
	25									
	30									

This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

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GEOTECHNICAL BORING LOG LB-6

Project No. 13822.001
Project EMWD Valley Boulevard Transmission Pipeline
Drilling Co. 2R Drilling
Drilling Method Hollow Stem Auger - 140lb - Autohammer - 30" Drop
Location See Boring Location Map
Date Drilled 4-21-23
Logged By JTD
Hole Diameter 8"
Ground Elevation '
Sampled By JTD

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION *This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.*	Type of Tests
	0			B-1				CL	**Quaternary Alluvium (Qal)**; SANDY Lean CLAY with GRAVEL, reddish brown, slightly moist, fine to coarse grained sand with subrounded gravel to 1", MD = 121.0 @ 11.5%, RV < 5, 64% -200	MD, RV, -200
				R-1	50/4"	99	5	SC	**Older Alluvium (Qalo)**; CLAYEY SAND with GRAVEL, very dense, slightly moist, fine to coarse grained sand with subangular gravel to 2"	
	5			R-2	30 42 40				CLAYEY SAND, very dense, dark yellowish brown, moist, fine to coarse grained sand	
				R-3	18 30 50				CLAYEY SAND, very dense, reddish brown, moist, fine to coarse grained sand	
	10			R-4	35 50			SM	SILTY SAND, very dense, dark yellowish brown, moist, fine to medium grained sand	
	15			R-5	21 30 35			SW-SM	Well-graded SAND with SILT, very dense, light brown, moist, fine to coarse grained sand	
									Total Depth = 16.5', no groundwater encountered, backfilled with cuttings on 04-21-23	
	20									
	25									
	30									

SAMPLE TYPES:
B BULK SAMPLE
C CORE SAMPLE
G GRAB SAMPLE
R RING SAMPLE
S SPLIT SPOON SAMPLE
T TUBE SAMPLE

TYPE OF TESTS:
-200 % FINES PASSING
AL ATTERBERG LIMITS
CN CONSOLIDATION
CO COLLAPSE
CR CORROSION
CU UNDRAINED TRIAXIAL
DS DIRECT SHEAR
EI EXPANSION INDEX
H HYDROMETER
MD MAXIMUM DENSITY
PP POCKET PENETROMETER
RV R VALUE
SA SIEVE ANALYSIS
SE SAND EQUIVALENT
SG SPECIFIC GRAVITY
UC UNCONFINED COMPRESSIVE STRENGTH

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GEOTECHNICAL BORING LOG LB-7

Project No.	13822.001	**Date Drilled**	4-21-23
Project	EMWD Valley Boulevard Transmission Pipeline	**Logged By**	JTD
Drilling Co.	2R Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	'
Location	See Boring Location Map	**Sampled By**	JTD

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
	0			B-1				SC	**Quaternary Alluvium (Qal)**; CLAYEY SAND with GRAVEL, reddish brown, slightly moist, fine to coarse grained sand with subrounded gravel to 2", EI = 58	EI
				R-1	4 13 25			CL	**Older Alluvium (Qalo)**; Lean CLAY with SAND, stiff, dark reddish brown, moist, fine to medium grained sand	
	5			R-2	11 20 30	117	14	SC	CLAYEY SAND, dense, reddish brown to orange brown, moist, fine to medium grained sand	
				R-3	17 35 50			SC-SM	SILTY, CLAYEY SAND with GRAVEL, very dense, light grayish brown, moist, fine to coarse grained sand with subangular gravel to 1.5", chloride staining	
	10			R-4	50/5"				**Granitic Bedrock (Kgr)**; Severely Weathered, recovered as: SILTY SAND with GRAVEL, very dense, dark gray, moist, fine to coarse grained sand with fine gravel	
	15			R-5	50/6"				Recovered as: SILTY SAND with GRAVEL, very dense, dark gray, moist, fine to coarse grained sand with fine gravel	
									Total Depth = 15.5', no groundwater encountered, backfilled with cuttings on 04-20-23	
	20									
	25									
	30									

This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

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GEOTECHNICAL BORING LOG LB-8

Project No.	13822.001	**Date Drilled**	4-21-23
Project	EMWD Valley Boulevard Transmission Pipeline	**Logged By**	JTD
Drilling Co.	2R Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	'
Location	See Boring Location Map	**Sampled By**	JTD

SOIL DESCRIPTION

This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
	0							SM	**Quaternary Alluvium (Qal)**; SILTY SAND with GRAVEL, grayish brown, slightly moist, fine to coarse grained sand with fine gravel	
				R-1	18 26 45	107	10	SC-SM	**Older Alluvium (Qalo)**; SILTY, CLAYEY SAND, very dense, dark reddish brown, moist, fine to medium grained sand	
	5			R-2 B-1	50/6"	99	9	SC	CLAYEY SAND with GRAVEL, very dense, dark reddish brown, moist, fine to coarse grained sand with fine gravel	
				R-3	50/6"			SM	SILTY SAND with GRAVEL, very dense, light grayish brown, moist, fine to coarse grained sand with fine gravel	
	10			R-4	38 40 50/2"				**Granitic Bedrock (Kgr)**; Highly weathered, recovered as: SILTY SAND, very dense, dark grayish brown, moist, fine to coarse grained sand	
	15			R-5	50/3"				No Recovery	
									Total Depth = 16.25', no groundwater encountered, backfilled with cuttings on 04-21-23	
	20									
	25									
	30									

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

Leighton

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GEOTECHNICAL BORING LOG LB-9

Project No.	13822.001	**Date Drilled**	4-21-23
Project	EMWD Valley Boulevard Transmission Pipeline	**Logged By**	JTD
Drilling Co.	2R Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	'
Location	See Boring Location Map	**Sampled By**	JTD

This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
	0			B-1				SC	**Older Alluivium (Qalo)**; CLAYEY SAND with GRAVEL, reddish brown, slightly moist, fine to coarse grained sand with subangular gravel to 3"	CR
				R-1	30 50/5"			SM	SILTY SAND, very dense, reddish brown, slightly moist, fine to coarse grained sand	
	5			R-2 B-2	50/6"	110	8		**Granitic Bedrock (Kgr)**; Severely weathered, recovered as: CLAYEY SAND with GRAVEL, light grayish brown, slightly moist, fine to coarse grained sand with fine gravel	
				R-3	28 50	129	3		Recovered as: Well-graded SAND with SILT and GRAVEL, very dense, light grayish brown, slightly moist, fine to coarse grained sand with fine gravel	
	10			R-4	50/5"				Recovered as: Well-graded SAND with SILT and GRAVEL, very dense, light grayish brown, slightly moist, fine to coarse grained sand with fine gravel	
	15			R-5	50/4"				Recovered as: Well-graded SAND with SILT and GRAVEL, very dense, light grayish brown, slightly moist, fine to coarse grained sand with fine gravel Sample Disturbed	
	20			R-6	50/4"				Recovered as: Well-graded SAND with SILT and GRAVEL, very dense, light grayish brown, slightly moist, fine to coarse grained sand with fine gravel Sample Disturbed	
									Total Depth = 20.33', no groundwater encountered, backfilled with cuttings on 04-21-23	
	25									
	30									

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

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GEOTECHNICAL BORING LOG LB-1

Project No.	12893.002	**Date Drilled**	4-18-23
Project	EMWD Valley Boulevard Brackish Transmission Pipeline	**Logged By**	JTD
Drilling Co.	2R Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	'
Location	See Boring Location Map	**Sampled By**	JTD

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION *This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.*	Type of Tests
	0								@ Surface: 5" AC / 10" AB	
				B-1				CL-ML	**Artificial Fill (Af)**; SANDY, SILTY CLAY, reddish brown, moist, fine to coarse grained sand, MD = 108.5 @ 16.0%, EI = 28, SE = 7	MD, EI, CR, SA
				R-1	7 17 12	92	25	CL-ML	**Older Alluvium (Qalo)**; CLAYEY SILT with SAND and GRAVEL, stiff, grayish brown, moist, fine to coarse grained sand with fine gravel, abundant caliche stringers	
	5			R-2	8 15 20	116	16	SC	CLAYEY SAND, medium dense, grayish brown, moist, fine to coarse grained sand	
				R-3	20 30 26				CLAYEY SAND, dense, reddish brown, moist, fine to coarse grained sand	
	10			R-4	2 3 12	106	16	CL	SANDY Lean CLAY, stiff, grayish brown, moist, fine to coarse grained sand	
	15			R-5	6 10 16				SANDY Lean CLAY, stiff, grayish brown, moist, fine to coarse grained sand, iron oxide staining	
									Total Depth = 16.5' BGS, no groundwater encountered, backfilled with cuttings and capped with cold patch AC on 4-18-23	
	20									
	25									
	30									

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:

-200	% FINES PASSING	DS	DIRECT SHEAR	SA	SIEVE ANALYSIS
AL	ATTERBERG LIMITS	EI	EXPANSION INDEX	SE	SAND EQUIVALENT
CN	CONSOLIDATION	H	HYDROMETER	SG	SPECIFIC GRAVITY
CO	COLLAPSE	MD	MAXIMUM DENSITY	UC	UNCONFINED COMPRESSIVE STRENGTH
CR	CORROSION	PP	POCKET PENETROMETER		
CU	UNDRAINED TRIAXIAL	RV	R VALUE		

Leighton

*** This log is a part of a report by Leighton and should not be used as a stand-alone document. ***

GEOTECHNICAL BORING LOG LB-2

Project No.	12893.002	**Date Drilled**	4-18-23
Project	EMWD Valley Boulevard Brackish Transmission Pipeline	**Logged By**	JTD
Drilling Co.	2R Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	'
Location	See Boring Location Map	**Sampled By**	JTD

This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
	0								@ Surface: 4.5" AC / 7" AB	
								SC	**Artificial Fill (Af)**; CLAYEY SAND, reddish brown, moist, fine to coarse grained sand	
				R-1	7 7 7	119	12		CLAYEY SAND, loose, reddish brown, moist, fine to medium grained sand	
	5			R-2 B-1	6 9 11	120	9	SC-SM	SILTY, CLAYEY SAND with GRAVEL, medium dense, reddish brown, moist, fine to coarse grained sand with fine gravel, CO = -0.96%	CO
				R-3	30 40 50			SM	**Older Alluvium (Qalo)**; SILTY SAND, very dense, reddish brown, moist, fine to medium grained sand, few caliche	
	10			R-4	13 17 15			CL	SANDY CLAY with GRAVEL, hard, reddish brown, moist, fine to coarse grained sand with subrounded gravel to 1"	
	15			R-5	11 8 10			SC	CLAYEY SAND with GRAVEL, medium dense, reddish brown, moist, fine to coarse grained sand with subrounded gravel to 1"	
									Total Depth = 16.5' BGS, no groundwater encountered, backfilled with cuttings and capped with cold patch AC on 4-18-23	
	20									
	25									
	30									

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

Leighton

*** * * This log is a part of a report by Leighton and should not be used as a stand-alone document. * * ***

GEOTECHNICAL BORING LOG LB-3

Project No. 12893.002
Date Drilled 4-18-23
Project EMWD Valley Boulevard Brackish Transmission Pipeline
Logged By JTD
Drilling Co. 2R Drilling
Hole Diameter 8"
Drilling Method Hollow Stem Auger - 140lb - Autohammer - 30" Drop
Ground Elevation '
Location See Boring Location Map
Sampled By JTD

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION *This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.*	Type of Tests
	0								@ Surface: 4" AC / 7" AB	
				B-1				SC	**Artificial Fill (Af)**; CLAYEY SAND, reddish brown, moist, fine to coarse grained sand	
				R-1	5 5 5	119	13		CLAYEY SAND with GRAVEL, loose, reddish brown, moist, fine to coarse grained sand with subrounded gravel to 1"	
	5			R-2	50/3"			GC	**Older Alluvium (Qalo)**; CLAYEY GRAVEL with SAND, dense, reddish brown, moist, fine to coarse grained sand with angular gravel to 3", sample disturbed	
				R-3	22 26 50/5"			SC	CLAYEY SAND, dense, light gray, moist, fine to coarse grained sand	
	10			R-4	20 37 50				CLAYEY SAND, very dense, light grayish brown and light reddish brown, moist, fine to coarse grained sand	
	15			R-5	20 32 40			SC-SM	SILTY, CLAYEY SAND, very dense, light gray, moist, fine to coarse grained sand	
									Total Depth = 16.5' BGS, no groundwater encountered, backfilled with cuttings and capped with cold patch AC on 4-18-23	
	20									
	25									
	30									

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

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GEOTECHNICAL BORING LOG LB-4

Project No.	12893.002	**Date Drilled**	4-18-23
Project	EMWD Valley Boulevard Brackish Transmission Pipeline	**Logged By**	JTD
Drilling Co.	2R Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	'
Location	See Boring Location Map	**Sampled By**	JTD

This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
	0							SC	**Artificial Fill (Af)**; CLAYEY SAND with GRAVEL, light reddish brown, slightly moist, fine to coarse grained sand with gravel to 3"	
				R-1	50/2"			GW-GM	**Older Alluvium (Qalo)**; Well-graded GRAVEL with SILT and SAND, very dense, reddish brown, moist, fine to coarse grained sand with gravel to 2"	
	5			R-2 B-1	20 50/5"	116	13	SC	CLAYEY SAND with GRAVEL, very dense, light reddish brown, moist, fine to coarse grained sand with subangular gravel to 2"	SA
				R-3	15 24 50	120	12		CLAYEY SAND with GRAVEL, very dense, light gray to light reddish brown, moist, fine to coarse grained sand with fine gravel	
	10			R-4 B-2	22 50/5"				CLAYEY SAND, very dense, light gray, moist, fine to coarse grained sand	
	15			R-5	17 30 40				CLAYEY SAND, very dense, light reddish brown, moist, fine to coarse grained sand	
									Total Depth = 16.5' BGS, no groundwater encountered, backfilled with cuttings on 4-18-23	
	20									
	25									
	30									

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

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GEOTECHNICAL BORING LOG LB-5

Project No.	12893.002	**Date Drilled**	4-18-23
Project	EMWD Valley Boulevard Brackish Transmission Pipeline	**Logged By**	JTD
Drilling Co.	2R Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	'
Location	See Boring Location Map	**Sampled By**	JTD

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
	0			B-1				SC-SM	**Artificial Fill (Af)**; SILTY, CLAYEY SAND with GRAVEL, light reddish brown, slightly moist, fine to coarse grained sand with subrounded gravel to 2"	
				R-1	21 32 26	123	7	SC	**Older Alluvium (Qalo)**; CLAYEY SAND with GRAVEL, dense, light grayish brown, moist, fine to coarse grained sand with fine gravel	
	5			R-2	22 30 42				CLAYEY SAND with GRAVEL, very dense, light reddish brown, moist, fine to coarse grained sand with fine gravel	
	10			R-3	30 50				CLAYEY SAND, very dense, light grayish brown, moist, fine to coarse grained sand	
	15			R-4	20 40 50				CLAYEY SAND, very dense, light grayish brown, moist, fine to coarse grained sand	
	20			R-5	20 50/5"			SM	SILTY SAND, very dense, light grayish brown to dark gray, moist, fine to coarse grained sand	
									Total Depth = 20.92' BGS, no groundwater encountered, backfilled with cuttings on 4-18-23	
	25									
	30									

This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

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GEOTECHNICAL BORING LOG LB-6

Project No.	12893.002	**Date Drilled**	4-18-23
Project	EMWD Valley Boulevard Brackish Transmission Pipeline	**Logged By**	JTD
Drilling Co.	2R Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	'
Location	See Boring Location Map	**Sampled By**	JTD

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION *This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.*	Type of Tests
	0							SC-SM	**Artificial Fill (Af)**; SILTY, CLAYEY SAND with GRAVEL and COBBLE, reddish brown, slightly moist, fine to coarse grained sand with subrounded clasts to 8"	
				R-1	20 50/5"	107	7	SC	**Older Alluvium (Qalo)**; CLAYEY SAND, very dense, reddish brown, moist, fine to coarse grained sand, cobble encountered from 3'-5'	
	5			R-2 B-1	50/2"			GW-GM	Well-graded GRAVEL with SAND, very dense, light reddish brown, slightly moist, fine to coarse grained sand with gravel to 3", sample disturbed, SE = 19	SE, SA, CR
				R-3	50/6"			SM	SILTY SAND, very dense, yellowish brown, moist, fine to medium grained sand	
	10			R-4	50/5"			GW-GM	Recovered as: 4-2" gravel in sampler, sample disturbed	
	15			R-5	30 50			SM	SILTY SAND, very dense, yellowish brown, moist, fine to medium grained sand	
									Total Depth = 16' BGS, no groundwater encountered, backfilled with cuttings on 4-18-23	
	20									
	25									
	30									

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

Leighton

GEOTECHNICAL BORING LOG LB-7

Project No.	12893.002	**Date Drilled**	4-18-23
Project	EMWD Valley Boulevard Brackish Transmission Pipeline	**Logged By**	JTD
Drilling Co.	2R Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	'
Location	See Boring Location Map	**Sampled By**	JTD

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION *This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.*	Type of Tests
	0							SC-SM	**Artificial Fill (Af)**; SILTY, CLAYEY SAND with GRAVEL and COBBLE, reddish brown, slightly moist, fine to coarse grained sand with rounded clasts to 6"	
				R-1	20 50/4"	133	4	SM	**Older Alluvium (Qalo)**; SILTY SAND with GRAVEL, very dense, dark brown, moist, fine to coarse grained sand with subrounded gravel to 2"	
	5			R-2 B-1	50/5"				**Granitic Bedrock (Kgr)**; Highly weathered, recovered as: SILTY SAND, very dense, grayish brown, moist, fine to coarse grianed sand	
				R-3	50/5"				Highly weathered, recovered as: SILTY SAND, very dense, grayish brown, moist, fine to coarse grianed sand	
	10			R-4	26 50				Highly weathered, recovered as: SILTY SAND, very dense, grayish brown, moist, fine to coarse grianed sand	
	15			R-5	50/5"				Highly weathered, recovered as: SILTY SAND, very dense, grayish brown, moist, fine to coarse grianed sand	
									Total Depth = 15.92' BGS, no groundwater encountered, backfilled with cuttings on 4-18-23	
	20									
	25									
	30									

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

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GEOTECHNICAL BORING LOG LB-8

Project No.	12893.002	**Date Drilled**	4-18-23
Project	EMWD Valley Boulevard Brackish Transmission Pipeline	**Logged By**	JTD
Drilling Co.	2R Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	'
Location	See Boring Location Map	**Sampled By**	JTD

Elevation Feet	Depth Feet	Graphic Log (N / S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
									This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.	
	0			B-1				SM	**Older Alluvium (Qalo)**; SILTY SAND with GRAVEL, grayish brown, slightly moist, fine to coarse grained sand with subrounded gravel to 3", SE = 37	SE, SA
				R-1	23 50/5"	119	6		**Granitic Bedrock (Kgr)**; Highly weathered, recovered as: SILTY SAND, very dense, grayish brown, moist, fine to coarse grained sand	
	5			R-2	50/3"				Recovered as: SILTY SAND, very dense, grayish brown, moist, fine to coarse grained sand	
	10			R-3	50/3"				Moderately weathered, recovered as: Well-graded SAND with SILT and GRAVEL, very dense, dark gray, moist, fine to coarse grained sand with fine gravel	
	15			R-4	50/3"				Recovered as: Well-graded SAND with SILT and GRAVEL, very dense, dark gray, moist, fine to coarse grained sand with fine gravel, sample disturbed	
									Total Depth = 16.25' BGS, no groundwater encountered, backfilled with cuttings on 4-18-23	
	20									
	25									
	30									

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

Leighton

GEOTECHNICAL BORING LOG LB-9

Project No.	12893.002	**Date Drilled**	4-18-23
Project	EMWD Valley Boulevard Brackish Transmission Pipeline	**Logged By**	JTD
Drilling Co.	2R Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	'
Location	See Boring Location Map	**Sampled By**	JTD

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION *This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.*	Type of Tests
	0								@ Surface: 5" AC, No AB	
								SM	**Artificial Fill (Af)**; SILTY SAND, dark brown, moist, fine to coarse grained sand	
				R-1	5 50	114	12	SC-SM	**Older Alluvium (Qalo)**; SILTY, CLAYEY SAND, dense, reddish brown, moist, fine to coarse grained sand	
	5			R-2 B-1	50/6"			SM	SILTY SAND, very dense, reddish brown, moist, fine to meidum grained sand, cobble from 5'-7'	
				R-3	35 50/5"			SC	CLAYEY SAND, very dense, light brown, moist, fine to coarse grained sand	
	10			R-4	24 37 50				CLAYEY SAND, very dense, light grayish brown, moist, fine to coarse grained sand	
	15			R-5	27 50				CLAYEY SAND, very dense, light grayish brown, moist, fine to coarse grained sand	
									Total Depth = 16' BGS, no groundwater encountered, backfilled with cuttings and capped with cold patch AC on 4-18-23	
	20									
	25									
	30									

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

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GEOTECHNICAL BORING LOG LB-10

Project No.	12893.002	**Date Drilled**	4-18-23
Project	EMWD Valley Boulevard Brackish Transmission Pipeline	**Logged By**	JTD
Drilling Co.	2R Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	'
Location	See Boring Location Map	**Sampled By**	JTD

SOIL DESCRIPTION

This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	Soil Description	Type of Tests
	0								@ Surface: 4" AC, No AB	
				B-1				SC-SM	**Artificial Fill (Af)**; SILTY, CLAYEY SAND, dark brown, moist, fine to coarse grained sand	
				R-1	50/6"	105	14	SC-SM	**Older Alluvium (Qalo)**; SILTY, CLAYEY SAND, very dense, reddish brown, moist, fine to coarse grained sand	
	5			R-2	35 50	122	12	SC	CLAYEY SAND, very dense, reddish brown, moist, fine to coarse grained sand	
				R-3	13 26 38				CLAYEY SAND, very dense, light grayish brown, moist, fine to coarse grained sand	
	10			R-4	16 27 50				CLAYEY SAND, very dense, light grayish brown, moist, fine to medium grained sand	
	15			R-5	20 50/5"				CLAYEY SAND, very dense, light grayish brown, moist, fine to coarse grained sand	
									Total Depth = 15.92' BGS, no groundwater encountered, backfilled with cuttings and capped with cold patch AC on 4-18-23	
	20									
	25									
	30									

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

Leighton

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GEOTECHNICAL BORING LOG LB-11

Project No.	12893.002	**Date Drilled**	4-19-23
Project	EMWD Valley Boulevard Brackish Transmission Pipeline	**Logged By**	JTD
Drilling Co.	2R Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	'
Location	See Boring Location Map	**Sampled By**	JTD

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
									This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.	
	0			B-1				SC	**Artificial Fill (Af)**; CLAYEY SAND with GRAVEL and COBBLE, light brown, slightly moist, fine to coarse grained sand with subangular clasts to 8"	CR
				R-1	50/5"				No recovery	
									Granitic Bedrock (Kgr); Slightly Weathered	
	5			R-2	50/1"				No Recovery	
									Auger Refusal @ 5.5' BGS, no groundwater encountered, backfilled with cuttings on 4-19-23	
	10									
	15									
	20									
	25									
	30									

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

Leighton

* * * This log is a part of a report by Leighton and should not be used as a stand-alone document. * * *

GEOTECHNICAL BORING LOG LB-12

Project No.	12893.002	**Date Drilled**	4-19-23
Project	EMWD Valley Boulevard Brackish Transmission Pipeline	**Logged By**	JTD
Drilling Co.	2R Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	'
Location	See Boring Location Map	**Sampled By**	JTD

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
	0								@ Surface: 5" AC / 5" AB	
								GW-GC	**Artificial Fill (Af)**; CLAYEY SAND with GRAVEL and COBBLE, dark brown, moist, fine to coarse grained sand with subangular clasts to 5"	
				R-1	18 27 24			SM	**Older Alluvium (Qalo)**; SILTY SAND with GRAVEL, dense, dark reddish brown, moist, fine to coarse grained sand with abundant gravel to 3", limited recovery, sample disturbed	
	5			R-2 B-1	50/5"				SILTY SAND with GRAVEL, very dense, dark reddish brown, moist, fine to coarse grained sand with subangular gravel to 1"	SA
				R-3	25 50/3"				SILTY SAND with GRAVEL, very dense, dark reddish brown, moist, fine to coarse grained sand with subangular clasts to 3"	
	10			R-4	50/5"				SILTY SAND with GRAVEL, very dense, dark reddish brown, moist, fine to coarse grained sand with angular gravel to 2"	
	15			R-5	50/1"				SILTY SAND with GRAVEL, very dense, yellowish brown, moist, fine to coarse grained sand with angular gravel to 2"	
	20			R-6	50/2"				SILTY SAND with GRAVEL, very dense, yellowish brown, moist, fine to coarse grained sand with angular gravel to 2" Total Depth = 21.16' BGS, no groundwater encountered, backfilled with cuttings on 4-19-23	
	25									
	30									

This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

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GEOTECHNICAL BORING LOG LB-13

Project No.	12893.002	**Date Drilled**	4-19-23
Project	EMWD Valley Boulevard Brackish Transmission Pipeline	**Logged By**	JTD
Drilling Co.	2R Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	'
Location	See Boring Location Map	**Sampled By**	JTD

SOIL DESCRIPTION

This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	Soil Description	Type of Tests
	0								@ Surface: 3.5" AC, No AB	
				B-1				SM	**Older Alluvium (Qalo)**; SILTY SAND with GRAVEL, light reddish brown, moist, fine to coarse grained sand with angular gravel to 2"	
				R-1	50/6"	120	5		SILTY SAND with GRAVEL, very dense, light reddish brown, moist, fine to coarse grained sand with angular gravel to 1.5"	
	5			R-2	33 50	122	11	SC	CLAYEY SAND with GRAVEL, very dense, dark reddish brown, moist, fine to coarse grained sand with fine gravel	
				R-3	50/5"				CLAYEY SAND with GRAVEL and COBBLE, very dense, reddish brown, moist, fine to coarse grained sand with clasts to 8"	
	10								Auger Refusal @ 8.5' BGS, no groundwater encountered, backfilled with cuttings on 4-19-23	
	15									
	20									
	25									
	30									

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

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GEOTECHNICAL BORING LOG LB-14

Project No.	12893.002	**Date Drilled**	4-19-23
Project	EMWD Valley Boulevard Brackish Transmission Pipeline	**Logged By**	JTD
Drilling Co.	2R Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	'
Location	See Boring Location Map	**Sampled By**	JTD

This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
	0								@ Surface: 5" AC / 4" AB	
								SC	**Artificial Fill (Af)**; CLAYEY SAND, dark reddish brown, moist, fine to medium grained sand	
				R-1	8 12 13	120	12	SC	**Older Alluvim (Qalo)**; CLAYEY SAND with GRAVEL, medium dense, dark reddish brown, moist, fine to coarse grained sand with fine gravel	
	5			R-2 B-1	5 15 26	125	10		CLAYEY SAND, dense, dark reddish brown, moist, fine to medium grained sand, EI = 17, 43% -200	EI, -200
				R-3	2 5 4			ML	SANDY SILT, medium stiff, dark reddish brown, moist, fine to medium grained sand, trace fine gravel	
	10			R-4	5 8 11	122	10	SC	CLAYEY SAND with GRAVEL, medium dense, dark reddish brown, moist, fine to medium grained sand with trace fine gravel	
	15			R-5	32 50			SM	SILTY SAND, very dense, light reddish brown, moist, fine to medium grained sand	
									Total Depth = 16' BGS, no groundwater encountered, backfilled with cuttings and capped with cold patch AC on 4-19-23	
	20									
	25									
	30									

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

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GEOTECHNICAL BORING LOG LB-15

Project No.	12893.002	**Date Drilled**	4-19-23
Project	EMWD Valley Boulevard Brackish Transmission Pipeline	**Logged By**	JTD
Drilling Co.	2R Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	'
Location	See Boring Location Map	**Sampled By**	JTD

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
									This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.	
	0								@ Surface: 3" AC / 4" AB	
								SC	**Artificial Fill (Af)**; CLAYEY SAND, dark reddish brown, moist, fine to coarse grained sand	
				R-1	3 2 10			CL	SANDY Lean CLAY with GRAVEL, stiff, reddish brown, moist, fine to medium grained sand with subangular gravel to 2"	
	5			R-2 B-1	30 50	117	12	SC	**Older Alluvium (Qalo)**; CLAYEY SAND, very dense, reddish brown, moist, fine to medium grained sand, MD = 132.5 @ 8.5%	MD, SA, CR
				R-3	20 25 50	120	12		CLAYEY SAND, very dense, reddish brown, moist, fine to medium grained sand	
	10			R-4	16 36 50				CLAYEY SAND, very dense, reddish brown, moist, fine to medium grained sand	
	15			R-5	25 40 50/5"				CLAYEY SAND, very dense, reddish brown, moist, fine to medium grained sand	
									Total Depth = 16.42' BGS, no groundwater encountered, backfilled with cuttings and capped with cold patch AC on 4-19-23	
	20									
	25									
	30									

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

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GEOTECHNICAL BORING LOG LB-16

Project No.	12893.002	**Date Drilled**	4-19-23
Project	EMWD Valley Boulevard Brackish Transmission Pipeline	**Logged By**	BAA
Drilling Co.	2R Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	'
Location	See Boring Location Map	**Sampled By**	BAA

SOIL DESCRIPTION

This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	Soil Description	Type of Tests
	0							SC	**Quaternary Alluvium (Qal)**; CLAYEY SAND, light reddish brown, slightly moist, fine to coarse grained sand	
				R-1	7 15 30	87	28	CL	**Older Alluvium (Qalo)**; Lean CLAY with SAND, very stiff, light brown to reddish brown, moist, fine to medium grained sand	
	5			R-2 B-1	17 50	107	19		Lean CLAY with SAND, very stiff, light brown to light reddish brown, slightly moist, fine to medium grained sand, EI = 79	EI
				R-3	42 50/3"			SC	CLAYEY SAND, very dense, reddish brown, slightly moist, fine to medium grained sand	
	10			R-4	26 50				CLAYEY SAND, very dense, reddish brown, slightly moist, fine to medium grained sand	
	15			R-5	15 40 50/4"				CLAYEY SAND, very dense, reddish brown, slightly moist, fine to medium grained sand	
									Total Depth = 16.33' BGS, no groundwater encountered, backfilled with cuttings on 4-19-23	
	20									
	25									
	30									

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

Leighton

GEOTECHNICAL BORING LOG LB-17

Project No.	12893.002	**Date Drilled**	4-19-23
Project	EMWD Valley Boulevard Brackish Transmission Pipeline	**Logged By**	BAA
Drilling Co.	2R Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	'
Location	See Boring Location Map	**Sampled By**	BAA

SOIL DESCRIPTION

This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	Soil Description	Type of Tests
	0			B-1				SC	**Quaternary Alluvium (Qal)**; CLAYEY SAND with GRAVEL, light reddish brown, slightly moist, fine to coarse grained sand, with fine gravel	
				R-1	6 11 36	117	8		CLAYEY SAND with GRAVEL, medium dense, slightly moist, reddish brown, slightly moist, fine to coarse grained sand with fine gravel	
	5			R-2	40 50/4"			SC	**Older Alluvium (Qalo)**; CLAYEY SAND with GRAVEL, very dense, reddish brown, moist, fine to coarse grained sand with fine gravel	
				R-3	14 32 50			SM	SILTY SAND with GRAVEL, very dense, light brown to reddish brown, moist, fine to coarse grained sand with trace clay and fine gravel	
	10			R-4	14 22 29				SILTY SAND, dense, light brown to light reddish brown, moist, fine to coarse grained sand with trace clay and fine gravel	
	15			R-5	13 17 22			SW-SM	Well-graded SAND with SILT and GRAVEL, medium dense, light brown to yellowish brown, moist, fine to coarse grained sand with trace gravel	
									Total Depth = 16.5' BGS, no groundwater encountered, backfilled with cuttings on 4-19-23	
	20									
	25									
	30									

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

Leighton

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GEOTECHNICAL BORING LOG LB-18

Project No.	12893.002	**Date Drilled**	4-19-23
Project	EMWD Valley Boulevard Brackish Transmission Pipeline	**Logged By**	BAA
Drilling Co.	2R Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	'
Location	See Boring Location Map	**Sampled By**	BAA

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
									This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.	
	0							CL	**Artificial Fill (Af)**; SANDY Lean CLAY with GRAVEL, stiff, reddish brown, moist, fine to coarse grained sand with fine gravel	
				R-1	3 9 10	116	16		SANDY Lean CLAY with GRAVEL, stiff, reddish brown, moist, fine to coarse grained sand with fine gravel	
	5			R-2	6 16 20	119	13		SANDY Lean CLAY with GRAVEL, hard, reddish brown, moist, fine to coarse grained sand with fine gravel	
				R-3	15 30 38				**Granitic Bedrock (Kgr)**; Severely weathered, recovered as: Well-graded SAND with SILT and CLAY, very dense, fine to coarse grained sand	
	10			R-4	15 24 50/5"				Recovered as: Well-graded SAND with SILT, olive to gray, moist, fine to coarse grained sand with iron oxide staining, fractures	
	15			R-5	50/6"				Recovered as: Well-graded SAND with SILT, olive to gray, moist, fine to coarse grained sand with iron oxide staining, fractures	
	20			R-6	50/5"				Recovered as: Well-graded SAND with SILT, olive to gray, moist, fine to coarse grained sand with iron oxide staining, fractures	
									Total Depth = 20.42' BGS, no groundwater encountered, backfilled with cuttings on 4-19-23	
	25									
	30									

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

Leighton

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GEOTECHNICAL BORING LOG LB-19

Project No.	12893.002	**Date Drilled**	4-20-23
Project	EMWD Valley Boulevard Brackish Transmission Pipeline	**Logged By**	JTD
Drilling Co.	2R Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	'
Location	See Boring Location Map	**Sampled By**	JTD

SOIL DESCRIPTION

This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

Elevation Feet	Depth Feet	Graphic Log (N / S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
	0			B-1				SM	**Artificial Fill (Af)**; SILTY SAND with GRAVEL, light brown, slightly moist, fine to coarse grained sand with fine gravel	
				R-1	17 30 33	118	6	SC-SM	**Older Alluvium (Qalo)**; SILTY, CLAYEY SAND with GRAVEL, very dense, reddish brown, moist, fine to coarse grained sand with angular gravel to 2"	
	5			R-2	22 22 32				No Recovery	
				R-3	29 39 50				SILTY, CLAYEY SAND with GRAVEL, very dense, reddish brown, moist, fine to medium grained sand with fine gravel	
	10			R-4	30 50			SM	SILTY SAND with GRAVEL, very dense, reddish brown, moist, fine to coarse grained sand with subangular gravel to 1"	
	15			R-5	50/6"				SILTY SAND with GRAVEL, very dense, reddish brown, moist, fine to coarse grained sand with subangular gravel to 2"	
									Total Depth = 15.5' BGS, no groundwater encountered, backfilled with cuttings on 4-20-23	
	20									
	25									
	30									

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

Leighton

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GEOTECHNICAL BORING LOG LB-20

Project No.	12893.002	**Date Drilled**	4-20-23
Project	EMWD Valley Boulevard Brackish Transmission Pipeline	**Logged By**	JTD
Drilling Co.	2R Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	'
Location	See Boring Location Map	**Sampled By**	JTD

SOIL DESCRIPTION

This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	Soil Description	Type of Tests
	0							SM	**Artificial Fill (Af)**; SILTY SAND with GRAVEL, light brownish gray, slightly moist, fine to coarse grained sand with subrounded gravel to 1"	
				R-1	50/6"	108	9	SC-SM	**Older Alluvium (Qalo)**; SILTY, CLAYEY SAND with GRAVEL, very dense, dark reddish brown, moist, fine to coarse grained sand with subangular gravel to 2"	
	5			R-2 B-1	50/3"				SILTY, CLAYEY SAND with GRAVEL, very dense, dark reddish brown, moist, fine to coarse grained sand with subangular gravel to 2"	
				R-3	40 50/4"			SC	CLAYEY SAND with GRAVEL, very dense, dark reddish brown, moist, fine to coarse grained sand with fine gravel	
	10			R-4	35 50			SM	SILTY SAND with GRAVEL, very dense, dark reddish brown, moist, fine to coarse grained sand with fine gravel	
	15			R-5	50/5"				SILTY SAND with GRAVEL, very dense, dark reddish brown, moist, fine to coarse grained sand with fine gravel	
									Total Depth = 15.5' BGS, no groundwater encountered, backfilled with cuttings on 4-19-23	
	20									
	25									
	30									

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

Leighton

* * * This log is a part of a report by Leighton and should not be used as a stand-alone document. * * *

GEOTECHNICAL BORING LOG LB-21

Project No.	12893.002	**Date Drilled**	4-20-23
Project	EMWD Valley Boulevard Brackish Transmission Pipeline	**Logged By**	JTD
Drilling Co.	2R Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	'
Location	See Boring Location Map	**Sampled By**	JTD

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
									This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.	
	0							GW	**Artificial Fill (Af)**; Ground AC Gravel Road, Well-graded GRAVEL with SILT and SAND, dark grayish brown, slightly moist, fine to coarse grained sand wtih angular clasts to 4"	
				B-1				CL	**Older Alluvium (Qalo)**; SANDY Lean CLAY, dark reddish brown, moist, fine to coarse grained sand, EI = 74	EI, CR
				R-1	21 29 31	114	11	SC	CLAYEY SAND, dense, dark reddish brown, moist, fine to coarse grained sand	
	5			R-2	25 50/5"			SM	SILTY SAND, very dense, light reddish brown, moist, fine to medium grained sand	
				R-3	12 50	110	12		SILTY SAND, very dense, light reddish brown, moist, fine to medium grained sand	
	10			R-4 B-2	45 50			SW-SM	Well-graded SAND with SILTY, very dense, light brown, slightly moist, fine to coarse grained sand	
	15			R-5	21 50			SM	SILTY SAND, very dense, dark reddish brown, moist, fine to coarse grained sand	
									Total Depth = 16' BGS, no groundwater encountered, backfilled with cuttings on 4-20-23	
	20									
	25									
	30									

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:

-200	% FINES PASSING	DS	DIRECT SHEAR	SA	SIEVE ANALYSIS
AL	ATTERBERG LIMITS	EI	EXPANSION INDEX	SE	SAND EQUIVALENT
CN	CONSOLIDATION	H	HYDROMETER	SG	SPECIFIC GRAVITY
CO	COLLAPSE	MD	MAXIMUM DENSITY	UC	UNCONFINED COMPRESSIVE STRENGTH
CR	CORROSION	PP	POCKET PENETROMETER		
CU	UNDRAINED TRIAXIAL	RV	R VALUE		

Leighton

*** This log is a part of a report by Leighton and should not be used as a stand-alone document. ***

GEOTECHNICAL BORING LOG LB-22

Project No.	12893.002	**Date Drilled**	5-11-23
Project	EMWD Valley Boulevard Brackish Transmission Pipeline	**Logged By**	JTD
Drilling Co.	2R Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	'
Location	See Boring Location Map	**Sampled By**	JTD

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
									This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.	
	0								@ Surface: 5" AC / 3" AB	
								SC-SM	**Older Alluvium (Qalo)**; SILTY, CLAYEY SAND, reddish brown, moist, fine to coarse grained sand	
				R-1	50/6"	122	6		SILTY, CLAYEY SAND with GRAVEL, dense, reddish brown, moist, fine to coarse grained sand with angular gravel to 2"	
	5			R-2 B-1	37 50/3"	119	10	SM	SILTY SAND with GRAVEL, dense, reddish brown, moist, fine to medium grained sand with fine gravel	
				R-3	50/6"				SILTY SAND, dense, reddish brown, moist, fine to medium grained sand	
	10			R-4	50/6"				SILTY SAND, dense, reddish brown, moist, fine to medium grained sand	
	15			R-5	43 50/3"			SC	CLAYEY SAND, dense, reddish brown, moist, fine to coarse grained sand	
									Total Depth = 15.75' BGS, no groundwater encountered, backfilled with cuttings on 5-11-23	
	20									
	25									
	30									

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

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GEOTECHNICAL BORING LOG LB-23

Project No.	12893.002	**Date Drilled**	5-11-23
Project	EMWD Valley Boulevard Brackish Transmission Pipeline	**Logged By**	JTD
Drilling Co.	2R Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	'
Location	See Boring Location Map	**Sampled By**	JTD

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	**SOIL DESCRIPTION** *This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.*	Type of Tests
	0								@ Surface: 3.5" AC / 4" AB (Class 1)	
				B-1				CL	**Artificial Fill (Af)**; SILTY SAND, grayish brown, moist, fine to coarse grained sand	
				R-1	8 20 40	125	10	SC	**Older Alluvium (Qalo)**; CLAYEY SAND, dense, dark reddish brown, moist, fine to medium grained sand	
	5			R-2	17 50/6"	121	13		CLAYEY SAND, dense, reddish brown, moist, fine to coarse grained sand	
				R-3	25 50/6"	119	14		CLAYEY SAND, dense, dark reddish brown and dark grayish brown, moist, fine to coarse grained sand, trace pinhole voids	
	10			R-4	27 50/5"			SM	SILTY SAND, dense, yellowish brown, moist, fine to coarse grained sand	
	15			R-5	18 50/6"			SC-SM	SILTY, CLAYEY SAND, dense, light grayish brown, moist, fine to medium grained sand	
									Total Depth = 16' BGS, no groundwater encountered, backfilled with cuttings on 5-11-23	
	20									
	25									
	30									

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

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GEOTECHNICAL BORING LOG LB-24

Project No.	12893.002	**Date Drilled**	5-11-23
Project	EMWD Valley Boulevard Brackish Transmission Pipeline	**Logged By**	JTD
Drilling Co.	2R Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	'
Location	See Boring Location Map	**Sampled By**	JTD

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
	0								@ Surface: 4" AC / 5" AB	
								SC	**Artificial Fill (Af)**; CLAYEY SAND, dark grayish brown, moist, fine to coarse grained sand	
				R-1	7 11 20	109	19	CL	**Older Alluvium (Qalo)**; SANDY Lean CLAY, very stiff, dark reddish brown, moist, fine to medium grained sand	
	5			R-2 B-1	20 35 50/5"			SC	CLAYEY SAND, dense, light grayish brown, moist, fine to coarse grained sand	
				R-3	30 50/6"	120	10	SC-SM	SILTY, CLAYEY SAND, dense, light brown, moist, fine to medium grained sand	
	10			R-4	25 50/6"			SP-SM	Poorly Graded SAND with SILT, dense, light grayish brown, moist, fine to medium grained sand	
	15			R-5	21 50/6"			SC-SM	SILTY, CLAYEY SAND, dense, light brown, moist, fine to coarse grained sand	
									Total Depth = 16' BGS, no groundwater encountered, backfilled with cuttings on 45-11-23	
	20									
	25									
	30									

This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

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GEOTECHNICAL BORING LOG LB-8

Project No.	10508.001	**Date Drilled**	10-29-15
Project	Van Daele Cimarron Ridge	**Logged By**	AWS
Drilling Co.	Martini Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	'
Location	See Figure 3	**Sampled By**	AWS

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION *This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.*	Type of Tests
	0			B1				GP	**Artificial Fill Undocumented (Afu)** GRAVEL with silt, light gray	
				R1	6 7 7	109	16	CL	SANDY CLAY, medium stiff, dark reddish brown, moist, with angular pebbles	
	5			R2	5 10 15	107	10		**Granitic Bedrock (Kgr)** medium dense, light red to light gray, moist, highly weathered granitic, excavates as fine to coarse sand	
				R3	50/5.5"	101	10		very dense, light gray, moist, weathered granitic, excavates as fine to coarse sand	
	10			R4	50/5"	119	9		very dense, light gray, moist, weathered granitic, excavates as fine to coarse sand	
	15			R5	50/3"	113	5		very dense, light gray, moist, weathered granitic, excavates as fine to coarse sand	
	20				50/1"				No recovery Refusal @ 20' 1" No groundwater encountered Backfilled with spoils	
	25									
	30									

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

GEOTECHNICAL BORING LOG LB-9

Project No.	10508.001	**Date Drilled**	10-29-15
Project	Van Daele Cimarron Ridge	**Logged By**	AWS
Drilling Co.	Martini Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	'
Location	See Figure 3	**Sampled By**	AWS

SOIL DESCRIPTION

This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
	0							SM	**Artificial Fill Undocumented (Afu)** SILTY SAND, light gray, fine to coarse sand	
				R1	14 13 13	116	7		SILTY SAND, light red to light gray, moist, fine to coarse sand, with angular gravel	
	5			R2	11 13 19				SILTY SAND, light gray to brown, moist, fine to coarse sand, with angular gravel	
					50/1"				**Granitic Bedrock (Kgr)** No recovery	
	10				50/3"				No recovery	
									Refusal @ 12.5' No groundwater encountered Backfilled with spoils	
	15									
	20									
	25									
	30									

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

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GEOTECHNICAL BORING LOG LB-1

Project No.	10932.003	**Date Drilled**	10-5-17
Project	The Village at Menifee Views	**Logged By**	BSS
Drilling Co.	Cal Pac Drilling	**Hole Diameter**	6"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	1480'
Location	See Boring Location Map - Figure 2	**Sampled By**	BSS

SOIL DESCRIPTION

This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
1480	0			B1				SM	**QUATERNARY ALLUVIUM (Qal)** SILTY SAND, medium dense, light brown, dry, fine to medium sand, some gravel	
				R1	21 50/6"				SILTY SAND, very dense, light brown, slightly moist, fine to medium sand, some gravel and cobbles	
1475	5			R2	9 16 21	124	4		medium dense, light reddish brown, moist, fine to coarse sand, few gravel, micaceous	
1470	10			R3	50/6"			SW	**GRANITIC BEDROCK (Kgr)** Slightly weathered granitic recovered as: Well graded SAND, very dense, light brown, slightly moist, fine to coarse sand, some silt, micaceous	
1465	15			R4	50/5"				Highly weathered granitic recovered as: Well graded SAND, very dense, grayish brown, slightly moist, fine to coarse sand, micaceous	
1460	20			R5	50/5"			SM	Highly weathered granitic recovered as: SILTY SAND, very dense, grayish brown, slightly moist, fine to coarse sand, some clay in center of bedrock (30% fines)	-200
1455	25			R6	50/6"				same as above	
									Total Depth 25.5' No Groundwater Encountered Backfilled with soil cuttings	
1450	30									

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

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GEOTECHNICAL BORING LOG LB-2

Project No.	10932.003	**Date Drilled**	10-5-17
Project	The Village at Menifee Views	**Logged By**	BSS
Drilling Co.	Cal Pac Drilling	**Hole Diameter**	6"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	1470'
Location	See Boring Location Map - Figure 2	**Sampled By**	BSS

SOIL DESCRIPTION

This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
1470	0							SM	**QUATERNARY ALLUVIUM (Qal)** SILTY SAND, loose, light brown, dry, fine to medium sand, some gravel	
				R1	3 6 13	112	4		medium dense, light reddish brown, slightly moist, fine to medium sand, few gravel	
				B1						SA
1465	5			R2	4 4 6	11	5		loose, light reddish brown, slightly moist, fine sand, some gravel (32% fines, 11% gravel, CO = -4.31%)	CO
1460	10			R3	14 50/4"			SW	**GRANITIC BEDROCK (Kgr)** Highly weathered granitic recovered as: Well graded SAND, very dense, grayish brown, slightly moist, micaceous	
									Total Depth 10.75' No Groundwater Encountered Backfilled with soil cuttings	
1455	15									
1450	20									
1445	25									
1440	30									

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

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GEOTECHNICAL BORING LOG LB-05

Project No.	10805.008	**Date Drilled**	12-13-21
Project	Pulte Cimarron Two	**Logged By**	DP
Drilling Co.	Martini Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	~1495 ft'
Location	See Boring Location Map	**Sampled By**	DP

SOIL DESCRIPTION

This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	Soil Description	Type of Tests
	0							SM	**Artificial Fill (Afu)** Silty SAND, medium dense, light reddish brown, slightly moist, fine sand	
				R1	16 19 21	115	8		Silty SAND with Gravel, medium dense, light reddish brown, slightly moist, fine sand	
	5			R2	14 28 45	126	8		Silty SAND, dense, light reddish brown, slightly moist, fine and coarse sand, note: Disturbed Sample	
				R3	12 27 50/5"				**Quaternary Older Alluvium (Qalo)** Silty SAND, dense, reddish brown, slightly moist, fine sand	
	10			R4	21 33 46	122	11		Silty SAND, dense, reddish brown, moist, fine sand	
	15			R5	19 50/6"				Silty SAND, very dense, reddish brown, moist, fine sand	
	20			R6	32 50/6"	117	11		Silty SAND, very dense, reddish brown, moist, fine sand	
	25									
	30									

Boring Terminated at 21.0 Feet
No Groundwater Encountered
Backfilled with Soil Cuttings

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

Leighton

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APPENDIX B

RESULTS OF LABORATORY TESTING

Leighton

MODIFIED PROCTOR COMPACTION TEST

ASTM D 1557

Project Name:	Stantec EMWD Valley Blvd Pipeline GE	Tested By:	F. Mina	Date:	05/11/23
Project No.:	13822.001	Input By:	M. Vinet	Date:	05/16/23
Boring No.:	LB-6	Depth (ft.):	0 - 5.0		
Sample No.:	B-1				
Soil Identification:	Sandy Lean Clay with Gravel s(CL), Reddish Brown.				

Note: Corrected dry density calculation assumes specific gravity of 2.70 and moisture content of 1.0% for oversize particles

			Scalp Fraction (%)	
Preparation Method:	X	Moist	#3/4	
		Dry	#3/8	13.6
Compaction Method	X	Mechanical Ram	#4	
		Manual Ram		

Rammer Weight (lb.) = 10.0
Height of Drop (in.) = 18.0
Mold Volume (ft³) 0.03340

TEST NO.	1	2	3	4	5	6
Wt. Compacted Soil + Mold (g)	5421	5514	5451			
Weight of Mold (g)	3526	3526	3526			
Net Weight of Soil (g)	1895	1988	1925			
Wet Weight of Soil + Cont. (g)	861.1	902.3	877.6			
Dry Weight of Soil + Cont. (g)	801.4	828.4	797.2			
Weight of Container (g)	277.5	280.2	278.6			
Moisture Content (%)	11.4	13.5	15.5			
Wet Density (pcf)	125.1	131.2	127.1			
Dry Density (pcf)	112.3	115.6	110.0			

Maximum Dry Density (pcf) 115.7 **Optimum Moisture Content (%)** 13.2

Corrected Dry Density (pcf) 121.0 **Corrected Moisture Content (%)** 11.5

☐ **Procedure A**
Soil Passing No. 4 (4.75 mm) Sieve
Mold : 4 in. (101.6 mm) diameter
Layers : 5 (Five)
Blows per layer : 25 (twenty-five)
May be used if +#4 is 20% or less

☒ **Procedure B**
Soil Passing 3/8 in. (9.5 mm) Sieve
Mold : 4 in. (101.6 mm) diameter
Layers : 5 (Five)
Blows per layer : 25 (twenty-five)
Use if +#4 is >20% and +3/8 in. is 20% or less

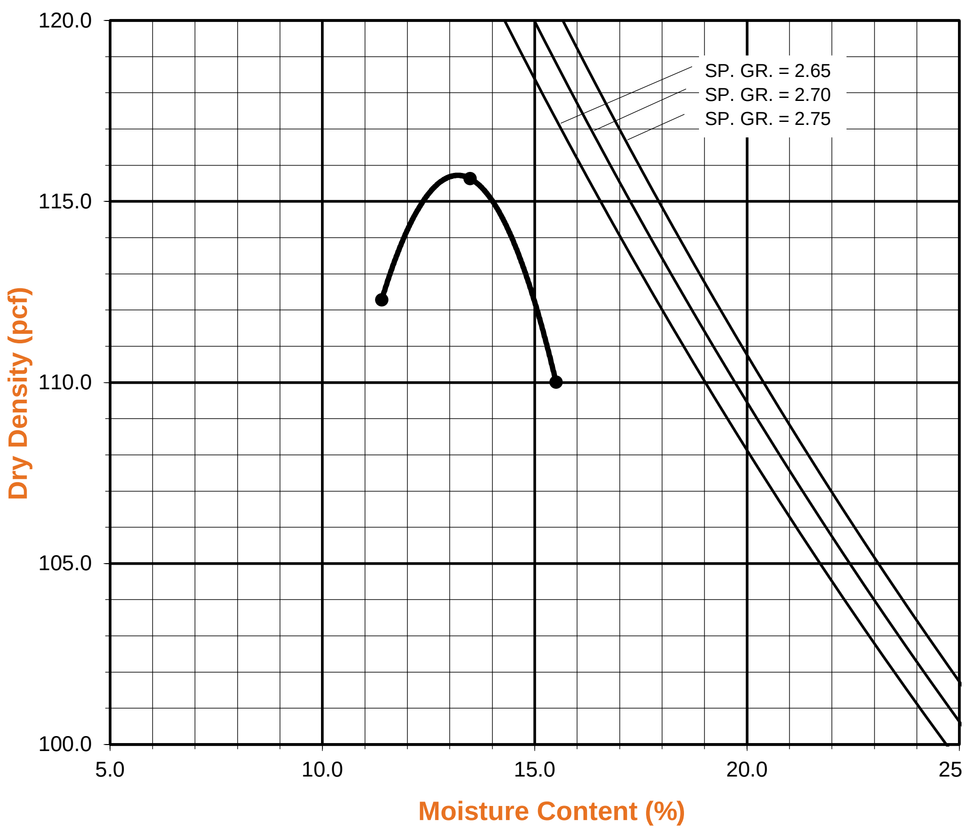
☐ **Procedure C**
Soil Passing 3/4 in. (19.0 mm) Sieve
Mold : 6 in. (152.4 mm) diameter
Layers : 5 (Five)
Blows per layer : 56 (fifty-six)
Use if +3/8 in. is >20% and +¾ in. is <30%

Particle-Size Distribution:

GR:SA:FI

Atterberg Limits:

LL,PL,PI



Leighton

EXPANSION INDEX of SOILS

ASTM D 4829

Project Name:	Stantec EMWD Valley Blvd Pipeline GE	Tested By:	M. Vinet	Date:	5/12/23
Project No. :	13822.001	Checked By:	M. Vinet	Date:	5/16/23
Boring No.:	LB-1	Depth:	0 - 5.0		
Sample No. :	B-1	Location:	N/A		
Sample Description:	Clayey Sand (SC), Dark Reddish Brown.				

Dry Wt. of Soil + Cont. (gm.)	896.2
Wt. of Container No. (gm.)	0.0
Dry Wt. of Soil (gm.)	896.2
Weight Soil Retained on #4 Sieve	6.0
Percent Passing # 4	99.3

MOLDED SPECIMEN	Before Test	After Test
Specimen Diameter (in.)	4.01	4.01
Specimen Height (in.)	1.0000	1.0135
Wt. Comp. Soil + Mold (gm.)	613.0	636.9
Wt. of Mold (gm.)	208.9	208.9
Specific Gravity (Assumed)	2.70	2.70
Container No.	10	10
Wet Wt. of Soil + Cont. (gm.)	579.4	636.9
Dry Wt. of Soil + Cont. (gm.)	552.1	367.4
Wt. of Container (gm.)	279.4	208.9
Moisture Content (%)	10.0	16.5
Wet Density (pcf)	121.9	127.4
Dry Density (pcf)	110.8	109.3
Void Ratio	0.521	0.542
Total Porosity	0.343	0.351
Pore Volume (cc)	70.9	73.7
Degree of Saturation (%) [S meas]	**51.8**	**82.2**

SPECIMEN INUNDATION in distilled water for the period of 24 h or expansion rate < 0.0002 in./h.

Date	Time	Pressure (psi)	Elapsed Time (min.)	Dial Readings (in.)
5/12/23	12:10	1.0	0	0.5000
5/12/23	12:20	1.0	10	0.5000
	Add Distilled Water to the Specimen			
5/13/23	8:00	1.0	1180	0.5135
5/13/23	9:00	1.0	1240	0.5135

Expansion Index (EI meas) =	((Final Rdg - Initial Rdg) / Initial Thick.) x 1000	13.5
Expansion Index (Report) =	Nearest Whole Number or Zero (0) if Initial Height is > than Final Heigh	**14**

Rev. 03-08

EXPANSION INDEX of SOILS
ASTM D 4829

Project Name:	Stantec EMWD Valley Blvd Pipeline GE	Tested By: M. Vinet	Date: 5/12/23
Project No. :	13822.001	Checked By: M. Vinet	Date: 5/16/23
Boring No.:	LB-7	Depth: 0 - 5.0	
Sample No. :	B-1	Location: N/A	
Sample Description:	Clayey Sand (SC), Dark Reddish Brown.		

Dry Wt. of Soil + Cont. (gm.)	1063.2
Wt. of Container No. (gm.)	0.0
Dry Wt. of Soil (gm.)	1063.2
Weight Soil Retained on #4 Sieve	10.2
Percent Passing # 4	99.0

MOLDED SPECIMEN	Before Test	After Test
Specimen Diameter (in.)	4.01	4.01
Specimen Height (in.)	1.0000	1.0576
Wt. Comp. Soil + Mold (gm.)	562.0	606.5
Wt. of Mold (gm.)	180.0	180.0
Specific Gravity (Assumed)	2.70	2.70
Container No.	11	11
Wet Wt. of Soil + Cont. (gm.)	339.8	606.5
Dry Wt. of Soil + Cont. (gm.)	307.7	341.1
Wt. of Container (gm.)	39.8	180.0
Moisture Content (%)	12.0	25.0
Wet Density (pcf)	115.2	121.6
Dry Density (pcf)	102.9	97.3
Void Ratio	0.639	0.733
Total Porosity	0.390	0.423
Pore Volume (cc)	80.7	92.6
Degree of Saturation (%) [S meas]	**50.7**	**92.3**

SPECIMEN INUNDATION in distilled water for the period of 24 h or expansion rate < 0.0002 in./h.

Date	Time	Pressure (psi)	Elapsed Time (min.)	Dial Readings (in.)
5/12/23	12:10	1.0	0	0.5000
5/12/23	12:20	1.0	10	0.5000
	Add Distilled Water to the Specimen			
5/13/23	8:00	1.0	1180	0.5576
5/13/23	9:00	1.0	1240	0.5576

Expansion Index (EI meas) = ((Final Rdg - Initial Rdg) / Initial Thick.) x 1000	57.6
Expansion Index (Report) = Nearest Whole Number or Zero (0) if Initial Height is > than Final Heigh	**58**

Rev. 03-08

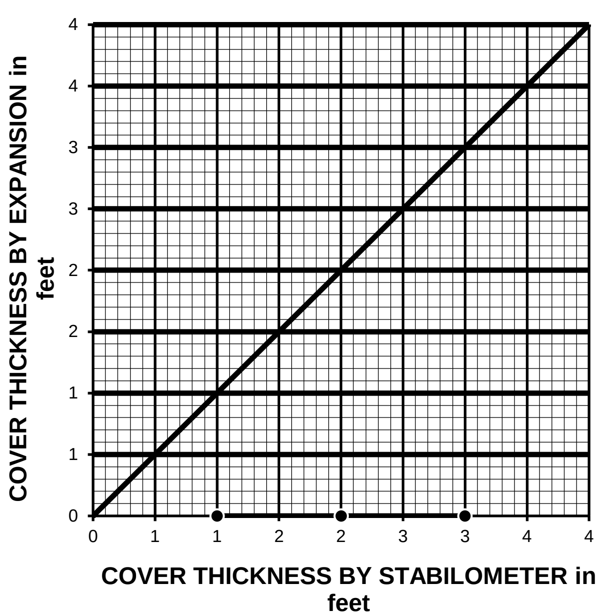
R-VALUE TEST RESULTS
ASTM D 2844

Project Name:	Stantec EMWD Valley Blvd Pipeline	Date:	5/15/23
Project Number:	13822.001	Technician:	F. Mina
Boring Number:	LB-6	Depth (ft.):	0 - 5.0
Sample Number:	B-1		
Sample Description:	Sandy Lean Clay s(CL), Reddish Brown.	Sample Location:	N/A

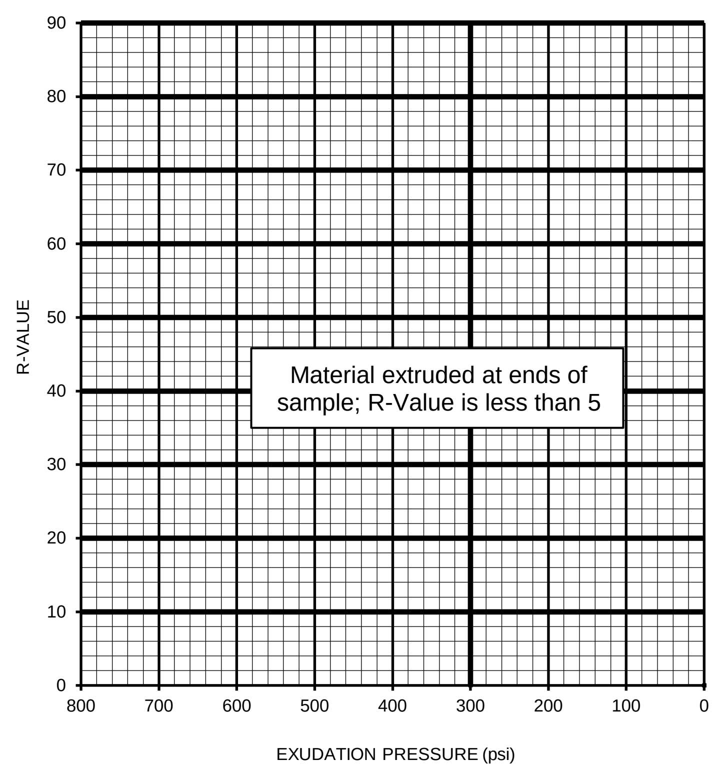
TEST SPECIMEN	A	B	C
MOISTURE AT COMPACTION %			
HEIGHT OF SAMPLE, Inches			
DRY DENSITY, pcf			
COMPACTOR AIR PRESSURE, psi			
EXUDATION PRESSURE, psi			
EXPANSION, Inches x 10exp-4			
STABILITY Ph 2,000 lbs (160 psi)			
TURNS DISPLACEMENT			
R-VALUE UNCORRECTED	N/A	N/A	N/A
R-VALUE CORRECTED	N/A	N/A	N/A

DESIGN CALCULATION DATA	a	b	c
GRAVEL EQUIVALENT FACTOR	1.0	1.0	1.0
TRAFFIC INDEX	5.0	5.0	5.0
STABILOMETER THICKNESS, ft.	N/A	N/A	N/A
EXPANSION PRESSURE THICKNESS, ft.	N/A	N/A	N/A

EXPANSION PRESSURE CHART



EXUDATION PRESSURE CHART



R-VALUE BY EXPANSION:	N/A
R-VALUE BY EXUDATION:	N/A
EQUILIBRIUM R-VALUE:	< 5

PARTICLE-SIZE DISTRIBUTION (GRADATION) of SOILS USING SIEVE ANALYSIS
ASTM D 6913

Leighton

Project Name:	Stantec EMWD Valley Blvd Pipeline GE	Tested By:	MRV	Date:	05/12/23
Project No.:	13822.001	Checked By:	MRV	Date:	05/16/23
Boring No.:	LB-4	Depth (feet):	0 - 5.0		
Sample No.:	B-1				
Soil Identification:	Sandy Lean Clay s(CL), Dark Yellowish Brown.				

		Moisture Content of Total Air - Dry Soil	
Container No.:	M	Wt. of Air-Dry Soil + Cont. (g)	1627.0
Wt. of Air-Dried Soil + Cont.(g)	1627.0	Wt. of Dry Soil + Cont. (g)	1475.7
Wt. of Container (g)	280.2	Wt. of Container No.______ (g)	280.2
Dry Wt. of Soil (g)	1195.5	Moisture Content (%)	12.7

After Wet Sieve	Container No.	M
	Wt. of Dry Soil + Container (g)	845.2
	Wt. of Container (g)	280.2
	Dry Wt. of Soil Retained on # 200 Sieve (g)	565.0

U. S. Sieve Size (in.)	U. S. Sieve Size (mm.)	Cumulative Weight Dry Soil Retained (g)	Percent Passing (%)
3"	75.000		100.0
1"	25.000	0.0	100.0
3/4"	19.000	19.4	98.4
1/2"	12.500	59.4	95.0
3/8"	9.500	76.5	93.6
#4	4.750	116.1	90.3
#8	2.360	138.2	88.4
#16	1.180	167.5	86.0
#30	0.600	210.7	82.4
#50	0.300	290.6	75.7
#100	0.150	420.2	64.9
#200	0.075	547.0	54.2
PAN			

GRAVEL: **10 %**

SAND: **36 %**

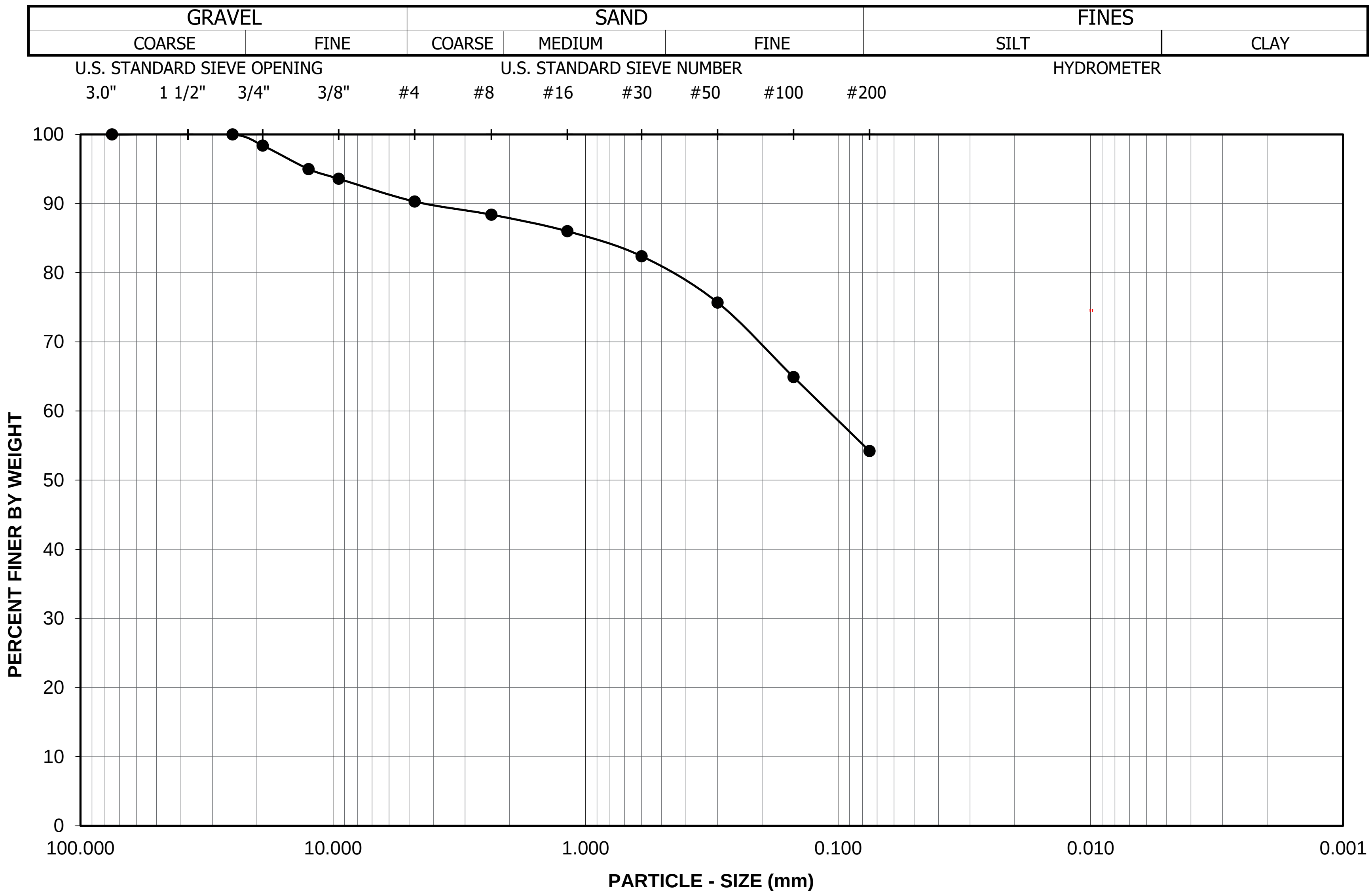
FINES: **54 %**

GROUP SYMBOL: **s(CL)**

$Cu = D60/D10 =$ N/A

$Cc = (D30)^2/(D60*D10) =$ N/A

Remarks:



Project Name: Stantec EMWD Valley Blvd Pipeline GE

Project No.: 13822.001

Boring No.: LB-4 Sample No.: B-1

Depth (feet): 0 - 5.0 Soil Type : s(CL)

Soil Identification: Sandy Lean Clay s(CL), Dark Yellowish Brown.

Leighton

PARTICLE - SIZE DISTRIBUTION ASTM D 6913

GR:SA:FI : (%) 10 : 36 : 54

May-23

SAND EQUIVALENT TEST

ASTM D 2419 / DOT CA Test 217

Project Name:	Stantec EMWD Valley Blvd Pipeline GE	Tested By:	M. Vinet	Date:	5/12/23
Project No. :	13822.001	Computed By:	M. Vinet	Date:	5/12/23
Client:	Stantec Consulting Services Inc.	Checked By:	M. Vinet	Date:	5/16/23

Boring No.	Sample No.	Depth (ft.)	Soil Description	T1	T2	T3	T4	R1	R2	SE	Average SE
LB-4	B-1	0 - 5.0	Sandy Lean Clay s(CL)	13:00	13:10	13:12	13:32	13.5	1.0	8	**8**
				13:02	13:12	13:14	13:34	13.5	1.0	8	

T1 = Starting Time
T2 = (T1 + 10 min) Begin Agitation

T3 = Settlement Starting Time
T4 = (T3 + 20 min) Take Clay Reading (R1)

Sand Equivalent = R2 / R1 * 100
Record SE as Next Higher Integer

Boring No.	LB-1	LB-6							
Sample No.	B-1	B-1							
Depth (ft.)	0 - 5.0	0 - 5.0							
Sample Type	BULK	BULK							
Soil Classification	SC	s(CL)							
Soak Time (min)	10	10							
Moisture Correction									
Wet Weight of Soil + Container (gm.)	851.0	803.9							
Dry Weight of Soil + Container (gm.)	792.0	771.2							
Weight of Container (gm)	278.0	278.3							
Moisture Content (%)	11.5	6.6							
Container No.:	BA	BL							
Sample Dry Weight Determination									
Weight of Sample + Container (gm.)	792.0	771.2							
Weight of Container (gm.)	278.0	278.3							
Weight of Dry Sample (gm.)	514.0	492.9							
Container No.:	BA	BL							
After Wash									
Dry Weight of Sample + Container (gm)	564.3	458.1							
Weight of Container (gm)	278.0	278.3							
Dry Weight of Sample (gm)	286.3	179.8							
% Passing No. 200 Sieve	**44**	**64**							
% Retained No. 200 Sieve	56	36							

Leighton

PERCENT PASSING
No. 200 SIEVE
ASTM D 1140

Project Name: Stantec EMWD Valley Blvd Pipeline
Project No.: 13822.001
Client Name: Stantec Consulting Services Inc.
Tested By: M. Vinet Date: 05/11/23

ATTERBERG LIMITS

ASTM D 4318

Project Name:	Stantec EMWD Valley Blvd Pipeline GE	Tested By:	M. Vinet	Date:	05/16/23
Project No. :	13822.001	Input By:	M. Vinet	Date:	05/16/23
Boring No.:	LB-1	Checked By:	M. Vinet		
Sample No.:	B-1	Depth (ft.)	0 - 5.0		
Soil Identification:	Clayey Sand (SC), Dark Yellowish Brown.				

