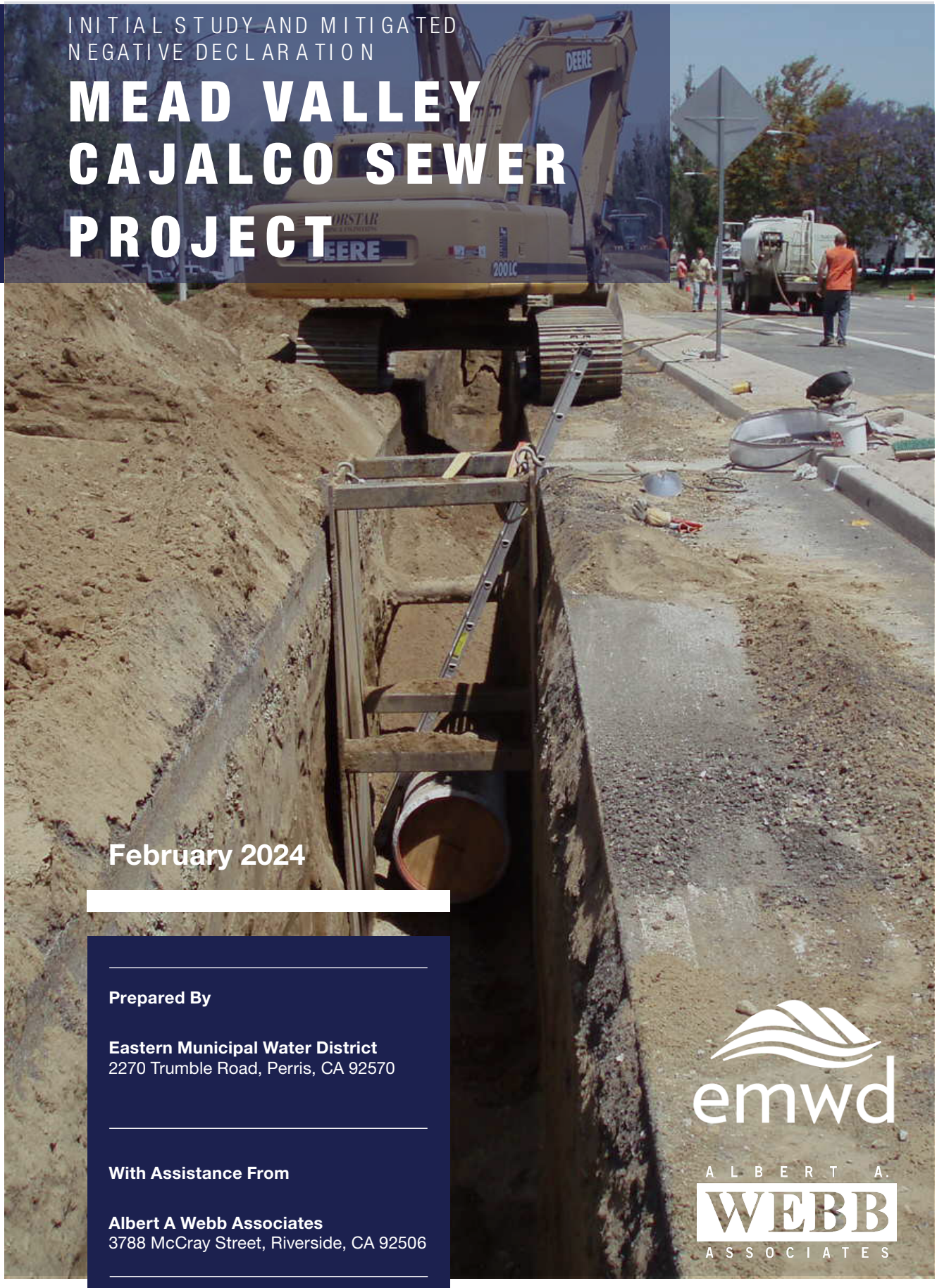
INITIAL STUDY AND MITIGATED NEGATIVE DECLARATION

MEAD VALLEY CAJALCO SEWER PROJECT



February 2024

Prepared By

Eastern Municipal Water District
2270 Trumble Road, Perris, CA 92570

With Assistance From

Albert A Webb Associates
3788 McCray Street, Riverside, CA 92506

emwd

ALBERT A. WEBB ASSOCIATES

Initial Study and Mitigated Negative Declaration

Mead Valley Cajalco Sewer Project

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With Assistance From:

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3788 McCray Street
Riverside, CA 92506

February 2024

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Acronyms

Acronym	Definition
AB	Assembly Bill
AQMP	Air Quality Management Plan
Basin Plan	Santa Ana Basin Water Quality Control Plan
BMPs	Best Management Practices
CAAQS	California Ambient Air Quality Standards
Caltrans	California Department of Transportation
CAP	Climate Action Plan
CDFW	California Department of Fish and Wildlife
CDOC	California Department of Conservation
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CHRIS	California Historical Resources Information System
CNEL	Community Noise Equivalent Level
CH_4	methane
CO	Carbon monoxide
CO_2e	carbon dioxide equivalent
dB	decibel
dBA	a-weighted decibel
DNL or L_{dn}	day-night average sound level
DTSC	California Department of Toxic Substances Control
DWR	California Department of Water Resources
EO	Executive Order
EOP	Emergency Operations Plan
EIC	Eastern Information Center
EIR	Environmental Impact Report
EMWD	Eastern Municipal Water District
US EPA	U.S. Environmental Protection Agency
FEMA	U.S. Department of Homeland Security Federal Emergency Management Agency

Acronym	Definition
FHWA	U.S. Department of Transportation Federal Highway Administration
FTA	U.S. Department of Transportation Federal Transit Administration
FRAP	California Department of Forestry and Fire Protection's Fire and Resource Assessment Program
GHG	greenhouse gas
GSA	Groundwater Sustainability Agency
GSP	Groundwater Sustainability Plan
GWP	global warming potential
H_2S	hydrogen sulfide
HCP	Habitat Conservation Plan
IBC	International Building Code
IS	Initial Study
IS/MND	Initial Study/Mitigated Negative Declaration
kHz	kilohertz
Pb	lead
L_{eq}	equivalent sound level
L_{10}	ten-percentile exceeded sound level
LHMP	Local Hazard Mitigation Plan
LST	localized significance thresholds
ND	Negative Declaration
N_2O	nitrous oxide
NO_2	nitrogen dioxide
NO_X	Nitrogen oxides
MARB	March Air Reserve Base
mgd	million gallons per day
MND	Mitigated Negative Declaration
MBTA	Migratory Bird Treaty Act
MMRP	Mitigation Monitoring and Reporting Program
MSHCP	Multiple Species Habitat Conservation Plan
MT	metric tons
MWD	Metropolitan Water District of Southern California

Acronym	Definition
NAAQS	National Ambient Air Quality Standards
NHMLA	Natural History Museum of Los Angeles County
NPDES	National Pollutant Discharge Elimination System
O_3	ozone
O&M	operations and maintenance
OHP	Office of Historic Preservation
OPR	Governor's Office of Planning and Research
$PM_{2.5}$	particulate matter with diameters that are generally <2.5 micrometers
PM_{10}	particulate matter with diameters that are generally <10 micrometers
PPV	peak particle velocity
PRC	Public Resources Code
RCFCWCD	Riverside County Flood Control and Water Conservation District
rms	root mean square
RTA	Riverside Transit Agency
RWQCB	Regional Water Quality Control Board
RWRF	regional water reclamation facility
SB	Senate Bill
Basin	South Coast Air Basin
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SCE	Southern California Edison
SGMA	Sustainable Groundwater Management Act
SO_2	sulfur dioxide
SRA	Source Receptor Area
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TACs	Toxic air contaminants
TMDL	total maximum daily load
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service

Acronym	Definition
USGS	U.S. Geological Survey
VdB	vibration decibels
VMT	vehicle miles traveled
VHFHSZ	very high fire hazard severity zone
VOC	volatile organic compound
WEAP	Worker Environmental Awareness Program
WRCOG	Western Riverside Council of Governments

1. INTRODUCTION

1.1 Purpose of this Document

Eastern Municipal Water District (EMWD) has prepared this Initial Study (IS) to evaluate the potential environmental impacts related to implementation of the Mead Valley Cajalco Sewer Project (the "proposed Project" or "Project"), which consists of construction of a sewer pipeline and the removal of an existing lift station.

EMWD is the lead agency under the California Environmental Quality Act (CEQA) for the proposed Project. CEQA requires that the lead agency prepare an IS to determine whether an Environmental Impact Report (EIR), Negative Declaration (ND), or Mitigated Negative Declaration (MND) is needed. EMWD has prepared this IS to evaluate the potential environmental consequences associated with the Mead Valley Cajalco Sewer Project, and to disclose to the public and decision makers the potential environmental effects of the proposed Project. Based on the analysis presented herein, an MND is the appropriate level of environmental documentation for the proposed Project.

1.2 Scope of this Document

This IS/MND has been prepared in accordance with CEQA (as amended) (Public Resources Code Section 21000 et. seq.) and the State CEQA Guidelines (California Code of Regulations, Title 14, Chapter 3, Section 15000 et. seq.), as updated on December 28, 2018. CEQA Guidelines Section 15063 describes the requirements for an IS and Sections 15070–15075 describe the process for the preparation of an MND. Where appropriate, this document refers to either the CEQA Statute or State CEQA Guidelines (as amended in December 2018). This IS/MND contains all of the contents required by CEQA, which includes a project description, a description of the environmental setting, potential environmental impacts, mitigation measures for any significant effects, consistency with plans and policies, and names of preparers.

This IS/MND evaluates the potential for environmental impacts to resource areas identified in Appendix G of the State CEQA Guidelines (as amended in December 2018). The environmental resource areas analyzed in this document include:

- Aesthetics
- Agriculture and Forestry Resources
- Air Quality
- Biological Resources
- Cultural Resources
- Energy
- Geology and Soils
- Land Use and Planning
- Mineral Resources
- Noise
- Population and Housing
- Public Services
- Recreation
- Transportation
- Tribal Cultural Resources

- Greenhouse Gas Emissions
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Utilities and Service Systems
- Wildfire
- Mandatory Findings of Significance

1.3 CEQA Process

In accordance with CEQA Guidelines Section 15073, this Draft IS/MND will be circulated for a 30-day public review period February 16, 2024 – March 18, 2024 to local and state agencies, and to interested organizations and individuals who may wish to review and comment on the report. EMWD will circulate the Draft IS/MND to the State Clearinghouse for distribution to State agencies. In addition, EMWD will circulate a Notice of Intent to Adopt a Mitigated Negative Declaration to the Riverside County Clerk, responsible agencies, and interested entities. A copy of the Draft IS/MND is available for review at: https://www.emwd.org/public-notices.

Written comments can be submitted to EMWD by 5:00 p.m. on March 18, 2024 and addressed to:

Joseph Broadhead, Principal Water Resources Specialist – CEQA/NEPA
Eastern Municipal Water District
2270 Trumble Road
P.O. Box 8300
Perris, CA 92572-8300
broadhej@emwd.org

Following the 30-day public review period, EMWD will evaluate all comments received on the Draft IS/MND and incorporate any substantial evidence that the proposed project could have an impact on the environment into the Final IS/MND and prepare a Mitigation Monitoring and Reporting Program (MMRP).

The IS/MND and MMRP will be considered for adoption by the EMWD Board of Directors in compliance with CEQA at a future publicly noticed hearing, which are held on the 1st and 3rd Wednesday of each month at EMWD's headquarters.

1.4 Impact Terminology

The level of significance for each resource area uses CEQA terminology as specified below:

No Impact. No adverse environmental consequences have been identified for the resource or the consequences are negligible or undetectable.

Less than Significant Impact. Potential adverse environmental consequences have been identified. However, they are not adverse enough to meet the significance threshold criteria for that resource. No mitigation measures are required.

Less than Significant with Mitigation Incorporated. Adverse environmental consequences that have the potential to be significant but can be reduced to less than significant levels through the application of identified mitigation strategies that have not already been incorporated into the proposed project.

Potentially Significant. Adverse environmental consequences that have the potential to be significant according to the threshold criteria identified for the resource, even after mitigation strategies are applied and/or an adverse effect that could be significant and for which no mitigation has been identified. If any potentially significant impacts are identified, an EIR must be prepared to meet the requirements of CEQA.

2. PROJECT DESCRIPTION

2.1 Project Overview

The Mead Valley Cajalco Sewer Project ("Project" or "proposed Project"), partially funded by the American Rescue Plan Act (ARPA) in partnership with the County of Riverside (County), involves the construction of approximately 12,600 linear feet of 8-inch to 15-inch diameter polyvinyl chloride (PVC) or vitrified clay pipe (VCP) gravity trunk sewer pipeline (including 4-to-5-foot manholes), and removal of the existing Clark Street Sewer Lift Station. The Project is located within the Mead Valley community located west of the City of Perris within the unincorporated area of Riverside County. (see **Figure 1 – Regional Location Map)** . Please refer to *Section 2.5 Proposed Project Description* for a detailed description of the Project components.

2.2 Project Purpose

The overall goal of the Project is to install a trunk sewer in Mead Valley, as described below in *Section 2.3 Project Location,* and redirect existing flow to the proposed trunk sewer in order to decommission the Clark Street Lift Station.

2.3 Project Location

The proposed Project is in the unincorporated Mead Valley area of Riverside County, located west of the City of Perris. (See **Figure 1** – Regional Location Map) The Project would be constructed entirely within Cajalco Road from Carpinus Drive to Day Street. (See **Figure 2 – Project**) The Project site is located entirely within Sections 8, 9, and 10 of Township 4 South, Range 4 West on the United States Geological Survey Steele Peak, California 7.5-Minute Quadrangle Map.

2.4 Environmental Setting

Refer to Section 3 *Environmental Checklist Form* for a discussion of the environmental setting applicable to each of the environmental factors evaluated.

2.4.1 Existing Site Conditions

The Project site, as shown in **Figure 4 – Existing Conditions**, is located on Cajalco Road which is a heavily traveled arterial road which connects I-15 and I-215. The Project site extends from Carpinus Drive to Day Street. Between Clark Street and Day Street, there is an existing 6-inch force main line that connects to an 18-inch sewer line. (DPR, p. 1.) Cajalco Road is a two-lane arterial road for the entire extent of the Project site with turn lanes at every intersection. Cajalco Road is bordered by residential, commercial, and undeveloped lots. The speed limit is 45 mph. There are no paved sidewalks along the roadway but there are bike lanes on each side of the road. The Project site crosses existing Cajalco Creek culverts (Arizona crossings) at Cajalco Road at Barton Street and Brown Street. The area near the western portion of the Project site contains willows that have been disturbed by past fires and clearing activities, (WEBB-B 2023, p. 21.)

Staging Area 1, which includes the Clark Street Lift Station, is located at the southwest corner of Cajalco Road and Clark Street. The lift station is enclosed by a chain link fence and contains paved and unpaved surfaces, an electrical panel, emergency generator, various sewer pumps, one wet well approximately 20-feet deep and 8-feet in diameter, and two submersible pumps. Influent flow is routed into the wet well from Clark Street via an 8-inch PVC sewer line. Effluent flow is routed north to Cajalco Road and is pumped east to a discharge manhole at Cajalco Road and Day Street.

Staging Area 2, located at the southeast corner of Elmwood Street and Carroll Street, is a fenced undeveloped parcel that is disturbed and contains mostly unpaved surfaces and portions of Staging Area 2 is used for storage and parking.

Staging Area 3, located at 22391 Cajalco Road, is a fenced EMWD-owned property that contains a 1.25 million-gallon (MG) water storage tank and associated appurtenances with paved and unpaved surfaces.

2.5 Proposed Project Description

The Project would construct approximately 12,600 linear feet of 8-inch to 15-inch diameter of polyvinyl chloride (PVC) or vitrified clay pipe (VCP) gravity trunk sewer and associated appurtenances along Cajalco Road in unincorporated Mead Valley. The Project would also remove the existing EMWD Clark Street Lift Station, and redirect EMWDs existing sewer flows to Western Municipal Water District's (WMWD's) existing 15-inch sewer line near the Cajalco Road and Carpinus Street intersection. Details are provided in the following subsections.

2.5.1 Flow Swap

The District and Western discussed the redirected flows and Western's facility capacities on December 12, 2023 and January 9, 2024. Western concluded that capacity exists at their Markham Lift Station and Treatment Plant to manage the District's existing flows. Buildout flows are not anticipated within the defined "near-term" through 2030. As such, Western will incorporate those future flows as part of Western's system-wide masterplan and CIP improvement priorities. The masterplan will establish a prioritization list of future system infrastructure expansion projects as determined by Western to adequately address capacity needs from buildout flows.

2.5.2 Sewer line and Associated Appurtenances Construction

The Project entails the construction of approximate 12,600 linear feet of 8-inch diameter polyvinyl chloride (PVC) sewer pipeline to 15-inch diameter vitrified clay pipe (VCP) sewer pipeline within Cajalco Road from Day Street to Carpinus Street. The majority of the Project site would require trenching, except at Cajalco Creek, where trenchless construction is anticipated. The depth of proposed pipelines would not exceed 20 feet in depth.

The Project also entails the construction of 12-inch to 15-inch precast polymer concrete manholes every 500 feet. The manholes would be installed at changes in alignment, and

at intersections to capture potential future inflow. Sections of ballast would be installed to provide stability and keep the pipeline from moving in areas where shallow groundwater occurs. A dead end manhole to remove receiving flows east of Day Street is proposed near the intersection of Cajalco Road and Day Street. A portion of the proposed sewer line in Cajalco Road, west of Day Street, which would be approximately 400-feet long, would not contain enough flows to self-clean because the dead end manhole is just upstream. This portion of the sewer line would be regularly maintained, at least twice a year, to meet EMWDs self-cleaning velocities. The existing 6-inch force main line between Day Street and Clark Street would no longer be used and would be left in place, that is, this segment of pipeline would not be removed.

Groundwater seepage may occur during construction activities in those areas of the Project site where there is high perched groundwater. The contractor may determine their means and methods of how to handle the groundwater depending on where it is encountered. At this time, it's assumed the groundwater could be pumped into a tank truck and then used within the Project site or on nearby lands for irrigation or dust control purposes. The application rate will ensure no site runoff occurs.

2.5.3 Clark Street Sewer Lift Station

The Project includes removal of the Clark Street lift station and associated sewer connections to re-direct the existing sewer flows to the Project's new sewer line. The above ground structures at the lift station site would be demolished and removed. Buried on-site utilities up to three feet below the soil surface would also be removed. This site would then be stabilized with a layer of crushed rock and resurfaced. The lift station decommissioning process includes filling the existing manhole in Clark Street and plugging the existing PVC gravity sewer at the wet wall and abandoning the pipe in place.

2.5.4 Construction Schedule

Project construction is anticipated to begin in approximately April 2024 and continue until December 2025. Construction would include the following three construction activities:

- Trenching/Pipeline installation Activities – April 1, 2024 to September 30, 2025
- Paving – October 1, 2025 to October 15, 2025
- Lift Station Decommissioning – October 16, 2025 to December 16, 2025

The majority of construction would take place Monday through Friday during daytime hours of 7:00 a.m. to 6:00 p.m. Because some areas of the Project site are narrow and Project construction would lead to lane closures, night and weekend construction would be required on portions of the Project site.

Construction of the pipelines would require the estimated offroad construction equipment shown in **Table 2-1**.

Table 2-1: Offroad Construction Equipment

Construction Activity	Construction Equipment	Unit Amount
Trenching (Grading and Excavation)	Excavators	2
	Rollers	2
	Rubber Tired Loaders	1
	Tractors/Loaders/Backhoes	2
Paving (Linear Paving)	Pavers	1
	Paving Equipment	1
	Rollers	3
	Tractors/Loaders/Backhoes	2
Lift Station Decommissioning/Demo (Grubbing & Land Clearing)	Crawler Tractors	1
	Crush Processing Equipment	1
	Excavators	1

2.5.5 Equipment Staging Areas

Three construction staging area options are included in this environmental analysis (See **Figure 2 – Project Site**). These three staging areas would be used for stockpiling, storage, and parking. No construction activities would occur. Staging Areas 1 and 3 are both owned by EMWD. Staging Area 1 is located at the existing Clark Street Lift Station, on the corner of Clark Street and Cajalco Road. This area is approximately 6.78 acres. Staging Area 3 is located along Cajalco Road between Day Street and Decker Road and is approximately 6.06 acres. Staging Area 2 is not owned by EMWD, but it is part of an existing vacant lot which has been highly disturbed. This lot is located south of Cajalco Road on the corner of Caroll Street and Elmwood Street. The approximate acreage of this area is 4.4 acres. The site conditions of staging areas used would be returned to existing conditions following construction of the pipeline and removal of the lift station.

2.6 Operations

Project O&M activities would only include pipeline inspection and repair, as necessary.

2.7 Environmental Commitments

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

- The design and construction of the facilities would be based on the geotechnical investigation report (Appendix D: Atlas 2023) to minimize geological risk.
- According to the geotechnical investigation report (Appendix D: Atlas 2023), high groundwater levels along the pipeline alignment are anticipated to be deeper than 10 feet below the existing ground surface. During construction, temporary

groundwater seepage may occur and a dewatering system would be designed as part of final design.

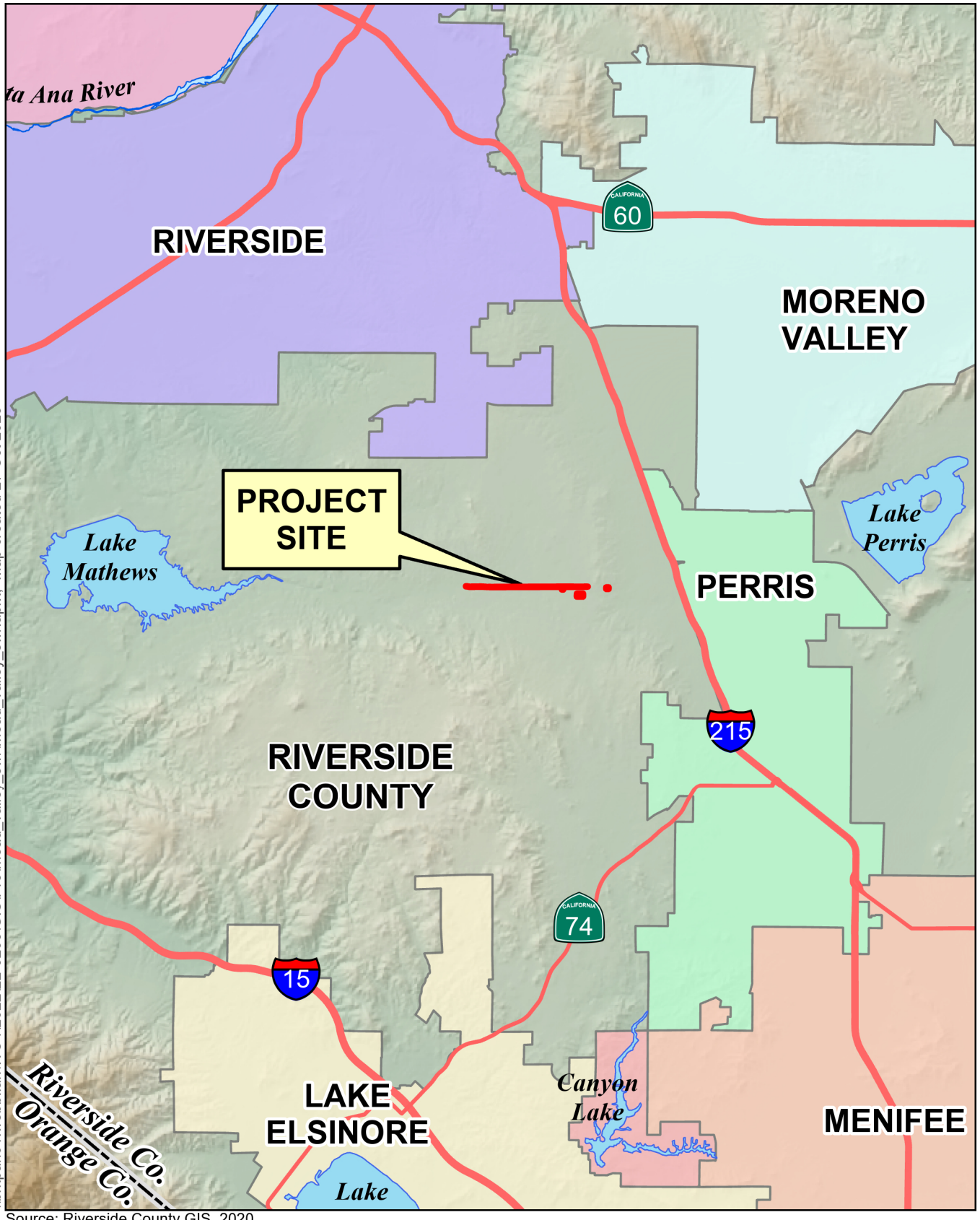
- "A traffic control plan (TCP) will be approved for all construction work within public roadways. The TCP will be prepared in accordance with US Department of Transportation Manual of Uniform Traffic Control Devices, the California Department of Transportation Manual of Uniform Traffic Control Devices, 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 work is not being performed, trenches would be covered with an appropriate cover to restore normal traffic flow."
- All construction work would require the contractor to implement fire hazard reduction measures, such as having fire extinguishers located onsite, use of spark arrestors on equipment and using a spotter during welding activities.
- Open trenches shall be covered with recessed trench plates during non-construction periods in accordance with encroachment permits.
- Construction would comply with 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 offsite, according to the SWPPP, such as site management "housekeeping," erosion control, sediment control, tracking control and wind erosion control.
- EMWD is required to comply with all relevant and applicable federal, State and local laws and regulations that pertain to the transport, storage, use, and disposal of hazardous materials and waste during construction of proposed facilities. Cal/OSHA regulations provide for the proper labeling, storage, and handling of hazardous materials to reduce the potential harmful health effects that could result from worker exposure to hazardous materials.
- Specifications would require the contractor to implement standard fire prevention measures. EMWD Specifications Detailed Provisions Section 02201 – Construction Methods & Earthwork of the Standard Detailed Provisions (EMWD 2015) include the entire work and site, including storage areas, is inspected at frequent intervals to verify that fire prevention measures are constantly enforced; fully charged fire extinguishers of the appropriate type, supplemented with temporary fire hoses wherever an adequate water supply exists, are furnished and maintained; and flammable materials are stored in a manner that prevents spontaneous combustion or dispersion.

2.8 Required Permits and Approvals

Anticipated permits are identified in **Table 2-2**.

Table 2-2: Permits and Approvals

Agency	Permit/Approval
County of Riverside	Encroachment Permit
South Coast Air Quality Management District	Dust Control Permits
Riverside County Flood Control and Water Conservation District	Encroachment Permit
State Water Resources Control Board	NPDES Construction General Permit for Storm Water Discharges NPDES De Minimum Threat Discharge
California Occupational Safety and Health Administration	Trenching/Shoring Permit



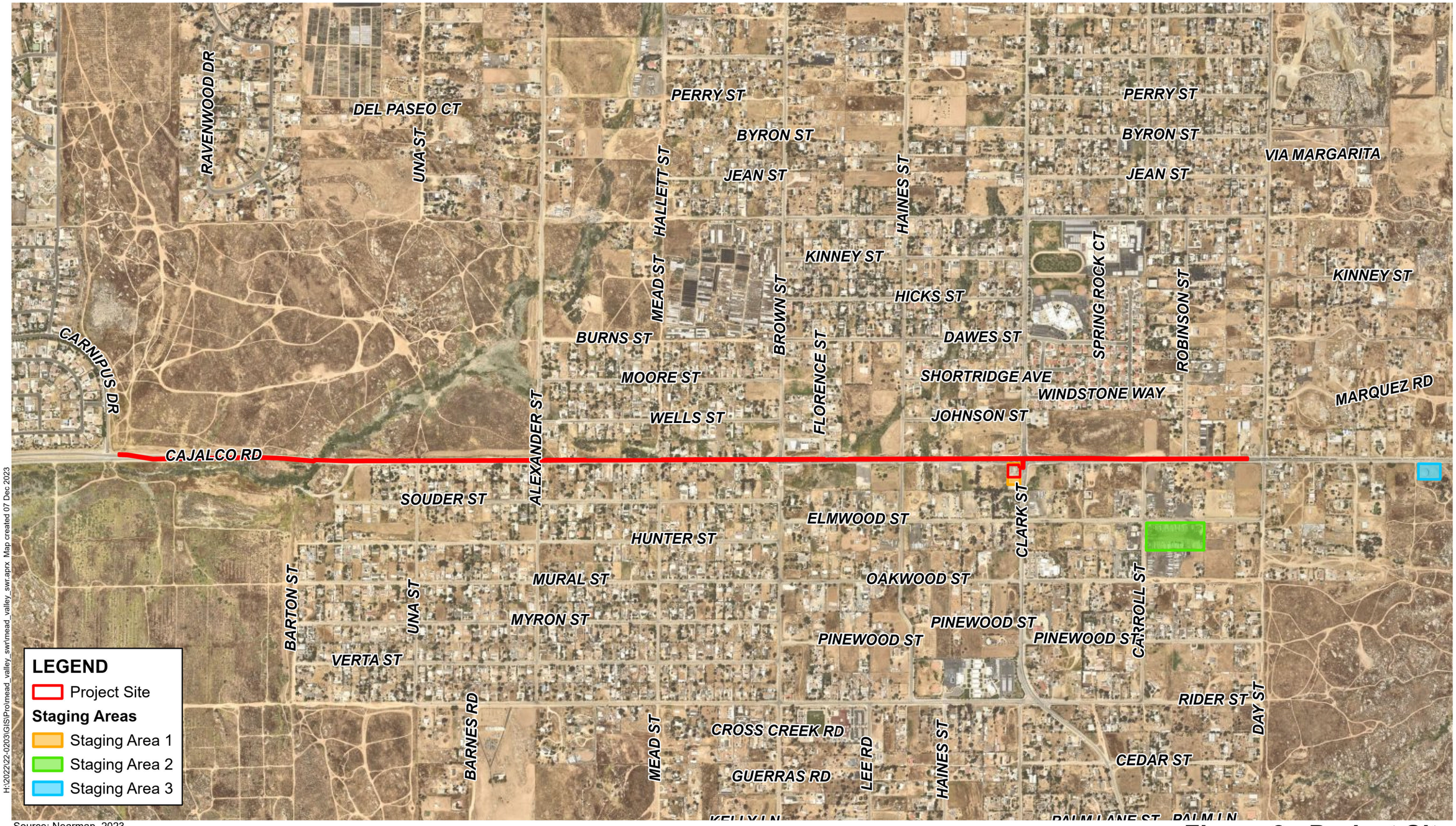
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Source: Riverside County GIS, 2020.

Figure 1 – Regional Map
Mead Valley Cajalco Sewer Project

0 2 4 6 Miles

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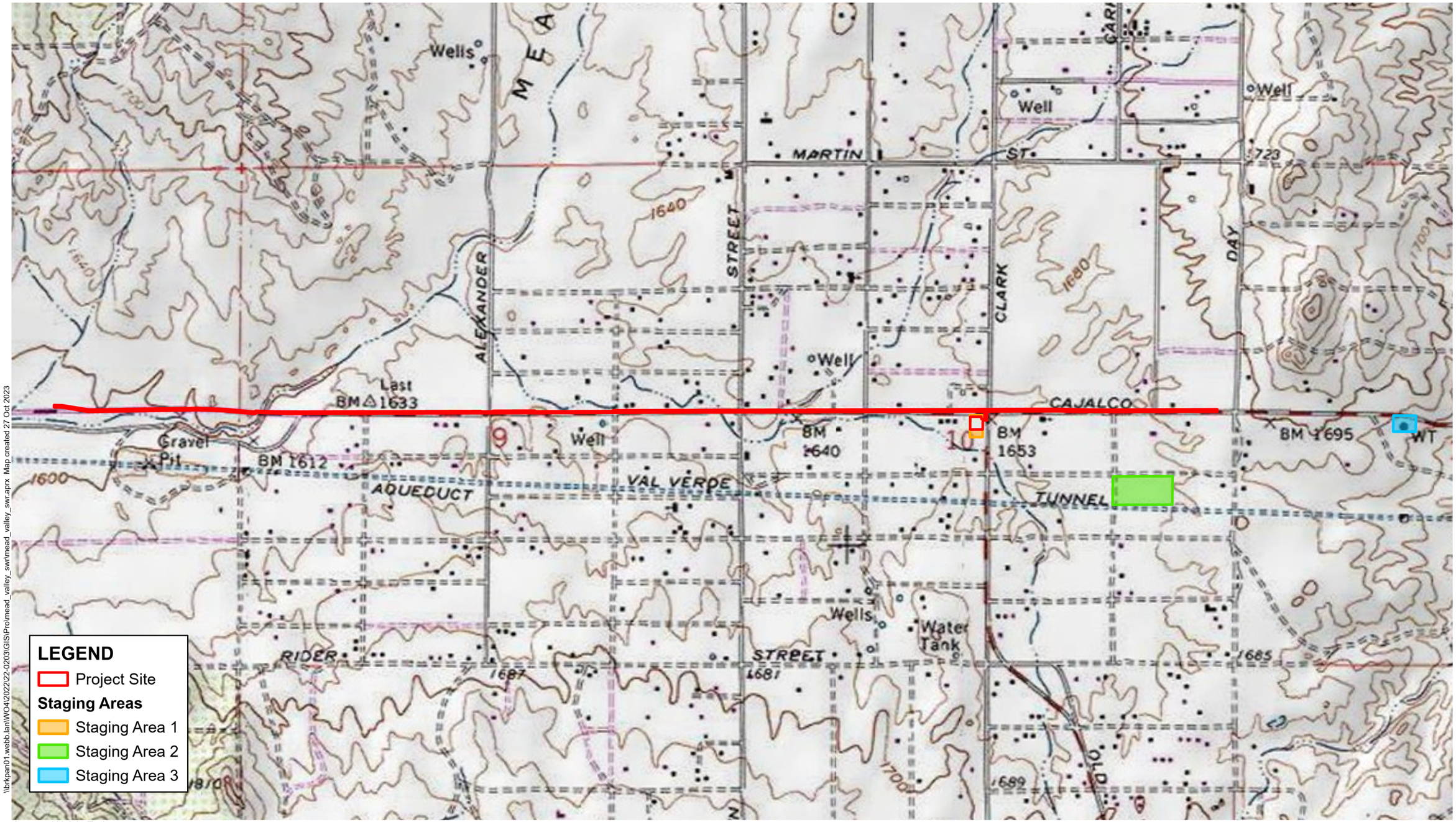
H:\2022\22-0203\GIS\Pro\mead_valley_swr\mead_valley_swr.aprx Map created 07 Dec 2023

Source: Nearmap, 2023.

Figure 2 - Project Site

Mead Valley Cajalco Sewer Project

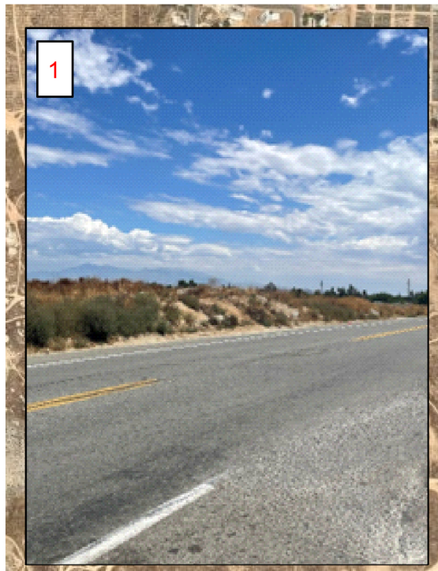
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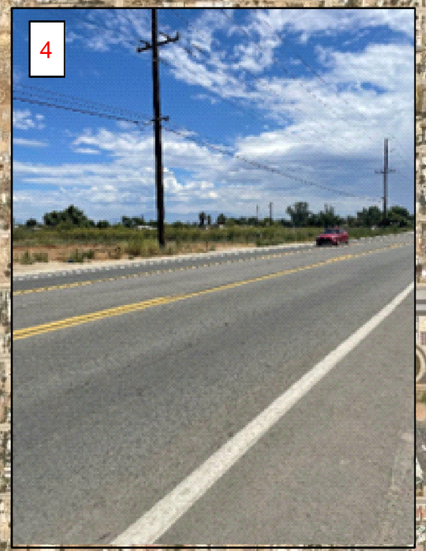
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Figure 3 - USGS Map
Mead Valley Cajalco Sewer Project

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1

2

3

4

LEGEND

Project Site

Staging Areas

Staging Area 1

Staging Area 2

Staging Area 3

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Source: Nearmap, 2023.

0 1,000 2,000 3,000 US Feet

Figure 4 - Existing Conditions

Mead Valley Cajalco Sewer Project

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3. ENVIRONMENTAL CHECKLIST FORM

1. **Project title:** Mead Valley Cajalco Sewer 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 Resources Specialist
broadhej@emwd.org
(951) 928-3777 ext. 4545

4. **Project location:** Unincorporated County,
Riverside County, California

5. **Project sponsor's name and address:** Same as Lead Agency

6. **General plan designations:** Cajalco Road roadway Right-of-way, Rural Community

7. **Zoning:** Right-of-way, A1-1 (Light Agricultural), RR (Rural Residential)

8. **Description of project:** The Cajalco Sewer Project involves (Project) involves construction and operation of approximately 12,600 linear feet of 8-inch to 15-inch polyvinyl chloride (PVC) or vitrified clay pipe (VCP) gravity trunk sewer pipelines with interconnections and appurtenances within the Mead Valley communities in unincorporated Riverside County west of the City of Perris. The proposed sewer pipelines would connect to existing sewer lines located in Cajalco Road between Carpinus Drive to Day Street. The Project would also involve redirecting existing sewer flows within this area, removal the Clark Street Lift Station, and providing flows to Western Municipal Water District's (WMWD) Western Water Recycling Facility for recycled water production. **Figure 1 – Regional Location Map, Figure 2 – Project Site,** and **Figure 3 – USGS Map** shows the vicinity of the Project site and the proposed pipeline alignments.

9. **Surrounding land uses and setting:** The area around the Project site is partially built-out. Surrounding land uses include residential, rural residential, residential agricultural, church, vacant and undeveloped land uses, and public facilities.

10. **Other public agencies whose approval is required (e.g., permits, financing approval, or participation agreement.)**
    - County of Riverside: Encroachment Permit

- Riverside County Flood Control and Water Conservation District: Encroachment Permit
- State Water Resources Control Board: NPDES Construction General Permit for Storm Water Discharges
- California Occupational Safety and Health Administration: Trenching/Shoring Permit
- South Coast Air Quality Management District: Dust Control Permits

11. Have California Native American tribes traditionally and culturally affiliated with the Project area requested consultation pursuant to Public Resources Code section 2180.3.1? 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 has consulted with Native American tribal representatives through written correspondence, based on a contact list of tribes who indicated to EMWD that they are interested in receiving notification. Additionally, EMWD staff has undertaken consultation with representatives from Agua Caliente Band of Cahuilla Indians to discuss the Project, potential effects to tribal cultural resources, and appropriate mitigation. Refer to the discussion in *Section 3.18 Tribal Cultural Resources.*

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" or “Less than Significant with Mitigation Incorporated” as indicated by the checklist on the following pages.

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

DETERMINATION: (To be completed by Lead Agency)

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.

[X] 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 EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed Project, nothing further is required.

Joe Broadhead
Signature

2/16/24
Date

Joe Broadhead
Printed Name

Eastern Municipal Water District
For

3.1 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?	[ ]	[ ]	[X]	[ ]
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	[ ]	[ ]	[ ]	[X]
c) In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the Project is in an urbanized area, would the Project conflict with applicable zoning and other regulations governing scenic quality?	[ ]	[ ]	[X]	[ ]
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	[ ]	[ ]	[X]	[ ]

Discussion

The Project site is within the County's Mead Valley Area Plan. This area contains a wide variation in physical terrain, including flat valley floors, gentle foothills, and steep hillsides. This area lies entirely within the larger Perris Valley, which is framed by the Gavilan Hills to the west, and the Lakeview Mountains across the valley to the east. The eastern flank of Mead Valley is generally flat, sloping gently upward toward the Gavilan Hills, which form a portion of the planning area's western boundary. Notable features within the Mead

Valley Area include the Gavilan Hills, located to the west of the Project site, Steele Peak, located near the Gavilan hills, and the Motte-Rimrock Reserve, located above a rocky plateau above the City of Perris. (MVAP, PP 6-7.)

As shown in the photographs of the existing conditions of the site (*Section 2.4.8 Existing Site Conditions*), the new sewer pipeline would be constructed within Cajalco Road that supports intermittent views of surrounding mountains and hills for motorists and pedestrians. The demolition of the Clark Street Sewer Lift Station would take place at that location.

Riverside County Ordinance Number 655 regulates light pollution by restricting the permitted use of certain outdoor light fixtures that emit light into the night sky which have a detrimental effect on astronomical observation and research. It defines various zones relative to the distance between the light source and Palomar Observatory and sets requirements for shielding for various types of outdoor lighting (e.g., decorative, parking lots, walkways, security). The Palomar Observatory has two zones. Zone A is within a fifteen (15) mile circular radius. Zone B is within a forty-five (45) circular radius. (ORD655.) The Project site is located approximately 40 miles from Palomar Observatory and is within Zone B.

The State of California Department of Transportation (Caltrans) manages the State Scenic Highway Program which was created by the State Legislature in 1963 with the purpose of protecting the natural scenic beauty of California highways. State-designated scenic highways have locally adopted policies to preserve the scenic quality of the corridor. Highways receive designation based on how much of the natural landscape can be seen by travelers, the scenic quality of the landscape, and the extent to which development intrudes upon the traveler's enjoyment of the view. The nearest State-designated scenic highway is State Route 243, approximately 24 miles east of the Project area. There are no state or county scenic highways adjacent to the Project site. (CAL 2023.)

a) Less than Significant Impact

The nearby foothills and hills can be seen from the Project site. The primary scenic impairments associated with the Project would be temporary and would occur during the construction phase. During construction, scenic views of surrounding hills and mountains near the Project site would be temporarily altered by the construction equipment such as tractors and excavators. Once the Project is completed, the pipeline would be underground and the area of temporary disturbance would be restored to its original condition. Accordingly, the underground pipelines would not obstruct any views. The permanent, above-ground pipeline appurtenances, including but not limited to valves, would be painted and labeled standard EMWD colors to match the existing appurtenances in the Project vicinity and would not block view. Thus, the Project would have no long-term impact on scenic vistas. Impacts would be less than significant.

b) No Impact

The proposed Project site is not located within the viewshed of a State scenic highway. Therefore, there would be no impact on scenic resources associated with a State scenic highway.

c) Less than Significant Impact

Project implementation may result in short-term impacts regarding the visual character or quality to the Project's surrounding area as a result of disturbed roadways, excavation, trenching, placement of materials and staging of equipment. Public views in the vicinity of the Project site include those from roadways, sidewalks and bicycle lanes. Installation of the proposed pipeline may cause slower traffic during construction, however the public views of the Project construction from Cajalco Road would be fleeting – on the order of seconds or minutes – whereas public views of the construction from the Class II bicycle lane in Cajalco Road would be longer. This short-term effect on visual continuity is considered less than significant because after construction the alignment would be returned to existing conditions or otherwise improved. The above-ground structures, including the valves and fire hydrants would be painted and labeled standard EMWD colors to match the existing visual character of appurtenances in the Project vicinity; the impact on visual quality would be minimal. Therefore, scenic vistas and visual character impacts would be less than significant.

d) Less than Significant Impact

Daytime construction would temporarily create a minor new source of light and glare from construction equipment. Once Project construction is complete, the equipment would be removed. Because some areas of the Project site are narrow and Project construction would require to lane closures, night and weekend construction would be required on portions of the Project site. Nighttime construction would temporarily create a new source of light and glare from the lighting that would be used for security purposes and construction activities. Security lighting and nighttime construction lighting would be directed downward and not onto adjacent properties consistent with Palomar Observatory Zone B's outdoor lighting requirements. Because temporary lighting would be directed downward and not onto adjacent properties, such lighting would not substantially affect views nor impact the Palomar Observatory, which is more than 40 miles south of the Project site. Once construction is complete, no permanent lights or sources of glare would be installed as part of the Project. Therefore, light and glare impacts would be less than significant.

Mitigation Measures: None required or recommended.

3.2 Agriculture and Forestry Resources

	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?	[ ]	[ ]	[ ]	[X]
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	[ ]	[ ]	[ ]	[X]
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))?	[ ]	[ ]	[ ]	[X]
d) Result in the loss of forest land or conversion of forest land to non-forest use?	[ ]	[ ]	[ ]	[X]
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?	[ ]	[ ]	[ ]	[X]

Discussion

The Project site and staging areas would be located solely on disturbed lands (paved roadway, unpaved disturbed roadway, and vacant disturbed parcels). The Cleveland and San Bernardino National forests are major forests in the County of Riverside. The Project site is not near any forest land. Per the California Department of Conservation (CDOC) Farmland Mapping and Monitoring Program, the Project site is within or nearby Other Land, Urban and Built-Up Land, and Farmland of Local Importance. (CDOC-A 2022.) Additionally, there are no Williamson Act contracts, or zoning classifications for forestland (as defined in Public Resources Code Section 12220(g)), timberland (as defined by Public Resources Code Section 4526) or timberland production (as defined by Government Code Section 51104(g)) within or near the Project site. (CDOC-B 2023; RIVZ 2023; RIVORD 348.)

a-e) No Impact

The proposed Project site and staging areas are not located on Prime Farmland, Unique Farmland, or Farmland of Statewide Importance. Therefore, impacts to Farmland would not occur. Similarly, the proposed Project site and staging areas are not within Williamson Act contracted lands and no impacts would occur in this regard.

The proposed Project site and staging areas are not zoned forest lands, timberland, or timberland zoned Timberland Production. Implementation of the Project would not conflict with zoning, or result in loss of forest land, or convert Farmland or forest land to a non-agricultural or non-forest use.

Mitigation Measures: None required or recommended.

3.3 Air Quality

	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?	[ ]	[ ]	[X]	[ ]
b) Result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is non- attainment	[ ]	[ ]	[X]	[ ]

under an applicable federal or state ambient air quality standard?				
c) Expose sensitive receptors to substantial pollutant concentrations?	[ ]	[ ]	[X]	[ ]
d) Result in other emissions (such as those leading to odors or adversely affecting a substantial number of people?	[ ]	[ ]	[X]	[ ]

Discussion

The Project, and all of EMWD's service area, is located within the jurisdiction of the South Coast Air Quality Management District (SCAQMD), within the South Coast Air Basin (Basin). (AQMP 2022.) The SCAQMD monitors air pollutant levels to ensure the National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS) are met and, if they are not met, to develop strategies to meet the standards. Air pollution in the Project area is monitored at stations in Perris and Roubidoux.

The NAAQS, which are required to be set by the United States Environmental Protection Agency (US EPA) under the Clean Air Act, provide public health protection, including protecting the health of sensitive populations such as asthmatics, children, and the elderly (US EPA 2023.) Similarly, the CAAQS are established to protect the health of the most sensitive groups and are mandated by State law. EPA has set NAAQS for six pollutants, which are called "criteria pollutants:" carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO_2), ozone (O_3), Particulate Matter (PM_{10} and $PM_{2.5}$), and sulfur dioxide (SO_2). In addition to these, California has added three criteria pollutants: hydrogen sulfide (H_2S), visibility reducing particles, and vinyl chloride. (CARB-A 2023.) In total, California regulates about 200 different substances and groups of substances as toxic air contaminants (TACs). (CARB-B 2023.)

Depending on whether or not the NAAQS or CAAQS are met or exceeded, the Basin is classified as being in "attainment" or "nonattainment." The 2022 Air Quality Management Plan (AQMP) assesses the attainment status of the Basin. **Table 3-1** summarizes the Basin's criteria pollutant status. The Basin is in nonattainment for the State 1-Hour Ozone, 8-Hour Ozone, PM_{10}-, and $PM_{2.5}$ requirements and the Federal 1-hour Ozone, 8-Hour Ozone, $PM_{2.5}$-24 hour, and $PM_{2.5}$ requirements. Thus, the Basin is required to implement strategies that would reduce pollutant levels to recognized standards.

Table 3-1: Criteria Pollutant Attainment Status – Basin

Criteria Pollutant	State CAAQS	Federal (NAAQS)
1-Hour Ozone	Nonattainment	Nonattainment (Extreme)
8-Hour Ozone	Nonattainment	Nonattainment (Extreme)
Carbon monoxide (CO)	Attainment	Attainment (Maintenance)
Nitrogen Dioxide ($NO_{2)}$	Attainment	Attainment (Maintenance)
Sulfur dioxide ($SO_{2)}$	Attainment	Unclassified/Attainment
PM_{10}	Nonattainment	Attainment (Maintenance)
$PM_{2.5}$	Nonattainment	Nonattainment (Serious)

Source: AQMP 2022

The SCAQMD provides numerical thresholds to analyze the significance of a project's construction and operational emissions on regional air quality. These thresholds are designed such that a project consistent with the thresholds would not have an individually or cumulatively significant impact on the Basin's air quality. These thresholds are listed in **Table 3-2**.

Table 3-2: SCAQMD Air Quality Significance Thresholds

Pollutant	Mass Thresholds – Construction Thresholds (pounds/day)	Mass Thresholds – Operation Thresholds (pounds/day)
NO_x	100	55
VOC	75	55
PM_{10}	150	150
$PM_{2.5}$	55	55
SO_x	150	150
CO	550	550
Lead	3	3
Toxic Air Contaminants	• Maximum Incremental Cancer Risk $\geq$ 10 in 1 million • Cancer Burden > 0.5 excess cancer cases (in areas $\geq$ 1 in 1 million) • Chronic & Acute Hazard Index $\geq$ 1.0 (project increment)	
Odor	Project creates an odor nuisance pursuant to SCAQMD Rule 402	

Source: SCAQMD 2023

In addition, the SCAQMD has developed Localized Significance Thresholds (LSTs) in response to concern regarding exposure of individuals to criteria pollutants in local communities. LSTs have been developed for nitrogen oxides (NO_X), CO, PM_{10} and $PM_{2.5}$. LSTs represent the maximum emissions from a project that will not cause or contribute to an air quality exceedance of the most stringent applicable federal or State ambient air quality standard at the nearest sensitive receptor, taking into consideration ambient concentrations in each source receptor area, distance to the sensitive receptor, and project size. LSTs only apply to emissions within a fixed stationary location; they are not applicable to mobile sources. The use of LSTs is voluntary, to be implemented at the discretion of local agencies. (SCAQMD 2008a.)

The SCAQMD LSTs are defined for 37 source receptor areas (SRA). The Project site is located in SRA 24. (SCAQMD 2008a.) LSTs have been developed for emissions within construction areas up to five acres in size. The SCAQMD provides lookup tables for sites

that measure up to one, two, or five acres. The proposed Project is limited to pipeline and appurtenance construction. Pursuant to SCAQMD guidance, LSTs for the one-acre site should be used for sites that are less than one acre in size. The Project is expected to disturb approximately 12.82 acres. Since the Project is linear it will progress in a linear fashion and would disturb a less than one acre per day. To be conservative, the one-acre LST lookup tables were utilized to estimate the construction emissions. LSTs for construction on a one-acre site in SRA-24 are shown in **Table 3-3**. LSTs are provided for receptors at a distance of 25 meters (82 feet) from the Project site boundary, which is the most conservative LST distance (LSTs range from 25 to 500 meters).

Table 3-3: SCAQMD LSTs for Construction and Operation

Pollutant	Allowable emission from a one-acre site in SRA-24 for a receptor within 25 meters, or 82 feet (pounds/day)
Gradual Conversion of NO_x to NO_2	118
CO	602
PM_{10} – operation	1
PM_{10} – construction	4
$PM_{2.5}$ – operation	1
$PM_{2.5}$ – construction	3

Source: SCAQMD 2009

a) Less than Significant Impact

The SCAQMD's 2022 AQMP is the applicable air quality plan for this IS/MND. The AQMP assesses the attainment status of the unincorporated Riverside County area and the EMWD area of the Basin and provides a strategy for attainment of State and federal air quality standards. The AQMP strategies are developed based on population, housing, and employment growth forecasts anticipated under local city general plans and the SCAG's 2022 Regional Transportation Plan/Sustainable Communities Strategy.[1]

A project would conflict with or obstruct an applicable air quality plan if it would lead to population, housing or employment growth that exceeds the forecasts used in the development of the applicable air quality plan. The proposed Project would construct approximately 12,600 linear feet of pipeline and appurtenances to improve operational efficiency and redundancy of the sewer system. The proposed Project promote economic development of the disadvantaged community of Mead Valley. Therefore, the proposed Project would not lead to unplanned population, housing or employment growth that

[1] SCAG completed an update to the Regional Transportation Plan/Sustainable Communities Strategy in 2020 (known as Connect SoCal). The 2022 AQMP was developed reflecting updated growth projections from Connect SoCal and was adopted December 2, 2022 by the South Coast AQMD Governing Board.

exceeds the forecasts used in the development of the AQMP. Potential for conflicts with the AQMP would be less than significant.

b) Less than Significant Impact

The proposed Project would result in emissions of criteria pollutants from short-term construction activities. The pipeline and appurtenances would not be associated with long-term energy usage or additional EMWD O&M activities. Inspection of the pipeline, above ground appurtenances and exercise of the valves would be incorporated into EMWD's existing O&M activities. Construction emissions were estimated using the California Emissions Estimator Model (CalEEMod) 2022.1, which was developed by the California Air Pollution Control Officer's Association (CAPCOA) in association with SCAQMD and is used throughout California to quantify criteria pollutants and greenhouse gas emissions (GHGs).

Project construction emissions have been analyzed in the *Air Quality/Greenhouse Gas Analysis for the Mead Valley Cajalco Sewer Project* (WEBB-A) study included in Appendix A. The CalEEMod emissions scenarios were based on Project-specific information, found in *Section 2.5 Project Description*. In instances where Project-specific information was not available (e.g., construction equipment horsepower, length of worker trips, soil moisture content), the analysis relied on CalEEMod default values for construction activities. As explained in *Section 2.5 Project Description*, it is assumed that construction would begin in April 2024 and have a duration of approximately 20 months. SCAQMD's Rule 403 (Fugitive Dust) requires construction projects to implement measures to suppress fugitive dust emissions, such as watering of exposed soils and the preparation of a Fugitive Dust Control Plan, where applicable. The construction contractor would be required to comply with Rule 403 prior to ground disturbing activities.

Construction Emissions

Air emissions of criteria pollutants during construction would result from the use of construction equipment with internal combustion engines, and offsite vehicles to transport workers, deliver materials to the site, and haul import and export material to and from the site. Project construction would also result in fugitive dust emissions, which would be lessened through the implementation of the fugitive dust control measures required by SCAQMD rules. **Table 3-4** summarizes the maximum daily pollutant emissions during construction of the proposed Project. As shown in **Table 3-4,** Project construction would not exceed SCAQMD regional thresholds for any criteria pollutant.