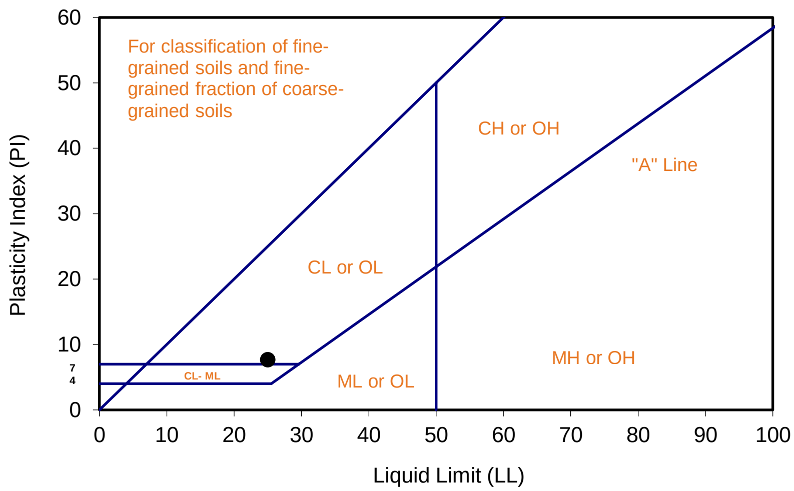
TEST	PLASTIC LIMIT		LIQUID LIMIT			
NO.	1	2	1	2	3	4
Number of Blows [N]			15	25	35	
Wet Wt. of Soil + Cont. (g)	26.34	23.70	25.88	28.44	27.88	
Dry Wt. of Soil + Cont. (g)	24.48	22.23	23.36	25.52	25.22	
Wt. of Container (g)	13.80	13.70	13.86	13.66	13.64	
Moisture Content (%) [Wn]	17.42	17.23	26.53	24.62	22.97	

Liquid Limit	**25**
Plastic Limit	**17**
Plasticity Index	**8**
Classification	**CL**

PI at "A" - Line = 0.73(LL-20) 3.65

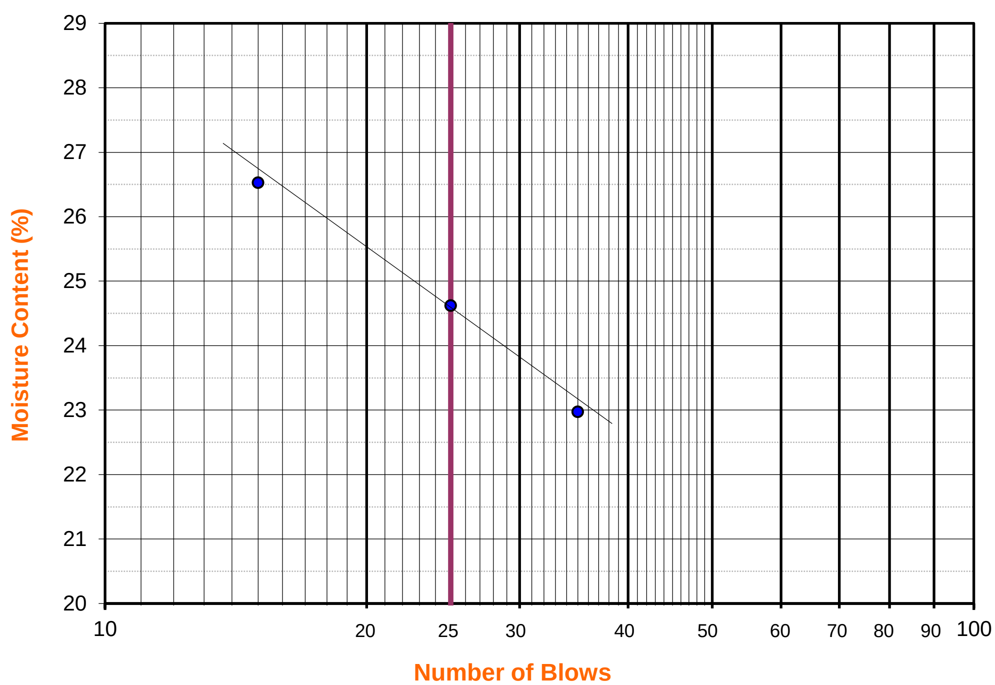
One - Point Liquid Limit Calculation

$LL = Wn(N/25)^{0.121}$



PROCEDURES USED

- [ ] Wet Preparation Multipoint - Wet
- [x] Dry Preparation Multipoint - Dry
- [x] Procedure A Multipoint Test
- [ ] Procedure B One-point Test



TESTS for SULFATE CONTENT
CHLORIDE CONTENT and pH of SOILS

Project Name: Stantec EMWD Valley Blvd Pipeline | Tested By : M. Vinet | Date: 05/16/23

Project No. : 13822.001 | Data Input By: M. Vinet | Date: 05/16/23

Boring No.	LB-1	LB-5	LB-9	
Sample No.	B-1	R-2	B-1	
Sample Depth (ft)	0 - 5.0	5.0	0 - 5.0	
Soil Identification:	Clayey Sand (SC)	Silty Sand (SM)	Silty Sand (SM)	
Wet Weight of Soil + Container (g)	100.00	100.00	100.00	
Dry Weight of Soil + Container (g)	100.00	100.00	100.00	
Weight of Container (g)	0.00	0.00	0.00	
Moisture Content (%)	0.00	0.00	0.00	
Weight of Soaked Soil (g)	100.00	100.00	100.00	

SULFATE CONTENT, DOT California Test 417, Part II

Beaker No.	1	2	3	
Crucible No.	1	2	3	
Furnace Temperature (°C)	850	850	850	
Time In / Time Out	Timer	Timer	Timer	
Duration of Combustion (min)	45	45	45	
Wt. of Crucible + Residue (g)	25.0410	24.8990	25.0150	
Wt. of Crucible (g)	25.0362	24.8953	25.0111	
Wt. of Residue (g) (A)	0.0048	0.0037	0.0039	
PPM of Sulfate (A) x 41150	197.52	152.26	160.49	
PPM of Sulfate, Dry Weight Basis	**198**	**152**	**160**	

CHLORIDE CONTENT, DOT California Test 422

ml of Extract For Titration (B)	30	30	30	
ml of AgNO3 Soln. Used in Titration (C)	0.8	0.6	0.4	
PPM of Chloride (C -0.2) * 100 * 30 / B	60	40	20	
PPM of Chloride, Dry Wt. Basis	**60**	**40**	**20**	

pH TEST, DOT California Test 643

pH Value	**8.50**	**7.70**	**7.60**	
Temperature °C	21.0	21.0	21.0	

SOIL RESISTIVITY TEST
DOT CA TEST 643

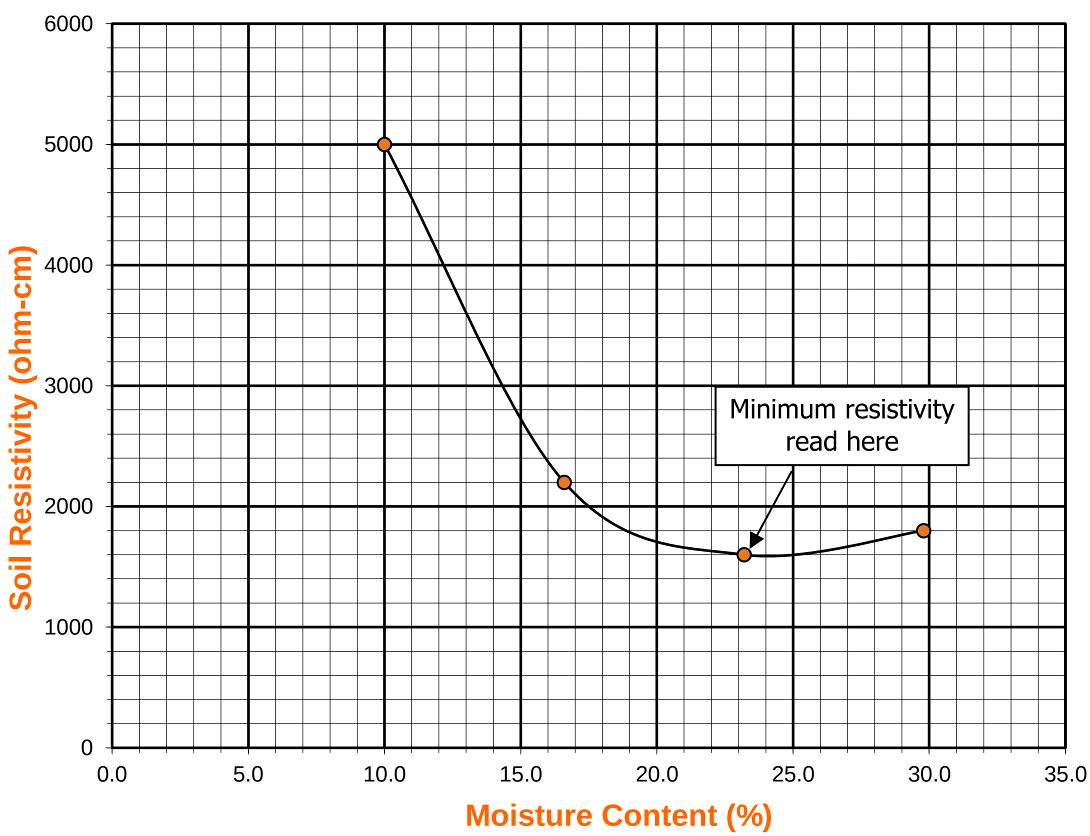
Project Name:	Stantec EMWD Valley Blvd Pipeline	Tested By :	M. Vinet	Date:	05/16/23
Project No. :	13822.001	Data Input By:	M. Vinet	Date:	05/16/23
Boring No.:	LB-1	Depth (ft.) :	0 - 5.0		
Sample No. :	B-1				
Soil Identification:*	Clayey Sand (SC)				

*California Test 643 requires soil specimens to consist only of portions of samples passing through the No. 8 US Standard Sieve before resistivity testing. Therefore, this test method may not be representative for coarser materials.

Specimen No.	Water Added (ml) (Wa)	Adjusted Moisture Content (MC)	Resistance Reading (ohm)	Soil Resistivity (ohm-cm)
1	50	10.00	5000	5000
2	83	16.60	2200	2200
3	116	23.20	1600	1600
4	149	29.80	1800	1800
5				

Moisture Content (%) (MCi)	0.00
Wet Wt. of Soil + Cont. (g)	100.00
Dry Wt. of Soil + Cont. (g)	100.00
Wt. of Container (g)	0.00
Container No.	A
Initial Soil Wt. (g) (Wt)	500.00
Box Constant	1.000
MC =(((1+Mci/100)x(Wa/Wt+1))-1)x100	

Min. Resistivity (ohm-cm)	Moisture Content (%)	Sulfate Content (ppm)	Chloride Content (ppm)	Soil pH: pH	Soil pH: Temp. (°C)
DOT CA Test 643		DOT CA Test 417 Part II	DOT CA Test 422	DOT CA Test 643	
1600	**23.2**	**198**	**60**	**8.50**	**21.0**



SOIL RESISTIVITY TEST

DOT CA TEST 643

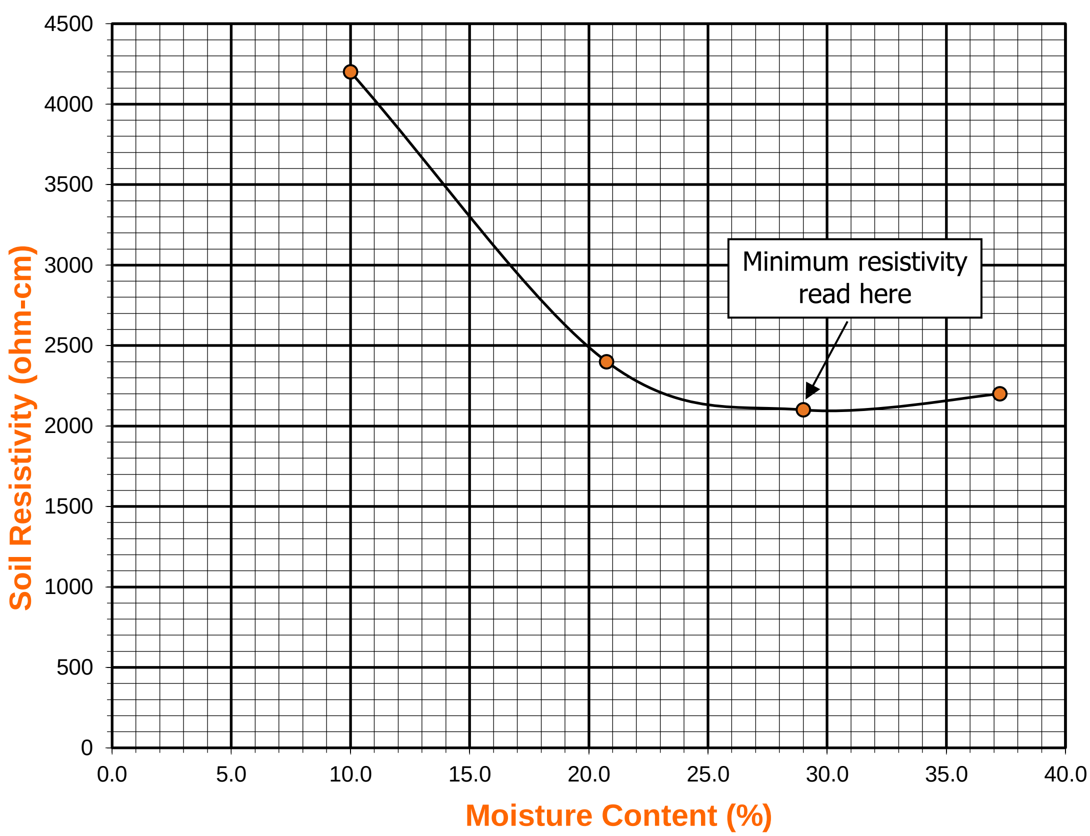
Project Name:	Stantec EMWD Valley Blvd Pipeline	Tested By :	M. Vinet Date: 05/16/23
Project No. :	13822.001	Data Input By:	M. Vinet Date: 05/16/23
Boring No.:	LB-5	Depth (ft.) :	5.0
Sample No. :	R-2		
Soil Identification:*	Silty Sand (SM)		

*California Test 643 requires soil specimens to consist only of portions of samples passing through the No. 8 US Standard Sieve before resistivity testing. Therefore, this test method may not be representative for coarser materials.

Specimen No.	Water Added (ml) (Wa)	Adjusted Moisture Content (MC)	Resistance Reading (ohm)	Soil Resistivity (ohm-cm)
1	40	10.00	4200	4200
2	83	20.75	2400	2400
3	116	29.00	2100	2100
4	149	37.25	2200	2200
5				

Moisture Content (%) (MCi)	0.00
Wet Wt. of Soil + Cont. (g)	100.00
Dry Wt. of Soil + Cont. (g)	100.00
Wt. of Container (g)	0.00
Container No.	A
Initial Soil Wt. (g) (Wt)	400.00
Box Constant	1.000
MC =(((1+Mci/100)x(Wa/Wt+1))-1)x100	

Min. Resistivity (ohm-cm)	Moisture Content (%)	Sulfate Content (ppm)	Chloride Content (ppm)	Soil pH	
				pH	Temp. (°C)
DOT CA Test 643		DOT CA Test 417 Part II	DOT CA Test 422	DOT CA Test 643	
2100	**29.0**	**152**	**40**	**7.70**	**21.0**



SOIL RESISTIVITY TEST
DOT CA TEST 643

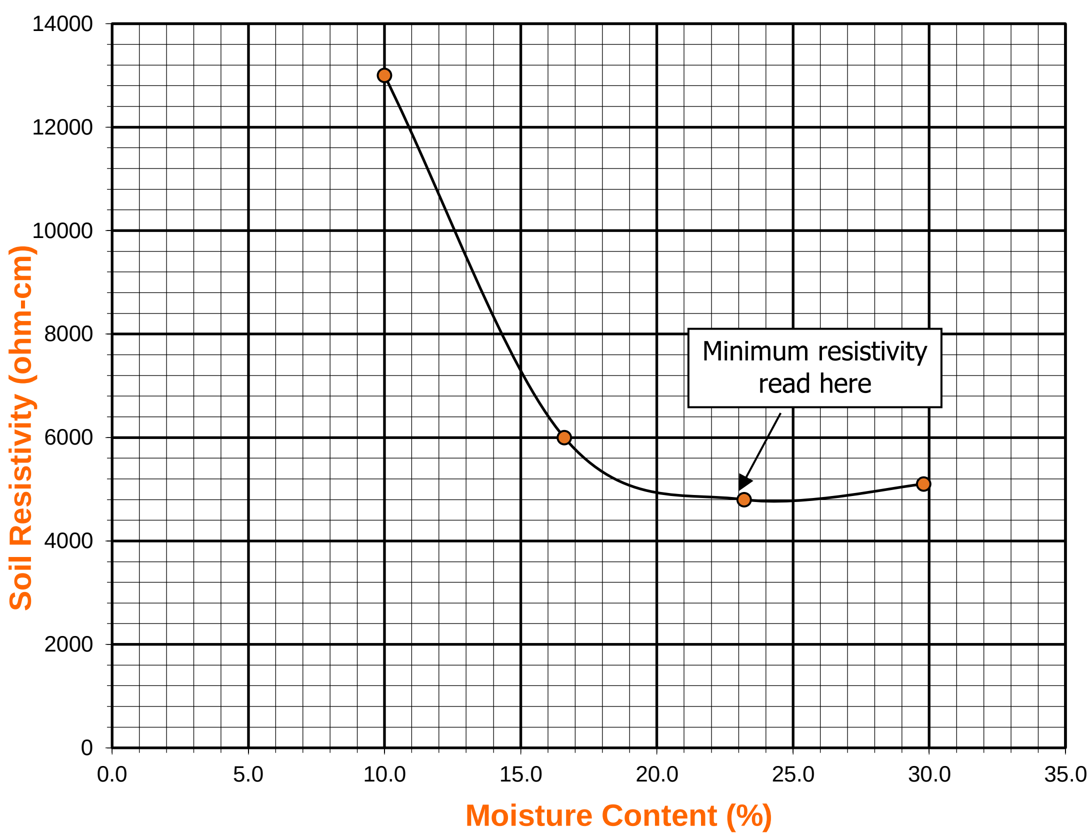
Project Name:	Stantec EMWD Valley Blvd Pipeline	Tested By :	M. Vinet Date: 05/16/23
Project No. :	13822.001	Data Input By:	M. Vinet Date: 05/16/23
Boring No.:	LB-9	Depth (ft.) :	0 - 5.0
Sample No. :	B-1		
Soil Identification:*	Silty Sand (SM)		

*California Test 643 requires soil specimens to consist only of portions of samples passing through the No. 8 US Standard Sieve before resistivity testing. Therefore, this test method may not be representative for coarser materials.

Specimen No.	Water Added (ml) (Wa)	Adjusted Moisture Content (MC)	Resistance Reading (ohm)	Soil Resistivity (ohm-cm)
1	50	10.00	13000	13000
2	83	16.60	6000	6000
3	116	23.20	4800	4800
4	149	29.80	5100	5100
5				

Moisture Content (%) (MCi)	0.00
Wet Wt. of Soil + Cont. (g)	100.00
Dry Wt. of Soil + Cont. (g)	100.00
Wt. of Container (g)	0.00
Container No.	A
Initial Soil Wt. (g) (Wt)	500.00
Box Constant	1.000
MC =(((1+Mci/100)x(Wa/Wt+1))-1)x100	

Min. Resistivity (ohm-cm)	Moisture Content (%)	Sulfate Content (ppm)	Chloride Content (ppm)	Soil pH	
				pH	Temp. (°C)
DOT CA Test 643		DOT CA Test 417 Part II	DOT CA Test 422	DOT CA Test 643	
4800	**23.2**	**160**	**20**	**7.60**	**21.0**



MODIFIED PROCTOR COMPACTION TEST

ASTM D 1557

Project Name:	EMWD Brackish Water Transmission Pipeline	Tested By:	J. Foltz	Date:	05/17/23
Project No.:	12893.002	Input By:	M. Vinet	Date:	05/23/23
Boring No.:	LB-1	Depth (ft.):	0 - 5.0		
Sample No.:	B-1				
Soil Identification:	Sandy Silty, Clay s(CL-ML), White.				

Preparation Method: [X] Moist [ ] Dry

[X] Mechanical Ram [ ] Manual Ram

Mold Volume (ft³) 0.03340

Ram Weight = 10 lb.; Drop = 18 in.

TEST NO.	1	2	3	4	5	6
Wt. Compacted Soil + Mold (g)	5315	5413	5436	5400		
Weight of Mold (g)	3521	3521	3521	3521		
Net Weight of Soil (g)	1794	1892	1915	1879		
Wet Weight of Soil + Cont. (g)	1622.2	1640.0	1614.2	1082.5		
Dry Weight of Soil + Cont. (g)	1465.0	1460.0	1417.6	952.5		
Weight of Container (g)	278.2	276.0	278.6	278.5		
Moisture Content (%)	13.2	15.2	17.3	19.3		
Wet Density (pcf)	118.4	124.9	126.4	124.0		
Dry Density (pcf)	104.6	108.4	107.8	104.0		

Maximum Dry Density (pcf) **108.5** **Optimum Moisture Content (%)** **16.0**

PROCEDURE USED

[X] **Procedure A**
Soil Passing No. 4 (4.75 mm) Sieve
Mold : 4 in. (101.6 mm) diameter
Layers : 5 (Five)
Blows per layer : 25 (twenty-five)
May be used if +#4 is 20% or less

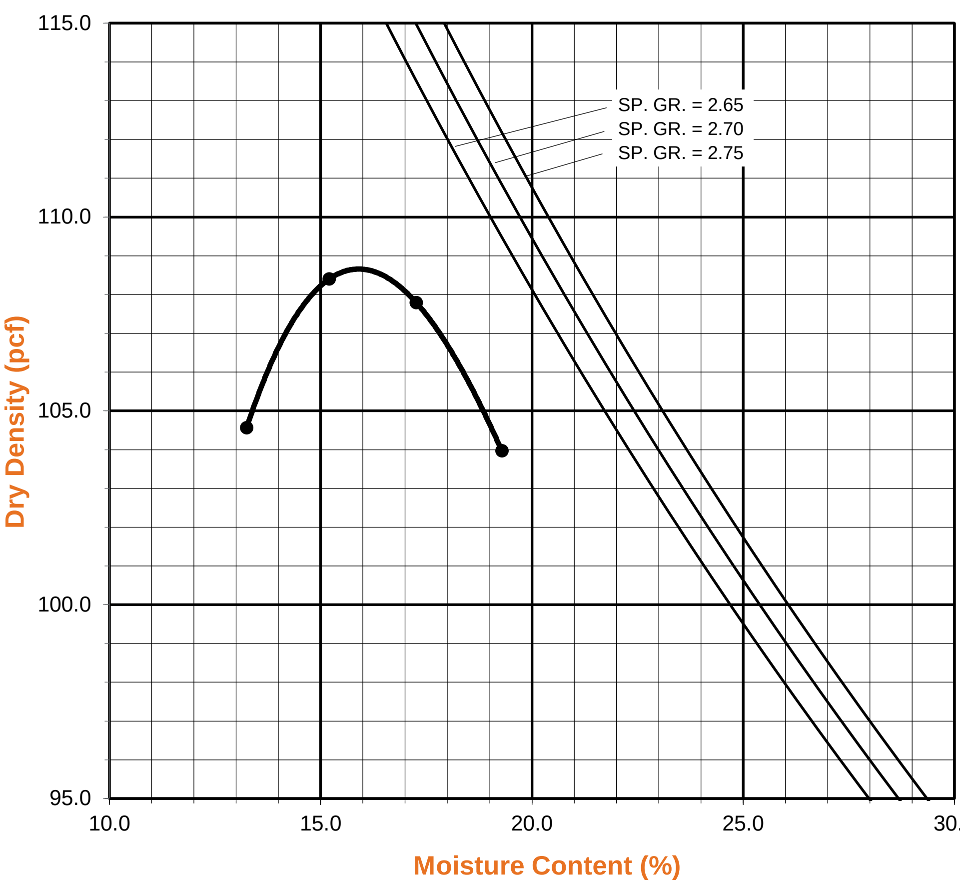
[ ] **Procedure B**
Soil Passing 3/8 in. (9.5 mm) Sieve
Mold : 4 in. (101.6 mm) diameter
Layers : 5 (Five)
Blows per layer : 25 (twenty-five)
Use if +#4 is >20% and +3/8 in. is 20% or less

[ ] **Procedure C**
Soil Passing 3/4 in. (19.0 mm) Sieve
Mold : 6 in. (152.4 mm) diameter
Layers : 5 (Five)
Blows per layer : 56 (fifty-six)
Use if +3/8 in. is >20% and +¾ in. is <30%

Particle-Size Distribution:
3:41:56
GR:SA:FI

Atterberg Limits:

LL,PL,PI



Compaction; LB-1, B-1 (04-18-23)

MODIFIED PROCTOR COMPACTION TEST
ASTM D 1557

Leighton

Project Name:	EMWD Brackish Water Transmission Pipeline	Tested By:	J. Foltz	Date:	05/17/23
Project No.:	12893.002	Input By:	M. Vinet	Date:	05/23/23
Boring No.:	LB-15	Depth (ft.):	5.0 - 10.0		
Sample No.:	B-1				
Soil Identification:	Clayey Sand (SC), Reddish Brown.				

Note: Corrected dry density calculation assumes specific gravity of 2.70 and moisture content of 1.0% for oversize particles

			Scalp Fraction (%)			
Preparation Method:	X	Moist	#3/4		Rammer Weight (lb.) =	10.0
		Dry			Height of Drop (in.) =	18.0
Compaction Method	X	Mechanical Ram	#3/8	10.8		
		Manual Ram	#4		Mold Volume (ft³)	0.03340

TEST NO.	1	2	3	4	5	6
Wt. Compacted Soil + Mold (g)	5572	5664	5588			
Weight of Mold (g)	3521	3521	3521			
Net Weight of Soil (g)	2051	2143	2067			
Wet Weight of Soil + Cont. (g)	1517.8	1223.9	1424.3			
Dry Weight of Soil + Cont. (g)	1431.4	1137.7	1299.9			
Weight of Container (g)	278.5	279.0	279.7			
Moisture Content (%)	7.5	10.0	12.2			
Wet Density (pcf)	135.4	141.4	136.4			
Dry Density (pcf)	125.9	128.5	121.6			

Maximum Dry Density (pcf)	**129.0**	**Optimum Moisture Content (%)**	**9.3**
Corrected Dry Density (pcf)	**132.5**	**Corrected Moisture Content (%)**	**8.5**

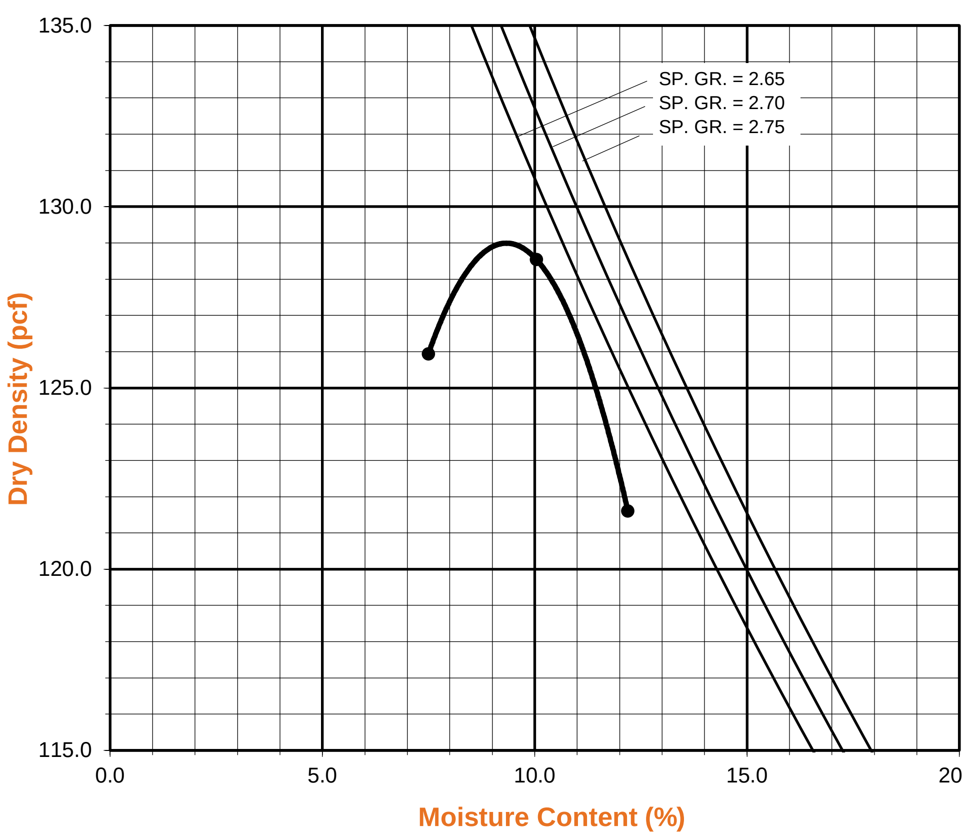
☐ **Procedure A**
Soil Passing No. 4 (4.75 mm) Sieve
Mold : 4 in. (101.6 mm) diameter
Layers : 5 (Five)
Blows per layer : 25 (twenty-five)
May be used if +#4 is 20% or less

☒ **Procedure B**
Soil Passing 3/8 in. (9.5 mm) Sieve
Mold : 4 in. (101.6 mm) diameter
Layers : 5 (Five)
Blows per layer : 25 (twenty-five)
Use if +#4 is >20% and +3/8 in. is 20% or less

☐ **Procedure C**
Soil Passing 3/4 in. (19.0 mm) Sieve
Mold : 6 in. (152.4 mm) diameter
Layers : 5 (Five)
Blows per layer : 56 (fifty-six)
Use if +3/8 in. is >20% and +¾ in. is <30%

Particle-Size Distribution:
13:46:41
GR:SA:FI
Atterberg Limits:

LL,PL,PI



Leighton

EXPANSION INDEX of SOILS

ASTM D 4829

Project Name:	TT/EMWD Brackish Water Transmission Pipeline	Tested By:	M. Vinet	Date:	5/22/23
Project No. :	12893.002	Checked By:	M. Vinet	Date:	5/23/23
Boring No.:	LB-1	Depth:	0 - 5.0		
Sample No. :	B-1	Location:	N/A		
Sample Description:	Sandy Silty, Clay s(CL-ML), White.				

Dry Wt. of Soil + Cont. (gm.)	1590.6
Wt. of Container No. (gm.)	0.0
Dry Wt. of Soil (gm.)	1590.6
Weight Soil Retained on #4 Sieve	90.6
Percent Passing # 4	94.3

MOLDED SPECIMEN	Before Test	After Test
Specimen Diameter (in.)	4.01	4.01
Specimen Height (in.)	1.0000	1.0278
Wt. Comp. Soil + Mold (gm.)	559.4	599.2
Wt. of Mold (gm.)	200.4	200.4
Specific Gravity (Assumed)	2.70	2.70
Container No.	7	7
Wet Wt. of Soil + Cont. (gm.)	350.2	599.2
Dry Wt. of Soil + Cont. (gm.)	311.1	312.2
Wt. of Container (gm.)	50.2	200.4
Moisture Content (%)	15.0	27.7
Wet Density (pcf)	108.3	117.0
Dry Density (pcf)	94.2	91.6
Void Ratio	0.790	0.840
Total Porosity	0.441	0.457
Pore Volume (cc)	91.4	97.1
Degree of Saturation (%) [S meas]	**51.2**	**89.2**

SPECIMEN INUNDATION in distilled water for the period of 24 h or expansion rate < 0.0002 in./h.

Date	Time	Pressure (psi)	Elapsed Time (min.)	Dial Readings (in.)
5/22/23	9:45	1.0	0	0.5000
5/22/23	9:55	1.0	10	0.5000
	Add Distilled Water to the Specimen			
5/23/23	8:00	1.0	1325	0.5278
5/23/23	9:00	1.0	1385	0.5278

Expansion Index (EI meas) =	((Final Rdg - Initial Rdg) / Initial Thick.) x 1000	27.8
Expansion Index (Report) =	Nearest Whole Number or Zero (0) if Initial Height is > than Final Heigh	**28**

EXPANSION INDEX of SOILS

ASTM D 4829

Project Name:	TT/EMWD Brackish Water Transmission Pipeline	Tested By: M. Vinet	Date: 5/22/23
Project No. :	12893.002	Checked By: M. Vinet	Date: 5/23/23
Boring No.:	LB-14	Depth: 5.0 - 10.0	
Sample No. :	B-1	Location: N/A	
Sample Description:	Clayey Sand (SC), Reddish Brown.		

Dry Wt. of Soil + Cont. (gm.)	1562.2
Wt. of Container No. (gm.)	0.0
Dry Wt. of Soil (gm.)	1562.2
Weight Soil Retained on #4 Sieve	56.2
Percent Passing # 4	96.4

MOLDED SPECIMEN	Before Test	After Test
Specimen Diameter (in.)	4.01	4.01
Specimen Height (in.)	1.0000	1.0170
Wt. Comp. Soil + Mold (gm.)	586.2	608.6
Wt. of Mold (gm.)	178.2	178.2
Specific Gravity (Assumed)	2.70	2.70
Container No.	8	8
Wet Wt. of Soil + Cont. (gm.)	350.2	608.6
Dry Wt. of Soil + Cont. (gm.)	324.2	372.6
Wt. of Container (gm.)	50.2	178.2
Moisture Content (%)	9.5	15.5
Wet Density (pcf)	123.1	127.7
Dry Density (pcf)	112.4	110.5
Void Ratio	0.500	0.525
Total Porosity	0.333	0.344
Pore Volume (cc)	69.0	72.5
Degree of Saturation (%) [S meas]	**51.3**	**79.7**

SPECIMEN INUNDATION in distilled water for the period of 24 h or expansion rate < 0.0002 in./h.

Date	Time	Pressure (psi)	Elapsed Time (min.)	Dial Readings (in.)
5/22/23	11:00	1.0	0	0.5000
5/22/23	11:10	1.0	10	0.5000
	Add Distilled Water to the Specimen			
5/23/23	8:00	1.0	1250	0.5170
5/23/23	9:00	1.0	1310	0.5170

Expansion Index (EI meas) = ((Final Rdg - Initial Rdg) / Initial Thick.) x 1000	17.0
Expansion Index (Report) = Nearest Whole Number or Zero (0) if Initial Height is > than Final Heigh	**17**

Rev. 03-08

Leighton

EXPANSION INDEX of SOILS

ASTM D 4829

Project Name:	TT/EMWD Brackish Water Transmission Pipeline	Tested By:	M. Vinet	Date:	5/22/23
Project No. :	12893.002	Checked By:	M. Vinet	Date:	5/23/23
Boring No.:	LB-16	Depth:	5.0 - 10.0		
Sample No. :	B-1	Location:	N/A		
Sample Description:	Lean Clay (CL), Yellowish Brown.				

Dry Wt. of Soil + Cont. (gm.)	2522.3
Wt. of Container No. (gm.)	0.0
Dry Wt. of Soil (gm.)	2522.3
Weight Soil Retained on #4 Sieve	125.2
Percent Passing # 4	95.0

MOLDED SPECIMEN	Before Test	After Test
Specimen Diameter (in.)	4.01	4.01
Specimen Height (in.)	1.0000	1.0792
Wt. Comp. Soil + Mold (gm.)	541.2	591.3
Wt. of Mold (gm.)	199.8	199.8
Specific Gravity (Assumed)	2.70	2.70
Container No.	9	9
Wet Wt. of Soil + Cont. (gm.)	350.7	591.3
Dry Wt. of Soil + Cont. (gm.)	309.3	294.3
Wt. of Container (gm.)	50.7	199.8
Moisture Content (%)	16.0	33.0
Wet Density (pcf)	103.0	109.4
Dry Density (pcf)	88.8	82.3
Void Ratio	0.899	1.049
Total Porosity	0.473	0.512
Pore Volume (cc)	98.0	114.4
Degree of Saturation (%) [S meas]	**48.1**	**85.0**

SPECIMEN INUNDATION in distilled water for the period of 24 h or expansion rate < 0.0002 in./h.

Date	Time	Pressure (psi)	Elapsed Time (min.)	Dial Readings (in.)
5/22/23	11:45	1.0	0	0.5000
5/22/23	11:55	1.0	10	0.5000
	Add Distilled Water to the Specimen			
5/23/23	8:00	1.0	1205	0.5792
5/23/23	9:00	1.0	1265	0.5792

Expansion Index (EI meas) =	((Final Rdg - Initial Rdg) / Initial Thick.) x 1000	79.2
Expansion Index (Report) =	Nearest Whole Number or Zero (0) if Initial Height is > than Final Heigh	**79**

EXPANSION INDEX of SOILS

ASTM D 4829

Project Name:	TT/EMWD Brackish Water Transmission Pipeline	Tested By: M. Vinet	Date: 5/22/23
Project No. :	12893.002	Checked By: M. Vinet	Date: 5/23/23
Boring No.:	LB-21	Depth: 0 - 5.0	
Sample No. :	B-1	Location: N/A	
Sample Description:	Lean Clay (CL), Dark Reddish Brown.		

Dry Wt. of Soil + Cont. (gm.)	1253.2
Wt. of Container No. (gm.)	0.0
Dry Wt. of Soil (gm.)	1253.2
Weight Soil Retained on #4 Sieve	20.2
Percent Passing # 4	98.4

MOLDED SPECIMEN	Before Test	After Test
Specimen Diameter (in.)	4.01	4.01
Specimen Height (in.)	1.0000	1.0740
Wt. Comp. Soil + Mold (gm.)	580.0	624.8
Wt. of Mold (gm.)	209.7	209.7
Specific Gravity (Assumed)	2.70	2.70
Container No.	10	10
Wet Wt. of Soil + Cont. (gm.)	579.0	624.8
Dry Wt. of Soil + Cont. (gm.)	545.7	329.2
Wt. of Container (gm.)	279.0	209.7
Moisture Content (%)	12.5	26.1
Wet Density (pcf)	111.7	116.6
Dry Density (pcf)	99.3	92.4
Void Ratio	0.698	0.824
Total Porosity	0.411	0.452
Pore Volume (cc)	85.1	100.4
Degree of Saturation (%) [S meas]	**48.4**	**85.6**

SPECIMEN INUNDATION in distilled water for the period of 24 h or expansion rate < 0.0002 in./h.

Date	Time	Pressure (psi)	Elapsed Time (min.)	Dial Readings (in.)
5/22/23	12:20	1.0	0	0.5000
5/22/23	12:30	1.0	10	0.5000
	Add Distilled Water to the Specimen			
5/23/23	8:00	1.0	1170	0.5740
5/23/23	9:00	1.0	1230	0.5740

Expansion Index (EI meas) =	((Final Rdg - Initial Rdg) / Initial Thick.) x 1000	74.0
Expansion Index (Report) =	Nearest Whole Number or Zero (0) if Initial Height is > than Final Heigh	**74**

Rev. 03-08

PARTICLE-SIZE DISTRIBUTION (GRADATION) of SOILS USING SIEVE ANALYSIS
ASTM D 6913

Leighton

Project Name:	EMWD Brackish Water Transmission Pipeline	Tested By:	MRV	Date:	05/19/23
Project No.:	12893.002	Checked By:	MRV	Date:	05/23/23
Boring No.:	LB-1	Depth (feet):	0 - 5.0		
Sample No.:	B-1				
Soil Identification:	Sandy Silty, Clay s(CL-ML), White.				

Calculation of Dry Weights	Whole Sample	Sample Passing #4	Moisture Contents	Whole Sample	Sample passing #4
Container No.:	M	K	Wt. of Air-Dry Soil + Cont.(g)	2134.2	593.6
Wt. Air-Dried Soil + Cont.(g)	2134.2	593.6	Wt. of Dry Soil + Cont. (g)	1826.7	593.6
Wt. of Container (g)	666.2	278.4	Wt. of Container No._____(g)	666.2	278.4
Dry Wt. of Soil (g)	1160.5	315.2	Moisture Content (%)	26.5	0.0

Passing #4 Material After Wet Sieve		
	Container No.	K
	Wt. of Dry Soil + Container (g)	415.2
	Wt. of Container (g)	278.4
	Dry Wt. of Soil Retained on # 200 Sieve (g)	136.8

U. S. Sieve Size		Cumulative Weight of Dry Soil Retained (g)		Percent Passing (%)
	(mm.)	Whole Sample	Sample Passing #4	
1 1/2"	37.500			100.0
1"	25.000			100.0
3/4"	19.000	0.0		100.0
1/2"	12.500	4.4		99.6
3/8"	9.500	11.6		99.0
#4	4.750	29.6		97.4
#8	2.360		8.5	94.8
#16	1.180		23.2	90.2
#30	0.600		41.8	84.5
#50	0.300		67.4	76.6
#100	0.150		100.4	66.4
#200	0.075		134.9	55.7
PAN				

GRAVEL: **3 %**

SAND: **41 %**

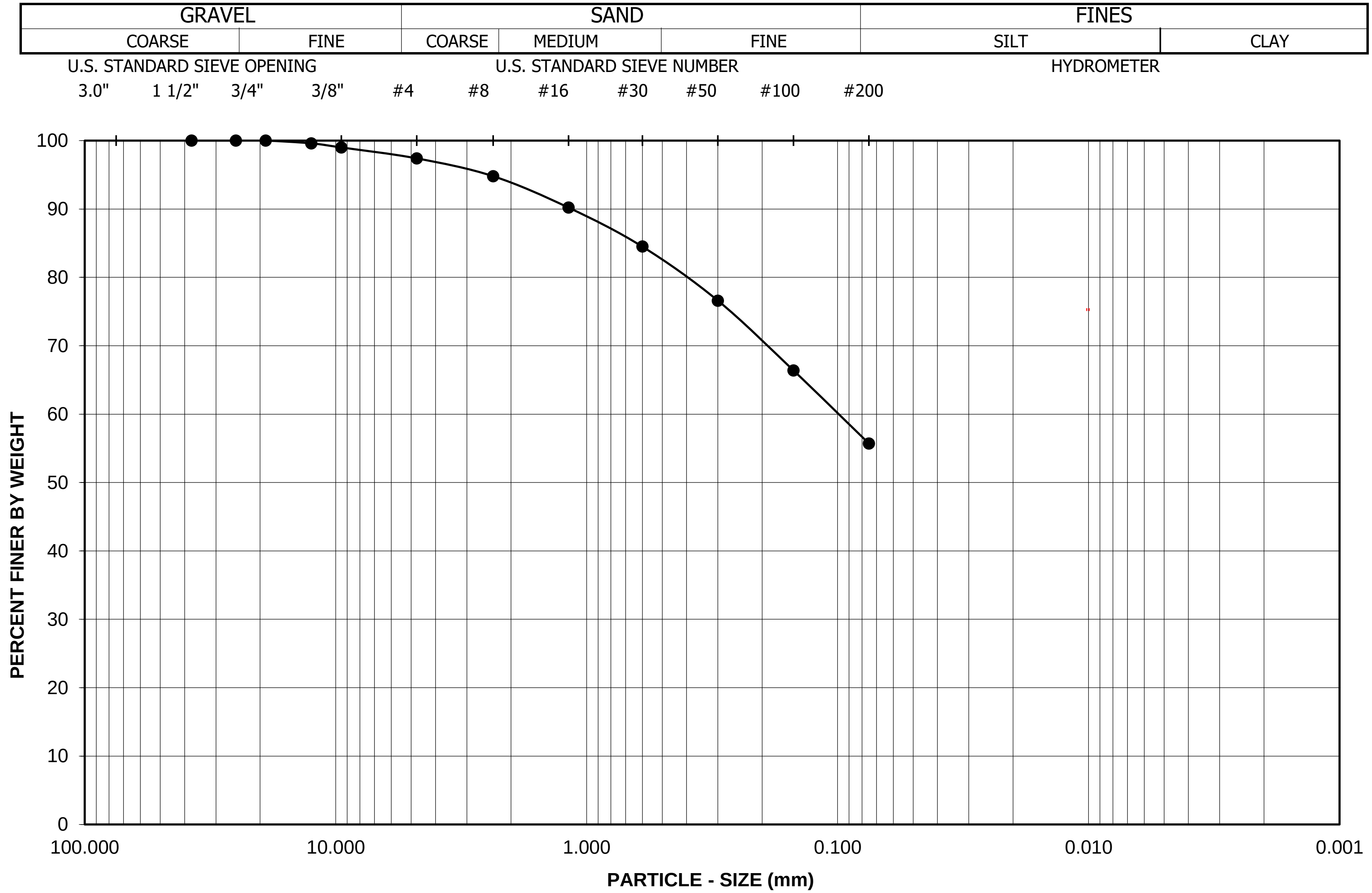
FINES: **56 %**

GROUP SYMBOL: **s(CL-ML)**

$Cu = D60/D10 =$ N/A

$Cc = (D30)^2/(D60*D10) =$ N/A

Remarks:



Project Name: EMWD Brackish Water Transmission Pipeline

Project No.: 12893.002

Boring No.: LB-1

Sample No.: B-1

Depth (feet): 0 - 5.0

Soil Type : s(CL-ML)

Soil Identification: Sandy Silty, Clay s(CL-ML), White.

Leighton

PARTICLE - SIZE DISTRIBUTION ASTM D 6913

GR:SA:FI : (%) 3 : 41 : 56

May-23

Sieve; LB-1, B-1 (04-18-23)

Leighton

PARTICLE-SIZE DISTRIBUTION (GRADATION) of SOILS USING SIEVE ANALYSIS

ASTM D 6913

Project Name:	EMWD Brackish Water Transmission Pipeline	Tested By:	MRV	Date:	05/19/23
Project No.:	12893.002	Checked By:	MRV	Date:	05/23/23
Boring No.:	LB-4	Depth (feet):	5.0 - 10.0		
Sample No.:	B-1				
Soil Identification:	Clayey Sand (SC), Reddish Brown.				

		Moisture Content of Total Air - Dry Soil	
Container No.:	R2	Wt. of Air-Dry Soil + Cont. (g)	815.3
Wt. of Air-Dried Soil + Cont.(g)	815.3	Wt. of Dry Soil + Cont. (g)	766.3
Wt. of Container (g)	276.2	Wt. of Container No.______ (g)	276.2
Dry Wt. of Soil (g)	490.1	Moisture Content (%)	10.0

After Wet Sieve	Container No.	R2
	Wt. of Dry Soil + Container (g)	589.6
	Wt. of Container (g)	276.2
	Dry Wt. of Soil Retained on # 200 Sieve (g)	313.4

U. S. Sieve Size		Cumulative Weight Dry Soil Retained (g)	Percent Passing (%)
(in.)	(mm.)		
3"	75.000		100.0
1"	25.000		100.0
3/4"	19.000	0.0	100.0
1/2"	12.500	9.7	98.0
3/8"	9.500	11.5	97.7
#4	4.750	14.5	97.0
#8	2.360	32.6	93.3
#16	1.180	84.2	82.8
#30	0.600	162.0	66.9
#50	0.300	225.7	53.9
#100	0.150	270.7	44.8
#200	0.075	306.5	37.5
PAN			

GRAVEL: **3 %**

SAND: **59 %**

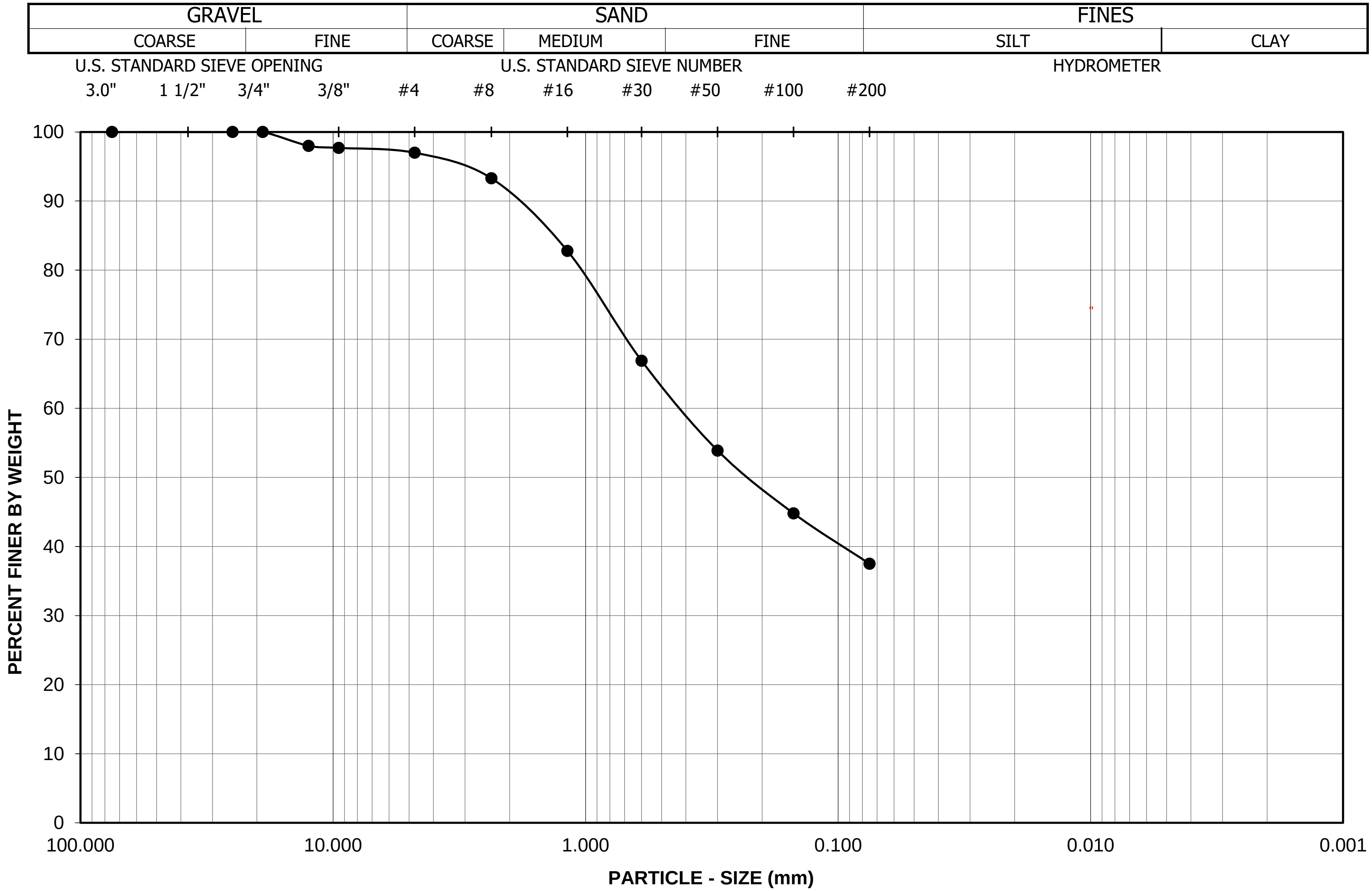
FINES: **38 %**

GROUP SYMBOL: **SC**

Cu = D60/D10 = N/A

Cc = $(D30)^2/(D60*D10)$ = N/A

Remarks:



Project Name: EMWD Brackish Water Transmission Pipeline

Project No.: 12893.002

Leighton

PARTICLE - SIZE DISTRIBUTION ASTM D 6913

Boring No.: LB-4

Sample No.: B-1

Depth (feet): 5.0 - 10.0

Soil Type : SC

Soil Identification: Clayey Sand (SC), Reddish Brown.

GR:SA:FI : (%) 3 : 59 : 38

May-23

PARTICLE-SIZE DISTRIBUTION (GRADATION) of SOILS USING SIEVE ANALYSIS
ASTM D 6913

Leighton

Project Name:	EMWD Brackish Water Transmission Pipeline	Tested By:	MRV	Date:	05/19/23
Project No.:	12893.002	Checked By:	MRV	Date:	05/23/23
Boring No.:	LB-6	Depth (feet):	5.0 - 10.0		
Sample No.:	B-1				
Soil Identification:	Silty Sand with Gravel (SM)g, Yellowish Brown.				

Calculation of Dry Weights	Whole Sample	Sample Passing #4	Moisture Contents	Whole Sample	Sample passing #4
Container No.:	L	L	Wt. of Air-Dry Soil + Cont.(g)	1420.5	594.1
Wt. Air-Dried Soil + Cont.(g)	1420.5	594.1	Wt. of Dry Soil + Cont. (g)	1380.1	594.1
Wt. of Container (g)	281.4	281.4	Wt. of Container No._____(g)	281.4	281.4
Dry Wt. of Soil (g)	1098.5	312.7	Moisture Content (%)	3.7	0.0

Passing #4 Material After Wet Sieve		
	Container No.	L
	Wt. of Dry Soil + Container (g)	520.1
	Wt. of Container (g)	281.4
	Dry Wt. of Soil Retained on # 200 Sieve (g)	238.7

U. S. Sieve Size		Cumulative Weight of Dry Soil Retained (g)		Percent Passing (%)
	(mm.)	Whole Sample	Sample Passing #4	
1 1/2"	37.500			100.0
1"	25.000	0.0		100.0
3/4"	19.000	36.8		96.6
1/2"	12.500	106.7		90.3
3/8"	9.500	136.9		87.5
#4	4.750	213.9		80.5
#8	2.360		24.5	74.2
#16	1.180		59.3	65.2
#30	0.600		93.6	56.4
#50	0.300		140.7	44.3
#100	0.150		192.6	30.9
#200	0.075		231.8	20.8
PAN				

GRAVEL: **20 %**

SAND: **59 %**

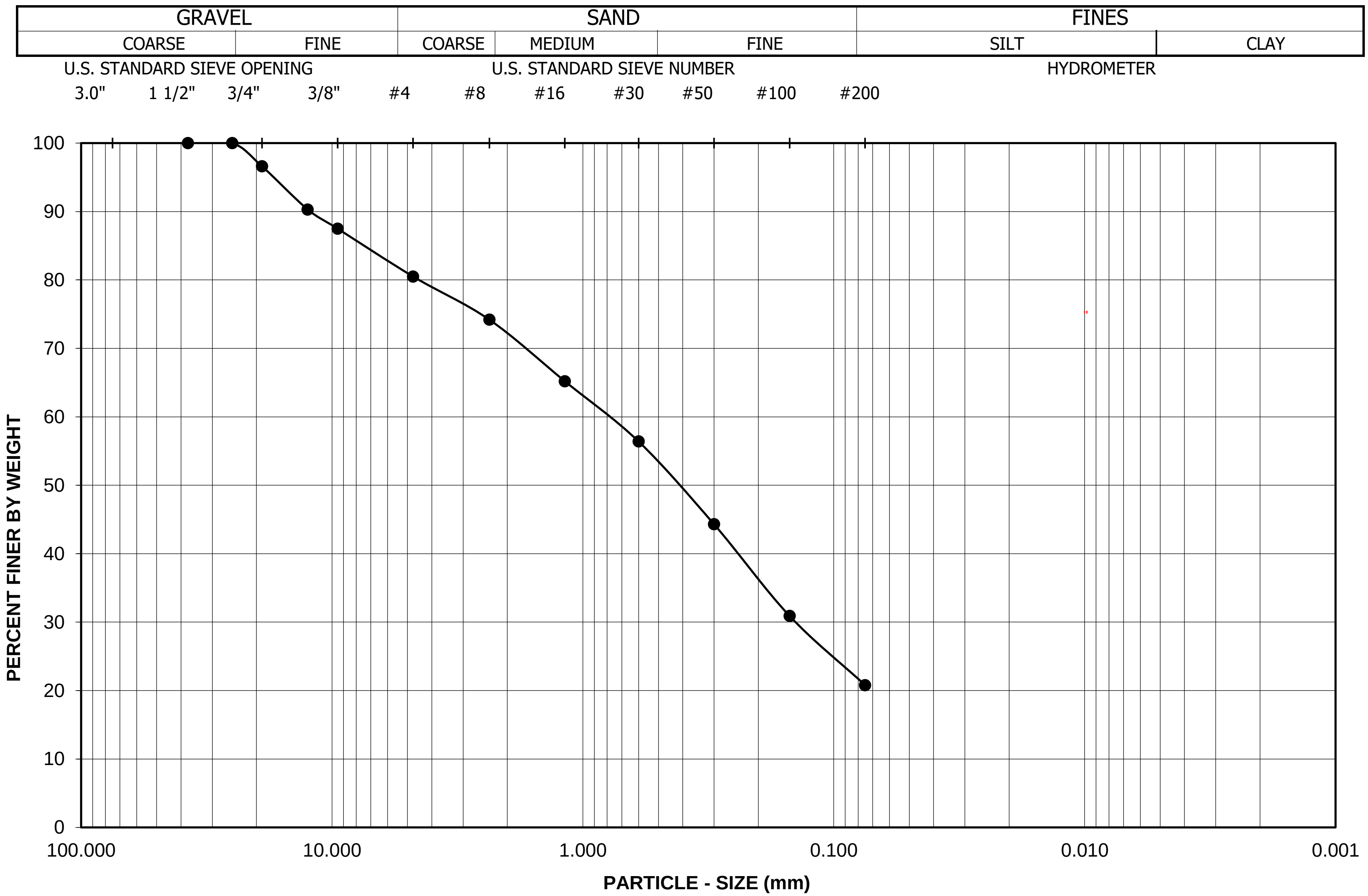
FINES: **21 %**

GROUP SYMBOL: **(SM)g**

$Cu = D60/D10 =$ N/A

$Cc = (D30)^2/(D60*D10) =$ N/A

Remarks:



Project Name: EMWD Brackish Water Transmission Pipeline

Project No.: 12893.002

Boring No.: LB-6 Sample No.: B-1

Depth (feet): 5.0 - 10.0 Soil Type : (SM)g

Soil Identification: Silty Sand with Gravel (SM)g, Yellowish Brown.

Leighton

PARTICLE - SIZE DISTRIBUTION ASTM D 6913

GR:SA:FI : (%) 20 : 59 : 21

May-23

Leighton

PARTICLE-SIZE DISTRIBUTION (GRADATION) of SOILS USING SIEVE ANALYSIS
ASTM D 6913

Project Name:	EMWD Brackish Water Transmission Pipeline	Tested By:	MRV	Date:	05/19/23
Project No.:	12893.002	Checked By:	MRV	Date:	05/23/23
Boring No.:	LB-8	Depth (feet):	0 - 5.0		
Sample No.:	B-1				
Soil Identification:	Silty Sand (SM), Dark Yellowish Brown.				

Calculation of Dry Weights	Whole Sample	Sample Passing #4	Moisture Contents	Whole Sample	Sample passing #4
Container No.:	B	B	Wt. of Air-Dry Soil + Cont.(g)	1305.6	601.5
Wt. Air-Dried Soil + Cont.(g)	1305.6	601.5	Wt. of Dry Soil + Cont. (g)	1279.3	601.5
Wt. of Container (g)	278.6	278.6	Wt. of Container No.______(g)	278.6	278.6
Dry Wt. of Soil (g)	1001.0	322.9	Moisture Content (%)	2.6	0.0

Passing #4 Material After Wet Sieve		
	Container No.	B
	Wt. of Dry Soil + Container (g)	550.0
	Wt. of Container (g)	278.6
	Dry Wt. of Soil Retained on # 200 Sieve (g)	271.4

U. S. Sieve Size		Cumulative Weight of Dry Soil Retained (g)		Percent Passing (%)
	(mm.)	Whole Sample	Sample Passing #4	
1 1/2"	37.500			100.0
1"	25.000	0.0		100.0
3/4"	19.000	14.1		98.6
1/2"	12.500	35.2		96.5
3/8"	9.500	38.3		96.2
#4	4.750	59.2		94.1
#8	2.360		22.6	87.5
#16	1.180		81.5	70.3
#30	0.600		137.6	54.0
#50	0.300		187.9	39.3
#100	0.150		233.6	26.0
#200	0.075		265.7	16.7
PAN				

GRAVEL: **6 %**

SAND: **77 %**

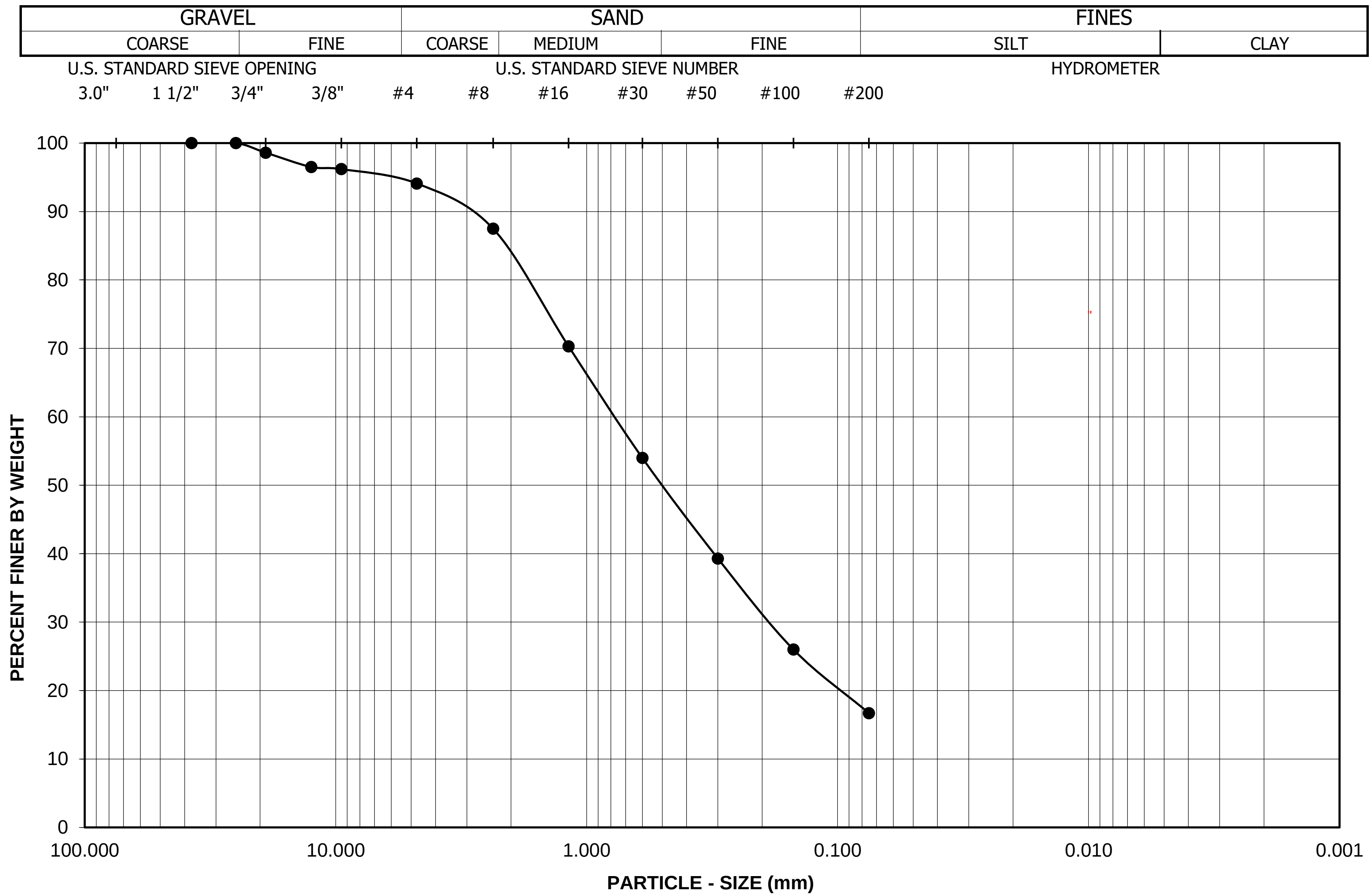
FINES: **17 %**

GROUP SYMBOL: **SM**

$Cu = D60/D10 =$ N/A

$Cc = (D30)^2/(D60*D10) =$ N/A

Remarks:



Project Name: EMWD Brackish Water Transmission Pipeline

Project No.: 12893.002

Boring No.: LB-8 Sample No.: B-1

Depth (feet): 0 - 5.0 Soil Type : SM

Soil Identification: Silty Sand (SM), Dark Yellowish Brown.

Leighton

PARTICLE - SIZE DISTRIBUTION ASTM D 6913

GR:SA:FI : (%) 6 : 77 : 17

May-23

Sieve; LB-8, B-1 (04-18-23)

PARTICLE-SIZE DISTRIBUTION (GRADATION) of SOILS USING SIEVE ANALYSIS
ASTM D 6913

Leighton

Project Name:	EMWD Brackish Water Transmission Pipeline	Tested By:	MRV	Date:	05/19/23
Project No.:	12893.002	Checked By:	MRV	Date:	05/23/23
Boring No.:	LB-12	Depth (feet):	5.0 - 10.0		
Sample No.:	B-1				
Soil Identification:	Silty Sand with Gravel (SM)g, Dark Reddish Brown.				

Calculation of Dry Weights	Whole Sample	Sample Passing #4	Moisture Contents	Whole Sample	Sample passing #4
Container No.:	A	A	Wt. of Air-Dry Soil + Cont.(g)	1655.8	608.3
Wt. Air-Dried Soil + Cont.(g)	1655.8	608.3	Wt. of Dry Soil + Cont. (g)	1562.5	608.3
Wt. of Container (g)	279.1	279.1	Wt. of Container No.______(g)	279.1	279.1
Dry Wt. of Soil (g)	1283.0	329.2	Moisture Content (%)	7.3	0.0

Passing #4 Material After Wet Sieve		
	Container No.	A
	Wt. of Dry Soil + Container (g)	503.6
	Wt. of Container (g)	279.1
	Dry Wt. of Soil Retained on # 200 Sieve (g)	224.5

U. S. Sieve Size		Cumulative Weight of Dry Soil Retained (g)		Percent Passing (%)
	(mm.)	Whole Sample	Sample Passing #4	
1 1/2"	37.500			100.0
1"	25.000			100.0
3/4"	19.000	0.0		100.0
1/2"	12.500	83.5		93.5
3/8"	9.500	131.2		89.8
#4	4.750	271.8		78.8
#8	2.360		32.2	71.1
#16	1.180		59.8	64.5
#30	0.600		89.1	57.5
#50	0.300		129.5	47.8
#100	0.150		177.0	36.4
#200	0.075		216.5	27.0
PAN				

GRAVEL: **21 %**

SAND: **52 %**

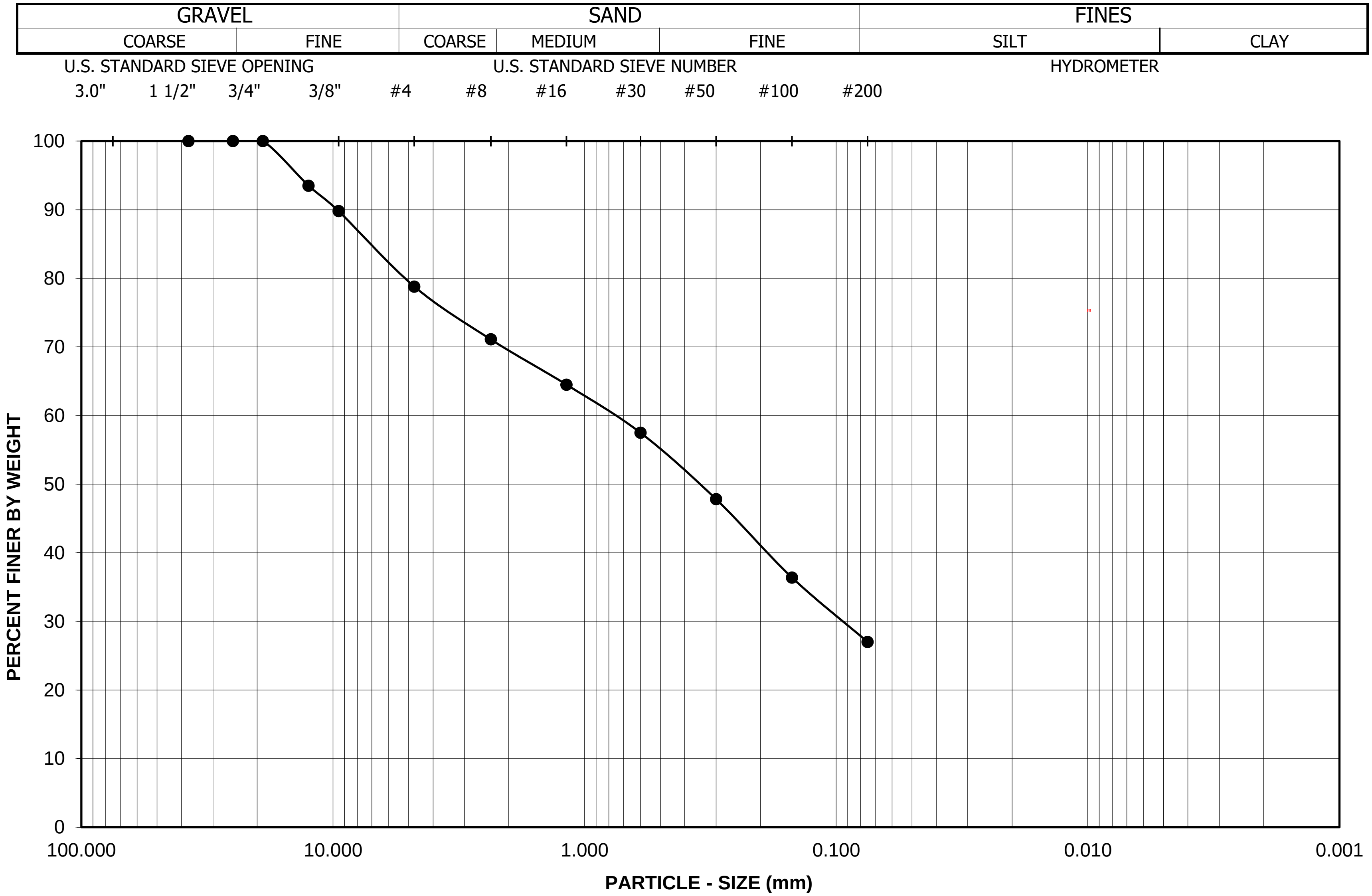
FINES: **27 %**

GROUP SYMBOL: **(SM)g**

Cu = D60/D10 = N/A

Cc = $(D30)^2/(D60*D10)$ = N/A

Remarks:



Project Name: EMWD Brackish Water Transmission Pipeline

Project No.: 12893.002

Boring No.: LB-12

Sample No.: B-1

Depth (feet): 5.0 - 10.0

Soil Type : (SM)g

Soil Identification: Silty Sand with Gravel (SM)g, Dark Reddish Brown.

GR:SA:FI : (%) 21 : 52 : 27

Leighton

PARTICLE - SIZE DISTRIBUTION ASTM D 6913

May-23

Leighton

PARTICLE-SIZE DISTRIBUTION (GRADATION) of SOILS USING SIEVE ANALYSIS

ASTM D 6913

Project Name:	EMWD Brackish Water Transmission Pipeline	Tested By:	MRV	Date:	05/19/23
Project No.:	12893.002	Checked By:	MRV	Date:	05/23/23
Boring No.:	LB-15	Depth (feet):	5.0 - 10.0		
Sample No.:	B-1				
Soil Identification:	Clayey Sand (SC), Reddish Brown.				