Table 3-4: Proposed Project Maximum Daily Construction Emissions Compared to Regional Thresholds (pounds/day)

Emissions Source	ROG	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
2024	1.07	**8.06**	12.5	0.02	0.64	0.40
2025	**34.30**	8.00	**52.10**	**0.02**	**1.12**	**0.70**
SCAQMD Regional Thresholds	*75*	*100*	*550*	*150*	*150*	*55*
Threshold exceeded?	**No**	**No**	**No**	**No**	**No**	**No**

Source: WEBB-A, Table 2.
Note: See the detailed model output reports included in Appendix A. Numbers are the maximum of summer or winter emissions in a given year and may not match due to rounding within the model.

Additionally, while the use of LSTs is voluntary, the proposed Project emissions were compared to LSTs for the Project area and are provided in **Table 3-5**. As noted above, LSTs are only applicable to emissions within a fixed, stationary location, such as construction sites, and vary based on project site size. **Table 3-5** provides LSTs that are applicable to the onsite construction activities, including pipeline trenching, installation of pipeline and appurtenances, and roadway resurfacing. As explained under the discussion above, SCAQMD provides LST lookup tables for sites that measure up to one, two, or five acres; LSTs for construction sites smaller than one acre should use the one-acre threshold. This threshold was used since less than one acre will be disturbed each day.

Table 3-5: Proposed Project Maximum Daily Construction Emissions Compared to Localized Significance Thresholds (pounds/day)

Emissions Source	NO_x	CO	PM_{10}	$PM_{2.5}$
Trenching – 2024	**7.74**	11.00	0.35	0.33
Trenching - 2025	7.17	11.00	0.30	0.27
Paving – 2025	7.71	10.80	0.34	0.31
Decommissioning/Demolition – 2025	4.24	**51.6**	**0.94**	**0.65**
LST (one-acre LST)	*118*	*602*	*4*	*3*
Threshold exceeded?	**No**	**No**	**No**	**No**

Source: WEBB-A, Table 3
Note: Maximums are the greater of either Trenching, Paving or Decommissioning/Demolition because these activities do not overlap. Maximums are shown in bold.

Operations

The pipeline and appurtenances would not be associated with long-term energy usage or additional EMWD O&M activities. Inspection and maintenance of the pipeline and above ground appurtenances, and exercise of the valves would be incorporated into EMWD's existing O&M activities. Thus, no new emissions would be associated with operation of the proposed Project.

c) Less than Significant Impact

Sensitive receptors are typically defined as schools (preschool–12th grade), hospitals, resident care facilities, senior housing facilities, day care centers, or other facilities that

may house individuals with health conditions that would be adversely impacted by changes in air quality. (CARB 2018.) Sensitive receptors near the proposed Project consist of single-family and multi-family residences along the pipeline alignment and adjacent to the lift station. Manual L. Real Elementary School, Columbia Elementary School, and California Rancho School are located within one-quarter mile of the proposed Project site.

LSTs represent the maximum emissions from a project that will not cause or contribute to an air quality exceedance of the most stringent applicable federal or State ambient air quality standard at the nearest sensitive receptor. The California and National Air Quality Standards provide public health protection, including protecting the health of "sensitive" populations such as asthmatics, children, and the elderly. If a project is consistent with the latest adopted clean air plan and does not exceed the SCAQMD significance thresholds, it can be assumed that it will not have a substantial adverse impact on public health. Therefore, projects that conform to the LSTs and SCAQMD regional thresholds are assumed to have a less than significant impact on nearby sensitive receptors. As discussed under response “3.3b” above, the proposed Project’s construction and operational emissions would not exceed SCAQMD regional thresholds or LSTs. Therefore, sensitive receptors would not be subjected to substantial pollutant concentrations and impacts would be less than significant.

d) Less than Significant Impact

The proposed Project would involve emissions of sulfur compounds from use of oil and diesel fuel during construction, which would potentially result in unpleasant odors. Construction would be temporary and odorous emissions from construction equipment tend to dissipate quickly within short distances from construction sites. Once the proposed Project is operational, the pipeline would not be associated with odors. Impacts would be less than significant.

Mitigation Measures: None required or recommended.

3.4 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?	[ ]	[X]	[ ]	[ ]
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	[ ]	[X]	[ ]	[ ]
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?	[ ]	[X]	[ ]	[ ]
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?	[ ]	[ ]	[ ]	[X]
e) Conflict with any local policies or ordinances protecting biological	[ ]	[ ]	[ ]	[X]

	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?	[ ]	[X]	[ ]	[ ]

Discussion

A Biological Technical Report (BTR) was prepared in September 2023 for the proposed Project and is provided in **Appendix B.** The BTR is relied upon for the analysis in this IS/MND. The BTR defines a biological study area (BSA) that encompasses the Project Site and a 100-foot buffer. Because suitable habitat to support burrowing owl (*Athene cunicularia*) and least Bell's vireo (*Vireo bellii pusillus*) was present within the BSA, focused surveys for these species were conducted.

Regulated or sensitive resources studied and analyzed in the BTR included special status plant and wildlife species, nesting birds and raptors, wildlife movement corridors and habitat linkages, sensitive plant communities, potentially jurisdictional waters and wetlands, and locally protected resources (i.e., heritage trees). Potential impacts on biological resources were analyzed based on the following statutes:

- Federal Endangered Species Act
- Migratory Bird Treaty Act (MBTA)
- Bald and Golden Eagle Protection Act
- California Endangered Species Act
- California Fish and Game Code (CFGC)
- California Environmental Quality Act (CEQA)
- Native Plant Protection Act
- Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP)
- Stephen's Kangaroo Rat Habitat Conservation Plan (SKR HCP)
- County of Riverside Code of Ordinances

A literature review was completed to ensure that current and accurate data were integrated into the determination of the proposed Project's environmental and regulatory setting. The review consisted of publicly available spatial data from a variety of public agencies, geospatial warehouses, aerial imagery, and previously written reports related to the proposed Project area and surrounding U.S. Geological Survey (USGS) 7.5-minute topographic quadrangles. (WEBB-B 2023, p. 8.) Pertinent sources reviewed included, but were not limited to, the following:

- U.S. Department of Agriculture Natural Resources Conservation Service Web Soil Survey
- California Department of Fish and Wildlife (CDFW) California Natural Diversity Database
- California Native Plant Society Inventory of Rare and Endangered Vascular Plants
- Google Earth aerial imagery
- NearMap aerial imagery
- U.S. Fish and Wildlife Service (USFWS) Critical Habitat Mapper and File Data, and Information for Planning and Consultation (IPAC)
- USFWS National Wetlands Inventory on-line wetlands mapper
- USGS National Hydrography Dataset
- Western Riverside County MSHCP

Field reconnaissance surveys of the 79.3-acre BSA were performed on February 22, 2023 and February 27, 2023. The purpose of the surveys was to characterize the existing biological conditions, search for special-status plants, animals, and habitats, and to map habitats and potentially jurisdictional aquatic resources. During the surveys, existing biological conditions were noted and vegetation communities (or land cover types if vegetation was absent) were mapped. (WEBB-B 2023, p. 8.) A formal jurisdictional delineation of waters and wetlands was not performed for the Project because no components of the proposed Project would be located within potentially jurisdictional features.

a) Less than Significant with Mitigation Incorporated

The proposed Project would be constructed within paved or otherwise disturbed road rights-of-way and at the Clark Street Lift Station site. All potential staging areas are either sparsely vegetated with non-native, often invasive plant species and/or comprised of disturbed, barren ground. As a result, although sensitive vegetation communities are present in the BSA, these species are not present within the Project footprint and staging areas due to the lack of suitable habitat as well as historical and existing disturbances. While the literature review identified 58 special-status amphibian, bird, crustaceans, fish, insect, mammal, and reptile species within the BSA, no special-status wildlife species were found on the Project site during the surveys, and 53 of the 58 species had no suitable habitat present in the BSA. (WEBB-B 2023, pp. 23-26.)

Suitable habitat was present in the BSA for the following five special-status bird species: burrowing owl (*Athene cunicularia*), yellow-breasted chat (*Icteria virens*), yellow warbler (*Setophaga petechia*), Lawrence's goldfinch (*Spinus lawrencei*), and least Bell's vireo (*Vireo bellii pusillus*). (WEBB-B 2023, Appendix C.)

Focused burrowing owl surveys were conducted for the Project site in accordance with the survey guidelines set forth in the California Department of Fish and Game *Staff Report*

on Burrowing Owl Mitigation, March 7, 2012. The burrowing owl survey area consisted of a 500-foot radius around the Project footprint and staging areas. As shown on **Figure 5 – Burrowing Owl Survey Results**,[2] a total of 79 burrows suitable for burrowing owl were recorded in the burrowing owl survey area. (WEBB-B 2023, pp. 24-25.) No burrowing owl or burrowing owl sign (i.e., pellets with regurgitated fur, bones, and insect parts; whitewash; or feathers) was detected at the burrows; therefore, burrowing owl is presumed to be absent from the burrowing owl study area. (WEBB-B 2023, pp. 9, 24–25.) Although burrowing owl is presumed to be absent, because suitable habitat for burrowing owl is present in the area adjacent to the Project footprint, a significant indirect impact to burrowing owls could occur if owls colonize burrows prior to construction. Therefore, **Mitigation Measure BIO-1**, which requires preconstruction surveys, would be implemented to avoid impacts to burrowing owls that may have colonized the burrows within the burrowing owl study area prior to Project construction.

As shown on **Figure 6A through Figure 6J – Vegetation and Land Cover Types**, southern riparian woodland (SRWD) habitat, which is suitable habitat for riparian birds including least Bell's vireo, yellow-breasted chat, yellow warbler, and Lawrence's goldfinch, is present within the BSA. Because suitable habitat for least Bell's vireo was present in the BSA, a total of eight protocol (focused) surveys were conducted for this species. The protocol surveys were conducted in accordance with the United States Fish and Wildlife Service, *Least Bell's Vireo Survey Guidelines*, January 19, 2001 (USFWS LBV Survey Guidelines). As set forth in the USFWD LBV Guidelines, the least Bell's vireo survey area for the Project encompassed the Project footprint and a survey buffer of 500-feet around the Project footprint. (WEBB-B 2023, pp. 10–11.) There were no observations of yellow-breasted chat, yellow warbler, or Lawrence's goldfinch during the vireo surveys; they are therefore presumed to be absent. (WEBB-B 2023; Appendix C.) Results of the vireo protocol surveys were positive for least Bell's vireo (one pair; adult male and female and one territorial male) within the southern riparian woodland vegetation on the north and south sides of the Project footprint as shown on **Figure 7 – Least Bell's Vireo Survey Results**. (WEBB-B 2023, pp. 25-26.) Because occupied least Bell's vireo habitat is present adjacent to the Project footprint, indirect impacts in the form of increased ambient noise or lighting (if construction takes place at night) from construction activities may affect this species. Therefore, **Mitigation Measures BIO-2, BIO-3, BIO-4, and BIO-5** would be implemented to avoid indirect impacts to least Bell's vireo and would address potential indirect impacts to other nesting birds. With incorporation of mitigation measures, impacts to special status species are less than significant.

b) Less than Significant With Mitigation Incorporated

As shown on **Figure 6A through Figure 6J**, six types of vegetation community (or land cover type) were identified in the BSA: urban/developed, disturbed habitat, non-native grassland, eucalyptus woodland, southern riparian woodland, and emergent wetland. (WEBB-B 2023, p. 28.) Only urban/developed, disturbed, and non-native grassland are

[2] Figures for *Section 3.4 Biological Resources* commence on page 3-25.

present within the Project footprint and staging areas. (WEBB-B 2023, p. 28.) Although southern riparian woodland and emergent wetland are sensitive vegetation communities, they are outside of the Project footprint and staging areas; thus, no direct impacts would occur. Inadvertent impacts, in the form of unintentional disturbances, to these sensitive vegetation communities from construction activities are possible. However, with incorporation of **Mitigation Measure BIO-2** to install temporary construction fencing adjacent to the construction footprint, inadvertent impacts to sensitive vegetation are less than significant.

The literature review conducted as part of the BTR identified 59 special-status plant species with potential to occur in the Project BSA. (WEBB-B 2023; Appendix C.) However, no special-status plant species were identified during the reconnaissance surveys; therefore, no impacts to special-status plants are expected to occur. (WEBB-B 2023, pp. 24, 28.) Given the Project location in the road rights-of-way and the disturbed condition of the Clark Street Sewer Lift Station and potential staging areas, impacts to special-status plants are not anticipated. Sensitive plant species typically have very specific habitat requirements which the Project area does not support.

The Project BSA is within the boundaries of the Western Riverside County MSHCP, which identifies sensitive natural communities and seeks to protect those communities by protecting areas with biological and ecological diversity. Within the Western Riverside MSHCP area, Criteria Areas, Public-Quasi Public Reserve Lands, and Core or Linkage Areas are defined in order to permanently preserve portions of habitat and decrease development in these areas. No components of the Project are within an existing or proposed Western Riverside MSHCP Criteria Area, Public-Quasi Public Reserve Lands, or within a Core or Linkage. (WEBB-B 2023, p. 31.)

Nine potentially jurisdictional aquatic features, identified as Features A through I on **Figure 8A through Figure 8J - Potentially Jurisdictional Aquatic Features**, occur within the BSA. These features are underground corrugated steel road culverts that intersect the Project footprint along Cajalco Road. (WEBB-B 2023, pp. 29, 36.) The Project will use trenchless installation methods (i.e., jack and bore) to install the proposed pipe in order to avoid direct impacts to these culverts. Construction activities may result in an inadvertent discharge of pollutants that could indirectly impact the riparian habitat along Cajalco Road, outside of the Project footprint, However, with preparation and implementation of a Storm Water Pollution Prevention Plan (SWPPP) to prevent the discharge of pollutants during construction using Best Management Practices, training, monitoring and reporting per *Section 2.7 Environmental Commitments*. impacts on a riparian habitat or other sensitive natural community will be less than significant.

c) Less Than Significant With Mitigation

No riparian habitat occurs in the Project footprint including staging areas and therefore no direct impacts to riparian habitat would occur. Riverine features that are potentially jurisdictional do intersect the Project footprint via underground corrugated steel culverts that extend out adjacent to either side of the proposed Project site some of which have

ephemeral pools (within the BSA). Although these ephemeral pools related to the Cajalco Road. culverts are suitable habitat for fairy shrimp species, no fairy shrimp surveys were conducted for the Project because the Project would avoid these areas. Inadvertent impacts to potentially jurisdictional features from Project construction are possible in the event construction activities results in ground disturbance outside the Project footprint and results in a direct disturbance or discharge into these features. Through compliance with Environmental Commitments (identified in Section 2.7) and implementation of **Mitigation Measures BIO-2 and BIO-4,** impacts are less than significant.

d) No Impact

No components of the Project footprint are within existing or proposed wildlife corridors or habitat linkages defined in the Western Riverside MSHCP or observed during field surveys. The proposed Project would not impact wildlife movement corridors, habitat linkages, and wildlife nurseries because the Project would be constructed within an existing roadway and previously disturbed, barren, unvegetated, and/or sparsely vegetated areas, outside the area of wildlife connectivity. Therefore, no impacts would occur.

e) No Impact

The Project will not require the removal of trees. Therefore, there would be no impact.

f) Less than Significant with Mitigation Incorporated

The proposed Project is located within the boundaries of two Habitat Conservation Plans: the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) and Stephen's kangaroo rat Habitat Conservation Plan (SKR HCP).

The MSHCP was developed by Riverside County to aid in maintaining biological and ecological diversity within the region, while addressing requirements of the California Endangered Species Act and Federal Endangered Species Act. The MSHCP defines a reserve system that includes existing and proposed core habitat blocks and habitat linkages to accommodate the needs of wildlife and plant species. The Plan was completed in 2003, and associated permits were issued in 2004. EMWD is not a signatory to the MSHCP or a Participating Special Entity and none of the Project features are located within existing or proposed reserve or criteria areas of the MSHCP. Nonetheless, Project implementation cannot conflict with the provisions of the MSHCP and because an encroachment permit is needed from the RCFCWCD, the Project must be consistent with the MSHCP.

Consistency of the MSHCP is determined through compliance with Sections 6.1.2, 6.1.3, 6.1.4, 6.3.2, and 7.5.3 of the MSHCP. The proposed Project is not located in a Criteria Area and therefore a Reserve Assembly Analysis is not required. (WEBB-B 203, p. 31.)

Section 6.1.2 of the MSHCP requires assessment of riparian, riverine, fairy shrimp, and vernal pool habitats. No riparian habitat or riparian features occur within the project site. However riverine features do occur within the BSA. (WEBB-B 2023, p. 31.) No vernal

pools were identified in the Project site. Some ephemeral pools riverine features do occur within the BSA, however these do not exhibit characteristics of vernal pools. No fairy shrimp surveys were conducted as part of the Project evaluation. (WEBB-B 203, p. 31.) With implementation of **Mitigation Measures BIO-1**, **BIO-4**, and **BIO-5**, impacts would be less than significant. Therefore, the implementation of the Project site would not conflict with Section 6.1.2 of the MSHCP.

Section 6.1.3 requires assessment of sites in a designed survey area for narrow endemic plants to be completed. The Project is not located in a Narrow Endemic Plant Species Survey Area. (WEBB-B 2023, p. 34.) Therefore, the implementation of the Project site would not conflict with Section 6.1.3 of the MSHCP.

Section 6.1.4 requires projects located adjacent or near MSHCP conservation areas to consider edge effects or conditions of their urban/wildlife interface into the project design. The proposed Project does not have any adjacency or on-site connection to existing conservation areas or lands designated for conservation purposes. (WEBB-B 2023, p. 34.) Therefore, the implementation of the Project site would not conflict with Section 6.1.4 of the MSHCP.

Section 6.3.2 requires assessments for particular species in designated survey areas. The BSA is within designated survey areas for Criteria Area Plant Species, amphibians, and burrowing owls. The Project site is not located within a survey area for Criteria Area Plant species or amphibians. No permanent, temporary, direct, or indirect impacts are proposed to burrowing owls. Burrowing owls are presumed absent from the burrowing owl study area. (WEBB-B 2023, pp. 33-34.) Because there was suitable habitat in the BSA, **Mitigation Measure BIO-2** would be required to conduct a preconstruction burrowing owl survey. Through compliance with **Mitigation Measure BIO-2,** Project impacts would be less than significant. Therefore, the implementation of the Project site would not conflict with Section 6.3.2 of the MSHCP with implementation of **Mitigation Measure BIO-2**.

Section 7.5.3 requires projects to adhere to standard best management practices and guidelines to minimize potential impacts to sensitive habitats. The MSHCP lists standard best management practices and guidelines to be implemented during project construction that will minimize potential impacts to sensitive habitats in the vicinity of a project. The guidelines relate to water pollution and erosion control, equipment storage, fueling, and staging, dust control, exotic plant control and timing of construction. Therefore, the implementation of the Project site would not conflict with Section 7.5.3 of the MSHCP.

The EMWD is not a permittee nor a Participating Special Entity to the Western Riverside County MSHCP. Furthermore, the Project does not occur in existing Criteria Cells or areas designated for conservation. Therefore, the Project will not conflict with the provisions of the Western Riverside County MSHCP.

Because the Project does not propose to remove or alter Stephen's kangaroo rat habitat, it is exempt from paying mitigation fees. No conflict with this HCP would occur. (WEBB-B 2023, p. 5.)

Mitigation Measures:

BIO-1: Burrowing Owl Pre-Construction Survey.

Two burrowing owl construction surveys shall be conducted. An initial burrowing owl take avoidance survey shall be conducted in suitable habitat no less than 14 days prior to initiating ground disturbance activities using the recommended methods described in the CDFW *Staff Report on Burrowing Owl Mitigation.*[3] (Refer to **Figure 5 – Burrowing Owl Survey Results** for location of suitable burrowing owl habitat.) Additionally, a final burrowing owl survey shall be conducted in suitable habitat within 24 hours prior to any ground disturbance related activities. If active nests are identified within the burrowing owl survey area during the pre-construction survey, the nests shall be avoided and an appropriate no-work buffer shall demarcated in the field at a defined distance deemed adequate by the Project biologist. If burrowing owls are present, the CDFW shall be consulted to determine if a Habitat Loss Mitigation and Relocation Program is warranted. Based on the location of the owls and if avoidance of the area is not feasible, mitigation options may range from passive relocation to habitat replacement.

BIO-2 Temporary Construction Fencing.

To protect biologically sensitive areas adjacent to the construction footprint or within any staging area (i.e., suitable habitat for least Bell's vireo and potentially jurisdictional aquatic features) from indirect and inadvertent disturbances, temporary construction fencing will be installed at the limits of Project impacts as shown on **Figure 8A through Figure 8J - Potentially Jurisdictional Aquatic Features** for locations of potentially jurisdictional aquatic features and as shown on **Figure 6A through Figure 6J – Vegetation and Land Cover Types** for the locations of least Bell's vireo suitable habitat (i.e., southern riparian woodland, SRWD). The installation of the fencing will be carefully supervised by a Project biologist to ensure that it does not adversely affect the sensitive areas that need to be preserved. In the event that work extends beyond the fenced areas or occurs within sensitive habitat areas, all activities will immediately cease until the issue has been resolved to the satisfaction of the Eastern Municipal Water District (EMWD). Any impacts that occur to sensitive areas beyond the approved fence will be addressed through mitigation measures determined by EMWD in coordination with relevant authorities, such as the USFWS, USACE, RWQCB, and/or the CDFW, as applicable based on jurisdiction. Upon completion of the project, the temporary construction fencing will be removed from the site.

[3] California Dept. of Fish and Game, March 7, 2012, available at https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=83843)

BIO-3 Least Bell's Vireo.

To avoid impacts to lead Bell's vireo, construction activities shall avoid the off-site riparian habitat, as shown on **Figure 6A through Figure 6J – Vegetation and Land Cover Types,** within 300 feet from Project construction, from March 15 to July 31, which corresponds to the least Bell's vireo breeding season, if feasible. If it is infeasible to avoid construction during this timeframe, a qualified biologist shall conduct surveys for the least Bell's vireo and noise monitoring shall be conducted for any activities within 300 feet of occupied habitat. In the event that noise levels are found to potentially adversely affect the least Bell's vireo, appropriate noise attenuation measures shall be implemented. This may involve installing a sound wall or employing other methods to minimize noise disturbances. If it is determined that noise levels cannot be adequately reduced to a level that will not harm the least Bell's vireo breeding cycle, construction activities within 300 feet of occupied habitat shall be temporarily halted in these areas until the earliest of (i) qualified biologist has determined construction will not impact the breeding cycle or (ii) after July 31, when the breeding season has concluded.

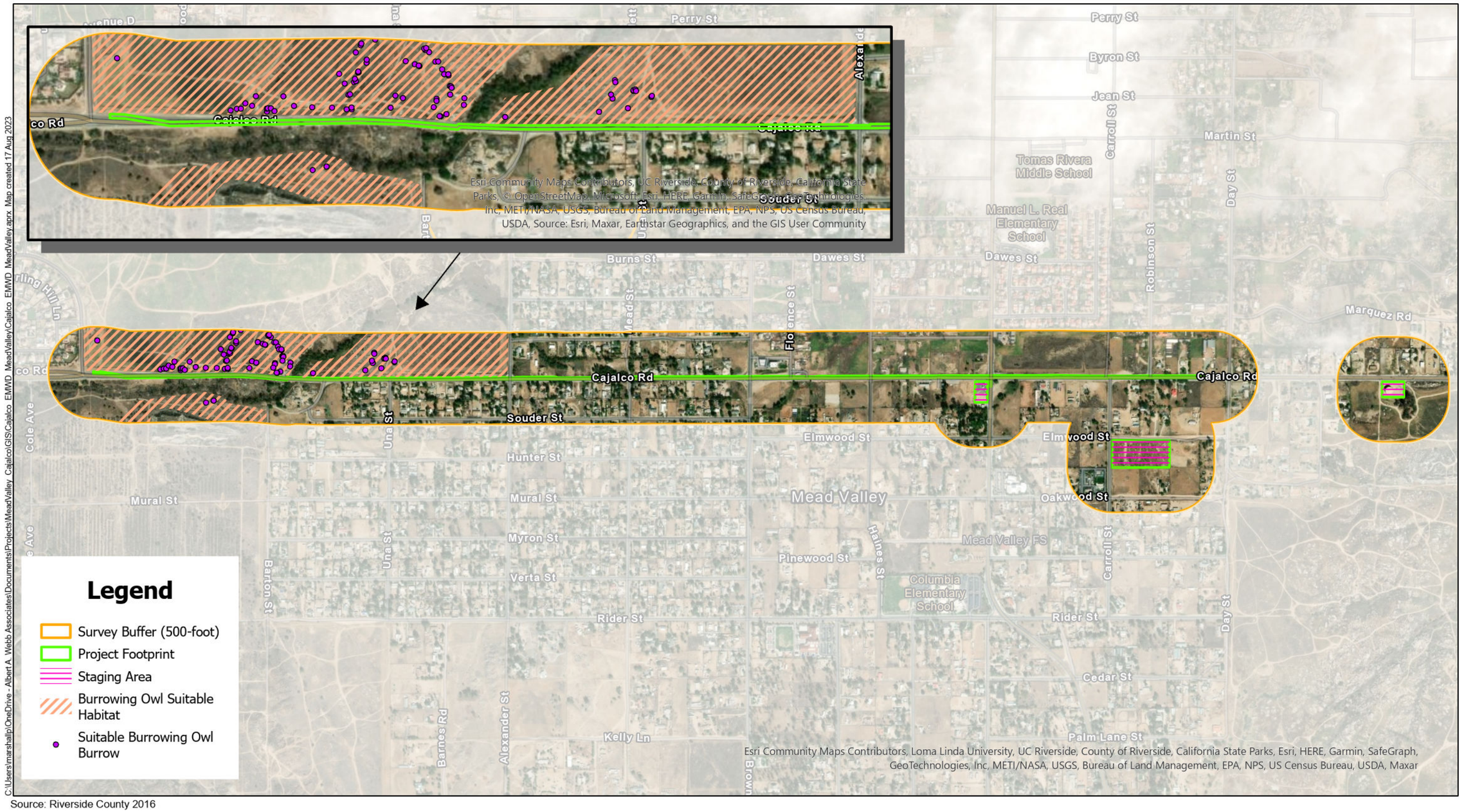
BIO-4 Workers Environmental Awareness Training and Biological Monitoring.

To ensure compliance with Project approvals and protection of aquatic resources and sensitive biological resources, a pre-construction environmental training session will be conducted by a qualified biologist for all construction personnel (i.e., Workers Environmental Awareness Training). This training will provide personnel with comprehensive information about the resources present within the Project vicinity and the specific avoidance measures that must be followed. The purpose is to enhance worker awareness and understanding of the importance of protecting these resources during construction activities. Additionally, the qualified biologist will conduct periodic monitoring of the construction limits to ensure that designated avoidance areas are clearly delineated with the installation of temporary fencing. The biologist will also verify that the fencing remains intact and effectively prevents any encroachment or disturbance in the protected areas.

BIO-5 Nesting Bird and Raptor Avoidance.