Calculation of Dry Weights	Whole Sample	Sample Passing #4	Moisture Contents	Whole Sample	Sample passing #4
Container No.:	BB	W	Wt. of Air-Dry Soil + Cont.(g)	2568.7	616.8
Wt. Air-Dried Soil + Cont.(g)	2568.7	616.8	Wt. of Dry Soil + Cont. (g)	2375.7	616.8
Wt. of Container (g)	673.2	278.3	Wt. of Container No._____(g)	673.2	278.3
Dry Wt. of Soil (g)	1703.1	338.5	Moisture Content (%)	11.3	0.0

Passing #4 Material After Wet Sieve		
	Container No.	W
	Wt. of Dry Soil + Container (g)	464.1
	Wt. of Container (g)	278.3
	Dry Wt. of Soil Retained on # 200 Sieve (g)	185.8

U. S. Sieve Size		Cumulative Weight of Dry Soil Retained (g)		Percent Passing (%)
	(mm.)	Whole Sample	Sample Passing #4	
1 1/2"	37.500	0.0		100.0
1"	25.000	87.4		94.9
3/4"	19.000	114.6		93.3
1/2"	12.500	152.1		91.1
3/8"	9.500	183.7		89.2
#4	4.750	227.3		86.7
#8	2.360		9.5	84.3
#16	1.180		23.5	80.7
#30	0.600		46.4	74.8
#50	0.300		84.1	65.2
#100	0.150		131.6	53.0
#200	0.075		178.1	41.1
PAN				

GRAVEL: **13 %**

SAND: **46 %**

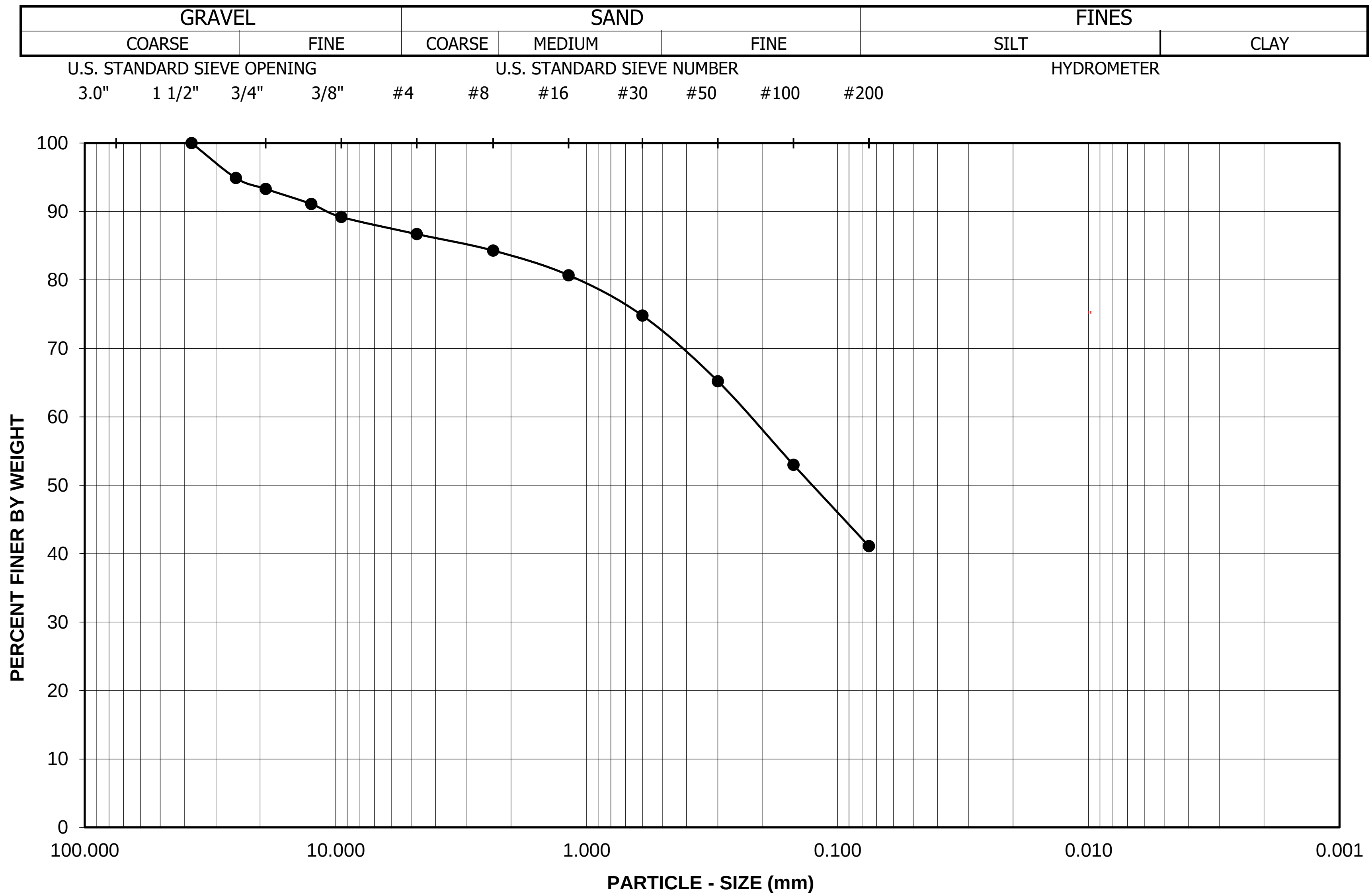
FINES: **41 %**

GROUP SYMBOL: **SC**

Cu = D60/D10 = N/A

Cc = (D30)²/(D60*D10) = N/A

Remarks:



Project Name: EMWD Brackish Water Transmission Pipeline

Project No.: 12893.002

Boring No.: LB-15 Sample No.: B-1

Depth (feet): 5.0 - 10.0 Soil Type : SC

Soil Identification: Clayey Sand (SC), Reddish Brown.

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PARTICLE - SIZE DISTRIBUTION ASTM D 6913

GR:SA:FI : (%) 13 : 46 : 41

May-23

SAND EQUIVALENT TEST

ASTM D 2419 / DOT CA Test 217

Project Name:	EMWD Brackish Water Transmission Pipeline	Tested By:	M. Vinet	Date:	5/22/23
Project No. :	12893.002	Computed By:	M. Vinet	Date:	5/22/23
Client:	Tetra Tech, Inc	Checked By:	M. Vinet	Date:	5/23/23

Boring No.	Sample No.	Depth (ft.)	Soil Description	T1	T2	T3	T4	R1	R2	SE	Average SE
LB-1	B-1	0 - 5.0	Sandy Silty, Clay s(CL-ML)	08:15	08:25	08:27	08:47	12.0	0.8	7	**7**
				08:17	08:27	08:29	08:49	12.0	0.8	7	

T1 = Starting Time
T2 = (T1 + 10 min) Begin Agitation
T3 = Settlement Starting Time
T4 = (T3 + 20 min) Take Clay Reading (R1)
Sand Equivalent = R2 / R1 * 100
Record SE as Next Higher Integer

SAND EQUIVALENT TEST

ASTM D 2419 / DOT CA Test 217

Project Name:	EMWD Brackish Water Transmission Pipeline	Tested By:	M. Vinet	Date:	5/22/23
Project No. :	12893.002	Computed By:	M. Vinet	Date:	5/22/23
Client:	Tetra Tech, Inc	Checked By:	M. Vinet	Date:	5/23/23

Boring No.	Sample No.	Depth (ft.)	Soil Description	T1	T2	T3	T4	R1	R2	SE	Average SE
LB-6	B-1	5.0 - 10.0	Silty Sand with Gravel (SM)g	10:20	10:30	10:32	10:52	11.3	2.1	19	**19**
				10:22	10:32	10:34	10:54	11.4	2.1	19	

T1 = Starting Time

T2 = (T1 + 10 min) Begin Agitation

T3 = Settlement Starting Time

T4 = (T3 + 20 min) Take Clay Reading (R1)

Sand Equivalent = R2 / R1 * 100

Record SE as Next Higher Integer

SAND EQUIVALENT TEST

ASTM D 2419 / DOT CA Test 217

Project Name:	EMWD Brackish Water Transmission Pipeline	Tested By:	M. Vinet	Date:	5/22/23
Project No. :	12893.002	Computed By:	M. Vinet	Date:	5/22/23
Client:	Tetra Tech, Inc	Checked By:	M. Vinet	Date:	5/23/23

Boring No.	Sample No.	Depth (ft.)	Soil Description	T1	T2	T3	T4	R1	R2	SE	Average SE
LB-8	B-1	0 - 5.0	Silty Sand (SM)	13:15	13:25	13:27	13:47	7.6	2.7	36	**37**
				13:17	13:27	13:29	13:49	8.0	2.9	37	

T1 = Starting Time

T2 = (T1 + 10 min) Begin Agitation

T3 = Settlement Starting Time

T4 = (T3 + 20 min) Take Clay Reading (R1)

Sand Equivalent = R2 / R1 * 100

Record SE as Next Higher Integer

Boring No.	LB-14
Sample No.	B-1
Depth (ft.)	5.0 - 10.0
Sample Type	BULK
Soil Classification	SC
Soak Time (min)	10
Moisture Correction	
Wet Weight of Soil + Container (gm.)	825.5
Dry Weight of Soil + Container (gm.)	765.5
Weight of Container (gm)	279.4
Moisture Content (%)	12.3
Container No.:	P
Sample Dry Weight Determination	
Weight of Sample + Container (gm.)	765.5
Weight of Container (gm.)	279.4
Weight of Dry Sample (gm.)	486.1
Container No.:	P
After Wash	
Dry Weight of Sample + Container (gm)	556.5
Weight of Container (gm)	279.4
Dry Weight of Sample (gm)	277.1
% Passing No. 200 Sieve	**43**
% Retained No. 200 Sieve	57

Leighton

PERCENT PASSING
No. 200 SIEVE
ASTM D 1140

Project Name: EMWD Brackish Water Transmission Pipeline
Project No.: 12893.002
Tested By: F. Mina Date: 05/18/23

One-Dimensional Swell or Settlement Potential of Cohesive Soils
(ASTM D 4546) -- Method 'B'

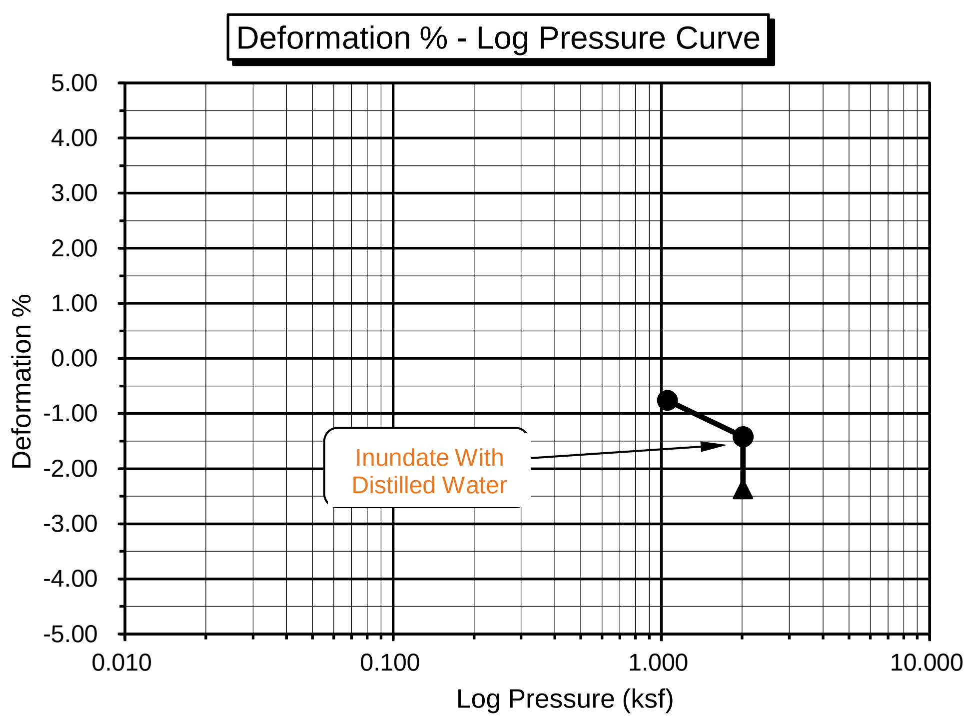
Project Name: EMWD Brackish Water Transmission Pipeline   Tested By: M. Vinet   Date: 5/19/23
Project No.: 12893.002   Checked By: M. Vinet   Date: 5/23/23
Boring No.: LB-2   Sample Type: IN SITU
Sample No.: R-2   Depth (ft.) 5.0
Sample Description: Silty, Clayey Sand (SC-SM), Reddish Brown.
Source and Type of Water Used for Inundation: Arrowhead (Distilled)
** Note: Loading After Wetting (Inundation) not Performed Using this Test Method.

Initial Dry Density (pcf):	114.8
Initial Moisture (%):	12.2
Initial Height (in.):	1.0000
Initial Dial Reading (in):	0.0000
Inside Diameter of Ring (in):	2.416

Final Dry Density (pcf):	117.6
Final Moisture (%) :	14.3
Initial Void ratio:	0.4677
Specific Gravity (assumed):	2.70
Initial Degree of Saturation (%):	70.2

Pressure (p) (ksf)	Final Reading (in)	Apparent Thickness (in)	Load Compliance (%)	Swell (+) Settlement (-) % of Sample Thickness	Void Ratio	Corrected Deformation (%)
1.050	0.0076	0.9924	0.00	-0.76	0.4566	-0.76
2.013	0.0142	0.9858	0.00	-1.42	0.4469	-1.42
H2O	0.0237	0.9763	0.00	-2.37	0.4330	-2.37

Percent Swell / Settlement After Inundation = -0.96



Rev. 01-10

TESTS for SULFATE CONTENT CHLORIDE CONTENT and pH of SOILS

Project Name: EMWD Brackish Water Transmission Pipeline   Tested By : M. Vinet   Date: 05/23/23

Project No. : 12893.002   Data Input By: M. Vinet   Date: 05/23/23

Boring No.	LB-1	LB-6	LB-11	LB-15
Sample No.	B-1	B-1	B-1	B-1
Sample Depth (ft)	0 - 5.0	5.0 - 10.0	0 - 5.0	5.0 - 10.0
Soil Identification:	s(CL-ML)	(SM)g	SM	SC
Wet Weight of Soil + Container (g)	100.00	100.00	100.00	100.00
Dry Weight of Soil + Container (g)	100.00	100.00	100.00	100.00
Weight of Container (g)	0.00	0.00	0.00	0.00
Moisture Content (%)	0.00	0.00	0.00	0.00
Weight of Soaked Soil (g)	100.00	100.00	100.00	100.00

SULFATE CONTENT, DOT California Test 417, Part II

Beaker No.	1	2	3	4
Crucible No.	1	2	3	4
Furnace Temperature (°C)	850	850	850	850
Time In / Time Out	Timer	Timer	Timer	Timer
Duration of Combustion (min)	45	45	45	45
Wt. of Crucible + Residue (g)	25.1161	24.9032	25.0157	24.9075
Wt. of Crucible (g)	25.0365	24.8953	25.0112	24.9032
Wt. of Residue (g) (A)	0.0796	0.0079	0.0045	0.0043
PPM of Sulfate (A) x 41150	3275.54	325.08	185.18	176.95
PPM of Sulfate, Dry Weight Basis	**3276**	**325**	**185**	**177**

CHLORIDE CONTENT, DOT California Test 422

ml of Extract For Titration (B)	30	30	30	30
ml of AgNO3 Soln. Used in Titration (C)	1.2	0.6	0.6	0.4
PPM of Chloride (C -0.2) * 100 * 30 / B	100	40	40	20
PPM of Chloride, Dry Wt. Basis	**100**	**40**	**40**	**20**

pH TEST, DOT California Test 643

pH Value	**7.50**	**7.30**	**7.80**	**7.30**
Temperature °C	21.0	21.0	21.0	21.0

TESTS for SULFATE CONTENT CHLORIDE CONTENT and pH of SOILS

Project Name: EMWD Brackish Water Transmission Pipeline　　Tested By : M. Vinet　　Date: 05/23/23

Project No. : 12893.002　　Data Input By: M. Vinet　　Date: 05/23/23

Boring No.	LB-21			
Sample No.	B-1			
Sample Depth (ft)	0 - 5.0			
Soil Identification:	CL			
Wet Weight of Soil + Container (g)	100.00			
Dry Weight of Soil + Container (g)	100.00			
Weight of Container (g)	0.00			
Moisture Content (%)	0.00			
Weight of Soaked Soil (g)	100.00			

SULFATE CONTENT, DOT California Test 417, Part II

Beaker No.	1			
Crucible No.	1			
Furnace Temperature (°C)	850			
Time In / Time Out	Timer			
Duration of Combustion (min)	45			
Wt. of Crucible + Residue (g)	25.0412			
Wt. of Crucible (g)	25.0362			
Wt. of Residue (g) (A)	0.0050			
PPM of Sulfate (A) x 41150	205.75			
PPM of Sulfate, Dry Weight Basis	**206**			

CHLORIDE CONTENT, DOT California Test 422

ml of Extract For Titration (B)	30			
ml of AgNO3 Soln. Used in Titration (C)	1.0			
PPM of Chloride (C -0.2) * 100 * 30 / B	80			
PPM of Chloride, Dry Wt. Basis	**80**			

pH TEST, DOT California Test 643

pH Value	**7.30**			
Temperature °C	21.0			

SOIL RESISTIVITY TEST

DOT CA TEST 643

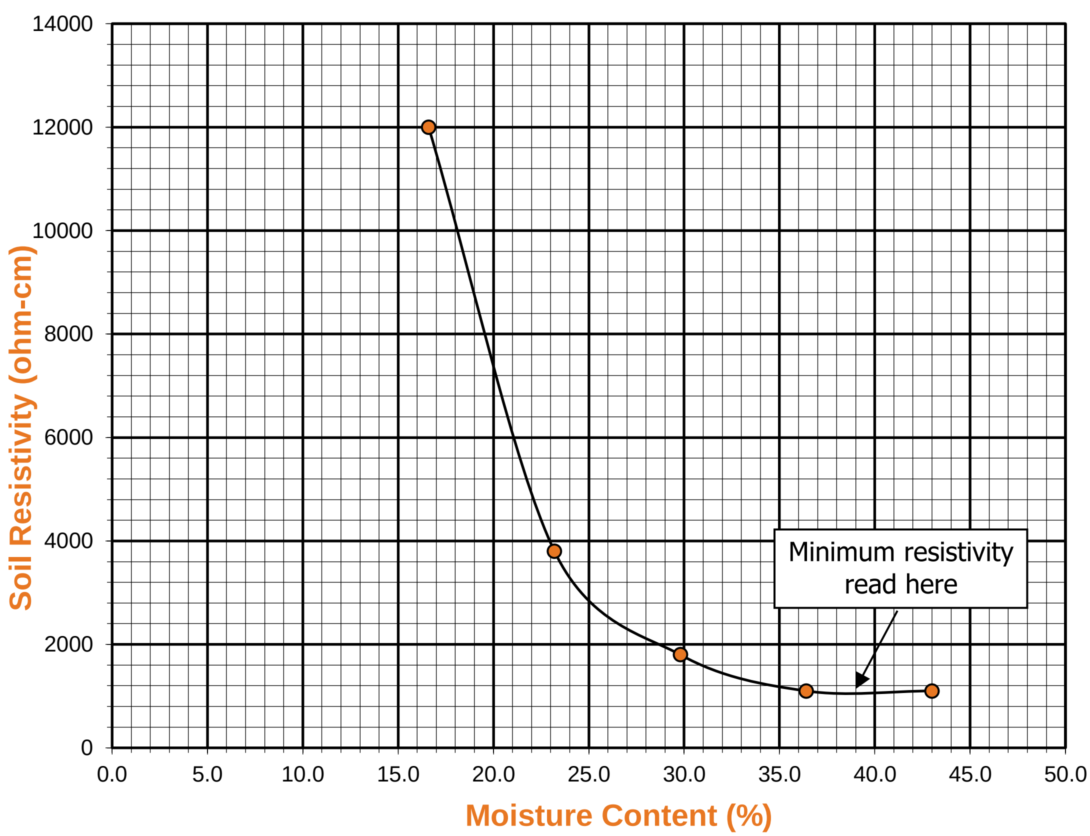
Project Name:	EMWD Brackish Water Transmission Pipeline	Tested By :	M. Vinet Date: 05/23/23
Project No. :	12893.002	Data Input By:	M. Vinet Date: 05/23/23
Boring No.:	LB-1	Depth (ft.) :	0 - 5.0
Sample No. :	B-1		
Soil Identification:*	s(CL-ML)		

*California Test 643 requires soil specimens to consist only of portions of samples passing through the No. 8 US Standard Sieve before resistivity testing. Therefore, this test method may not be representative for coarser materials.

Specimen No.	Water Added (ml) (Wa)	Adjusted Moisture Content (MC)	Resistance Reading (ohm)	Soil Resistivity (ohm-cm)
1	83	16.60	12000	12000
2	116	23.20	3800	3800
3	149	29.80	1800	1800
4	182	36.40	1100	1100
5	215	43.00	1100	1100

Moisture Content (%) (MCi)	0.00
Wet Wt. of Soil + Cont. (g)	100.00
Dry Wt. of Soil + Cont. (g)	100.00
Wt. of Container (g)	0.00
Container No.	A
Initial Soil Wt. (g) (Wt)	500.00
Box Constant	1.000
MC =(((1+Mci/100)x(Wa/Wt+1))-1)x100	

Min. Resistivity (ohm-cm)	Moisture Content (%)	Sulfate Content (ppm)	Chloride Content (ppm)	Soil pH: pH	Soil pH: Temp. (°C)
DOT CA Test 643		DOT CA Test 417 Part II	DOT CA Test 422	DOT CA Test 643	
1000	**39.0**	**3276**	**100**	**7.50**	**21.0**



SOIL RESISTIVITY TEST

DOT CA TEST 643

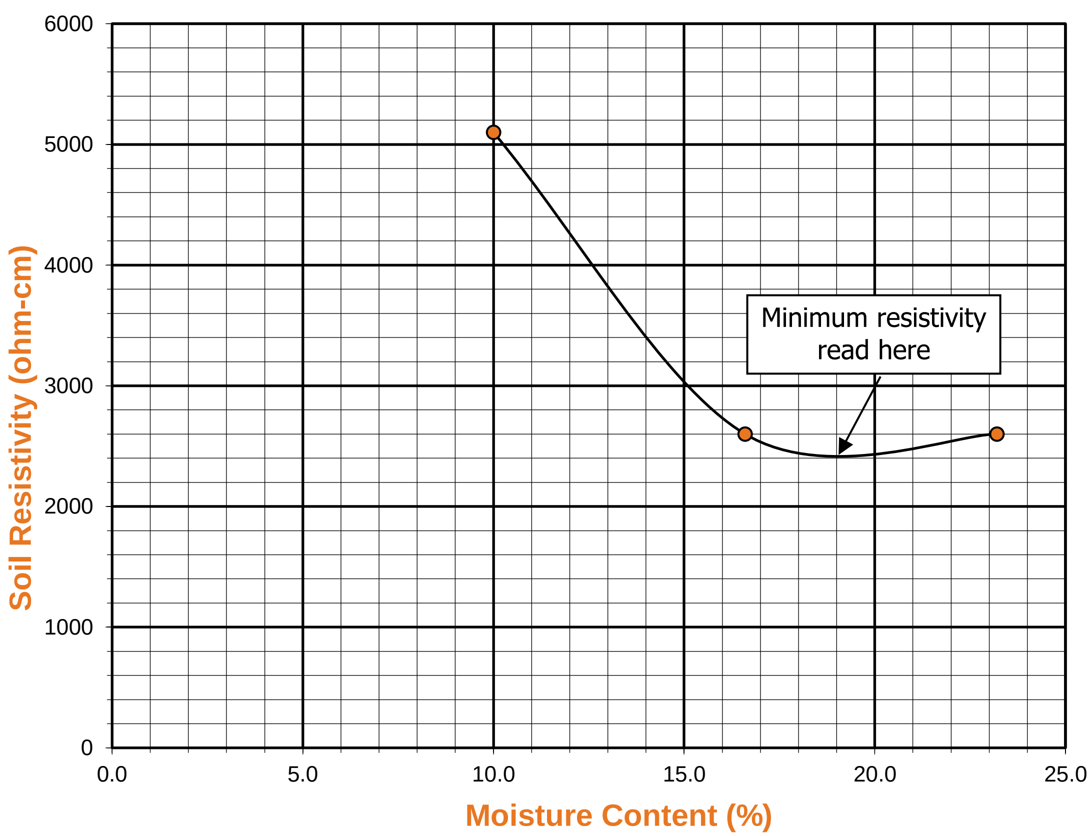
Project Name:	EMWD Brackish Water Transmission Pipeline	Tested By :	M. Vinet	Date:	05/23/23
Project No. :	12893.002	Data Input By:	M. Vinet	Date:	05/23/23
Boring No.:	LB-6	Depth (ft.) :	5.0 - 10.0		
Sample No. :	B-1				
Soil Identification:*	(SM)g				

*California Test 643 requires soil specimens to consist only of portions of samples passing through the No. 8 US Standard Sieve before resistivity testing. Therefore, this test method may not be representative for coarser materials.

Specimen No.	Water Added (ml) (Wa)	Adjusted Moisture Content (MC)	Resistance Reading (ohm)	Soil Resistivity (ohm-cm)
1	50	10.00	5100	5100
2	83	16.60	2600	2600
3	116	23.20	2600	2600
4				
5				

Moisture Content (%) (MCi)	0.00
Wet Wt. of Soil + Cont. (g)	100.00
Dry Wt. of Soil + Cont. (g)	100.00
Wt. of Container (g)	0.00
Container No.	A
Initial Soil Wt. (g) (Wt)	500.00
Box Constant	1.000
MC =(((1+Mci/100)x(Wa/Wt+1))-1)x100	

Min. Resistivity (ohm-cm)	Moisture Content (%)	Sulfate Content (ppm)	Chloride Content (ppm)	Soil pH	
				pH	Temp. (°C)
DOT CA Test 643		DOT CA Test 417 Part II	DOT CA Test 422	DOT CA Test 643	
2400	**19.0**	**325**	**40**	**7.30**	**21.0**



SOIL RESISTIVITY TEST

DOT CA TEST 643

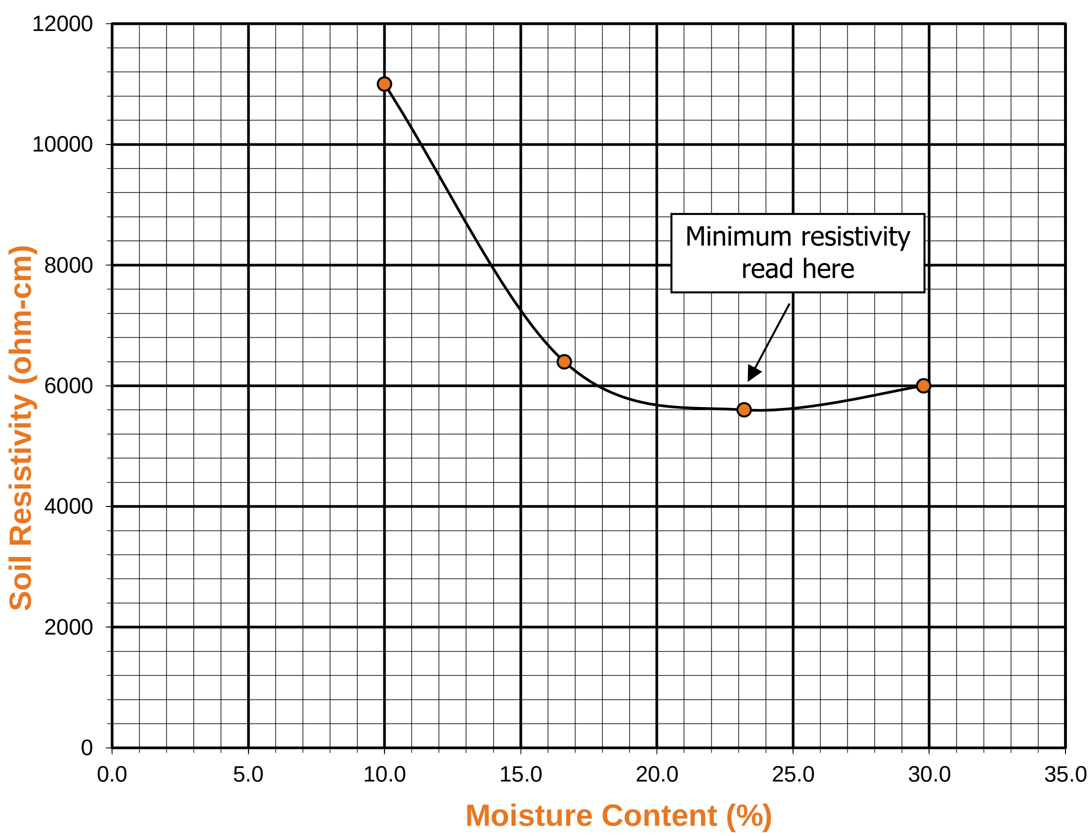
Project Name:	EMWD Brackish Water Transmission Pipeline	Tested By :	M. Vinet	Date:	05/23/23
Project No. :	12893.002	Data Input By:	M. Vinet	Date:	05/23/23
Boring No.:	LB-11	Depth (ft.) :	0 - 5.0		
Sample No. :	B-1				
Soil Identification:*	SM				

*California Test 643 requires soil specimens to consist only of portions of samples passing through the No. 8 US Standard Sieve before resistivity testing. Therefore, this test method may not be representative for coarser materials.

Specimen No.	Water Added (ml) (Wa)	Adjusted Moisture Content (MC)	Resistance Reading (ohm)	Soil Resistivity (ohm-cm)
1	50	10.00	11000	11000
2	83	16.60	6400	6400
3	116	23.20	5600	5600
4	149	29.80	6000	6000
5				

Moisture Content (%) (MCi)	0.00
Wet Wt. of Soil + Cont. (g)	100.00
Dry Wt. of Soil + Cont. (g)	100.00
Wt. of Container (g)	0.00
Container No.	A
Initial Soil Wt. (g) (Wt)	500.00
Box Constant	1.000
MC =(((1+Mci/100)x(Wa/Wt+1))-1)x100	

Min. Resistivity (ohm-cm)	Moisture Content (%)	Sulfate Content (ppm)	Chloride Content (ppm)	Soil pH	
				pH	Temp. (°C)
DOT CA Test 643		DOT CA Test 417 Part II	DOT CA Test 422	DOT CA Test 643	
5600	**23.2**	**185**	**40**	**7.80**	**21.0**



SOIL RESISTIVITY TEST
DOT CA TEST 643

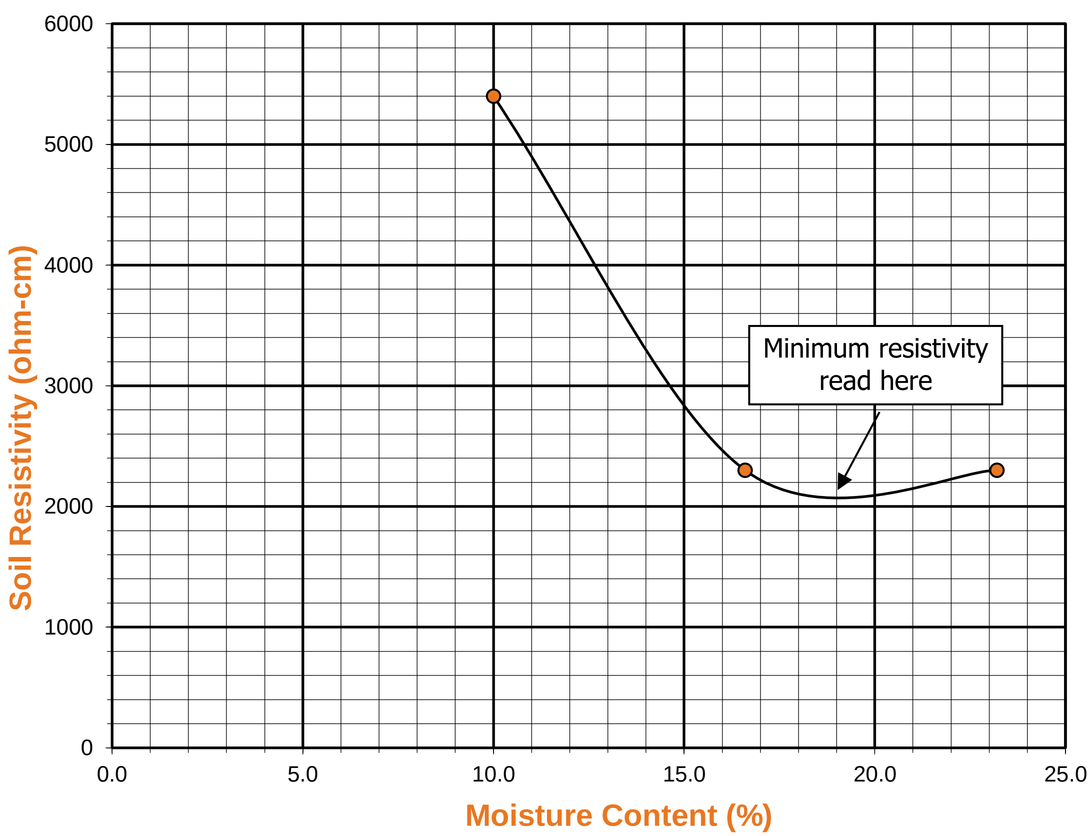
Project Name:	EMWD Brackish Water Transmission Pipeline	Tested By :	M. Vinet Date: 05/23/23
Project No. :	12893.002	Data Input By:	M. Vinet Date: 05/23/23
Boring No.:	LB-15	Depth (ft.) :	5.0 - 10.0
Sample No. :	B-1		
Soil Identification:*	SC		

*California Test 643 requires soil specimens to consist only of portions of samples passing through the No. 8 US Standard Sieve before resistivity testing. Therefore, this test method may not be representative for coarser materials.

Specimen No.	Water Added (ml) (Wa)	Adjusted Moisture Content (MC)	Resistance Reading (ohm)	Soil Resistivity (ohm-cm)
1	50	10.00	5400	5400
2	83	16.60	2300	2300
3	116	23.20	2300	2300
4				
5				

Moisture Content (%) (MCi)	0.00
Wet Wt. of Soil + Cont. (g)	100.00
Dry Wt. of Soil + Cont. (g)	100.00
Wt. of Container (g)	0.00
Container No.	A
Initial Soil Wt. (g) (Wt)	500.00
Box Constant	1.000
MC =(((1+Mci/100)x(Wa/Wt+1))-1)x100	

Min. Resistivity (ohm-cm)	Moisture Content (%)	Sulfate Content (ppm)	Chloride Content (ppm)	Soil pH	
				pH	Temp. (°C)
DOT CA Test 643		DOT CA Test 417 Part II	DOT CA Test 422	DOT CA Test 643	
2050	**19.0**	**177**	**20**	**7.30**	**21.0**



SOIL RESISTIVITY TEST

DOT CA TEST 643

Project Name:	EMWD Brackish Water Transmission Pipeline	Tested By :	M. Vinet	Date:	05/23/23
Project No. :	12893.002	Data Input By:	M. Vinet	Date:	05/23/23
Boring No.:	LB-21	Depth (ft.) :	0 - 5.0		
Sample No. :	B-1				
Soil Identification:*	CL				

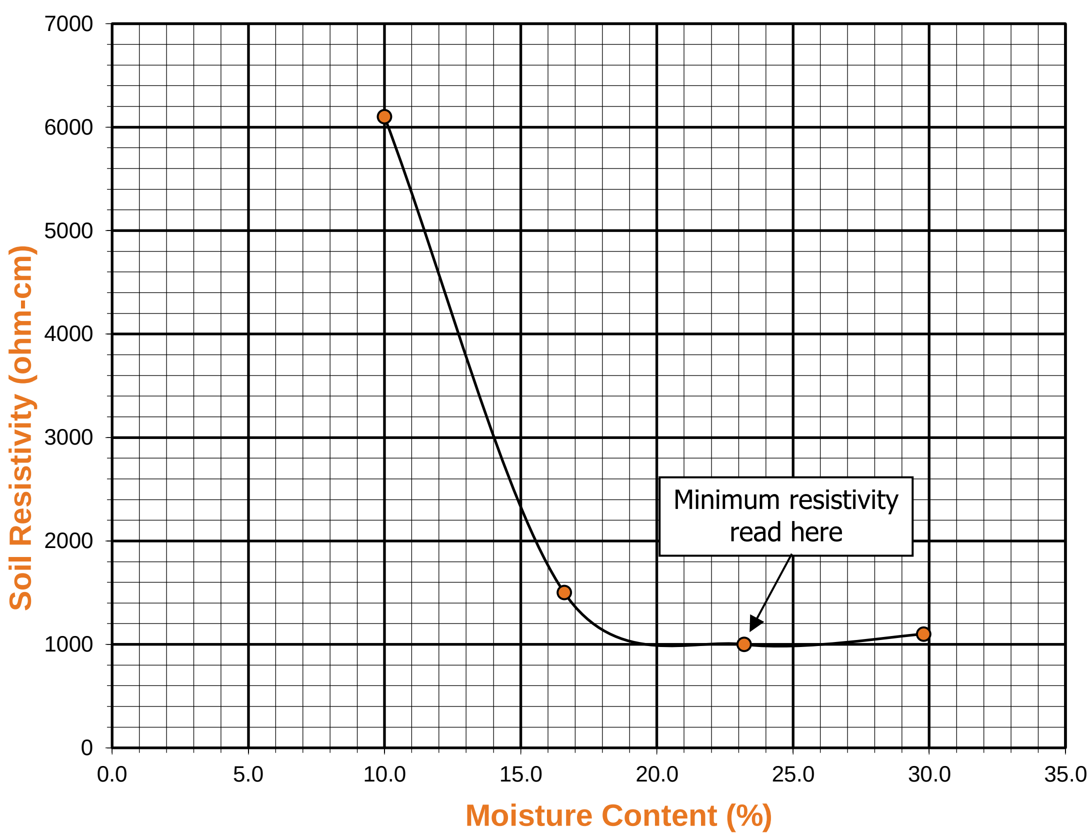
*California Test 643 requires soil specimens to consist only of portions of samples passing through the No. 8 US Standard Sieve before resistivity testing. Therefore, this test method may not be representative for coarser materials.

Specimen No.	Water Added (ml) (Wa)	Adjusted Moisture Content (MC)	Resistance Reading (ohm)	Soil Resistivity (ohm-cm)
1	50	10.00	6100	6100
2	83	16.60	1500	1500
3	116	23.20	1000	1000
4	149	29.80	1100	1100
5				

Moisture Content (%) (MCi)	0.00
Wet Wt. of Soil + Cont. (g)	100.00
Dry Wt. of Soil + Cont. (g)	100.00
Wt. of Container (g)	0.00
Container No.	A
Initial Soil Wt. (g) (Wt)	500.00
Box Constant	1.000

MC =(((1+Mci/100)x(Wa/Wt+1))-1)x100

Min. Resistivity (ohm-cm)	Moisture Content (%)	Sulfate Content (ppm)	Chloride Content (ppm)	Soil pH	
				pH	Temp. (°C)
DOT CA Test 643		DOT CA Test 417 Part II	DOT CA Test 422	DOT CA Test 643	
1000	**23.2**	**206**	**80**	**7.30**	**21.0**



APPENDIX E

GEOPHYSICAL EVALUATION

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GEOPHYSICAL EVALUATION

EMWD VALLEY BOULEVARD TRANSMISSION PIPELINE

Menifee, California

PREPARED FOR:

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May 22, 2023

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Atlas No. 9343

MR. JEFFREY T. DELAND
LEIGHTON
41715 ENTERPRISE CIRCLE NORTH, SUITE 103
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Subject: Geophysical Evaluation
EMWD Valley Boulevard Transmission Pipeline
Menifee, California

Dear Mr. DeLand:

In accordance with your authorization, Atlas has performed a seismic refraction study pertaining to the subject project located in Menifee, California. Specifically, our evaluation consisted of performing two seismic P-wave refraction traverses at preselected locations. The purpose of our evaluation was to develop subsurface velocity profiles of the study areas in order to assess the depth to bedrock and apparent rippability of the subsurface materials. Our field services were conducted on April 24th, 2023. This data report presents our methodology, equipment used, analysis, and results.

We appreciate the opportunity to be of service on this project. Should you have any questions, please contact the undersigned at your convenience.

Respectfully submitted,
Atlas Technical Consultants LLC

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1. INTRODUCTION

In accordance with your authorization, Atlas has performed a seismic refraction study pertaining to the subject project located in Menifee, California (Figure 1). Specifically, our evaluation consisted of performing two seismic P-wave refraction traverses at preselected locations. The purpose of our evaluation was to develop subsurface velocity profiles of the study areas in order to assess the depth to bedrock and apparent rippability of the subsurface materials. Our field services were conducted on April 24th, 2023. This data report presents our methodology, equipment used, analysis, and results.

2. SCOPE OF SERVICES

Our scope of services included:

- Performance of two seismic P-wave refraction traverses, SL-1 and SL-2, at the project site.
- Compilation and analysis of the data collected.
- Preparation of this data report presenting our results and conclusions.

3. SITE AND PROJECT DESCRIPTION

The project sites were located in two different residential areas in Menifee, California (Figure 1). SL-1 was generally located north of the junction between McCall Boulevard and Valley Boulevard, while SL-2 was generally located southwest of the intersection of Beyers Road and McLaughlin Road. Both seismic traverses were conducted on recently graded roadways. The study area locations for the seismic traverses were selected by a representative from your office. It is important to note that there was active construction activities in the location of SL-1. Figures 2a, 2b, and Figure 3 depict the seismic line locations and the general site conditions, respectively. Based on our discussions with you, we understand that your office requested this study to evaluate the depth of the bedrock for trenching purposes. We also understand that the results of our study may be used in the formulation of design and construction parameters for the project.

4. STUDY METHODOLOGY

Two seismic P-wave (compression wave) refraction studies were conducted at the project sites to develop subsurface velocity profiles of the areas studied, and to assess the depth to bedrock and apparent rippability of the subsurface materials. The seismic refraction method uses first-arrival times of refracted seismic waves to estimate the thicknesses and seismic velocities of subsurface layers. Seismic P-waves generated at the surface, using a hammer and plate, are refracted at boundaries separating materials of contrasting velocities. These refracted seismic waves are then detected by a series of surface vertical component 14-Hz geophones and recorded with a 24-channel Geometrics Geode seismograph. The travel times of the seismic

P-waves are used in conjunction with the shot-to-geophone distances to obtain thickness and velocity information on the subsurface materials.

Geophones were placed at intervals of 5 feet for SL-1 and SL-2. Profile lengths include the two innermost off-end shots for total profile lengths of 125 feet. The general locations and lengths of the lines were determined by surface conditions, site access, depth of investigation, and you and your office. Shot points (signal-generation locations) were conducted along the lines at the ends, midpoint, and intermediate points between the ends of the midpoint.

In general, classical seismic refraction theory requires that subsurface velocities increase with depth (generalized reciprocal method (GRM) and time-intercept modeling). In classical analysis methods, a layer having a velocity lower than that of the layer above will not generally be detectable by the seismic refraction method and could lead to errors in the depth calculations of subsequent layers. In addition, lateral variations in velocity such as those caused by core stones, intrusions, or boulders can also result in the misinterpretation of the subsurface conditions. However, application of seismic tomography methods, as was performed for this project by Atlas, produces velocity models which, in general, are not subject to this limitation. Even the application of seismic tomography analysis does have certain limitations regarding vertical and horizontal resolution. When a velocity anomaly target is of similar scale length to the seismic wavelet (or smaller), then diffraction behavior dominates because scattering is governing the loci of the wavefronts. For travel time analysis a target feature must be at a scale versus its depth that is detectable relative to the scale length of the seismic wavelet we produce and receive. There is a general limit to what scale of feature seismic tomography methods can detect regarding relatively small velocity anomaly features, related to both source and to medium velocities, and travel time uncertainties. In effect, some relatively smaller scale features including "thin" velocity inversion layers or voids, and some types of lateral and vertical velocity variations caused by core stones and intrusions might not be detected in our results. In general, the effective depth of evaluation for a seismic refraction traverse is approximately one third to one-fifth of the length of the spread.

Generally, the seismic P-wave velocity of a material can be correlated to rippability (see Table 1 below), or to some degree "hardness." Table 1 is based on published information from the Caterpillar Performance Handbook (Caterpillar, 2018), as well as our experience with similar materials, and assumes that a Caterpillar D-9 dozer ripping with a single shank is used. We emphasize that the cutoffs in this classification scheme are approximate and that rock characteristic, such as fracture spacing and orientation, play a significant role in determining rock quality or rippability. The rippability of a mass is also dependent on the excavation equipment used and the skill and experience of the equipment operator.

For trenching operations, the rippability values should be scaled downward. For example, velocities as low as 3,500 feet/second may indicate difficult ripping during trenching operations. In addition, the presence of boulders, which can be troublesome in narrow trenching operations, should be anticipated.

Table 1 – Rippability Classification

Seismic P-wave Velocity	Rippability
0 to 2,000 feet/second	Easy
2,000 to 4,000 feet/second	Moderate
4,000 to 5,500 feet/second	Difficult, Possible Blasting
5,500 to 7,000 feet/second	Very Difficult, Probable Blasting
Greater than 7,000 feet/second	Blasting Generally Required

It should be noted that the rippability cutoffs presented in Table 1 are slightly more conservative than those published in the Caterpillar Performance Handbook. Accordingly, the above classification scheme should be used with discretion, and contractors should not be relieved of making their own independent evaluation of the rippability of the on-site materials prior to submitting their bids.

5. DATA ANALYSIS

The collected data were processed using SIPwin (Rimrock Geophysics, 2003), a seismic interpretation program, and analyzed using Rayfract® Version 4.02 (Intelligent Resources Inc., 2022) which employs wave path analysis. Rayfract first provides forward modeling of refraction, transmission, and diffraction and then back-projects travel-time residuals along wave paths also known as Fresnel volumes instead of conventional analysis by rays. This increases the numerical robustness of the inversion. A smooth minimum-structure one dimensional (1-D) starting velocity-depth profile model is determined automatically directly from the seismic travel-time data first arrival picks and elevation data to produce subsurface velocities by horizontally averaging via the Delta t-V method. The Delta t-V method is based on common mid-point sorted travel times and assumes multiple horizontal layers with constant interior velocity gradients (Rohdewald 2007; Gebrande 1985). Modeled seismic rays follow circular arcs inside each modeled layer. The Delta t-V starting model is then refined with 2-D Wavepath Eikonal Traveltime (WET) inversion method (Schuster, 1993). The resulting 2-D WET velocity model provides a 2-D tomographic image of the P-wave velocities which can be used to estimate subsurface geologic conditions. Both vertical and lateral velocity information is contained in the tomography model. Changes in layer velocity are generally revealed as gradients rather than discrete contacts, which typically are more representative of actual conditions.

6. RESULTS AND CONCLUSIONS

As previously indicated, two seismic traverses were conducted as part of our study and Figures 4a and 4b present the velocity models generated from our analysis. Based on the results obtained, it appears that the study area near SL-1 is underlain by a thin layer of low velocity materials with higher velocity materials in the shallow subsurface while SL-2 is generally underlain by low-velocity materials in the near subsurface, with higher-velocity materials found at somewhat greater depths. The models reveal distinct vertical and lateral variations in velocity. Furthermore, the degree of bedrock weathering and depth to bedrock exhibit variability across the study areas, with SL-1 having remnant the potential for shallow bedrock and boulders present in the near subsurface. Based on the refraction results, variability in the excavatability (including depth of rippability) of the subsurface materials may be expected across portions of the project area. Furthermore, blasting may be required depending on the excavation, depth, location, equipment used, and desired rate of production. In addition, oversized materials should be expected. A contractor with excavation experience in similarly difficult conditions should be consulted for expert advice on excavation methodology, equipment, and production rate.

7. LIMITATIONS

The field evaluation and geophysical analyses presented in this report have been conducted in general accordance with current practice and the standard of care exercised by consultants performing similar tasks in the project area. No warranty, express or implied, is made regarding the conclusions, recommendations, and opinions presented in this report. There is no evaluation detailed enough to reveal every subsurface condition. Variations may exist and conditions not observed or described in this report may be present. Uncertainties relative to subsurface conditions can be reduced through additional subsurface exploration. Additional subsurface surveying will be performed upon request.

This document is intended to be used only in its entirety. No portion of the document, by itself, is designed to completely represent any aspect of the project described herein. Atlas should be contacted if the reader requires additional information or has questions regarding the content, interpretations presented, or completeness of this document. This report is intended exclusively for use by the client. Any use or reuse of the findings, conclusions, and/or recommendations of this report by parties other than the client is undertaken at said parties' sole risk.

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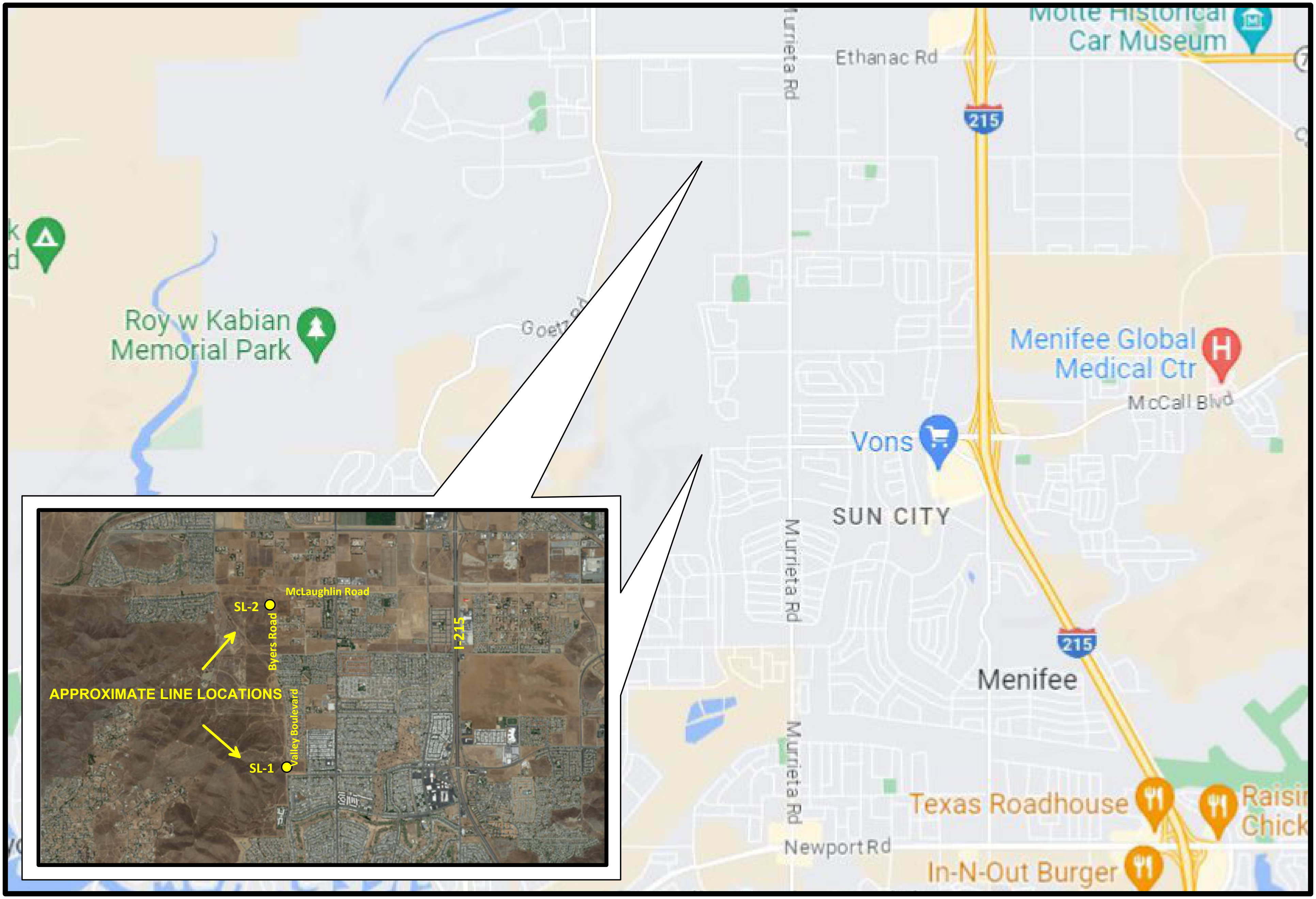


SITE LOCATION MAP	N	EMWD Valley Boulevard Transmission Pipeline Menifee, California Project No.: 9343 Date: 05/23	ATLAS Figure 1

SEISMIC LINE LOCATION MAP **SL-1**	N	EMWD Valley Boulevard Transmission Pipeline Menifee, California Project No.: 9343 Date: 05/23	ATLAS Figure 2a	Scale (feet) 0 50 100 150 200 250

SEISMIC LINE LOCATION MAP
SL-2

N

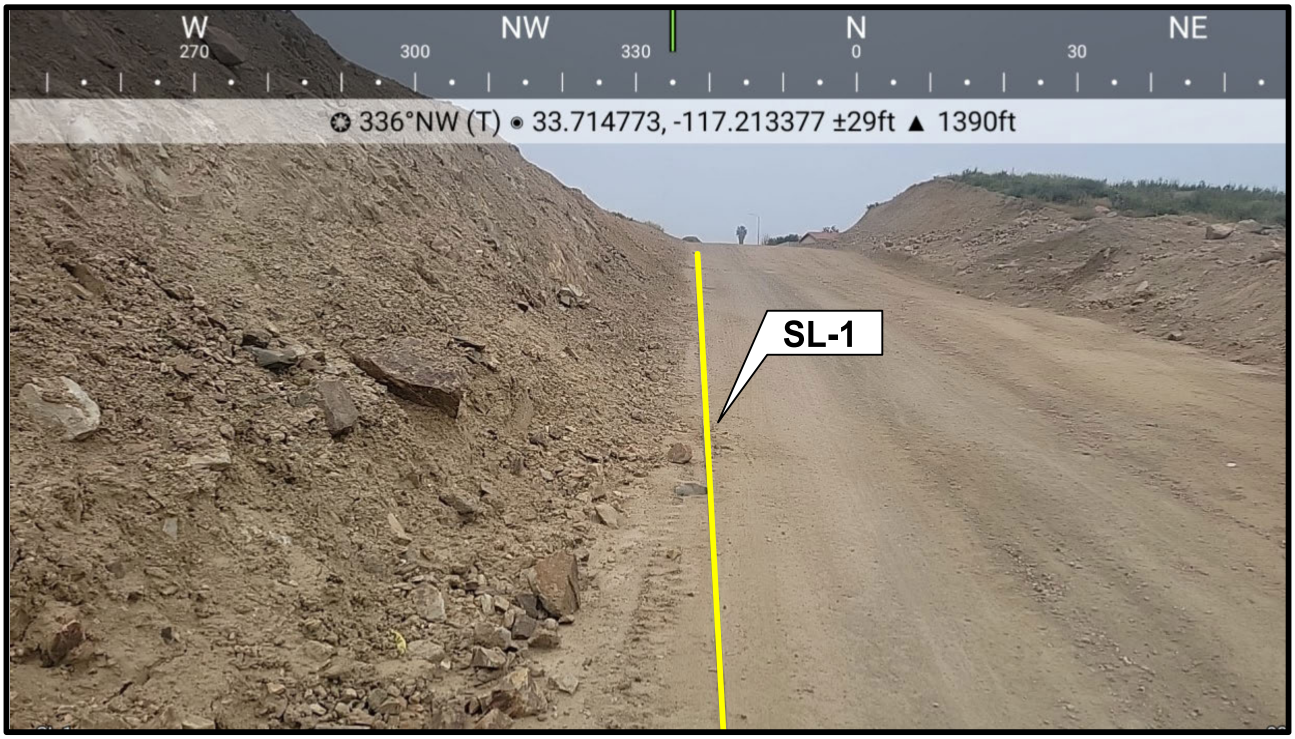
EMWD Valley Boulevard Transmission Pipeline
Menifee, California

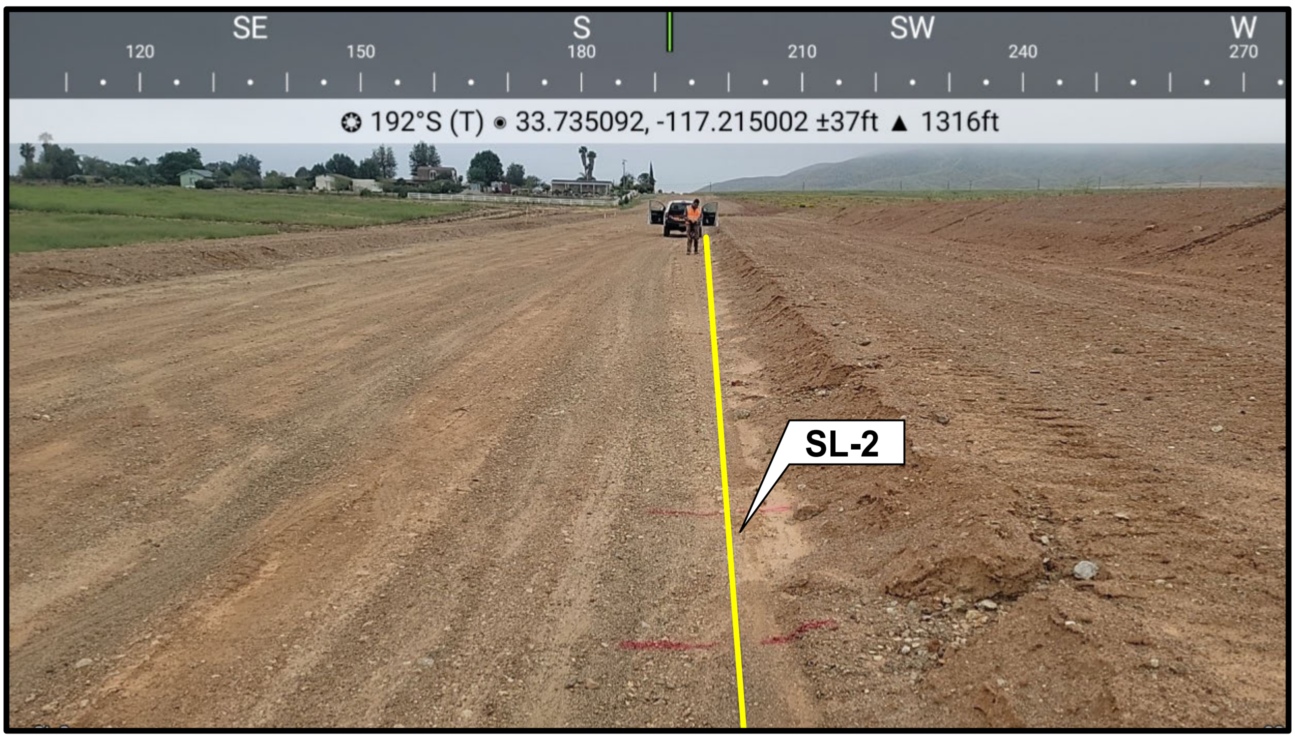
Project No.: 9343 | Date: 05/23

ATLAS

Figure 2b

Scale (feet)
0 50 100 150 200





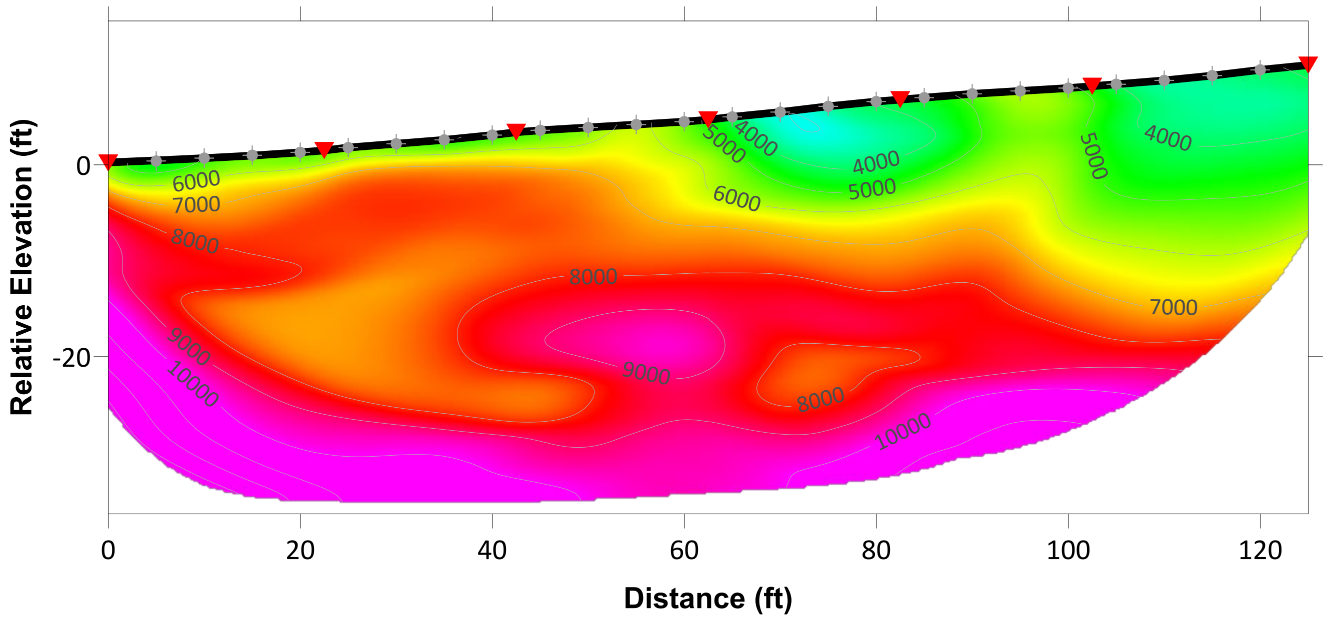
SITE PHOTOGRAPHS	EMWD Valley Boulevard Transmission Pipeline Menifee, California	ATLAS Figure 3
	Project No.: 9343 / Date: 05/23	

LEGEND

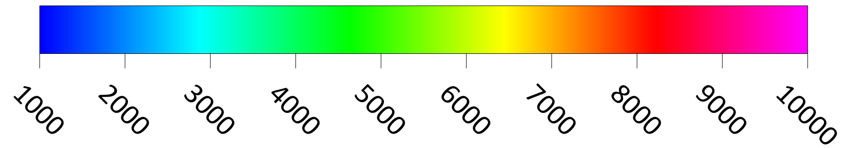
Geophone

Shot point

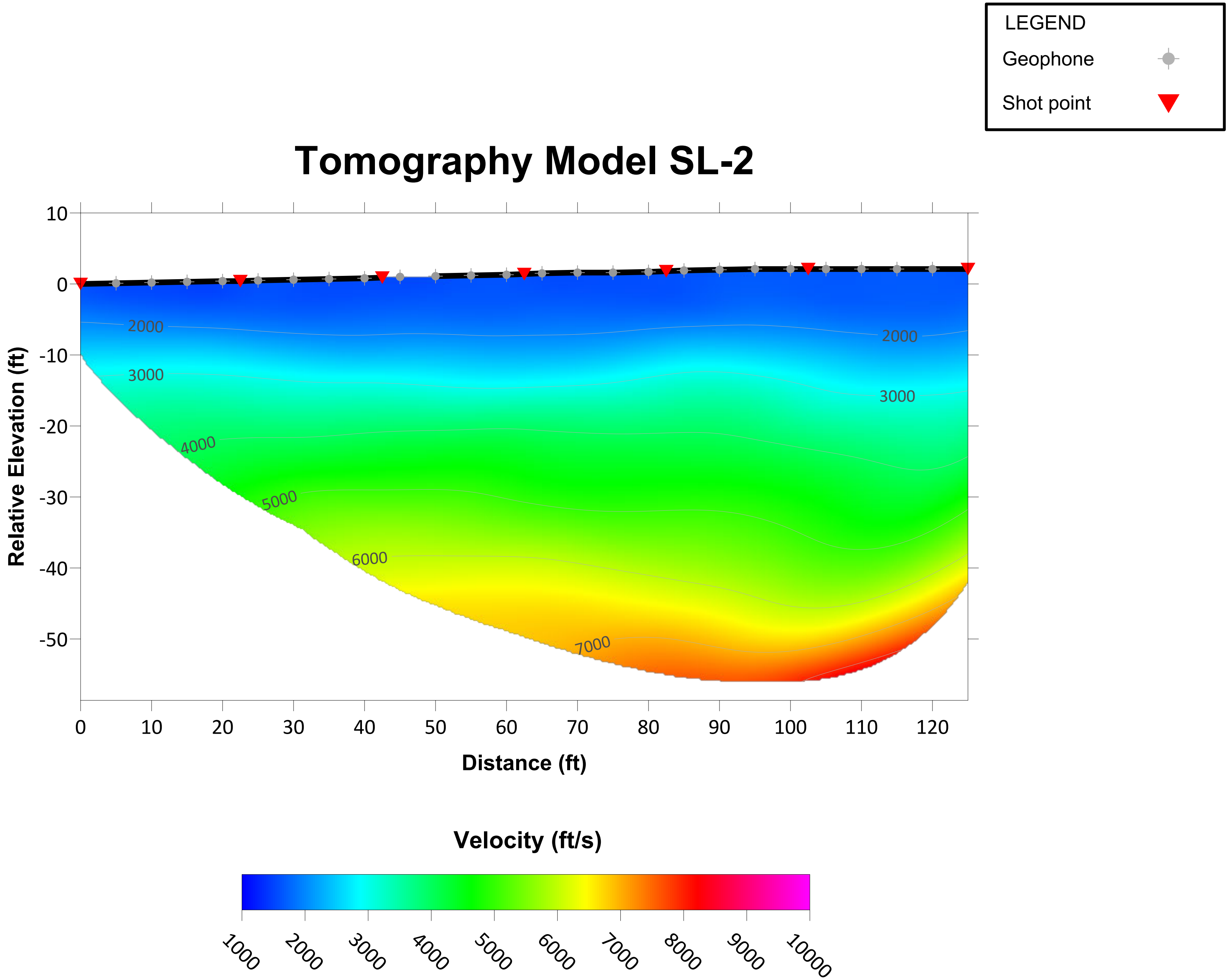
Tomography Model SL-1



Velocity (ft/s)



ATLAS	EMWD Valley Boulevard Transmission Pipeline Menifee, California	Project No.: 9343 Date: 05/23	Figure 4a	**P-WAVE PROFILE SL-1**



ATLAS	EMWD Valley Boulevard Transmission Pipeline Menifee, California	Project No.: 9343 Date: 05/23	Figure 4b	**P-WAVE PROFILE SL-2**

APPENDIX F

PALEONTOLOGICAL RESOURCES ASSESSMENT

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CARLSBAD
CLOVIS
IRVINE
LOS ANGELES
PALM SPRINGS
POINT RICHMOND
RIVERSIDE
ROSEVILLE
SAN LUIS OBISPO

October 22, 2024

Joseph Broadhead
Principal Water Resource Specialist
Eastern Municipal Water District
2270 Trumble Road
P.O. Box 8300
Perris, CA 92572-8300

Subject: Paleontological Resources Assessment for the Valley Boulevard Pipeline Project, City of Menifee, Riverside County, California (LSA Project No. EWD2101.04)

Dear Mr. Broadhead:

LSA is under contract to the Eastern Municipal Water District (EMWD) to conduct a paleontological resources assessment for the proposed Valley Boulevard Pipeline Project (project) in Menifee, Riverside County, California (see Figure 1; all figures provided in Attachment B). The purpose of the assessment was to determine whether paleontological resources may be present within the proposed project area, whether they might be impacted by development of the project, and to make recommendations to mitigate any potential impacts to paleontological resources.

This assessment was prepared to ensure that the project is in compliance with all applicable State and City of Menifee (City) regulations and requirements regarding paleontological resources, as well as the standards of the Society of Vertebrate Paleontology (SVP, 2010). The applicable regulations and requirements include the California Environmental Quality Act (CEQA): Public Resources Code (PRC) Division 13, Chapter 2.6; the *State CEQA Guidelines*: California Code of Regulations (CCR), Title 14, Chapter 3, Appendix G; and PRC §5097.5. EMWD is the Lead Agency for CEQA compliance.

PROJECT LOCATION AND DESCRIPTION

The project alignment is depicted on the United States Geological Survey (USGS) *Romoland, California* 7.5-minute topographic quadrangle map in Township 65 South, Range 23 West, Sections 17, 20, 29, and 32, San Bernardino Baseline and Meridian (USGS, 1979; Figure 1).

The proposed project involves the installation of 4.4 miles of 36-inch-diameter, 30-inch-diameter, and 18-inch-diameter pipelines along Valley Boulevard from EMWD's existing Desalination Complex at 29285 Valley Boulevard in Menifee to McLaughlin Road/Goetz Road. The project includes construction and operation of the new water pipelines to improve operational reliability by providing additional conveyance and redundancy for existing transmission pipelines in the project area and to support operation of the proposed Goetz Road water storage tank. In addition, a turnout facility with a motor-operated valve (MOV), antenna, and remote terminal units would be constructed on a vacant parcel at the intersection of Valley Boulevard and Thornton Avenue.

Development of the project would involve demolition of previous improvements followed by new grading to prepare for road widening, construction of the new pedestrian bridge, and installation of new wet and dry utilities, hardscaping, landscaping, and lighting.

Excavation Parameters

The deepest excavation associated with the project is expected to reach a depth of 22.5 feet to trench into a large existing slope at near the intersection at Thornton, (personal communication, Christopher Carey, EMWD, September 18, 2024). The majority of pipeline excavation will extend to a depth of seven feet below the ground surface. Deeper trenching will be necessary in some areas due to existing utilities and excavation for these areas will extend from 10 to 22.5 feet.

REGULATORY ENVIRONMENT

State of California

Under State law, paleontological resources are protected by CEQA and PRC Section 5097.5.

California Environmental Quality Act (PRC 21000 et seq.)

The purpose of CEQA is to provide a statewide policy of environmental protection. As part of this protection, State and local agencies are required to analyze, disclose, and, when feasible, mitigate the environmental impacts of, or find alternatives to, proposed projects. The *State CEQA Guidelines* (CCR 15000 et seq.) provide regulations for the implementation of CEQA and include more specific direction on the process of documenting, analyzing, disclosing, and mitigating environmental impacts of a project. To assist in this process, Appendix G of the *State CEQA Guidelines* provides a sample checklist form that may be used to identify and explain the degree of impact a project will have on a variety of environmental aspects, including paleontological resources (Section V[c]). As stated in Section 15002(b)(1-3) of the *State CEQA Guidelines*, CEQA applies to governmental action, including activities that are undertaken by, financed by, or require approval from a governmental agency.

California Public Resources Code, Section 5097.5

This law protects historic, archaeological, and paleontological resources on public lands within California and establishes criminal and civil penalties for violations. Specifically, PRC Section 5097.5 states that "No person shall knowingly or willfully excavate upon, remove, destroy, injure, or deface any … paleontological or historical feature, situated on public lands" and that public lands includes lands "… under the jurisdiction of the state, or any city, county, district, authority, or public corporation, or any agency thereof."

METHODS

LSA examined geologic maps of the project site and reviewed relevant geological and paleontological literature to determine which geologic units are present in the project site and whether fossils have been recovered in the project site or from similar geologic units elsewhere in the region. A search for known fossil localities was also conducted through the Western Science Center (WSC) to determine the status and extent of previously recorded paleontological resources within and surrounding the project site. On April 18, 2024, a pedestrian field survey of the project site was conducted by LSA Paleontologist, Paul Alms, M.Sc.

RESULTS

Literature Review

The project site is in the Peninsular Ranges Geomorphic Province, a 900-mile-long northwest-southeast trending structural block, with similarly trending faults, that extends from the Transverse Ranges in the north to the tip of Baja California in the south and includes the Los Angeles Basin (California Geological Survey, 2002; Norris and Webb, 1976). The total width of this province is 225 miles, extending from the Colorado Desert in the east across the continental shelf to the southern Channel Islands (i.e., Santa Barbara, San Nicolas, Santa Catalina, and San Clemente) in the west (Sharp, 1976). This province is characterized by a series of mountain ranges and valleys that trend in a northwest-southeast direction roughly parallel to the San Andreas Fault Zone (Norris and Webb, 1976; Sharp, 1976). It contains extensive pre-Cenozoic (more than 66 million years ago [Ma]) igneous and metamorphic rocks covered by Cenozoic (less than 66 Ma) sedimentary deposits (Norris and Webb, 1976).

Geologic mapping by Morton and Miller (2006) indicates that the project site contains Old Alluvial Fan Deposits; Very Old Alluvial Fan Deposits; Very Old Axial Channel Deposits; Gabbro, Undifferentiated; and quartz-rich rocks of Menifee Valley (Figure 2). Artificial Fill is likely also present in the project site from previous construction of the roads and surrounding residential areas. These geologic units and their relative paleontological sensitivities are described in more detail below. The dates for the geologic time intervals are based on the *International Chronostratigraphic Chart* prepared by the International Commission on Stratigraphy (Cohen et al., 2023).

Artificial Fill

Artificial Fill consists of sediments that have been removed from one location and transported to another location by human activity rather than by natural means. The transportation distance can vary from a few feet to many miles, and composition is dependent on the source and purpose. Artificial Fill will sometimes contain modern debris such as asphalt, wood, bricks, concrete, metal, glass, plastic, and even plant material.

While Artificial Fill may contain fossils, these fossils have been removed from their original location and are thus out of stratigraphic context. They are not considered important for scientific study. As such, Artificial Fill has no paleontological sensitivity.

Old Alluvial Fan Deposits

The Old Alluvial Fan Deposits are late to middle Pleistocene in age (11,700–774,000 years ago). They consist of reddish-brown, moderately to well consolidated silt, sand, and gravel (Morton and Miller, 2006). These sediments were eroded from higher elevations, carried by flooding streams and debris flows, and deposited in a fan or lobe shape at the base of the hills. These deposits have moderate to well developed pedogenic soils (Morton and Miller, 2006).

The Old Alluvial Fan Deposits span the latest two North American Land Mammal Ages (NALMAs): the Rancholabrean (11,700–240,000 years ago) and the Irvingtonian (240,000–1.8 Ma) (Bell et al., 2004; Sanders et al., 2009). Fossils are known in similar Rancholabrean and Irvingtonian deposits from excavations for roads, housing developments, and quarries, as well as scientific investigations in the southern California area (Jefferson, 1991a, 1991b; Miller, 1971; Pajak et al., 1996; Reynolds and Reynolds, 1991; Springer et al., 2009). These fossils include mammoths, mastodons, horses, bison, camels, saber-toothed cats, coyotes, deer, and sloths, as well as smaller animals like rodents, rabbits, birds, reptiles, and fish. These deposits are considered to have high paleontological sensitivity.

Very Old Alluvial Fan Deposits

Like the Old Alluvial Fan Deposits, the Very Old Alluvial Fan Deposits formed from sediment carried by rivers and streams down from higher elevations and deposited in a fan or lobe shape at the base of the hills. However, these deposits accumulated during the middle to early Pleistocene (126,000 years ago to 2.588 Ma) and consist of a moderately to well consolidated mixture of silt, sand, gravel, and conglomerate (Morton and Miller, 2006). They were deposited at the mouths of canyons, along the sides of hills flanking river and stream valleys, and within the valleys themselves. These deposits consist of moderately to well consolidated silt, sand, gravel, and conglomerate (Morton and Miller, 2006). They show some soil development and dissection by erosional gullies (Morton and Miller, 2006).

The Very Old Alluvial Fan Deposits formed during an interval that spans three NALMAs: the Rancholabrean (11,000–240,000 years ago), the Irvingtonian (240,000–1.8 Ma), and the Blancan (1.8–4.75 Ma) (Bell et al., 2004; Sanders et al., 2009). Fossils are known in similar Rancholabrean, Irvingtonian, and Blancan deposits from excavations for roads, housing developments, and quarries, as well as scientific investigations within the Southern California area (Bell et al., 2004; Jefferson, 1991a, 1991b; Miller, 1971; Pajak et al., 1996). These fossils include mammoths, mastodons, horses, camels, saber-toothed cats, coyotes, deer, peccaries, and sloths, as well as smaller animals like rodents, rabbits, birds, reptiles, and fish. As such, these deposits are considered to have high paleontological sensitivity.

Very Old Axial Channel Deposits

The Very Old Axial Channel Deposits formed during the middle to early Pleistocene (126,000–2.588 Ma) (Morton and Miller, 2006) from sediment carried by rivers and streams down the mountains. Because they were deposited in ancient canyon floors, they may not be found along modern streambeds and valleys. These deposits are reddish-brown in color and predominantly composed of sand with local layers of gravel, pebbles, silt, and clay (Morton and Miller, 2006). They are moderately to well consolidated and have been dissected by erosional gullies (Morton and Miller, 2006).

Like the Very Old Alluvial Fan Deposits, these deposits formed during an interval that spans three NALMAs: the Rancholabrean, the Irvingtonian, and the Blancan (Bell et al., 2004; Sanders et al., 2009). Fossils are known in similar Rancholabrean, Irvingtonian, and Blancan deposits from excavations for roads, housing developments, and quarries, as well as scientific investigations within the Southern California area (Bell et al., 2004; Jefferson, 1991a, 1991b; Miller, 1971; Pajak et al., 1996; Reynolds and Reynolds, 1991; Springer et al., 2009). These fossils include mammoths, mastodons, horses, camels, saber-toothed cats, coyotes, deer, peccaries, and sloths, as well as smaller animals like rodents, rabbits, birds, reptiles, and fish. As such, these deposits are considered to have high paleontological sensitivity.

Gabbro, Undifferentiated

The Gabbro, Undifferentiated formed during the Cretaceous period (66.0–145.0 Ma) and consists of medium- to very coarse-grained hornblende gabbro (Morton and Miller, 2006). These intrusive igneous rocks contain a mix of dark- and light-colored minerals and are weathered to a brownish color (Morton and Miller, 2006). Because the Gabbro, Undifferentiated formed from magma that intruded the surrounding rocks and cooled below the surface, it will not contain fossils. Therefore, these rocks have no paleontological sensitivity.

Rocks of Menifee Valley, Quartz-rich

Rocks of Menifee Valley formed during the Triassic period (201.3–251.902 Ma) and consist of a variety of low- to high-grade metamorphic rocks, including graywacke, metagraywacke, quartzite, quartz-rich metasandstone, phyllite, schist, marble, amphibolite, metadunite, gneiss, and serpentinite (Morton and Miller, 2006). Low-grade metamorphic rocks within this unit still contain primary sedimentary structures (Morton and Miller, 2006). The project area contains the quartz-rich rocks of Menifee Valley, which consists of quartz-rich metasandstone and quartzite.

Because of the extreme temperatures and pressures under which these metamorphic rocks formed, the potential for fossils to be preserved within them is low. However, poorly preserved and deformed fossils of large crinoid stems and bivalves have been found in lenses of marble from this geologic unit in one location east of Sun City, approximately 4 miles east of the project area (Morton and Miller, 2006). Due to the rarity of known fossil localities and the extreme temperatures and pressures under which these rocks formed, this geologic unit is considered to have low paleontological sensitivity.

Fossil Locality Search

The fossil locality search through the WSC indicated that no fossil localities are present within the boundaries of the project site or within a 1-mile radius, but they do have localities in similarly mapped units across Southern California. Approximately 9 miles southeast of the project, thousands of Pleistocene fossils were recovered during the development of Diamond Valley Lake. These fossils include ground sloths (*Megalonyx jeffersonii*), sabre-toothed cat (*Smilodon fatalis*), camel (*Camelops hesternus*), bison (*Bison antiquus*, *Bison latifrons*), horses (*Equus conversidens*, *Equus occidentalis*), mastodon (*Mammut pacificus*), dire wolf (*Canis dirus*), and mammoth (*Mammuthus columbi*) (Springer et al. 2009). A copy of the fossil locality search results through the WSC is included in Attachment C.

Field Survey

On April 19, 2024, the project area was surveyed by Paul Alms. The survey consisted of an intensive pedestrian investigation of all areas of exposed ground surface. Much of the project area was completely developed, paved, and landscaped. Visibility throughout the project area varied from 0 percent in areas that were paved and landscaped to 100 percent visibility in areas that had not been previously disturbed, such as shoulder areas of McCall Road and McLaughlin Road. All visible native sediments were consistent with mapping by Morton and Miller (2006). No paleontological resources were observed during the survey.

CONCLUSIONS AND RECOMMENDATIONS

The project site contains Artificial Fill; Gabbro, Undifferentiated; and quartz-rich rocks of Menifee Valley, which have no paleontological sensitivity. The Old Alluvial Fan Deposits, Very Old Alluvial Fan Deposits, and the Very Old Axial Channel Deposits all have high paleontological sensitivity. Excavation for the various project components will extend to depths of 7 to 22.5 feet across the project site. Development of this project is expected to extend into paleontologically sensitive sediments and has the potential to impact scientifically significant paleontological resources. To mitigate potential impacts to these resources, LSA recommends the following mitigation measures:

PALEO-1 A paleontologist who meets the qualifications established by the Society of Vertebrate Paleontology (SVP) shall be retained to develop a Paleontological Resources Impact Mitigation Program (PRIMP) for this project. The PRIMP shall be consistent with the standards of the SVP and include the methods that will be used to protect paleontological resources that may exist within the project site, as well as procedures for monitoring, fossil preparation and identification, curation into a repository, and preparation of a report at the conclusion of grading.

PALEO-2 Excavation and grading activities in deposits with high paleontological sensitivity (i.e., Old Alluvial Fan Deposits, Very Old Alluvial Fan Deposits, and Very Old Axial Channel Deposits) shall be monitored by a qualified paleontological monitor following a PRIMP. No monitoring is required for excavations in deposits with no or low paleontological sensitivity (i.e., Artificial Fill; Gabbro, Undifferentiated; and quartz-rich rocks of Menifee Valley). If paleontological resources are encountered during ground disturbance, the paleontological monitor shall have the authority to temporarily redirect construction away from the area of the find. If paleontological resources are encountered when a paleontological monitor is not present, work in the immediate area of the find shall be redirected, and the paleontologist or paleontological monitor shall be contacted to assess the find for scientific significance. If determined to be scientifically significant, the fossil shall be collected from the field.

PALEO-3 Collected resources shall be prepared to the point of identification, identified to the lowest taxonomic level possible, catalogued, and curated into the permanent collections of a museum repository. At the conclusion of the monitoring program, a report of findings shall be prepared to document the results of the monitoring program.

Implementation of Mitigation Measures PALEO-1 through PALEO-3 will ensure that project impacts on paleontological resources will be reduced to a level that is less than significant.

Sincerely,

LSA Associates, Inc.

Kelly Vreeland

Kelly Vreeland, M.Sc.
Senior Paleontologist

Attachments: A— References
B— Figures
C— Fossil Locality Search Results from the Western Science Center

ATTACHMENT A

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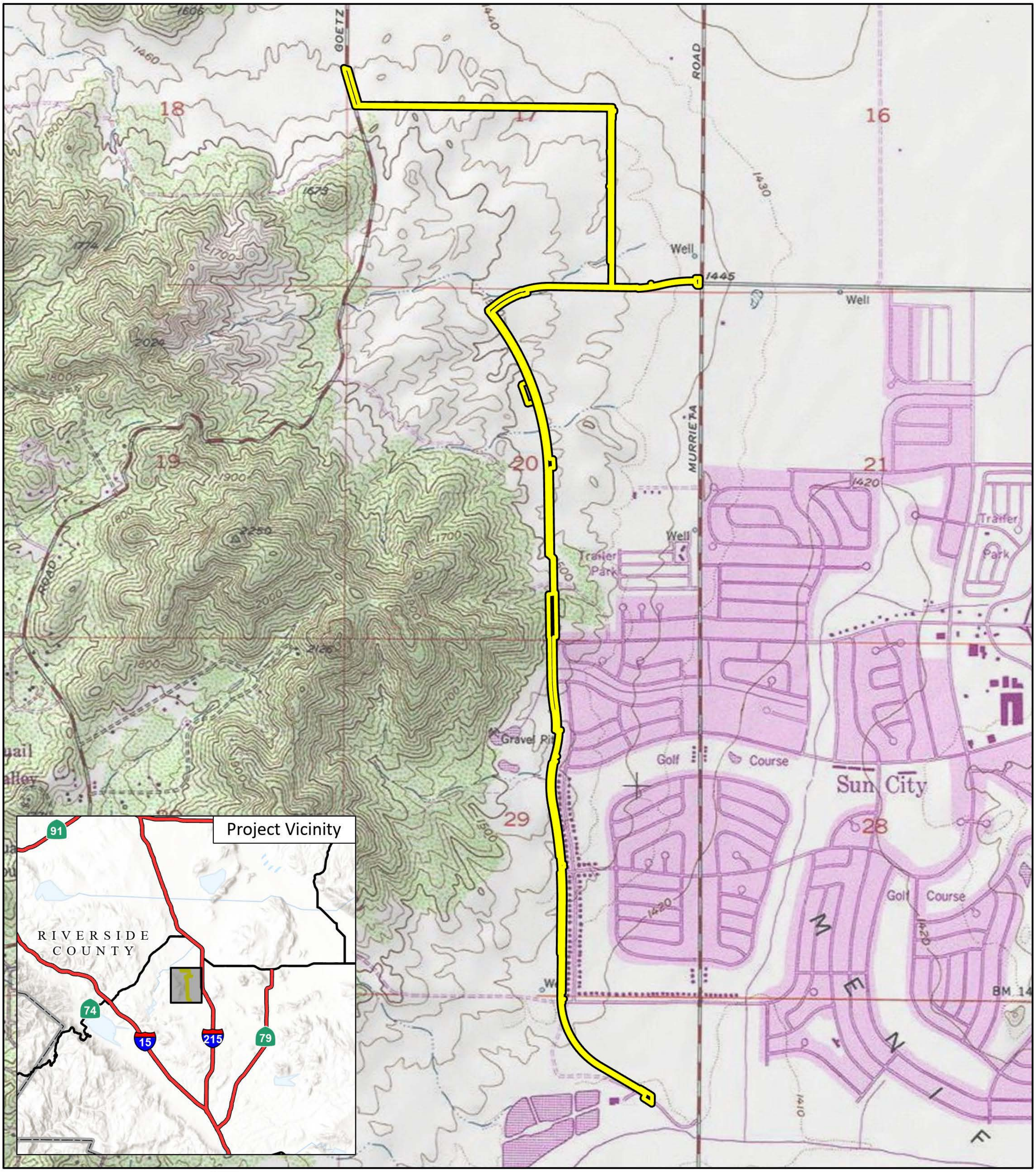
ATTACHMENT B

FIGURES



LSA

Project Boundary

FIGURE 1

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Valley Boulevard Potable Water Transmission Pipelines Project

Project Location and Vicinity

SOURCE: USGS 7.5' Quad - *Romoland (1979)*, CA

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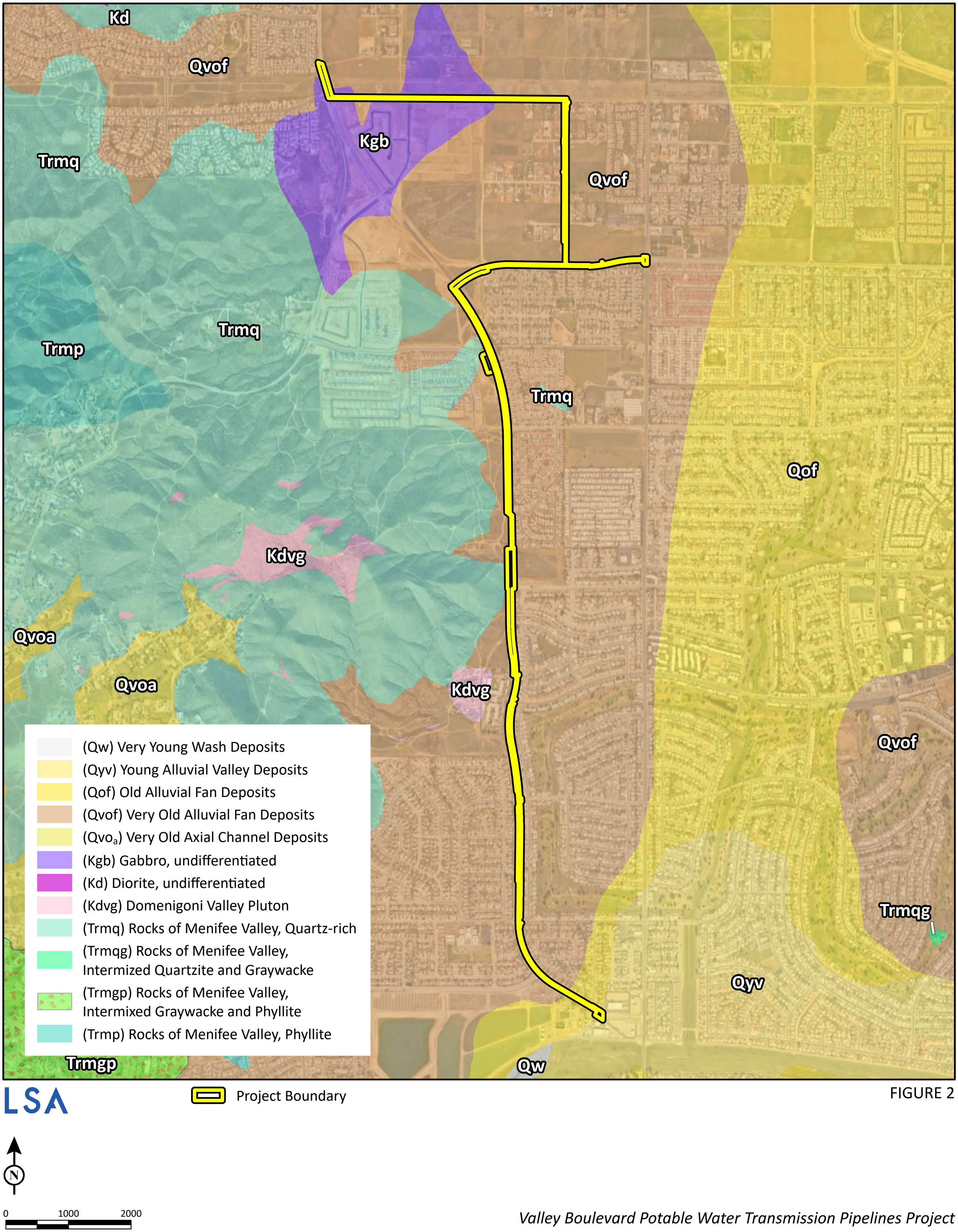

LSA

FIGURE 2

Valley Boulevard Potable Water Transmission Pipelines Project

Geology Map

SOURCE: Google Imagery (2023); Morton and Miller (2006)

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ATTACHMENT C

FOSSIL LOCALITY SEARCH RESULTS FROM THE WESTERN SCIENCE CENTER

April 17th, 2024

LSA Associates, Inc.
Kelly Vreeland
3210 El Camino Real, Ste. 100
Irvine, CA 92602

Hello,

This letter presents the results of a record search conducted for the Valley Boulevard Potable Water Transmission Pipeline Project located in the City of Menifee, Riverside County, CA. The project area spans 4.4 miles along Valley Boulevard to McLaughlin Road/Goetz Road in Township 5 South, Range 3 West, Sections 16, 17, 18, 20, 21, 29, & 32 of the *Romoland, CA* USGS 7.5 minute quadrangle.

The geologic units underlying this project are mapped as alluvial fan deposits from the Pleistocene epoch (Morton, Bovard, and Morton 2003). Pleistocene alluvial units are considered to be highly paleontologically sensitive. The Western Science Center does not have localities within the project area or within a 1 mile radius, but does have localities in similarly mapped units across Southern California.

Any fossil specimen from the Valley Boulevard Potable Water Transmission Pipeline Project would be scientifically significant. Excavation activity associated with the development of the project area would impact the paleontologically sensitive Pleistocene alluvial units, and it is the recommendation of the Western Science Center that a paleontological resource mitigation program be put in place to monitor, salvage, and curate any recovered fossils associated with the study area.

If you have any questions, or would like further information, please feel free to contact me at bstoneburg@westerncentermuseum.org.

Sincerely,

Brittney Elizabeth Stoneburg, MSc
Collections Manager

APPENDIX G

NOISE MONITORING SHEETS

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Noise Measurement Survey – 24 HR

Project Number: EWD2101.04
Project Name: Valley Blvd Pipeline

Test Personnel: Kevin Nguyendo
Equipment: Spark 706RC (SN:908)

Site Number: LT-1 Date: 3/18/24

Time: From 5:00 p.m. To 5:00 p.m.

Site Location: 29137 Crestline Drive, Menifee, CA 92584. Near the southern property line of a home on a tree.

Primary Noise Sources: Traffic on Valley Boulevard.

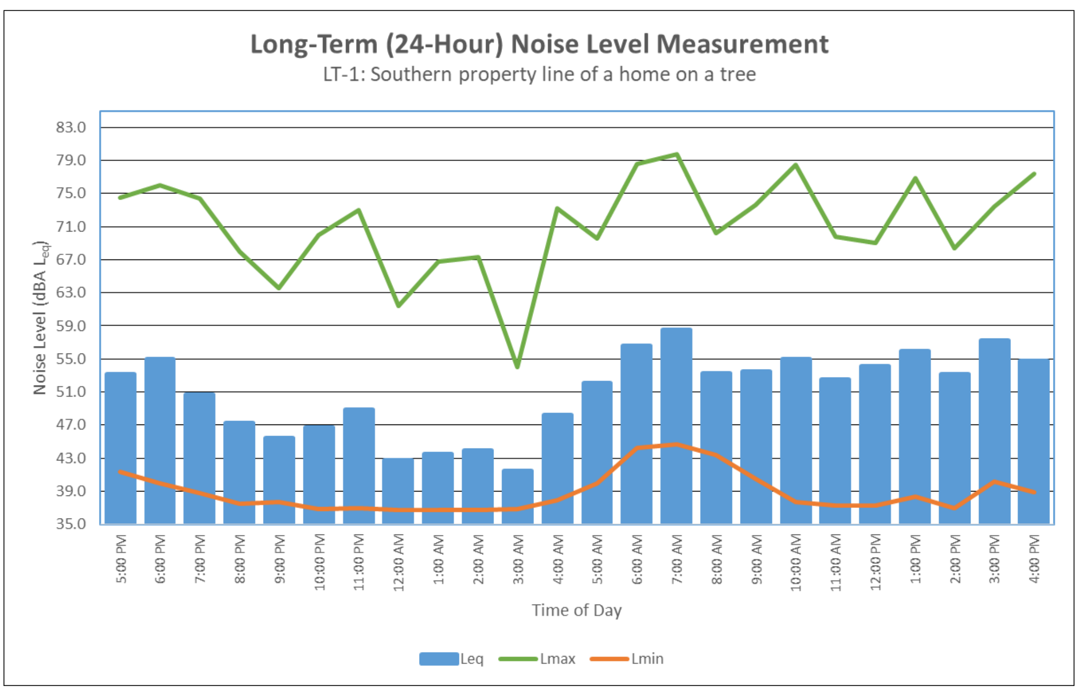
Comments:

Photo:

Long-Term (24-Hour) Noise Level Measurement Results at LT-1

Start Time	Date	Noise Level (dBA)		
		L_{eq}	L_{max}	L_{min}
5:00 PM	3/18/24	53.1	74.5	41.3
6:00 PM	3/18/24	55.0	76.0	40.0
7:00 PM	3/18/24	50.7	74.4	38.8
8:00 PM	3/18/24	47.3	67.9	37.5
9:00 PM	3/18/24	45.4	63.5	37.7
10:00 PM	3/18/24	46.7	70.0	36.9
11:00 PM	3/18/24	48.9	73.0	37.0
12:00 AM	3/19/24	42.8	61.4	36.7
1:00 AM	3/19/24	43.5	66.8	36.7
2:00 AM	3/19/24	43.9	67.3	36.7
3:00 AM	3/19/24	41.4	54.0	36.9
4:00 AM	3/19/24	48.3	73.2	37.9
5:00 AM	3/19/24	52.1	69.6	40.0
6:00 AM	3/19/24	56.6	78.6	44.2
7:00 AM	3/19/24	58.5	79.8	44.7
8:00 AM	3/19/24	53.3	70.2	43.4
9:00 AM	3/19/24	53.4	73.6	40.5
10:00 AM	3/19/24	54.9	78.5	37.7
11:00 AM	3/19/24	52.5	69.8	37.3
12:00 PM	3/19/24	54.1	69.0	37.3
1:00 PM	3/19/24	56.0	76.9	38.4
2:00 PM	3/19/24	53.1	68.4	37.0
3:00 PM	3/19/24	57.2	73.4	40.2
4:00 PM	3/19/24	54.8	77.4	38.9

Source: Compiled by LSA Associates, Inc. (2024).
dBA = A-weighted decibel
L_{eq} = equivalent continuous sound level
L_{max} = maximum instantaneous noise level
L_{min} = minimum measured sound level



Noise Measurement Survey – 24 HR

Project Number: EWD2101.04

Test Personnel: Kevin Nguyendo

Project Name: Valley Blvd Pipeline

Equipment: Spark 706RC (SN:908)

Site Number: LT-2 Date: 3/18/24

Time: From 5:00 p.m. To 5:00 p.m.

Site Location: 28477 Portsmouth Dr, Menifee, CA 92586. Near the southwestern property line of a home on a light pole.

Primary Noise Sources: Traffic on Valley Boulevard.

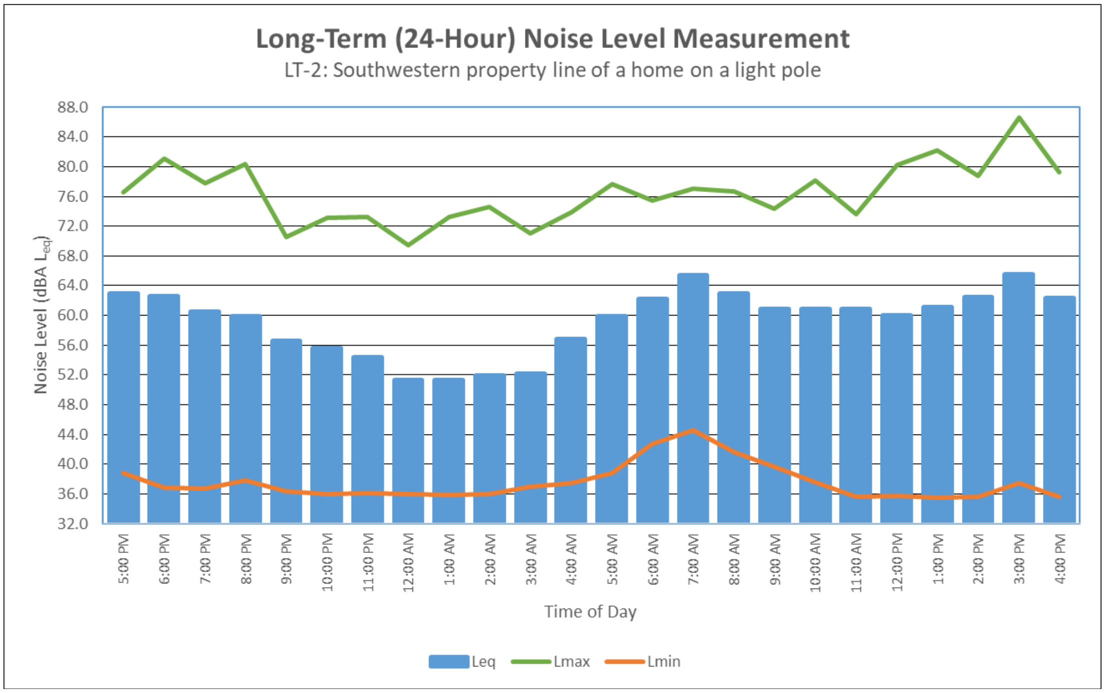
Comments:

Photo:

Long-Term (24-Hour) Noise Level Measurement Results at LT-2

Start Time	Date	Noise Level (dBA)		
		L_{eq}	L_{max}	L_{min}
5:00 PM	3/18/24	63.0	76.6	38.8
6:00 PM	3/18/24	62.6	81.1	36.9
7:00 PM	3/18/24	60.4	77.8	36.7
8:00 PM	3/18/24	59.8	80.3	37.8
9:00 PM	3/18/24	56.6	70.6	36.4
10:00 PM	3/18/24	55.6	73.1	36.0
11:00 PM	3/18/24	54.3	73.3	36.1
12:00 AM	3/19/24	51.3	69.5	36.0
1:00 AM	3/19/24	51.3	73.3	35.9
2:00 AM	3/19/24	51.9	74.6	36.0
3:00 AM	3/19/24	52.1	71.0	37.0
4:00 AM	3/19/24	56.8	73.8	37.4
5:00 AM	3/19/24	59.9	77.7	38.8
6:00 AM	3/19/24	62.2	75.4	42.7
7:00 AM	3/19/24	65.4	77.1	44.6
8:00 AM	3/19/24	63.0	76.7	41.6
9:00 AM	3/19/24	60.9	74.3	39.6
10:00 AM	3/19/24	60.8	78.2	37.6
11:00 AM	3/19/24	60.9	73.6	35.6
12:00 PM	3/19/24	60.0	80.2	35.7
1:00 PM	3/19/24	61.2	82.2	35.5
2:00 PM	3/19/24	62.5	78.8	35.6
3:00 PM	3/19/24	65.6	86.6	37.4
4:00 PM	3/19/24	62.3	79.3	35.6

Source: Compiled by LSA Associates, Inc. (2024).
dBA = A-weighted decibel
L_{eq} = equivalent continuous sound level
L_{max} = maximum instantaneous noise level
L_{min} = minimum measured sound level



Noise Measurement Survey – 24 HR

Project Number: EWD2101.04

Project Name: Valley Blvd Pipeline

Test Personnel: Kevin Nguyendo

Equipment: Spark 706RC (SN:908)

Site Number: LT-3 Date: 3/18/24

Time: From 5:00 p.m. To 5:00 p.m.

Site Location: 27663 Genevieve Dr, Menifee, CA 92586. Near the southwestern property line of a home on a light pole.

Primary Noise Sources: Traffic on Valley Boulevard.

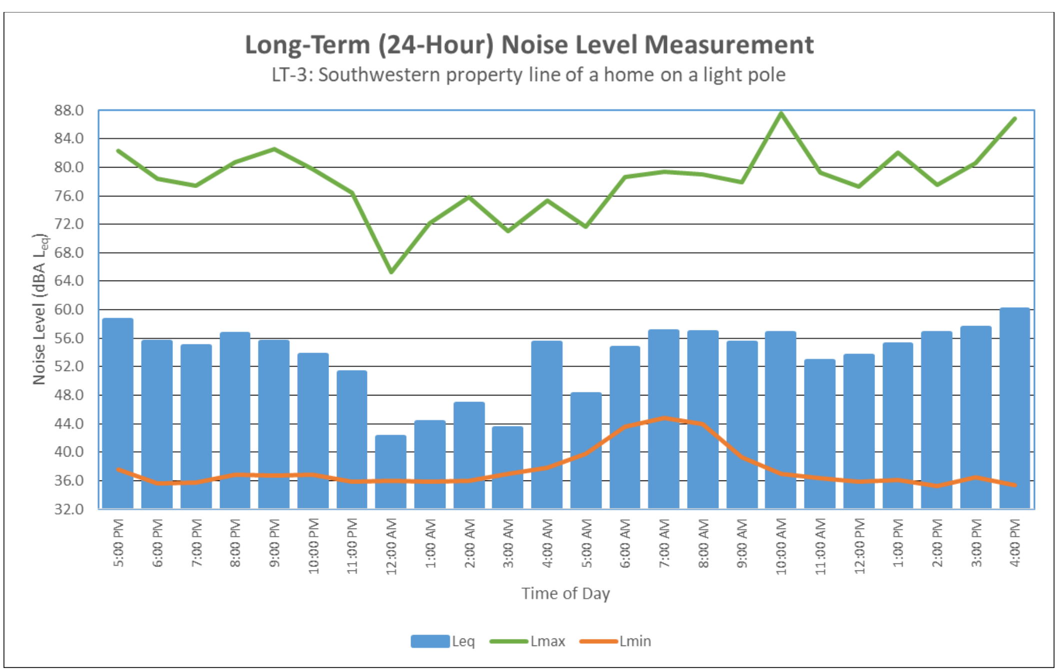
Comments:

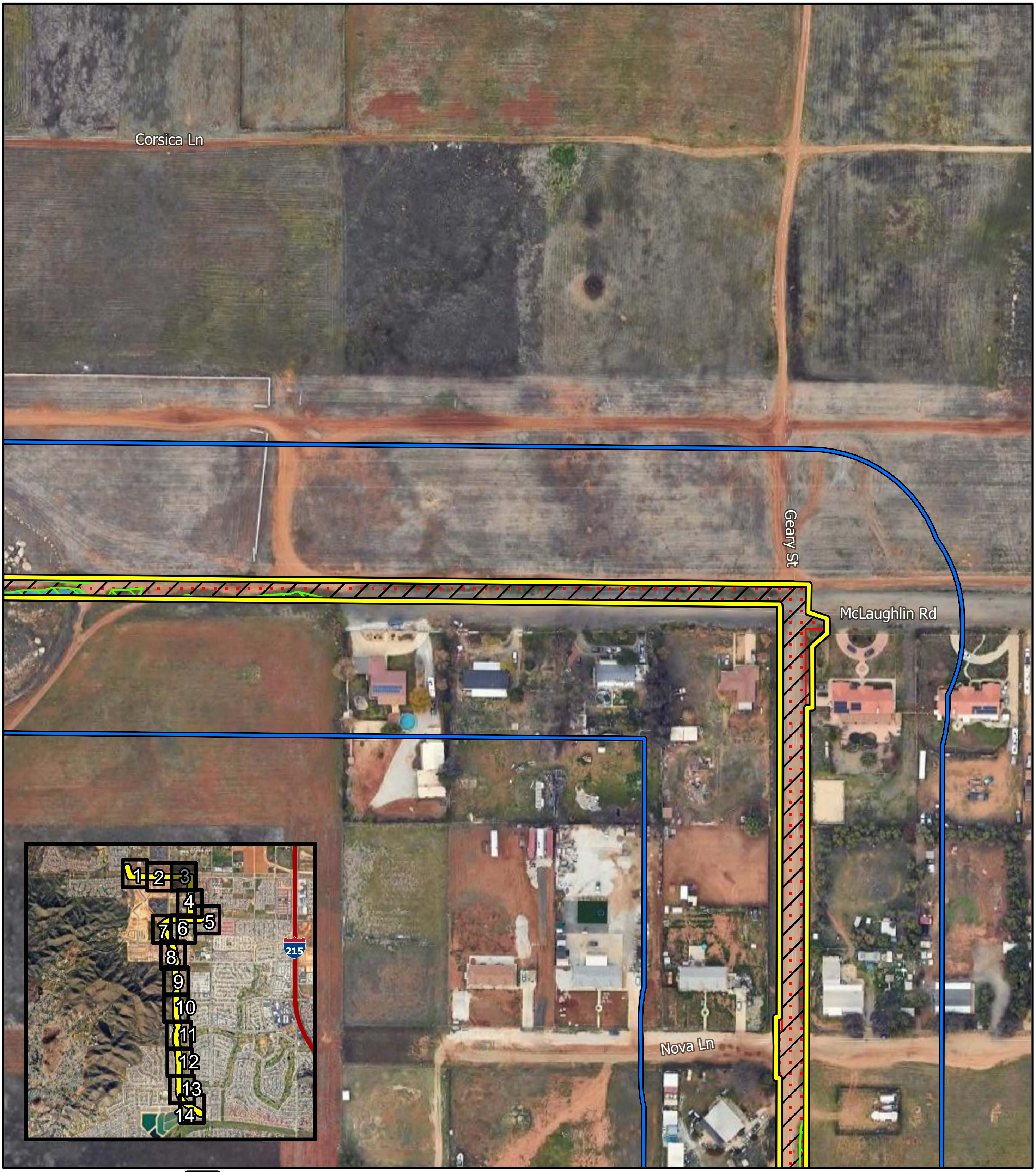
Photo:

Long-Term (24-Hour) Noise Level Measurement Results at LT-3

Start Time	Date	Noise Level (dBA)		
		L_{eq}	L_{max}	L_{min}
5:00 PM	3/18/24	58.5	82.3	37.6
6:00 PM	3/18/24	55.5	78.4	35.6
7:00 PM	3/18/24	54.8	77.4	35.7
8:00 PM	3/18/24	56.6	80.7	36.8
9:00 PM	3/18/24	55.5	82.6	36.7
10:00 PM	3/18/24	53.6	79.7	36.9
11:00 PM	3/18/24	51.2	76.4	35.9
12:00 AM	3/19/24	42.1	65.3	36.0
1:00 AM	3/19/24	44.2	72.2	35.8
2:00 AM	3/19/24	46.7	75.8	36.0
3:00 AM	3/19/24	43.3	71.1	37.0
4:00 AM	3/19/24	55.4	75.3	37.8
5:00 AM	3/19/24	48.2	71.6	39.8
6:00 AM	3/19/24	54.6	78.6	43.6
7:00 AM	3/19/24	56.9	79.4	44.8
8:00 AM	3/19/24	56.8	79.0	44.0
9:00 AM	3/19/24	55.3	77.9	39.3
10:00 AM	3/19/24	56.8	87.6	37.0
11:00 AM	3/19/24	52.8	79.3	36.4
12:00 PM	3/19/24	53.6	77.3	35.8
1:00 PM	3/19/24	55.1	82.1	36.1
2:00 PM	3/19/24	56.7	77.5	35.3
3:00 PM	3/19/24	57.4	80.6	36.5
4:00 PM	3/19/24	60.0	86.8	35.4

Source: Compiled by LSA Associates, Inc. (2024).
dBA = A-weighted decibel
L_{eq} = equivalent continuous sound level
L_{max} = maximum instantaneous noise level
L_{min} = minimum measured sound level





LSA

Project Boundary
Study Area (200-ft Buffer)
Nesting Bird and Burrowing Owl Survey Area
Bumble Bee Survey Area
Rare Plant Survey Area
California Gnatcatcher Survey Area

N

0 100 200
FEET

FIGURE 4.4-3
Sheet 3 of 14

Valley Boulevard Potable Water Transmission Pipelines Project

Focused Survey Map

SOURCE: Google Maps (2023)

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LSA

Project Boundary
Study Area (200-ft Buffer)
Nesting Bird and Burrowing Owl Survey Area
Bumble Bee Survey Area
Rare Plant Survey Area

0 100 200
FEET

FIGURE 4.4-3
Sheet 4 of 14

Valley Boulevard Potable Water Transmission Pipelines Project

Focused Survey Map

SOURCE: Google Maps (2023)

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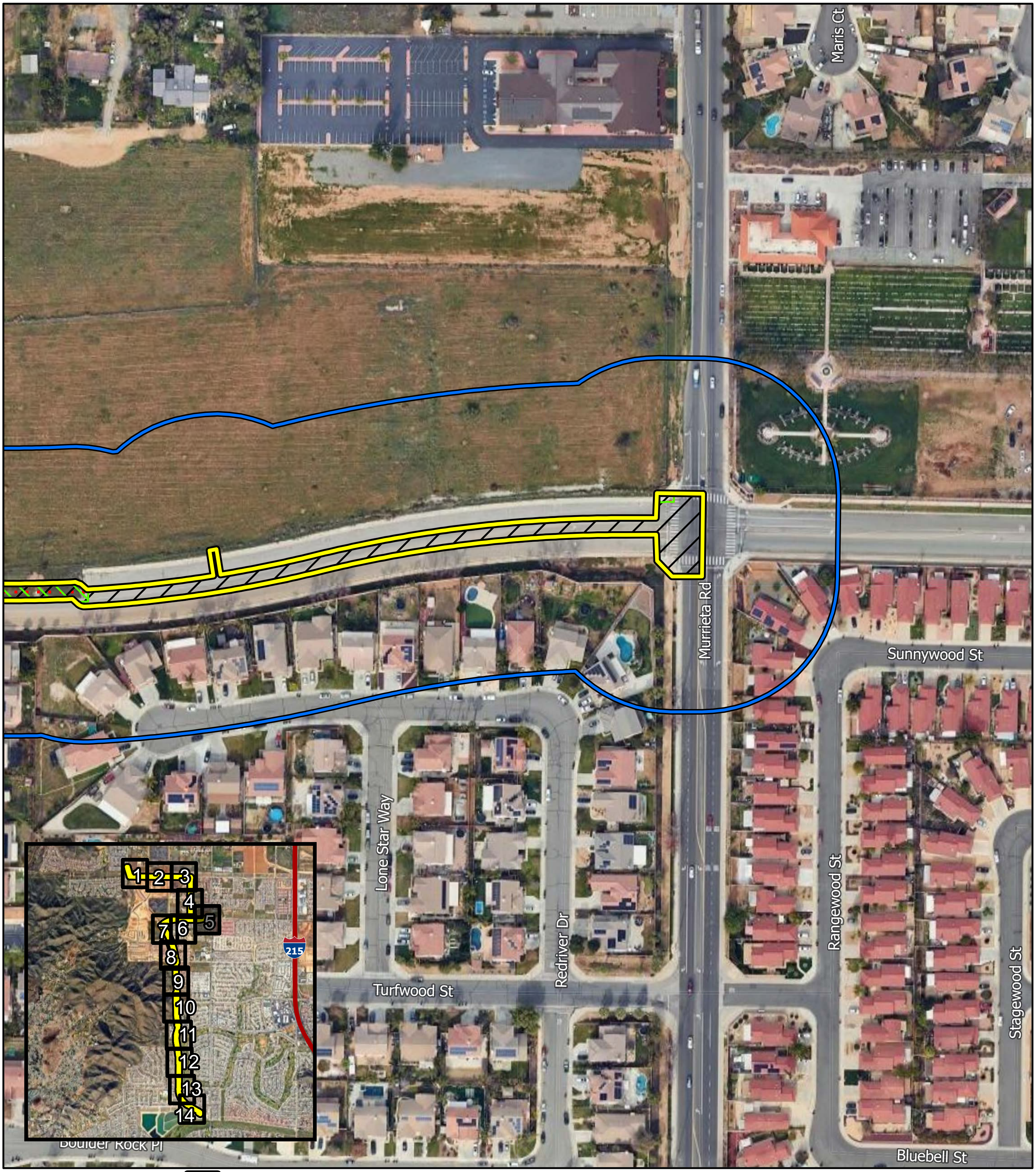

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Project Boundary
Study Area (200-ft Buffer)
Nesting Bird and Burrowing Owl Survey Area
Bumble Bee Survey Area
Rare Plant Survey Area

0 100 200
FEET

SOURCE: Google Maps (2023)

FIGURE 4.4-3
Sheet 5 of 14

Valley Boulevard Potable Water Transmission Pipelines Project

Focused Survey Map

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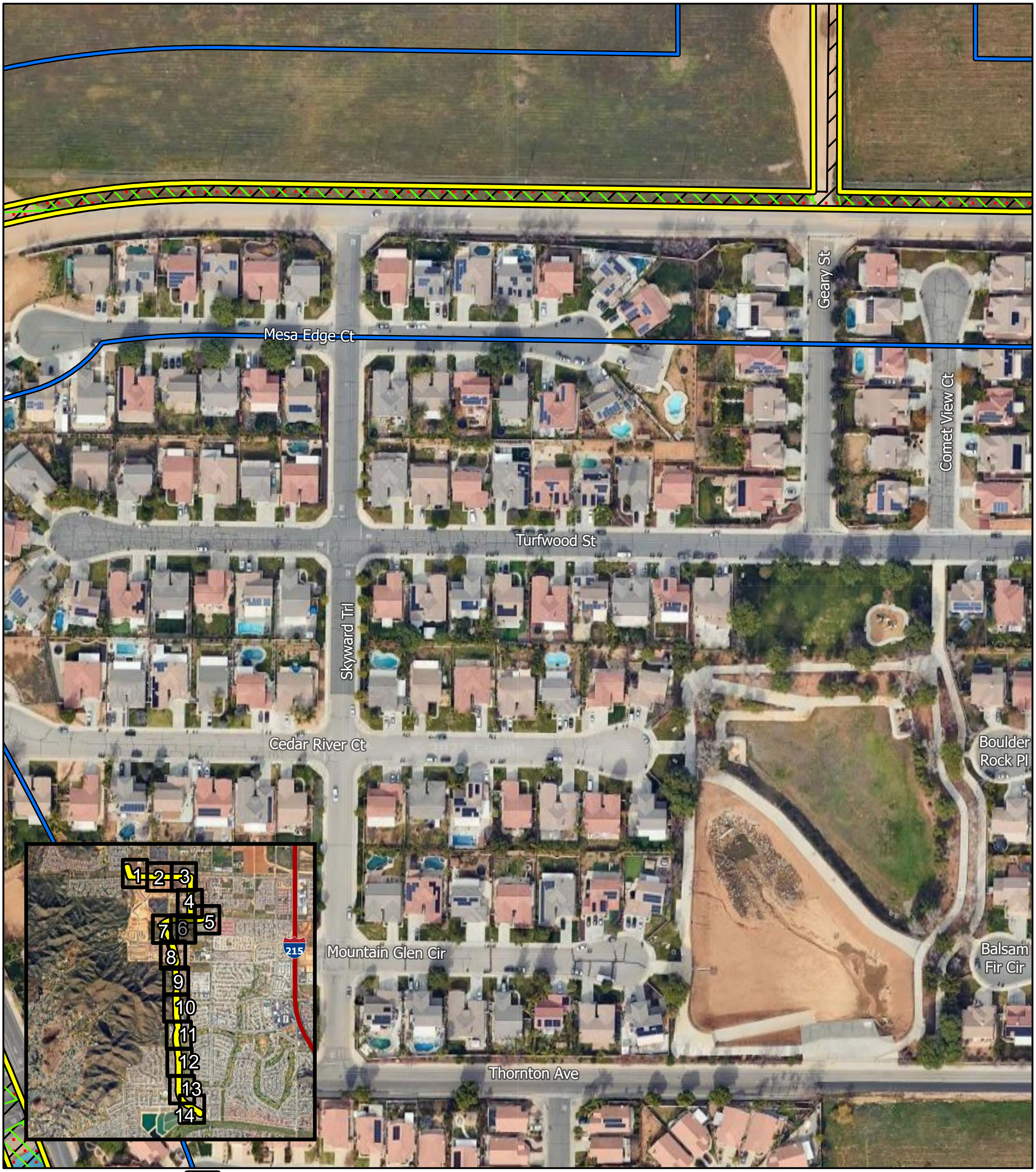

LSA

Project Boundary
Study Area (200-ft Buffer)
Nesting Bird and Burrowing Owl Survey Area
Bumble Bee Survey Area
Rare Plant Survey Area
California Gnatcatcher Survey Area

0 100 200
FEET

FIGURE 4.4-3
Sheet 6 of 14

Valley Boulevard Potable Water Transmission Pipelines Project

Focused Survey Map

SOURCE: Google Maps (2023)

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LSA

Project Boundary
Study Area (200-ft Buffer)
Nesting Bird and Burrowing Owl Survey Area
Bumble Bee Survey Area
Rare Plant Survey Area
California Gnatcatcher Survey Area

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0 100 200
FEET

SOURCE: Google Maps (2023)

FIGURE 4.4-3
Sheet 7 of 14

Valley Boulevard Potable Water Transmission Pipelines Project

Focused Survey Map

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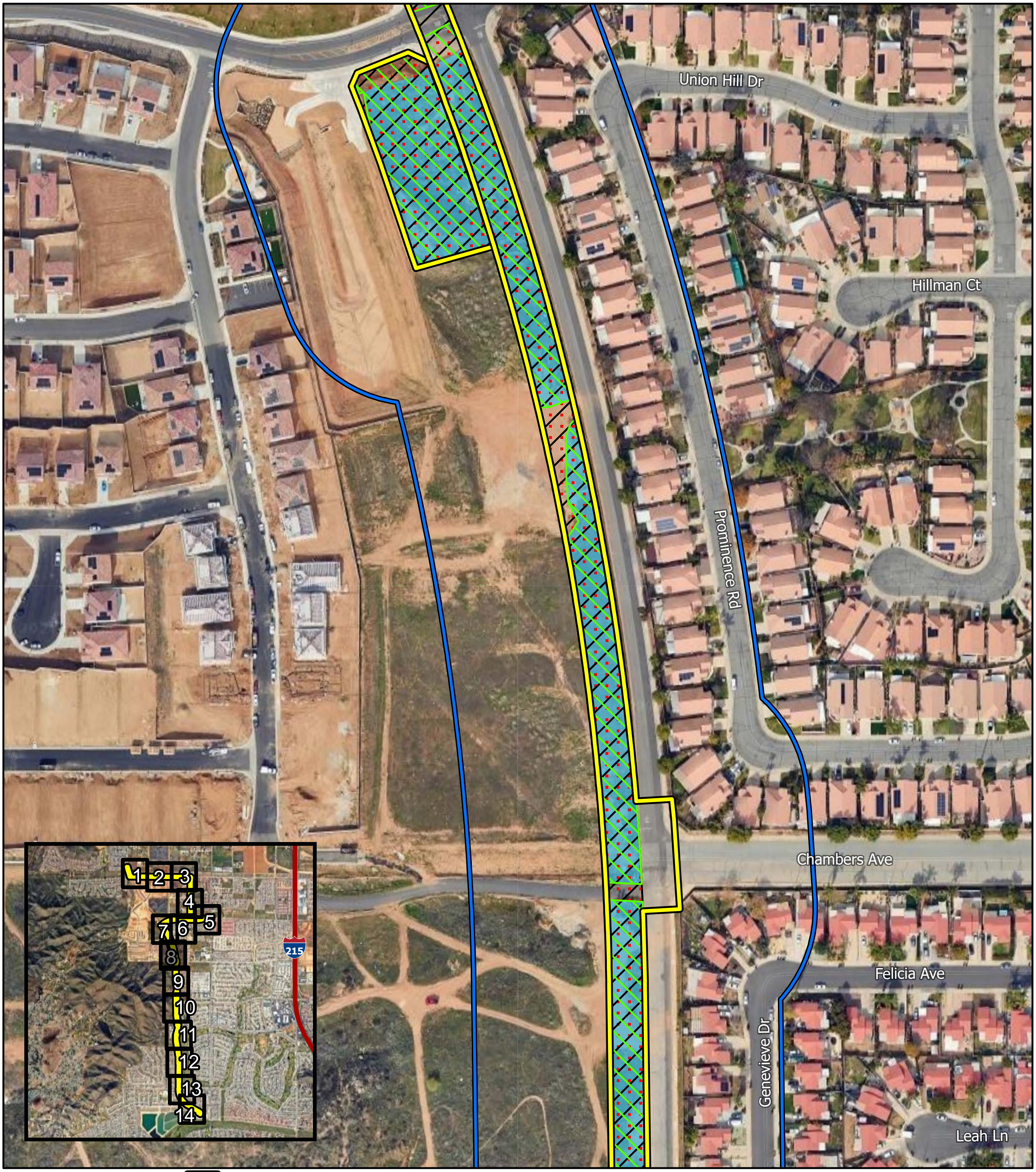

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Project Boundary
Study Area (200-ft Buffer)
Nesting Bird and Burrowing Owl Survey Area
Bumble Bee Survey Area
Rare Plant Survey Area
California Gnatcatcher Survey Area

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FEET

FIGURE 4.4-3
Sheet 8 of 14

Valley Boulevard Potable Water Transmission Pipelines Project
Focused Survey Map

SOURCE: Google Maps (2023)

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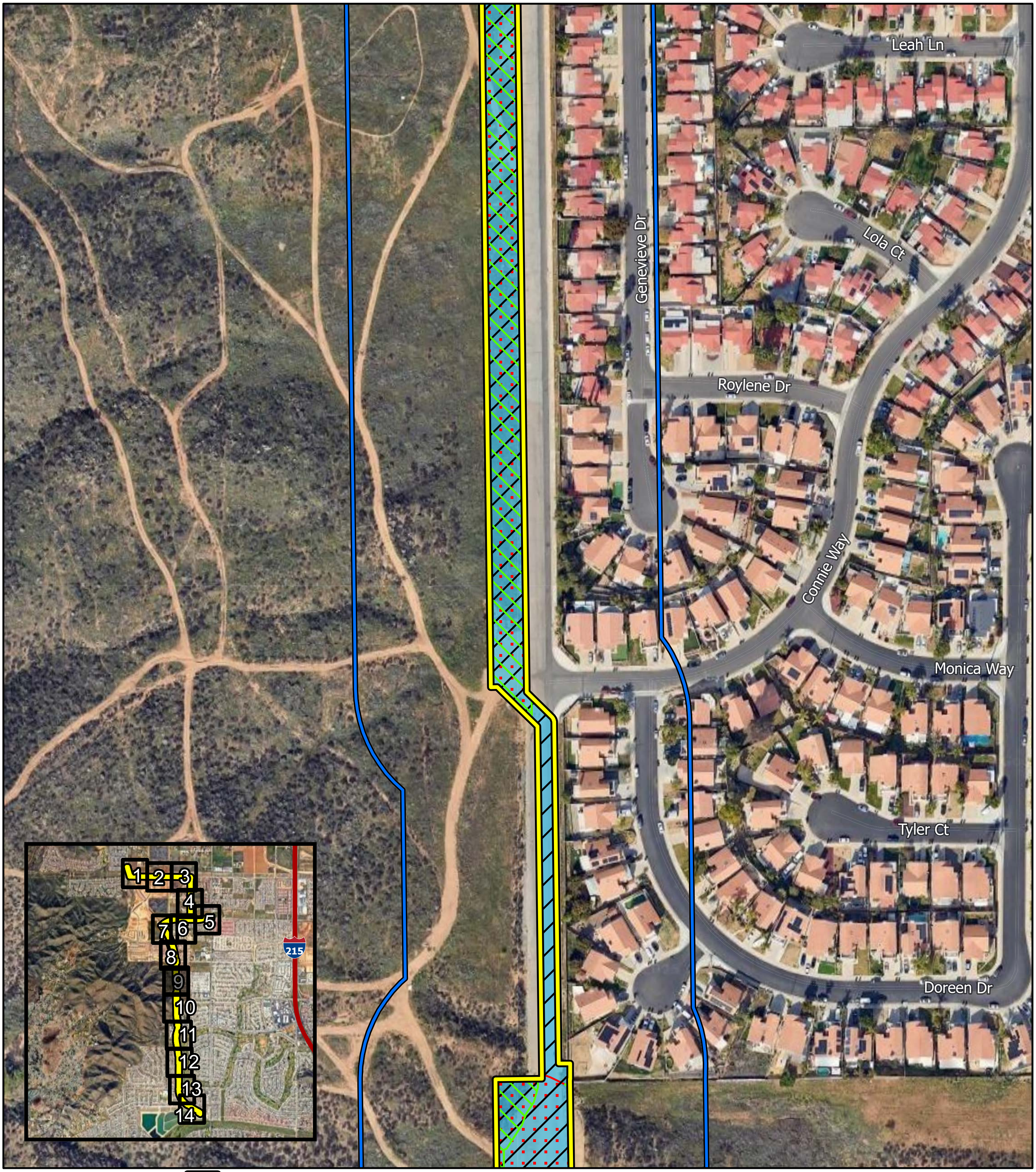

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Project Boundary
Study Area (200-ft Buffer)
Nesting Bird and Burrowing Owl Survey Area
Bumble Bee Survey Area
Rare Plant Survey Area
California Gnatcatcher Survey Area

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FEET

SOURCE: Google Maps (2023)

FIGURE 4.4-3
Sheet 9 of 14

Valley Boulevard Potable Water Transmission Pipelines Project

Focused Survey Map

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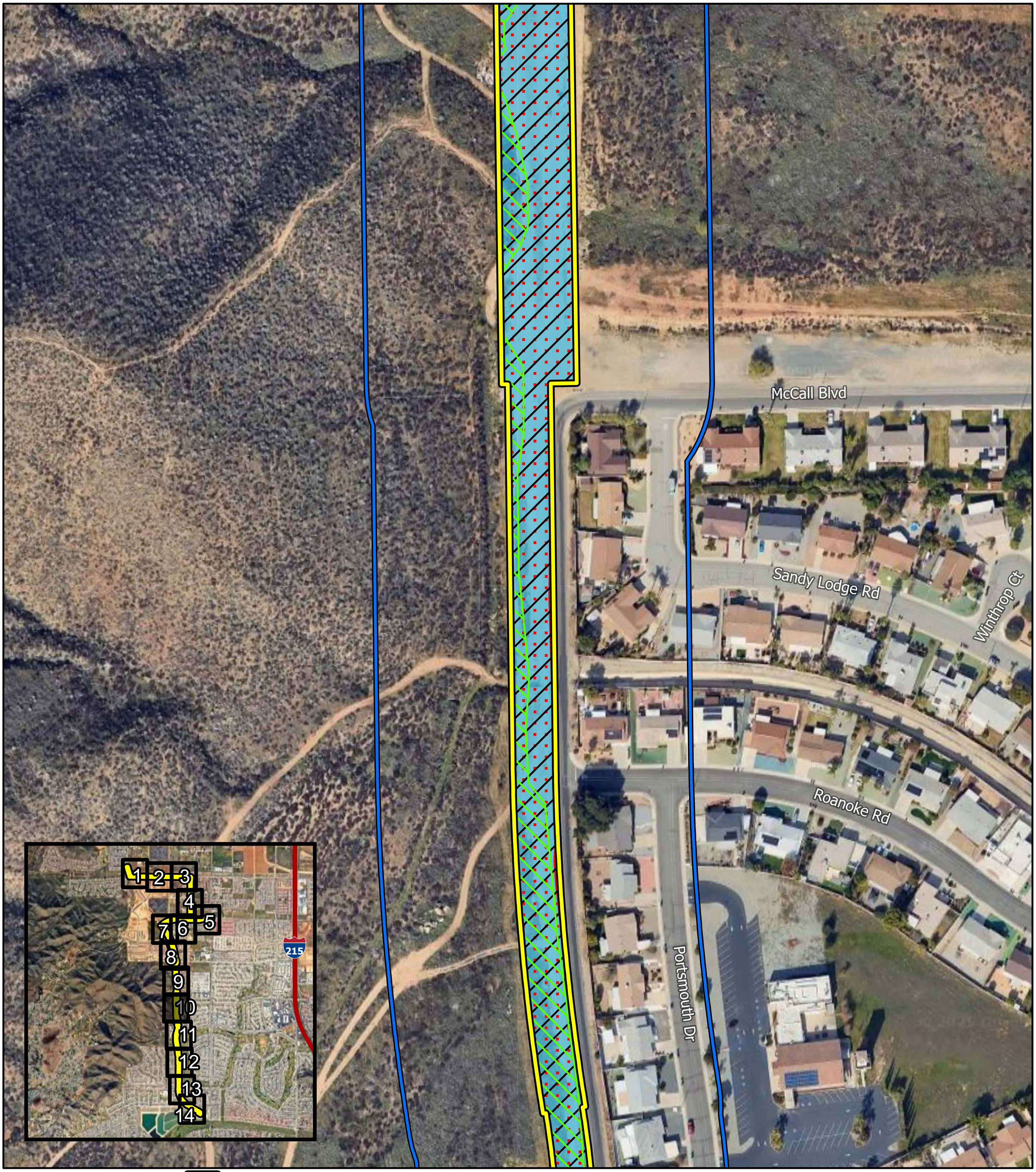

LSA

Project Boundary
Study Area (200-ft Buffer)
Nesting Bird and Burrowing Owl Survey Area
Bumble Bee Survey Area
Rare Plant Survey Area
California Gnatcatcher Survey Area

0 100 200
FEET

FIGURE 4.4-3
Sheet 10 of 14

Valley Boulevard Potable Water Transmission Pipelines Project

Focused Survey Map

SOURCE: Google Maps (2023)

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LSA

FIGURE 4.4-3
Sheet 11 of 14

Project Boundary
Study Area (200-ft Buffer)
Nesting Bird and Burrowing Owl Survey Area
Bumble Bee Survey Area
Rare Plant Survey Area
California Gnatcatcher Survey Area

0 100 200
FEET

Valley Boulevard Potable Water Transmission Pipelines Project

Focused Survey Map

SOURCE: Google Maps (2023)

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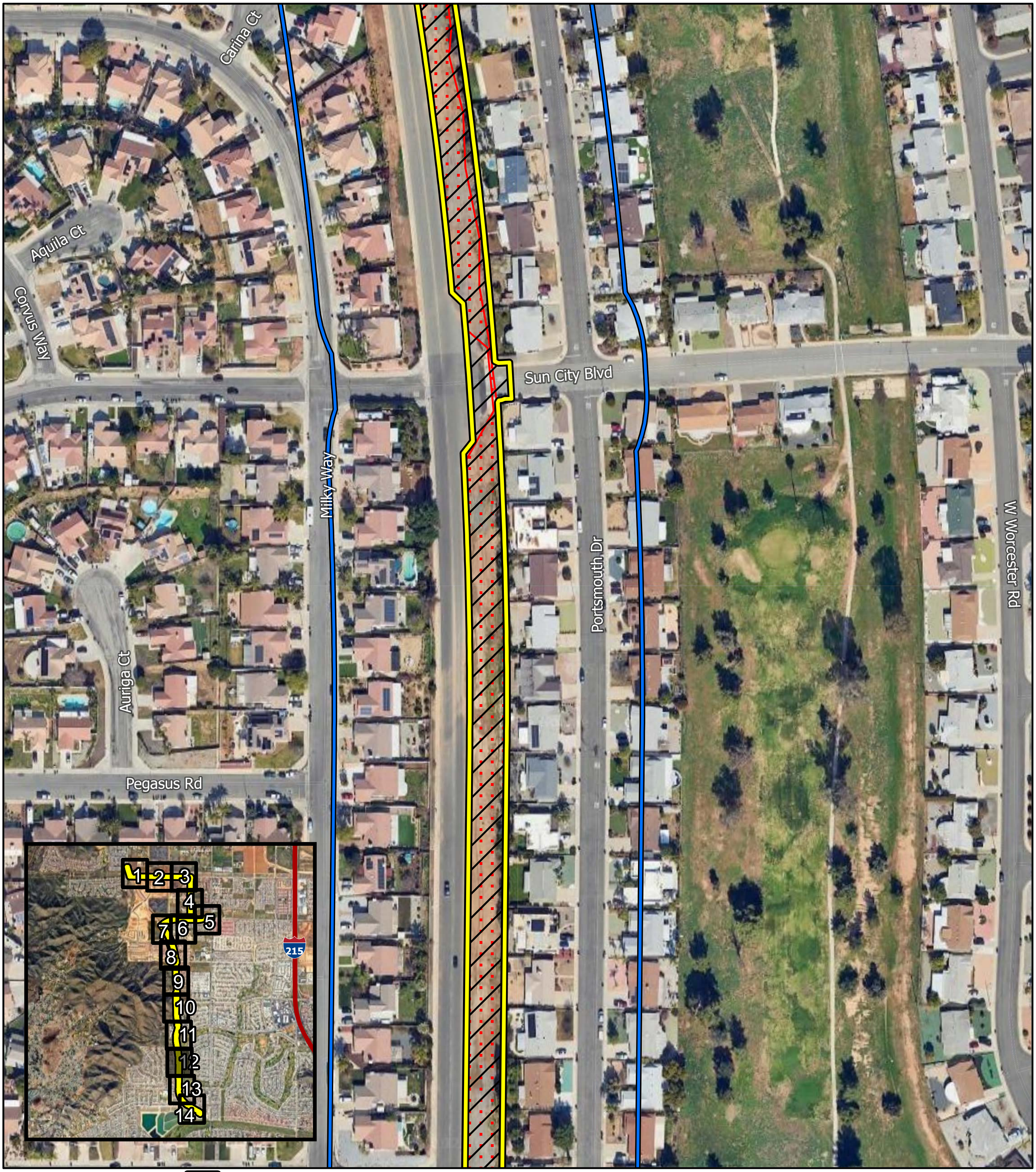

LSA

Project Boundary
Study Area (200-ft Buffer)
Nesting Bird and Burrowing Owl Survey Area
Rare Plant Survey Area

N

0 100 200
FEET

SOURCE: Google Maps (2023)

FIGURE 4.4-3
Sheet 12 of 14

Valley Boulevard Potable Water Transmission Pipelines Project

Focused Survey Map

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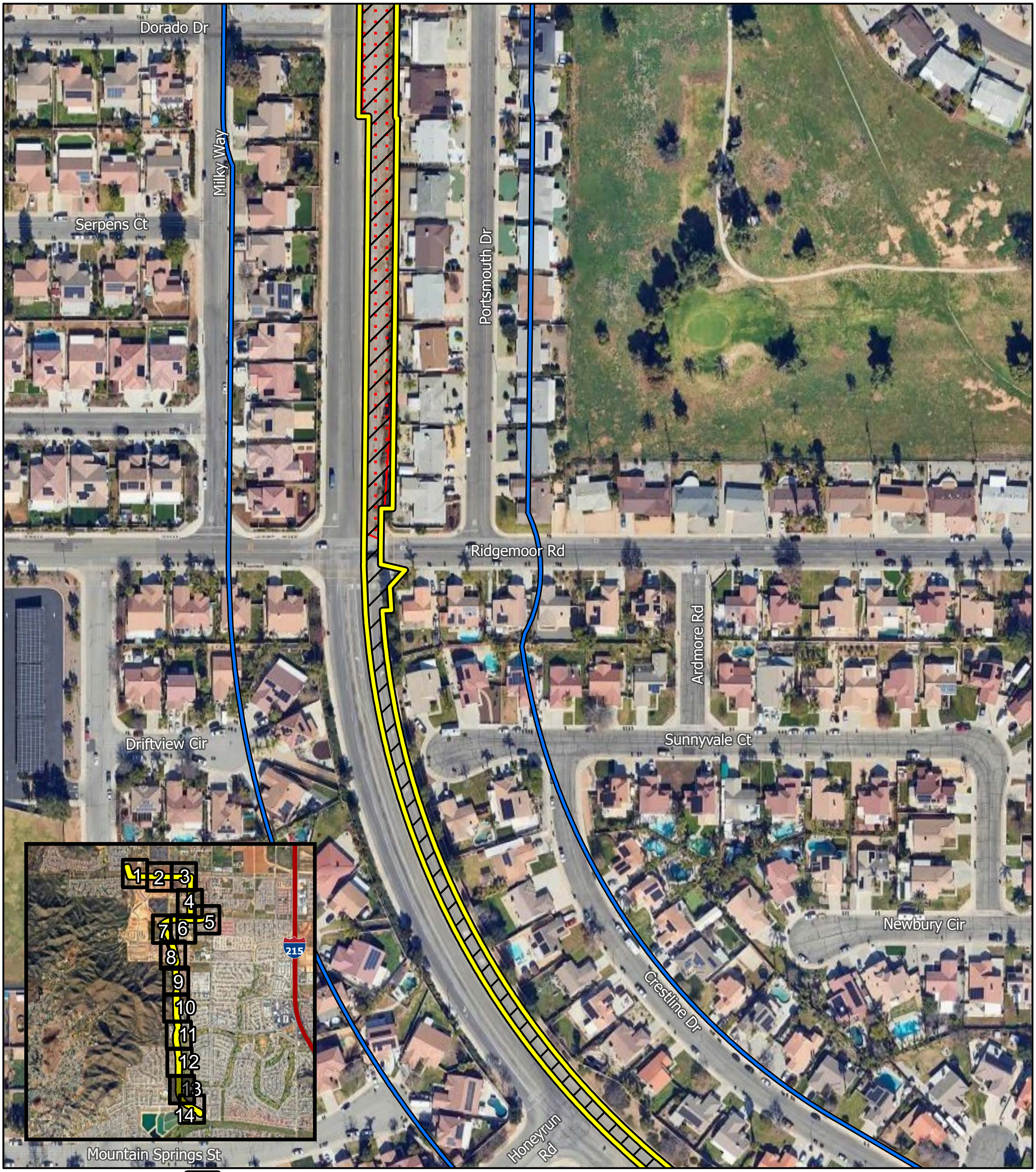

LSA

Project Boundary
Study Area (200-ft Buffer)
Nesting Bird and Burrowing Owl Survey Area
Bumble Bee Survey Area
Rare Plant Survey Area

0 100 200
FEET

SOURCE: Google Maps (2023)

FIGURE 4.4-3
Sheet 13 of 14

Valley Boulevard Potable Water Transmission Pipelines Project

Focused Survey Map

I:\E\EWD2101.04\GIS\Pro\Valley Boulevard Potable Water Transmission Pipelines Project\Valley Boulevard Potable Water Transmission Pipelines Project.aprx (2/20/2025)

LSA

Project Boundary

Study Area (200-ft Buffer)

Nesting Bird and Burrowing Owl Survey Area

Bumble Bee Survey Area

Rare Plant Survey Area

0 100 200

FEET

SOURCE: Google Maps (2023)

FIGURE 4.4-3

Sheet 14 of 14

Valley Boulevard Potable Water Transmission Pipelines Project

Focused Survey Map

I:\E\EWD2101.04\GIS\Pro\Valley Boulevard Potable Water Transmission Pipelines Project\Valley Boulevard Potable Water Transmission Pipelines Project.aprx (2/20/2025)

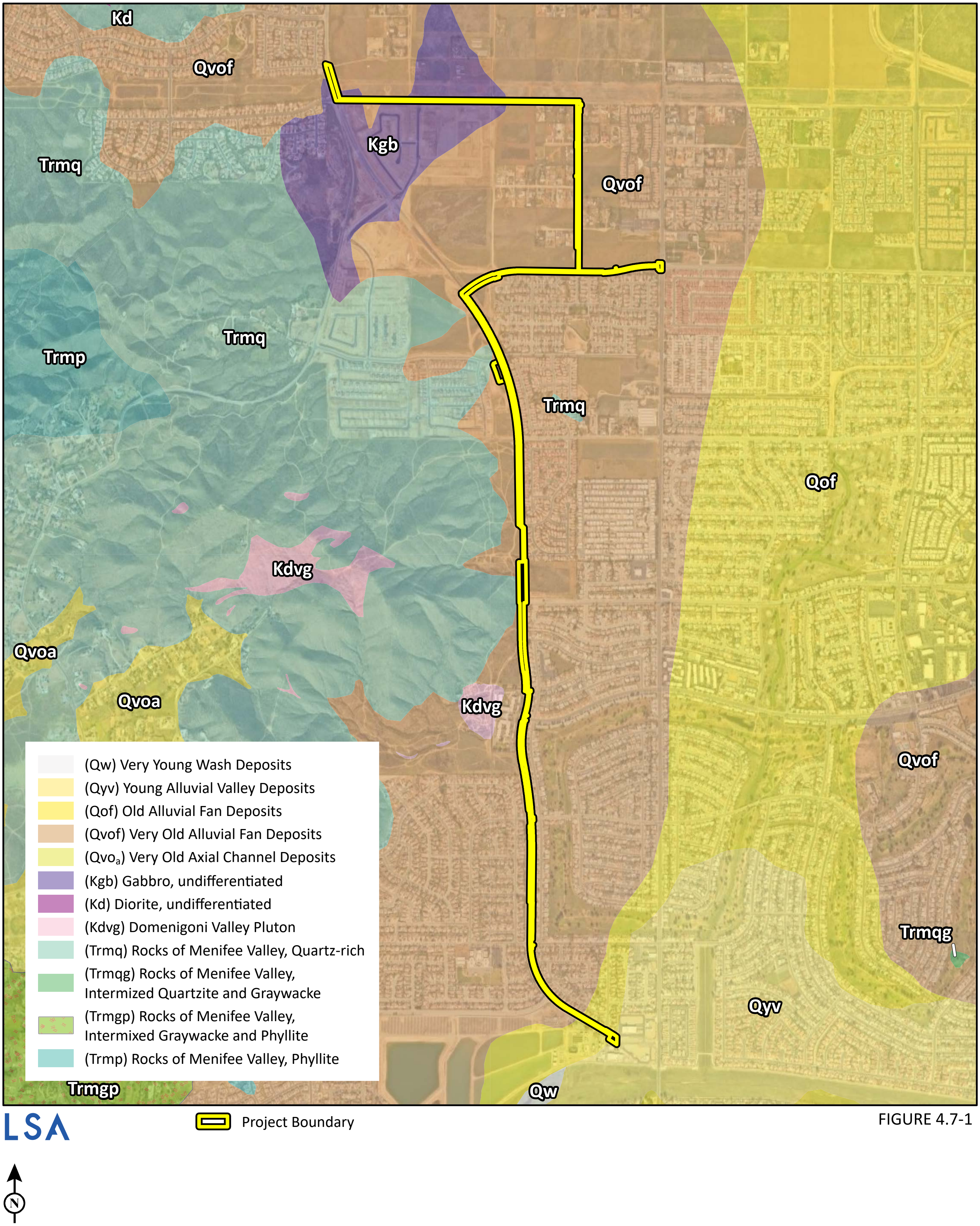

FIGURE 4.7-1

Valley Boulevard Potable Water Transmission Pipelines Project

Geology Map

SOURCE: Google Imagery (2023); Morton and Miller (2006)

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LSA

LEGEND

Project Site Boundary

LT-1 Long-term Noise Monitoring Location

FIGURE 4.13-1

0 750 1500
FEET

SOURCE: Google Earth 2024

VALLEY BOULEVARD POTABLE WATER TRANSMISSION PIPELINES PROJECT

Noise Monitoring Locations

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TABLE OF CONTENTS

FIGURES

APPENDICES

LIST OF ABBREVIATIONS AND ACRONYMS

ALMU	Munz's onion (*Allium munzii*)
AMPU	San Diego ambrosia (*Ambrosia pumila*)
ATCON	San Jacinto Valley crownscale (*Atriplex coronata* var. *notatior*)
BAEA	Bald eagle (*Haliaeetus leucocephalus*)
BESP	Bell's sparrow (*Artemisiospiza belli belli*)
BMPs	best management practices
BRFI	Thread-leaved brodiaea (*Brodiaea filifolia*)
BUOW	Burrowing owl (*Athene cunicularia*)
CAGN	Coastal California gnatcatcher (*Polioptila californica californica*)
CBB	Crotch bumble bee (*Bombus crotchii*)
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CHPAP	Parry's spineflower (*Chorizanthe parryi* var. *parryi*)
City	City of Menifee
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
COHA	Cooper’s hawk (*Accipiter cooperii*)
County	Riverside County
CRPR	California Rare Plant Rank
CWA	Clean Water Act
DOLE	Slender-horned spineflower (*Dodecahema leptoceras*)
EMWD	Eastern Municipal Water District
FESA	Federal Endangered Species Act
GOEA	Golden eagle (*Aquila chrysaetos*)
HCP	Habitat Conservation Plan
HOLA	California horned lark (*Eremophila alpestris actia*)
I-215	Interstate 215
IPaC	USFWS’s Information for Planning and Consultation

ISA	International Society of Arboriculture
LBVI	Least Bell's vireo (*Vireo bellii pusillus*)
LEVIR	Robinson's pepper-grass (*Lepidium virginicum* var. *robinsonii*)
LSA	LSA Associates, Inc.
MBTA	Migratory Bird Treaty Act
MM	Mitigation Measure
MOV	motor-operated valve
MSHCP	Western Riverside County Multiple Species Habitat Conservation Plan
NAFO	Spreading navarretia (*Navarretia fossalis*)
NEPSSA	Narrow Endemic Plant Species Survey Area
NRCS	Natural Resources Conservation Service
OHWM	ordinary high water mark
ORCA	California Orcutt grass (*Orcuttia californica*)
project	Valley Boulevard Potable Water Transmission Pipelines Project
PSE	Participating Special Entity
QCB	Quino checkerspot butterfly (*Euphydryas editha quino*)
RCHCA	Riverside County Habitat Conservation Authority
RCSP	Southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*)
RFS	Riverside fairy shrimp (*Streptocephalus woottoni*)
RWQCB	Regional Water Quality Control Board
SBKR	San Bernardino kangaroo rat (*Dipodomys merriami parvus*)
SDFS	San Diego fairy shrimp (*Branchinecta sandiegonensis*)
SKR	Stephens' kangaroo rat (*Dipodomys stephensi*)
SKR HCP	Stephens' Kangaroo Rat Habitat Conservation Plan
SNPL	Western snowy plover (*Charadrius alexandrinus nivosus*)
SWFL	Southwestern willow flycatcher (*Empidonax traillii extimus*)
SWRCB	State Water Resources Control Board
TRBL	Tricolored blackbird (*Agelaius tricolor*)
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service

USGS	United States Geological Survey
VPFS	Vernal pool fairy shrimp (*Branchinecta lynchi*)
WPT	Western pond turtle (*Emys marmorata* [*Actinemys marmorata*])

1.0 EXECUTIVE SUMMARY

LSA Associates, Inc. (LSA) was retained by the Eastern Municipal Water District (EMWD) to prepare a Biological Resources Assessment. This report has been prepared for compliance with the California Environmental Quality Act (CEQA) and Federal and California Endangered Species Acts.