If Project related ground disturbing activities or construction cannot be avoided during the avian nesting season, February 1st to August 31st, a qualified biologist the Project Biologist) shall be retained by EMWD and shall will conduct a nesting bird survey within 72 hours prior to commencement any Project-related ground disturbance or construction within a specified area to determine if active nests of species protected by the MBTA or the California Fish and Game Code are present in the construction zone and appropriate survey buffer defined as, 500-feet for raptor species, and 100-feet for passerines. If active nests are located during the nesting bird survey; a no-construction buffer will be demarcated in the field at a distance defined by the Project Biologist retained by EMWD. The no-construction buffers will be applied until it is determined by the Project Biologist that the nesting cycle is completed or the nests are no longer active. If a previously surveyed area is left vacant (i.e., no Project-related

ground disturbance or construction work performed) for more than 72 hours, an additional nesting bird survey shall be conducted in those areas prior to commencement of construction to ensure no active nests are present.

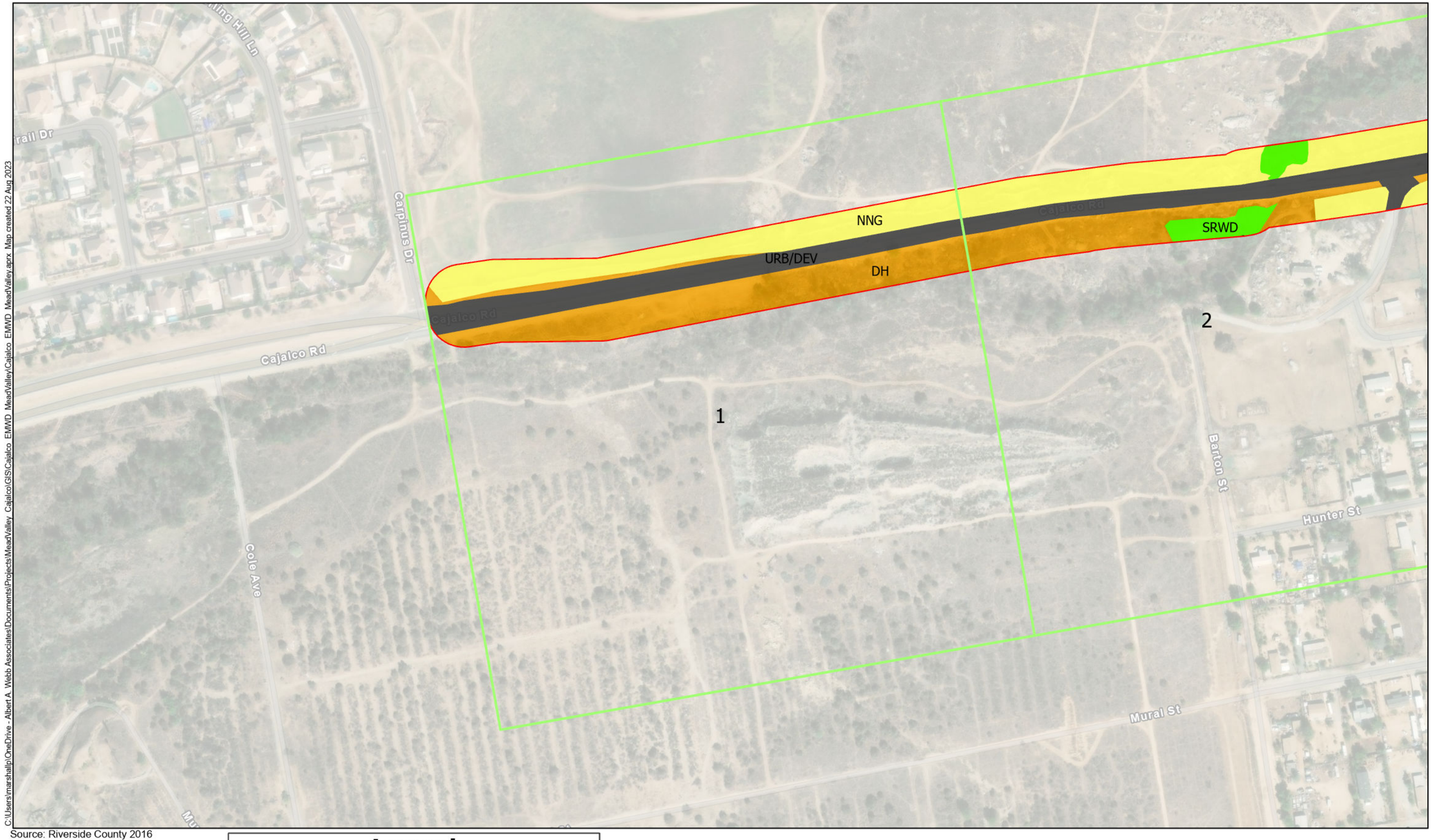


Source: Riverside County 2016

Figure 5- Burrowing Owl Survey Results

Mead Valley Cajalco Sewer Project

ALBERT A. WEBB ASSOCIATES



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Source: Riverside County 2016

0 90 180 360 Feet

Legend

- Biological Study Area (BSA)
- Southern Riparian Woodland (SRWD)
- Urban/Developed (URB/DEV)
- Non Native Grassland (NNG)
- Disturbed Habitat (DH)

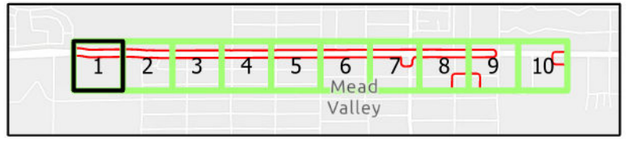
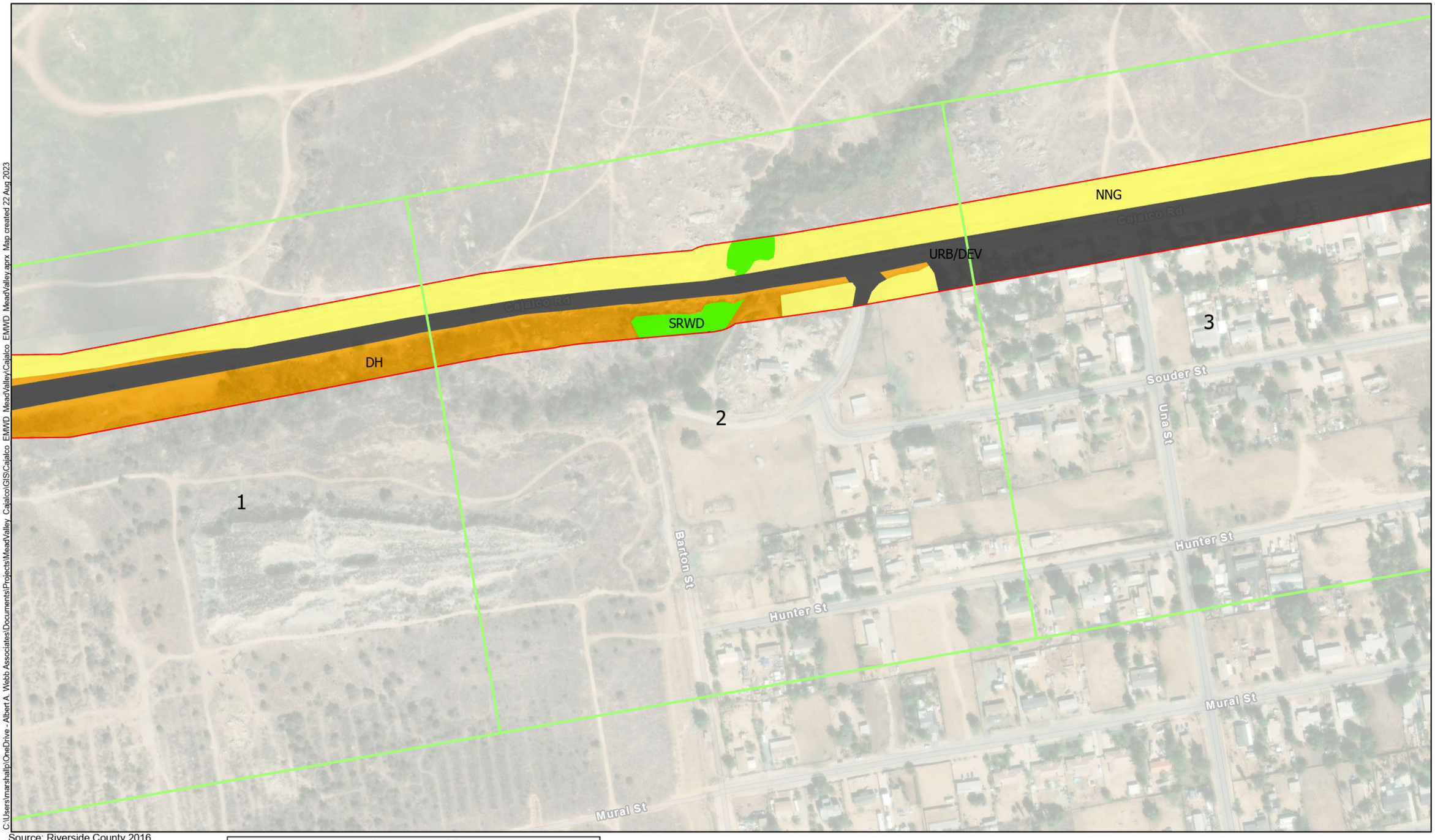


Figure 6-A - Vegetation and Land Cover Types

Mead Valley Cajalco Sewer Project

ALBERT A. WEBB ASSOCIATES



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Source: Riverside County 2016

0 90 180 360 Feet

Legend

- Biological Study Area (BSA)
- Southern Riparian Woodland (SRWD)
- Urban/Developed (URB/DEV)
- Non Native Grassland (NNG)
- Disturbed Habitat (DH)

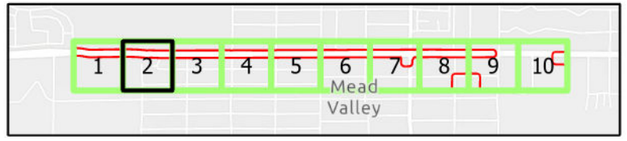


Figure 6-B - Vegetation and Land Cover Types

Mead Valley Cajalco Sewer Project

ALBERT A. WEBB ASSOCIATES

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NNG

URB/DEV

DH

SRWD

Cajalco Rd

Wells St

Alexander St

Souder St

Una St

Hunter St

Barton St

Mural St

2

3

4

Source: Riverside County 2016

0 90 180 360 Feet

Legend

- Biological Study Area (BSA)
- Southern Riparian Woodland (SRWD)
- Urban/Developed (URB/DEV)
- Non Native Grassland (NNG)
- Disturbed Habitat (DH)

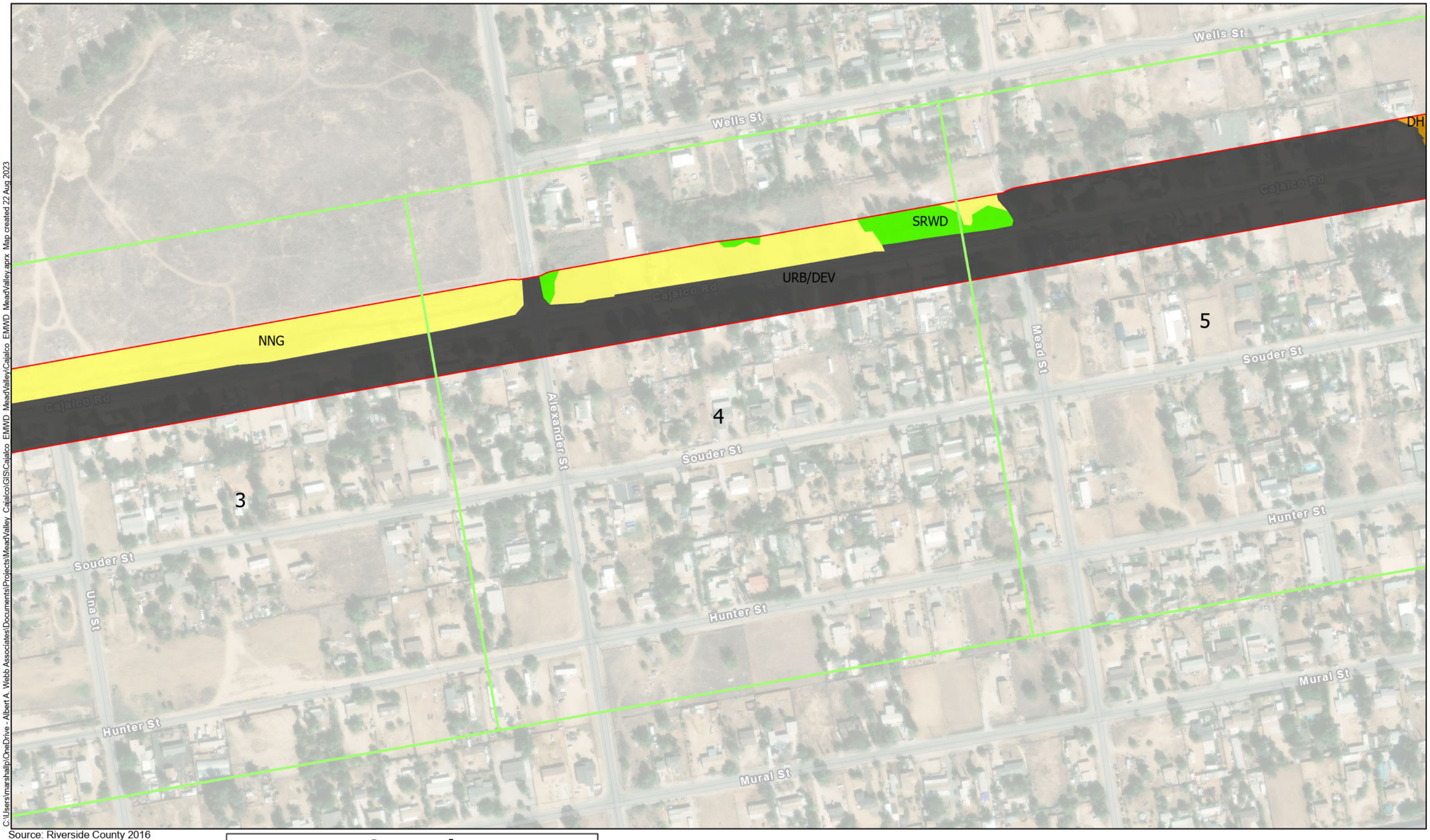
1 2 3 4 5 6 7 8 9 10

Mead Valley

Figure 6-C - Vegetation and Land Cover Types

Mead Valley Cajalco Sewer Project

ALBERT A. WEBB ASSOCIATES



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Source: Riverside County 2016

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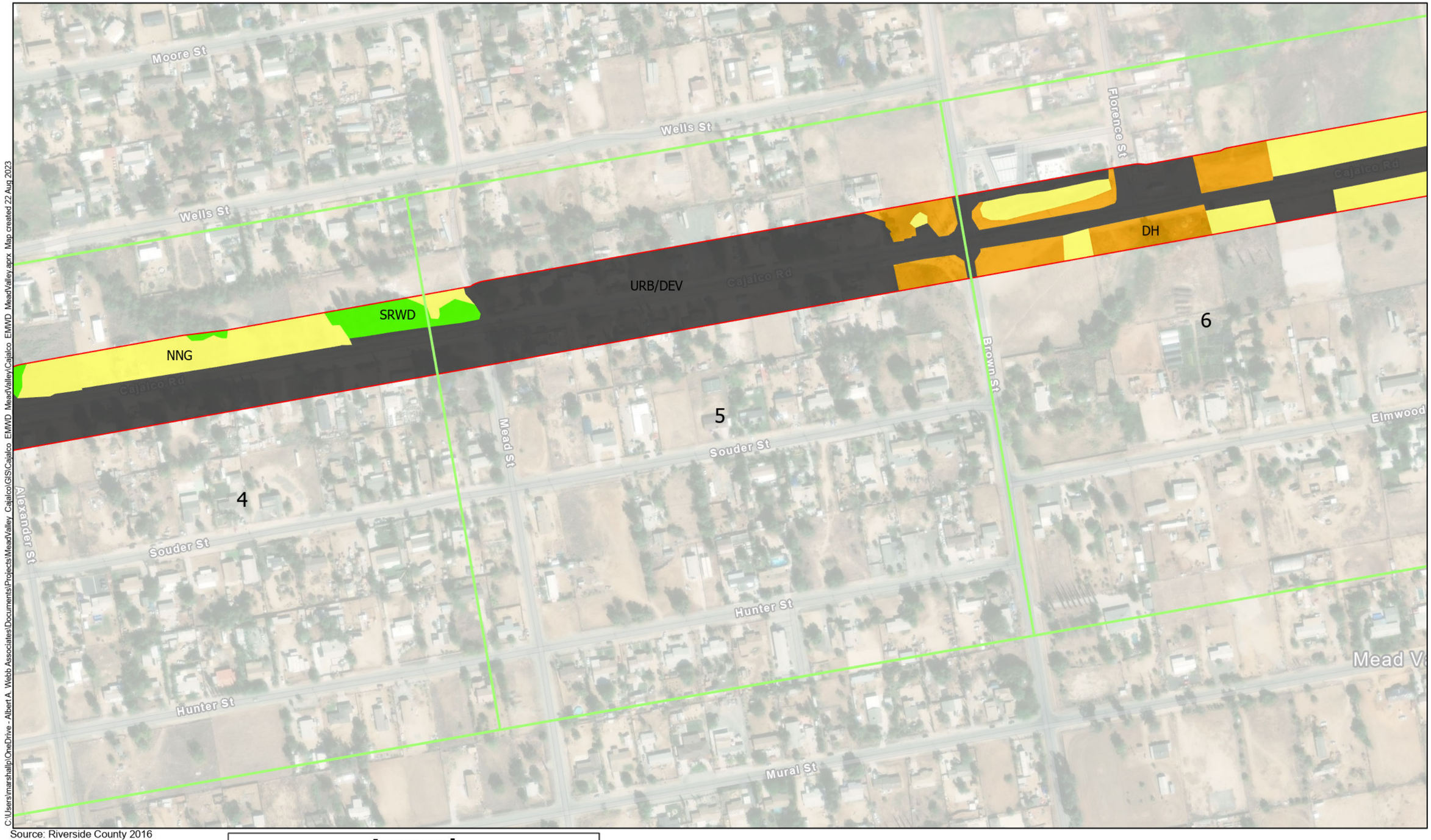
- Biological Study Area (BSA)
- Southern Riparian Woodland (SRWD)
- Urban/Developed (URB/DEV)
- Non Native Grassland (NNG)
- Disturbed Habitat (DH)

0 90 180 360 Feet

Figure 6-D - Vegetation and Land Cover Types

Mead Valley Cajalco Sewer Project

ALBERT A. WEBB ASSOCIATES



Source: Riverside County 2016

0 90 180 360 Feet

Legend

- Biological Study Area (BSA)
- Southern Riparian Woodland (SRWD)
- Urban/Developed (URB/DEV)
- Non Native Grassland (NNG)
- Disturbed Habitat (DH)

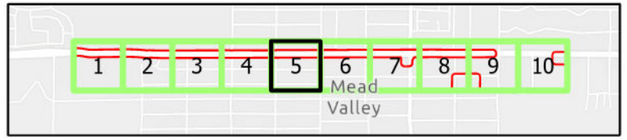


Figure 6-E - Vegetation and Land Cover Types

Mead Valley Cajalco Sewer Project

ALBERT A. WEBB ASSOCIATES

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Moore St
Johnson St
Wells St
Florence St
Haines St
Cajalco Rd
Brown St
Souder St
Elmwood St
Hunter St
Mead Valley
DH
NNG
SRWD
URB/DEV
5
6
7

Source: Riverside County 2016

0 90 180 360 Feet

Legend

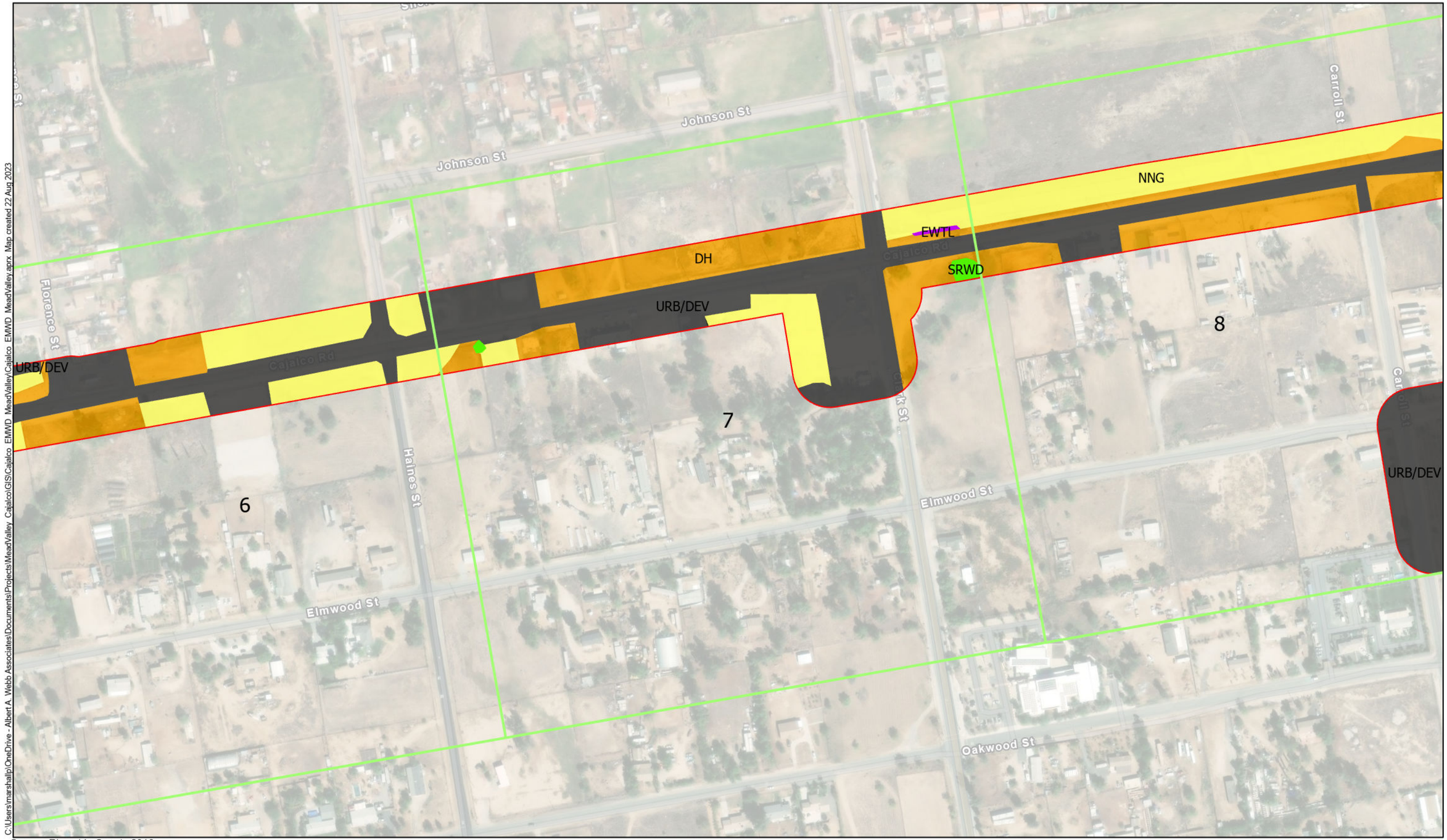
- Biological Study Area (BSA)
- Southern Riparian Woodland (SRWD)
- Urban/Developed (URB/DEV)
- Non Native Grassland (NNG)
- Disturbed Habitat (DH)

1 2 3 4 5 6 7 8 9 10
Mead Valley

Figure 6-F - Vegetation and Land Cover Types

Mead Valley Cajalco Sewer Project

ALBERT A. WEBB ASSOCIATES



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Source: Riverside County 2016

0 90 180 360 Feet

Legend

- Biological Study Area (BSA)
- Emergent Wetland (EWTL)
- Southern Riparian Woodland (SRWD)
- Urban/Developed (URB/DEV)
- Non Native Grassland (NNG)
- Disturbed Habitat (DH)

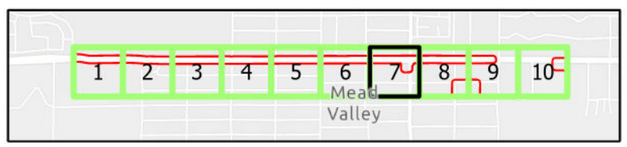


Figure 6-G - Vegetation and Land Cover Types

Mead Valley Cajalco Sewer Project

ALBERT A. WEBB ASSOCIATES



Source: Riverside County 2016

0 90 180 360 Feet

Legend

- Biological Study Area (BSA)
- Emergent Wetland (EWTL)
- Southern Riparian Woodland (SRWD)
- Urban/Developed (URB/DEV)
- Non Native Grassland (NNG)
- Disturbed Habitat (DH)

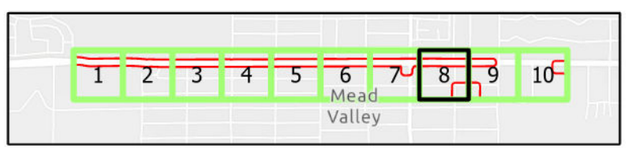
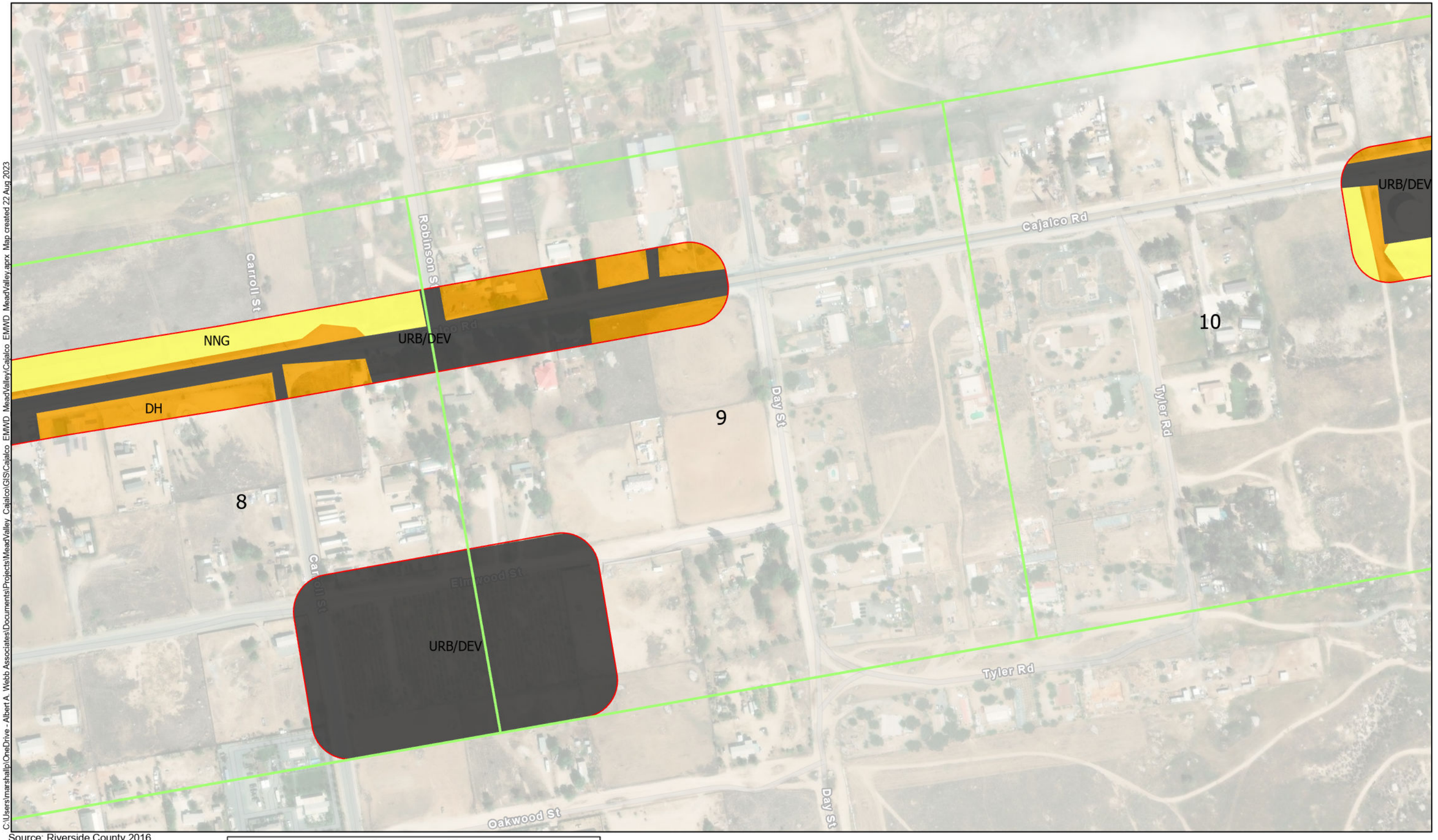


Figure 6-H - Vegetation and Land Cover Types

Mead Valley Cajalco Sewer Project

ALBERT A. WEBB ASSOCIATES

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Source: Riverside County 2016

0 90 180 360 Feet

Legend

- Biological Study Area (BSA)
- Urban/Developed (URB/DEV)
- Non Native Grassland (NNG)
- Disturbed Habitat (DH)

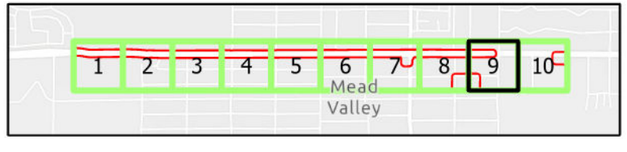


Figure 6-I - Vegetation and Land Cover Types

Mead Valley Cajalco Sewer Project

ALBERT A. WEBB ASSOCIATES

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Marquez Rd

Decker Rd

Cajalco Rd

Cajalco Rd

URB/DEV

DH

URB/DEV

NNG

EUC

10

9

D St

Tyler Rd

Anderson Rd

URB/DEV

Tyler Rd

Source: Riverside County 2016

0 90 180 360 Feet

Legend

- Biological Study Area (BSA)
- Eucalyptus Woodland (EUC)
- Urban/Developed (URB/DEV)
- Non Native Grassland (NNG)
- Disturbed Habitat (DH)

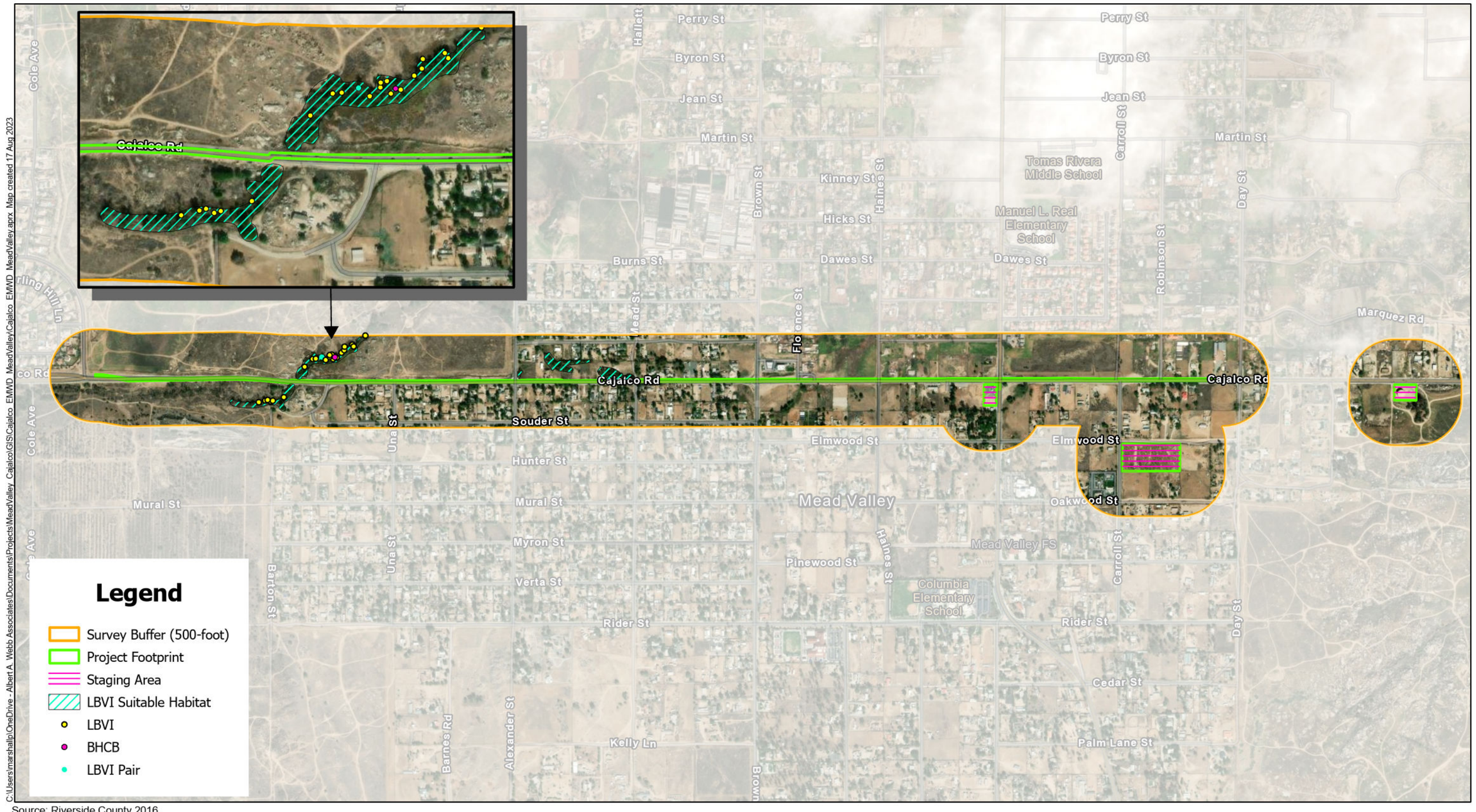
1 2 3 4 5 6 7 8 9 10

Mead Valley

Figure 6-J - Vegetation and Land Cover Types

Mead Valley Cajalco Sewer Project

ALBERT A. WEBB ASSOCIATES



Source: Riverside County 2016

Figure 7 - Least Bell's Vireo Survey Results

Mead Valley Cajalco Sewer Project

Feature A
Feature B
Feature C
Cajalco Rd
Carpinus Dr
Cole Ave
Barton St
Hunter St
Mural St
1
2
C:\Users\marshallp\OneDrive - Albert A. Webb Associates\Documents\Projects\MeadValley_Cajalco\GIS\Cajalco_EMWD_MeadValley\Cajalco_EMWD_MeadValley.aprx Map created 22 Aug 2023

Source: Riverside County 2016

0 90 180 360 Feet

Legend

- Biological Study Area (BSA)
- Aquatic Features
- Culverts

1 2 3 4 5 6 7 8 9 10
Mead Valley

Figure 8-A - Potentially Jurisdictional Aquatic Features

Mead Valley Cajalco Sewer Project

ALBERT A. WEBB ASSOCIATES



Source: Riverside County 2016

0 90 180 360 Feet

Legend

- Biological Study Area (BSA)
- Aquatic Features
- Culverts

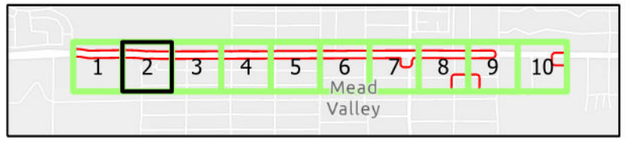
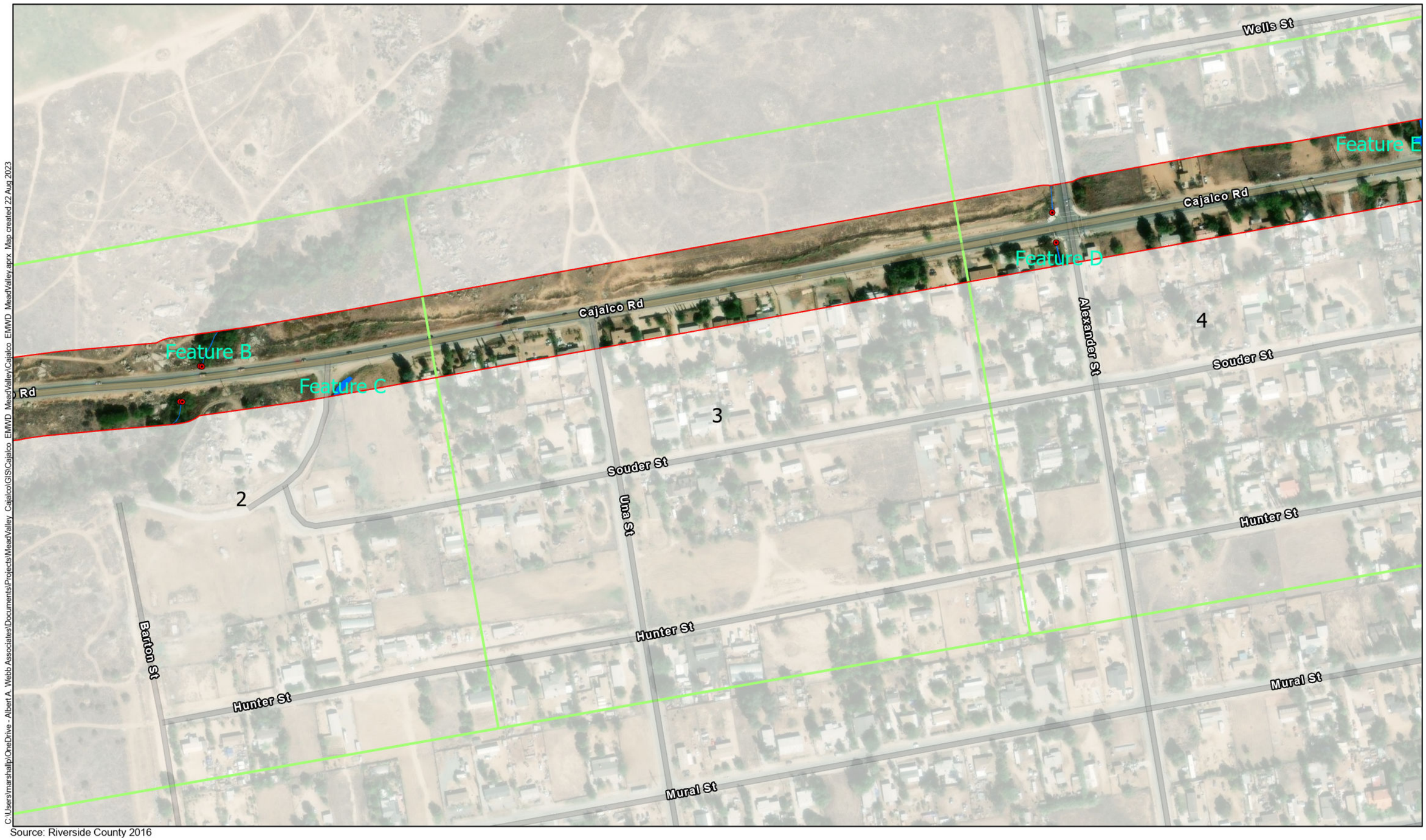


Figure 8-B - Potentially Jurisdictional Aquatic Features

Mead Valley Cajalco Sewer Project

ALBERT A. WEBB ASSOCIATES



Source: Riverside County 2016

0 90 180 360 Feet

Legend

- Biological Study Area (BSA)
- Aquatic Features
- Culverts

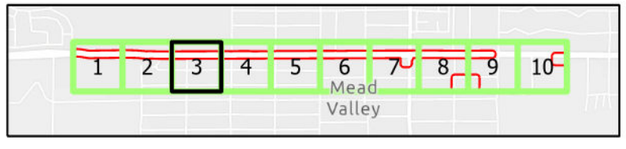


Figure 8-C - Potentially Jurisdictional Aquatic Features

Mead Valley Cajalco Sewer Project

ALBERT A. WEBB ASSOCIATES



Source: Riverside County 2016

0 90 180 360 Feet

Legend

- Biological Study Area (BSA)
- Aquatic Features
- Culverts

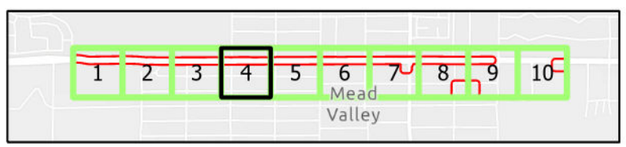


Figure 8-D - Potentially Jurisdictional Aquatic Features

Mead Valley Cajalco Sewer Project

ALBERT A. WEBB ASSOCIATES



Source: Riverside County 2016

0 90 180 360 Feet

Legend

- Biological Study Area (BSA)
- Aquatic Features
- Culverts

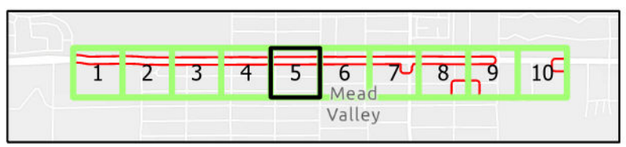


Figure 8-E - Potentially Jurisdictional Aquatic Features

Mead Valley Cajalco Sewer Project

ALBERT A. WEBB ASSOCIATES



Source: Riverside County 2016

0 90 180 360 Feet

Legend

- Biological Study Area (BSA)
- Aquatic Features
- Culverts

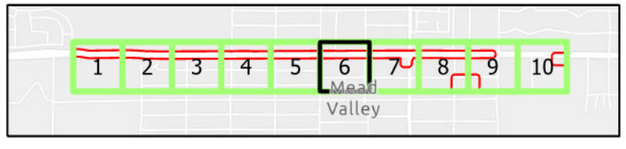


Figure 8-F - Potentially Jurisdictional Aquatic Features

Mead Valley Cajalco Sewer Project

ALBERT A. WEBB ASSOCIATES



0 90 180 360 Feet

Legend

- Biological Study Area (BSA)
- Aquatic Features
- Culverts

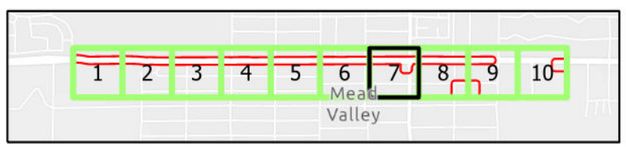
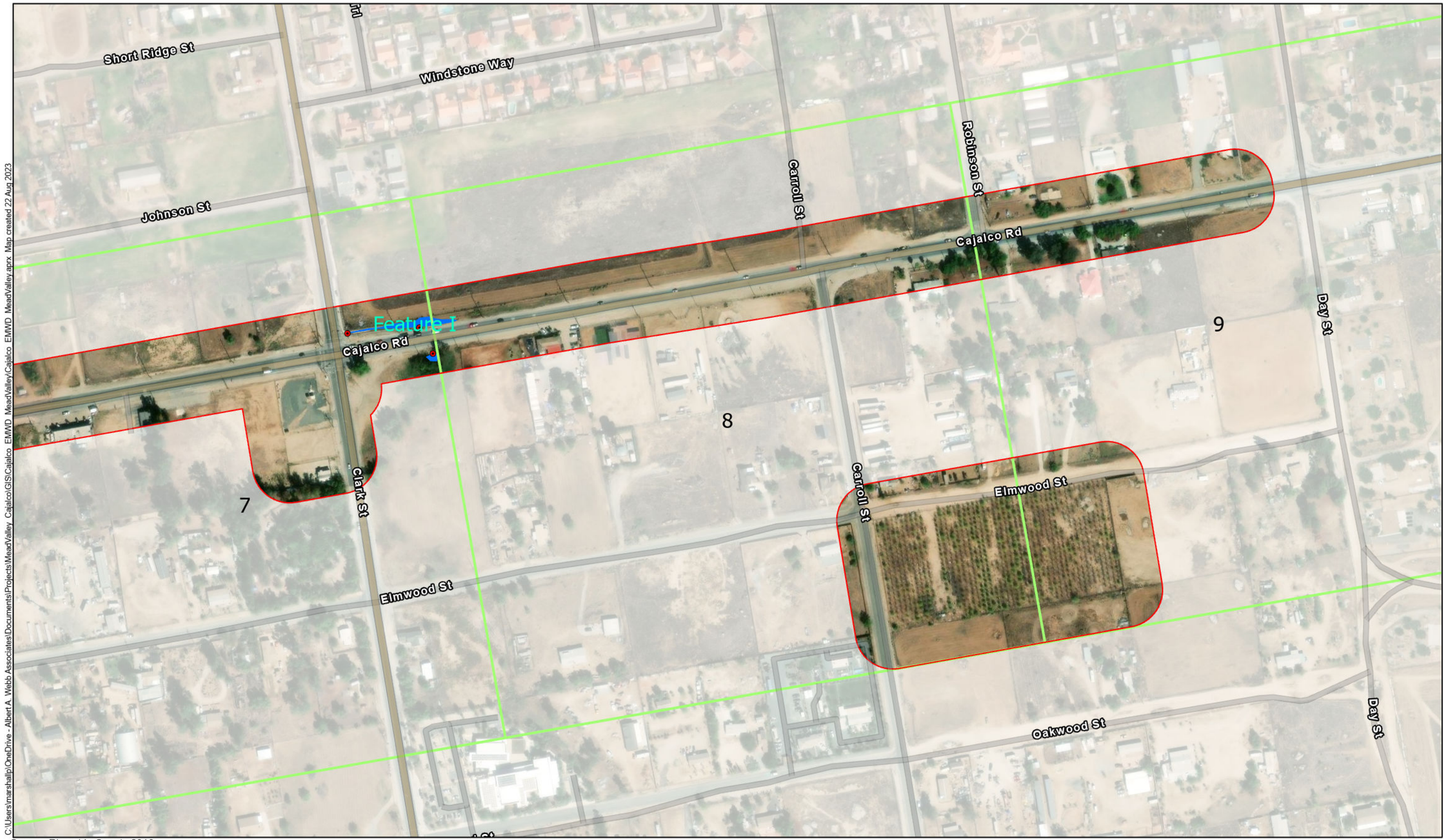


Figure 8-G - Potentially Jurisdictional Aquatic Features

Mead Valley Cajalco Sewer Project

ALBERT A. WEBB ASSOCIATES



Source: Riverside County 2016

0 90 180 360 Feet

Legend

- Biological Study Area (BSA)
- Aquatic Features
- Culverts

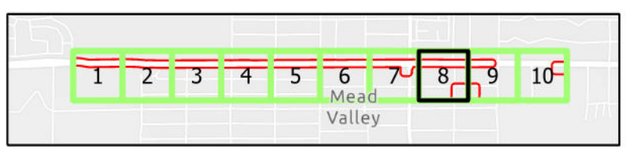


Figure 8-H - Potentially Jurisdictional Aquatic Features

Mead Valley Cajalco Sewer Project

ALBERT A. WEBB ASSOCIATES



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Source: Riverside County 2016

0 90 180 360 Feet

Legend

Biological Study Area (BSA)

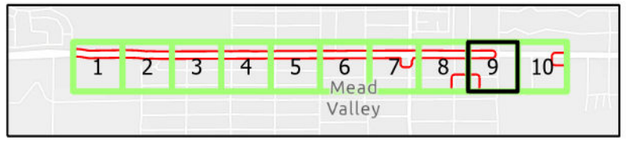
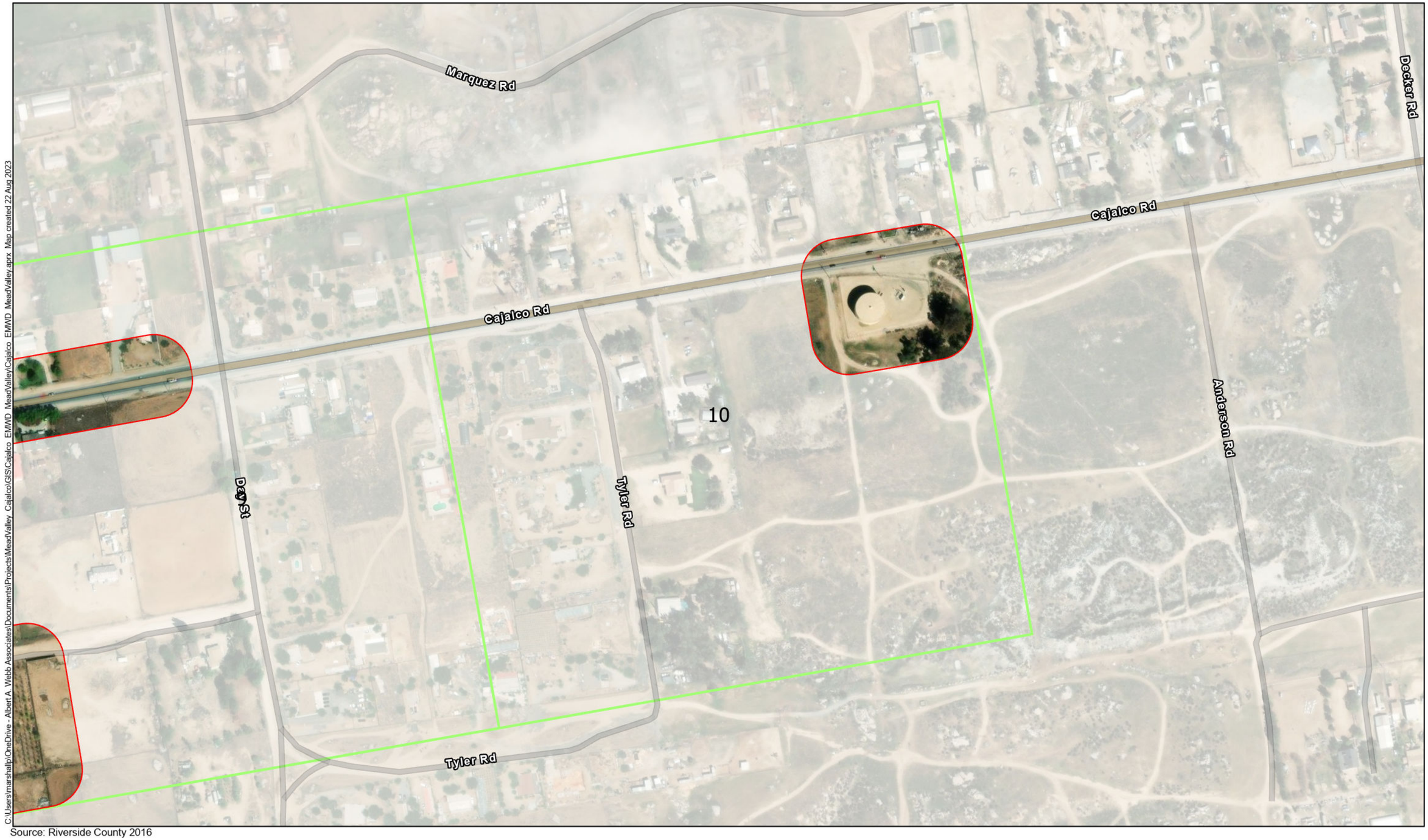


Figure 8-I - Potentially Jurisdictional Aquatic Features

Mead Valley Cajalco Sewer Project

ALBERT A. WEBB ASSOCIATES



Source: Riverside County 2016

0 90 180 360 Feet

Legend

Biological Study Area (BSA)

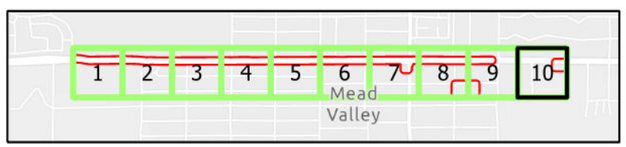


Figure 8-J - Potentially Jurisdictional Aquatic Features

Mead Valley Cajalco Sewer Project

ALBERT A. WEBB ASSOCIATES

3.5 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 Section 15064.5?	[ ]	[X]	[ ]	[ ]
b) Cause a substantial adverse change in the significance of a unique archaeological resource pursuant to Section 15064.5?	[ ]	[X]	[ ]	[ ]
c) Disturb any human remains, including those interred outside of dedicated cemeteries?	[ ]	[X]	[ ]	[ ]

Discussion

The discussion in this section is based on the findings of the *Cultural Resource Technical Report for the Mead Valey Cajalco Sewer Project* dated October 2023, prepared by South Environmental (hereinafter referred to as the Cultural Resource Study). The Cultural Resources Study consisted of a cultural resources records search, literature review, and a cultural resources survey.

a) Less than Significant Impact with Mitigation Incorporated

On August 23 2023, a cultural resources records search of the California Historical Resources Information System (CHRIS) at the Eastern Information Center (EIC) at the University of California, Riverside was conducted to identify any previously recorded cultural resources and cultural resources studies in and within a 0.5-mile radius of the proposed Project site. (SE 2023, p. 12.) The CHRIS record search included their collections of mapped prehistoric and historic archaeological resources and historic built-environment resources, State of California Department of Parks and Recreation Site Records (DPR forms), technical reports, archival resources, and ethnographic references. Additional consulted sources include historical maps of the study area, the NRHP, the CRHR, the lists of California State Historical Landmarks, California Points of Historical Interest, and the Archaeological Determinations of Eligibility. (SE 2023, p. 12.)

The records search found 24 cultural resource studies that had been previously conducted within a 0.5-mile radius of the Project site between 1972 and 2012. (SE 2023,

pp. 21-28.) From these studies, 44 previously recorded cultural resources were identified within a 0.5-mile radius of the proposed Project site. However no historic resources are within the Project site or the staging areas. (SE 2023, pp. 22-28.)

A pedestrian field survey was conducted on August 23, 2023. The purpose of the survey was to identify cultural resources that may be present along the Project site. The Project vicinity included paved roads, graded dirt roads, or plowed private lots. Ground visibility varied from 0 percent to 95 percent. (SE 2023, p 46.) During the pedestrian survey no cultural resources or features were observed. (SE 2023, p. 46.)

As concluded by the Cultural Resource Study, no significant historical resources were identified within the Project site. Although no known historical resources would be affected by the proposed Project, construction has the potential to encounter previously unknown archaeological or historical resources. While encountering unknown historical resources is unlikely based on the previously disturbed condition of the proposed Project site and surrounding area's ground disturbance from previous development, because the Project site is near historical resources the Cultural Resource Study recommends archaeological monitoring. **Mitigation Measures CUL-1** and **CUL-2** will be implemented to reduce impacts to historic cultural resources. **Mitigation Measure CUL-1** requires archaeological monitoring and the preparation of a Cultural Resources Monitoring Plan by a qualified archaeologist. **Mitigation Measure CUL-2** requires evaluation of discovered artifacts. Operation of the proposed Project would not involve ground disturbing activities and would therefore have no impact on cultural resources. Implementation of **Mitigation Measures CUL-1 and CUL-2** would reduce potential impacts to previously unknown historical resources, if encountered during construction, to less than significant.

b) Less than Significant Impact with Mitigation Incorporated

As discussed in response "5a" above, a total of 44 previously recorded cultural resources were identified within a 0.5-mile radius of the proposed Project site. One previously recorded prehistoric village complex, overlaps the proposed pipeline alignment along Cajalco Road. This resource contains Areas of Tribal Interest (ATI) and is eligible for the National Register of Historical Places (NRHP). There is a second previously recorded cultural resource adjacent to the pipeline alignment, which is likely associated with the village complex. (SE 2023, p. 21.)