The study area lies within the planning boundaries of the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) area. The MSHCP is a comprehensive multi-jurisdictional effort that includes western Riverside County and multiple cities. EMWD is the lead agency but is not signatory to the MSHCP. EMWD is not pursuing a Participating Special Entity (PSE) designation for the project site.

The project site is within an MSHCP Narrow Endemic Plant Species Survey Area (NEPSSA) for six plant species: Munz's onion (*Allium munzii*), San Diego Ambrosia (*Ambrosia pumila*), many-stemmed dudleya (*Dudleya multicaulis*), spreading navarretia (*Navarretia fossalis*), California Orcutt grass (*Orcuttia californica*), and Wright's trichocoronis (*Trichocoronis wrightii* var. *wrightii*). Potentially suitable habitat for three of these species is present on site; therefore, a rare plant survey is required to identify whether these special-status plants are present on the project site.

The project site contains suitable habitat for Crotch bumble bee (*Bombus crotchii*), in the form of buckwheat scrub. Therefore, focused Crotch bumble bee surveys are required to determine if Crotch bumble bee is present on the project site.

The site contains suitable fairy shrimp habitat in the form of road ruts and shallow depressions. Additionally, unknown fairy shrimp species (*Branchinecta* sp.) were observed in three separate road ruts. All road ruts and shallow depressions will be avoided by project activities. Therefore, fairy shrimp will not be impacted, and focused wet and dry season fairy shrimp surveys will not be required.

The site contains suitable habitat for coastal California gnatcatcher (*Polioptila californica californica*) in the form of buckwheat scrub. Therefore, focused coastal California gnatcatcher surveys are required to determine if coastal California gnatcatcher is present on the project site.

The project study area contains suitable habitat for the burrowing owl (*Athene cunicularia hypugaea*) and other nesting birds protected by the Migratory Bird Treaty Act (MBTA) and the California Fish and Game Code. A burrowing owl pre-construction survey will be required to ensure any direct impacts to this species will be avoided. In addition, it is recommended that vegetation removal be conducted between September 1 and January 15 (outside the general bird nesting season) to avoid impacts to nesting birds. If vegetation cannot be removed outside the bird nesting season, a pre-construction nesting bird survey by a qualified biologist is required prior to vegetation removal. Additionally, standard best management practices (BMPs) shall be implemented during construction activities to reduce impacts to wildlife resources in the project vicinity.

An official jurisdictional delineation was not conducted as part of the biological resources assessment for this project. There were six drainage features and five detention basins identified within the project study area, which includes a 200-foot buffer from the project site, which are considered potential jurisdictional waters that may be subject to the regulatory authority of the United States Army Corps of Engineers (USACE), the California Department of Fish and Wildlife (CDFW), or the Regional Water Quality Control Board (RWQCB). In addition, there were a number of shallow depressions and road ruts observed within the project study area. The shallow depressions are considered potential jurisdictional waters that may be subject to the regulatory authority of the RWQCB. The road ruts are not considered potential jurisdictional waters. A jurisdictional delineation would be required to determine any project effects to these potential jurisdictional waters if project activities were proposed within these features.

2.0 INTRODUCTION

LSA was retained by Eastern Municipal Water District (EMWD) to prepare a Biological Resources Assessment. This report evaluates the proposed 4.4-mile-long, 36-inch, 30-inch, and 18-inch diameter pipelines along Valley Boulevard, Rouse Road, Geary Street, McLaughlin Road, and Goetz Road in the City of Menifee (City), County of Riverside (County), California. The project site is depicted on the United States Geological Survey (USGS) *Romoland, California* 7.5-minute topographic quadrangles in Sections 17, 20, 29 and 32, Township 5 South, Range 3 West (see Figure 1, Project Location and Vicinity).

2.1 PROJECT DESCRIPTION

The proposed project involves the installation of 4.4 miles of 36-inch diameter, 30-inch diameter, and 18-inch diameter pipelines along Valley Boulevard from EMWD's existing Desalination Complex at 29285 Valley Boulevard in Menifee to McLaughlin Road/Goetz Road. The project includes construction and operation of the new water pipelines to improve operational reliability by providing additional conveyance and redundancy for existing transmission pipelines in the project area and to support operation of the proposed Goetz Road water storage tank. In addition, a turnout facility with a motor-operated valve (MOV), antenna, and remote terminal units would be constructed on a vacant parcel at the intersection of Valley Boulevard and Thornton Avenue.

3.0 METHODS

3.1 LITERATURE REVIEW

A literature review was conducted to assist in determining the existence or potential occurrence of special-status plant and animal species within the project site and the project study area (200-foot buffer on either side of the alignment). A records search of the California Department of Fish and Wildlife's (CDFW) California Natural Diversity Data Base (CNDDB) *Rarefind 5* (Version 5.3.0), the United States Fish and Wildlife Service's (USFWS) Information for Planning and Consultation (IPaC) system, and the California Native Plant Society's *Online Inventory of Rare and Endangered Plants* (CNPS v9.5) for the *Romoland, California* United States Geological Survey (USGS) 7.5-minute quadrangle and surrounding quadrangles within a 7-mile radius of the project site were searched on March 12, 2024, and updated on October 29, 2024. Soil types were determined using the WebSoil Survey (NRCS 2019; available at http://websoilsurvey.sc.egov.usda.gov).

Geographic Information System software was used to map the project location, habitat types, and land uses, etc.

3.2 FIELD SURVEY

The general biological resources assessment included a site visit on February 14, 2024, by LSA biologists Carla Cervantes and Julia Lung between 7:30 a.m. and 1:00 p.m. Notes were taken on general site conditions, vegetation, and suitability of habitat for various special-status elements. Weather conditions started as cloudy skies and ended with clear skies (0–100 percent cloud cover), cool temperatures (44–60 degrees Fahrenheit), and 1–3 mile per hour (mph) winds during the site survey. The entire project study area, which includes a 200-foot buffer from the project site, was surveyed on foot. Binoculars were used as needed. All plant and animal species observed or otherwise detected during this field survey were noted and are listed in Appendix A. Appendix B summarizes the special-status plant and animal species potentially present within the project study area.

4.0 RESULTS

4.1 EXISTING SITE CONDITIONS

The project study area is generally located north of Salt Creek, east of an unnamed mountain range found east of Kabian Park, south of Ethanac Road, and west of Interstate 215 (I-215). Other surrounding land uses include residential and commercial use areas to the east. The project falls within the boundaries of the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP), as discussed in further detail below.

4.1.1 Topography and Soils

The project site is situated on relatively flat land within elevations ranging from approximately 1,410 feet to 1,520 feet above mean sea level. A variety of soil types occurs within the project site; the soil types are mapped by the *Natural Resource Conservation Service Soil Survey Geographic Database SSURGO metadata and GIS maps* as the following types:

- Arbuckle loam, 2 to 8 percent slopes
- Arlington fine sandy loam, 8 to 15 percent slopes
- Auld clay, 2 to 8 percent slopes
- Auld clay, 8 to 15 percent slopes
- Buchenau silt loam, 2 to 8 percent slopes, eroded
- Cajalco fine sandy loam, 8 to 15 percent slopes, eroded
- Cajalco rocky fine sandy loam, 5 to 15 percent slopes, eroded
- Domino silt loam, saline-alkali
- Escondido fine sandy loam, 2 to 8 percent slopes, eroded
- Escondido fine sandy loam, 8 to 15 percent slopes, eroded
- Exeter sandy loam, deep, 0 to 2 percent slopes
- Friant fine sandy loam, 5 to 25 percent slopes, eroded
- Garretson gravelly very fine sandy loam, 2 to 8 percent slopes
- Garretson very fine sandy loam, 2 to 8 percent slopes
- Honcut loam, 2 to 8 percent slopes, eroded
- Las Posas loam, 8 to 15 percent slopes, eroded
- Lodo gravelly loam, 15 to 50 percent slopes, eroded
- Lodo rocky loam, 8 to 25 percent slopes, eroded
- Monserate sandy loam, 0 to 5 percent slopes
- Perkins gravelly loam, 5 to 8 percent slopes
- Wyman loam, 2 to 8 percent slopes, eroded
- Ysidora gravelly very fine sandy loam, 8 to 25 percent slopes, eroded
- Ysidora gravelly very fine sandy loam. 8 to 25 percent slopes, severely eroded

Soils observed in undeveloped portions of the project study area appear to be consistent with these designations. Figure 2, Soils, shows the soils mapped within the project study area.

4.1.2 Vegetation

Vegetation within the project study area consists primarily of developed, buckwheat scrub, and non-native grassland, with patches of brittlebush scrub-disturbed, disturbed and barren ground, as well as ornamental landscaping located throughout residential and commercial areas.

Dominant species within non-native grassland include mouse barley (*Hordeum murinum*), red brome (*Bromus rubens*) and common Mediterranean grass (*Schismus barbatus*). Other species observed within non-native grassland include Russian thistle (*Salsola tragus*), prickly lettuce (*Lactuca serriola*), Bermuda grass (*Cynodon dactylon*), and wild oat (*Avena fatua*).

Dominant species within buckwheat scrub include California buckwheat (*Eriogonum fasciculatum*). Other species observed within buckwheat scrub include California sagebrush (*Artemisia californica*), Mediterranean grass, valley cholla (*Cylindropuntia bernardina*), and brittlebush (*Encelia farinosa*).

Dominant species within brittlebush scrub - disturbed include brittlebush and stinknet (*Oncosiphon pilulifer).* Other species observed within brittlebush scrub-disturbed include shortpod mustard (*Hirschfeldia incana*), prickly sow thistle (*Sonchus asper*), Mediterranean grass, and California aster (*Corethrogyne filaginifolia*).

There are no other plant communities on the site. Areas mapped as developed consist of lawn, ornamental landscaping, areas containing manmade structures, and paved roads. Areas mapped as disturbed and barren ground consist of well-traveled dirt roads that do not allow for the establishment of vegetation. A complete list of plant species observed on the site is included in Appendix A. Figure 3, Vegetation, Land Use, and Photo Locations, shows the vegetation and land cover, and site photographs are provided in Figure 4, Site Photographs.

4.1.3 Wildlife

A few wildlife species common to urban and disturbed areas were observed during the field survey. American crow (*Corvus brachyrhynchos*), mourning dove (*Zenaida macroura),* house finch (*Haemorhous mexicanus*), lesser goldfinch (*Spinus psaltria*), Anna's hummingbird (*Calypte anna*), song sparrow (*Melospiza melodia*), black phoebe (*Sayornis nigricans*), western meadowlark (*Sturnella neglecta*), mallard (*Anas platyrhynchos*), rock pigeon (*Columba livia*), red-tailed hawk (*Buteo jamaicensis*), American kestrel (*Falco sparverius*), Say's phoebe (*Sayornis saya*), Cassin's kingbird (*Tyrannus vociferans*), California horned lark (*Eremophila alpestris actia*), white-crowned sparrow (*Zonotrichia leucophrys*), yellow-rumped warbler (*Setophaga coronate*), California ground squirrel (*Spermophilus beecheyi*), Botta's pocket gopher (*Thomomys bottae*), and desert cottontail (*Sylvilagus audubonii*) were observed within the project study area. A complete list of wildlife species observed is provided as Appendix A.

4.1.4 Western Riverside County Multiple Species Habitat Conservation Plan

The proposed project occurs within the Western Riverside County MSHCP area. The MSHCP is a comprehensive multi-jurisdictional effort that includes western Riverside County and multiple cities. The EMWD is the lead agency but is not signatory to the MSHCP. The EMWD is not pursuing a Participating Special Entity (PSE) designation for the project site. The MSHCP defines PSE agencies as any regional public facility provider, such as a utility company, or public district, or any other agency that owns land or operates a facility within the MSHCP plan area. The following MSHCP policies and procedures do not apply to this project and are not addressed in this report: Protection of Species Associated with Riparian/Riverine Areas and Vernal Pools (MSHCP Section 6.1.2), Protection of the Narrow Endemic Plant Species (MSHCP Section 6.1.3), Additional Survey Needs and procedures (MSHCP Section 6.3.2), and Urban/Wildland Interface Guidelines (MSHCP Section 6.1.4). The MSHCP allows participating entities to issue take permits for listed species so that individual applicants need not seek their own permits from the USFWS and/or CDFW. In order to obtain MSHCP coverage as a PSE, the project is required to demonstrate MSHCP compliance through specific habitat assessments, applicable biological surveys, and the provision of an MSHCP consistency analysis. Due to the project not being processed through the MSHCP for covered species, the project is subject to the Federal Endangered Species Act (FESA) and/or the California Endangered Species Act (CESA) for threatened, endangered, and/or candidate species.

4.1.5 Stephens' Kangaroo Rat (SKR) Habitat Conservation Plan (HCP)

The MSHCP and the SKR HCP are the principal habitat conservation plans in western Riverside County. Riverside County established a boundary in 1996 for protecting the Stephens' kangaroo rat, a federally and State threatened species. As described in the HCP Implementation Agreement, a Section 10(a) Permit, and California Fish and Game Code Section 2081 Management Authorization were issued to the Riverside County Habitat Conservation Agency (RCHCA) for the Long-Term SKR HCP and was approved by the USFWS and CDFW in August 1990. Relevant terms of the SKR HCP have been incorporated into the MSHCP and its Implementation Agreement. The SKR HCP will continue to be implemented as a separate HCP; however, to provide the greatest conservation for the largest number of Covered Species, the Core Reserves established by the SKR HCP are managed as part of the MSHCP Conservation Area consistent with the SKR HCP. Actions shall not be taken as part of the implementation of the SKR HCP that will significantly affect other Covered Species. Take of Stephens' kangaroo rat outside of the boundaries but within the MSHCP area is authorized under the MSHCP and the associated permits.

The proposed project is within the planning area of the SKR HCP; however, as a public agency, the EMWD is exempt from the requirements of the SKR HCP.

4.1.6 Special-Status Species

This section discusses special-status species observed or potentially occurring within a 7-mile radius of the project site. Legal protection for special-status species varies widely, from the comprehensive protection extended to listed threatened/endangered species, to no legal interest at present. The CDFW, USFWS, local agencies, and special-status groups such as the CNPS, publish watch lists of declining species. Species on watch lists can be included as part of the special-status species assessment. Species that are candidates for State and/or federal listing and species on watch lists are included in the special-status species list. Inclusion of species described in the special-status species analysis is based on the following criteria:

- Direct observation of the species or its sign in the study area or immediate vicinity during previous biological studies;
- Sighting by other qualified observers;
- Record reported by the CNDDB, published by the CDFW;
- Presence or location information for specific species provided by private groups (e.g., CNPS); and/or
- Study area lies within known distribution of a given species and contains appropriate habitat.

The special-status species analysis revealed 63 special-status species with the potential to occur within the project study area. Appendix B lists these species with a data summary and determination of the likelihood of each species occurring within the project study area.

4.1.7 Threatened/Endangered Species

The following 24 federally/State listed species were identified as potentially present (Appendix B) in the project vicinity:

- Munz's onion (*Allium munzii* [ALMU]): Federally listed endangered, State listed threatened, and State plant rank 1B.1;
- San Diego ambrosia (*Ambrosia pumila* [AMPU]); Federally listed endangered and State plant rank 1B;
- San Jacinto Valley crownscale (*Atriplex coronata* var. *notatior* [ATCON]): Federally listed endangered and State plant rank 1B;
- Thread-leaved brodiaea (*Brodiaea filifolia* [BRFI]): Federally listed threatened, State listed endangered, and State plant rank 1B;
- Slender-horned spineflower (*Dodecahema leptoceras* [DOLE]): Federally listed endangered, State listed endangered, and State plant rank 1B;
- Spreading navarretia (*Navarretia fossalis* [NAFO]): Federally listed threatened and State plant rank 1B;
- California Orcutt grass (*Orcuttia californica* [ORCA]): Federally listed endangered, State listed endangered, and State plant rank 1B;
- Crotch bumble bee (*Bombus crotchii* [CBB]): State candidate for listing as endangered;

- American bumble bee (*Bombus pensylvanicus*): State candidate for listing as endangered;
- Vernal pool fairy shrimp (*Branchinecta lynchi* [VPFS]): Federally listed as threatened and State Special Animal;
- San Diego fairy shrimp (*Branchinecta sandiegonensis* [SDFS]): Federally listed as endangered and State Special Animal;
- Monarch butterfly (*Danaus plexippus*): Federal candidate for listing as endangered;
- Quino checkerspot butterfly (*Euphydryas editha quino* [QCB]): Federally listed as endangered and State Special Animal;
- Riverside fairy shrimp (*Streptocephalus woottoni* [RFS]): Federally listed as endangered and State Special Animal;
- Western pond turtle (*Emys marmorata* [*Actinemys marmorata*, WPT]): Federal candidate for listing as threatened and State Species of Special Concern;
- Tricolored blackbird (*Agelaius tricolor* [TRBL]): State listed as threatened and State Species of Special Concern;
- Burrowing owl (*Athene cunicularia* [BUOW]); State candidate for listing as endangered/ threatened;
- Western snowy plover (*Charadrius alexandrinus nivosus* [SNPL]): Federally listed as threatened and State Species of Special Concern;
- Southwestern willow flycatcher (*Empidonax traillii extimus* [SWFL]): Federally listed as endangered and State listed endangered;
- Bald eagle (*Haliaeetus leucocephalus* [BAEA]): State listed as endangered and State Fully Protected species;
- Coastal California gnatcatcher (*Polioptila californica californica* [CAGN]): Federally listed as threatened and State Species of Special Concern;
- Least Bell's vireo (*Vireo bellii pusillus* [LBVI]) Federally listed as endangered and State listed as endangered;
- San Bernardino kangaroo rat (*Dipodomys merriami parvus* [SBKR]): Federally listed as endangered, State listed endangered, and State Species of Special Concern; and
- Stephens' kangaroo rat (*Dipodomys stephensi* [SKR]): Federally listed as endangered and State listed as threatened.

Habitat within the study area is considered unsuitable for 14 of the 24 species identified above. Low quality suitable habitat for ALMU, AMPU, BRFI, VPFS, SDFS, monarch butterfly, American bumble bee, RFS, and SKR was found to be present within the project study area. Low to moderately suitable habitat for CAGN and CBB was found to be present within the project study area.

4.1.8 Non-Listed Special-Status Species

Of the 39 other non-listed special-status species identified and discussed in Appendix B, 16 species are not expected to occur based on lack of suitable habitat, 17 species are considered to have a low probability of occurrence, five species are considered to have a moderate probability of occurrence, and one species is considered present within the project site. The following non-listed special-status species have at least a moderate probability to occur within the project study area:

- Cooper's hawk (*Accipiter cooperii* [COHA]);
- Southern California rufous-crowned sparrow (*Aimophila ruficeps canescens* [RCSP]);
- Bell's sparrow (*Artemisiospiza belli belli* [BESP]);
- Parry's spineflower (*Chorizanthe parryi* var. *parryi* [CHPAP]);
- California horned lark (*Eremophila alpestris actia* [HOLA]); and
- Robinson's pepper-grass (*Lepidium virginicum* var. *robinsonii* [LEVIR]).

Nesting bird species, including special-status species identified in Appendix B, with potential to occur are protected by California Fish and Game Code Sections 3503, 3503.5, and 3800, and by the Migratory Bird Treaty Act (MBTA) (16 United States Code 703–711). These laws regulate the take, possession, or destruction of the nest or eggs of any migratory bird or bird of prey. However, the USFWS has recently determined that the MBTA should apply only to "…affirmative actions that have as their purpose the taking or killing of migratory birds, their nests, or their eggs" and will not be applied to incidental take of migratory birds pursuant to otherwise lawful activities.

4.1.9 Critical Habitat

The project study area does not lie within federally designated critical habitat.

4.1.10 Potential Jurisdictional Waters

The United States Army Corps of Engineers (USACE), under Section 404 of the Federal Clean Water Act (CWA), regulates discharges of dredged or fill material into "waters of the United States." These waters include wetlands and non-wetland bodies of water that meet specific criteria, including a connection to interstate commerce. This connection may be direct (through a tributary system linking a stream channel with traditional navigable waters used in interstate or foreign commerce) or it may be indirect (through a connection identified in USACE regulations). The USACE typically regulates as non-wetland waters of the United States any body of water displaying an "ordinary high water mark" (OHWM). In order to be considered a "jurisdictional wetland" under Section 404, an area must possess hydrophytic vegetation, hydric soils, and wetland hydrology. The CDFW, under Sections 1600 et seq. of the California Fish and Game Code, regulates alterations to lakes, rivers, and streams. A stream is defined by the presence of a channel bed and banks and at least an occasional flow of water. The Regional Water Quality Control Board (RWQCB) is responsible for the administration of Section 401 of the CWA, through water quality certification of any activity that may result in a discharge to jurisdictional waters of the United States. The RWQCB may also regulate discharges to "waters of the State," including wetlands, under the California Porter-Cologne Water Quality Control Act.

There are six drainage features within the project study area (see Figure 5, Potential Jurisdictional Features), and they are identified as Drainages A, B, C, D, E, and F for purposes of this analysis. Additionally, five detention basins exist adjacent to Valley Boulevard and McLaughlin Road. Although an official jurisdictional delineation was not conducted as part of the biological resources assessment for this project, the preliminary results of these drainage features and detention basins are discussed below.

Drainage A is located parallel to the west of Goetz Road and perpendicular to Goldenrod Road. It originates from an open field to the north and travels south into a concrete culvert beneath Goldenrod Avenue to the south. This drainage is an ephemeral, earthen bottom drainage created to carry stormwater. Vegetation within Drainage A consist of non-native grassland.

Drainage B is an ephemeral drainage that flows across Geary Street, along the north side of Rouse Road. This earthen bottom drainage carries stormwater and disperses in a west-to-east direction and disperses into the adjacent land with no direct end. Vegetation within Drainage B is dominated by non-native grassland species.

Drainage C is a drainage along developed landscaping and runs parallel to the southern side of Rouse Road adjacent to Murrieta Road. It enters a concrete drain that seems to redirect water flow underground to the east. It receives flow from the landscape irrigation and is an ephemeral, earthen bottom drainage. Vegetation within Drainage C is dominated ornamental landscaping.

Drainage D is a natural drainage feature that is located to the west of Valley Boulevard. This feature appears to flow in a southwest-to-east direction. A newly installed concrete culvert located at the east end of Drainage D leads direct water flow into Detention Basin 3 on the east side of Valley Boulevard. Vegetation within Drainage D is dominated by turkey-mullein (*Croton setiger*) with a very small patch of mule fat (*Baccharis salicifolia*).

Drainage E is a drainage feature that is located on the west side of Valley Boulevard and to the north of Thornton Avenue. This drainage receives stormwater runoff from a concrete lined v-ditch located parallel to the north of Thornton Avenue. Stormwater from the concrete lined v-ditch travels northeast into Detention Basin 4. A newly installed concrete culvert located to the east of Detention Basin 4 appears to have been placed in that location for stormwater runoff as well as in case of overflow of Detention Basin 4. Vegetation within Drainage E is a mix of non-native grassland species and disturbed or barren land.

Drainage F is a drainage feature that is located on the west side of Valley Boulevard, across and just north of Roanoke Road. It appears to be a natural drainage originating from the southwest and flowing east. A concrete culvert located at the east end of Drainage E leads direct water flow into a concrete channel to the east side of Valley Boulevard into the neighborhood. Vegetation within Drainage D is best characterized as disturbed or barren.

Five detention basins (Detention Basin 1 through Detention Basin 5; Figure 5) were observed during the field survey and are best described as manmade basins created to capture flows from nearby roads and development areas. The detention basins are located adjacent to McLaughlin Road, Rouse Road, and Valley Boulevard. Detention Basins 2 and 3 are nestled within residential areas and are bordered by a chain-link fence. Land cover within Detention Basins 2 and 3 is considered developed. Detention Basins 1, 4, and 5 are concave areas located to the west of Valley Boulevard and to the south of McLaughlin Road. Detention Basins 1, 4, and 5 are all earthen bottom, with Detention Basins 1 and 5 containing some concrete structures. All detention basins lack vegetation as they are either partially concrete-lined or maintained to be free of vegetation.

It should be noted that a handful of culverts not connected to a drainage or detention basin are present within the project study area but do not relate or connect to a potential jurisdictional water. This includes the isolated culverts displayed on Figure 5, Sheets 4 and 5. Due to the absence of defined bed and bank and OHWM, these isolated culverts and adjacent areas are not considered potentially jurisdictional waters.

These six drainage features and five detention basins are considered potential jurisdiction waters that may be subject to the regulatory authority of the USACE, CDFW, or RWQCB. A jurisdictional delineation would be required to determine any project effects to these potential jurisdictional waters if project activities were proposed within these features.

Additionally, eleven road ruts and one shallow depression were observed within the project boundary with several other road ruts and shallow depressions occurring outside of the project boundary but within the overall project study area (see Figure 6, Shallow Depressions). The road ruts are classified as such due to their presence and creation by vehicles within dirt roadways. The shallow depressions appear to be naturally or semi-naturally occurring low spots in the topography. The road ruts are expected to be non-jurisdictional as they lack a defined bed and bank, riparian vegetation, freshwater flow, and are mostly devoid of vegetation. The shallow depressions may be subject to the regulatory authority of RWQCB but are expected to be non-jurisdictional under CDFW and USACE regulations due to their ephemeral nature and lack of defined bed and bank and riparian habitat.

5.0 IMPACTS AND RECOMMENDATIONS

Following is a discussion of potential disturbances and recommendations for avoidance, minimization, and mitigation measures per applicable local, State, and federal policy.

5.1 THREATENED AND ENDANGERED SPECIES

5.1.1 Rare Plants

Several special-status species plants have a low to moderate potential to occur on site (Appendix B). Additionally, the project site is within an MSHCP Narrow Endemic Plant Species Survey Area (NEPSSA) for six plant species: ALMU , AMPU , many-stemmed dudleya, NAFO , ORCA , and Wright's trichocoronis. Potentially suitable habitat for three of the six NEPSSA species, ALMU, AMPU, and many-stemmed dudleya, is present on site. The project has potential to impact one or more of these species if present. As noted below, Mitigation Measure (MM) BIO-1 would require a focused survey for sensitive plant species to occur during the seasonally appropriate blooming period to determine the presence of special-status plant species prior to project implementation.

5.1.2 Crotch Bumble Bee

There is extensive buckwheat scrub that occurs within the southern portion of the project site. This habitat is considered low to moderate quality suitable habitat for CBB. The project is anticipated to impact buckwheat scrub and as a result may impact CBB, if present. MM BIO-2 would require focused surveys for CBB to determine the presence of CBB prior to project implementation.

5.1.3 Fairy Shrimp

As noted above, there are road ruts and similar shallow depressions that provide suitable habitat for fairy shrimp on the project site. Water was observed pooling in these areas, which resulted from the continued vehicular use along dirt access roads present and natural or semi-natural topographical depressions for those located outside of dirt access roads present, as observed on seasonally appropriate aerial photographs (Google Earth: 12/2003, 12/2005, 1/2006, 3/2011, 12/2018, 2/2022, 1/2023 and 4/2023). As noted in Figure 6, fairy shrimp (*Branchinecta* sp.) were observed in three of the thirty ponded areas observed during the February 14, 2024, field survey. The fairy shrimp observed were not keyed to the species level as protocol surveys were not conducted. However, the site has been highly disturbed, and soils and micro topography have been altered on site due to decades long use of the existing dirt access roads.

Although ten road ruts and one shallow depression occur within the project footprint, the project design has been updated to either go around these areas or go under them utilizing trenchless methods such as horizontal directional drilling. Therefore, no impacts to fairy shrimp and their habitat are anticipated.

5.1.4 Coastal California Gnatcatcher

The project site contains low to moderate suitable habitat for CAGN and occurs within 0.50 mile of critical habitat for this species. Focused surveys for CAGN shall be conducted according to MM BIO-4, to determine if this species is present within the project vicinity prior to project implementation.

5.1.5 Burrowing Owl

The project site is located within an MSHCP Survey Area for burrowing owl. However, no suitable burrowing owl burrows were observed within the project site during the field survey. Despite this, California ground squirrels (*Otospermophilus beecheyi*) were observed throughout the project study area. Suitable habitat in the form of non-native grassland, disturbed, and barren ground is found throughout the project site. MM BIO-5 requires a pre-construction burrowing owl survey using an accepted protocol (CDFW guidelines).

5.1.6 Critical Habitat

No federally designated critical habitat is present within the study area; thus, there will be no project-related effects to critical habitat.

5.2 NON-LISTED SPECIAL-STATUS SPECIES

The 22 non-listed, special-status species identified in Appendix B as having a low to moderate probability of occurrence in the project study area have limited population distribution in Southern California, and development is further reducing their ranges and numbers. These species have no official State or federal protection status, but they merit consideration under CEQA. Due to the disturbed nature of the site and surrounding development, impacts from the project are anticipated to have a less than significant effect on these non-listed special-status species.

5.3 NESTING BIRDS

To ensure compliance with the California Fish and Game Code and to avoid potential impacts to nesting birds, MM BIO-6 requires that the vegetation removal activities be conducted outside the general bird nesting season (January 15 through August 31). If vegetation cannot be removed outside the bird nesting season, a pre-construction nesting bird survey by a qualified biologist is required prior to vegetation removal.

5.4 JURISDICTIONAL WATERS

Potential jurisdictional waters of the United States regulated by the USACE or RWQCB, or CDFW jurisdictional lakes, rivers, or streams are present within the proposed project site. This includes six drainage features, five detention basins, and a number of shallow depressions. Although some of these features occur within the project footprint, the project has been designed to avoid impacts to each of these features. This will be accomplished by going around the potential jurisdictional waters or by going under them through trenchless methods such as horizontal directional drilling. Thus, there will be no project-related effects to jurisdictional waters. If the project proposes impacts to these aquatic resources, MM BIO-7 shall be implemented which requires a formal jurisdictional delineation to determine impacts.

5.5 HABITAT FRAGMENTATION AND WILDLIFE MOVEMENT

Wildlife movement and habitat fragmentation are important issues in assessing effects to wildlife. Habitat fragmentation occurs when a proposed action results in a single, unified habitat area being divided into two or more areas such that the division isolates the two new areas from each other. Isolation of habitat occurs when wildlife cannot move freely from one portion of the habitat to another or from one habitat type to another. An example is the fragmentation of habitats within and around "checkerboard" residential development. Habitat fragmentation can also occur when a portion of one or more habitats is converted into another habitat, as when scrub habitats are converted into annual grassland habitat because of frequent burning.

The project site does not correspond to any natural landscape blocks, small natural areas, interstate connections, essential connectivity areas or potential riparian connections, as documented in the California Essential Habitat Connectivity Project: A Strategy for Conserving a Connected California report (Spencer et al. 2010). Wildlife movement of species such as coyote (*Canis latrans*) is expected within the majority of the project given the project's proximity to vacant undeveloped lands such as the unnamed mountain range to the west of Valley Boulevard. There are a variety of structural barriers throughout the project study area and the proposed project will occur within or adjacent to busy roadways (e.g., Valley Boulevard, Rouse Road, Goetz Road, McLaughlin Road, and Geary Street).

The wildlife species that occur in the vicinity of the project site are likely adapted to the urban-wildland interface, and the project would not introduce new effects to the area. Potential noise, vibration, light, dust, or human disturbance associated with project activities would only temporarily deter wildlife from using areas in the immediate vicinity. These indirect effects could temporarily alter migration behaviors, territories, or foraging habitats in select areas. However, because these are temporary effects and the project vicinity is partially developed, it is likely that wildlife already living and moving close to the project site would alter their normal functions for the duration of land use changes and development and then re-establish these functions once all temporary effects have been removed. Nonetheless, implementation of MM BIO-8 requires the implementation of standard best management practices (BMPs) to avoid project impacts to natural resources. Project activities would not place any permanent barriers within any known wildlife movement corridors or interfere with habitat connectivity. Therefore, the proposed project would not substantially limit wildlife movement.

5.6 LOCAL POLICIES AND ORDINANCES

The City of Menifee and Riverside County General Plans and development ordinances may include regulations or policies governing biological resources. For example, policies may include tree preservation, locally designated species survey areas, local species of interest, and significant ecological areas. Pursuant to California Code Section 53090 Section D and Section E, the EMWD is exempt from local land use policies, plans, and zoning ordinances.

5.6.1 City of Menifee Municipal Code

Menifee Landscape Standards (Section 9.2 of the City of Menifee Municipal Code) consists of Section 9.205.030 of the City Municipal Code, which establishes Tree Preservation Regulations that are described below.

Section 9.205.030 (Tree Preservation Regulations). This section serves to outlines its purpose to protecting mature trees that are in good health, do not pose safety threats, are not nuisance trees, and those categorized as heritage trees. Application of a tree removal permit is required despite the status of existing trees.

Project impacts to protected trees shall follow this guideline: Existing healthy trees with a 6-inch or larger trunk diameter measured at 4 feet from the surrounding grade shall be replaced at a three-to-one ratio if removed, in addition to any other new tree installation required. Existing healthy trees, with a 6-inch or larger trunk diameter measured at 4 feet from the surrounding grade, which are retained on site shall be credited toward the tree installation requirements of this chapter at a one-to-two ratio (one tree saved equals a two-tree credit toward the installation of new trees required).

In the event that a heritage tree is removed, replacement is required with the largest nursery-grown tree(s) available as determined by the approval authority. To determine adequate replacement values for heritage trees, the applicant may be required to submit an independent appraisal prepared by a horticulturist, International Society of Arboriculture (ISA)-certified arborist, or licensed landscape architect to determine the replacement value of the tree(s) to be removed.

All trees that are to remain on site are to be enclosed by an appropriate construction barrier, such as a chain-link fence or other means, prior to the issuance of a grading permit or building permit, or before commencement of work, whichever occurs first. Fences are to remain in place during all phases of construction and may not be removed until construction is complete. Protection of trees, their roots, and drip lines is also required. Compaction of soil within any part of the tree, including its drip line, is not permitted.

The proposed project would result in the removal of one non-native tree, Jerusalem thorn (*Parkinsonia aculeata*). Pursuant to California Code Section 53090, the project would not be subject to the City's tree removal ordinance. Implementation of the proposed project would not conflict with any local policies or ordinances protecting biological resources.

5.6.2 Western Riverside Multiple Species Habitat Conservation Plan

The project study area lies within the planning area of the MSHCP; however, the EMWD is not pursuing a PSE designation for the project site and is not seeking to obtain MSHCP coverage. Therefore, the proposed project is not subject to the requirements of the MSHCP (e.g., development fees and MSHCP consistency analysis).

5.6.3 Stephens' Kangaroo Rat Habitat Conservation Plan

The project study area lies within the planning area of the SKR HCP; however, as a water utility agency, the EMWD is exempt from the requirements of the SKR HCP (e.g., development fees).

6.0 MITIGATION MEASURES

MM BIO-1 **Rare Plant Survey.** A focused plant survey shall be conducted due to the presence of clay soils within the project site. These clay soils may be suitable for special-status plant species such as Mun's onion (*Allium munzii*), San Diego Ambrosia (*Ambrosia pumila*), and thread-leaved brodiaea (*Brodiaea filifolia*) that are known to occur in the project vicinity. The objective of the survey will be to determine presence or absence of special-status plant species and, if present, to quantify and map the distribution of the species on the project site. All plant species detected on the site during the survey will be identified to the extent necessary to determine rarity and listing status. The survey shall be conducted during the months of April or May to coincide with the appropriate peak flowering season of the target special-status species. If special-status species are identified within the project limits and project impacts to the species would be significant, coordination with the United States Fish and Wildlife Service (USFWS) or the California Department of Fish and Wildlife (CDFW) (depending on the listing status of the species) will be required to determine additional appropriate mitigation measures. This may include the transplant of individual special-status plants, collection and dispersal of special-status plant seeds, and the purchase of compensatory mitigation lands to off-site significant impacts.

MM BIO-2 **Focused Crotch Bumble Bee Survey.** Prior to commencing construction activities, a qualified biologist with expertise in surveying for native bumble bees shall conduct a focused survey for Crotch bumble bee (*Bombus crotchii* [CBB]) in areas of buckwheat scrub and grassland during the survey season before activities begin. The qualified biologist authorized to survey for CBB by the California Department of Fish and Wildlife (CDFW) shall conduct the surveys when colonies of this species are active (typically April through August) in accordance with the most recent CDFW guidelines (*Survey Considerations for California Endangered Species Act [CESA] Candidate Bumble Bee Species*, dated June 6, 2023). At least 14 days prior to the anticipated start date of the surveys, the qualified biologist shall submit a notification of intent to survey to the CDFW. The bumble bee nest survey involves systematically walking through suitable habitat areas (grassland and scrub) while looking for potential nests and for high levels of bee activity that may signal a nest site. If a CBB nest is found within or adjacent to the project area, CDFW will be notified within 3 days in accordance with CDFW survey guidelines. The foraging bee survey will consist of three site visits, 2 to 4 weeks apart. Visits must be conducted on sunny days with temperatures between 65°F and 90°F and sustained winds of less than 8 miles per hour. Visits must begin at least 1 hour after sunrise and end at least 2 hours before sunset. The surveys are conducted by walking throughout areas of suitable foraging habitat at a rate of no more than 3 acres of suitable habitat per hour to look for bumble bees. Bumble bees encountered during the survey will be captured with a net, photographed, and released on site. If CBB is detected, Eastern Municipal Water District (EMWD) shall submit an avoidance and minimization plan to CDFW. A 50-ft buffer will be proposed in the plan to CDFW, but this plan will need to be approved and construction activities may not commence prior to CDFW's approval of the plan.

MM BIO-3 **Focused Protocol Coastal California Gnatcatcher Survey.** Prior to commencing construction activities, a qualified biologist with a Section 10(a)(1)(A) Recovery Permit for the Coastal California Gnatcatcher (CAGN) shall conduct focused protocol surveys for the species within scrub habitats. The survey shall be conducted in accordance with the latest United States Fish and Wildlife Service (USFWS) survey protocol for this species (August 1997). The USFWS focused survey protocol for CAGN requires 6 survey visits at 1-week intervals if the focused survey is conducted during the breeding season (March 15 to June 30), or 9 survey visits at 2-week intervals if the focused surveys are conducted outside of the breeding season (July 1 – March 14). In the event that CAGN is found on or adjacent to the project site, consultation with the USFWS in accordance with Section 7 of the Endangered Species Act will be required to determine appropriate avoidance, minimization and mitigation measures. Alternatively, EMWD can obtain third party take authorization in compliance with the MSHCP Implementation Agreement, Section 17.

MM BIO-4 **Pre-Construction Burrowing Owl Survey.** A burrowing owl take avoidance survey shall be performed by a qualified biologist not more than 14 days prior to any site disturbance (grubbing, grading, and construction) in accordance with California Department of Fish and Wildlife (CDFW) guidelines (*Staff Report on Burrowing Owl Mitigation*, March 7, 2012). If an occupied burrow is found (as indicated by the observation of a burrowing owl or the presence of burrowing owl sign), a 250-foot buffer around the burrow will be staked and flagged, and no construction activities will be allowed within the buffer area during the breeding season (February 1 through August 31). If the burrow is within the project disturbance area, CDFW will be consulted to coordinate relocation of the owl in accordance with accepted protocols. Determination of the appropriate method of relocation, such as eviction/ passive relocation or active relocation, shall be based on the specific site conditions (e.g., distance to nearest suitable habitat and presence of burrows within that habitat) in coordination with the CDFW. Active relocation and eviction/passive relocation require the preservation and maintenance of suitable burrowing owl habitat determined through coordination with the CDFW.

MM BIO-5 **Pre-construction Nesting Bird Survey.** To ensure compliance with California Fish and Game Code and the Migratory Bird Treaty Act (MBTA) and to avoid potential impacts to nesting birds, vegetation removal activities shall be conducted outside the general bird nesting season (January 15 through August 31). Any vegetation removal and/or construction activities that occur during the nesting season will require that all suitable habitats be thoroughly surveyed for the presence of nesting birds by a qualified biologist. Prior to commencement of clearing within each project segment, a qualified biologist shall conduct a pre-construction survey within 3 days prior to ground-disturbing activities. This may warrant various pre-construction surveys to assure that each survey aligns with the start of each segment of the project. Should nesting birds be found, an exclusionary buffer will be established by the qualified biologist. The buffer may be up to 500 feet in diameter, depending on the species of nesting bird found. This buffer will be clearly marked in the field by construction personnel under guidance of the qualified biologist, and construction or clearing will not be conducted within this zone until the qualified biologist determines that the young have fledged or the nest is no longer active. The buffer may be modified and/or other recommendations proposed as determined appropriate by the biologist to minimize impacts. Nesting bird habitat within the project site will be resurveyed during bird breeding season if there is a lapse in construction activities longer than 7 days.

MM BIO-6 **Jurisdictional Delineation.** Prior to commencing construction activities, a jurisdictional delineation shall be conducted if impacts to any aquatic resources within the project site are expected. A three parameter delineation shall be conducted according to the CDFW's *Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (Regional Supplement) and the 1987 Corps Wetland Delineation Manual, and to delineate the jurisdictional limit of non- wetland waters of the United States following the procedures set forth in 33 Code of Federal Regulations (CFR) 328.3(e). If impacts to identified aquatic resources are expected to occur, appropriate permits will need to be acquired from the appropriate agencies. This includes the issuance of a Streambed Alteration Agreement as issued by CDFW under Section 1602 of the Fish and Game Code and Waste Discharge Requirements as issued by the RWQCB under the Porter-Cologne Water Quality Control Act. A verification, in the form of a jurisdictional determination, will also need to be requested from the USACE on the regulatory conclusions made in the jurisdictional delineation for USACE jurisdiction. Should the USACE determine aquatic resources under their jurisdiction are present within the project site and are proposed for impacts, a Section 404 permit will need to be acquired from the USACE.

MM BIO-7 **Standard Best Management Practices.** The following best management practices (BMPs), taken directly from the MSHCP Appendix C, shall be implemented to the extent feasible during construction activities to reduce impacts to wildlife resources in the project vicinity.

1. A qualified biologist shall conduct a training session for project personnel prior to grading. The training shall include a description of the species of concern and its habitats, the general provisions of the Endangered Species Act (Act) and the MSHCP, the need to adhere to the provisions of the Act and the MSHCP, the penalties associated with violating the provisions of the Act, the general measures that are being implemented to conserve the species of concern as they relate to the project, and the access routes to and project site boundaries within which the project activities must be accomplished.

2. Water pollution and erosion control plans shall be developed and implemented in accordance with RWQCB requirements.

3. The footprint of disturbance shall be minimized to the maximum extent feasible. Access to sites shall be via pre-existing access routes to the greatest extent possible.

4. Projects should be designed to avoid the placement of equipment and personnel within the stream channel or on sand and gravel bars, banks, and adjacent upland habitats used by target species of concern.

5. Projects that cannot be conducted without placing equipment or personnel in sensitive habitats should be timed to avoid the breeding season of riparian species identified in MSHCP Global Species Objective No. 7.

6. Equipment storage, fueling, and staging areas shall be located on upland sites with minimal risks of direct drainage into riparian areas or other sensitive habitats. These designated areas shall be located in such a manner as to prevent any runoff from entering sensitive habitat. Necessary precautions shall be taken to prevent the release of cement or other toxic substances into surface waters. Project-related spills of hazardous materials shall be reported to appropriate entities, including but not limited to, applicable jurisdictional city, USFWS, CDFW, and RWQCB, and shall be cleaned up immediately and contaminated soils removed to approved disposal areas.

7. Erodible fill material shall not be deposited into water courses. Brush, loose soils, or other similar debris material shall not be stockpiled within the stream channel or on its banks.

8. The qualified project biologist shall monitor construction activities for the duration of the project to ensure that practicable measures are being employed to avoid incidental disturbance of habitat and species of concern outside the project footprint.

9. The removal of native vegetation shall be avoided and minimized to the maximum extent practicable. Temporary impacts shall be returned to pre-existing contours and revegetated with appropriate native species.

10. Exotic species that prey upon or displace target species of concern should be permanently removed from the site to the extent feasible.

11. To avoid attracting predators of the species of concern, the project site shall be kept as clean of debris as possible. All food related trash items shall be enclosed in sealed containers and regularly removed from the site(s).

12. Construction employees shall strictly limit their activities, vehicles, equipment, and construction materials to the proposed project footprint and designated staging areas and routes of travel. The construction area(s) shall be the minimal area necessary to complete the project and shall be specified in the

construction plans. Construction limits will be fenced with orange snow screen. Exclusion fencing should be maintained until the completion of all construction activities. Employees shall be instructed that their activities are restricted to the construction areas.

13. The Permittee shall have the right to access and inspect any sites of approved projects including any restoration/enhancement area for compliance with project approval conditions including these BMPs.

7.0 CUMULATIVE IMPACTS

According to Section 15130 of the *State CEQA Guidelines*, "cumulative impacts" refers to incremental effects of an individual project when viewed in connection with the effects of past projects, current projects, and probable future projects. Due to the relatively disturbed nature of the project study area and its proximity to residential development, impacts are not considered to be cumulatively significant.

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APPENDIX A

PLANT AND ANIMAL SPECIES OBSERVED

Plant Species Observed

Scientific Name	Common Name
CONIFERS	
Cupressaceae	**Cypress family**
*Cupressus sempervirens**	Italian cypress
EUDICOT FLOWERING PLANTS	
Asteraceae	**Sunflower family**
Artemisia californica	California sagebrush
Baccharis salicifolia	Mule fat
Baccharis sp.	Baccharis
*Centaurea melitensis**	Maltese star-thistle
Corethrogyne filaginifolia	Common sandaster
Encelia farinosa	Brittlebush
Ericameria palmeri var. *pachylepis*	Box Springs goldenbush
Heterotheca grandiflora	Telegraph weed
*Lactuca serriola**	Prickly lettuce
Lasthenia gracilis	Needle goldfields
Layia platyglossa	Coastal tidytips
Logfia filaginoides	California cottonrose
*Oncosiphon pilulifer**	Stinknet
*Sonchus asper**	Prickly sow thistle
Boraginaceae	**Borage family**
Amsinckia menziesii	Menzies' fiddleneck
Brassicaceae	**Mustard family**
*Hirschfeldia incana**	Shortpod mustard
Lepidium nitidum	Shining peppergrass
*Sisymbrium orientale**	Indian hedgemustard
Cactaceae	**Cactus family**
Cylindropuntia bernardina	Valley cholla
Chenopodiaceae	**Saltbush family**
*Salsola tragus**	Russian thistle
Convolvulaceae	**Morning-glory family**
Cuscuta californica	Chaparral dodder
Euphorbiaceae	**Spurge family**
Croton setigerus	Dove weed
Euphorbia polycarpa	Smallseed sandmat
Fabaceae	**Pea family**
*Medicago polymorpha**	Bur-clover
*Parkinsonia aculeata**	Jerusalem thorn
Malvaceae	**Mallow family**
*Malva parviflora**	Cheeseweed mallow
Myrtaceae	**Myrtle family**
Eucalyptus sp.*	Eucalyptus
Nyctaginaceae	**Four-o'clock family**
Mirabilis laevis	Wishbone bush
Oleaceae	**Olive family**
*Olea europaea**	Olive
Polygonaceae	**Buckwheat family**
Eriogonum fasciculatum	California buckwheat
Solanaceae	**Nightshade family**
*Nicotiana glauca**	Tree tobacco

Plant Species Observed

Scientific Name	Common Name
MONOCOT FLOWERING PLANTS	
Agavaceae	**Agave family**
*Agave americana**	American century plant
Alliaceae	**Onion family**
Allium vineale	Wild garlic
Arecaceae	**Palm family**
Washingtonia filifera	California fan palm
*Washingtonia robusta**	Mexican fan palm
Poaceae	**Grass family**
*Avena fatua**	Wild oat
*Bromus rubens**	Red brome
*Cynodon dactylon**	Bermuda grass
*Hordeum murinum**	Mouse barley
*Schismus barbatus**	Common Mediterranean grass
Asclepiadaceae (see Apocynaceae)	**Milkweed family**
Helianthus annuus	Common sunflower
Opuntia sp.	Pricklypear
Ericaceae	**Blueberry family**
Acmispon strigosus	Strigose lotus
Helianthus annuus	Common sunflower

Wildlife Species Observed

Scientific Name	Common Name
BIRDS	
Anatidae	**Swans, Geese. And Ducks**
Anas platyrhynchos	Mallard
Columbidae	**Pigeons and Doves**
*Columba livia**	Rock pigeon
Zenaida macroura	Mourning dove
Trochilidae	**Hummingbirds**
Calypte anna	Anna's hummingbird
Accipitridae	**Kites, Hawks, and Eagles**
Buteo jamaicensis	Red-tailed hawk
Falconidae	**Falcons**
Falco sparverius	American kestrel
Tyrannidae	**Tyrant Flycatchers**
Sayornis nigricans	Black phoebe
Sayornis saya	Say's phoebe
Tyrannus vociferans	Cassin's kingbird
Corvidae	**Crows and Ravens**
Corvus brachyrhynchos	American crow
Alaudidae	**Larks**
Eremophila alpestris actia	California horned lark
Fringillidae	**Finches**
Haemorhous mexicanus	House finch
Spinus psaltria	Lesser goldfinch
Passerellidae	**New World Sparrows**
Melospiza melodia	Song sparrow
Zonotrichia leucophrys	White-crowned sparrow

Wildlife Species Observed

Scientific Name	Common Name
Icteridae	**Blackbirds, Orioles and Allies**
Sturnella neglecta	Western meadowlark
Parulidae	**Wood Warblers**
Setophaga coronata	Yellow-rumped warbler
MAMMALS	
Sciuridae	**Squirrels**
Spermophilus beecheyi	California ground squirrel
Geomyidae	**Pocket Gophers**
Thomomys bottae	Botta's pocket gopher
Leporidae	**Rabbits and Hares**
Sylvilagus audubonii	Desert cottontail

APPENDIX B

SPECIAL-STATUS SPECIES SUMMARY

Special-Status Species Summary

Species	Status	Habitat and Distribution	Activity Period	Occurrence Probability
PLANTS				
Abronia villosa var. aurita **chaparral sand-verbena**	US: – CA: 1B	Sandy areas (generally flats and benches along washes) in chaparral and coastal sage scrub, and improbably in desert dunes or other sandy areas, below 1,600 meters (5,300 feet) elevation. In California, reported from Riverside, San Diego, Imperial, Los Angeles, and Ventura Counties. Believed extirpated from Orange County. Also reported from Arizona and Mexico (Baja California). Plants reported from desert communities are likely misidentified.	Blooms mostly March through August	**Not expected to occur.** There is no suitable habitat (sandy areas [generally flats and benches along washes] in chaparral and coastal sage scrub) present within the project site.
Allium munzii **Munz's onion**	US: FE CA: ST/1B.1	Seasonally moist sites on clay soils (generally) or within rocky outcrops (pyroxenite) on rocky-sandy loams (such as Cajalco, Las Posas, and Vallecitos) with clay subsoils, in openings within coastal sage scrub, pinyon juniper woodland, and grassland, at 300 to 1,070 meters (1,000 to 3,500 feet) elevation. Known only from western Riverside County in the greater Perris Basin (Temescal Canyon-Gavilan Hills/Plateau, Murrieta-Hot Springs areas) and within the Elsinore Peak (Santa Ana Mountains) and Domenigoni Hills regions.	Blooms March to May	**Low potential to occur.** Suitable habitat (seasonally moist sites on clay soils) is present within the project site, specifically on the northern portion of the site. However, these areas are highly disturbed.
Ambrosia pumila **San Diego ambrosia**	US: FE CA: 1B	Open, seasonally wet, generally low areas in floodplains or at edges of vernal pools or playas, usually in sandy loam or on clay (including upland clay slopes), at 20 to 487 meters (70 to 1,600 feet) elevation. Known from western Riverside and western San Diego Counties. Also occurs in Mexico.	Generally non-flowering	**Low potential to occur.** Suitable habitat (seasonally wet area on clay) is present within the project site, specifically on the northern portion of the site. However, these areas are highly disturbed.
Atriplex coronata var. *notatior* **San Jacinto Valley crownscale**	US: FE CA: 1B	Alkaline flats in playas, chenopod scrub, valley and foothill grasslands, vernal pools at 365 to 520 meters (1,200 to 1,700 feet) elevation. Endemic to the San Jacinto River Valley area of western Riverside County.	Blooms April through May	**Not expected to occur.** There is no suitable habitat present (alkaline flats in playas, chenopod scrub, valley and foothill grasslands, vernal pools) within the project site.

Special-Status Species Summary

Species	Status	Habitat and Distribution	Activity Period	Occurrence Probability
Atriplex parishii **Parish's brittlescale**	US: – CA: 1B	Alkali soils in meadows, vernal pools, chenopod scrub, and playas. Usually on drying alkali flats with fine soils. In California, known from Riverside and San Diego Counties. Also occurs in Mexico. Believed extirpated from Los Angeles, Orange, and San Bernardino Counties.	Blooms June through October	**Not expected to occur.** There is no suitable habitat (alkali soils in meadows, vernal pools, chenopod scrub, and playas) present within the project site.
Atriplex serenana var. davidsonii **Davidson's saltscale**	US: – CA: 1B	Alkaline soils in scrub and herbaceous communities from 10 to 460 meters (30 to 1,500 feet) elevation. In California, known only from Los Angeles, Orange, Riverside, San Diego, San Luis Obispo, and Ventura Counties. Believed extirpated from Santa Barbara and perhaps Los Angeles Counties. Also occurs in Mexico.	Blooms April through October	**Not expected to occur.** There is no suitable habitat (alkaline soils in scrub and herbaceous communities) present within the project site.
Brodiaea filifolia **thread-leaved brodiaea**	US: FT CA: SE/1B	Usually on clay or associated with vernal pools or alkaline flats; occasionally in vernally moist sites in fine soils (clay loam, silt loam, fine sandy loam, loam, loamy fine sand). Typically associated with needlegrass or alkali grassland or vernal pools. Occurs from 25 to 1,120 meters (80 to 3,700 feet) elevation. Known only from Los Angeles, Orange, Riverside, San Bernardino, San Diego, and San Luis Obispo Counties, California.	Blooms March through June	**Low potential to occur.** Suitable habitat (seasonally moist sites on clay soils) is present within the project site, specifically on the northern portion of the site. However, these areas are highly disturbed.
Calochortus weedii var. intermedius **intermediate mariposa-lily**	US: – CA: 1B	Dry, open rocky slopes and rock outcrops in chaparral, coastal sage scrub, and grassland, at 105 to 855 meters (340 to 2,800 feet) elevation. Known only from Los Angeles, Orange, Riverside, and San Bernardino Counties, California. In the western Riverside County area, this species is known from the hills and valleys west of Lake Skinner and Vail Lake (The Vascular Plants of Western Riverside County, California. F.M. Roberts et al., 2004). Appears to intergrade with *Calochortus plummerae*, which is mostly east and north of Santa Ana Mountains.	Blooms May through July (perennial herb)	**Not expected to occur.** There is no suitable habitat (rocky slopes and rock outcrops in chaparral, coastal sage scrub, and grassland) present within the project site.

Special-Status Species Summary

Species	Status	Habitat and Distribution	Activity Period	Occurrence Probability
Caulanthus simulans **Payson's jewel-flower**	US: – CA: 4.2	Recently burned areas or disturbed sites such as streambeds in chaparral, coastal sage scrub, riparian areas, and grassland at 60 to 2,200 meters (200 to 7,200 feet) elevation. Known from San Diego County (Collections in western Riverside County misidentified, are C. heterophyllus var. pseudosimulans).	Blooms (Feb) March through May (June)	**Not expected to occur.** There is no suitable habitat (streambeds in chaparral, coastal sage scrub, riparian areas, and grassland) present within the project site.
Centromadia pungens ssp. laevis **smooth tarplant**	US: – CA: 1B.1	Generally alkaline areas in chenopod scrub, meadows, playas, riparian woodland, valley and foothill grassland below 480 meters (1,600 feet) elevation. Known from Riverside and San Bernardino Counties, extirpated from San Diego County.	Blooms April through September	**Not expected to occur.** There is no suitable habitat present (alkaline areas in chenopod scrub, meadows, playas, riparian woodland, valley and foothill grassland) within the project site.
Chorizanthe parryi var. parryi **Parry's spineflower**	US: – CA:1B.1	Sandy or rocky soils in chaparral, coastal scrub, oak woodlands, and grassland at 40 to 1,705 meters (100 to 5,600 feet) elevation. Known only from Los Angeles, Riverside, and San Bernardino Counties.	Blooms April through June	**Moderate potential to occur.** Potentially suitable habitat (sandy soil in buckwheat scrub) is present within the project site. There are 2 observations within 1 mile of the project site, from prior to 2001 (CDFW 2024).
Chorizanthe polygonoides var. longispina **long-spined spineflower**	US: – CA:1B.2	Generally clay soils in chaparral, coastal sage scrub, and grassland at 30 to 1,530 meters (100 to 5,000 feet) elevation. In California, known only from Orange, Riverside, Santa Barbara, and San Diego Counties. Also occurs in Mexico.	Blooms April through July	**Low potential to occur.** Suitable habitat (clay soils in brittlebush scrub and grassland) is present within the project site, specifically on the northern portion of the site. However, these areas are highly disturbed.

Special-Status Species Summary

Species	Status	Habitat and Distribution	Activity Period	Occurrence Probability
Dodecahema leptoceras **slender-horned spineflower**	US: FE CA: SE/1B	In the Vail Lake area, occurs in gravel soils of Temecula arkose deposits in openings in chamise chaparral. In other areas, occurs in sandy cobbly riverbed alluvium in alluvial fan sage scrub (usually late seral stage), on floodplain terraces and benches that receive infrequent overbank deposits from generally large washes or rivers, where it is most often found in shallow silty depressions dominated by leather spineflower (Lastarriaea coriacea) and other native annual species, and is often associated with cryptogamic soil crusts composed of bryophytes, algae and/or lichens. Occurs at 200 to 760 meters (600 to 2,500 feet) elevation. Known only from Los Angeles, Riverside, and San Bernardino Counties, California.	Blooms April through June	**Not expected to occur.** No suitable habitat (sandy cobbly riverbed alluvium in alluvial fan sage scrub) is present within the project site.
Dudleya multicaulis **many-stemmed dudleya**	US: – CA: 1B	Heavy, often clay soils or around granitic outcrops in chaparral, coastal sage scrub, and grassland below 790 meters (2,600 feet) elevation. Known only from Los Angeles, Orange, Riverside, San Bernardino, and San Diego Counties.	Blooms April through July (perennial herb)	**Low potential to occur.** Suitable habitat (clay soils in grassland) is present within the project site, specifically on the northern portion of the site. However, these areas are highly disturbed.
Harpagonella palmeri **Palmer's grapplinghook**	US: – CA: 4.2	Clay soils in openings in coastal sage scrub, juniper woodland, and grassland below 830 meters (2,700 feet) elevation. In California, known only from Orange, Riverside, and San Diego Counties and the Channel Islands. Also occurs in Arizona and Mexico.	Blooms March through May	**Low potential to occur.** Suitable habitat (clay soils in brittlebush scrub and grassland) is present within the project site, specifically on the northern portion of the site. However, these areas are highly disturbed.

Special-Status Species Summary

Species	Status	Habitat and Distribution	Activity Period	Occurrence Probability
Lasthenia glabrata ssp. coulteri **Coulter's goldfields**	US: – CA: 1B.1	Vernal pools and alkaline soils in marshes, playas, and similar habitats below 1,220 meters (4,000 feet) elevation. Known from Colusa, Merced, Tulare, Orange, Riverside, Santa Barbara, San Diego, San Luis Obispo, Tehama, Ventura, and Yolo Counties. Believed extirpated from Kern, Los Angeles, and San Bernardino Counties, and possibly also from Tulare County. Also occurs in Mexico.	Blooms February through June	**Not expected to occur.** No suitable habitat (vernal pools and alkaline soils in marshes, playas, and similar habitats) is present within the project site.
Lepidium virginicum var. robinsonii **Robinson's pepper-grass**	US: – CA: 4.3	Dry soils in coastal sage scrub and chaparral below 885 meters (2,900 feet) elevation. In California, known only from Los Angeles, Orange, Riverside, Santa Barbara, San Bernardino and San Diego Counties, and Santa Cruz Island. Also occurs in Mexico.	Blooms January through July	**Moderate potential to occur.** Suitable habitat (dry soils in buckwheat scrub) is present within the project site. There is one observation 1.8 miles to the east of the project site, from 2008 (CDFW 2024).
Myosurus minimus ssp. apus **little mousetail**	US: – CA: 3.1	Alkaline areas in vernal pools at 20 to 640 meters (70 to 2,100 feet) elevation. In California, known only from the Central Valley of the coastal and inland areas of Southern California. Also occurs in Oregon and Mexico.	Blooms March through June (annual herb)	**Not expected to occur.** No suitable habitat (alkaline areas in vernal pools) present within the project site.
Navarretia fossalis **spreading navarretia**	US: FT CA: 1B	In vernal pools, playas, shallow freshwater marshes, and similar sites at 15 to 820 meters (50 to 2,700 feet) elevation. In California, known only from Los Angeles, San Luis Obispo, Riverside, and San Diego Counties. Also occurs in Mexico.	Blooms April through June	**Not expected to occur.** No suitable habitat (vernal pools, playas, shallow freshwater marshes, and similar sites) present within the project site.
Orcuttia californica **California Orcutt grass**	US: FE CA: SE/1B	Vernal pools from 15 to 660 meters (50 to 2,200 feet) elevation. In California, known from Los Angeles, Ventura, Riverside, and San Diego Counties. Also occurs in Mexico.	Blooms April through August	**Not expected to occur.** No suitable habitat (vernal pools) present within the project site.
Trichocoronis wrightii var. wrightii **Wright's trichocoronis**	US: – CA: 2B	Alkali soils in meadows, riverbeds, vernal pools, and lakes at 5 to 435 meters (20 to 1,430 feet) elevation. In California, known from the Central Valley and Riverside County. Also occurs in Texas and Baja California.	Blooms May through September	**Not expected to occur.** No suitable habitat (alkali soils in meadows, riverbeds, vernal pools, and lakes) present within the project site.

Special-Status Species Summary

Species	Status	Habitat and Distribution	Activity Period	Occurrence Probability
INVERTEBRATES				
Bombus crotchii **Crotch bumble bee**	US: – CA: SCE	Inhabits open scrub and grassland from coastal California to crest of Sierra-Cascade and in desert edge areas, south into Mexico. Primarily nests underground. Suitable bumble bee habitat requires the continuous availability of flowers on which to forage throughout the duration of the colony (spring through fall), colony nest sites, and overwintering sites for the queens. Nectars on Antirrhinum, Phacelia, Clarkia, Dendromecon, Eschscholzia, and Eriogonum in coastal California east to the Sierra-Cascade crest and south into Mexico.	Spring and summer	**Moderate potential to occur.** Suitable habitat (buckwheat scrub) is present within the project site. The unnamed mountain range to the west of Valley Boulevard provides extensive habitat necessary to potentially support this species. One occurrence from 1975 occurs approximately 0.9 mile to the west of the project site (CDFW 2024).
Bombus pensylvanicus **American bumble bee**	US: – CA: SC	Inhabits open farmland and fields throughout the U.S. Also occurs in Canada and Mexico. Primarily nests at the ground surface in tall grass, but occasionally underground. Suitable bumble bee habitat requires the continuous availability of flowers on which to forage throughout the duration of the colony (spring through fall), colony nest sites, and overwintering sites for the queens.	Spring and summer	**Moderate potential to occur.** Suitable habitat (buckwheat scrub) is present within the project site. The unnamed mountain range to the west of Valley Boulevard provides extensive habitat necessary to potentially support this species. Two occurrences from 1946 occur approximately 2.11 miles to the north and 2.6 miles to the east of the project site (CDFW 2024).

Special-Status Species Summary

Species	Status	Habitat and Distribution	Activity Period	Occurrence Probability
Branchinecta lynchi **vernal pool fairy shrimp**	US: FT CA: SA	Vernal pools and similar features in unplowed grassland areas. Pools must contain water continuously for at least 18 days in all but the driest years to allow for reproduction. Known from the Central Valley and adjacent foothill areas, the central coast and south coast ranges, from the transverse ranges near Santa Clarita, from the Santa Rosa Plateau, Skunk Hollow, and the Stowe Road vernal pool west of Hemet in Riverside County, and from northwest San Diego County. May also occur in Orange County. Occurs at up to about 2,300 feet elevation in areas north of Kern County and at up to 5,600 feet elevation in areas to the south.	Seasonally following rains; typically January through April	**Low potential to occur.** Shallow depression areas best described as road ruts occur within the project site. Road ruts are disturbed areas on site that may provide suitable habitat.
Branchinecta sandiegonensis **San Diego fairy shrimp**	US: FE CA: SA	Small, shallow (usually less than 30 centimeters deep), relatively clear but unpredictable vernal pools on coastal terraces. Pools must retain water for a minimum of 13 days for this species to reproduce (3 to 8 days for hatching, and 10 to 20 days to reach reproductive maturity). Known from Orange and San Diego Counties, and Baja California.	Seasonally following rains in late fall, winter and spring	**Low potential to occur.** Shallow depression areas best described as road ruts occur within the project site. Road ruts are disturbed areas on site that may provide suitable habitat.
Cicindela senilis frosti **Senile tiger beetle**	US: - CA: SA	Inhabits marine shoreline, from central California coast south to salt marshes of San Diego, also found at Lake Elsinore. Inhabits dark-colored mud in the lower zone and dried salt pans in the upper zone.	Presumed spring through fall	**Not expected to occur.** Suitable habitat (shoreline and salt marshes) is not present within the project site. The nearest known location for the species, Lake Elsinore, is located approximately 7 miles to the west of the project site.

Special-Status Species Summary

Species	Status	Habitat and Distribution	Activity Period	Occurrence Probability
Danaus plexippus **monarch butterfly** (wintering sites)	US: FPE CA: SA	Winter roosts are located in wind-protected tree groves (Eucalyptus, Monterey Pine, Cypress) with nectar and water sources nearby.	September through March	**Low potential to occur.** Suitable habitat (eucalyptus trees) is present adjacent to the project site. Trees near the Cherry Hill Boulevard and Valley Boulevard intersection may be suitable for roosting. However, to date, this has not been identified as a California overwintering population. Furthermore, the project does not propose any direct impacts to these trees.
Euphydryas editha quino **quino checkerspot butterfly**	US: FE CA: SA	Meadows or openings within coastal sage scrub or chaparral below about 5,000 feet where food plants (*Plantago erecta* and/or *Orthocarpus purpurascens*) are present. Historically known from Santa Monica Mountains to northwest Baja California; currently known only from southwestern Riverside County, southern San Diego County, and northern Baja California.	January through late April	**Not expected to occur.** The project study area does not offer suitable foraging plants (*Plantago erecta* and/or *Orthocarpus purpurascens*) to sustain this species.
Socalchemmis icenoglei **Icenogle's socalchemmis spider**	US: - CA: SA	Coastal scrub. Known only from the type locality in the vicinity of Winchester, Riverside County.	Secretive year-round.	**Not expected to occur.** Suitable habitat (coastal scrub) is present within the project site in the form of buckwheat scrub. However, the nearest known location for the species, Winchester, is located approximately 6 miles to the west of the project site.

Special-Status Species Summary

Species	Status	Habitat and Distribution	Activity Period	Occurrence Probability
Streptocephalus wootton **Riverside fairy shrimp**	US: FE CA: SA	Warm-water vernal pools (i.e., large, deep pools that retain water into the warm season) with low to moderate dissolved solids, in annual grassland areas interspersed through chaparral or coastal sage scrub vegetation. Suitable habitat includes some artificially created or enhanced pools, such as some stock ponds, that have vernal pool like hydrology and vegetation. Known from areas within about 50 miles of the coast from Ventura County south to San Diego County and Baja California.	Seasonally following rains; typically, January through April	**Low potential to occur.** Shallow depression areas best described as road ruts occur within the project site. Road ruts are disturbed areas on site that may provide suitable habitat.
REPTILES				
Anniella stebbinsi **Southern California legless lizard**	US: – CA: SSC	Inhabits sandy or loose loamy soils with high moisture content under sparse vegetation in Southern California.	Nearly year round, at least in southern areas	**Not expected to occur.** Suitable habitat (sandy or loose loamy soils with high moisture content) is not present within the project site.
Arizona elegans occidentalis **California glossy snake**	US: – CA: SSC	Scrub and grassland habitats, often with loose or sandy soils. Patchily distributed from the eastern portion of San Francisco Bay to southern San Joaquin Valley and in non-desert areas of southern California. Also occurs in Baja California, Mexico.	Most active March through June (nocturnal)	**Low potential to occur.** Suitable habitat (buckwheat scrub and non-native grassland) is present within the project site. However, grasslands are highly disturbed.
Aspidoscelis hyperythra **orange-throated whiptail**	US: – CA: SA	Prefers washes and other sandy areas with patches of brush and rocks, in chaparral, coastal sage scrub, juniper woodland, and oak woodland from sea level to 915 meters (3,000 feet) elevation. Perennial plants required. Occurs in Riverside, Orange, San Diego Counties west of the crest of the Peninsular Ranges, in extreme southern San Bernardino County near Colton, and in Baja California.	Year-round	**Low potential to occur.** Suitable habitat (buckwheat scrub) is present within the project site.
Aspidoscelis tigris stejnegeri **coastal western whiptail**	US: – CA: SSC	Woodlands, riparian areas, and sparsely vegetated areas in a wide variety of habitats including coastal sage scrub and sparse grassland. Occurs in valleys and foothills from Ventura County to Baja California.	April through August	**Low potential to occur,** Suitable habitat (buckwheat scrub and non-native grassland) is present within the project site. However, grasslands are highly disturbed.

Special-Status Species Summary

Species	Status	Habitat and Distribution	Activity Period	Occurrence Probability
Crotalus ruber **red diamond rattlesnake**	US: – CA: SSC	Desert scrub, thornscrub, open chaparral and woodland; occasional in grassland and cultivated areas. Prefers rocky areas and dense vegetation. Morongo Valley in San Bernardino and Riverside Counties to the west and south into Mexico.	Mid-spring through mid-fall	**Low potential to occur.** Suitable habitat (non-native grassland) is present within the project site. However, grasslands are highly disturbed.
Emys marmorata [*Actinemys marmorata*] **western pond turtle**	US: FPT CA: SSC	Inhabits permanent or nearly permanent water. Absent from desert regions, except in the Mojave Desert along the Mojave River and its tributaries. Requires basking sites such as partially submerged logs, rocks, or open mud banks.	Year-round	**Not expected to occur.** Manmade basins that hold water occur in the project study area. However, these areas are highly disturbed and are currently undergoing development.
Phrynosoma blainvillii coronatum **coast horned lizard**	US: – CA: SSC	Primarily in sandy soil in open areas, especially washes and floodplains, in many plant communities. Requires open areas for sunning, bushes for cover, patches of loose soil for burial, and an abundant supply of ants or other insects. Occurs west of the deserts from northern Baja California north to Shasta County below 2,400 meters (8,000 feet) elevation.	April through July with reduced activity August through October	**Not expected to occur.** No suitable sandy soils are on site.
AMPHIBIANS				
Spea hammondii **western spadefoot**	US: – CA: SSC	Grasslands and occasionally hardwood woodlands; largely terrestrial but requires rain pools or other ponded water persisting at least three weeks for breeding; burrows in loose soils during dry season. Occurs in the Central Valley and adjacent foothills, the non-desert areas of southern California, and Baja California.	Year-round, nocturnal	**Not expected to occur.** Manmade basins that hold water occur in the project study area. However, these areas are highly disturbed and are currently undergoing development.
BIRDS				
Accipiter cooperii **Cooper's hawk** (nesting)	US: – CA: SA	Forages in a wide range of habitats, but primarily in forests and woodlands. These include natural areas as well as human-created habitats such as plantations and ornamental trees in urban landscapes. Usually nests in tall trees (20 to 60 feet) in extensive forested areas (generally woodlots of 4 to 8 hectares with canopy closure of greater than 60 percent).	Year-round	**Moderate potential to occur.** No suitable nesting habitat is present within the project site but may forage and nest in the vicinity.