The pedestrian field survey conducted on August 23, 2023, did not identify any new archaeological resources within the Project site or staging areas.

Construction activities have the potential to inadvertently impact known and unknown archaeological resources. Implementation of **Mitigation Measures CUL-1** and **CUL-2** would reduce impacts to a less than significant level.

c) Less than Significant Impact with Mitigation Incorporated

Previous land uses along the proposed pipeline, alignment, Clark Street Sewer Lift Station, and staging areas uses do not include known cemetery use and the Project site

is not expected to contain human remains, including those interred outside of formal cemeteries. However, the potential exists for previously unknown human remains to be discovered during Project construction activities. **Mitigation Measure CUL-3** would be implemented to ensure proper procedures are in place if human remains are discovered during construction. There would be no ground disturbing activities during operation of the proposed Project and therefore no mitigation related to discovery of human remains would be required during operation. With implementation of **Mitigation Measures CUL-3** during construction, impacts as a result of the inadvertent discovery of human remains would be less than significant.

Mitigation Measures:

CUL-1 Cultural Resources Monitoring and Plan Development.

Prior to grading activities, a Cultural Resources Monitoring Plan (Plan) shall be prepared by a qualified archaeologist (Project 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 meeting Secretary of Interior standards, based on observations of subsurface soil stratigraphy or other factors during initial grading, and in consultation with the Consulting Tribe(s) and their designated Native American monitor and the lead agency, may reduce or discontinue monitoring as warranted if the Project 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 mitigation impacts to cultural resources. The plan shall establish the criteria utilized to evaluate the historic significance (per CEQA) of the discoveries, methods of avoidance consistent with CEQA Guidelines Section 15126.4(b)(3), as well as 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. The Project Archaeologist and Consulting Tribe(s) tribal monitor shall attend a pre-grade meeting with Eastern Municipal Water District staff, the contractor, and appropriate subcontractors to discuss the monitoring program, including protocols to be followed in the event that cultural material is encountered.

CUL-2 Evaluation of Discovered Artifacts.

Artifacts discovered along the pipeline alignment. Clark Lift Station site, or any staging areas shall be inventoried and analyzed by the Project Archaeologist and Native American 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.

CUL-3 Procedure for Discovery of Human Remains.

If Native American human remains are encountered, Public Resources Code 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 Public Resources Code 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." The most likely descendant shall then make recommendations and engage in consultations concerning the treatment of the remains as provided in Public Resources Code Section 5097.98.

3.6 Energy

	Potentially Significant Impact	*Less Than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
Would the Project:				
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	[ ]	[ ]	[X]	[ ]
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	[ ]	[ ]	[X]	[ ]

Discussion

Electrical service for the proposed Project area is provided by Southern California Edison (SCE). Natural gas service for the entire proposed Project area is provided by the Southern California Gas Company. SCE's power content mix utilizes approximately 31 percent renewables, two percent large hydroelectric, 22 percent natural gas, nine percent nuclear, and 34 percent from purchased unspecified power sources. (SCE 2021.)

The County of Riverside approved their 2019 Climate Action Plan (CAP) on December 17, 2019. The 2019 CAP updates the 2015 CAP and builds upon the 2015 CAP GHG reduction strategies. The 2019 CAP Update refines the County's efforts to meet greenhouse gas (GHG) reduction strategies, specifically for the years 2035 and 2050. The CAP describes the County of Riverside's GHG emissions for the year 2017, projects how these emissions will increase into 2020, 2030, and 2050, and includes strategies to reduce emissions to a level consistent with the State of California's emissions reduction targets. In order to reach the reduction target, the County of Riverside would also need to implement additional local reduction measures. These measures encourage energy efficiency and renewable energy, development and penetration of zero-emission vehicles (ZEVs), water conservation, and increased waste diversion. In addition to local government, efforts at the local business and community level would be required to achieve these targets. These strategies complement Riverside County's General Plan policies and are consistent with Riverside County's vision for a more sustainable community. (CAP 2019.)

The County of Riverside partners with Southern California Association of Governments (SCAG), Western Riverside Council of Governments (WRCOG), SCE, and SoCalGas for outreach events, such as annual energy-efficiency fair. In addition, the County of Riverside also promotes programs such as Home Energy Renovation Opportunity (HERO) program sponsored by the Western Riverside County Council of Governments (WRCOG) and other Property Assessed Clean Energy (PACE) programs. (CAP 2019)

a) Less than Significant Impact

Construction of the proposed Project would involve construction-related fossil fuel consumption from operation of diesel-powered construction equipment, and fossil fuel consumption from material hauling, delivery, and worker vehicle trips. The anticipated construction fleet for the proposed Project includes typical off-road construction equipment and on-road vehicle fleet such as a backhoe/loader, excavator, rubber-tired loaders, pavers, graders, water truck, and dump trucks.

Operation of the proposed Project would not involve the consumption of energy. Routine inspection of above ground components would be incorporated into EMWD's existing O&M activities and would not cause a net change in vehicle trips and hence fossil fuel consumption.

The proposed Project would implement typical construction practices such as trenching and repaving. The Project would not require unusual or excessive construction equipment or practices that would result in wasteful, inefficient, or unnecessary consumption of energy compared to projects of similar type and size. In addition, the construction fleet contracted for the proposed Project would be required to comply with the CARB In-Use Off-Road Diesel-Fueled Fleets Regulations, which would limit vehicle idling time to five minutes, restrict adding vehicles to construction fleets with older-tier engines, and establish a schedule for retiring older, less fuel-efficient engines from the construction fleet and replacing the retired vehicles with newer vehicles, repowering older engines, or installing verified diesel emission control strategies in older engine. Effective January 1,

2024, the In-Use Off-Road Diesel-Fueled Fleets Regulations would require contracting entities to obtain and retain a fleet's valid Certificate of Reported Compliance prior to awarding a contract or hiring a fleet. (CARB-C 2023.)

Once construction is complete, the proposed Project would not involve operational energy consumption. As such, construction and operation of the proposed Project would not result in wasteful, inefficient, or unnecessary consumption of energy and impacts would be less than significant.

b) Less than Significant Impact

The County of Riverside's 2019 CAP focuses on reducing energy and emissions from the County as an organization and encourages the local community and local business to reduce their own energy and GHG emissions. The County of Riverside's 2019 CAP includes the suggested measures to reduce emissions and GHGs through energy use reduction, water use reduction, recycling and diversion, alternative transportation, and renewable energy utilization. The proposed Project would not result in a net increase beyond existing levels in energy use or vehicle trips during operation. The Project would not involve land use changes that would indirectly result in an increase in vehicle trips or vehicle miles travelled, such as from relocation of an existing road. As explained under response "*3.6a",* above, the Project would not involve wasteful or inefficient energy consumption. Operation of the Project would not involve consumption of water or generation of solid waste. Therefore, the Project would not conflict with the 2019 CAP's plan for energy efficiency, which was developed to keep countywide GHG emissions in line with State reduction targets. Therefore, the proposed Project would not conflict with or obstruct a State or local plan for renewable energy or energy efficiency. Impacts would be less than significant, and no mitigation would be required.

Mitigation Measures: None required or recommended.

3.7 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.	[ ]	[ ]	[ ]	[X]
ii) Strong seismic ground shaking?	[ ]	[ ]	[X]	[ ]
iii) Seismic-related ground failure, including liquefaction?	[ ]	[ ]	[X]	[ ]
iv) Landslides?	[ ]	[ ]	[X]	[ ]
b) Result in substantial soil erosion or the loss of top soil?	[ ]	[ ]	[X]	[ ]
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?	[ ]	[ ]	[X]	[ ]
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994),	[ ]	[ ]	[X]	[ ]

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

Discussion

Riverside County contains rugged mountains, flat valley areas, open desert, and expansive natural open space areas. As with many regions in Southern California, the County is located in areas of several known active earthquake faults. Riverside County contains Alquist—Priolo Zones including the San Jacinto Fault Zone, San Andres Fault Zone, and the Elsinore Fault Zone. (GPEIR, 4.10.1.) Areas throughout Riverside County maybe susceptible to liquefaction hazards, unstable soils, and/or be susceptible to landslides. (GPEIR, 4.10.1.)

A Geotechnical Investigation Report was prepared for the proposed Project **(Appendix D**) to address potential geologic hazards and geotechnical conditions that could impact the proposed construction. As part of the geotechnical investigation, pertinent documents reviewed included published reports and mapping, aerial photographs, in-house geotechnical reports, and available reports by others. Additionally, thirteen (13) test borings were drilled within and near the Project site. The borings drilled to the approximate depths up to 41½ feet below the existing ground surface found that Project site consisted of soils that include: fill, very old axial-channel deposits, young wash deposits, and Val Verde tonalite (granitic rock). (ATLAS 2023, p. 3.) Groundwater was encountered in depths as shallow as 13 feet below ground surface. The approximate depth to granite igneous rock ranged from below the surficial spills to the depths the borings explored. (ATLAS 2023, pp. 3.)

The Project is located within the Peninsular Ranges Geomorphic Province of California, which stretches from the Los Angeles basin south into Baja California. This province is characterized as a series of northwest-trending mountain ranges separated by subparallel fault zones and a coastal plain of subdued landforms. (ATLAS 2023, p. 2.)

The mountain ranges are underlain primarily by Mesozoic metamorphic rocks that were intruded by plutonic rocks of the southern California batholith, while the coastal plain is underlain by subsequently deposited marine and non-marine sedimentary formations. The Project site is located in the coastal plain and the subsurface materials consists of

fill, very old axial-channel deposits, young wash deposits, and Val Verde tonalite (granite rock). (ATLAS 2023, pp. 2-3.)

The closest active fault to the Project site and the staging areas is the Glen Ivy North fault (ATLAS 2023, p. 5.) The Project site and the staging areas are not located in an Alquist-Priolo Earthquake Fault Zone. (ATLAS 2023, p. 4.)

a.i) No Impact

The Project would not be associated with significant levels of risk of loss, injury or death from rupture of a known earthquake fault. Based on California's Geological Survey's Earthquake Fault Zone Map the Project site and the staging areas are not within a known fault. (DOC-B 2023.) The Project site and the staging areas are not located in an Alquist-Priolo Earthquake Fault Zone. (ATLAS 2023, p. 5.) The closest active fault to the Project site and the staging areas is the Glen Ivy North fault located southwest of the Project site. (ATLAS 2023, p. 5; DPC-B 2023.) The shortest distance between this Glen Ivy North fault and the Project site is 10 miles. Due to the distance of the Glen Ivy North fault, there is no potential for surface fault rupture in the Project site.

a.ii) Less than Significant Impact

The proposed Project is situated in a seismically active region. As is the case for most areas of Southern California, ground-shaking resulting from earthquakes associated with nearby and more distant faults may occur at the proposed Project site. During the life of the Project, seismic activity associated with active faults can be expected to generate moderate to strong ground shaking at the Project site.

However, the Project facilities would be designed per EMWD's Engineering Standards and Specifications, which would ensure structural resiliency. The Project would also be designed and constructed pursuant to recommendations and requirements of the Geotechnical Investigation Report (**Appendix D**) as well as applicable American Water Works Association (AWWA) standards and would incorporate measures to accommodate seismic loading pursuant to guidelines such as the "Greenbook" Standard Specifications for Public Works Construction and the International Building. These guidelines are produced through joint efforts by industry groups to provide standard specifications for engineering and construction activities, including measures to accommodate seismic loading parameters. These standards and guidelines are widely accepted by regulatory authorities and are regularly included in related standards such as municipal building and grading codes. In addition, the Project design would follow guidelines within the California Building Code (CBC; California Code of Regulations, Title 24, Part 2), which is based on the International Building Code (IBC) with amendments to reflect conditions specific to California.

Because building and construction codes related to seismic shaking would be followed, there would be less potential for structural damage or loss due to seismic ground shaking. Even if structural damage does occur during a seismic event, it would be isolated to the various Project components; the Project would not exacerbate a risk of seismic-related

damage to other existing resources and land uses in the vicinity. Impacts would be less than significant.

a.iii) Less than Significant Impact

Liquefaction occurs when loose, saturated, generally fine sands and silts are subjected to strong ground shaking. The soils lose shear strength and become liquid, potentially resulting in large total and differential ground surface settlements as well as possible lateral spreading during an earthquake. (ATLAS 2023, p. 5.) Shallow hard material was mapped along the Project site and no liquefiable material was found. (ATLAS 2023, p. 6.)

Additionally, the Project would be designed and constructed in accordance with EMWD's Engineering Standards and Specifications, and the other standards and guidelines described under response "3.7a.ii" above. Therefore, impacts would be less than significant.

a.iv) Less than Significant Impact

Seismically induced landslides and slope failures are common occurrences during or soon after large earthquakes. However, the Geotechnical Report Investigation did not indicate slope instability near the Project site and determined that slope instabilities, or landslides, to affect the Project site were considered low. (ATLAS 2023, p. 5.) As described under response "3.7a.ii" above, all Project facilities would be designed in accordance with EMWD's Engineering Standards and Specifications and the other standards and guidelines in accordance with recommendations in the Geotechnical Investigation Report. Therefore, impacts would be less than significant.

b) Less than Significant Impact

Construction of the Project components would require soil-disturbing activities such as excavation, which would expose soil. The soil exposed by construction would be subject to erosion during strong winds, heavy rains, or other storm events. Proposed Project construction activities would disturb one acre or more in total and would be covered under the National Pollutant Discharge Elimination System (NPDES) Construction General Permit. A SWPPP would be prepared and implemented in compliance with the Construction General Permit. Best management practices (B MPs) would be identified in the SWPPP to control and reduce pollutant discharges associated with construction and erosion. Once construction is complete, all pipelines and associated appurtenances disturbance areas would be returned to pre-Project conditions and therefore would not result in further soil erosion. Therefore, impacts would be less than significant.

c) Less than Significant Impact

Similar to the seismically induced landslide impacts addressed in response "3.7a.iv" above and the liquefaction impacts addressed in response "3.7a.iii" above, the Project's potential to result in unstable soils that could result in landslides would be low because the relatively flat nature of the Project area and the Project's location within an existing roadway.

The Project site has a low potential for liquefaction and settlement because of the dense soils, depth to groundwater, and absence of liquefiable material. (ATLAS 2023, p. 5.) The Project site is not located in an area known for subsidence and the potential for subsidence is low. (ATLAS 2023, p. 6.) Additionally, adherence to the Geotechnical Investigation Report design recommendations, EMWD's Engineering Standards and Specifications, and other standards and guidelines would ensure structural resiliency to earthquake events and any other causes of lateral spreading or liquefaction. Therefore, impacts would be less than significant.

d) Less than Significant Impact

Expansive soils have the ability to significantly change their volume, shrink and swell, due to their soil moisture content. (GPEIR, 4.10.1.) As part of the Geotechnical Investigation Report, samples of the soils along the Project site were evaluated and determined that they have a very low to low potential for expansion. (ATLAS 2023, p. 8.) Additionally, as described above, the Project's design would adherence to the Geotechnical Investigation Report design recommendations, EMWD's Engineering Standards and Specifications, and other standards and guidelines for structural resiliency that include, but are not limited to, grading recommendations to further reduce risk associated with expansive soils. Therefore, impacts would be less than significant.

e) No Impact

The Project does not propose the construction or use of septic tanks or alternative wastewater disposal systems. The proposed Project would provide wastewater services to the surrounding area, eliminating the current usage of septic tanks Therefore, there would be no impact.

f) Less than Significant Impact with Mitigation Incorporated

A *Cultural Resources Technical Report the Mead Valley Cajalco Sewer Project* dated October 2023, was prepared by South Environmental and is included as Appendix C of this IS. The paleontological study prepared as part of the Cultural Resources Technical Report was completed in compliance with CEQA, federal, state, and local regulations to determine the potential Project impacts to paleontological resources in the Project area. Fossils are valuable and nonrenewable resources of remains of ancient, commonly extinct organisms that help us understand the evolutionary history of life on earth.

The California Public Resources Code (Section 5097.5) prevents an individual from removing, destroying, or altering any paleontological resources found on public lands without the permission of the public agency that has jurisdiction over the lands. Riverside County contains a policies (Policy OS 19.6 – Policy OS 19.9) for paleontological resources in its General Plan which states that areas within high-paleontological sensitivity designation must prepare a paleontological impact mitigation program (PRIMP), areas within a low-paleontological sensitivity designation would not require direct mitigation unless fossils are encountered, areas within undermined-paleontological sensitivity designation must prepare a paleontological report to document potential

significance of paleontological resources and appropriate mitigation, and should paleontological resources are found, these resources would be sent to Riverside County for curation. (COR 2015, p. OS-51.)

Paleontological sensitivity of the geological units beneath the Project area was assessed through a literature review and a paleontological locality search. A request was submitted to the Western Science Center (WSC) in Hemet for a list of known fossil localities for the Project site area and within a one-mile radius. (SE 2023, p. 35.) The records did not identify fossil localities within the Project site and the staging area or the surrounding one-mile radius. (SE 2023, p. 35.) However, the geologic units underlying the Project site are mapped as alluvial sand and gravel from the Pleistocene epoch and quartz diorite from the Cretaceous. (SE 2023, p. 35.) Pleistocene alluvial units are considered to be highly paleontologically sensitive. Should paleontological resources be discovered within the Project site, these resources have a potential to be scientifically significant. (SE 2023, p. 36.)

Although no known paleontological resources were identified within the Project site, the Project site area is highly paleontological sensitive. To ensure that potential paleontological resources impacts are less than significant, EMWD would be required to implement mitigation measures that include paleontological monitoring, the preparation of a Paleontological Resource Impact Mitigation Program (PRIMP), and implementation of a Workers Environmental Awareness Program, (WEAP). Therefore, with implementation of **Mitigation Measure GEO-1 through Mitigation Measure GEO-3,** impacts would be less than significant**.**

Mitigation Measures:

GEO-1 Paleontological Resources Workers Environmental Awareness Program (WEAP).

To educate construction crews about the types of paleontological resources that may be encountered during construction, EMWD shall retain a professional paleontologist (the "Project Paleontologist") to prepare a Paleontological Resources Workers Environmental Awareness Program (WEAP). The Paleontological Resources WEAP shall provide a description of the laws and ordinances protecting fossil resources, the types of fossil resources that may be encountered in the area, the role of the paleontological monitor, outline steps to follow in the event that a fossil discovery is made, and provide contact information for the Project Paleontologist. The Project Paleontologist or designee(s) shall present the Paleontological Resources WEAP to the construction contractor and construction crew(s) during a preconstruction meeting. The Paleontological Resources WEAP shall be taped and presented to any construction crew members not present at the preconstruction meeting during which it was initially presented prior to such crew members working on the Project. This training may be conducted concurrent with other preconstruction training (e.g., biological resources, safety).

GEO-2 Paleontological Mitigation Monitoring.

Prior to the commencement of Project-related ground-disturbing activities the Project Paleontologist retained under **Mitigation Measure GEO-1** shall prepare and implement a Paleontological Resources Mitigation Monitoring Plan (PRMMP) for the Project. The PRMMP shall describe the monitoring required during excavations that extend into the three Pleistocene alluvial units and the location of other areas deemed to have a high paleontological resource potential. Paleontological Monitoring shall entail the visual inspection of excavated or graded areas and trench sidewalls. If the Project Paleontologist determines full-time monitoring is no longer warranted, based on the geologic conditions at depth, the Paleontological Monitor may recommend that monitoring be reduced or cease entirely.

GEO-3 Fossil Discoveries.

In the event that a paleontological resource is discovered, the Project Paleontologist shall have the authority to temporarily divert the construction equipment around the find until it is assessed for scientific significance and, if appropriate, collected. If the resource is determined to be of scientific significance, the Project Paleontologist shall complete the following:

1. Salvage of Fossils. If fossils are discovered, all work in the immediate vicinity should be halted to allow the paleontological monitor, and/or Project Paleontologist to evaluate the discovery and determine if the fossil may be considered significant. If the fossils are determined to be potentially significant, the Project Paleontologist (or paleontological monitor) should recover them following standard field procedures for collecting paleontological as outlined in the PRMMP prepared per Mitigation Measure GEO-1. Typically, fossils can be safely salvaged quickly by a single paleontologist and not disrupt construction activity. In some cases, larger fossils (such as complete skeletons or large mammal fossils) require more extensive excavation and longer salvage periods. In this case the Project Paleontologist shall have the authority to temporarily direct, divert or halt construction activity to ensure that the fossil(s) can be removed in a safe and timely manner.

2. Fossil Preparation and Curation. The PRMMP shall identify the museum that has agreed to accept fossils that may be discovered during project-related excavations. Upon completion of fieldwork, all significant fossils collected shall be prepared in a properly equipped laboratory to a point ready for curation. Preparation may include the removal of excess matrix from fossil materials and stabilizing or repairing specimens. During preparation and inventory, the fossils specimens will be identified to the lowest taxonomic level practical prior to curation at an accredited museum. The fossil specimens must be delivered to the accredited museum or repository no later than 90 days after all fieldwork is completed. The cost of curation will be assessed by the repository and will be the responsibility of EMWD.

3. Final Paleontological Mitigation Report. Upon completion of ground disturbing activity (and curation of fossils if necessary), the Project Paleontologist shall

prepare a final mitigation and monitoring report outlining the results of the mitigation and monitoring program. The report shall include discussion of the location, duration and methods of the monitoring, stratigraphic sections, any recovered fossils, and the scientific significance of those fossils, and where fossils were curated.

3.8 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?	[ ]	[ ]	[X]	[ ]
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	[ ]	[ ]	[X]	[ ]

Discussion

GHGs are pollutants that are known to increase the greenhouse effect in the earth's atmosphere thereby adding to global climate change impacts. Several pollutants have been identified as GHGs, and the State of California definition of a GHG in the Health and Safety Code, Section 38505(g) includes CO_2, methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. Water vapor is also a GHG, however, it is short lived, and concentrations are largely determined by natural processes such as evaporation. Other GHGs such as fluorinated gases are created and emitted through anthropogenic sources. The most common anthropogenic sourced GHGs are CO_2, CH_4, and N_2O.

Measuring how much energy the emissions of one ton of a gas will absorb over a given period of time relative to the emissions of one ton of CO_2 is called the Global Warming Potential (GWP). CO_2e is the amount of GHG emitted multiplied by its GWP. CO_2 has a 100-year GWP of one; CH_4 has a GWP of 25; and N_2O has a GWP of 298.

In 2005, Executive Order (EO) S-3-05 set GHG emission reduction targets:

- 2010 should have 2000 levels;
- 2020 should have 1990 levels; and
- GHG emissions should be 80 percent below 1990 levels by 2050.

Senate Bill (SB) 32, passed in 2016, required that the CARB include in its next update to the Assembly Bill (AB) 32 Scoping Plan, "ensure that statewide GHG emissions are reduced to at least 40 percent below the statewide GHG emissions limit no later than December 31, 2030." EO B-55 set a GHG emission reduction target for California to be carbon neutral by 2045.

CARB adopted the *Scoping Plan* in December 2008 and *2022 Scoping Plan Update* in December 2022. The *Scoping Plan* contains the strategies California will implement to achieve a reduction of 85 percent below 1990 levels no later than 2045. In the *Scoping Plan*, CARB recommends that lead agencies prioritize onsite design features that reduce emissions, especially from mobile sources, and direct investments in GHG reductions within the proposed Project's region that contribute potential air quality, health, and economic co-benefits locally."

EMWD service area and the proposed Project lie within the jurisdiction of the SCAQMD. On December 5, 2008, the SCAQMD Board approved interim CEQA GHG significance thresholds for stationary sources, rules, and plans using a tiered approach for determining significance. Tier 3, the primary tier the SCAQMD board uses for determining significance, set a screening significance threshold of 10,000 $MTCO_2e$/year for determining whether a stationary source project would have a less than significant cumulative GHG impact. (SCAQMD 2008b.)

The County of Riverside adopted a CAP in 2015 to establish goals and policies that incorporate sustainability and GHG reduction targets into its management process. The County set a goal to reduce emissions to 1990 levels by 2020 in line with the State's AB 32 GHG reduction targets. The CAP was updated in 2019 to contain further guidance on Riverside County's GHG Inventory reduction goals, thresholds, policies, guidelines, and implementation programs including 2030 thresholds to reduce emissions to 40 percent below 1990 levels. In particular the CAP elaborates on the County's *General Plan* goals and policies relative to GHG emissions and provides a specific implementation tool to guide future decisions of the County. The County's CAP includes a review process procedure for evaluating individual project GHG impacts and determining the significance under CEQA. The County's CAP is qualified for CEQA tiering and streamlining of individual projects' CEQA review. The County's CAP has set a threshold of 3,000 metric tons (MT) CO_2e per year to be used to identify projects that, when combined with the modest efficiency measures (e.g., energy efficiency matching or exceeding the Title 24 requirements in effect as of January 2017; water conservation measures that match the California Green Building Standards Code in effect as of January 2017) are considered less than significant.

a) Less than Significant Impact

The Project would create GHG emissions during construction only. Construction is expected to last approximately twenty months, and the Project's life expectancy is conservatively assumed to be 30 years for the purposes of this GHG analysis. Construction impacts would include emissions associated with pipeline trenching and installation, as well as on-road vehicle trips for mobilization and demobilization activities (e.g., potholing, testing/chlorination, and other activities). The Project would not be associated with a net increase in operation emissions because the pipeline would not require energy use to operate, and inspection of the pipeline and above ground appurtenances, and exercise of the valves would be incorporated into EMWD's existing O&M trips. Further details can be found in *Section 2.5 Project Description*.

Modeling of air emissions from construction was completed in CalEEMod version 2022.1 for construction of the pipeline. Details on construction, including timing and equipment, can be found in *Section 2.5 Proposed Project Description.* The Project would not emit GHGs associated with electricity consumption; all GHG emission would result from vehicle use, including construction equipment, haul trips, and worker trips. No energy requirements are expected for the operation of the pipeline. Other Project details necessary for GHG emissions modeling were obtained from CalEEMod and design engineer estimates (e.g., equipment horsepower, load factors, fleet mix, and vehicle emissions factors). The Project's short-term GHG emissions were analyzed in the *Air Quality/Greenhouse Gas Analysis for the Mead Valley Cajalco Sewer Project* (WEBB-A) included as Appendix A.

The results of the inventory for GHG emissions, as shown in the CalEEMod output tables in Appendix A, are presented in **Table 3-6** along with the significance threshold. Consistent with the methodologies in the County CAP and SCAQMD GHG significance thresholds, total GHG emissions from construction have been amortized over the 30-year lifetime of the Project.

Table 3-6: Proposed Project GHG Emissions per Year ($MTCO_2e$/year)

Source	Total CO_2	Total CH_4	Total N_2O	Total R	Total CO_2e
Operation	negligible				
Construction 2024	184	0.01	0.00	0.06	186
Construction 2025	210	0.01	0.01	0.07	212
Total	**394**	**0.02**	**0.01**	**0.13**	**398**
Construction (amortized over 30 years)					13.27
Threshold					3,000
Exceed Threshold?					*No*

Source: WEBB-A, Table 4.
Note: CalEEMod's default CO_2e intensity factor for Southern California Edison is 531.983 lb/MWhr, which was used in this analysis.