Special-Status Species Summary

Species	Status	Habitat and Distribution	Activity Period	Occurrence Probability
		Occasionally nests in isolated trees in more open areas.		
Agelaius tricolor **tricolored blackbird**	US: – CA: ST/SSC	Open country. Forages in grassland and cropland habitats. Nests in large groups near fresh water, preferably in emergent wetland with tall, dense cattails or tules, but also in thickets of willow, blackberry, wild rose, or tall herbs. Seeks cover for roosting in emergent wetland vegetation, especially cattails and tules, and also in trees and shrubs. Occurs in western Oregon, California, and northwestern Baja California.	Year-round	**Not expected to occur.** Marginally suitable non-native grassland habitat is present that may be suitable for foraging. However, non-native grassland habitat is isolated and small in size.
Aimophila ruficeps canescens **southern California rufous-crowned sparrow**	US: – CA: SA	Steep, rocky coastal sage scrub and open chaparral habitats, particularly scrubby areas mixed with grasslands. From Santa Barbara County to northwestern Baja California.	Year-round	**Moderate potential to occur.** An unnamed mountain range occurs adjacent to the western side of the project site and provides suitable buckwheat scrub habitat.
Aquila chrysaetos **golden eagle** (nesting & wintering)	US: – CA: SFP BLM: S	Generally open country of the Temperate Zone worldwide. Nesting primarily in rugged mountainous country. Uncommon resident in Southern California.	Year-round diurnal	**Low potential to occur.** May potentially forage in the area but nesting habitat is absent from the project site.
Artemisiospiza belli belli **Bell's sparrow**	US: – CA: SA	Occupies chaparral and coastal sage scrub from west central California to northwestern Baja California.	Year-round, diurnal activity	**Moderate potential to occur.** Suitable habitat (buckwheat scrub) is present within the project site.
Athene cunicularia **burrowing owl** (nesting)	US: – CA: SPE/SPT/SSC	Open country in much of North and South America. Usually occupies ground squirrel burrows in open, dry grasslands, agricultural and range lands, railroad rights-of-way, and margins of highways, golf courses, and airports. Often utilizes man-made structures, such as earthen berms, cement culverts, cement, asphalt, rock, or wood debris piles. They avoid thick, tall vegetation, brush, and trees, but may occur in areas where brush or tree cover is less than 30 percent.	Year-round	**Moderate potential to occur.** The location of the project borders an urban environment and open field of potential burrowing owl habitat within the project study area. California ground squirrels were observed on site and could create potentially suitable burrows for the owls.

Special-Status Species Summary

Species	Status	Habitat and Distribution	Activity Period	Occurrence Probability
Buteo regalis **ferruginous hawk** (wintering)	US: – CA: SA	Forages in open fields, grasslands and agricultural areas, sagebrush flats, desert scrub, fringes of pinyon-juniper habitats, and other open country in western North America. Not known to breed in California.	Mid-September through mid-April	**Low potential to occur.** Suitable habitat (non-native grassland) is present within the project site. However, these areas are highly disturbed.
Charadrius alexandrinus nivosus **western snowy plover** (nesting)	US: FT (coastal population) CA: SSC	Sandy coastal beaches, lakes, alkaline playas. Scattered locations along coastal California and Channel Islands, inland at Salton Sea and at various alkaline lakes.	Coast: Year-round Inland lakes: April through September	**Not expected to occur.** No suitable habitat (sandy coastal beaches, lakes, alkaline playas) is present within the project site.
Empidonax traillii extimus **southwestern willow flycatcher**	US: FE CA: SE	Rare and local breeder in extensive riparian areas of dense willows or (rarely) tamarisk, usually with standing water, in the southwestern U.S. and possibly extreme northwestern Mexico. Winters in Central and South America. Below 6,000 feet elevation.	May through September	**Not expected to occur.** No suitable habitat (riparian areas) is present within the project site.
Eremophila alpestris actia **California horned lark**	US: – CA: SA	Open grasslands and fields, agricultural area, open montane grasslands. This subspecies is resident from northern Baja California northward throughout non-desert areas to Humboldt County, including the San Joaquin Valley and the western foothills of the Sierra Nevada (north to Calaveras County). Prefers bare ground such as plowed or fall-planted fields for nesting, but may also nest in marshy soil. During the breeding season, this is the only subspecies of horned lark in non-desert southern California; however, from September through April or early May, other subspecies visit the area.	Year-round interior (inland areas)	**Present**. This species was observed during the February 14, 2024, field survey. Suitable nesting habitat is present within the project site.
Haliaeetus leucocephalus **bald eagle**	US: – CA: SE/CFP	Winters locally at deep lakes and reservoirs feeding on fish and waterfowl. Locally rare throughout North America.	November through February	**Not expected to occur.** Suitable habitat (deep lakes and reservoirs) is not present within the project site.

Special-Status Species Summary

Species	Status	Habitat and Distribution	Activity Period	Occurrence Probability
Icteria virens **yellow-breasted chat** (nesting)	US: – CA: SSC (breeding)	Riparian thickets of willow, brushy tangles near watercourses. Nests in riparian woodland throughout much of western North America. Winters in Central America.	April through September	**Not expected to occur.** Suitable habitat (riparian) is not present within the project site.
Lanius ludovicianus **loggerhead shrike** (nesting)	US: – CA: SSC	Prefers open habitats with scattered small trees and with fences, utility lines, or other perches. Inhabits open country with short vegetation, pastures, old orchards, cemeteries, golf courses, riparian areas, and open woodlands. Highest density occurs in open-canopied valley foothill hardwood, valley foothill hardwood-conifer, valley foothill riparian, pinyon-juniper, juniper, desert riparian, and Joshua tree habitats. Occurs only rarely in heavily urbanized areas, but often found in open cropland. Found in open country in much of North America.	Year-round	**Low potential to occur.** Suitable habitat (open habitats with scattered small trees) is present to the west of the project site. However, much of the project site is adjacent to developed areas.
Polioptila californica californica **coastal California gnatcatcher**	US: FT CA: SSC	Inhabits coastal sage scrub in low-lying foothills and valleys up to about 500 meters (1,640 feet) elevation in cismontane southwestern California and Baja California.	Year-round	**Moderate potential to occur.** Suitable habitat (buckwheat scrub) is present within the project site. Additionally, critical habitat for this species is located within 0.50 mile of the project site.
Vireo bellii pusillus **least Bell's vireo**	US: FE CA: SE	Riparian forests and willow thickets. The most critical structural component of least Bell's Vireo habitat in California is a dense shrub layer 0.6–3.0 meters (2–10 feet) (above ground. Willows usually dominant. Nests from central California to northern Baja California. Winters in southern Baja California.	April through September	**Not expected to occur.** Suitable habitat (riparian forests and willow thickets) is not present within the project site.
MAMMALS				
Chaetodipus californicus femoralis **Dulzura pocket mouse**	US: – CA: SSC	Found in a variety of habitats including coastal sage scrub, chaparral and grassland in northern Baja California, San Diego and extreme southwestern and western Riverside Counties. Limit of range to northwest (at interface with C.c. dispar) unclear.	Year-round	**Low potential to occur.** Suitable habitat (buckwheat scrub and non-native grasslands) is present within the project site.

Special-Status Species Summary

Species	Status	Habitat and Distribution	Activity Period	Occurrence Probability
Chaetodipus fallax fallax **northwestern San Diego pocket mouse**	US: – CA: SSC	Found in sandy herbaceous areas, usually associated with rocks or coarse gravel in coastal scrub, chaparral, grasslands, and sagebrush, from Los Angeles County through southwestern San Bernardino, western Riverside, and San Diego Counties to northern Baja California.	Year-round	**Low potential to occur.** Suitable habitat (buckwheat scrub and non-native grasslands) is present within the project site.
Dipodomys merriami parvus **San Bernardino kangaroo rat**	US: FE CA: SE/SSC	Gravelly and sandy soils of alluvial fans, braided river channels, active channels and terraces; San Bernardino Valley (San Bernardino County) and San Jacinto Valley (Riverside County). In San Bernardino County, this species occurs primarily in the Santa Ana River and its tributaries north of Interstate 10, with small remnant populations in the Etiwanda alluvial fan, the northern portion of the Jurupa Mountains in the south Bloomington area, and in Reche Canyon. In Riverside County, this species occurs along the San Jacinto River east of approximately Sanderson Avenue, and along Bautista Creek. Remnant populations may also occur within Riverside County in Reche Canyon, San Timoteo Canyon, Laborde Canyon, the Jurupa Mountains, and the Santa Ana River Wash north of State Route 60.	Nocturnal, active year-round	**Not expected to occur.** No suitable habitat (gravelly and sandy soils of alluvial fans, braided river channels, active channels and terraces) is present within the project site.
Dipodomys stephensi **Stephens' kangaroo rat**	US: FE CA: ST	Found in plant communities transitional between grassland and coastal sage scrub, with perennial vegetation cover of less than 50%. Most commonly associated with Artemisia tridentata, Eriogonum fasciculatum, and Erodium. Requires well-drained soils with compaction characteristics suitable for burrow construction (neither sandy nor too hard). Not found in soils that are highly rocky or sandy, less than 20 inches deep, or heavily alkaline or clay, or in areas exceeding 25% slope. Occurs only in western Riverside County, northern San Diego County, and extreme southern San Bernardino County, below 915	Year-round, nocturnal	**Low potential to occur.** Suitable habitat (buckwheat scrub and non-native grasslands) is present within the project site. However, the grasslands and scrub present are not associated with each other and both habitat types are surrounded by development.

Special-Status Species Summary

Species	Status	Habitat and Distribution	Activity Period	Occurrence Probability
		meters (3,000 feet) elevation. In northwestern Riverside County, known only from east of Interstate 15. Reaches its northwest limit in south Norco, southeast Riverside, and in the Reche Canyon area of Riverside and extreme southern San Bernardino Counties.		
Eumops perotis californicus **Western mastiff bat**	US: – CA: SSC	Occurs in many open, semi-arid to arid habitats, including conifer and deciduous woodlands, coastal scrub, grasslands, chaparral, etc.; roosts in crevices in vertical cliff faces, high buildings, and tunnels, and travels widely when foraging.	Year-round, nocturnal	**Low potential to occur.** Suitable habitat (buckwheat scrub) is present within the project site. However, the proposed project will not impact roosting habitat for this species.
Lepus californicus bennettii **San Diego black-tailed jackrabbit**	US: – CA: SA	Variety of habitats including herbaceous and desert scrub areas, early stages of open forest and chaparral. Most common in relatively open habitats. Restricted to the cismontane areas of Southern California, extending from the coast to the Santa Monica, San Gabriel, San Bernardino, and Santa Rosa Mountain ranges.	Year-round, diurnal and crepuscular activity	**Low potential to occur.** Suitable habitat (buckwheat scrub, non-native grassland, brittlebush scrub) is present within the project site. However, grasslands are highly disturbed and are surrounded by development.
Lasiurus xanthinus **Western yellow bat**	US: – CA: SSC	Found mostly in desert and desert riparian areas of the southwest US, but also expanding its range with the increased usage of native and non-native ornamental palms in landscaping. Individuals typically roost amid dead fronds of palms in desert oases, but have also been documented roosting in cottonwood trees. Forage over many habitats.	Year-round, nocturnal	**Not expected to occur.** No suitable habitat (desert and desert riparian areas or non-native ornamental palms) present on site or within buffer.
Onychomys torridus ramona **Southern grasshopper mouse**	US: – CA: SSC	Believed to inhabit sandy or gravelly valley floor habitats with friable soils in open and semi-open scrub, including coastal sage scrub, mixed chaparral, low sagebrush, riparian scrub, and annual grassland with scattered shrubs, preferring low to moderate shrub cover. More susceptible to small- and large-scale habitat loss and fragmentation than most other rodents, due to its low fecundity, low population density,	Nocturnal, active year-round	**Low potential to occur.** Suitable habitat (buckwheat scrub) is present within the project site.

Special-Status Species Summary

Species	Status	Habitat and Distribution	Activity Period	Occurrence Probability
		and large home range size. Arid portions of southwestern California and northwestern Baja California.		
Perognathus longimembris brevinasus **Los Angeles pocket mouse**	US: – CA: SSC	Prefers sandy soil for burrowing, but has been found on gravel washes and stony soils. Found in coastal sage scrub in Los Angeles, Riverside, and San Bernardino Counties.	Nocturnal, active late spring to early fall	**Low potential to occur.** Suitable habitat (buckwheat scrub) is present within the project site.
Taxidea taxus **American badger**	US: – CA: SSC	Primary habitat requirements seem to be sufficient food and friable soils in relatively open uncultivated ground in grasslands, woodlands, and desert. Widely distributed in North America.	Year-round	**Not expected to occur.** Suitable habitat (non-native grassland) is present within the project site. However, grasslands are highly disturbed and are surrounded by development.

US: Federal Classifications
– No applicable classification.
FE Taxa federally listed as Endangered.
FT Taxa federally listed as Threatened.
FPE Taxa federally listed as Proposed Endangered.
FPT Taxa federally listed as Proposed Threatened.
CA: State Classifications
– No applicable classification
SE Taxa State listed as Endangered.
ST Taxa State listed as Threatened.
SPE Taxa State listed as Proposed Endangered.
SPT Taxa State listed as Proposed Threatened.
SFP Taxa State listed as fully protected.
SSC California Species of Special Concern. Refers to animals with vulnerable or seriously declining populations.
SA Special Animal. Refers to any other animal monitored by the Natural Diversity Database, regardless of its legal or protection status.
1B California Rare Plant Rank 1B: Rare, threatened, or endangered in California and elsewhere.
2B California Rare Plant Rank 2B: Rare, threatened or endangered in California, but more common elsewhere.
4 California Rare Plant Rank 4: A watch list of plants of limited distribution.

unlandscaped portions of the project alignment. Areas of exposed soil were examined for surface artifacts and features, and rodent aprons were inspected for evidence of subsurface resources. The project alignment has been subjected to severe disturbance from road construction and previous and on-going grading, earth-moving, and weed-abatement activities. Modern construction-related and miscellaneous refuse was noted within and beyond the project alignment. Soils were alluvial sands and gravels, imported gravels, and partially compacted fill (in graded areas). No cultural resources were identified.

FINDINGS AND RECOMMENDATIONS

A cultural resources records search and a field survey were conducted for the project area. The majority of the project alignment has sustained severe, protracted disturbances from road construction and other activities, and overall sensitivity for *in situ* undocumented resources appears generally low. However, due to the proximity of multiple prehistoric resources (particularly a habitation site) and poor surface visibility, the alignment retains some potential for non-*in situ* undocumented resources that may be of local interest. Therefore, part-time archaeological monitoring and Worker's Environmental Awareness Program (WEAP) training may be considered.

If buried cultural materials are encountered during earthmoving operations associated with the project, all work in that area should be halted or diverted until a qualified archaeologist can evaluate the nature and significance of the finds and determine appropriate treatment.

In the event human remains are encountered, State Health and Safety Code Section 7050.5 states that no further disturbance shall take place 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 Native American, the County Coroner will notify the Native American Heritage Commission (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 will have the opportunity to offer recommendations for the disposition of the remains.

If you have any questions regarding this information, please contact me at rory.goodwin@lsa.net.

Sincerely,

LSA Associates, Inc.

Riordan Goodwin

Riordan Goodwin, RA
Associate/Archaeologist Historian

Attachments: A – Figure 1: Project Location and Vicinity
B – Records Search Results

DESKTOP GEOTECHNICAL/GEOLOGY REVIEW
EASTERN MUNICIPAL WATER DISTRICT
VALLEY BOULEVARD POTABLE WATER TRANSMISSION PIPELINES
MENIFEE, CALIFORNIA

Prepared For **STANTEC CONSULTING SERVICES INC.**
9797 AERO DRIVE, SUITE 310
SAN DIEGO, CA 92123-1898

Prepared By **LEIGHTON CONSULTING, INC.**
410715 ENTERPRISE CIRCLE N, SUITE 103
TEMECULA, CA 92590

Project No. 13822.001

April 26, 2023

GEOTECHNICAL DESIGN REPORT VALLEY BOULEVARD POTABLE WATER TRANSMISSION PIPELINES

EASTERN MUNICIPAL WATER DISTRICT (EMWD) MENIFEE, CALIFORNIA

Prepared For **STANTEC CONSULTING SERVICES, INC.**
9797 AERO DRIVE, SUITE 310
SAN DIEGO, CALIFORNIA 92123

Prepared By **LEIGHTON CONSULTING, INC.**
41715 ENTERPRISE CIRCLE N SUITE 103
TEMECULA, CA 92590

Project Number 13822.001

June 14, 2023

June 14, 2023

Project No. 13822.001

Stantec Consulting Services, Inc.
9797 Aero Drive, Suite 310
San Diego, California 92123

Attention: Ms. Nita Kazi, PE

Subject: Geotechnical Design Report
Valley Boulevard Potable Water Transmission Pipelines
Eastern Municipal Water District (EMWD)
Menifee, California

In accordance with your authorization, we performed a geotechnical exploration for the subject project located in the City of Menifee, California. Based on the results of this exploration, the subsurface soils conditions along the proposed pipeline alignment vary depending on location and depth. The major geologic units are artificial fill associated with existing roads, alluvial deposits, and granitic bedrock within shallow depth at various locations. Groundwater was not encountered in any of our explorations to a maximum depth explored of approximately 21 feet below ground surface. A summary of our findings and our geotechnical recommendations for the design and construction of the proposed pipeline are provided in this report.

The opportunity to be of service is sincerely appreciated. If you should have any questions, please do not hesitate to call our office.

Respectfully submitted,
LEIGHTON CONSULTING, INC.

Simon I. Saiid, PE, GE
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Distribution: (1) Addressee (PDF copy via email)

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1.0 INTRODUCTION

1.1 Site/Alignment Description

The proposed potable water transmission pipeline is generally located within the Rights-Of-Way's (ROW) of Valley Boulevard, Byers Road, McLaughlin Road, Rouse Road and Geary Street as depicted on Figure 1, *Site Location Map*. The surrounding areas along the proposed pipeline generally consist of residential homes and commercial developments. The pipeline begins at EMWD Desalter II site and runs northerly within Valley Boulevard ROW to Rouse Road then east on Rouse Road to a tie in point along Murrieta Road. The pipeline will also continue north from Rouse Road to McLaughlin Road along either Byers Road or Geary Street, then continue west along McLaughlin Road to a tie in point along Goetz Road. The pipeline alignment is located mostly within the City of Menifee, California, with a small segment on Goetz Road located within the City of Perris, California (See Figure 1). Site topography is generally sloping to the south toward Salt Creek in the southern portion of the alignment and relatively flat north of McCall Boulevard. Valley Boulevard is fully developed along most of the alignment (2 lanes in each direction) and narrows to one lane in each direction north of McCall Boulevard. Rouse Road is also fully developed residential street. McLaughlin Road is a residential dirt road along most of the alignment being paved east of Calle Emiliano. Geary Street is an unimproved dirt road. This exploration was performed in conjunction with another EMWD project (Valley Brackish Transmission Pipeline project) as they generally share same alignment. Geotechnical information gathered from that exploration is also used in this report.

1.2 Project Description

Based on information provided, we understand that the project will improve pipeline conveyance capacity north of the District's Desalination Complex along the western side of the Perris Valley 1627 Pressure Zone and will support the future Goetz Road Tank operation. The project includes approximately 7,400 lineal feet (LF) of 36-inch diameter pipeline from the Desalination Complex to McCall Boulevard, 8,300 LF of 30-inch diameter pipeline from McCall Boulevard to Murrieta Road, and 7,000 LF of 18-inch diameter pipeline north of Rouse Road to the Goetz Road tie-in. We anticipate this pipeline to be located within existing street right-of-way (ROW) and installed at depth of 5 to 10 feet below existing ground surface (BGS).

1.3 Purpose and Scope of Exploration

The purpose of our exploration is to (1) evaluate geotechnical engineering characteristics of the earth materials along the proposed alignment, and (2) provide geotechnical recommendations for design and construction of the proposed project. As described in our proposal, the scope of our evaluation included the following tasks:

- Field Exploration: Our field exploration consisted of nine (9) hollow stem auger borings drilled along the proposed alignments to provide field data for geotechnical evaluation. In addition, twenty-four (24) borings and two (2) seismic refraction traverses performed by Leighton during previous studies are also incorporated into this study.
- Geotechnical Laboratory Tests: Geotechnical laboratory tests were performed on selected soil samples collected during our field exploration. This laboratory-testing program was designed to evaluate general physical and engineering characteristics of soil along the proposed alignment.
- Engineering Analysis: Data obtained from our background review, field exploration, and geotechnical laboratory testing program was evaluated to develop geotechnical conclusions and recommendations for the proposed pipeline design and construction.
- Report Preparation: Results of this evaluation have been summarized in this report, presenting our findings and geotechnical recommendations for the proposed pipeline.

This report does not address the potential for encountering hazardous materials along this alignment. Important information about limitations of geotechnical reports, in general, is presented in Appendix D.

1.4 Field Exploration

As indicated above, our field exploration consisted of the excavation of nine (9) hollow stem auger borings in accessible areas along the proposed alignment to supplement previous borings performed by Leighton along this alignment. Prior to drilling, we located and marked boring locations for coordination with DigAlert and obtained an encroachment permit from the City of Menifee. Approximate locations of the borings are depicted on the Boring Location Map (*Plate 1*). Borings along Murrieta Road could not be performed due to existing utility conflicts and were relocated to adjacent streets (Lancaster Drive and Brandywine Drive) as close to Murrieta Road as possible. The exploratory borings were excavated utilizing a truck-mounted, CME 75 drill rig using 8-inch hollow-stem flight augers. During the drilling operation, bulk and relatively undisturbed samples were obtained from the borings for laboratory testing and evaluation. Sampling of the borings was conducted by a staff geologist from our office. The collected samples were transported to our laboratory for testing. Borings were drilled in existing street shoulders to minimize impact on existing traffic and backfilled with native soils. The logs of borings are presented in Appendix A including those from previous explorations performed by Leighton.

Atlas Technical Consultants, LLC performed a seismic refraction survey consisting of two (2) seismic traverses in areas where shallow bedrock was encountered in our exploratory borings. The seismic refraction report is presented in Appendix D.

1.5 Laboratory Testing

Laboratory tests were performed on representative samples to provide a basis for development of geotechnical design parameters. Selected samples were tested to determine the following parameters: insitu moisture and density, maximum dry density and optimum moisture content, sieve analysis (gradation), sand equivalent, soluble sulfate content and chloride, pH and resistivity. The results of our laboratory testing are presented in Appendix B.

2.0 SUMMARY OF GEOTECHNICAL FINDINGS

A summary of our findings from research of pertinent literature, site-specific field exploration, laboratory testing and engineering analysis, is discussed in this section.

2.1 Regional Geology

As shown on Figure 2, *Regional Geology Map*, the proposed pipeline alignment is generally underlain by older fan deposits (Qof), very old fan deposits (Qvof) and granitic bedrock (gr).

2.2 Alignment Subsurface Conditions

The subsurface soils conditions along the proposed alignment vary depending on location and depth. Detailed descriptions of the earth materials encountered are provided in Appendix A.

2.2.1. Artificial Fill

Artificial fill was encountered in most of our borings as typical embankment fill associated with existing roadways. The fill thickness generally extended from a few inches to as much as 7.5 feet in LB-2 and LB-18 (Leighton, 2023). The encountered artificial fill generally consisted of silty and clayey sand (SM/SC) to sandy clay (CL). This fill is expected to possess an Expansion Index (EI) of less than 50. Where our borings penetrated existing asphalt, the measured thickness of asphaltic concrete and aggregate base layers are listed in Table 1 below.

Table 1. Existing Pavement Thickness

Boring #	Location (see Plate 1)	Approx. AC Thickness (Inch)	Approx. Aggregate Base Thickness (Inch)
LB-1	Rouse Road	5.0	6.0
LB-3	Rouse Road	4.5	5.0
LB-1 (previous)	Valley Boulevard	5.0	10.0
LB-2 (previous)	Valley Boulevard	4.5	7.0
LB-3 (previous)	Valley Boulevard	4.0	7.0
LB-9 (previous)	McCall Boulevard	5.0	None
LB-10 (previous)	McCall Boulevard	4.0	None
LB-12 (previous)	Valley Boulevard	5.0	5.0
LB-13 (previous)	Valley Boulevard	3.5	None
LB-14 (previous)	Valley Boulevard	5.0	4.0
LB-15 (previous)	Chambers Avenue	3.0	4.0
LB-22 (previous)	McLaughlin Road	5.0	3.0
LB-23 (Brackish)	Brandywine Drive	3.5	4.0 (Class 1)
LB-24 (Brackish)	Lancaster Drive	4.0	5.0

2.2.2. Young Alluvium (Qya)

Young alluvial deposits were encountered in LB-2, LB-3, LB-4, LB-6 through LB-9 (this study) and LB-16 and LB-17 (Leighton, 2023) at the surface and above the older alluvium. As encountered, this alluvium generally consists of silty and clayey sands with varying amounts of gravel (SC-SM).

2.2.3. Older Alluvium (Qalo)

Older alluvial materials were encountered beneath the artificial fill and younger alluvial deposits in most of the borings. The older alluvium is generally medium dense to dense/hard and consist of silty/clayey (SC/SM), sandy clays (CL) sand and poorly- to well-graded sand (SP/SW) with varying amounts of gravel. The Expansion index (EI) is expected to vary from very low to medium (0<EI<91). Our field geologist noted "possible small size cobbles" at depth of 7 feet in LB-13 (Leighton, 2023) due to difficult excavation or higher resistance to the advancing 8-inch auger. No actual cobbles were visually noted in any of the soils cuttings at ground surface. Large cobbles and boulders cannot be detected at depth unless existed at the tip of auger. In such case, the auger will typically stop from advancing further or experience very difficult drilling condition. Based on this observation, scattered cobbles should be anticipated in this older alluvium.

2.2.4. Granitic Bedrock (gr)

Sallow granitic bedrock (within 7 feet BGS) was generally encountered in borings LB-9 (this study), LB-7, LB-8, LB-11 and LB-18 (Leighton, 2023) as shown on Plate 1. Depths to bedrock may vary depending on location. As encountered, the bedrock was severely to highly weathered and generally excavates into well-graded sand with varying amounts of silt and gravel during our drilling operation. Bedrock hardness or rippability characteristics are discussed further in Appendix C.

2.3 Surface and Groundwater

No surface or groundwater was observed or encountered at the time of our field exploration along the proposed alignment. However, groundwater conditions can fluctuate seasonally and also be directly-impacted by other factors not observed at the time of our field explorations.

2.4 Faulting and Seismicity

The subject site, like the rest of Southern California, is located within a seismically active region as a result of being located near the active margin between the North American and Pacific tectonic plates. The principal source of seismic activity on this site is movement along the northwest-trending regional fault systems such as the Lake Elsinore, San Andreas, and San Jacinto faults. Based on our review of published geologic map (see Figure 2), the proposed alignment is not located within an Alquist-Priolo Earthquake Fault Zoning Act or County mapped fault zones. For the purpose of structural design, seismic coefficients based on the 2022 California Building Code (CBC) are provided below (see Table 2).

Table 2. 2022 CBC Site Categorization and Seismic Coefficients

Parameters	Central Alignment
Site Longitude (decimal degrees)	-117.21309
Site Latitude (decimal degrees)	33.71418
Site Class Definition	**C**
Mapped Spectral Response Acceleration at 0.2s Period, S_s	1.42
Mapped Spectral Response Acceleration at 1s Period, S_1	0.52
Short Period Site Coefficient at 0.2s Period, F_a	1.20
Long Period Site Coefficient at 1s Period, F_v	1.48
Adjusted Spectral Response Acceleration at 0.2s Period, S_{MS}	1.70
Adjusted Spectral Response Acceleration at 1s Period, S_{M1}	0.77
Design Spectral Response Acceleration at 0.2s Period, S_{DS}	**1.14**
Design Spectral Response Acceleration at 1s Period, S_{D1}	**0.52**

2.5 Secondary Seismic Hazards

Secondary seismic hazards such as ground rupture, landsliding, liquefaction, and lateral spreading are discussed below.

2.5.1. Ground Rupture

As indicated above, the site is not located in any designated earthquake hazard zone per the Alquist Priolo Act or Riverside County Hazard Maps. Chance of ground rupture along the proposed alignment is considered low.

2.5.2. Dynamic Settlement / Liquefaction

The proposed pipeline is generally planned to be installed in dense older alluvium or granitic rock, which are not prone to liquefaction.

2.5.3. Lateral Spreading

Based on Section 2.6.2 above, lateral spreading is not considered a geologic hazard for this pipeline.

2.5.4. Landslides

Based on our site review and published geologic maps, no landslides were noted along the proposed alignment.

3.0 RECOMMENDATIONS

3.1 General

The proposed potable water transmission pipeline appears feasible from a geotechnical viewpoint. However, the main geotechnical/geologic constraint is the presence of shallow granitic bedrock along portions of the alignment (see Plate 1) and deeper excavations may require special considerations. This granitic bedrock will vary in hardness and density depending on depth and location. Very difficult excavation will likely be encountered within the new cut area north of McCall Boulevard (LB-11). The rock hardness is further discussed in Section 4.2 and Appendix D (Seismic Refraction Survey). A contractor was installing a water line in this portion of the alignment during our field exploration and indicated very difficult excavation in this area.

3.2 Earthwork Considerations

Earthwork associated with the proposed pipelines should be performed in accordance with applicable EMWD Specifications, "Standard Specifications for Public Works Construction" (Greenbook, latest edition) and the recommendations included in the text of this report.

3.2.1. General

Trench excavation should be performed in accordance with the project plans, specifications, and all applicable OSHA requirements. The contractor should be responsible for providing the "competent person" required by OSHA standards. Contractors should be advised that onsite sandy soils could make excavations particularly unsafe and hence necessary safety precautions should be taken at all times.

3.2.2. Excavation Characteristics

Based on the results of our exploratory borings and seismic refraction survey, the encountered artificial fill, alluvium, and shallow granitic rock (upper 5 to 10 feet) should generally be excavatable with conventional heavy duty earthmoving/excavation equipment in good working conditions. Oversized materials (i.e. greater than 6 inches) might be generated where encountering granitic rock. However, as discussed above and further in Section 4.2, very dense granitic rock may be locally encountered requiring specialized excavation/rock reduction equipment, such as in the vicinity of Boring LB-11.

3.2.3. Pipe Subgrade

Prior to pipe installation, the subgrade should be firm, uniform, and free of standing water, loose materials and then properly compacted to provide uniform seating and support to the entire section of the pipe placed on bedding material. Oversize particles larger than 2-inches in largest dimension should be removed from the trench subgrade and replaced with compacted uniform bedding materials. Where groundwater or very moist soils are encountered or the subgrade become disturbed due to localized seepage/surface water or caused by the removal of dense core-stones, the contractor should excavate the disturbed or saturated soils to a maximum depth of 12 inches (or depth of disturbed soils/bedrock) and replace with suitable materials to provide a stable trench bottom. Crushed rock (½-inch maximum size) may be used if found necessary to stabilize bottom of trench/pit prior to placing bedding materials. It is not anticipated that placement of filter fabric separation layer will be required due to the dense and granular nature of onsite soils.

3.2.4. Backfill

Prior to backfilling, pipes should be bedded in and covered with a uniform, granular material that has a Sand Equivalent (SE) of 30 or greater, and a gradation meeting requirements of the pipe manufacturer. Approved pipe bedding material may be mechanically compacted or water-densified in-place provided appropriate water evacuation is utilized. Most onsite soils are expected to be too silty/clayey to be considered for bedding material. A minimum cover of 12 inches of bedding material should be provided above the top of the pipe. As an alternative, crushed rock per EMWD Standards (SB-157) can be used as pipe bedding and pipe zone backfill.

Native soils are generally considered suitable as backfill materials over the pipe bedding zone. These materials should be placed in thin lifts moisture conditioned (or dried back) as necessary, and mechanically compacted to a minimum of 90 percent relative compaction per ASTM D 1557 or as required per EMWD standard specifications. The actual lift thickness should depend on the compaction equipment used. For hand-directed mechanical equipment such as vibratory plates or tampers, the maximum lift thickness should not exceed 4 inches. The contractor should not use jetting to compact trench backfill unless approved by EMWD and the jetting procedures and soils requirements comply with the "GreenBook". Screening may be required along portions of the alignment if oversized materials (i.e. > 3 inches) are generated during excavation.

3.3 Bearing Capacity and Earth Pressures

3.3.1. Bearing Capacity

A net allowable bearing capacity of 2,500 pounds-per-square-foot (psf) or a modulus of subgrade reaction of 150 pounds-per-cubic-inch (pci) may be used for design of footings of appurtenant structures founded into a minimum of 2 feet of compacted fill or dense older alluvium. A net allowable bearing capacity of 4,000 psf or a modulus of subgrade reaction of 250 pci may be used if footings are founded into dense granitic rock. A minimum base width of 18 inches for continuous footings and a minimum bearing area of 3 square feet (1.75 ft by 1.75 ft) for pad foundations should be used. Additionally, an increase of one-third may be applied when considering short-term live loads (e.g. seismic and wind).

3.3.2. Earth Pressures

Lateral loads on thrust blocks and other appurtenant structures may be resisted by passive soil pressure and friction, in combination. An allowable passive pressure based on an equivalent fluid pressure of 300 pounds-per-cubic-foot (pcf), not to exceed 3,500 pounds per square foot (psf) can be used if the pipe is embedded in the dense alluvium or granitic rock (minimum 2 feet embedment). This equivalent fluid pressure may be doubled for isolated thrust blocks. We have not applied a factor-of-safety to these values. A soil-pipeline surface friction of 0.20 for PVC pipes may be applied.

A modulus of soil reaction (E') of 1,200 psi can be used to estimate the stiffness of the soil bedding backfill at the sides and below buried flexible pipelines, if applicable, for the purpose of evaluating deflection caused by weight of the backfill over the pipe. An E' of 1,800 psi or higher can be used where pipeline is underlain by dense granitic rock or older alluvium.

3.4 Pipeline Design

3.4.1. Soils Parameters

Structural design of pipes requires proper evaluation of possible loads acting on the pipe, including dead and live or transient loads. Stresses and strains induced on a buried pipe depend on many factors, including the type of pipe, depth and width of trench, bedding and embedment conditions, soil density, angle of internal friction, coefficient of passive earth pressure, and coefficient of friction at the interface between the backfill and in-situ soils. We recommend the following soil parameters for the proposed pipe design:

Table 3. Soil Parameters for Pipe Design

Soil Parameters	Recommended Values
Average Compacted fill moist unit weight, (pcf)	115 to 135
Angle of internal friction of soils (degrees)	30 to 34
Soil cohesion, c (psf)	200
Sliding friction between pipe and native soils	0.20
Coefficient of friction between backfill and native soils	0.45

3.4.2. External Loads on Flexible Pipe by Soil

Structural design of pipes requires proper evaluation of possible loads acting on the pipe, including dead and live or transient loads. Stresses and strains induced on a buried flexible pipe depend on many factors. The magnitude of the load supported depends on the amount of backfill, type of soil, and pipe stiffness. The approximate dead load per unit length can be calculated from the following formula:

$$W = C\gamma\ B\,D$$

Where,

W	External soil load on pipe: (pounds per foot of pipe)
C	Unitless load coefficient (C = 1.5 for 6 feet deep trench, and 2.0 for 10 feet or deeper trench, assuming a trench width of 3 to 6 feet just above the pipe)
γ	Total unit weight of soil above pipe (pounds-per-cubic-foot)
B	Width of the trench (width just above top of the pipe, in feet)
D	Pipe diameter (feet)

In addition to the load from backfill (above equation), loads due to embankments (if applicable) and other loads (live loads) should be considered.

3.5 Corrosivity Evaluation

Sulfate ions in the soil can lower soil resistivity and can be highly aggressive to Portland cement concrete by combining chemically with certain constituents of the concrete, principally tricalcium aluminate. This reaction is accompanied by expansion and eventual disruption of the concrete matrix. Potentially high sulfate content could also cause corrosion of the reinforcing steel in concrete. Table 4 below summarizes current standards for concrete exposed to sulfate-containing solutions.

Table 4. Sulfate Concentration and Sulfate Exposure

Sulfate In Water (parts-per-million)	Water-Soluble Sulfate (SO_4) in soil (percentage by weight)	Sulfate Exposure
0-150	0.00 - 0.10	Negligible
150-1,500	0.10 - 0.20	Moderate (Seawater)
1,500-10,000	0.20 - 2.00	Severe
>10,000	Over 2.00	Very Severe

The sulfate content was determined in the laboratory for representative onsite soil samples. The results indicate that the water soluble sulfate range is considered **negligible** for most alignment, except for soils in the vicinity of LB-1 (more than 0.2 percent by weight, which is considered **severe** per Table 4 above.

Many factors can affect corrosion potential of soil including soil moisture content, resistivity, permeability and pH, as well as chloride and sulfate concentration. In general, soil resistivity, which is a measure of how easily electrical current flows through soils, is the most influential factor. Based on the findings of studies presented in ASTM STP 1013 titled "Effects of Soil Characteristics on Corrosion" (February, 1989), the approximate relationship between soil resistivity and soil corrosiveness was developed as shown in Table 5 below.

Table 5. Relationship between Soil Resistivity and Soil Corrosivity

Soil Resistivity (ohm-cm)	Classification of Soil Corrosiveness
0 to 900	Very Severely Corrosive
900 to 2,300	Severely Corrosive
2,300 to 5,000	Moderately Corrosive
5,000 to 10,000	Mildly Corrosive
10,000 to >100,000	Very Mildly Corrosive

Acidity is an important factor of soil corrosivity. The lower the pH (the more acidic the environment), the higher the soil corrosivity will be with respect to buried metallic structures and utilities. As soil pH increases above 7 (the neutral value), the soil is increasingly more alkaline and less corrosive to buried steel structures, due to protective surface films, which form on steel in high pH environments. The pH of site soils on representative samples vary from 7.30 to 7.80 which is generally considered less active from a corrosion standpoint. Chloride and sulfate ion concentrations, and pH appear to play secondary roles in affecting corrosion potential. High chloride levels tend to reduce soil resistivity and break down otherwise protective surface deposits, which can result in corrosion of buried steel or reinforced concrete structures.

Based on minimum resistivity laboratory test results (see Table 6 below), **the onsite soil is considered severely to moderately corrosive**. Ferrous pipe can be protected by polyethylene bags, tape or coatings, di-electric fittings, concrete encasement or other means to separate the pipe from wet onsite soils. We understand that further testing and/or soil corrosivity evaluation is being performed by others and specific recommendations for corrosion protection is provided by the corrosion engineer.

Table 6. Corrosion Sample Results

Boring #	Sample Depth (ft)	Sulfate Content (ppm)	Chloride Content (ppm)	pH	Minimum Resistivity (ohm-cm)
LB-1	0.0-5.0	198	60	8.50	1,600
LB-5	5.0	152	40	7.70	2,100
LB-9	0.0-5.0	160	20	7.60	4,800
LB-1 (previous)	0.0-5.0	3276	100	7.50	1,000
LB-6 (previous)	5.0-10.0	325	40	7.30	2,400
LB-11 (previous)	0.0-5.0	185	40	7.80	5,600
LB-15 (previous)	5.0-10.0	177	20	7.30	2,050
LB-21 (previous)	0.0-5.0	206	80	7.30	1,000

3.6 Temporary Slopes/Excavations

The contractor is responsible for all temporary slopes and trenches excavated at the site and the design of any required temporary shoring. Shoring, bracing and benching should be performed by the contractor in accordance with the current edition of the *California Construction Safety Orders*, see:

http://www.dir.ca.gov/title8/sb4a6.html

During construction, exposed earth material conditions should be regularly evaluated to verify that conditions are as anticipated. The contractor is responsible for providing the "competent person" required by OSHA standards to evaluate soil conditions. Close coordination between the competent person and geotechnical consultant should be maintained to facilitate construction while providing safe excavations. Existing artificial fill and alluvial soils encountered are classified as OSHA soil Type C. Therefore, unshored temporary cut slopes should be no steeper than 1½:1 (horizontal:vertical), for a height no-greater-than (≤) 20 feet (*California Construction Safety Orders*, Appendix B to Section 1541.1, Table B-1). Encountered granitic rock may be classified as OSHA soil Type B. Therefore, unshored temporary cut slopes should be no steeper than 1:1, for a height no-greater-than (≤) 20 feet. These recommended temporary cut slopes assume a level ground surface for a distance equal to one-and-a-half (x1.5) the depth of excavation. For steeper temporary slopes, deeper excavations, and/or where sloped terrain exists within close proximity to excavation (<1.5xdepth), appropriate shoring methods or flatter slopes may be required to protect the workers in the excavation and adjacent improvements. Such methods should be implemented by the contractor and approved by the geotechnical consultant.

3.7 Temporary Shoring

3.7.1. Trench Excavation

If the sloped open cut excavation is not feasible based on requirements above and due to existing structures, excavations for the proposed pipeline should be supported by a temporary shoring system such as cross-braced hydraulic shoring, conventional shields, sheet piles, soldier piles and wood lagging. The choice should be left to the contractor's judgment since economic considerations and/or the individual contractor's construction experience may determine which method is more economical and/or appropriate. However, the contractor and shoring designer should also consider the presence of groundwater and perform additional geotechnical studies as necessary to select the proper method.

The support of all adjacent existing structures during excavation and construction (including pavements) without distress is the contractor's responsibility. In addition, it should be the contractor's responsibility to undertake a pre-construction survey with benchmarks and photographs of the adjacent properties. Shoring systems should be designed by a California licensed civil or structural engineer. As preliminary design guidelines, we present the following geotechnical parameters for shoring design. The following lateral earth pressures are recommended for temporary shoring supporting encountered alignment soils with level ground behind the shoring. Passive pressure also may be used to compute lateral soil resistance, if necessary, for sheet piles. Earth pressures provided are ultimate values and a safety factor should be applied as appropriate.

Table 7. Static Lateral Earth Pressures

Conditions[1]	Static Equivalent Fluid Weight (pcf)
Active (cantilever)	33
At-Rest (braced)	52
Passive[2]	300

1. For temporary excavations only, with level backfill, not including surcharges
2. Passive equivalent fluid pressure may be doubled for isolated soldier piles spaced at least 2½ diameters on-center. Passive resistance should not exceed 3,000 pounds-per-square-foot (psf)

Determination of appropriate design conditions (active or at-rest) depends on shoring flexibility. If a rotation of more than 0.001 radian (0.06 degrees) is allowed, active pressure conditions apply; otherwise, at-rest condition governs.

Surcharge loads (dead or live) should be added to the indicated lateral earth pressures and should be applied uniformly, if such loads are within a horizontal distance that is less-than the exposed shoring height. The corresponding lateral earth pressure will approximately be 33-percent of the vertical surcharge for active conditions, and 50-percent for at-rest conditions. Surcharge pressures from concentrated loads should be evaluated after geometric constraints and loading conditions are determined on an individual basis.

3.7.2. Temporary Shafts for Trenchless Methods

If braced shoring is used for the deep shafts (i.e. soldier beams with struts), then a uniform distribution of lateral earth pressure of 24***H*** (psf) plus any surcharge loadings occurring as a result of traffic and adjacent foundations should be used. In addition, the contractor/designer should consider the presence of the groundwater in designing the shoring system to resist lateral hydrostatic pressures along the sides and the bottom of the shafts if dewatering is not allowed.

3.8 Pavement Considerations

Where applicable, the upper 8 inches of trench backfill and pavement areas should be scarified, moisture conditioned and recompacted to a minimum of 95 percent relative compaction. Aggregate base should also be compacted to 95-percent of the ASTM D1557 laboratory maximum dry density. If needed, pavement patching should at least match existing pavement section or be design based on actual R-value testing of subgrade soils during construction and appropriate Traffic Index (TI) selected by Engineer and/or City standards.

4.0 CONSTRUCTION CONSIDERATIONS

4.1 Pre-excavation Survey and Settlement Monitoring

A very important geotechnical concern is to avoid damaging any existing improvements adjacent to excavations. It is recommended that the contractor provide settlement monitoring and contingency plans when excavating near existing settlement-sensitive structures or underground utilities.

4.2 Rippability

As indicated on Plate 1, granitic bedrock materials were encountered in borings located near the intersection of Valley Boulevard and McCall Boulevard (Borings LB-7, LB-8, LB-11 and previous borings LB-1 and LB-2) and near the intersection of Byers Road and McLaughlin Road (Boring LB-18 and previous borings B-8 and B-9), with rock outcrops observed within the alignment vicinity. Depths to bedrock were observed to vary from 2.5 to 10.0 feet below the ground surface. Based on seismic refraction survey data performed by Atlas and Southwest Geophysics (Appendix D), easy to moderate ripping (weathered rock with less than 4,000 ft/sec P-waves) using Caterpillar D-9 dozer with a single shank is expected in the upper 5 feet to 10 feet of bedrock along most alignment with very difficult ripping (less weathered rock with more than 8,000 ft/sec P-waves) expected along the newly cut area for Valley Boulevard north of McCall Boulevard. This classification is based on published information from the Caterpillar Performance Handbook (Caterpillar, 2011). Although no similar correlations are published for typical trench excavation equipment, a cut-off velocity of ±3,800 ft/sec may be used as a basis for non-rippable trenching using Cat 235 trackhoe (hydraulic excavator with rock bucket). Difficult to very difficult ripping/trenching or possible blasting (or other rock reducing techniques) may be required as shallow as 5 feet BGS at this location as presented within the “Tomography Model” for seismic line SL-1. As previously indicated, numerous boulder outcrops were observed throughout the site and should likewise be anticipated below the surface.

Trench excavation characteristics using conventional excavators may vary based on the specific equipment used. It is important that a contractor with excavation experience in similar conditions should be consulted for the proper excavation methodology, equipment, and production rate based on the findings of this report.

4.3 Dewatering during Open Trench Excavation

If encountered during trench excavation, groundwater control, such as dewatering, will be required to limit instability of the pipeline trench and aid in foundation construction and soil backfill. Dewatering or any other suitable method for stabilizing excavation bottom may be selected by the contractor based on actual groundwater conditions encountered and based on the contractor's chosen means-and-methods of construction. The selected method by the contractor should be able to effectively mitigate for bottom heave or stabilize subgrade soils during construction/backfilling. However, deep groundwater drawdown should be avoided, to reduce the potential for damaging adjacent structures, if applicable. Dewatering flow/volume will vary significantly based on the specific geologic conditions described in our report and actual depth and geometry of excavated trench or pit. Contractors should be responsible for estimating dewatering quantities and verify subsurface conditions prior to construction.

4.4 Additional Geotechnical Services

Recommendations are based on information available at the time our report was prepared and may change as plans are developed, or if supplemental subsurface exploration is authorized. Leighton Consulting, Inc. should review site, grading and foundation plans, when available, and comment further on geotechnical aspects of the project. Geotechnical observation and testing should be conducted during excavation and all phases of grading. Geotechnical conclusions and preliminary recommendations should be reviewed and verified by us (Leighton Consulting, Inc.) during construction, and revised accordingly if geotechnical conditions encountered vary from our findings and interpretations. Geotechnical observation and testing should be provided:

- During over-excavation of unsuitable soil,
- During compaction of all fill materials,
- During trench backfilling and compaction,
- During pavement subgrade and base and/or sub-base preparation, and
- When any unusual conditions are encountered.

5.0 LIMITATIONS

This report was necessarily based in part upon data obtained from a limited number of observances, site visits, soil samples, tests, analyses, histories of occurrences, spaced subsurface explorations and limited information on historical events and observations. Such information is necessarily incomplete. The nature of many sites is such that differing characteristics can be experienced within small distances and under various climatic conditions. Changes in subsurface conditions can and do occur over time. This exploration was performed with the understanding that the project as described in Section 1.2 of this report.

This report was prepared for Stantec Consulting Services, Inc. based on Stantec Consulting Services, Inc.' needs, directions, and requirements at the time of our investigation. This report is not authorized for use by, and is not to be relied upon by any party except Stantec Consulting Services, Inc., and its successors and assigns as owner of the property, with whom Leighton Consulting, Inc. has contracted for the work. Use of or reliance on this report by any other party is at that party's risk. Unauthorized use of or reliance on this report constitutes an agreement to defend and indemnify Leighton Consulting, Inc. from and against any liability which may arise as a result of such use or reliance, regardless of any fault, negligence, or strict liability of Leighton Consulting, Inc.

The client is referred to Appendix D regarding important information provided by the Geoprofessional Business Association (GBA) on geotechnical engineering studies and report and their applicability.

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APPENDIX A

FIELD EXPLORATION / LOGS OR EXPLORATORY BORINGS

Our field exploration consisted of a site reconnaissance and a subsurface exploration program consisting of hollow-stem auger soil borings. Approximate locations of the borings are depicted on the Boring Location Map (*Plate 1*). Encountered soils were continuously logged in the field by our representative and described in accordance with the Unified Soil Classification System (ASTM D 2488). Logs of these subsurface explorations, as well as a key to the classification of the soil, are included as part of this appendix.

Relatively undisturbed soil samples were obtained at selected intervals within the borings using a California ring sampler, with 2.42-inch inside diameter brass rings, driven into the soil with a 140-pound hammer free falling 30-inches in general accordance with ASTM Test Method D3550. The numbers of blows required for each 6 inches of drive penetration were noted in the field and are recorded on the boring logs. Unless otherwise indicated, the blows per foot recorded on the boring logs represent the number of blows required to drive 18 inches in 6 inch increments. In addition, disturbed bag (or bulk) samples were also obtained from soil cuttings. Types of samples obtained from each location are shown on the boring logs at corresponding depths. Our borings were backfilled with soil cuttings obtained during the drilling. Representative earth-material samples obtained from these subsurface explorations were transported to our Temecula geotechnical laboratory for evaluation and appropriate testing.

The attached subsurface exploration logs and related information depict subsurface conditions only at the locations indicated and at the particular date designated on the logs. Subsurface conditions at other locations may differ from conditions occurring at these locations. The passage of time may result in altered subsurface conditions due to environmental changes. In addition, any stratification lines on the logs represent the approximate boundary between soil types and the transition may be gradual.

APPENDIX B

RESULTS OF LABORATORY TESTING

Leighton

MODIFIED PROCTOR COMPACTION TEST
ASTM D 1557

Leighton

Project Name:	Stantec EMWD Valley Blvd Pipeline GE	Tested By:	F. Mina	Date:	05/11/23
Project No.:	13822.001	Input By:	M. Vinet	Date:	05/16/23
Boring No.:	LB-6	Depth (ft.):	0 - 5.0		
Sample No.:	B-1				
Soil Identification:	Sandy Lean Clay with Gravel s(CL), Reddish Brown.				

Note: Corrected dry density calculation assumes specific gravity of 2.70 and moisture content of 1.0% for oversize particles

Preparation Method:	X	Moist
		Dry
Compaction Method	X	Mechanical Ram
		Manual Ram

Scalp Fraction (%)	
#3/4	
#3/8	13.6
#4	

Rammer Weight (lb.) = 10.0
Height of Drop (in.) = 18.0
Mold Volume (ft³) 0.03340

TEST NO.	1	2	3	4	5	6
Wt. Compacted Soil + Mold (g)	5421	5514	5451			
Weight of Mold (g)	3526	3526	3526			
Net Weight of Soil (g)	1895	1988	1925			
Wet Weight of Soil + Cont. (g)	861.1	902.3	877.6			
Dry Weight of Soil + Cont. (g)	801.4	828.4	797.2			
Weight of Container (g)	277.5	280.2	278.6			
Moisture Content (%)	11.4	13.5	15.5			
Wet Density (pcf)	125.1	131.2	127.1			
Dry Density (pcf)	112.3	115.6	110.0			

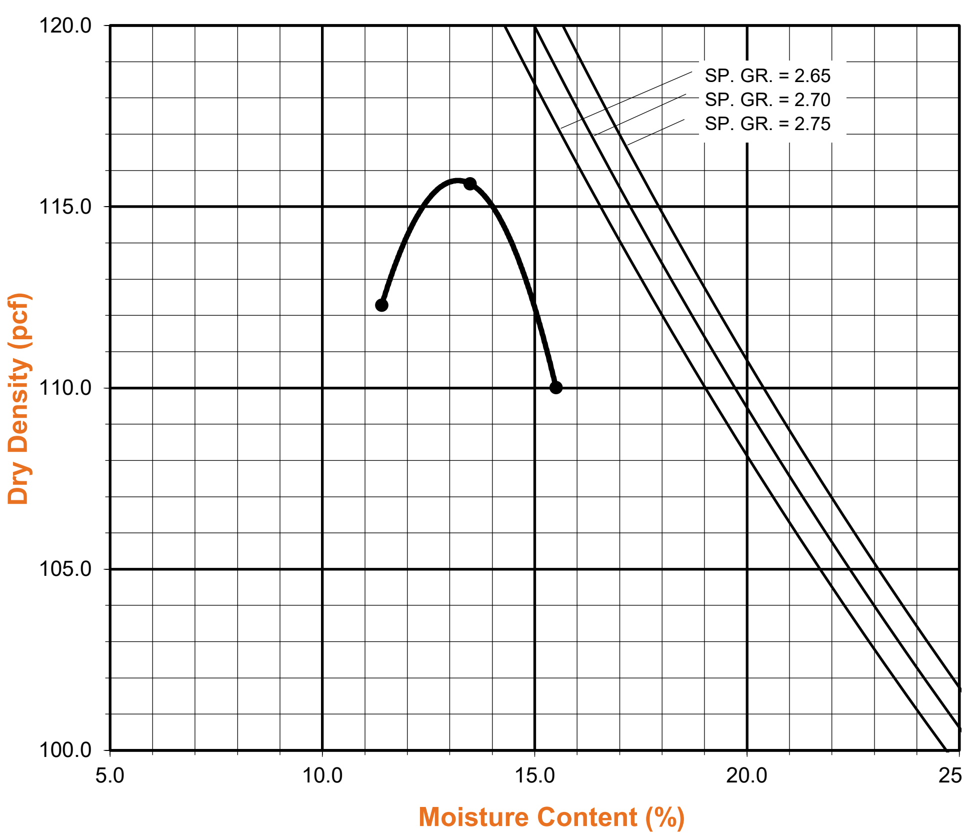
Maximum Dry Density (pcf) 115.7
Optimum Moisture Content (%) 13.2
Corrected Dry Density (pcf) 121.0
Corrected Moisture Content (%) 11.5

☐ **Procedure A**
Soil Passing No. 4 (4.75 mm) Sieve
Mold : 4 in. (101.6 mm) diameter
Layers : 5 (Five)
Blows per layer : 25 (twenty-five)
May be used if +#4 is 20% or less

☒ **Procedure B**
Soil Passing 3/8 in. (9.5 mm) Sieve
Mold : 4 in. (101.6 mm) diameter
Layers : 5 (Five)
Blows per layer : 25 (twenty-five)
Use if +#4 is >20% and +3/8 in. is 20% or less

☐ **Procedure C**
Soil Passing 3/4 in. (19.0 mm) Sieve
Mold : 6 in. (152.4 mm) diameter
Layers : 5 (Five)
Blows per layer : 56 (fifty-six)
Use if +3/8 in. is >20% and +¾ in. is <30%

Particle-Size Distribution:
GR:SA:FI
Atterberg Limits:
LL,PL,PI



EXPANSION INDEX of SOILS

ASTM D 4829

Project Name:	Stantec EMWD Valley Blvd Pipeline GE	Tested By:	M. Vinet	Date:	5/12/23
Project No. :	13822.001	Checked By:	M. Vinet	Date:	5/16/23
Boring No.:	LB-1	Depth:	0 - 5.0		
Sample No. :	B-1	Location:	N/A		
Sample Description:	Clayey Sand (SC), Dark Reddish Brown.				

Dry Wt. of Soil + Cont. (gm.)	896.2
Wt. of Container No. (gm.)	0.0
Dry Wt. of Soil (gm.)	896.2
Weight Soil Retained on #4 Sieve	6.0
Percent Passing # 4	99.3

MOLDED SPECIMEN	Before Test	After Test
Specimen Diameter (in.)	4.01	4.01
Specimen Height (in.)	1.0000	1.0135
Wt. Comp. Soil + Mold (gm.)	613.0	636.9
Wt. of Mold (gm.)	208.9	208.9
Specific Gravity (Assumed)	2.70	2.70
Container No.	10	10
Wet Wt. of Soil + Cont. (gm.)	579.4	636.9
Dry Wt. of Soil + Cont. (gm.)	552.1	367.4
Wt. of Container (gm.)	279.4	208.9
Moisture Content (%)	10.0	16.5
Wet Density (pcf)	121.9	127.4
Dry Density (pcf)	110.8	109.3
Void Ratio	0.521	0.542
Total Porosity	0.343	0.351
Pore Volume (cc)	70.9	73.7
Degree of Saturation (%) [S meas]	**51.8**	**82.2**

SPECIMEN INUNDATION in distilled water for the period of 24 h or expansion rate < 0.0002 in./h.

Date	Time	Pressure (psi)	Elapsed Time (min.)	Dial Readings (in.)
5/12/23	12:10	1.0	0	0.5000
5/12/23	12:20	1.0	10	0.5000
	Add Distilled Water to the Specimen			
5/13/23	8:00	1.0	1180	0.5135
5/13/23	9:00	1.0	1240	0.5135

Expansion Index (EI meas) =	((Final Rdg - Initial Rdg) / Initial Thick.) x 1000	13.5
Expansion Index (Report) =	Nearest Whole Number or Zero (0) if Initial Height is > than Final Heigh	**14**

EXPANSION INDEX of SOILS

ASTM D 4829

Project Name:	Stantec EMWD Valley Blvd Pipeline GE	Tested By:	M. Vinet	Date:	5/12/23
Project No. :	13822.001	Checked By:	M. Vinet	Date:	5/16/23
Boring No.:	LB-7	Depth:	0 - 5.0		
Sample No. :	B-1	Location:	N/A		
Sample Description:	Clayey Sand (SC), Dark Reddish Brown.				

Dry Wt. of Soil + Cont. (gm.)	1063.2
Wt. of Container No. (gm.)	0.0
Dry Wt. of Soil (gm.)	1063.2
Weight Soil Retained on #4 Sieve	10.2
Percent Passing # 4	99.0

MOLDED SPECIMEN	Before Test	After Test
Specimen Diameter (in.)	4.01	4.01
Specimen Height (in.)	1.0000	1.0576
Wt. Comp. Soil + Mold (gm.)	562.0	606.5
Wt. of Mold (gm.)	180.0	180.0
Specific Gravity (Assumed)	2.70	2.70
Container No.	11	11
Wet Wt. of Soil + Cont. (gm.)	339.8	606.5
Dry Wt. of Soil + Cont. (gm.)	307.7	341.1
Wt. of Container (gm.)	39.8	180.0
Moisture Content (%)	12.0	25.0
Wet Density (pcf)	115.2	121.6
Dry Density (pcf)	102.9	97.3
Void Ratio	0.639	0.733
Total Porosity	0.390	0.423
Pore Volume (cc)	80.7	92.6
Degree of Saturation (%) [S meas]	**50.7**	**92.3**

SPECIMEN INUNDATION in distilled water for the period of 24 h or expansion rate < 0.0002 in./h.

Date	Time	Pressure (psi)	Elapsed Time (min.)	Dial Readings (in.)
5/12/23	12:10	1.0	0	0.5000
5/12/23	12:20	1.0	10	0.5000
	Add Distilled Water to the Specimen			
5/13/23	8:00	1.0	1180	0.5576
5/13/23	9:00	1.0	1240	0.5576

Expansion Index (EI meas) =	((Final Rdg - Initial Rdg) / Initial Thick.) x 1000	57.6
Expansion Index (Report) =	Nearest Whole Number or Zero (0) if Initial Height is > than Final Heigh	**58**

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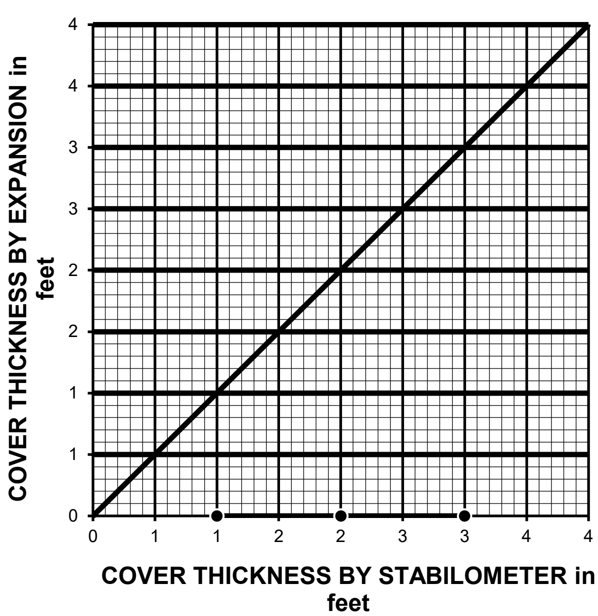
R-VALUE TEST RESULTS
ASTM D 2844

Project Name:	Stantec EMWD Valley Blvd Pipeline	Date:	5/15/23
Project Number:	13822.001	Technician:	F. Mina
Boring Number:	LB-6	Depth (ft.):	0 - 5.0
Sample Number:	B-1		
Sample Description:	Sandy Lean Clay s(CL), Reddish Brown.	Sample Location:	N/A

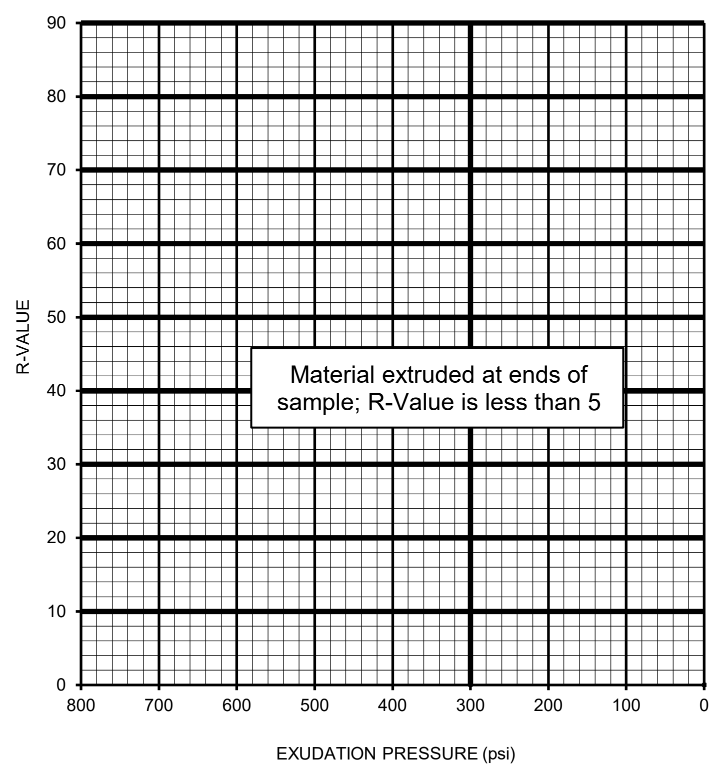
TEST SPECIMEN	**A**	**B**	**C**
MOISTURE AT COMPACTION %			
HEIGHT OF SAMPLE, Inches			
DRY DENSITY, pcf			
COMPACTOR AIR PRESSURE, psi			
EXUDATION PRESSURE, psi			
EXPANSION, Inches x 10exp-4			
STABILITY Ph 2,000 lbs (160 psi)			
TURNS DISPLACEMENT			
R-VALUE UNCORRECTED	N/A	N/A	N/A
R-VALUE CORRECTED	N/A	N/A	N/A

DESIGN CALCULATION DATA	**a**	**b**	**c**
GRAVEL EQUIVALENT FACTOR	1.0	1.0	1.0
TRAFFIC INDEX	5.0	5.0	5.0
STABILOMETER THICKNESS, ft.	N/A	N/A	N/A
EXPANSION PRESSURE THICKNESS, ft.	N/A	N/A	N/A

EXPANSION PRESSURE CHART



EXUDATION PRESSURE CHART



R-VALUE BY EXPANSION:	N/A
R-VALUE BY EXUDATION:	N/A
EQUILIBRIUM R-VALUE:	< 5

Leighton

PARTICLE-SIZE DISTRIBUTION (GRADATION) of SOILS USING SIEVE ANALYSIS
ASTM D 6913

Project Name:	Stantec EMWD Valley Blvd Pipeline GE	Tested By:	MRV	Date:	05/12/23
Project No.:	13822.001	Checked By:	MRV	Date:	05/16/23
Boring No.:	LB-4	Depth (feet):	0 - 5.0		
Sample No.:	B-1				
Soil Identification:	Sandy Lean Clay s(CL), Dark Yellowish Brown.				

		Moisture Content of Total Air - Dry Soil	
Container No.:	M	Wt. of Air-Dry Soil + Cont. (g)	1627.0
Wt. of Air-Dried Soil + Cont.(g)	1627.0	Wt. of Dry Soil + Cont. (g)	1475.7
Wt. of Container (g)	280.2	Wt. of Container No.______ (g)	280.2
Dry Wt. of Soil (g)	1195.5	Moisture Content (%)	12.7

After Wet Sieve	Container No.	M
	Wt. of Dry Soil + Container (g)	845.2
	Wt. of Container (g)	280.2
	Dry Wt. of Soil Retained on # 200 Sieve (g)	565.0

U. S. Sieve Size (in.)	U. S. Sieve Size (mm.)	Cumulative Weight Dry Soil Retained (g)	Percent Passing (%)
3"	75.000		100.0
1"	25.000	0.0	100.0
3/4"	19.000	19.4	98.4
1/2"	12.500	59.4	95.0
3/8"	9.500	76.5	93.6
#4	4.750	116.1	90.3
#8	2.360	138.2	88.4
#16	1.180	167.5	86.0
#30	0.600	210.7	82.4
#50	0.300	290.6	75.7
#100	0.150	420.2	64.9
#200	0.075	547.0	54.2
PAN			

GRAVEL: **10 %**

SAND: **36 %**

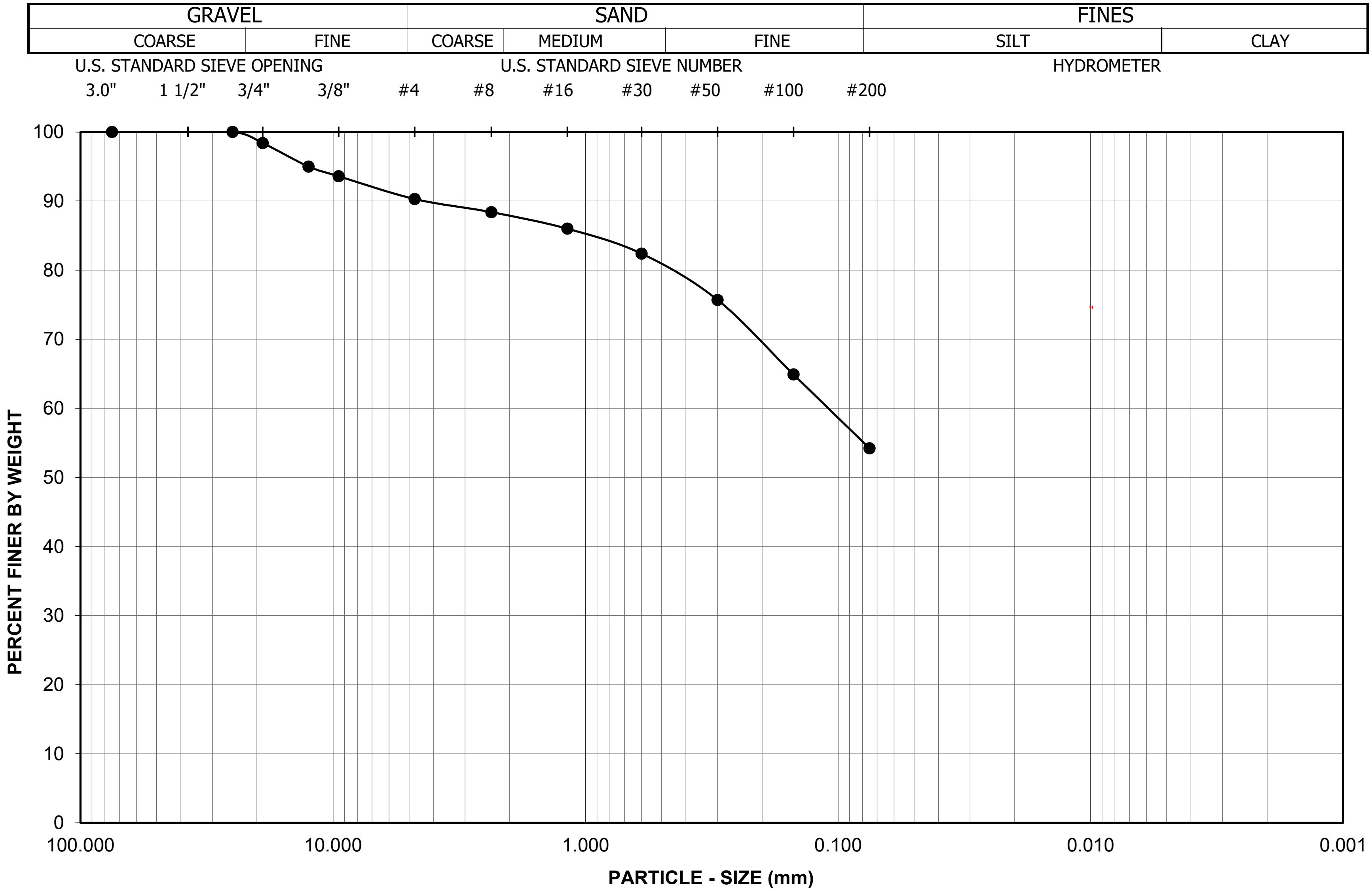
FINES: **54 %**

GROUP SYMBOL: **s(CL)**

Cu = D60/D10 = N/A

Cc = $(D30)^2/(D60*D10)$ = N/A

Remarks:



Project Name: Stantec EMWD Valley Blvd Pipeline GE

Project No.: 13822.001

Leighton	**PARTICLE - SIZE DISTRIBUTION ASTM D 6913**

Boring No.: LB-4 Sample No.: B-1

Depth (feet): 0 - 5.0 Soil Type : s(CL)

Soil Identification: Sandy Lean Clay s(CL), Dark Yellowish Brown.

GR:SA:FI : (%) 10 : 36 : 54

May-23

Sieve; LB-4, B-1 (04-21-23)

SAND EQUIVALENT TEST

ASTM D 2419 / DOT CA Test 217

Project Name:	Stantec EMWD Valley Blvd Pipeline GE	Tested By:	M. Vinet	Date:	5/12/23
Project No. :	13822.001	Computed By:	M. Vinet	Date:	5/12/23
Client:	Stantec Consulting Services Inc.	Checked By:	M. Vinet	Date:	5/16/23

Boring No.	Sample No.	Depth (ft.)	Soil Description	T1	T2	T3	T4	R1	R2	SE	Average SE
LB-4	B-1	0 - 5.0	Sandy Lean Clay s(CL)	13:00	13:10	13:12	13:32	13.5	1.0	8	**8**
				13:02	13:12	13:14	13:34	13.5	1.0	8	

T1 = Starting Time

T2 = (T1 + 10 min) Begin Agitation

T3 = Settlement Starting Time

T4 = (T3 + 20 min) Take Clay Reading (R1)

Sand Equivalent = R2 / R1 * 100

Record SE as Next Higher Integer

Boring No.	LB-1	LB-6							
Sample No.	B-1	B-1							
Depth (ft.)	0 - 5.0	0 - 5.0							
Sample Type	BULK	BULK							
Soil Classification	SC	s(CL)							
Soak Time (min)	10	10							
Moisture Correction									
Wet Weight of Soil + Container (gm.)	851.0	803.9							
Dry Weight of Soil + Container (gm.)	792.0	771.2							
Weight of Container (gm)	278.0	278.3							
Moisture Content (%)	11.5	6.6							
Container No.:	BA	BL							
Sample Dry Weight Determination									
Weight of Sample + Container (gm.)	792.0	771.2							
Weight of Container (gm.)	278.0	278.3							
Weight of Dry Sample (gm.)	514.0	492.9							
Container No.:	BA	BL							
After Wash									
Dry Weight of Sample + Container (gm)	564.3	458.1							
Weight of Container (gm)	278.0	278.3							
Dry Weight of Sample (gm)	286.3	179.8							
% Passing No. 200 Sieve	**44**	**64**							
% Retained No. 200 Sieve	56	36							

Leighton

PERCENT PASSING
No. 200 SIEVE
ASTM D 1140

Project Name: Stantec EMWD Valley Blvd Pipeline
Project No.: 13822.001
Client Name: Stantec Consulting Services Inc.
Tested By: M. Vinet Date: 05/11/23

ATTERBERG LIMITS

ASTM D 4318

Leighton

Project Name:	Stantec EMWD Valley Blvd Pipeline GE	Tested By:	M. Vinet	Date:	05/16/23
Project No. :	13822.001	Input By:	M. Vinet	Date:	05/16/23
Boring No.:	LB-1	Checked By:	M. Vinet		
Sample No.:	B-1	Depth (ft.)	0 - 5.0		
Soil Identification:	Clayey Sand (SC), Dark Yellowish Brown.				

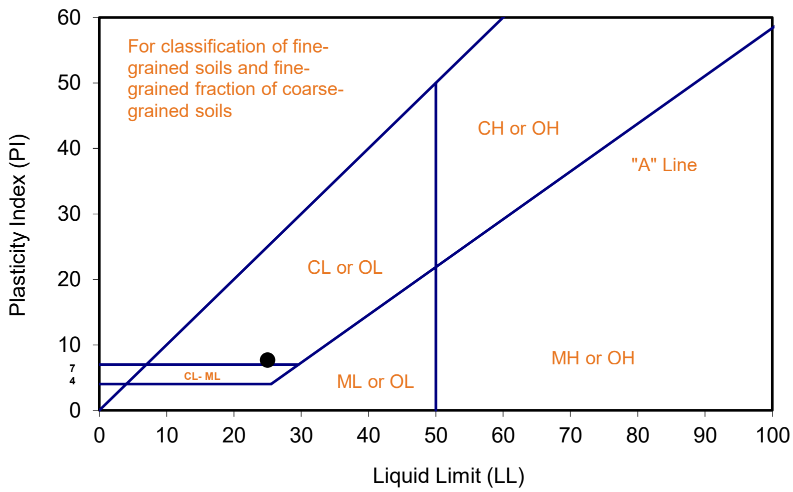
TEST NO.	PLASTIC LIMIT 1	PLASTIC LIMIT 2	LIQUID LIMIT 1	LIQUID LIMIT 2	LIQUID LIMIT 3	LIQUID LIMIT 4
Number of Blows [N]			15	25	35	
Wet Wt. of Soil + Cont. (g)	26.34	23.70	25.88	28.44	27.88	
Dry Wt. of Soil + Cont. (g)	24.48	22.23	23.36	25.52	25.22	
Wt. of Container (g)	13.80	13.70	13.86	13.66	13.64	
Moisture Content (%) [Wn]	17.42	17.23	26.53	24.62	22.97	

Liquid Limit	**25**
Plastic Limit	**17**
Plasticity Index	**8**
Classification	**CL**

PI at "A" - Line = 0.73(LL-20) | 3.65

One - Point Liquid Limit Calculation

$LL = Wn(N/25)^{0.121}$



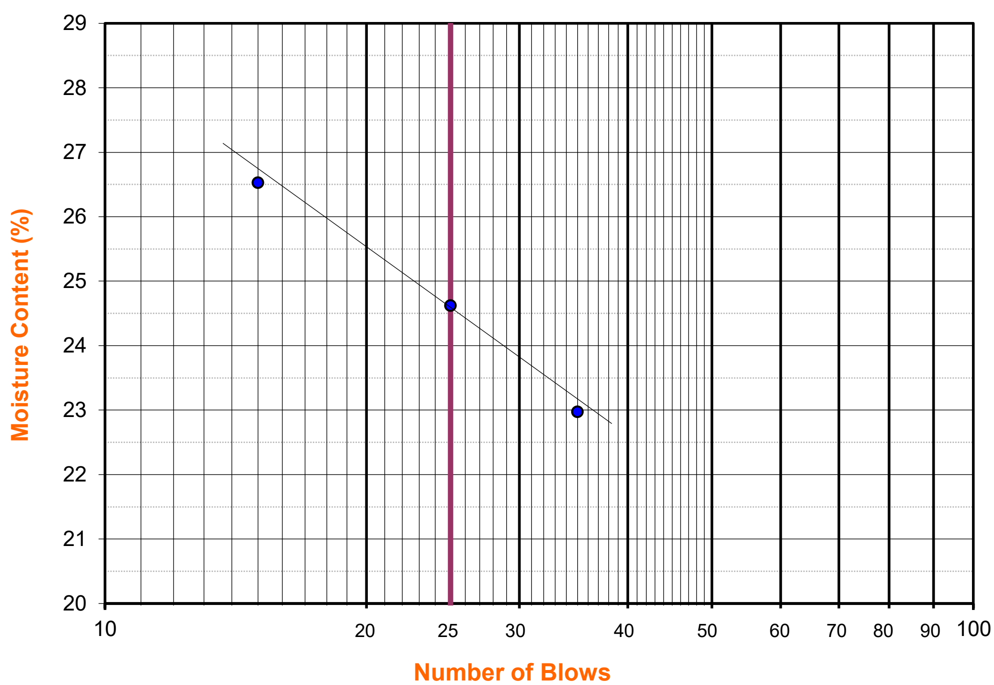
PROCEDURES USED

☐ Wet Preparation
Multipoint - Wet

X Dry Preparation
Multipoint - Dry

X Procedure A
Multipoint Test

☐ Procedure B
One-point Test



Leighton

TESTS for SULFATE CONTENT
CHLORIDE CONTENT and pH of SOILS

Project Name: Stantec EMWD Valley Blvd Pipeline   Tested By : M. Vinet   Date: 05/16/23

Project No. : 13822.001   Data Input By: M. Vinet   Date: 05/16/23

Boring No.	LB-1	LB-5	LB-9	
Sample No.	B-1	R-2	B-1	
Sample Depth (ft)	0 - 5.0	5.0	0 - 5.0	
Soil Identification:	Clayey Sand (SC)	Silty Sand (SM)	Silty Sand (SM)	
Wet Weight of Soil + Container (g)	100.00	100.00	100.00	
Dry Weight of Soil + Container (g)	100.00	100.00	100.00	
Weight of Container (g)	0.00	0.00	0.00	
Moisture Content (%)	0.00	0.00	0.00	
Weight of Soaked Soil (g)	100.00	100.00	100.00	

SULFATE CONTENT, DOT California Test 417, Part II

Beaker No.	1	2	3	
Crucible No.	1	2	3	
Furnace Temperature (°C)	850	850	850	
Time In / Time Out	Timer	Timer	Timer	
Duration of Combustion (min)	45	45	45	
Wt. of Crucible + Residue (g)	25.0410	24.8990	25.0150	
Wt. of Crucible (g)	25.0362	24.8953	25.0111	
Wt. of Residue (g) (A)	0.0048	0.0037	0.0039	
PPM of Sulfate (A) x 41150	197.52	152.26	160.49	
PPM of Sulfate, Dry Weight Basis	**198**	**152**	**160**	

CHLORIDE CONTENT, DOT California Test 422

ml of Extract For Titration (B)	30	30	30	
ml of AgNO3 Soln. Used in Titration (C)	0.8	0.6	0.4	
PPM of Chloride (C -0.2) * 100 * 30 / B	60	40	20	
PPM of Chloride, Dry Wt. Basis	**60**	**40**	**20**	

pH TEST, DOT California Test 643

pH Value	**8.50**	**7.70**	**7.60**	
Temperature °C	21.0	21.0	21.0	

SOIL RESISTIVITY TEST
DOT CA TEST 643

Project Name:	Stantec EMWD Valley Blvd Pipeline	Tested By :	M. Vinet Date: 05/16/23
Project No. :	13822.001	Data Input By:	M. Vinet Date: 05/16/23
Boring No.:	LB-1	Depth (ft.) :	0 - 5.0
Sample No. :	B-1		

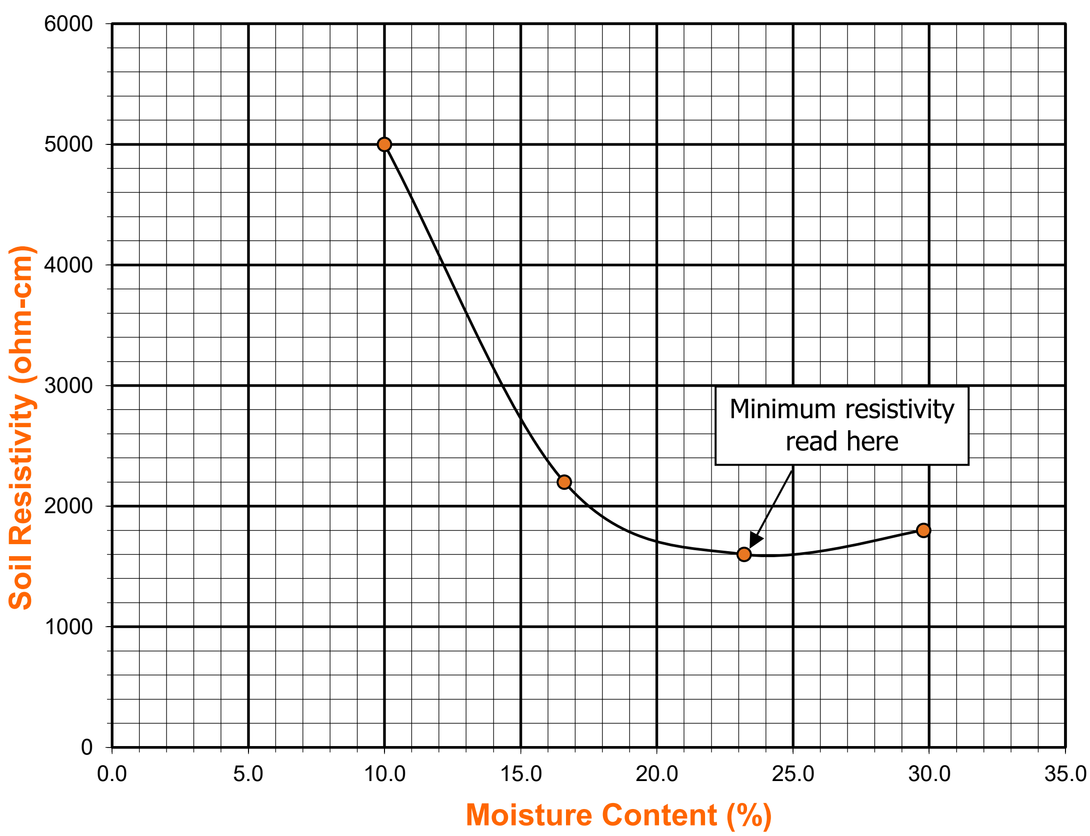
Soil Identification:* Clayey Sand (SC)

*California Test 643 requires soil specimens to consist only of portions of samples passing through the No. 8 US Standard Sieve before resistivity testing. Therefore, this test method may not be representative for coarser materials.

Specimen No.	Water Added (ml) (Wa)	Adjusted Moisture Content (MC)	Resistance Reading (ohm)	Soil Resistivity (ohm-cm)
1	50	10.00	5000	5000
2	83	16.60	2200	2200
3	116	23.20	1600	1600
4	149	29.80	1800	1800
5				

Moisture Content (%) (MCi)	0.00
Wet Wt. of Soil + Cont. (g)	100.00
Dry Wt. of Soil + Cont. (g)	100.00
Wt. of Container (g)	0.00
Container No.	A
Initial Soil Wt. (g) (Wt)	500.00
Box Constant	1.000
MC =(((1+Mci/100)x(Wa/Wt+1))-1)x100	

Min. Resistivity (ohm-cm)	Moisture Content (%)	Sulfate Content (ppm)	Chloride Content (ppm)	Soil pH	
				pH	Temp. (°C)
DOT CA Test 643		DOT CA Test 417 Part II	DOT CA Test 422	DOT CA Test 643	
1600	**23.2**	**198**	**60**	**8.50**	**21.0**



SOIL RESISTIVITY TEST
DOT CA TEST 643

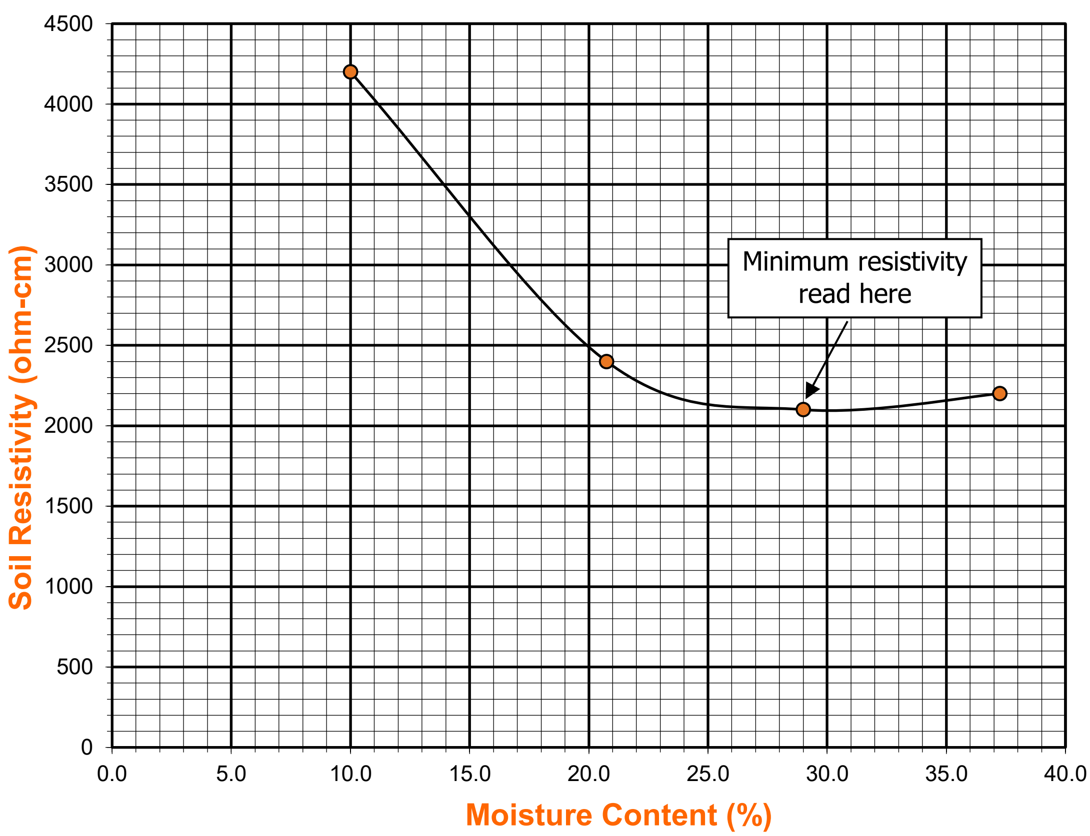
Project Name:	Stantec EMWD Valley Blvd Pipeline	Tested By :	M. Vinet	Date:	05/16/23
Project No. :	13822.001	Data Input By:	M. Vinet	Date:	05/16/23
Boring No.:	LB-5	Depth (ft.) :	5.0		
Sample No. :	R-2				
Soil Identification:*	Silty Sand (SM)				

*California Test 643 requires soil specimens to consist only of portions of samples passing through the No. 8 US Standard Sieve before resistivity testing. Therefore, this test method may not be representative for coarser materials.

Specimen No.	Water Added (ml) (Wa)	Adjusted Moisture Content (MC)	Resistance Reading (ohm)	Soil Resistivity (ohm-cm)
1	40	10.00	4200	4200
2	83	20.75	2400	2400
3	116	29.00	2100	2100
4	149	37.25	2200	2200
5				

Moisture Content (%) (MCi)	0.00
Wet Wt. of Soil + Cont. (g)	100.00
Dry Wt. of Soil + Cont. (g)	100.00
Wt. of Container (g)	0.00
Container No.	A
Initial Soil Wt. (g) (Wt)	400.00
Box Constant	1.000
MC =(((1+Mci/100)x(Wa/Wt+1))-1)x100	

Min. Resistivity (ohm-cm)	Moisture Content (%)	Sulfate Content (ppm)	Chloride Content (ppm)	Soil pH	
				pH	Temp. (°C)
DOT CA Test 643		DOT CA Test 417 Part II	DOT CA Test 422	DOT CA Test 643	
2100	**29.0**	**152**	**40**	**7.70**	**21.0**



SOIL RESISTIVITY TEST
DOT CA TEST 643

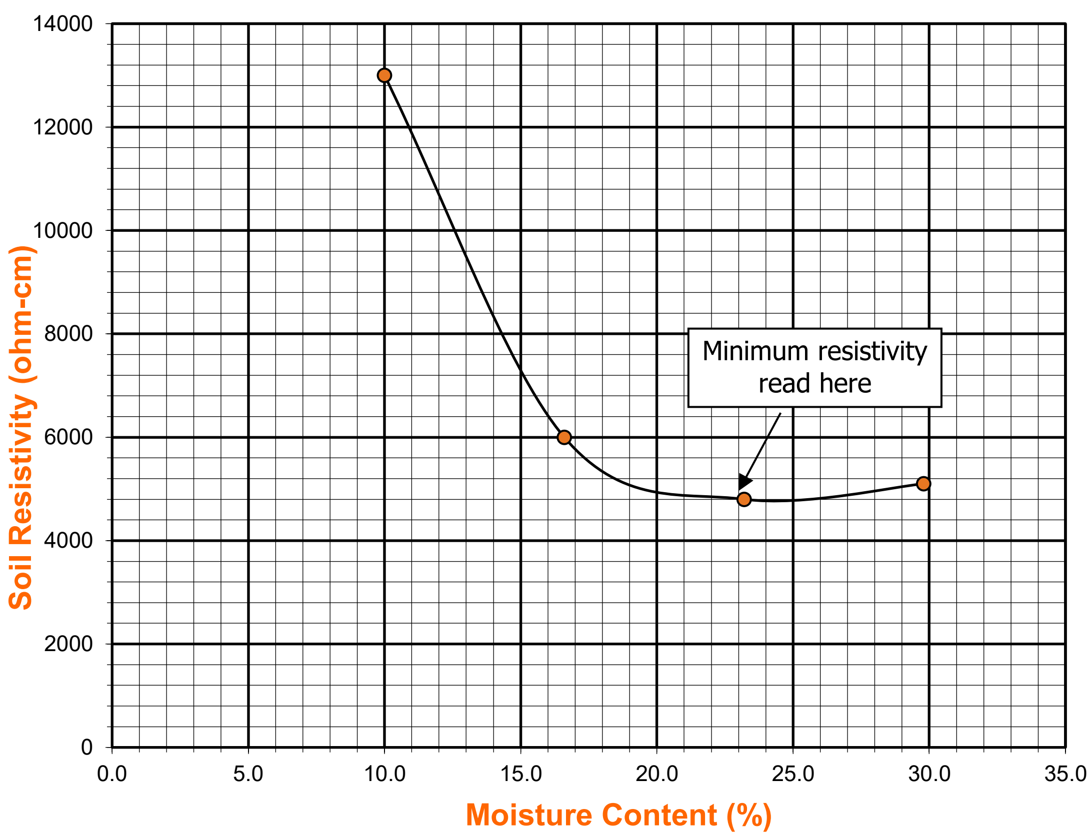
Project Name:	Stantec EMWD Valley Blvd Pipeline	Tested By :	M. Vinet Date: 05/16/23
Project No. :	13822.001	Data Input By:	M. Vinet Date: 05/16/23
Boring No.:	LB-9	Depth (ft.) :	0 - 5.0
Sample No. :	B-1		
Soil Identification:*	Silty Sand (SM)		

*California Test 643 requires soil specimens to consist only of portions of samples passing through the No. 8 US Standard Sieve before resistivity testing. Therefore, this test method may not be representative for coarser materials.

Specimen No.	Water Added (ml) (Wa)	Adjusted Moisture Content (MC)	Resistance Reading (ohm)	Soil Resistivity (ohm-cm)
1	50	10.00	13000	13000
2	83	16.60	6000	6000
3	116	23.20	4800	4800
4	149	29.80	5100	5100
5				

Moisture Content (%) (MCi)	0.00
Wet Wt. of Soil + Cont. (g)	100.00
Dry Wt. of Soil + Cont. (g)	100.00
Wt. of Container (g)	0.00
Container No.	A
Initial Soil Wt. (g) (Wt)	500.00
Box Constant	1.000
MC =(((1+Mci/100)x(Wa/Wt+1))-1)x100	

Min. Resistivity (ohm-cm)	Moisture Content (%)	Sulfate Content (ppm)	Chloride Content (ppm)	Soil pH	
				pH	Temp. (°C)
DOT CA Test 643		DOT CA Test 417 Part II	DOT CA Test 422	DOT CA Test 643	
4800	**23.2**	**160**	**20**	**7.60**	**21.0**



MODIFIED PROCTOR COMPACTION TEST

ASTM D 1557

Project Name:	EMWD Brackish Water Transmission Pipeline	Tested By:	J. Foltz	Date:	05/17/23
Project No.:	12893.002	Input By:	M. Vinet	Date:	05/23/23
Boring No.:	LB-1	Depth (ft.):	0 - 5.0		
Sample No.:	B-1				
Soil Identification:	Sandy Silty, Clay s(CL-ML), White.				

Preparation Method: [X] Moist [ ] Dry [X] Mechanical Ram [ ] Manual Ram

Mold Volume (ft³) 0.03340 *Ram Weight = 10 lb.; Drop = 18 in.*

TEST NO.	1	2	3	4	5	6
Wt. Compacted Soil + Mold (g)	5315	5413	5436	5400		
Weight of Mold (g)	3521	3521	3521	3521		
Net Weight of Soil (g)	1794	1892	1915	1879		
Wet Weight of Soil + Cont. (g)	1622.2	1640.0	1614.2	1082.5		
Dry Weight of Soil + Cont. (g)	1465.0	1460.0	1417.6	952.5		
Weight of Container (g)	278.2	276.0	278.6	278.5		
Moisture Content (%)	13.2	15.2	17.3	19.3		
Wet Density (pcf)	118.4	124.9	126.4	124.0		
Dry Density (pcf)	104.6	108.4	107.8	104.0		

Maximum Dry Density (pcf) 108.5 **Optimum Moisture Content (%)** 16.0

PROCEDURE USED

[X] **Procedure A**
Soil Passing No. 4 (4.75 mm) Sieve
Mold : 4 in. (101.6 mm) diameter
Layers : 5 (Five)
Blows per layer : 25 (twenty-five)
May be used if +#4 is 20% or less

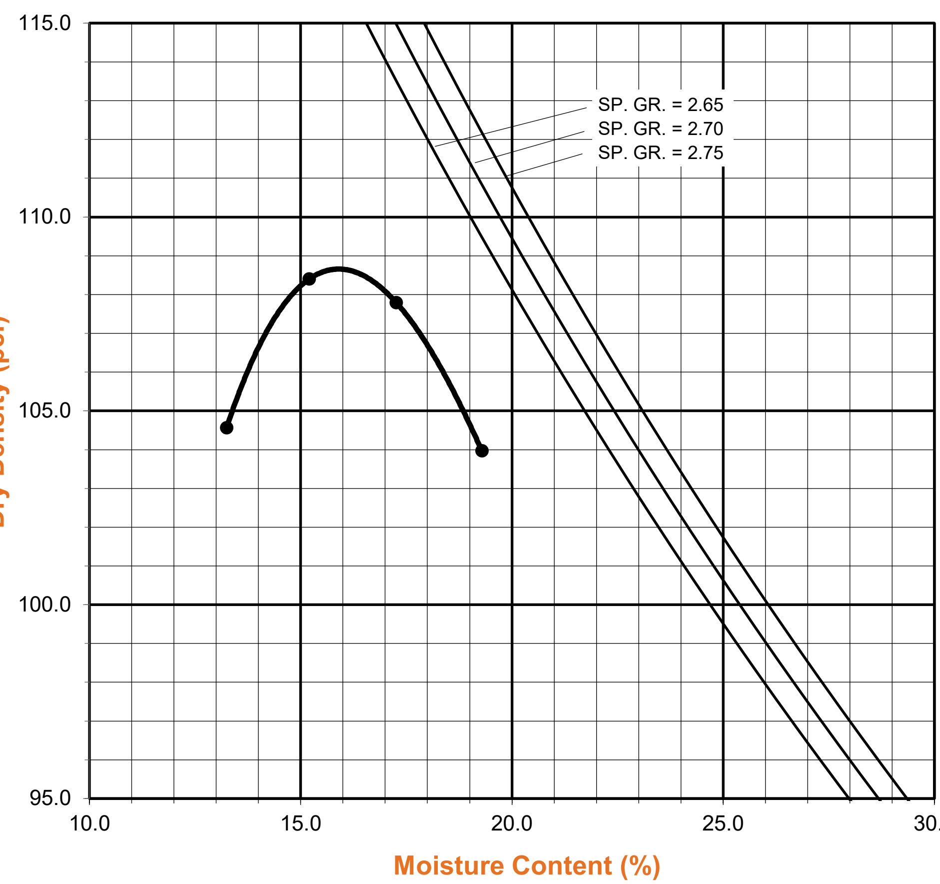
[ ] **Procedure B**
Soil Passing 3/8 in. (9.5 mm) Sieve
Mold : 4 in. (101.6 mm) diameter
Layers : 5 (Five)
Blows per layer : 25 (twenty-five)
Use if +#4 is >20% and +3/8 in. is 20% or less

[ ] **Procedure C**
Soil Passing 3/4 in. (19.0 mm) Sieve
Mold : 6 in. (152.4 mm) diameter
Layers : 5 (Five)
Blows per layer : 56 (fifty-six)
Use if +3/8 in. is >20% and +¾ in. is <30%

Particle-Size Distribution:
3:41:56
GR:SA:FI

Atterberg Limits:

LL,PL,PI



Compaction; LB-1, B-1 (04-18-23)

Leighton

MODIFIED PROCTOR COMPACTION TEST

ASTM D 1557

Project Name:	EMWD Brackish Water Transmission Pipeline	Tested By:	J. Foltz	Date:	05/17/23
Project No.:	12893.002	Input By:	M. Vinet	Date:	05/23/23
Boring No.:	LB-15	Depth (ft.):	5.0 - 10.0		
Sample No.:	B-1				
Soil Identification:	Clayey Sand (SC), Reddish Brown.				

Note: Corrected dry density calculation assumes specific gravity of 2.70 and moisture content of 1.0% for oversize particles

Preparation Method:	X	Moist
		Dry
Compaction Method	X	Mechanical Ram
		Manual Ram

Scalp Fraction (%)	
#3/4	
#3/8	10.8
#4	

Rammer Weight (lb.) = 10.0
Height of Drop (in.) = 18.0
Mold Volume (ft³) = 0.03340

TEST NO.	1	2	3	4	5	6
Wt. Compacted Soil + Mold (g)	5572	5664	5588			
Weight of Mold (g)	3521	3521	3521			
Net Weight of Soil (g)	2051	2143	2067			
Wet Weight of Soil + Cont. (g)	1517.8	1223.9	1424.3			
Dry Weight of Soil + Cont. (g)	1431.4	1137.7	1299.9			
Weight of Container (g)	278.5	279.0	279.7			
Moisture Content (%)	7.5	10.0	12.2			
Wet Density (pcf)	135.4	141.4	136.4			
Dry Density (pcf)	125.9	128.5	121.6			

Maximum Dry Density (pcf) 129.0 **Optimum Moisture Content (%)** 9.3

Corrected Dry Density (pcf) 132.5 **Corrected Moisture Content (%)** 8.5

☐ **Procedure A**
Soil Passing No. 4 (4.75 mm) Sieve
Mold : 4 in. (101.6 mm) diameter
Layers : 5 (Five)
Blows per layer : 25 (twenty-five)
May be used if +#4 is 20% or less

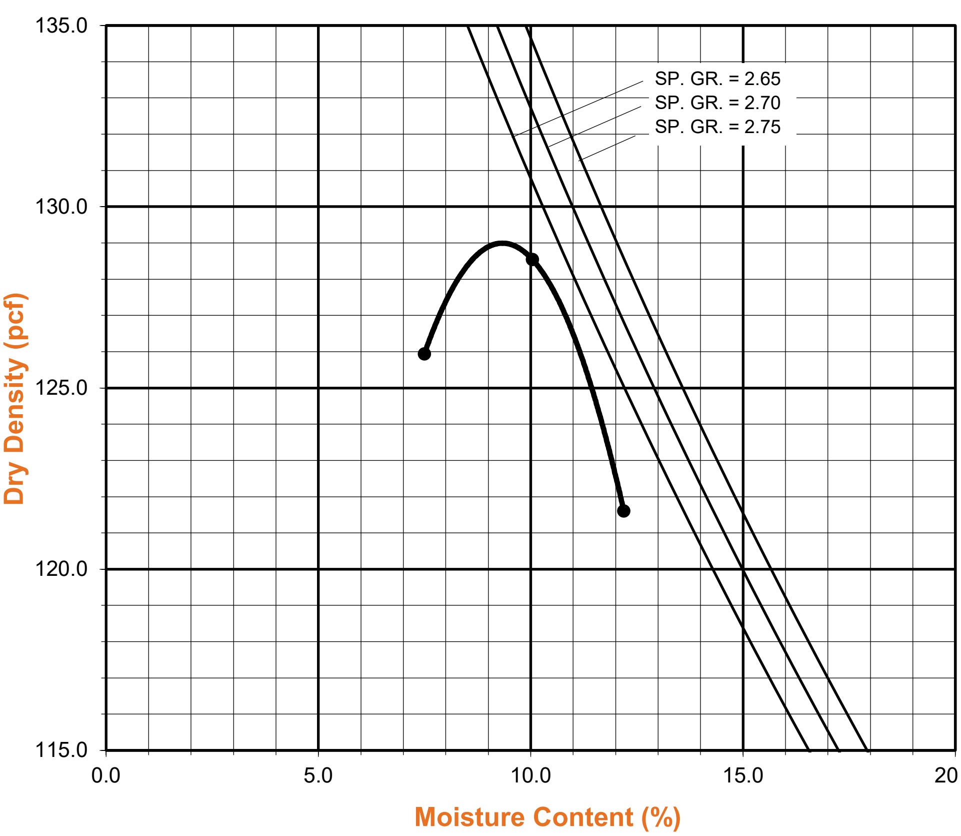
☒ **Procedure B**
Soil Passing 3/8 in. (9.5 mm) Sieve
Mold : 4 in. (101.6 mm) diameter
Layers : 5 (Five)
Blows per layer : 25 (twenty-five)
Use if +#4 is >20% and +3/8 in. is 20% or less

☐ **Procedure C**
Soil Passing 3/4 in. (19.0 mm) Sieve
Mold : 6 in. (152.4 mm) diameter
Layers : 5 (Five)
Blows per layer : 56 (fifty-six)
Use if +3/8 in. is >20% and +¾ in. is <30%

Particle-Size Distribution:
13:46:41
GR:SA:FI

Atterberg Limits:

LL,PL,PI



Leighton

EXPANSION INDEX of SOILS

ASTM D 4829

Project Name:	TT/EMWD Brackish Water Transmission Pipeline	Tested By:	M. Vinet	Date:	5/22/23
Project No. :	12893.002	Checked By:	M. Vinet	Date:	5/23/23
Boring No.:	LB-1	Depth:	0 - 5.0		
Sample No. :	B-1	Location:	N/A		
Sample Description:	Sandy Silty, Clay s(CL-ML), White.				

Dry Wt. of Soil + Cont. (gm.)	1590.6
Wt. of Container No. (gm.)	0.0
Dry Wt. of Soil (gm.)	1590.6
Weight Soil Retained on #4 Sieve	90.6
Percent Passing # 4	94.3

MOLDED SPECIMEN	Before Test	After Test
Specimen Diameter (in.)	4.01	4.01
Specimen Height (in.)	1.0000	1.0278
Wt. Comp. Soil + Mold (gm.)	559.4	599.2
Wt. of Mold (gm.)	200.4	200.4
Specific Gravity (Assumed)	2.70	2.70
Container No.	7	7
Wet Wt. of Soil + Cont. (gm.)	350.2	599.2
Dry Wt. of Soil + Cont. (gm.)	311.1	312.2
Wt. of Container (gm.)	50.2	200.4
Moisture Content (%)	15.0	27.7
Wet Density (pcf)	108.3	117.0
Dry Density (pcf)	94.2	91.6
Void Ratio	0.790	0.840
Total Porosity	0.441	0.457
Pore Volume (cc)	91.4	97.1
Degree of Saturation (%) [S meas]	**51.2**	**89.2**

SPECIMEN INUNDATION in distilled water for the period of 24 h or expansion rate < 0.0002 in./h.

Date	Time	Pressure (psi)	Elapsed Time (min.)	Dial Readings (in.)
5/22/23	9:45	1.0	0	0.5000
5/22/23	9:55	1.0	10	0.5000
	Add Distilled Water to the Specimen			
5/23/23	8:00	1.0	1325	0.5278
5/23/23	9:00	1.0	1385	0.5278

Expansion Index (EI meas)	=	((Final Rdg - Initial Rdg) / Initial Thick.) x 1000	27.8
Expansion Index (Report)	=	Nearest Whole Number or Zero (0) if Initial Height is > than Final Heigh	**28**

Rev. 03-08

Leighton

EXPANSION INDEX of SOILS

ASTM D 4829

Project Name:	TT/EMWD Brackish Water Transmission Pipeline	Tested By:	M. Vinet	Date:	5/22/23
Project No. :	12893.002	Checked By:	M. Vinet	Date:	5/23/23
Boring No.:	LB-14	Depth:	5.0 - 10.0		
Sample No. :	B-1	Location:	N/A		
Sample Description:	Clayey Sand (SC), Reddish Brown.				

Dry Wt. of Soil + Cont. (gm.)	1562.2
Wt. of Container No. (gm.)	0.0
Dry Wt. of Soil (gm.)	1562.2
Weight Soil Retained on #4 Sieve	56.2
Percent Passing # 4	96.4

MOLDED SPECIMEN	Before Test	After Test
Specimen Diameter (in.)	4.01	4.01
Specimen Height (in.)	1.0000	1.0170
Wt. Comp. Soil + Mold (gm.)	586.2	608.6
Wt. of Mold (gm.)	178.2	178.2
Specific Gravity (Assumed)	2.70	2.70
Container No.	8	8
Wet Wt. of Soil + Cont. (gm.)	350.2	608.6
Dry Wt. of Soil + Cont. (gm.)	324.2	372.6
Wt. of Container (gm.)	50.2	178.2
Moisture Content (%)	9.5	15.5
Wet Density (pcf)	123.1	127.7
Dry Density (pcf)	112.4	110.5
Void Ratio	0.500	0.525
Total Porosity	0.333	0.344
Pore Volume (cc)	69.0	72.5
Degree of Saturation (%) [S meas]	**51.3**	**79.7**

SPECIMEN INUNDATION in distilled water for the period of 24 h or expansion rate < 0.0002 in./h.

Date	Time	Pressure (psi)	Elapsed Time (min.)	Dial Readings (in.)
5/22/23	11:00	1.0	0	0.5000
5/22/23	11:10	1.0	10	0.5000
	Add Distilled Water to the Specimen			
5/23/23	8:00	1.0	1250	0.5170
5/23/23	9:00	1.0	1310	0.5170

Expansion Index (EI meas) =	((Final Rdg - Initial Rdg) / Initial Thick.) x 1000	17.0
Expansion Index (Report) =	Nearest Whole Number or Zero (0) if Initial Height is > than Final Heigh	**17**

Rev. 03-08

EXPANSION INDEX of SOILS

ASTM D 4829

Project Name:	TT/EMWD Brackish Water Transmission Pipeline	Tested By:	M. Vinet	Date:	5/22/23
Project No. :	12893.002	Checked By:	M. Vinet	Date:	5/23/23
Boring No.:	LB-16	Depth:	5.0 - 10.0		
Sample No. :	B-1	Location:	N/A		
Sample Description:	Lean Clay (CL), Yellowish Brown.				

Dry Wt. of Soil + Cont. (gm.)	2522.3
Wt. of Container No. (gm.)	0.0
Dry Wt. of Soil (gm.)	2522.3
Weight Soil Retained on #4 Sieve	125.2
Percent Passing # 4	95.0

MOLDED SPECIMEN	Before Test	After Test
Specimen Diameter (in.)	4.01	4.01
Specimen Height (in.)	1.0000	1.0792
Wt. Comp. Soil + Mold (gm.)	541.2	591.3
Wt. of Mold (gm.)	199.8	199.8
Specific Gravity (Assumed)	2.70	2.70
Container No.	9	9
Wet Wt. of Soil + Cont. (gm.)	350.7	591.3
Dry Wt. of Soil + Cont. (gm.)	309.3	294.3
Wt. of Container (gm.)	50.7	199.8
Moisture Content (%)	16.0	33.0
Wet Density (pcf)	103.0	109.4
Dry Density (pcf)	88.8	82.3
Void Ratio	0.899	1.049
Total Porosity	0.473	0.512
Pore Volume (cc)	98.0	114.4
Degree of Saturation (%) [S meas]	**48.1**	**85.0**

SPECIMEN INUNDATION in distilled water for the period of 24 h or expansion rate < 0.0002 in./h.

Date	Time	Pressure (psi)	Elapsed Time (min.)	Dial Readings (in.)
5/22/23	11:45	1.0	0	0.5000
5/22/23	11:55	1.0	10	0.5000
	Add Distilled Water to the Specimen			
5/23/23	8:00	1.0	1205	0.5792
5/23/23	9:00	1.0	1265	0.5792

Expansion Index (EI meas)	=	((Final Rdg - Initial Rdg) / Initial Thick.) x 1000	79.2
Expansion Index (Report)	=	Nearest Whole Number or Zero (0) if Initial Height is > than Final Heigh	**79**

Leighton

EXPANSION INDEX of SOILS

ASTM D 4829

Project Name:	TT/EMWD Brackish Water Transmission Pipeline	Tested By:	M. Vinet	Date:	5/22/23
Project No. :	12893.002	Checked By:	M. Vinet	Date:	5/23/23
Boring No.:	LB-21	Depth:	0 - 5.0		
Sample No. :	B-1	Location:	N/A		
Sample Description:	Lean Clay (CL), Dark Reddish Brown.				

Dry Wt. of Soil + Cont. (gm.)	1253.2
Wt. of Container No. (gm.)	0.0
Dry Wt. of Soil (gm.)	1253.2
Weight Soil Retained on #4 Sieve	20.2
Percent Passing # 4	98.4

MOLDED SPECIMEN	Before Test	After Test
Specimen Diameter (in.)	4.01	4.01
Specimen Height (in.)	1.0000	1.0740
Wt. Comp. Soil + Mold (gm.)	580.0	624.8
Wt. of Mold (gm.)	209.7	209.7
Specific Gravity (Assumed)	2.70	2.70
Container No.	10	10
Wet Wt. of Soil + Cont. (gm.)	579.0	624.8
Dry Wt. of Soil + Cont. (gm.)	545.7	329.2
Wt. of Container (gm.)	279.0	209.7
Moisture Content (%)	12.5	26.1
Wet Density (pcf)	111.7	116.6
Dry Density (pcf)	99.3	92.4
Void Ratio	0.698	0.824
Total Porosity	0.411	0.452
Pore Volume (cc)	85.1	100.4
Degree of Saturation (%) [S meas]	**48.4**	**85.6**

SPECIMEN INUNDATION in distilled water for the period of 24 h or expansion rate < 0.0002 in./h.

Date	Time	Pressure (psi)	Elapsed Time (min.)	Dial Readings (in.)
5/22/23	12:20	1.0	0	0.5000
5/22/23	12:30	1.0	10	0.5000
	Add Distilled Water to the Specimen			
5/23/23	8:00	1.0	1170	0.5740
5/23/23	9:00	1.0	1230	0.5740

Expansion Index (EI meas) =	((Final Rdg - Initial Rdg) / Initial Thick.) x 1000	74.0
Expansion Index (Report) =	Nearest Whole Number or Zero (0) if Initial Height is > than Final Heigh	**74**

Rev. 03-08

Leighton

PARTICLE-SIZE DISTRIBUTION (GRADATION) of SOILS USING SIEVE ANALYSIS

ASTM D 6913

Project Name: EMWD Brackish Water Transmission Pipeline
Tested By: MRV Date: 05/19/23
Project No.: 12893.002
Checked By: MRV Date: 05/23/23
Boring No.: LB-1
Depth (feet): 0 - 5.0
Sample No.: B-1
Soil Identification: Sandy Silty, Clay s(CL-ML), White.

Calculation of Dry Weights	Whole Sample	Sample Passing #4	Moisture Contents	Whole Sample	Sample passing #4
Container No.:	M	K	Wt. of Air-Dry Soil + Cont.(g)	2134.2	593.6
Wt. Air-Dried Soil + Cont.(g)	2134.2	593.6	Wt. of Dry Soil + Cont. (g)	1826.7	593.6
Wt. of Container (g)	666.2	278.4	Wt. of Container No._____(g)	666.2	278.4
Dry Wt. of Soil (g)	1160.5	315.2	Moisture Content (%)	26.5	0.0

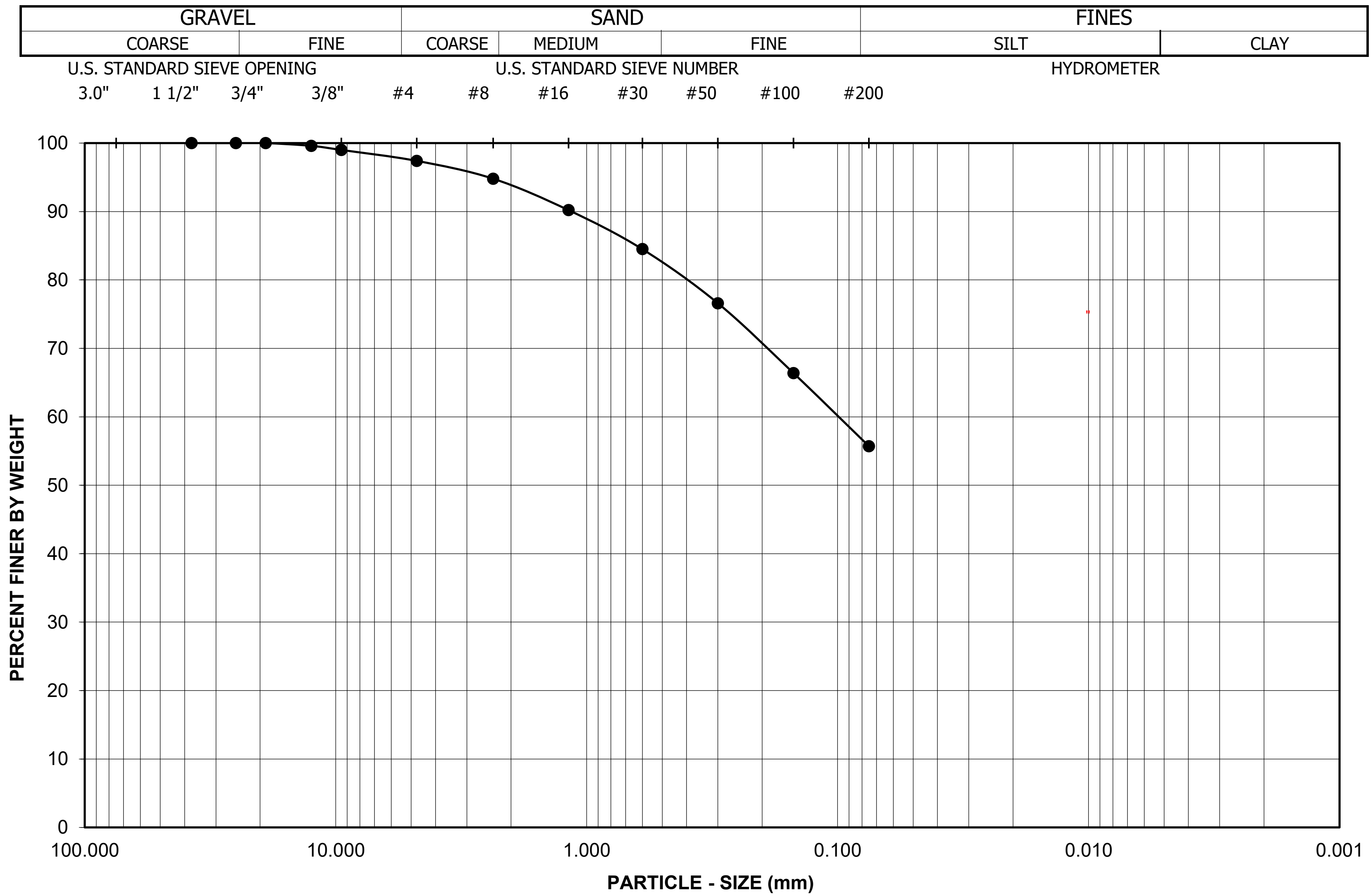
Passing #4 Material After Wet Sieve		
	Container No.	K
	Wt. of Dry Soil + Container (g)	415.2
	Wt. of Container (g)	278.4
	Dry Wt. of Soil Retained on # 200 Sieve (g)	136.8

U. S. Sieve Size	(mm.)	Cumulative Weight of Dry Soil Retained (g) Whole Sample	Sample Passing #4	Percent Passing (%)
1 1/2"	37.500			100.0
1"	25.000			100.0
3/4"	19.000	0.0		100.0
1/2"	12.500	4.4		99.6
3/8"	9.500	11.6		99.0
#4	4.750	29.6		97.4
#8	2.360		8.5	94.8
#16	1.180		23.2	90.2
#30	0.600		41.8	84.5
#50	0.300		67.4	76.6
#100	0.150		100.4	66.4
#200	0.075		134.9	55.7
PAN				

GRAVEL: **3 %**
SAND: **41 %**
FINES: **56 %**
GROUP SYMBOL: **s(CL-ML)**

Cu = D60/D10 = N/A
Cc = $(D30)^2/(D60*D10)$ = N/A

Remarks:



Project Name: EMWD Brackish Water Transmission Pipeline

Project No.: 12893.002

Boring No.: LB-1 Sample No.: B-1

Depth (feet): 0 - 5.0 Soil Type : s(CL-ML)

Soil Identification: Sandy Silty, Clay s(CL-ML), White.

Leighton

PARTICLE - SIZE DISTRIBUTION ASTM D 6913

GR:SA:FI : (%) 3 : 41 : 56

May-23

Sieve; LB-1, B-1 (04-18-23)

Leighton

PARTICLE-SIZE DISTRIBUTION (GRADATION) of SOILS USING SIEVE ANALYSIS
ASTM D 6913

Project Name:	EMWD Brackish Water Transmission Pipeline	Tested By:	MRV	Date:	05/19/23
Project No.:	12893.002	Checked By:	MRV	Date:	05/23/23
Boring No.:	LB-4	Depth (feet):	5.0 - 10.0		
Sample No.:	B-1				
Soil Identification:	Clayey Sand (SC), Reddish Brown.				

		Moisture Content of Total Air - Dry Soil	
Container No.:	R2	Wt. of Air-Dry Soil + Cont. (g)	815.3
Wt. of Air-Dried Soil + Cont.(g)	815.3	Wt. of Dry Soil + Cont. (g)	766.3
Wt. of Container (g)	276.2	Wt. of Container No.______ (g)	276.2
Dry Wt. of Soil (g)	490.1	Moisture Content (%)	10.0

After Wet Sieve	Container No.	R2
	Wt. of Dry Soil + Container (g)	589.6
	Wt. of Container (g)	276.2
	Dry Wt. of Soil Retained on # 200 Sieve (g)	313.4

U. S. Sieve Size (in.)	U. S. Sieve Size (mm.)	Cumulative Weight Dry Soil Retained (g)	Percent Passing (%)
3"	75.000		100.0
1"	25.000		100.0
3/4"	19.000	0.0	100.0
1/2"	12.500	9.7	98.0
3/8"	9.500	11.5	97.7
#4	4.750	14.5	97.0
#8	2.360	32.6	93.3
#16	1.180	84.2	82.8
#30	0.600	162.0	66.9
#50	0.300	225.7	53.9
#100	0.150	270.7	44.8
#200	0.075	306.5	37.5
PAN			

GRAVEL: **3 %**

SAND: **59 %**

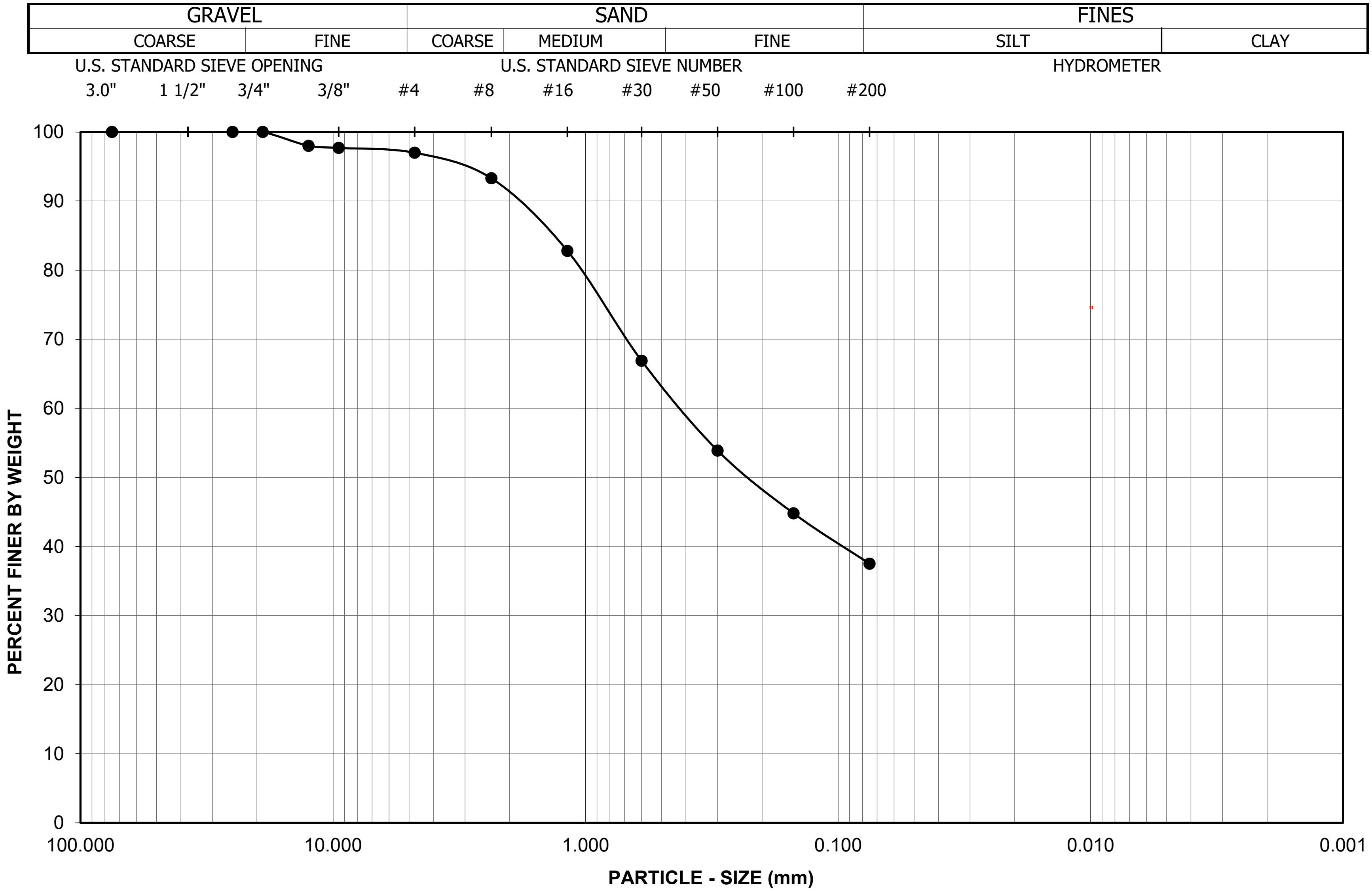
FINES: **38 %**

GROUP SYMBOL: **SC**

Cu = D60/D10 = N/A

Cc = $(D30)^2/(D60*D10)$ = N/A

Remarks:



Project Name: EMWD Brackish Water Transmission Pipeline

Project No.: 12893.002

Boring No.: LB-4 Sample No.: B-1

Depth (feet): 5.0 - 10.0 Soil Type : SC

Soil Identification: Clayey Sand (SC), Reddish Brown.

GR:SA:FI : (%) 3 : 59 : 38

Leighton

PARTICLE - SIZE DISTRIBUTION ASTM D 6913

May-23

Sieve; LB-4, B-1 (04-18-23)

PARTICLE-SIZE DISTRIBUTION (GRADATION) of SOILS USING SIEVE ANALYSIS
ASTM D 6913

Leighton

Project Name:	EMWD Brackish Water Transmission Pipeline	Tested By:	MRV	Date:	05/19/23
Project No.:	12893.002	Checked By:	MRV	Date:	05/23/23
Boring No.:	LB-6	Depth (feet):	5.0 - 10.0		
Sample No.:	B-1				
Soil Identification:	Silty Sand with Gravel (SM)g, Yellowish Brown.				

Calculation of Dry Weights	Whole Sample	Sample Passing #4	Moisture Contents	Whole Sample	Sample passing #4
Container No.:	L	L	Wt. of Air-Dry Soil + Cont.(g)	1420.5	594.1
Wt. Air-Dried Soil + Cont.(g)	1420.5	594.1	Wt. of Dry Soil + Cont. (g)	1380.1	594.1
Wt. of Container (g)	281.4	281.4	Wt. of Container No._____(g)	281.4	281.4
Dry Wt. of Soil (g)	1098.5	312.7	Moisture Content (%)	3.7	0.0

Passing #4 Material After Wet Sieve		
	Container No.	L
	Wt. of Dry Soil + Container (g)	520.1
	Wt. of Container (g)	281.4
	Dry Wt. of Soil Retained on # 200 Sieve (g)	238.7

U. S. Sieve Size		Cumulative Weight of Dry Soil Retained (g)		Percent Passing (%)
	(mm.)	Whole Sample	Sample Passing #4	
1 1/2"	37.500			100.0
1"	25.000	0.0		100.0
3/4"	19.000	36.8		96.6
1/2"	12.500	106.7		90.3
3/8"	9.500	136.9		87.5
#4	4.750	213.9		80.5
#8	2.360		24.5	74.2
#16	1.180		59.3	65.2
#30	0.600		93.6	56.4
#50	0.300		140.7	44.3
#100	0.150		192.6	30.9
#200	0.075		231.8	20.8
PAN				

GRAVEL: **20 %**

SAND: **59 %**

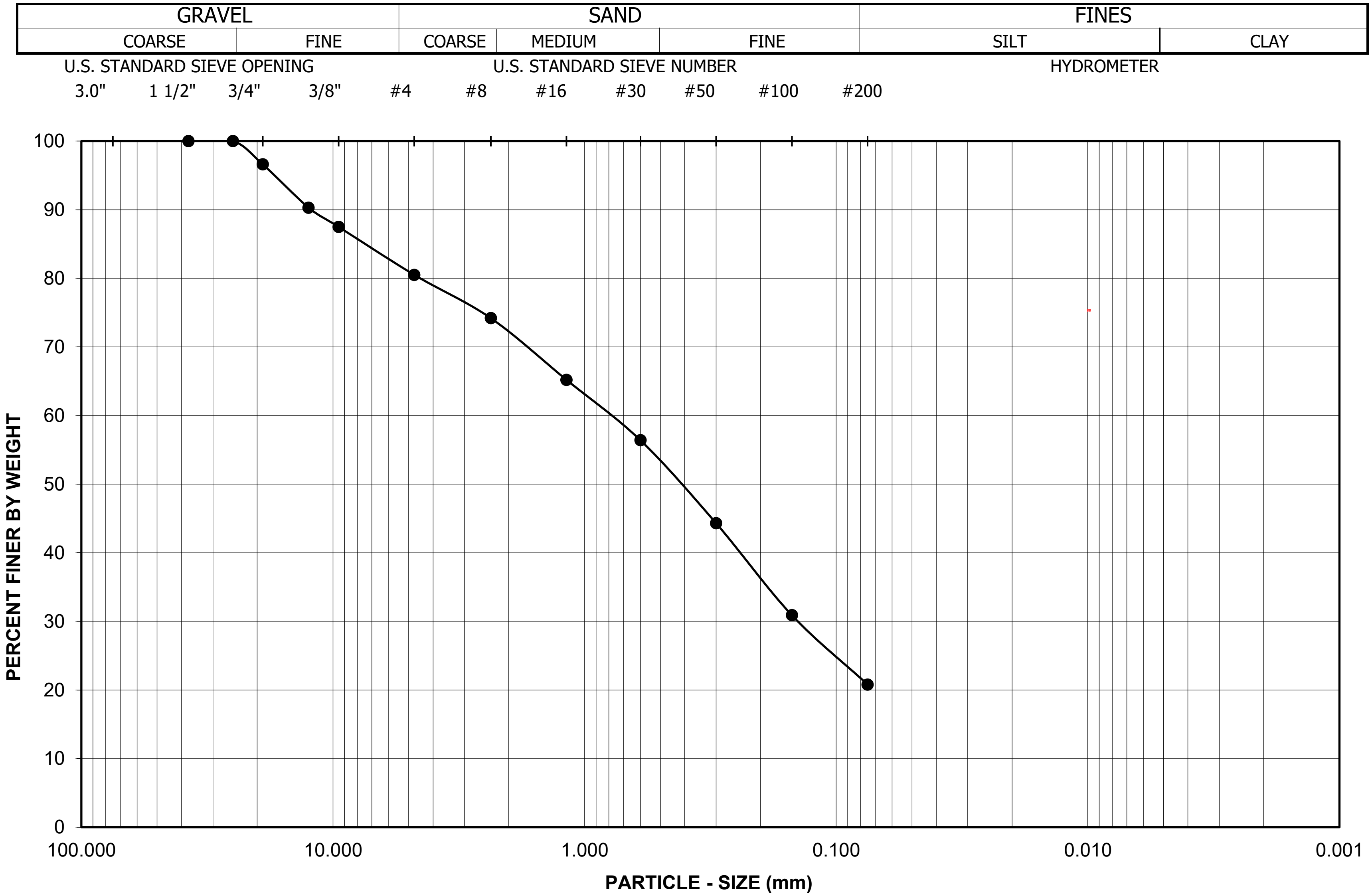
FINES: **21 %**

GROUP SYMBOL: **(SM)g**

Cu = D60/D10 = N/A

Cc = (D30)²/(D60*D10) = N/A

Remarks:



Project Name: EMWD Brackish Water Transmission Pipeline

Project No.: 12893.002

Boring No.: LB-6 Sample No.: B-1

Depth (feet): 5.0 - 10.0 Soil Type : (SM)g

Soil Identification: Silty Sand with Gravel (SM)g, Yellowish Brown.

GR:SA:FI : (%) 20 : 59 : 21

Leighton

PARTICLE - SIZE DISTRIBUTION ASTM D 6913

May-23

Sieve; LB-6, B-1 (04-18-23)

PARTICLE-SIZE DISTRIBUTION (GRADATION) of SOILS USING SIEVE ANALYSIS
ASTM D 6913

Leighton

Project Name:	EMWD Brackish Water Transmission Pipeline	Tested By:	MRV	Date:	05/19/23
Project No.:	12893.002	Checked By:	MRV	Date:	05/23/23
Boring No.:	LB-8	Depth (feet):	0 - 5.0		
Sample No.:	B-1				
Soil Identification:	Silty Sand (SM), Dark Yellowish Brown.				

Calculation of Dry Weights	Whole Sample	Sample Passing #4	Moisture Contents	Whole Sample	Sample passing #4
Container No.:	B	B	Wt. of Air-Dry Soil + Cont.(g)	1305.6	601.5
Wt. Air-Dried Soil + Cont.(g)	1305.6	601.5	Wt. of Dry Soil + Cont. (g)	1279.3	601.5
Wt. of Container (g)	278.6	278.6	Wt. of Container No.______(g)	278.6	278.6
Dry Wt. of Soil (g)	1001.0	322.9	Moisture Content (%)	2.6	0.0

Passing #4 Material After Wet Sieve		
	Container No.	B
	Wt. of Dry Soil + Container (g)	550.0
	Wt. of Container (g)	278.6
	Dry Wt. of Soil Retained on # 200 Sieve (g)	271.4

U. S. Sieve Size		Cumulative Weight of Dry Soil Retained (g)		Percent Passing (%)
	(mm.)	Whole Sample	Sample Passing #4	
1 1/2"	37.500			100.0
1"	25.000	0.0		100.0
3/4"	19.000	14.1		98.6
1/2"	12.500	35.2		96.5
3/8"	9.500	38.3		96.2
#4	4.750	59.2		94.1
#8	2.360		22.6	87.5
#16	1.180		81.5	70.3
#30	0.600		137.6	54.0
#50	0.300		187.9	39.3
#100	0.150		233.6	26.0
#200	0.075		265.7	16.7
PAN				

GRAVEL: **6 %**

SAND: **77 %**

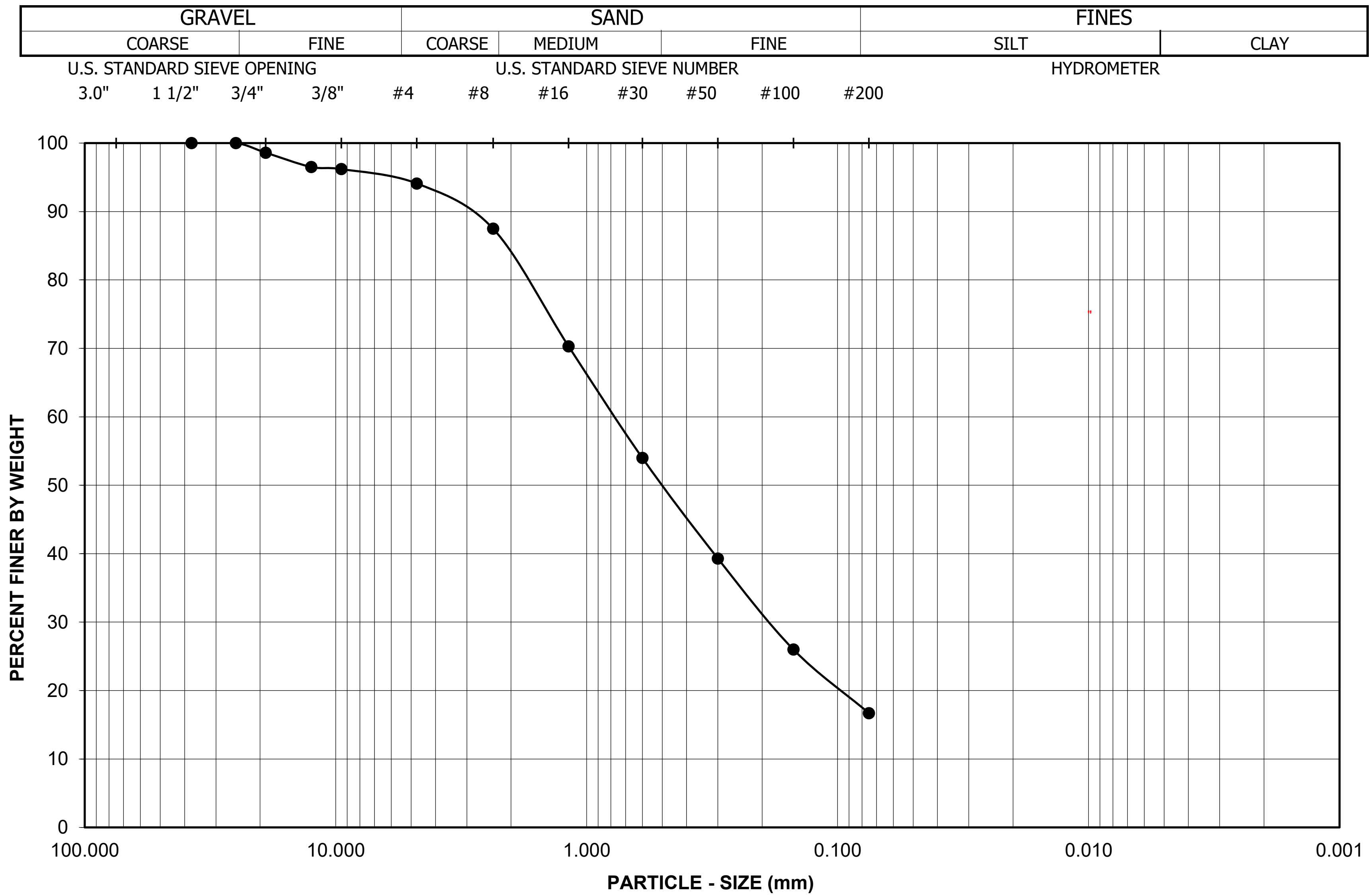
FINES: **17 %**

GROUP SYMBOL: **SM**

Cu = D60/D10 = N/A

Cc = $(D30)^2/(D60*D10)$ = N/A

Remarks:



Project Name: EMWD Brackish Water Transmission Pipeline

Project No.: 12893.002

Boring No.: LB-8 Sample No.: B-1

Depth (feet): 0 - 5.0 Soil Type : SM

Soil Identification: Silty Sand (SM), Dark Yellowish Brown.

Leighton

PARTICLE - SIZE DISTRIBUTION ASTM D 6913

GR:SA:FI : (%) 6 : 77 : 17

May-23

PARTICLE-SIZE DISTRIBUTION (GRADATION) of SOILS USING SIEVE ANALYSIS

ASTM D 6913

Project Name:	EMWD Brackish Water Transmission Pipeline	Tested By:	MRV	Date:	05/19/23
Project No.:	12893.002	Checked By:	MRV	Date:	05/23/23
Boring No.:	LB-12	Depth (feet):	5.0 - 10.0		
Sample No.:	B-1				
Soil Identification:	Silty Sand with Gravel (SM)g, Dark Reddish Brown.				

Calculation of Dry Weights	Whole Sample	Sample Passing #4	Moisture Contents	Whole Sample	Sample passing #4
Container No.:	A	A	Wt. of Air-Dry Soil + Cont.(g)	1655.8	608.3
Wt. Air-Dried Soil + Cont.(g)	1655.8	608.3	Wt. of Dry Soil + Cont. (g)	1562.5	608.3
Wt. of Container (g)	279.1	279.1	Wt. of Container No._____(g)	279.1	279.1
Dry Wt. of Soil (g)	1283.0	329.2	Moisture Content (%)	7.3	0.0

Passing #4 Material After Wet Sieve		
	Container No.	A
	Wt. of Dry Soil + Container (g)	503.6
	Wt. of Container (g)	279.1
	Dry Wt. of Soil Retained on # 200 Sieve (g)	224.5

U. S. Sieve Size		Cumulative Weight of Dry Soil Retained (g)		Percent Passing (%)
	(mm.)	Whole Sample	Sample Passing #4	
1 1/2"	37.500			100.0
1"	25.000			100.0
3/4"	19.000	0.0		100.0
1/2"	12.500	83.5		93.5
3/8"	9.500	131.2		89.8
#4	4.750	271.8		78.8
#8	2.360		32.2	71.1
#16	1.180		59.8	64.5
#30	0.600		89.1	57.5
#50	0.300		129.5	47.8
#100	0.150		177.0	36.4
#200	0.075		216.5	27.0
PAN				

GRAVEL: **21 %**

SAND: **52 %**

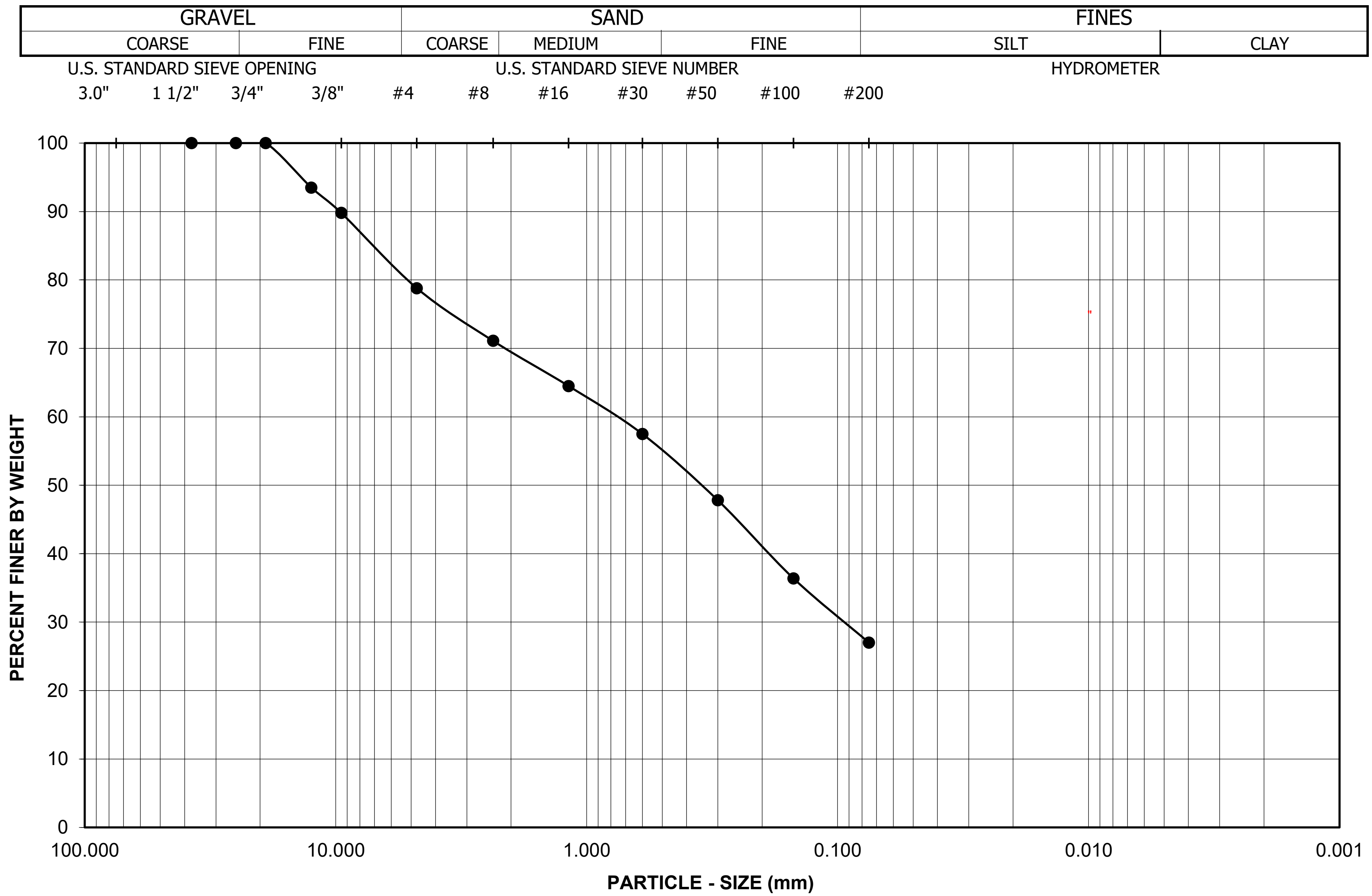
FINES: **27 %**

GROUP SYMBOL: **(SM)g**

$Cu = D60/D10 =$ N/A

$Cc = (D30)^2/(D60*D10) =$ N/A

Remarks:



Project Name: EMWD Brackish Water Transmission Pipeline

Project No.: 12893.002

Boring No.: LB-12 Sample No.: B-1

Depth (feet): 5.0 - 10.0 Soil Type : (SM)g

Soil Identification: Silty Sand with Gravel (SM)g, Dark Reddish Brown.

GR:SA:FI : (%) 21 : 52 : 27

Leighton

PARTICLE - SIZE DISTRIBUTION ASTM D 6913

May-23

PARTICLE-SIZE DISTRIBUTION (GRADATION) of SOILS USING SIEVE ANALYSIS
ASTM D 6913

Leighton

Project Name:	EMWD Brackish Water Transmission Pipeline	Tested By:	MRV	Date:	05/19/23
Project No.:	12893.002	Checked By:	MRV	Date:	05/23/23
Boring No.:	LB-15	Depth (feet):	5.0 - 10.0		
Sample No.:	B-1				
Soil Identification:	Clayey Sand (SC), Reddish Brown.				