During construction, the proposed Project would emit a total of 398 $MTCO_2e$. Amortized over a 30-year period, the Project would generate approximately 13.27 $MTCO_2e$ per year). In addition to the low per-year generation of $MTCO_2e$, the Project would adhere to existing energy efficiency requirements during construction, including CARB's In-Use Off-

Road Diesel-Fueled Fleets Regulations that limit vehicle idling time to five minutes, restrict adding vehicles to construction fleets that have lower than Tier 3 engines, and establish a schedule for retiring older and less fuel-efficient engines. (CARB 2011.) Construction related GHG impacts would be less than significant.

The State of California has set targets for renewable energy from the energy sector through the Renewable Portfolio Standard. The Renewable Portfolio Standard directs energy utilities to source half of their electricity sales from renewable sources by 2030. (CEC 2017.) The proposed Project would not consume electricity. Therefore, the proposed Project would not conflict with or obstruct this target, and impacts would be less than significant.

b) Less than Significant Impact

California's 2022 Climate Change Scoping Plan focuses on reducing energy demand and GHG emissions that result from mobile sources and land use development. The proposed Project would not involve a considerable increase in new vehicle trips or land use changes that would result in an increase in vehicle trips, such as urban sprawl. California Department of Water Resources recognizes that about two percent of the total energy used in the state is related to water conveyance, the proposed Project improves operational flexibility for EMWD, thus improving management of sewer systems.

The proposed Project would not interfere with existing County or regional programs intended to reduce energy and improve water use efficiency. It would not result in GHG emissions higher than the SCAQMD or Riverside County CAP significance screening thresholds. The proposed Project would not, therefore, conflict with or obstruct a State or local plan for renewable energy or energy efficiency. Impacts would be less than significant, and no mitigation would be required.

Mitigation Measures: None required or recommended.

3.9 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?	[ ]	[ ]	[X]	[ ]
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?	[ ]	[ ]	[X]	[ ]
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	[ ]	[ ]	[X]	[ ]
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?	[ ]	[ ]	[ ]	[X]
e) For a Project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the Project result in a safety hazard or excessive noise for people residing or working in the Project area?	[ ]	[ ]	[X]	[ ]
f) Impair implementation of or physically interfere with an	[ ]	[ ]	[X]	[ ]

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?	[ ]	[ ]	[X]	[ ]	

Discussion

a) Less than Significant Impact

Construction and operational activities would involve the routine use, transport, and storage of hazardous materials (e.g., gasoline, diesel fuel, automotive fluids, solvents, lubricants). To minimize the risks of exposure to hazardous materials from construction and routine O&M activities, federal, state and local regulations have been put into place to regulate hazardous material use, storage, transportation, and handling. EMWD would be required to be in compliance with all applicable federal, state, and local regulations pertaining to hazardous materials pursuant to Federal Code Title 40 and 49; Occupational Safety and Health Administration (OSHA) 29 CFR 1910; California code section 5001, 5401, 5701, and 25507; California Health and Safety Code Division 20, Chapter 6.5, Article 6.5, Article 6.6, and Article 13; and Riverside County ordinance 651.5. In addition, the proposed Project would require implementation of a SWPPP to address the discharge of contaminants (including construction-related hazardous materials) through appropriate BMPs. While specific BMPs would be determined during the SWPPP process based on site-specific characteristics (equipment types, etc.), they would include standard industry measures and guidelines contained in the National Pollutant Discharge Elimination System (NPDES) Construction General Permit text. *Section 2.7 Environmental Commitments* requires conformance with federal hazardous materials transportation law (49 U.S.C. 5101 et seq.) and California Health and Safety Code Division 20, Chapter 6.5, Article 6.5 would require precautionary measures be taken during the routine transport of hazardous materials, such as testing and preparation of a transportation safety plan. According to California Health and Safety Code Division 20, Chapter 6.5, Article 13, used oil that may be produced from construction or operation of the Project would be recycled. Through compliance with the Project's Environmental Commitments and existing regulations, impacts would be less than significant.

b) Less than Significant Impact

The Project involves construction and operation of underground pipelines and aboveground valves and associated appurtenances. Construction of the Project may include the transport and storage of hazardous materials, such as fuels for the construction equipment. The transportation of hazardous materials can result in accidental spills, leaks, toxic releases, fire, or explosion. Construction activities would be required to comply with fire protection and prevention requirements specific by the California Code of Regulations (CCR) and Division of Occupational Safety and Health

(DOSH), better known as Cal/OSHA protects workers from health and safety hazards on the job as identified in *Section 2.7 Environmental Commitments*. This includes various measures such as easy accessibility of firefighting equipment, proper storage of combustible liquids, no smoking in service and refueling areas, and worker training for firefighter extinguisher use. Further, all new construction is required to comply with the California Fire and Building Codes. Compliance with the Project's Environmental Commitments and applicable federal and state laws related to the transportation, use, storage, and response to upsets or accidents that may involve hazardous materials would reduce the likelihood and severity of upsets and accidents during transit and storage.

Construction and operation of the Project is not expected to result in the use of large amounts of hazardous materials that would create a hazard to the public or environment. As stated under response "3.3c" above, there are sensitive receptors within the Project vicinity which increases the risk of impact from an accidental release of hazardous materials; however implementation of the Project's Environmental Commitments identified in Section 2.7, would minimize the risk of hazardous material exposure through material use and accidents by requiring EMWD and its construction contractor to develop a Hazardous Materials Management and Spill Prevention and Control Plan to ensure Project-specific contingencies are in place. These contingencies include, but are not limited to, the delineation of hazardous material storage areas, and spill control and countermeasures. Therefore, through compliance with the Project's Environmental Commitments and existing regulations, potential impacts would be less than significant.

c) Less than Significant Impact

The Project site is located within one-quarter mile of the following schools: Manual L. Real Elementary School, Columbia Elementary School, and California Rancho School.

There is a risk of accidental release of hazardous materials or toxic air pollutants during Project construction. As explained under responses "3.9a" and "3.9b" above, construction of the proposed Project would be compliant with local regulations and would implement Environmental Commitments that includes preparation of a Hazardous Materials Management and Spill Prevention and Control Plan that includes, but is not limited to, the delineation of hazardous material storage areas, and spill control and countermeasures to reduce risk of release of hazardous materials**.** Therefore, through implementation of Project Environmental Commitments described in Section 2.7, impacts to schools within one-quarter mile of the proposed Project would be less than significant.

d) No Impact

The Project site, and adjacent areas are not listed on the Department of Toxic Substance Control's Cortese List, compiled pursuant to Government Code Section 65962.5. (DTSC 2021.) Because the proposed Project site and its adjacent areas are not on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5, the Project will not create a significant hazard to the public or the environment. Therefore, no impacts will occur.

e) Less than Significant Impact

The Project site is located approximately 2.3 miles southwest of March Air Reserve Base/Inland Port Airport (MARB/IPA). The MARB/IPA is currently active as a center for military reserve activities and as a military communication center. The Project site is within the March Air Reserve Base/Inland Port Airport Land Use Compatibility Plan (MARB/IPA ALUCP). The MARB/IPA ALUCP classifies the area close to the airport into zones based on proximity to the airport and perceived risks. The MARB/IPA ALUCP indicates the allowable uses, potential noise impacts, potential safety impacts, and density/intensity restrictions for each zone. The pipeline alignment, Clark Street Lift Station site, and staging areas are located within Compatibility Zone E. Zone E is designated as having low noise and low aircraft safety risks. (ALUC 2014.) The Perris Valley Airport, a private airport, is located approximately 6 miles southeast from the Project site. Since the Project does not propose habitable structures, and the duration of Project construction would be short and temporary, people would not be exposed to safety hazards or excessive noise from MARB/IPA. In addition, the Project does not include tall structures that would interfere with airport safety measures. Therefore, impacts would be less than significant.

f) Less than Significant Impact

The Couty of Riverside Multi-Jurisdictional Local Hazard Mitigation Plan (MJLHMP) identify the County's hazards, review and assess past disaster occurrences, estimate the probability of future occurrences, and set goals to mitigate potential risks to reduce or eliminate long-term risk to people and property from natural and human-caused hazards. (MJLHMP 2023.)

The Project site can be accessed by various nearby roadways near Cajalco Road including Day Street, Clark Street, and Brown Street. Construction of the proposed Project may potentially result in temporary traffic obstructions. However, with implementation of EMWD's standard construction BMPs identified in *Section 2.7 Environmental Commitment*s 2.7, which requires preparation and implementation a Traffic Control Plan that would coordinate lane closures, access, and construction work hours in order to minimize potential impacts associated with emergency response. Thus, the proposed Project will not impair implementation of or physically interfere with an adopted emergency response plan or an emergency evacuation plan. Impacts would be less than significant.

g) Less than Significant Impact

The proposed Project is the installation, operation, and maintenance of an underground pipeline and several above-ground valves, and other appurtenances. Operation of these types of infrastructure is not typically associated with fire risk. (See *Section 3.20 Wildfire*.) However, the portions of the proposed Project site are within a State Responsibility Areas of moderate, high and very high fire hazard severity zones (FHSZs). The use of construction equipment could potentially spark or otherwise ignite a fire during normal construction activities. Implementation of standard fire safety prevention measures, as required by EMWD's standard construction BMPs identified in *Section 2.7 Environmental*

*Commitment*s 2.7, would ensure Project implementation would not expose people or structures to a significant risk of loss, injury or death involving wildland fires. Impacts would be less than significant.

Mitigation Measures: None required or recommended.

3.10 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 ground water quality?	[ ]	[ ]	[X]	[ ]
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the Project may impede sustainable groundwater management of the basin?	[ ]	[ ]	[X]	[ ]
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;	[ ]	[ ]	[X]	[ ]
ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site;	[ ]	[ ]	[X]	[ ]
iii) create or contribute runoff water which would exceed the	[ ]	[ ]	[X]	[ ]

capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or				
iv) impede or redirect flood flows?	[ ]	[ ]	[X]	[ ]
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to Project inundation?	[ ]	[ ]	[ ]	[X]
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	[ ]	[ ]	[X]	[ ]

Discussion

Surface Water

Existing drainage facilities within the Project site include an 84-inch and 60-inch corrugated metal pipe (CMP) via culvert located West of Barton Road, and two parallel 28-inch by 20-inch arch CMPs via an Arizona crossing located west of Brown Street.

The Project site is located within the San Jacinto River watershed, (Santa Ana RWQCB 2015.) Water quality is regulated by the Regional Water Quality Control Board (RWQCB), Santa Ana Region.

The proposed Project is located in the Santa Ana River Basin, which includes portions of San Bernardino, Riverside, and Orange counties. Within the Basin, the Project is located in the San Jacinto River Watershed, which drains approximately 540 square miles into Canyon Lake. Canyon Lake discharges into Lake Elsinore, and Lake Elsinore discharges into a tributary of the Santa Ana River; however, discharges from these two lakes are very rare.

The Santa Ana Regional Water Quality Control Board (RWQCB) prepares and maintains the Water Quality Control Plan (Basin Plan) for the Santa Ana Region which includes the upper and lower Santa River water sheds, the San Jacinto River watershed, and several small drainage areas. (RWQCB 2019, p. 1-1.) The Basin Plan sets water quality standards in the Santa Ana River Basin by establishing beneficial uses for specific water bodies and designating numerical and narrative water quality objectives. Intermittent, and existing or potential beneficial uses of the San Jacinto River Basin include municipal and domestic supply waters, agricultural supply waters, groundwater recharge waters, water contract recreation waters, non-water recreation waters, warm freshwater habitat waters, cold freshwater habitat waters, wildlife habitat waters, rare, threatened or endangered species waters, and spawning waters. (RWQCB 2019, pp. 3-42–3-43.)

The Santa Ana RWQCB also maintains the 303(d) List of Impaired Water Bodies, which identifies water bodies where water quality indicators exceed acceptable thresholds. The Project area does not directly drain to a 303(d)-listed impaired water body. However, Lake Elsinore and Canyon Lake are not attaining water quality standards due to excessive nutrients (nitrogen and phosphorous). Lake Elsinore is on the 303(d) list of impaired waters due to excessive levels of nutrients and organic enrichment/low dissolved oxygen. Canyon Lake is 303(d)-listed for excessive levels of nutrients. (SWRCB 2019, p. 6-134.) The Santa Ana Regional Water Quality Control Board (RWQCB) develops and implements total maximum daily loads (TMDLs) to address water quality impairments and help achieve water quality standards. Water quality is also governed through NPDES stormwater discharge permits issued to municipalities, construction sites, and industrial facilities to control non-point-source pollutants in stormwater discharges to surface waters.

The U.S. Department of Homeland Security Federal Emergency Management Agency (FEMA) identifies flood hazard areas on Flood Insurance Rate Maps prepared for the National Flood Insurance Program. These areas, known as Special Flood Hazard Areas, are defined as areas where there is a one percent chance of flooding in any given year (also referred to as a 100-year flood). These zones are labeled Zone A, Zone AO, Zone AH, Zones A1-A30, Zone AE, Zone A99, Zone AR, Zone AR/AE, Zone AR/AO, Zone AR/A1-A30, Zone AR/A, Zone V, Zone VE, and Zones V1-V30. FEMA maps also identify moderate flood hazard areas, which are areas outside the one-percent flood area where there is a 0.2 percent chance of flooding in a given year (also referred to as a 500-year flood). These zones are labeled as Zone B or Zone X (shaded). A. Areas outside the 100-year and 500-year flood zones are considered areas of minimal flood hazard and are labeled as Zone C or Zone X (unshaded). (FEMA 2020.) There are no 100-year or 500-year flood zones in the Project area.

Groundwater

The San Jacinto Groundwater Basin (California Department of Water Resources [DWR] Basin Number 8-05). the underlies the San Jacinto, Perris, Moreno Valley, and Menifee Valley in the western Riverside County and contains a surface area of approximately 293 square miles. (DWR 2006.) The San Jacinto Groundwater Basin is bounded by the San Jacinto Mountains on the east, the San Timoteo Badlands on the northeast, the Box Mountains on the north, the Santa Rosa Hills and Bell Mountain on the south, and unnamed hills on the west. Lake Perris is located in the eastern part of Perris Valley. The valleys are drained by the San Jacinto River and its tributaries. (DWR 2006.)

The Sustainable Groundwater Management Act (SGMA) prevents significant and unreasonable impacts to groundwater basins in California. Under SGMA, each high and medium priority basin, as identified by the California Department of Water Resources (DWR), is required to have a Groundwater Sustainability Agency (GSA) that will be responsible for groundwater management and development of a Groundwater Sustainability Plan (GSP). The GSP will document basin conditions, and basin management will be based on measurable objectives and minimum thresholds defined to

prevent significant and unreasonable impacts on the sustainability indicators defined in the GSP. (EMWD-A 2023.) The EMWD Board of Directors is the GSA for the West San Jacinto Groundwater Basin and is responsible for development and implementation of a GSP. The San Jacinto Groundwater Basin is deemed a high priority basin, but not critically overdrafted, by DWR, and the GSA is required to develop by 2022 and implement by 2042 a Groundwater Sustainability Plan (GSP). EMWD became the exclusive GSA for the western portion of the San Jacinto Groundwater Basin and prepared a GSP for the West San Jacinto Groundwater Sustainability Agency Area. (EMWD-A 2023.) The Project site is outside the West San Jacinto Groundwater Sustainability Agency Area and is outside a GSA or GSP.

The beneficial uses for the San Jacinto Groundwater Basin include municipal and domestic supply waters, agricultural supply waters, industrial service supply waters, and industrial process supply waters. (RWQCB 2019, 3-49.)

a) Less than Significant Impact

The proposed Project would disturb an area greater than one acre in size and would therefore be required to obtain coverage under the NPDES Stormwater Construction General Permit during Project construction. The total Project disturbance area is approximately 12.82 acres. As part of the NPDES conditions, the construction contractor would be required to prepare a SWPPP, which would identify BMPs to control sediment and other construction-related pollutants in stormwater discharges. Typical BMPs include housekeeping practices such as proper waste disposal, covering stockpiles with tarps, containment of building materials, and inspection of construction vehicles to prevent leaks or spills. Contractors would be required to comply with the Construction General Permit throughout construction. Construction dewatering will occur in areas where there is high perched groundwater, and would be discharged to land in accordance with RWQCB Waste Discharge Requirements for construction dewatering; or discharged to the local storm drain system per Riverside County Flood Control and Water Conservation District (RCFCWCD) requirements; or discharged to the EMWD sewer system. Compliance with these permits, including implementation of BMPs would ensure the Project would not violate water quality standards or waste discharge requirements, nor significantly degrade surface water quality. Impacts on surface water quality during Project construction would be less than significant.

Operation of the proposed Project would consist of distributing wastewater through the proposed pipeline to EMWD's sewer water system which would not require groundwater. No impacts would occur as a result of Project operation.

b) Less than Significant Impact

As discussed in *Section 2 Project Description*, the proposed Project would improve operational efficiency of EMWD's sewer service to disadvantaged communities of Mead Valley and promote economic development; redirect existing flow to the proposed trunk sewer in order to decommission the Clark Street Lift Station; and provide additional flow to WMWD to produce additional recycled water. The Project would connect to existing

pipelines and would be designed for future connections. As discussed in *Section 3.14 Population and Housing,* the proposed Project would serve existing demand and planned future growth and would not induce population growth or increased water demands. Therefore, the proposed Project would not decrease groundwater supplies or interfere with groundwater recharge efforts. Impacts would be less than significant.

c) Less than Significant Impact

Existing drainage facilities within the Project site include an 84-inch and 60-inch corrugated metal pipe (CMP) via culvert located West of Barton Road, and two parallel 28-inch by 20-inch arch CMPs via an Arizona crossing located west of Brown Street.

The proposed Project pipelines would be constructed in an existing roadway which would be restored to pre-construction conditions, and thus would not permanently increase total impervious surface area. The associated aboveground appurtenances would have a cumulatively small footprint and not add a substantial new amount of impervious surface area to the watershed. Project construction may result in disturbance or exposure of soil that could be subject to erosion and sedimentation during a rain event. However, implementation of BMPs as required by the NPDES Stormwater Construction General Permit and SWPPP as described in *Section 2.7 Environmental Commitments*, would limit erosion and sedimentation. As a result, the proposed Project would not impede or redirect flood flows, alter drainage patterns of the Project area, cause substantial erosion, substantially increase surface runoff, generate runoff in excess of the existing storm drainage systems, or be a source of polluted runoff. Therefore, impacts would be less than significant.

d) No Impact

A tsunami is a large ocean wave, caused by earthquakes or major ground movement. The proposed Project site is located approximately 38 miles from the Pacific Ocean; at this distance, a tsunami would not impact the Project vicinity. A seiche is a large wave generated in an enclosed body of water such as a lake, which is also typically caused by an earthquake. The waterbodies near the Project site are Lake Perris, approximately 5.5 miles east and Lake Elsinore approximately 6.5 miles to the west, may have the potential for seismically induced seiche. However, the Project site has low risk for flooding from a seiche due to the distance of the Project site from these waterbodies. According to the FEMA maps there are no 100-year or 500-year floodplains within the Project area. (FEMA 2008.) In addition, the Project pipeline would be installed underground on along Cajalco Road would be resurfaced after construction, so there would be no risk of 100-year or 500-year floods inundating the Project and the potential for release of pollutants is low. Therefore, no impacts would occur.

e) Less than Significant Impact

As previously discussed, the Basin Plan sets water quality objectives for the Project area. Water quality thresholds identified in the Basin Plan are intended to reduce pollutant discharge and ensure that water bodies are of sufficient quality to meet their designated

beneficial uses. The Project would not conflict with the water quality standards outlined in the Basin Plan or worsen water quality conditions in any 303(d)-listed water body. As discussed above, pollutant discharge during construction would be avoided via compliance with the Construction General Permit and SWPPP and NPDES permits for construction dewatering, if needed. Once operational, the Project would convey wastewater to WMWD's lift station to produce recycled water. The Project would not discharge extracted or treated water or be a source of pollutants for downstream water bodies (e.g., San Jacinto River, Canyon Lake, Lake Elsinore). Therefore, the proposed Project would not conflict with the Basin Plan.

As previously stated, the Project site is not within a GSA or GSP. Moreover, the proposed Project is not expected to have any adverse impacts on groundwater sustainability. The purpose of the Project is to provide sewer service to disadvantaged communities of Mead Valley and promote economic development; redirect existing flow to the proposed trunk sewer in order to decommission the Clark Street Lift Station; and provide additional flow to WMWD to produce additional recycled water. The Project does not involve the extraction of groundwater nor would result in any increases in impervious surfaces that could affect groundwater recharge, and thus the Project would not impact groundwater sustainability. Therefore, the Project would not conflict with applicable water quality control plans or groundwater management plans, and impacts would be less than significant.

Mitigation Measures: None required or recommended.

3.11 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?	[ ]	[ ]	[X]	[ ]

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	[ ]	[ ]	[ ]	[X]

Discussion

The proposed Project is located in an unincorporated area of Riverside County in the community of Mead Valley. Land use in Riverside County is governed by the land use designations established in the General Plan and by the County's zoning ordinance that identifies acceptable uses in each zone. The surrounding land uses within and adjacent to the pipeline alignment, Clark Street Lift Station, and staging areas include residential, rural residential, residential agricultural, vacant and undeveloped, and public facilities. The pipelines would be constructed underground and the associated appurtenances would be constructed aboveground within various paved and unpaved roadways within the pipeline alignment as shown on **Figure 4 – Existing Conditions.**

a) Less than Significant Impact

The physical division of an established community typically refers to the construction of a physical feature (such as a wall, interstate highway, or railroad tracks) or the removal of a means of access (such as a local road or bridge) that would impair mobility. The Project pipelines are underground facilities and once construction is complete, any roads in which the pipeline is installed would be returned to its original condition and access restored. For these reasons impacts regarding physically dividing an established community would be less than significant. The temporary construction staging areas would be located on disturbed land, roadway shoulder, and EMWD-owned property. The proposed Project would not permanently interfere with pedestrian, bicycle or vehicle circulation and would not result in a physical barrier within the existing community. Therefore, the proposed Project would have a less than significant impact related to physically dividing an established community.

b) No Impact

EMWD is the agency with jurisdiction over the proposed Project. However, EMWD does not have land use authority in Mead Valley, that authority rests with Riverside County. Construction and operation of the Project would not conflict with Riverside County's land use plans, zoning policies, or regulations.

As described in *Section 3.4, Biological Resources*, no components of the Project site are located within existing or proposed criteria areas or reserves defined in the Western Riverside MSHCP. The proposed Project would not impact wildlife movement corridors and habitat linkages because the Project would be developed within a roadway and previously disturbed, barren, unvegetated, and/or sparsely vegetated areas. Therefore,

the Project would not conflict with applicable land use plans, policies, or regulations intended to avoid or mitigate an environmental effect, and no impacts would occur.

Mitigation Measures: None required or recommended.

3.12 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?	[ ]	[ ]	[X]	[ ]
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?	[ ]	[ ]	[X]	[ ]

Discussion

The Surface Mining and Reclamation Act of 1975 (SMARA, Public Resources Code, Sections 2710-2796) policies regulate surface mining operations to assure that adverse environmental impacts are minimized and mined lands are reclaimed to a usable condition. SMARA also encourages the production, conservation, and protection of the state's mineral resources. (DOC 2023.) Classification of land within the State of California takes place according to a priority list that was established by the State Mining and Geology Board (SMGB) in 1982, or when the SMGB is petitioned to classify a specific area. (GPEIR, 4.12.1.) The SMGB established Mineral Resources Zones (MRZs) to designate lands that contain mineral deposits. Classification and designation of lands containing potentially important mineral deposits is carried out by the California Geological Survey (CGS) State Geologist and designation is a function of the CGS State Mining and Geology Board. Lands are given a priority listing through classification into MRZs. These MRZs are based on geological appraisals which include the use of literature, geological maps, and publications and data from the CDOC Division of Mines and Geology, US Geological Survey, the former US Bureau of Mines, and the US Bureau of Land Management. It also includes site investigations that determine the chemical and physical components of the area. An area can be classified as (GPEIR, 4.12.1):

- MRZ-1: Areas where the available geologic information indicates no significant likelihood of significant mineral deposits
- MRZ-2a: Areas where the available geologic information indicates that there are significant mineral deposits
- MRZ-2b: Areas where the available geologic information indicates that there is a likelihood of significant mineral deposits
- MRZ-3a: Areas where the available geologic information indicates that mineral deposits exist, however, the significance of the deposit is undetermined.
- MRZ-3b: Areas where the available geologic information indicates that mineral deposits are likely to exist, however, the significance of the deposit is undetermined
- MRZ-4: Areas where there is not enough information available to determine the presence or absence of mineral deposits

Riverside County's Open Space-Mineral Resource land use designation allows for mineral extraction and processing facilities designated on the basis of the SMARA of 1975 classification. Areas held in reserve for future mining activities also fall under this designation. (GP EIR,4.12.3.) Ancillary structures or uses may be permitted which assist in the extraction, processing, or preservation of minerals. Actual building or structure size, siting, and design will be determined on a case-by-case basis. According to the GPEIR, the Project site is located within MRZ-3, where mineral deposits are likely to exist, but significance is undetermined.

a, b) Less Than Significant Impact

Implementation of the proposed Project could result in direct impacts to mineral resources; however, given the small footprint of the Project pipelines, appurtenant structures and temporary nature of the staging areas, this loss is not considered substantial. Additionally, since the Project site and staging areas are not currently used as a mineral resource recovery site, implementation of the Project would not result in the loss of availability of a locally-important mineral resource recovery site. Therefore, impacts would be less than significant.

Mitigation Measures: None required or recommended.

3.13 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?	[ ]	[X]	[ ]	[ ]
b) Generation of excessive groundborne vibration or groundborne noise levels?	[ ]	[ ]	[X]	[ ]
c) For a Project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the Project expose people residing or working in the Project area to excessive noise levels?	[ ]	[ ]	[ ]	[X]

Discussion

Noise is generally defined as unwanted sound. Noise can cause hearing impairment for humans, and may also disrupt everyday activities such as sleep, speech, and activities requiring concentration. Noise can also interfere with the activities of wildlife, especially nesting birds. Noise-sensitive land uses are generally those where excess noise would disrupt how humans and/or wildlife use the land. Land uses such as schools, churches, and hospitals would typically be considered noise-sensitive. Noise may be generated by mobile (i.e., line) sources (for example, cars, trains, and aircraft) or stationary (i.e., point) sources (for example, machinery, airports, and construction sites).

EMWD, as a public agency, is not subject to other jurisdictional agencies' established noise standards. EMWD has not established an applicable noise standard of its own for permanent or temporary ambient noise levels. However, EMWD follows a "good neighbor" approach to adhering to local noise standards. The Riverside County noise

standards are used for the purposes of evaluating the significance of the proposed Project's noise levels for the purposes of this analysis under CEQA. Riverside County outlines their noise regulations and standards within its County Code and the Noise Element of the *County of Riverside General Plan*. The proposed Project would not construct a noise sensitive land use or create an operational source of noise. The regulations and standards applicable to pipeline construction would be those associated with construction noise and vibration. The following describes standards, goals, and policies related to the construction of the proposed Project:

Noise Standards

The proposed Project would be located entirely within unincorporated Riverside County. The noise standards for this jurisdiction are summarized herein.

The Riverside County Municipal Code, *Section 9.52 – Noise Regulation, Table 1 Sound Level Standards (Dbl L_{max})* establishes the maximum exterior noise to protect land uses from noise emitted by outside sources. However, the proposed Project is exempt from these noise regulations per *Section 9.52.020- Exemptions (B)* which indicates that sounds emanating from capital improvement projects of a governmental agency, like this waterline Project, is exempt from the provisions of *Section 9.52*.