Calculation of Dry Weights	Whole Sample	Sample Passing #4	Moisture Contents	Whole Sample	Sample passing #4
Container No.:	BB	W	Wt. of Air-Dry Soil + Cont.(g)	2568.7	616.8
Wt. Air-Dried Soil + Cont.(g)	2568.7	616.8	Wt. of Dry Soil + Cont. (g)	2375.7	616.8
Wt. of Container (g)	673.2	278.3	Wt. of Container No.______(g)	673.2	278.3
Dry Wt. of Soil (g)	1703.1	338.5	Moisture Content (%)	11.3	0.0

Passing #4 Material After Wet Sieve		
	Container No.	W
	Wt. of Dry Soil + Container (g)	464.1
	Wt. of Container (g)	278.3
	Dry Wt. of Soil Retained on # 200 Sieve (g)	185.8

U. S. Sieve Size		Cumulative Weight of Dry Soil Retained (g)		Percent Passing (%)
	(mm.)	Whole Sample	Sample Passing #4	
1 1/2"	37.500	0.0		100.0
1"	25.000	87.4		94.9
3/4"	19.000	114.6		93.3
1/2"	12.500	152.1		91.1
3/8"	9.500	183.7		89.2
#4	4.750	227.3		86.7
#8	2.360		9.5	84.3
#16	1.180		23.5	80.7
#30	0.600		46.4	74.8
#50	0.300		84.1	65.2
#100	0.150		131.6	53.0
#200	0.075		178.1	41.1
PAN				

GRAVEL: **13 %**

SAND: **46 %**

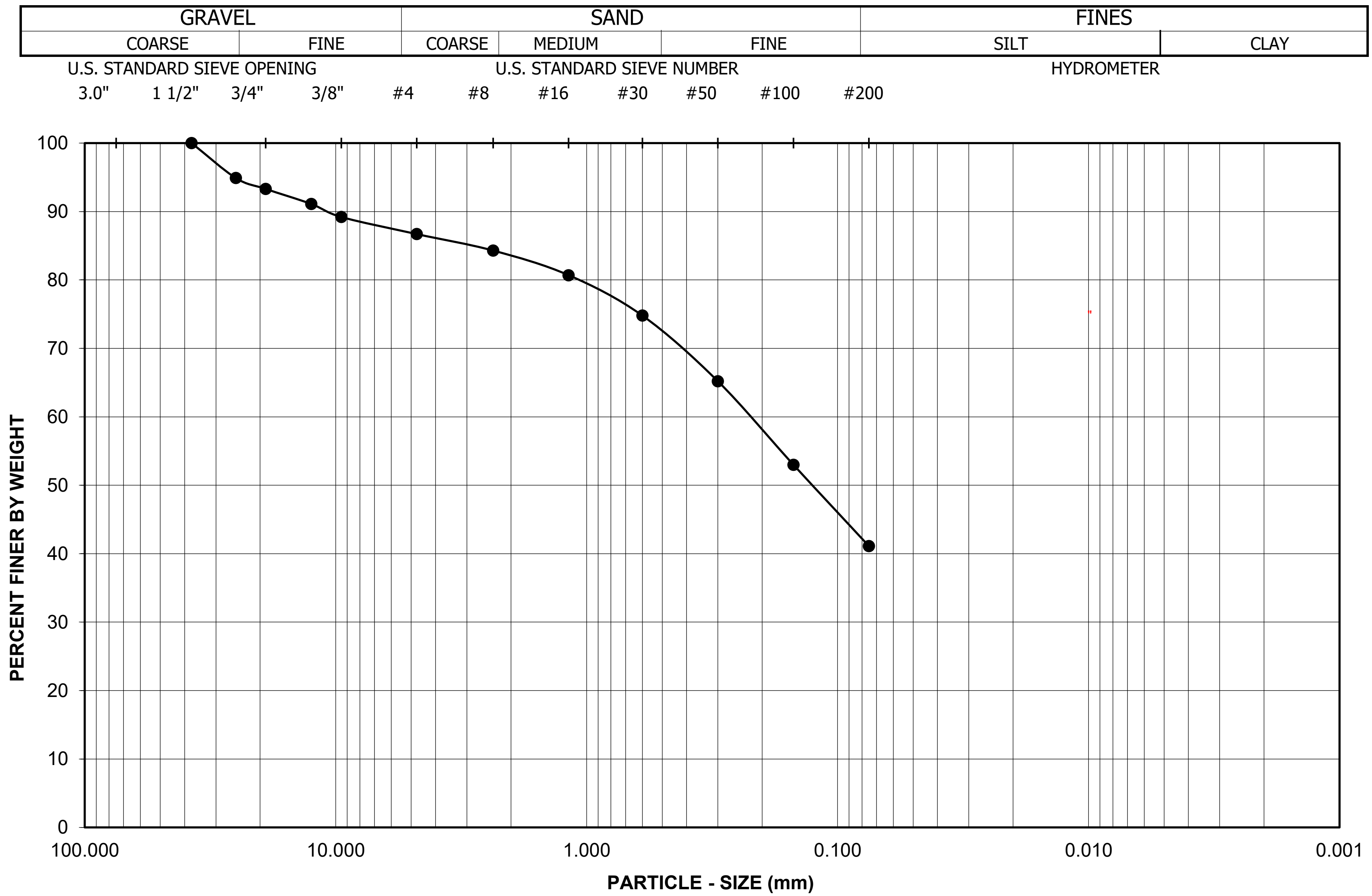
FINES: **41 %**

GROUP SYMBOL: **SC**

$Cu = D60/D10 =$ N/A

$Cc = (D30)^2/(D60*D10) =$ N/A

Remarks:



Project Name: EMWD Brackish Water Transmission Pipeline

Project No.: 12893.002

Boring No.: LB-15 Sample No.: B-1

Depth (feet): 5.0 - 10.0 Soil Type : SC

Soil Identification: Clayey Sand (SC), Reddish Brown.

GR:SA:FI : (%) 13 : 46 : 41

Leighton

PARTICLE - SIZE DISTRIBUTION ASTM D 6913

May-23

Sieve; LB-15, B-1 (04-18-23)

SAND EQUIVALENT TEST

ASTM D 2419 / DOT CA Test 217

Project Name:	EMWD Brackish Water Transmission Pipeline	Tested By:	M. Vinet	Date:	5/22/23
Project No. :	12893.002	Computed By:	M. Vinet	Date:	5/22/23
Client:	Tetra Tech, Inc	Checked By:	M. Vinet	Date:	5/23/23

Boring No.	Sample No.	Depth (ft.)	Soil Description	T1	T2	T3	T4	R1	R2	SE	Average SE
LB-1	B-1	0 - 5.0	Sandy Silty, Clay s(CL-ML)	08:15	08:25	08:27	08:47	12.0	0.8	7	**7**
				08:17	08:27	08:29	08:49	12.0	0.8	7	

T1 = Starting Time
T2 = (T1 + 10 min) Begin Agitation

T3 = Settlement Starting Time
T4 = (T3 + 20 min) Take Clay Reading (R1)

Sand Equivalent = R2 / R1 * 100
Record SE as Next Higher Integer

SAND EQUIVALENT TEST

ASTM D 2419 / DOT CA Test 217

Project Name:	EMWD Brackish Water Transmission Pipeline	Tested By:	M. Vinet	Date:	5/22/23
Project No. :	12893.002	Computed By:	M. Vinet	Date:	5/22/23
Client:	Tetra Tech, Inc	Checked By:	M. Vinet	Date:	5/23/23

Boring No.	Sample No.	Depth (ft.)	Soil Description	T1	T2	T3	T4	R1	R2	SE	Average SE
LB-6	B-1	5.0 - 10.0	Silty Sand with Gravel (SM)g	10:20	10:30	10:32	10:52	11.3	2.1	19	**19**
				10:22	10:32	10:34	10:54	11.4	2.1	19	

T1 = Starting Time

T2 = (T1 + 10 min) Begin Agitation

T3 = Settlement Starting Time

T4 = (T3 + 20 min) Take Clay Reading (R1)

Sand Equivalent = R2 / R1 * 100

Record SE as Next Higher Integer

SAND EQUIVALENT TEST

ASTM D 2419 / DOT CA Test 217

Project Name:	EMWD Brackish Water Transmission Pipeline	Tested By:	M. Vinet	Date:	5/22/23
Project No. :	12893.002	Computed By:	M. Vinet	Date:	5/22/23
Client:	Tetra Tech, Inc	Checked By:	M. Vinet	Date:	5/23/23

Boring No.	Sample No.	Depth (ft.)	Soil Description	T1	T2	T3	T4	R1	R2	SE	Average SE
LB-8	B-1	0 - 5.0	Silty Sand (SM)	13:15	13:25	13:27	13:47	7.6	2.7	36	**37**
				13:17	13:27	13:29	13:49	8.0	2.9	37	

T1 = Starting Time

T2 = (T1 + 10 min) Begin Agitation

T3 = Settlement Starting Time

T4 = (T3 + 20 min) Take Clay Reading (R1)

Sand Equivalent = R2 / R1 * 100

Record SE as Next Higher Integer

Boring No.	LB-14							
Sample No.	B-1							
Depth (ft.)	5.0 - 10.0							
Sample Type	BULK							
Soil Classification	SC							
Soak Time (min)	10							
Moisture Correction								
Wet Weight of Soil + Container (gm.)	825.5							
Dry Weight of Soil + Container (gm.)	765.5							
Weight of Container (gm)	279.4							
Moisture Content (%)	12.3							
Container No.:	P							
Sample Dry Weight Determination								
Weight of Sample + Container (gm.)	765.5							
Weight of Container (gm.)	279.4							
Weight of Dry Sample (gm.)	486.1							
Container No.:	P							
After Wash								
Dry Weight of Sample + Container (gm)	556.5							
Weight of Container (gm)	279.4							
Dry Weight of Sample (gm)	277.1							
% Passing No. 200 Sieve	**43**							
% Retained No. 200 Sieve	57							

Leighton

PERCENT PASSING
No. 200 SIEVE
ASTM D 1140

Project Name: EMWD Brackish Water Transmission Pipeline
Project No.: 12893.002
Tested By: F. Mina Date: 05/18/23

200 Wash; LB-14, B-1 (04-18-23)

One-Dimensional Swell or Settlement Potential of Cohesive Soils
(ASTM D 4546) -- Method 'B'

Project Name: EMWD Brackish Water Transmission Pipeline
Tested By: M. Vinet Date: 5/19/23
Project No.: 12893.002
Checked By: M. Vinet Date: 5/23/23
Boring No.: LB-2
Sample Type: IN SITU
Sample No.: R-2
Depth (ft.) 5.0
Sample Description: Silty, Clayey Sand (SC-SM), Reddish Brown.
Source and Type of Water Used for Inundation: Arrowhead (Distilled)
** Note: Loading After Wetting (Inundation) not Performed Using this Test Method.

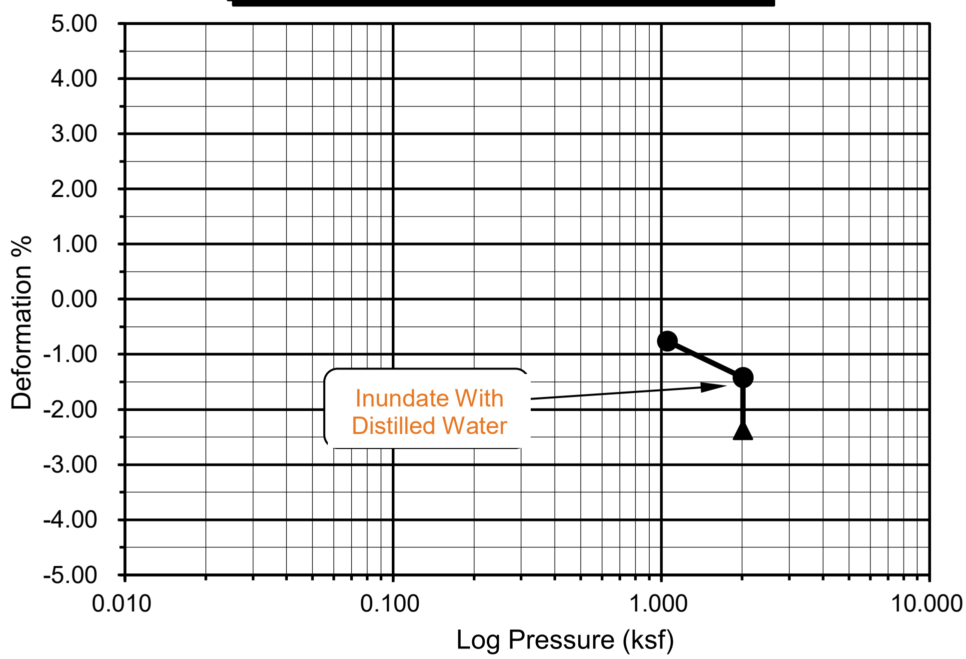
Initial Dry Density (pcf):	114.8
Initial Moisture (%):	12.2
Initial Height (in.):	1.0000
Initial Dial Reading (in):	0.0000
Inside Diameter of Ring (in):	2.416

Final Dry Density (pcf):	117.6
Final Moisture (%) :	14.3
Initial Void ratio:	0.4677
Specific Gravity (assumed):	2.70
Initial Degree of Saturation (%):	70.2

Pressure (p) (ksf)	Final Reading (in)	Apparent Thickness (in)	Load Compliance (%)	Swell (+) Settlement (-) % of Sample Thickness	Void Ratio	Corrected Deformation (%)
1.050	0.0076	0.9924	0.00	-0.76	0.4566	-0.76
2.013	0.0142	0.9858	0.00	-1.42	0.4469	-1.42
H2O	0.0237	0.9763	0.00	-2.37	0.4330	-2.37

Percent Swell / Settlement After Inundation = -0.96

Deformation % - Log Pressure Curve



Rev. 01-10

TESTS for SULFATE CONTENT
CHLORIDE CONTENT and pH of SOILS

Project Name: EMWD Brackish Water Transmission Pipeline   Tested By : M. Vinet   Date: 05/23/23

Project No. : 12893.002   Data Input By: M. Vinet   Date: 05/23/23

Boring No.	LB-1	LB-6	LB-11	LB-15
Sample No.	B-1	B-1	B-1	B-1
Sample Depth (ft)	0 - 5.0	5.0 - 10.0	0 - 5.0	5.0 - 10.0
Soil Identification:	s(CL-ML)	(SM)g	SM	SC
Wet Weight of Soil + Container (g)	100.00	100.00	100.00	100.00
Dry Weight of Soil + Container (g)	100.00	100.00	100.00	100.00
Weight of Container (g)	0.00	0.00	0.00	0.00
Moisture Content (%)	0.00	0.00	0.00	0.00
Weight of Soaked Soil (g)	100.00	100.00	100.00	100.00

SULFATE CONTENT, DOT California Test 417, Part II

Beaker No.	1	2	3	4
Crucible No.	1	2	3	4
Furnace Temperature (°C)	850	850	850	850
Time In / Time Out	Timer	Timer	Timer	Timer
Duration of Combustion (min)	45	45	45	45
Wt. of Crucible + Residue (g)	25.1161	24.9032	25.0157	24.9075
Wt. of Crucible (g)	25.0365	24.8953	25.0112	24.9032
Wt. of Residue (g) (A)	0.0796	0.0079	0.0045	0.0043
PPM of Sulfate (A) x 41150	3275.54	325.08	185.18	176.95
PPM of Sulfate, Dry Weight Basis	**3276**	**325**	**185**	**177**

CHLORIDE CONTENT, DOT California Test 422

ml of Extract For Titration (B)	30	30	30	30
ml of AgNO3 Soln. Used in Titration (C)	1.2	0.6	0.6	0.4
PPM of Chloride (C -0.2) * 100 * 30 / B	100	40	40	20
PPM of Chloride, Dry Wt. Basis	**100**	**40**	**40**	**20**

pH TEST, DOT California Test 643

pH Value	**7.50**	**7.30**	**7.80**	**7.30**
Temperature °C	21.0	21.0	21.0	21.0

TESTS for SULFATE CONTENT CHLORIDE CONTENT and pH of SOILS

Leighton

Project Name:	EMWD Brackish Water Transmission Pipeline	Tested By :	M. Vinet	Date:	05/23/23
Project No. :	12893.002	Data Input By:	M. Vinet	Date:	05/23/23

Boring No.	LB-21			
Sample No.	B-1			
Sample Depth (ft)	0 - 5.0			
Soil Identification:	CL			
Wet Weight of Soil + Container (g)	100.00			
Dry Weight of Soil + Container (g)	100.00			
Weight of Container (g)	0.00			
Moisture Content (%)	0.00			
Weight of Soaked Soil (g)	100.00			

SULFATE CONTENT, DOT California Test 417, Part II

Beaker No.	1			
Crucible No.	1			
Furnace Temperature (°C)	850			
Time In / Time Out	Timer			
Duration of Combustion (min)	45			
Wt. of Crucible + Residue (g)	25.0412			
Wt. of Crucible (g)	25.0362			
Wt. of Residue (g) (A)	0.0050			
PPM of Sulfate (A) x 41150	205.75			
PPM of Sulfate, Dry Weight Basis	**206**			

CHLORIDE CONTENT, DOT California Test 422

ml of Extract For Titration (B)	30			
ml of AgNO3 Soln. Used in Titration (C)	1.0			
PPM of Chloride (C -0.2) * 100 * 30 / B	80			
PPM of Chloride, Dry Wt. Basis	**80**			

pH TEST, DOT California Test 643

pH Value	**7.30**			
Temperature °C	21.0			

SOIL RESISTIVITY TEST
DOT CA TEST 643

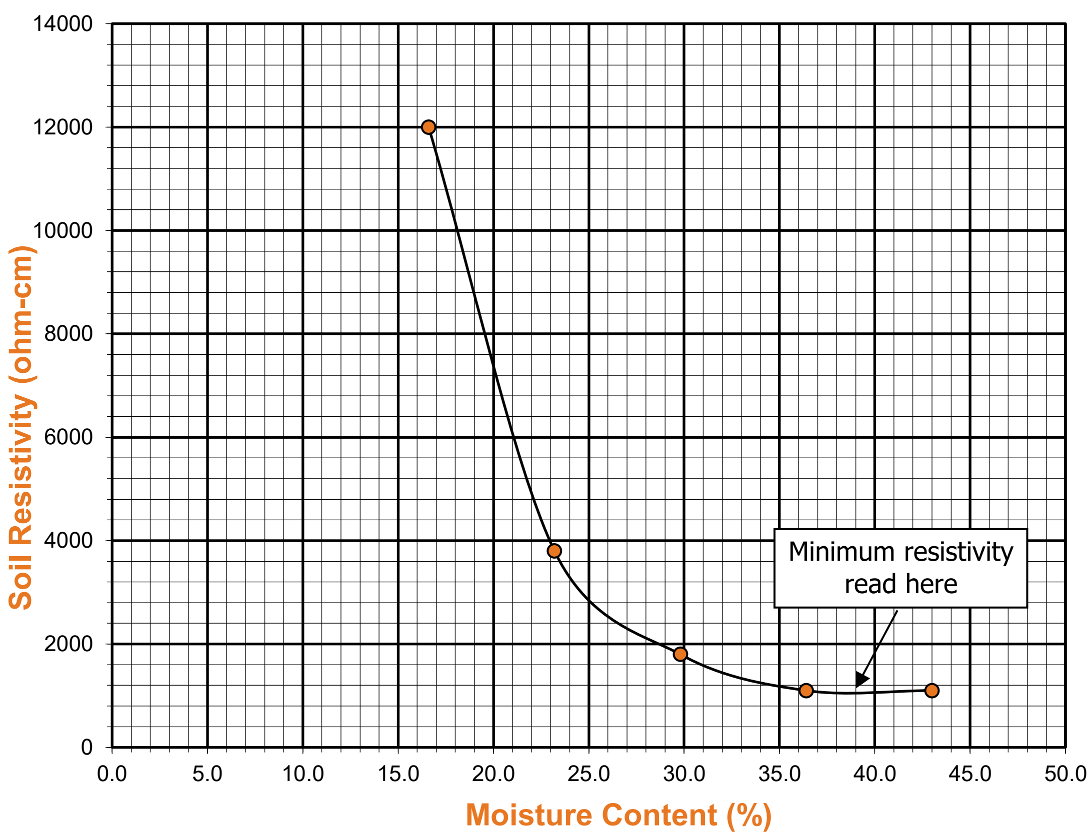
Project Name:	EMWD Brackish Water Transmission Pipeline	Tested By :	M. Vinet Date: 05/23/23
Project No. :	12893.002	Data Input By:	M. Vinet Date: 05/23/23
Boring No.:	LB-1	Depth (ft.) :	0 - 5.0
Sample No. :	B-1		
Soil Identification:*	s(CL-ML)		

*California Test 643 requires soil specimens to consist only of portions of samples passing through the No. 8 US Standard Sieve before resistivity testing. Therefore, this test method may not be representative for coarser materials.

Specimen No.	Water Added (ml) (Wa)	Adjusted Moisture Content (MC)	Resistance Reading (ohm)	Soil Resistivity (ohm-cm)
1	83	16.60	12000	12000
2	116	23.20	3800	3800
3	149	29.80	1800	1800
4	182	36.40	1100	1100
5	215	43.00	1100	1100

Moisture Content (%) (MCi)	0.00
Wet Wt. of Soil + Cont. (g)	100.00
Dry Wt. of Soil + Cont. (g)	100.00
Wt. of Container (g)	0.00
Container No.	A
Initial Soil Wt. (g) (Wt)	500.00
Box Constant	1.000
MC =(((1+Mci/100)x(Wa/Wt+1))-1)x100	

Min. Resistivity (ohm-cm)	Moisture Content (%)	Sulfate Content (ppm)	Chloride Content (ppm)	Soil pH	
				pH	Temp. (°C)
DOT CA Test 643		DOT CA Test 417 Part II	DOT CA Test 422	DOT CA Test 643	
1000	**39.0**	**3276**	**100**	**7.50**	**21.0**



SOIL RESISTIVITY TEST

DOT CA TEST 643

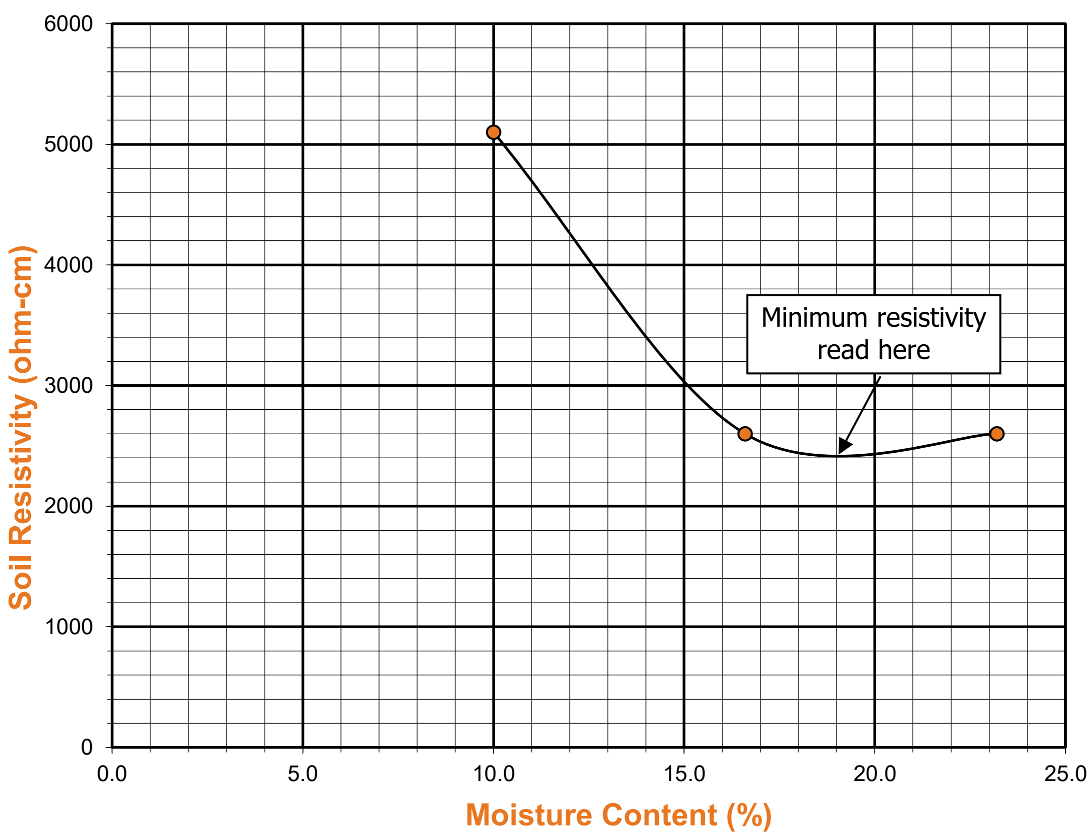
Project Name:	EMWD Brackish Water Transmission Pipeline	Tested By :	M. Vinet	Date:	05/23/23
Project No. :	12893.002	Data Input By:	M. Vinet	Date:	05/23/23
Boring No.:	LB-6	Depth (ft.) :	5.0 - 10.0		
Sample No. :	B-1				
Soil Identification:*	(SM)g				

*California Test 643 requires soil specimens to consist only of portions of samples passing through the No. 8 US Standard Sieve before resistivity testing. Therefore, this test method may not be representative for coarser materials.

Specimen No.	Water Added (ml) (Wa)	Adjusted Moisture Content (MC)	Resistance Reading (ohm)	Soil Resistivity (ohm-cm)
1	50	10.00	5100	5100
2	83	16.60	2600	2600
3	116	23.20	2600	2600
4				
5				

Moisture Content (%) (MCi)	0.00
Wet Wt. of Soil + Cont. (g)	100.00
Dry Wt. of Soil + Cont. (g)	100.00
Wt. of Container (g)	0.00
Container No.	A
Initial Soil Wt. (g) (Wt)	500.00
Box Constant	1.000
MC =(((1+Mci/100)x(Wa/Wt+1))-1)x100	

Min. Resistivity (ohm-cm)	Moisture Content (%)	Sulfate Content (ppm)	Chloride Content (ppm)	Soil pH	
				pH	Temp. (°C)
DOT CA Test 643		DOT CA Test 417 Part II	DOT CA Test 422	DOT CA Test 643	
2400	**19.0**	**325**	**40**	**7.30**	**21.0**



SOIL RESISTIVITY TEST
DOT CA TEST 643

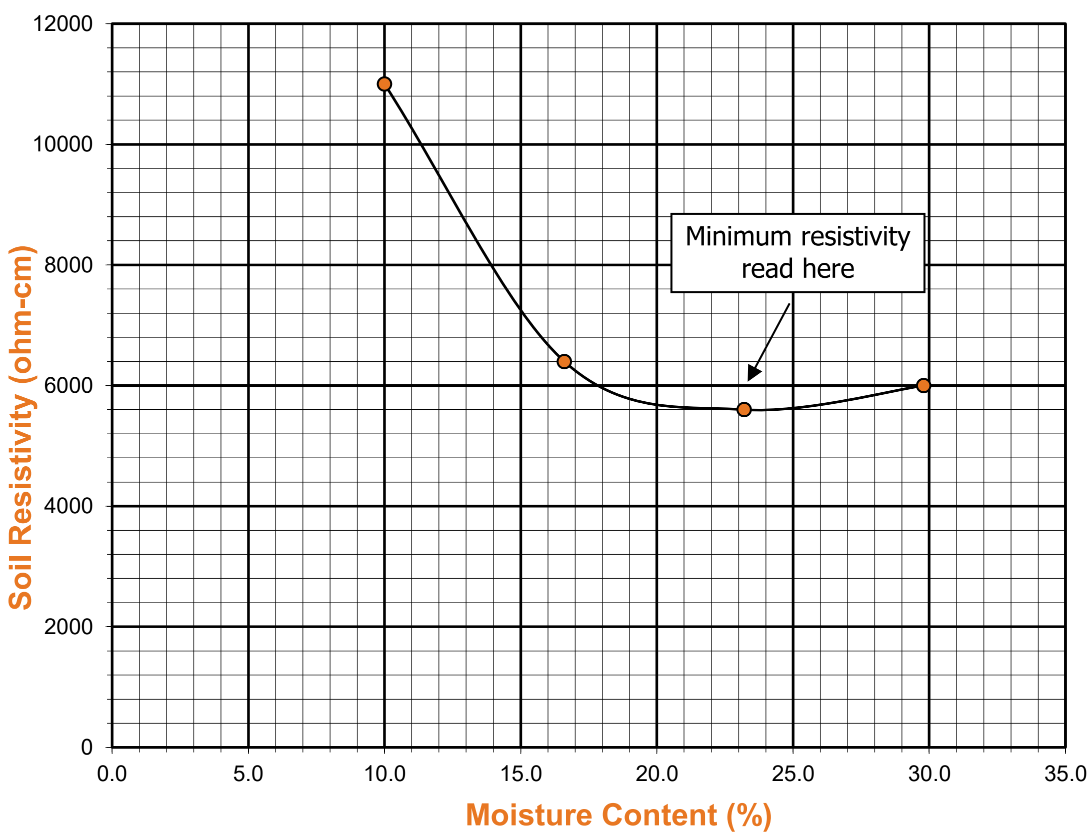
Project Name:	EMWD Brackish Water Transmission Pipeline	Tested By :	M. Vinet	Date:	05/23/23
Project No. :	12893.002	Data Input By:	M. Vinet	Date:	05/23/23
Boring No.:	LB-11	Depth (ft.) :	0 - 5.0		
Sample No. :	B-1				
Soil Identification:*	SM				

*California Test 643 requires soil specimens to consist only of portions of samples passing through the No. 8 US Standard Sieve before resistivity testing. Therefore, this test method may not be representative for coarser materials.

Specimen No.	Water Added (ml) (Wa)	Adjusted Moisture Content (MC)	Resistance Reading (ohm)	Soil Resistivity (ohm-cm)
1	50	10.00	11000	11000
2	83	16.60	6400	6400
3	116	23.20	5600	5600
4	149	29.80	6000	6000
5				

Moisture Content (%) (MCi)	0.00
Wet Wt. of Soil + Cont. (g)	100.00
Dry Wt. of Soil + Cont. (g)	100.00
Wt. of Container (g)	0.00
Container No.	A
Initial Soil Wt. (g) (Wt)	500.00
Box Constant	1.000
MC =(((1+Mci/100)x(Wa/Wt+1))-1)x100	

Min. Resistivity (ohm-cm)	Moisture Content (%)	Sulfate Content (ppm)	Chloride Content (ppm)	Soil pH	
				pH	Temp. (°C)
DOT CA Test 643		DOT CA Test 417 Part II	DOT CA Test 422	DOT CA Test 643	
5600	**23.2**	**185**	**40**	**7.80**	**21.0**



SOIL RESISTIVITY TEST
DOT CA TEST 643

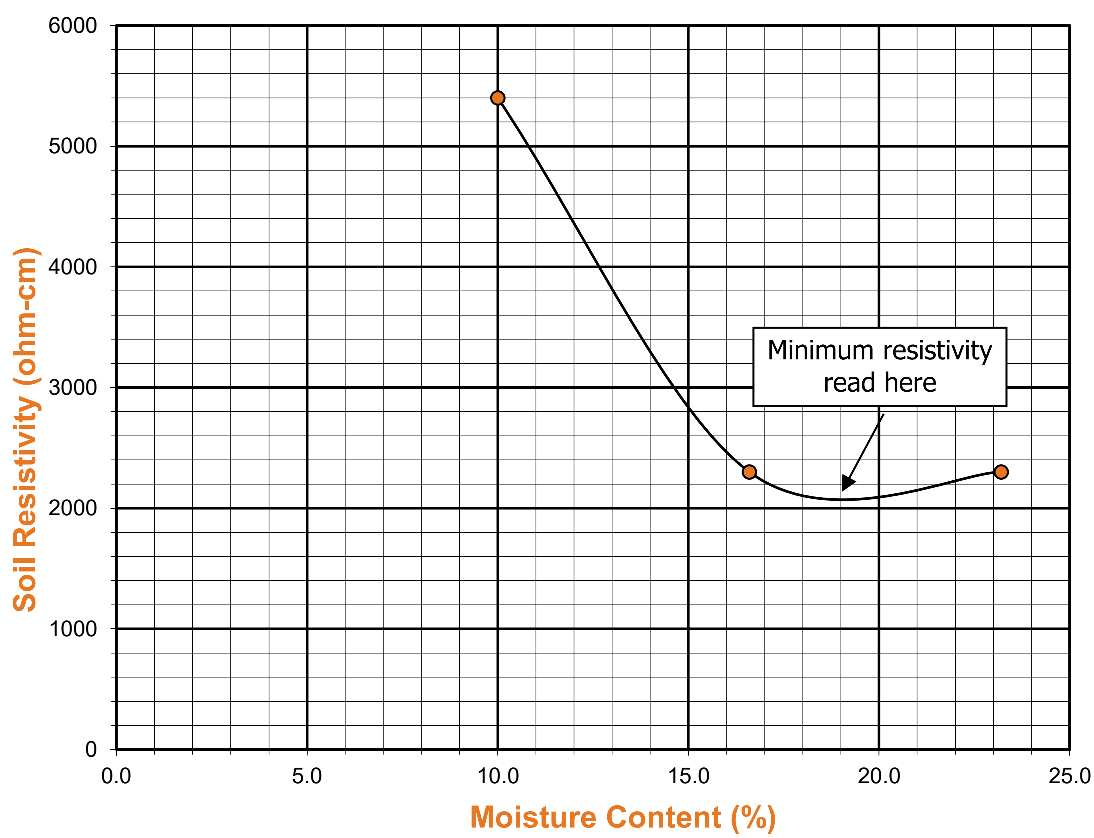
Project Name:	EMWD Brackish Water Transmission Pipeline	Tested By :	M. Vinet Date: 05/23/23
Project No. :	12893.002	Data Input By:	M. Vinet Date: 05/23/23
Boring No.:	LB-15	Depth (ft.) :	5.0 - 10.0
Sample No. :	B-1		
Soil Identification:*	SC		

*California Test 643 requires soil specimens to consist only of portions of samples passing through the No. 8 US Standard Sieve before resistivity testing. Therefore, this test method may not be representative for coarser materials.

Specimen No.	Water Added (ml) (Wa)	Adjusted Moisture Content (MC)	Resistance Reading (ohm)	Soil Resistivity (ohm-cm)
1	50	10.00	5400	5400
2	83	16.60	2300	2300
3	116	23.20	2300	2300
4				
5				

Moisture Content (%) (MCi)	0.00
Wet Wt. of Soil + Cont. (g)	100.00
Dry Wt. of Soil + Cont. (g)	100.00
Wt. of Container (g)	0.00
Container No.	A
Initial Soil Wt. (g) (Wt)	500.00
Box Constant	1.000
MC =(((1+Mci/100)x(Wa/Wt+1))-1)x100	

Min. Resistivity (ohm-cm)	Moisture Content (%)	Sulfate Content (ppm)	Chloride Content (ppm)	Soil pH: pH	Soil pH: Temp. (°C)
DOT CA Test 643		DOT CA Test 417 Part II	DOT CA Test 422	DOT CA Test 643	
2050	**19.0**	**177**	**20**	**7.30**	**21.0**



SOIL RESISTIVITY TEST
DOT CA TEST 643

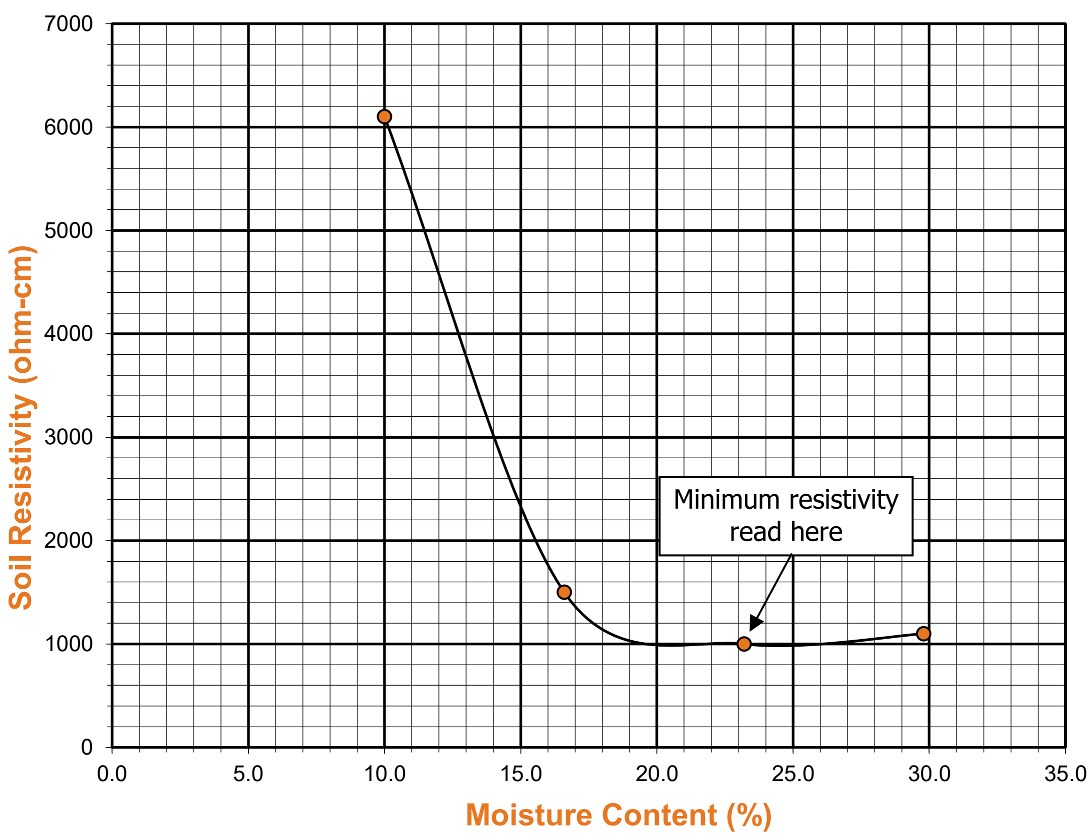
Project Name:	EMWD Brackish Water Transmission Pipeline	Tested By :	M. Vinet	Date:	05/23/23
Project No. :	12893.002	Data Input By:	M. Vinet	Date:	05/23/23
Boring No.:	LB-21	Depth (ft.) :	0 - 5.0		
Sample No. :	B-1				
Soil Identification:*	CL				

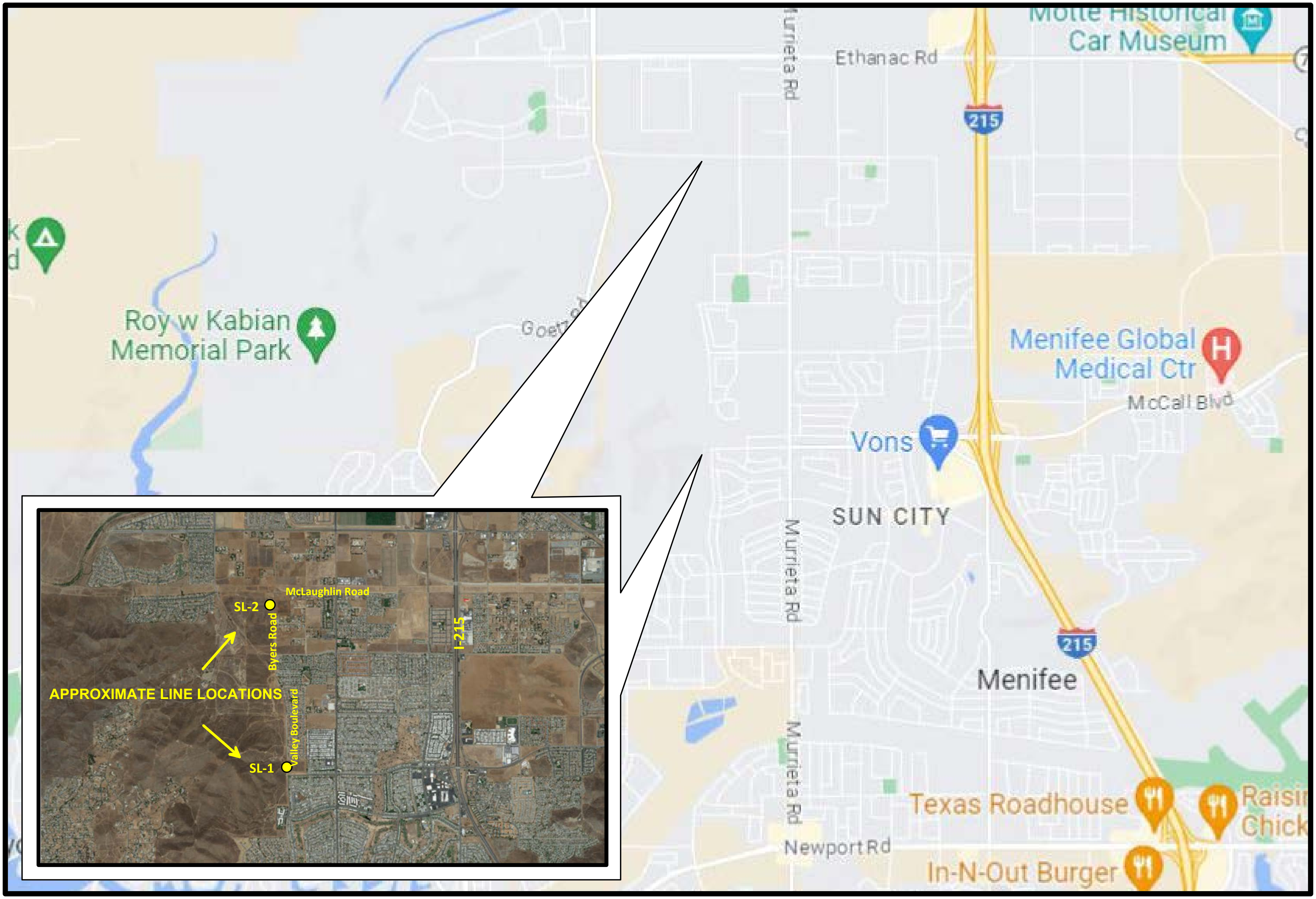
*California Test 643 requires soil specimens to consist only of portions of samples passing through the No. 8 US Standard Sieve before resistivity testing. Therefore, this test method may not be representative for coarser materials.

Specimen No.	Water Added (ml) (Wa)	Adjusted Moisture Content (MC)	Resistance Reading (ohm)	Soil Resistivity (ohm-cm)
1	50	10.00	6100	6100
2	83	16.60	1500	1500
3	116	23.20	1000	1000
4	149	29.80	1100	1100
5				

Moisture Content (%) (MCi)	0.00
Wet Wt. of Soil + Cont. (g)	100.00
Dry Wt. of Soil + Cont. (g)	100.00
Wt. of Container (g)	0.00
Container No.	A
Initial Soil Wt. (g) (Wt)	500.00
Box Constant	1.000
MC =(((1+Mci/100)x(Wa/Wt+1))-1)x100	

Min. Resistivity (ohm-cm)	Moisture Content (%)	Sulfate Content (ppm)	Chloride Content (ppm)	Soil pH	
				pH	Temp. (°C)
DOT CA Test 643		DOT CA Test 417 Part II	DOT CA Test 422	DOT CA Test 643	
1000	**23.2**	**206**	**80**	**7.30**	**21.0**





SITE LOCATION MAP

N

EMWD Valley Boulevard Transmission Pipeline
Menifee, California

Project No.: 9343

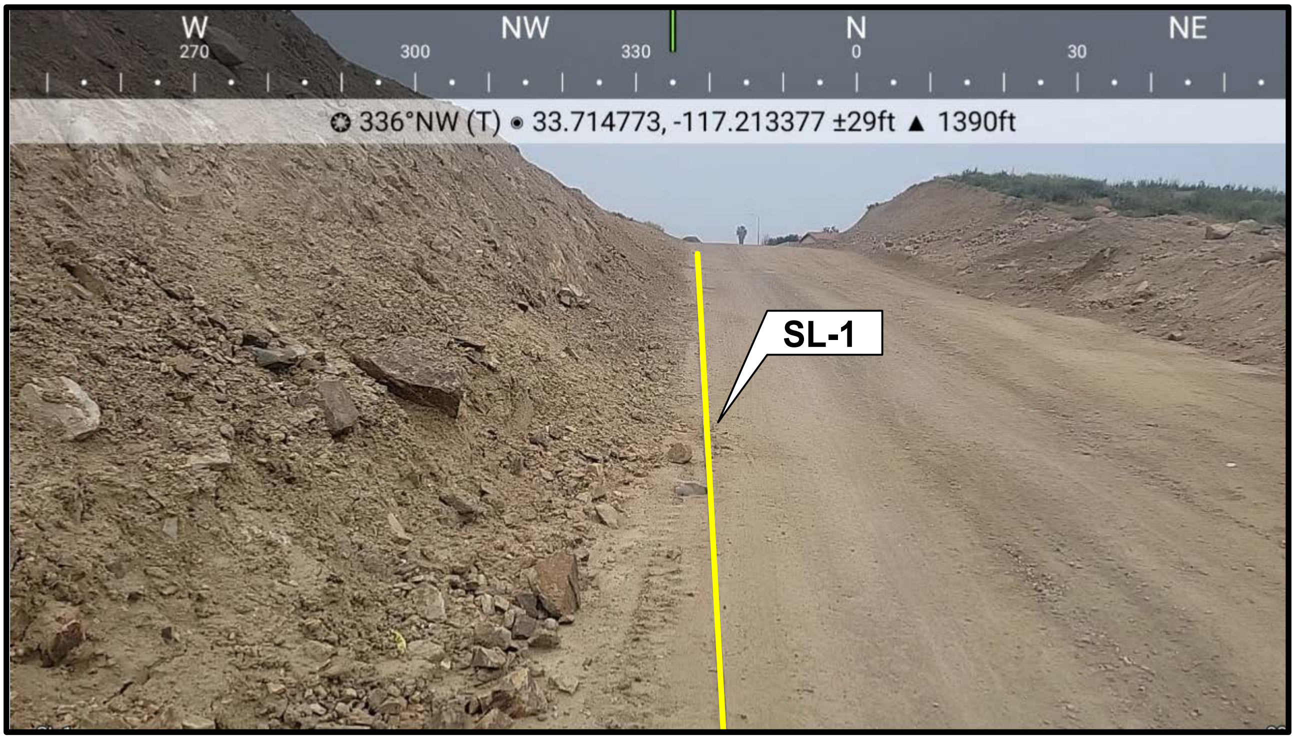
Date: 05/23

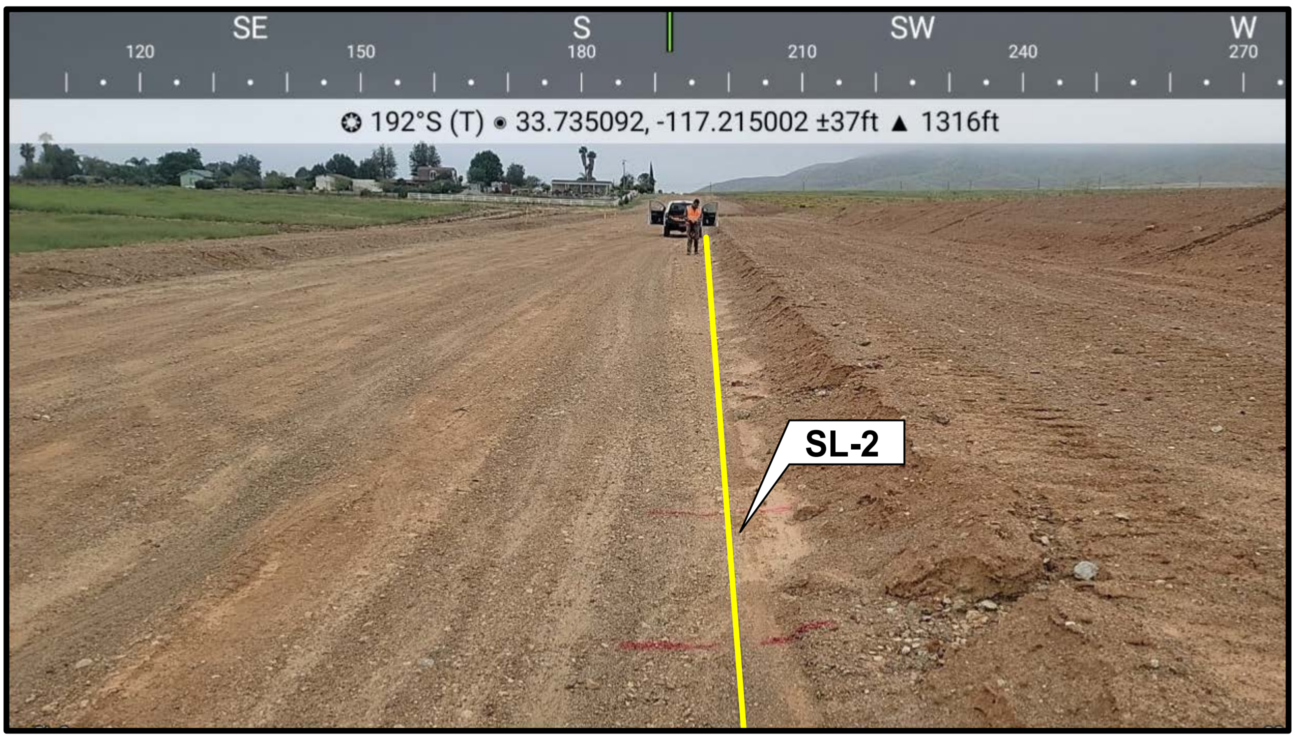
ATLAS

Figure 1

SEISMIC LINE LOCATION MAP **SL-1**	N	EMWD Valley Boulevard Transmission Pipeline Menifee, California Project No.: 9343 · Date: 05/23	ATLAS Figure 2a	Scale (feet) 0 50 100 150 200 250

SEISMIC LINE LOCATION MAP **SL-2**	N	EMWD Valley Boulevard Transmission Pipeline Menifee, California Project No.: 9343 Date: 05/23	ATLAS Figure 2b	Scale (feet) 0 50 100 150 200





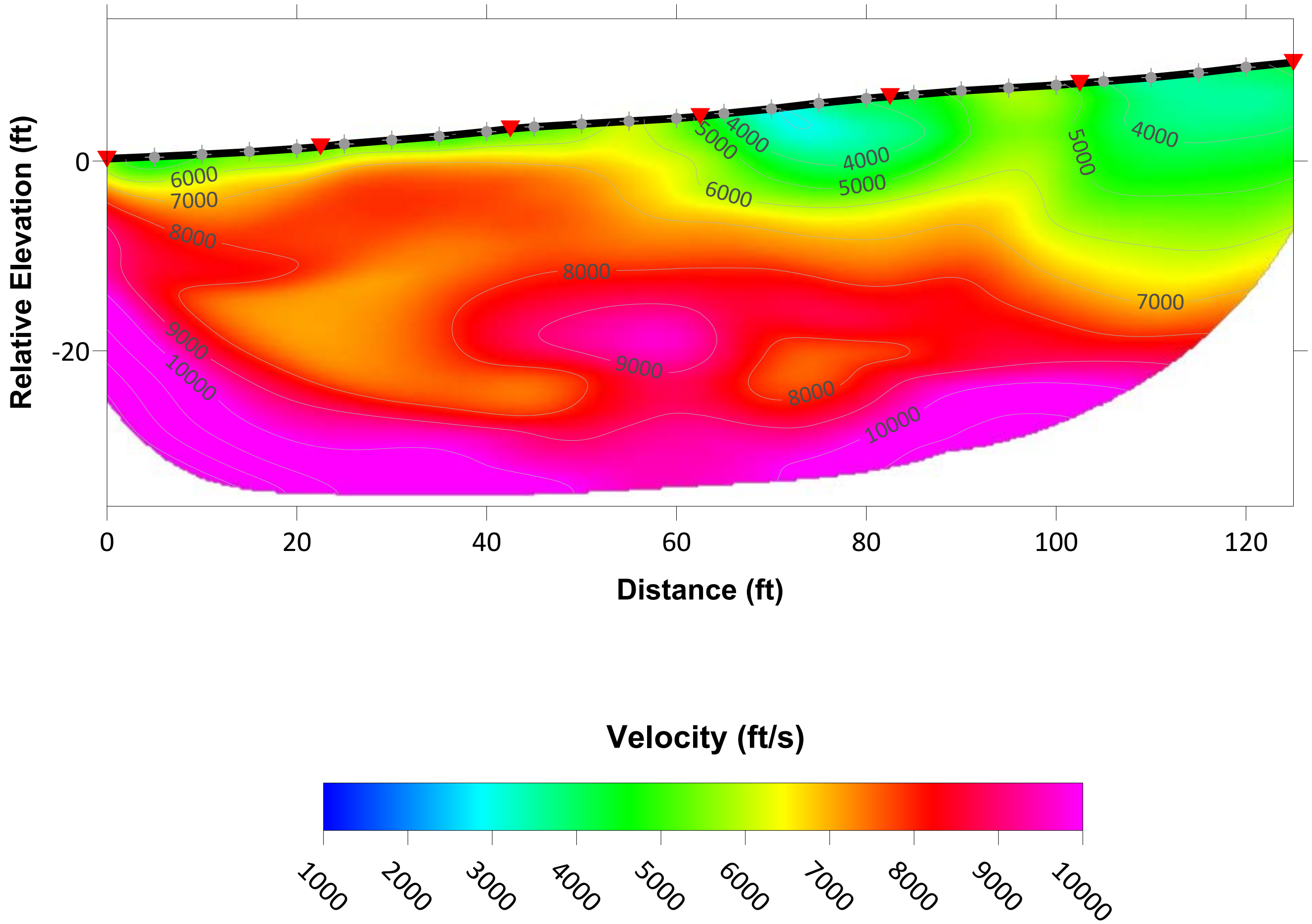
SITE PHOTOGRAPHS	EMWD Valley Boulevard Transmission Pipeline Menifee, California Project No.: 9343 — Date: 05/23	ATLAS Figure 3

LEGEND

Geophone

Shot point

Tomography Model SL-1



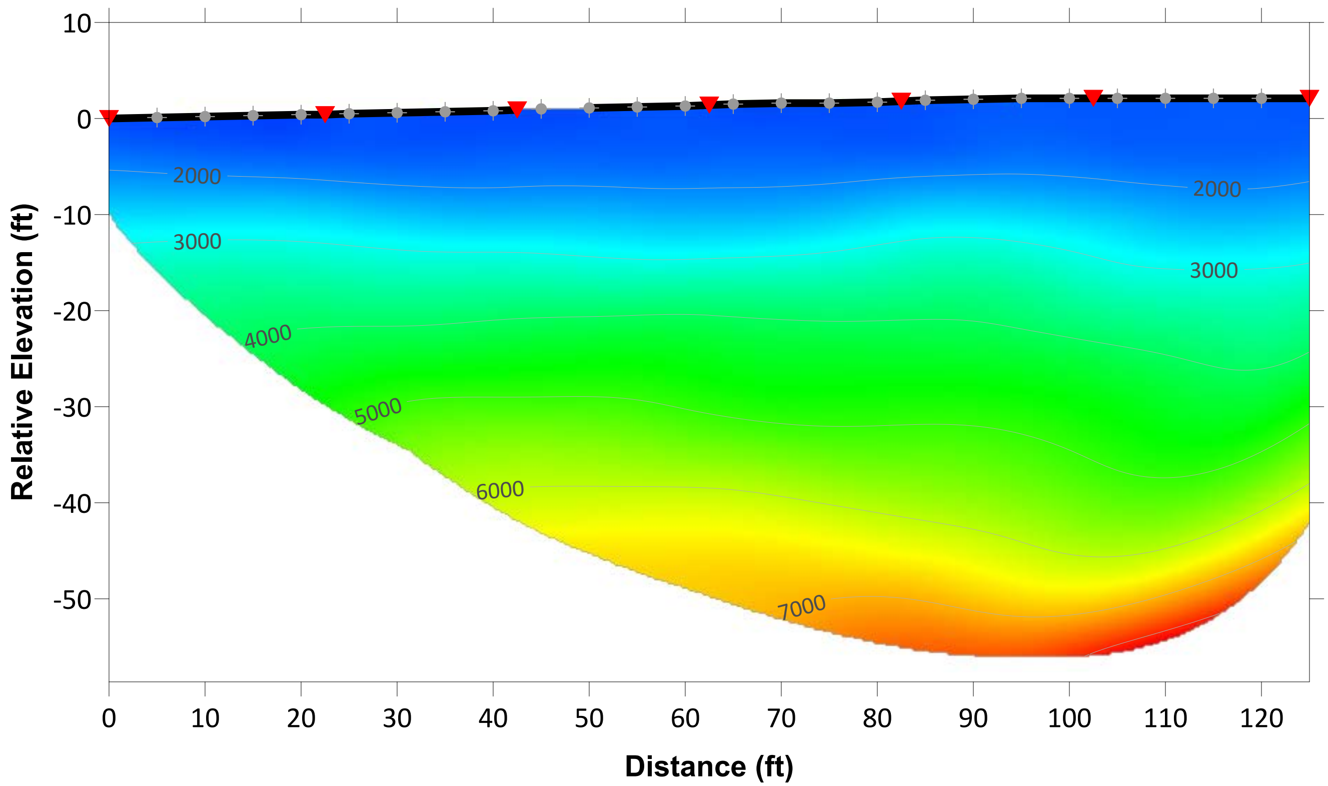
ATLAS	EMWD Valley Boulevard Transmission Pipeline Menifee, California	Project No.: 9343 Date: 05/23	Figure 4a	**P-WAVE PROFILE SL-1**

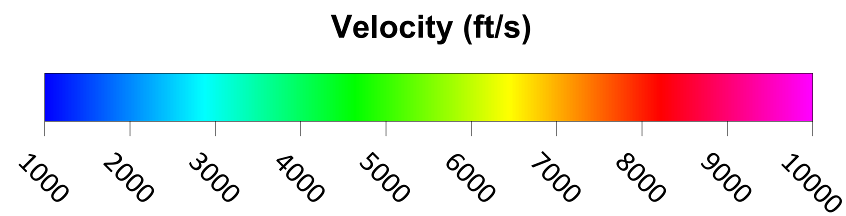
LEGEND

Geophone

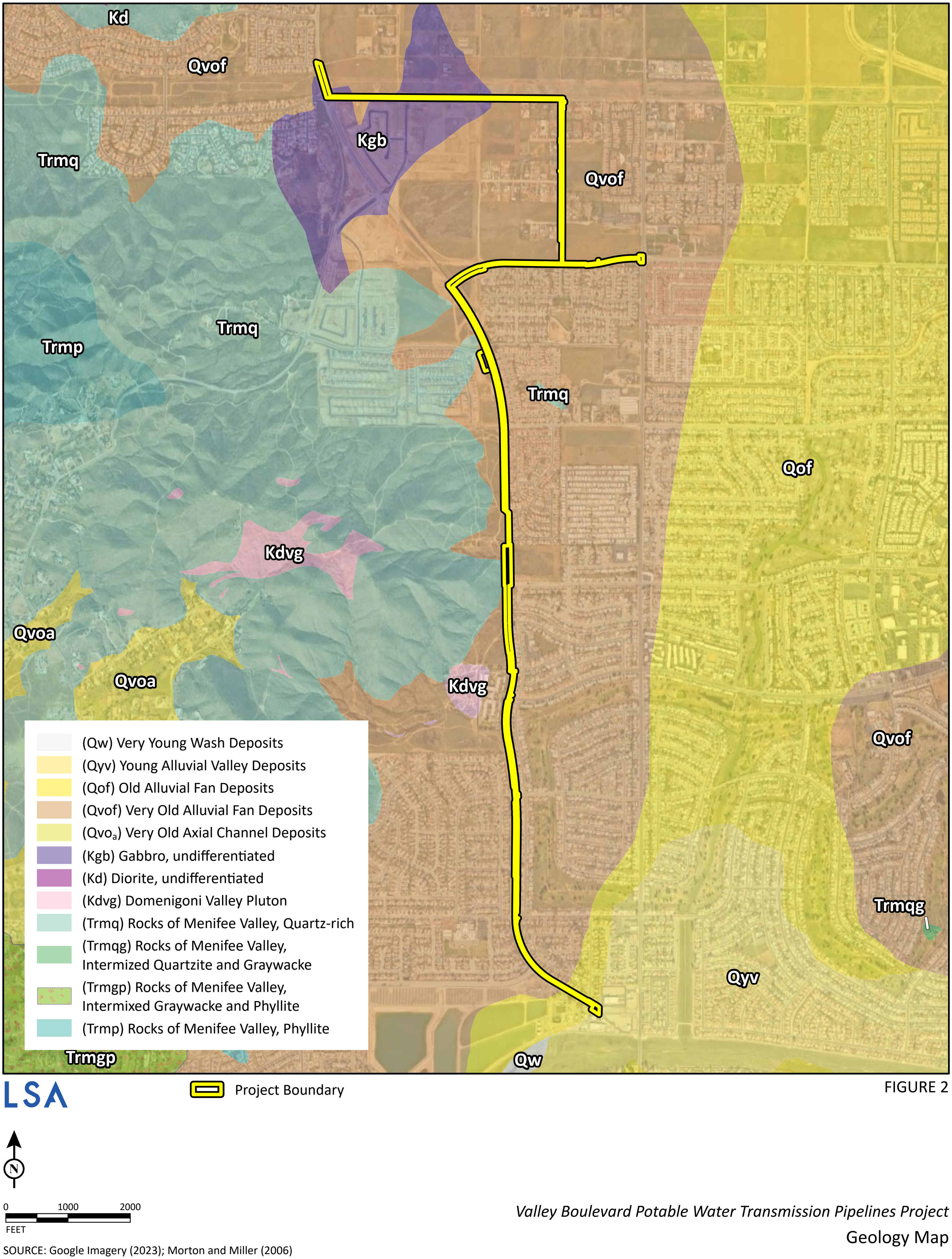
Shot point

Tomography Model SL-2





ATLAS	EMWD Valley Boulevard Transmission Pipeline Menifee, California	Project No.: 9343 Date: 05/23	Figure 4b	**P-WAVE PROFILE SL-2**



LSA

FIGURE 2

Valley Boulevard Potable Water Transmission Pipelines Project

Geology Map

SOURCE: Google Imagery (2023); Morton and Miller (2006)

J:\EWD2101.04\GIS\Pro\Valley Boulevard Potable Water Transmission Pipelines Project\Valley Boulevard Potable Water Transmission Pipelines Project.aprx (5/8/2024)

WESTERN SCIENCE CENTER

April 17th, 2024

LSA Associates, Inc.
Kelly Vreeland
3210 El Camino Real, Ste. 100
Irvine, CA 92602

Hello,

This letter presents the results of a record search conducted for the Valley Boulevard Potable Water Transmission Pipeline Project located in the City of Menifee, Riverside County, CA. The project area spans 4.4 miles along Valley Boulevard to McLaughlin Road/Goetz Road in Township 5 South, Range 3 West, Sections 16, 17, 18, 20, 21, 29, & 32 of the *Romoland, CA* USGS 7.5 minute quadrangle.

The geologic units underlying this project are mapped as alluvial fan deposits from the Pleistocene epoch (Morton, Bovard, and Morton 2003). Pleistocene alluvial units are considered to be highly paleontologically sensitive. The Western Science Center does not have localities within the project area or within a 1 mile radius, but does have localities in similarly mapped units across Southern California.

Any fossil specimen from the Valley Boulevard Potable Water Transmission Pipeline Project would be scientifically significant. Excavation activity associated with the development of the project area would impact the paleontologically sensitive Pleistocene alluvial units, and it is the recommendation of the Western Science Center that a paleontological resource mitigation program be put in place to monitor, salvage, and curate any recovered fossils associated with the study area.

If you have any questions, or would like further information, please feel free to contact me at bstoneburg@westerncentermuseum.org.

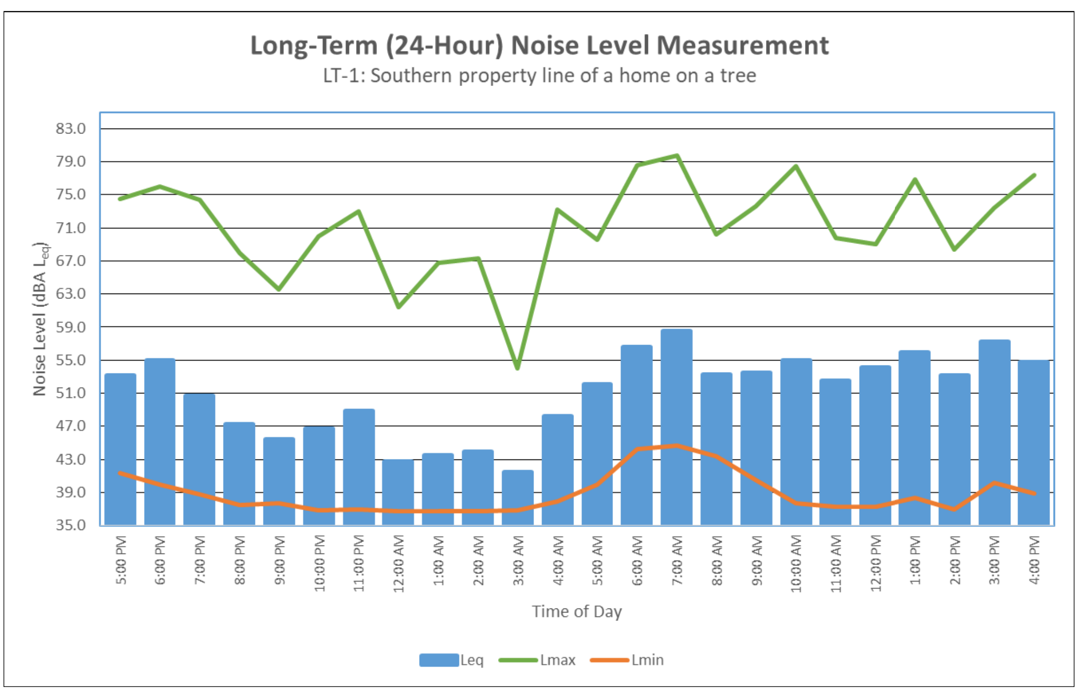
Sincerely,

Brittney Elizabeth Stoneburg, MSc
Collections Manager

Long-Term (24-Hour) Noise Level Measurement Results at LT-1

Start Time	Date	Noise Level (dBA)		
		L_{eq}	L_{max}	L_{min}
5:00 PM	3/18/24	53.1	74.5	41.3
6:00 PM	3/18/24	55.0	76.0	40.0
7:00 PM	3/18/24	50.7	74.4	38.8
8:00 PM	3/18/24	47.3	67.9	37.5
9:00 PM	3/18/24	45.4	63.5	37.7
10:00 PM	3/18/24	46.7	70.0	36.9
11:00 PM	3/18/24	48.9	73.0	37.0
12:00 AM	3/19/24	42.8	61.4	36.7
1:00 AM	3/19/24	43.5	66.8	36.7
2:00 AM	3/19/24	43.9	67.3	36.7
3:00 AM	3/19/24	41.4	54.0	36.9
4:00 AM	3/19/24	48.3	73.2	37.9
5:00 AM	3/19/24	52.1	69.6	40.0
6:00 AM	3/19/24	56.6	78.6	44.2
7:00 AM	3/19/24	58.5	79.8	44.7
8:00 AM	3/19/24	53.3	70.2	43.4
9:00 AM	3/19/24	53.4	73.6	40.5
10:00 AM	3/19/24	54.9	78.5	37.7
11:00 AM	3/19/24	52.5	69.8	37.3
12:00 PM	3/19/24	54.1	69.0	37.3
1:00 PM	3/19/24	56.0	76.9	38.4
2:00 PM	3/19/24	53.1	68.4	37.0
3:00 PM	3/19/24	57.2	73.4	40.2
4:00 PM	3/19/24	54.8	77.4	38.9

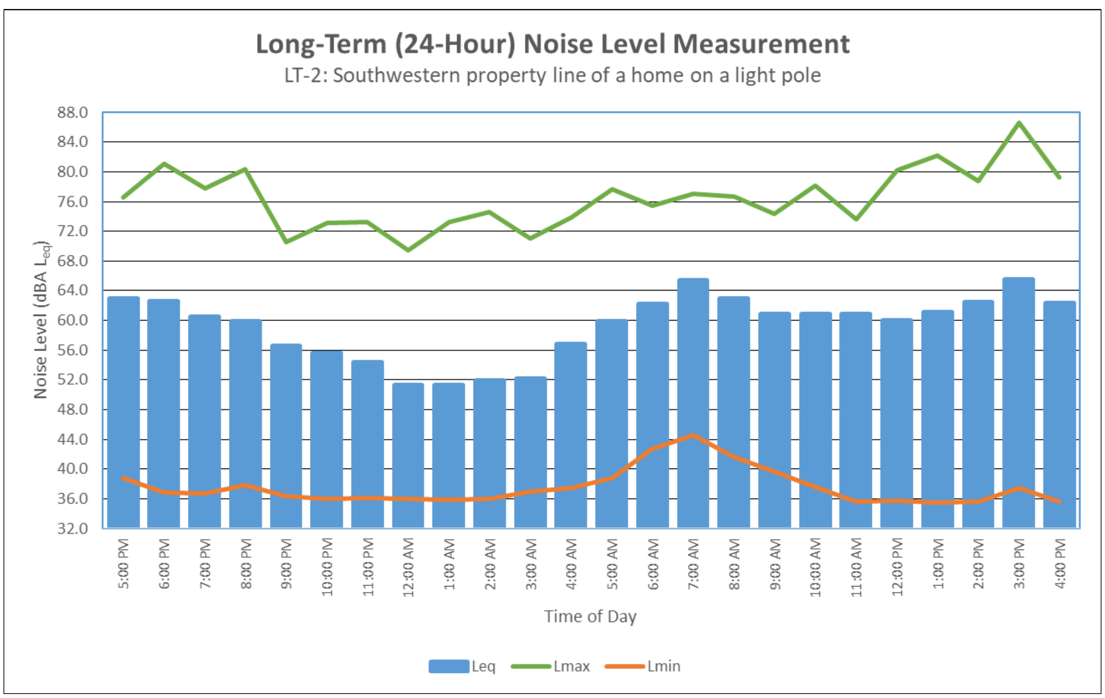
Source: Compiled by LSA Associates, Inc. (2024).
dBA = A-weighted decibel
L_{eq} = equivalent continuous sound level
L_{max} = maximum instantaneous noise level
L_{min} = minimum measured sound level



Long-Term (24-Hour) Noise Level Measurement Results at LT-2

Start Time	Date	Noise Level (dBA)		
		L_{eq}	L_{max}	L_{min}
5:00 PM	3/18/24	63.0	76.6	38.8
6:00 PM	3/18/24	62.6	81.1	36.9
7:00 PM	3/18/24	60.4	77.8	36.7
8:00 PM	3/18/24	59.8	80.3	37.8
9:00 PM	3/18/24	56.6	70.6	36.4
10:00 PM	3/18/24	55.6	73.1	36.0
11:00 PM	3/18/24	54.3	73.3	36.1
12:00 AM	3/19/24	51.3	69.5	36.0
1:00 AM	3/19/24	51.3	73.3	35.9
2:00 AM	3/19/24	51.9	74.6	36.0
3:00 AM	3/19/24	52.1	71.0	37.0
4:00 AM	3/19/24	56.8	73.8	37.4
5:00 AM	3/19/24	59.9	77.7	38.8
6:00 AM	3/19/24	62.2	75.4	42.7
7:00 AM	3/19/24	65.4	77.1	44.6
8:00 AM	3/19/24	63.0	76.7	41.6
9:00 AM	3/19/24	60.9	74.3	39.6
10:00 AM	3/19/24	60.8	78.2	37.6
11:00 AM	3/19/24	60.9	73.6	35.6
12:00 PM	3/19/24	60.0	80.2	35.7
1:00 PM	3/19/24	61.2	82.2	35.5
2:00 PM	3/19/24	62.5	78.8	35.6
3:00 PM	3/19/24	65.6	86.6	37.4
4:00 PM	3/19/24	62.3	79.3	35.6

Source: Compiled by LSA Associates, Inc. (2024).
dBA = A-weighted decibel
L_{eq} = equivalent continuous sound level
L_{max} = maximum instantaneous noise level
L_{min} = minimum measured sound level



Long-Term (24-Hour) Noise Level Measurement Results at LT-3

Start Time	Date	Noise Level (dBA)		
		L_{eq}	L_{max}	L_{min}
5:00 PM	3/18/24	58.5	82.3	37.6
6:00 PM	3/18/24	55.5	78.4	35.6
7:00 PM	3/18/24	54.8	77.4	35.7
8:00 PM	3/18/24	56.6	80.7	36.8
9:00 PM	3/18/24	55.5	82.6	36.7
10:00 PM	3/18/24	53.6	79.7	36.9
11:00 PM	3/18/24	51.2	76.4	35.9
12:00 AM	3/19/24	42.1	65.3	36.0
1:00 AM	3/19/24	44.2	72.2	35.8
2:00 AM	3/19/24	46.7	75.8	36.0
3:00 AM	3/19/24	43.3	71.1	37.0
4:00 AM	3/19/24	55.4	75.3	37.8
5:00 AM	3/19/24	48.2	71.6	39.8
6:00 AM	3/19/24	54.6	78.6	43.6
7:00 AM	3/19/24	56.9	79.4	44.8
8:00 AM	3/19/24	56.8	79.0	44.0
9:00 AM	3/19/24	55.3	77.9	39.3
10:00 AM	3/19/24	56.8	87.6	37.0
11:00 AM	3/19/24	52.8	79.3	36.4
12:00 PM	3/19/24	53.6	77.3	35.8
1:00 PM	3/19/24	55.1	82.1	36.1
2:00 PM	3/19/24	56.7	77.5	35.3
3:00 PM	3/19/24	57.4	80.6	36.5
4:00 PM	3/19/24	60.0	86.8	35.4

Source: Compiled by LSA Associates, Inc. (2024).
dBA = A-weighted decibel
L_{eq} = equivalent continuous sound level
L_{max} = maximum instantaneous noise level
L_{min} = minimum measured sound level