Noise levels from grading and other construction activities would potentially result in noise levels reaching 91 dBA L_{max} at off-site locations 50 feet from the noise source. (GPEIR, 4.13.3.) This would result in potentially significant noise impacts to off-site sensitive receptors adjacent to the individual construction site.

EMWD's standard specification and contracts require the use of construction equipment with noise reduction features no less effective than those originally installed by the manufacturers.

Groundborne Vibration

Riverside County has not adopted any criteria or regulations for groundborne vibration impacts. While the Noise Element of the Riverside County GP contains policies that stipulate restricting the placement of sensitive land uses in proximity to vibration-producing lands and prohibiting exposure of residential dwellings to perceptible ground vibration from passing trains, these policies do not apply to the proposed Project.

Groundborne vibration levels resulting from construction activities within the Project area were estimated using the data published by the Federal Transit Administration (FTA) in its *Transit Noise and Vibration Impact Assessment Manual* (FTA, 2018.)

Groundborne vibration may occur when heavy equipment or vehicles create vibrations in the ground, which can then propagate through the ground to buildings, creating a low-frequency sound. Groundborne vibration can be described by both its amplitude and frequency. Amplitude may be characterized by particle velocity, which is measured in inches or millimeters per second. Vibration can be felt outdoors, but the perceived intensity of vibration impacts is much greater indoors, due to the shaking of the structure.

Groundborne vibrations can be a source of annoyance to humans due to a "rumbling" effect, and such vibrations may also cause damage to buildings. Groundborne vibration is discussed in terms of these impacts on humans and structures. The annoyance potential of groundborne noise is typically characterized with the A-weighted sound level. Some of the most common sources of vibration come from trains, transit vehicles, construction equipment, airplanes, and large vehicles. Several land uses are especially sensitive to vibration, and therefore have a lower vibration threshold. The following vibration terminology have been adapted from the FTA's *Transit Noise and Vibration Impact Assessment Manual* (FTA 2018):

- **Vibration Decibels (VdB)**. The vibration velocity level in decibel scale.
- **Peak Particle Velocity (PPV)**. The peak signal value (maximum positive or negative peak) of the vibration signal. PPV is often used in monitoring of construction vibration (such as blasting) because it is related to the stresses that are experienced by buildings and is not used to evaluate human response. PPV is usually expressed in inches/second in the United States.
- **Root Mean Square (rms)**. The rms is used to describe the smoothed vibration amplitude. The rms amplitude is used to convey the magnitude of the vibration signal felt by the human body, in inches/second. The average is typically calculated over a one-second period. The rms amplitude is always less than the PPV and is always positive.

a) Less than Significant with Mitigation Incorporated

Construction of the proposed pipeline and demolition of the Clark Street Lift Station is expected to last 20 months. The pipeline trenching and installation phase would involve the most noise-generating activities from use of heavy construction equipment and hauling during day and nighttime construction activities. The offroad construction equipment that would be used for this Project is identified in *Section 2.5.4, Construction Schedule.* The typical noise level for each piece of construction equipment anticipated to be used is shown in **Table 3-7**: Typical Construction Equipment Noise Levels.

Table 3-7: Typical Construction Equipment Noise Levels

Equipment[1]	Typical Noise Levels (dBA, at 50 feet)
Backhoe/Loader	78
Excavator	81
Grader	85
Front End Loader	79
Paver	77
Roller	80
Tractor	84
Source: FHWA 2006, Table 1, CA/T equipment noise emissions and acoustical usage factors database [1]. Selected equipment that would be used for Project construction.	

The equipment listed above that will be used for the construction of the proposed pipeline and demolition of the Clark Street Lift Station would increase ambient noise levels. The Project site is adjacent to various uses, including residential properties. However, construction activities and the associated noise impacts would be temporary and would cease once the Project is completed. Moreover, as stated in Riverside County's Municipal Code, *Section 9.52.020- Exemptions (B),* this Project is exempt from noise regulations outlined in Section 9.52 because the Project is a capital improvement project. Nevertheless, due to the proximity of construction activities to residences and other noise-sensitive receptors, EMWD will incorporate **Mitigation Measure NOI-1**, which requires the construction contractor to implement BMPs, such as locating noise-generating equipment as far from sensitive receptors as feasible, for noise control. Therefore, with mitigation, impacts would be less than significant.

Once operational, the below-ground pipelines would not generate noise. Noise may be associated with occasional vehicle maintenance trips but these trips would be negligible and no long term noise impacts would occur.

b) Less than Significant Impact

Construction and demolition activities associated with the proposed Project would have the potential to generate low levels of groundborne vibration. Groundborne vibrations propagate through the ground and decrease in intensity quickly as they move away from the source. (FTA 2018, p. 117.) Vibrations with a PPV of 0.2 inches/second or greater have the potential to cause damage to non-engineered timber and masonry buildings (FTA 2018, p. 186.) The *Transit Noise and Vibration Impact Assessment Manual* provides average source levels for typical construction equipment that may generate groundborne vibrations. Most construction equipment that would be used in construction of the Project is not expected to generate substantial groundborne vibration. For example, a loaded truck would generate 0.076 PPV at a distance of 25 feet. None of the construction equipment to be used would exceed the PPV threshold at a distance of 25 feet which is the closest that the Project construction would be to adjacent, existing building structures along the Project site.

According to the FTA's *Transit Noise and Vibration Impact Assessment Manual*, 80 VdB is the threshold for human annoyance from groundborne vibration noise when events are infrequent. Typical vibration dB levels for a loaded truck are 86 VdB at 25 feet which is the closest that the Project construction would be to adjacent, existing building structures along the Project site. Pipeline construction would occur near sensitive receptors, including residences. However, vibrations associated with pipeline construction would occur infrequently and would be short in duration. Additionally, pipeline construction would move along the alignment and would not remain in the same location for an extended period of time; therefore, sensitive receptors near the pipeline alignment would not experience vibrations for the entire duration of Project construction. Exposure would be temporary, sporadic, and limited in duration. Once operational, the pipeline would not produce groundborne vibration or groundborne noise. Therefore, impacts would be less than significant.

c) No impact

The pipeline alignment, Clark Street Lift Station, and staging areas are not located within two miles of an airport. The pipeline alignment, Clark Street Lift Station, and staging areas are within Land Use Compatibility Zone E of the MARB/IPA ALUCP. This zone is designated as having low noise and low aircraft safety risks. (ALUC 2014.)

The Project is located approximately 2.3 miles from MARB/IPA and is outside the 60-CNEL noise contour for the airport. (ALUC 2014.) The Project does not propose housing. Because noise from the MARB/IPA is less than 60 dBA CNEL and the Project does not propose housing, Project implementation would not expose workers to excessive aircraft noise and there would be no impacts.

Mitigation Measures:

To mitigate possible noise impacts resulting from the Project, EMWD shall implement **Mitigation Measure NOI-1**. With implementation of this mitigation measure, Project-related noise impacts are considered less than significant.

NOI-1 Construction and Demolition Noise Reduction Measures.

EMWD shall require its contractor to implement the following actions relative to construction and demolition noise:

- Two weeks prior to construction or demolition activities, EMWD in coordination with the construction contractor, shall provide written notification to all properties within 50 feet of the proposed Project facilities informing occupants of the type and duration of construction activities. Notification materials shall identify a method to contact EMWD's program manager with noise concerns. Prior to commencing construction or demolition activities, the EMWD program manager shall establish a noise complaint process to allow for resolution of noise problems. This process shall be clearly described in the notifications.
- Stationary noise-generating equipment shall be located as far from sensitive receptors as feasible. Such equipment shall also be oriented to minimize noise that would be directed toward sensitive receptors. Whenever possible, other non-noise generating equipment (e.g., roll-off dumpsters) shall be positioned between the noise source and sensitive receptors.
- Equipment and staging areas shall be located as far from sensitive receptors as feasible. At the staging location, equipment and materials shall be kept as far from adjacent sensitive receptors as possible.
- Construction vehicles and equipment shall be maintained in the best possible working order; operated by an experienced, trained operator; and shall utilize the best available noise control techniques (including mufflers, use of intake silencers, ducts, engine enclosures and acoustically attenuating shields or shrouds).

- Unnecessary idling of internal combustion engines shall be prohibited. In practice, this would require turning off equipment if it would idle for five or more minutes.
- Electrically powered equipment shall be used instead of pneumatic or internal-combustion powered equipment, where feasible.
- The use of noise-producing signals, including horns, whistles, alarms, and bells, shall be for safety warning purposes only.

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

Discussion

In 2020, EMWD served an estimated retail population of 603,950 through approximately 155,561 single family, multi-family, and other commercial, industrial, institutional, landscape, and irrigation accounts. EMWD 2020, pp.3-9, 2-2.) EMWD's service area is currently 40 percent built out, making it one of the few regions in Southern California that will see significant population growth in the coming decades. (EMWD 2020, p. 9-4.) Ultimate demand estimates indicate that before EMWD reaches build out, the population will more than double compared to the current size. As planned for in the EMWD 2020 Urban Water Management Plan (UWMP), EMWD's retail service area population will increase to approximately 807,200 in 2045. (EMWD 2020, p. 3-8.)

a) No Impact

The proposed Project would not directly induce unplanned population growth because no new housing or permanent employment are proposed. The proposed Project involves expansion of EMWD's sewer service infrastructure within its existing service area to improve sewer access to existing residents surrounding the Project area and provide additional flow to Western Municipal Water District's (WMWD) Western Water Recycling Facility to produce additional recycled water. Inspection and repair of the proposed Project would be incorporated into EMWD's existing O&M activities; no new staff would be required to serve the Project. Therefore, the proposed Project would not directly or indirectly induce unplanned population growth and no impact would occur.

b) No Impact

Construction and operation of the Project would occur entirely within the existing Cajalco Road and the designated staging areas which are disturbed lots and EMWD-owned facilities. The Project would not displace existing people or houses or require the construction of replacement housing. For these reasons, no impact would occur.

Mitigation Measures: None required or recommended.

3.15 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 following public services:	[ ]	[ ]	[ ]	[X]
i) Fire protection?	[ ]	[ ]	[ ]	[X]

ii) Police protection?	[ ]	[ ]	[ ]	[X]
iii) Schools?	[ ]	[ ]	[ ]	[X]
iv) Parks?	[ ]	[ ]	[ ]	[X]
v) Other public facilities?	[ ]	[ ]	[ ]	[X]

Discussion

Fire Protection

Riverside County Fire Department operates 85 fire stations. A total of 51 of these stations, as well as three stations operated by the California Department of Forestry, are located in the unincorporated portion of Riverside County. Riverside County Fire Department provides fire protection services to unincorporated areas. (GPEIR, 4.15.1.) The closest station to the Project site is the Riverside County Fire Station No 59 located at 21510 Pinewood Street, approximately 0.37 miles to the south.

Police Protection

The Riverside County Sheriff's Department provides area-level community service. The Riverside County Station requires one sworn officer per 1,000 population. (GPEIR, 4.15.2.) The closest Riverside County Sheriff's office is located at 22850 Calle San Juan de Los Lagos, Moreno Valley, approximately five miles to the northeast.

Schools

Children who reside in the Mead Valley Area and Good Hope attend schools within the Val Verde Unified School District. The Val Verde Unified School District operates 22 preschools, elementary schools, middle schools, high schools, and alternative schools within Riverside County. (VVUSD 21.) Manual L. Real Elementary is located approximately 0.3 miles north of the Project site and Columbia Elementary is located approximately 0.4 miles south of the Project site.

Parks

Within Riverside County there are approximately 70 national, state, and county parks. Out of the 70 parks, 35 are maintained by Riverside County. Private recreational facilities are found primarily in planned communities and apartment complexes. These facilities usually include tennis/basketball courts, pools/spas, and/or playgrounds. However, the existing facilities are generally small and are so few in number that they have a minor impact in the overall provision of recreational facilities within Riverside County. (GPEIR, 4.14.1.)

Libraries

Riverside County operates a system of 35 libraries and two (2) book mobiles to serve unincorporated populations. The library system manages the library catalog of the 1.3

million items in the library system and the annual checkout of over 3.5 million books/audios/videos. (GPEIR, 4.15.6.) The Mead Valley Library, located at 21580 Oakwood, is 0.14 miles from the Project site.

Hospitals

There are two hospitals near the Project site vicinity. The Kindred Hospital is located at 2224 Medical Center Drive in the City of Perris, approximately four miles southeast from the Project site.

a.i.) No Impact

The proposed Project would not construct new or physically alter existing fire protection facilities, nor would it substantially change response times or service ratios for fire protection services and facilities. Fire protection requirements during construction of the proposed Project would be short-term and the demands would be filled by the existing fire personnel. Existing fire protection services provided by the Riverside County Fire Department would be sufficient to provide fire or other emergency response to the proposed Project site. In addition, operation of the proposed Project would not directly or indirectly induce unplanned population growth that would require construction of new fire departments or expansion of fire protection facilities. No additional or increased fire protection facilities to maintain response times, service ratios, or other measures of performance would be required. As a result, no impact on fire protection service facilities would occur.

a.ii.) No Impact

The proposed Project would not construct new or physically alter existing police protection facilities, nor would it substantially change response times or service ratios for police services and stations. In the event of an emergency or non-emergency call , the existing police services provided by the Riverside County Sheriff's Department would be sufficient. In addition, operation of the proposed Project would not directly or indirectly induce unplanned population growth that would require construction of a new or expansion of an existing sheriff station to maintain response ratios, service ratios, or other measures of performance. As a result, no impact on police service facilities would occur.

a.iii.) No Impact

The proposed Project would not change existing demand on schools because the Project would serve existing and planned communities and population. Construction of the proposed Project does not include housing and operation would not result in new employment or population growth that would result in an influx of students. No new school facilities would need to be built to maintain class size ratios or other performance objectives. As a result, no impact on school facilities would occur.

a.iv.) No Impact

The proposed Project would not change existing demand on parks or recreational facilities because the Project does not propose new housing units, nor would it directly or indirectly induce population or employment within the area. Construction and operation of the Project would not necessitate expansion of existing or construction of new parks or recreational facilities. Therefore, no impact on park facilities would occur.

a.v.) No Impact

The proposed Project would not change existing demand on other public facilities because the Project does not propose new housing units, nor would it directly or indirectly induce population or employment within the area. Construction and operation of the Project would not necessitate expansion of existing or construction of new public facilities such as libraries or hospitals. Therefore, no impact on other public facilities would occur.

Mitigation Measures: None required or recommended.

3.16 Recreation

	Potentially Significant Impact	*Less Than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
Would the Project:				
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?	[ ]	[ ]	[X]	[ ]
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?	[ ]	[ ]	[ ]	[X]

Discussion

As discussed under *Section 3.15 Public Services*, Riverside County contains approximately 70 national, state, and county parks. There are no parks within the Project site. According to the County of Riverside Mead Valley Area Plan, Cajalco Road is designated as a Class II Bike Path. (MVAP, Figure 9),

a) Less than Significant

The proposed Project would serve existing and planned communities. The proposed Project does not include residential housing and would not induce permanent employment or population growth that would permanently increase the use of the parks and recreational facilities. Accordingly, the Project would not increase the use of existing parks or other recreational facilities such that substantial physical deterioration of the facilities would occur or be accelerated. The proposed Project would require temporary closures of roadways, bicycle lanes, and sidewalks, with Cajalco Road. However, these impacts are temporary, and access would be restored upon completion of the Project. Therefore, impacts would be less than significant.

b) No Impact

Implementation of the proposed Project would not require construction or expansion of recreational facilities which could have an adverse physical impact on the environment. As a result, no impact would occur.

Mitigation Measures: None required or recommended.

3.17 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?	[ ]	[ ]	[X]	[ ]
b) Conflict or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b)?	[ ]	[ ]	[X]	[ ]

c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	[ ]	[ ]	[X]	[ ]
d) Result in inadequate emergency access?	[ ]	[ ]	[X]	[ ]

Discussion

The Project site is located site is located roughly one and a half miles west of Interstate Highway I-215 (I-215) and seven miles south of Highway 60/Moreno Valley Freeway. Local access within the Project site is provided by various streets near Cajalco Road including Day Street, Clark Street, and Brown Street.

The Riverside County Transportation Commission owns a commuter rail line parallel to I-215 (roughly 2 miles from the Project site), which provides commuter rail service for the region and a low volume of freight trains. Public transportation in the Project area consists of bus service provided by the RTA. Bus route 41 services the Mead Valley area and includes a transfer stop at the intersection of Cajalco Road and Clark Street. (RTA 2023.)

Bikeways also exist in the Project vicinity. There is a Class II bike lane along Cajalco Road, adjacent to the Project site. Day Street and Clark Street are community trails. (MVAP, Figure 9 – Mead Valley Area Plan Trails and Bikeway System.)

Section 15064.3 of the 2023 CEQA Guidelines provide that transportation impacts of projects are, in general, best measured by evaluating the project's vehicle miles traveled (VMT), a measure of the total number of miles driven to or from a development which is sometimes expressed as an average per trip or per person. Section 15064.3 of the CEQA Guidelines suggests that the analysis of VMT impacts applies mainly to land use and transportation projects, rather than water infrastructure projects.

On September 3, 2020, the Southern California Association of Governments (SCAG) adopted Connect SoCal, SCAG's 2020-2045 Regional Transportation Plan/Sustainable Communities Strategy. The plan is a long-range visioning plan that balances future mobility and housing needs with economic, environmental, and public health goals. The plan details how the region will address its transportation and land use challenges and opportunities in order to achieve its regional emissions standards and GHG reduction targets. The Connect SoCal plan represents the vision for Southern California's future, including policies, strategies, and projects for advancing the region's mobility, economy, and sustainability through 2040. (SCAG 2020.)

a) Less than Significant Impact

The proposed Project does not consist of a traffic-generating land use project since the Project entails underground pipes, aboveground appurtenances, and demolition of the Clark Street Lift Station. Project construction and demolition is estimated to last 20

months. Most of the construction activities would take place during daytime hours, however construction along portions of the Project site would require construction to occur during nighttime hours. Additional details on the construction schedule can be found in *Section 2.5 Proposed Project Description*.

Construction-related conflict with the circulation system has the potential to occur. Construction of the Project may require temporary closures of roadways, bicycle lanes, and sidewalks. However, with the implementation of a Traffic Control Plan, as described in *Section 2.7 Environmental Commitments*, impacts would be less than significant.

Project construction would require approximately 36 round-trip worker trips per day during the pipeline trenching/ installation phase of construction, which is phase with the most worker trips. (WEBB-A.)

During Project operations, minimum trips would be generated to service and maintain installed pipelines and associated appurtenances which would be built to EMWD standard specifications such that they would not impact circulation. Inspection of the above ground appurtenances and exercise of the valves would be incorporated into EMWD's existing O&M activities. As described in response "3.17b", below, the Project would not conflict with CEQA Guidelines Section 15064.3 related to Vehicle Miles Traveled. Moreover, because of the nature of the project, underground pipes and aboveground appurtenances, Project operations would not conflict with local or regional transportation plans, ordinance, or policy addressing circulation system.

Therefore, as described above, through implementation of a TCP as described in *Section 2.7 Environmental Commitment*s, impacts would be less than significant.

b) Less than Significant Impact

CEQA Guidelines Section 15064.3, subdivision (b) outlines criteria for analyzing transportation impacts in terms of VMT for land use projects and transportation projects. VMT refers to the amount and distance of automobile travel attributable to a project. According to the Office of Planning and Research Technical Advisory on Evaluating Transportation Impacts in CEQA (OPR 2018), the term "automobile" refers to on-road passenger vehicles, specifically cars and light-duty trucks. In the case of the proposed Project, worker trips would be conducted in cars and light-duty trucks. Vendor and hauling trips would be conducted in medium- or heavy-duty trucks and are therefore excluded from the estimation of VMT. Environmental impacts associated with the use of medium- and heavy-duty truck trips are addressed in the Air Quality, Energy, and Greenhouse Gas sections of this document.

Construction of the proposed Project would involve temporary trips associated with workers, delivery of construction supplies and equipment, and hauling materials to and from the site. These trips would be temporary and would cease once construction is completed. During the busiest phase of construction - pipeline trenching/ installation - Project construction would require approximately 36 round-trip worker trips per day. Worker trip details were based on CalEEMod default assumptions. According to OPR

Technical Advisory on Evaluating Transportation Impacts in CEQA, projects that generate fewer than 110 trips per day may be assumed to cause a less-than-significant transportation impact (OPR 2018.) Therefore, construction of the Project would not result in a considerable increase in VMT. Operations associated with the proposed Project would not expect to require worker trips for inspection and testing of the pipeline, valves, and other appurtenances. These trips would be incorporated into EMWD's existing O&M program and would not increase VMT in the Project area. Therefore, the Project would be consistent with CEQA Guidelines Section 15064.3, subdivision (b) and the impact would be less than significant.

c) Less than Significant Impact

The Project would not construct new roadways or introduce vehicles that are incompatible with existing roads; existing roadways would be restored to their prior condition once construction is complete. Therefore, after construction, the Project would not create roadway hazards.

Project construction would temporarily increase transportation hazards in the Project vicinity because it would require incompatible uses (i.e., use of heavy construction equipment) and ingress/egress to temporary staging areas from existing roadways. However, through implementation of a TCP as described in *Section 2.7 Environmental Commitment*s, impacts would be less than significant.

d) Less than Significant Impact

Construction of the proposed Project may require lane closures along the pipeline alignment and would generate trips associated with construction (worker travel and delivery of materials and equipment). Lane closures have the potential to hinder access for emergency vehicles. Traffic control measures implemented during Project construction would require that emergency crews be able to access sites and surrounding areas. The contractor would coordinate to ensure that emergency responders are informed of construction locations. Traffic control measures would also require that the contractor make a reasonable effort to preserve access to business and properties during construction. In order to prevent Project construction from interfering with emergency responders, a TCP as described in *Section 2.7 Environmental Commitment*s is required and with the implementation of the TCP, impacts would be less than significant.

Mitigation Measures: None required or recommended.

3.18 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	[ ]	[X]	[ ]	[ ]
ii) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	[ ]	[X]	[ ]	[ ]

Discussion

a) Less than Significant with Mitigation Incorporated

Per AB 52, EMWD initiated consultation with Native 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 June 1, 2023, EMWD sent consultation notification letters to Native Tribes on the District's Master List pursuant to the requirements of AB 52 pertaining to government-to-government consultation. **Table 3-8: Tribal Consultation Summary** summarizes the District's consultation efforts. To date, EMWD has conducted consultation with one federally recognized Native Tribe: Agua Caliente Band of Cahuilla Indians. An additional five Native Tribes were contacted but declined consultation or did not respond, as noted in **Table 3-8**.

Table 3-8: Tribal Consultation Summary

Tribe	Individual Contacted	Date Letter Mailed	Response Received	Consultation Held
Agua Caliente Band of Cahuilla Indians	Pattie Garcia	06/01/2023	06/06/2023	09/21/2023
Morongo Band of Mission Indians	Laura Chatterton	06/01/2023	08/02/2023	N/Ac
Pechanga Band of Luiseño Indians	Ebru Ozdil	06/01/2023	Did not Respond	N/A
Rincon Band of Luiseño Indians	Cheryl Madrigal	06/01/2023	06/25/2023	N/A
San Manuel Band of Mission Indians	Bonnie Bryant	06/01/2023	06/12/2023	N/A
Soboba Band of Luiseño Indians	Joe Ontiveros	06/01/2023	Did not Respond	N/A

During the consultation meeting, the responding Tribe highlighted their concerns for the general area noting that it is within the Tribe's Traditional Use Areas and considered sensitive as there are existing sites in the surrounding areas. The Tribe provided recommendations with regards to mitigation. The Tribe expressed concern with potential unearthing of unknown artifacts while grading the selected site. The Tribe recommended tribal monitoring consistent with those measures used in prior CEQA analysis conducted by EMWD to mitigate the potential for uncovering of unknown buried artifacts.

As a result of the AB 52 consultation process, **Mitigation Measure TRI-1**, **Mitigation Measure TRI-2**, **Mitigation Measure TRI-3**, and **Mitigation Measure TRI-4** shall be implemented. With the implementation of **Mitigation Measure TRI-1** through **Mitigation Measure TRI-4,** impacts to tribal cultural resources would be less than significant.

Mitigation Measures:

To mitigate possible tribal cultural impacts resulting from the Project, EMWD shall implement **Mitigation Measures TRI-1** through **TRI-4**. With implementation of these mitigation measures, Project- related tribal cultural impacts are considered less than significant.

TRI-1 Tribal Resources Monitoring Agreement.

At least 30 days prior to the start of ground-disturbing activities, Eastern Municipal Water District (District) 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.

TRI-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, the District 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 in order 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 occur at a location determined between the District and the consulting Tribe as described in **Mitigation Measure TRI-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 District, 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.

TRI-3 Disposition of Inadvertent Discoveries.

In the event that Tribal Cultural Resources are recovered during the course of grading, the District shall relinquish ownership of all cultural resources, including sacred items,

burial goods, archaeological artifacts, and non-human remains. The District 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 District and the consulting Tribe.

TRI-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.

3.19 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 storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	[ ]	[ ]	[X]	[ ]
b) Have sufficient water supplies available to serve the Project and reasonably foreseeable future development during normal, dry and multiple dry years?	[ ]	[ ]	[ ]	[X]

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

Discussion

Water Supply

EMWD is the primary potable water, recycled water, and wastewater services purveyor for the Project area. The majority of EMWD's supply is imported from the Metropolitan Water District of Southern California (MWD) via the State Water Project and the Colorado River Aqueduct for potable and non-potable use and groundwater recharge. (EMWD 2020, pp. E-2, 6-2, 6-4.) Groundwater is also pumped from the Hemet/San Jacinto and West San Jacinto areas of the San Jacinto Groundwater Basin to offset imported water supplies. (EMWD 2020, pp. 6-5, 6-23.) Groundwater in portions of the West San Jacinto Basin is high in salinity and requires desalination treatment in one of two EMWD desalination plants before potable use. (EMWD 2020, p. 6-20.)

Wastewater and Recycled Water

EMWD provides wastewater collection, treatment, and recycled water services in the Project area. EMWD currently treats approximately 49 million gallons per day (mgd) of wastewater at its four active regional water reclamation facilities (RWRF) in San Jacinto Valley, Moreno Valley, Perris Valley, and Temecula Valley. (EMWD 2020, p. 3-3; EMWD-B 2023.) The Perris Valley RWRF is located at 301 Case Road in Perris and is the closest RWRF location to the Project site. In 2021, the Perris Valley RWRF typically treated an average of 15.5 mgd and has a current capacity of 22 mgd. (EMWD 2021.)

EMWD owns, operates, and maintains a recycled water system in conjunction with the RWRFs. Recycled water is used extensively in EMWD's service area and EMWD

regularly uses 100 percent of its recycled water supply for beneficial use. (EMWD 2020, p. 6-2.) The majority of recycled water sold is used for agricultural irrigation. A portion of the water sold for agriculture is used in lieu of groundwater, preserving the groundwater basin, and improving water supply reliability. (EMWD 2020, p. 6-14.)

Western Municipal Water District (WMWD) borders EMWD to the west. Sewer flows within the WMWD service area are conveyed to the Western Water Recycling Facility located off the I-215 freeway near the MARB. The Western Water Recycling Facility produces up to 3 million gallons of high-quality, tertiary-treated recycled water daily. WMWD also owns an existing 15-inch sewer line connection near the Cajalco Road and Carpinus Street intersection.

Stormwater

Existing drainage facilities within the Project site include an 84-inch and 60-inch corrugated metal pipe (CMP) via culvert located West of Barton Road, and two parallel 28-inch by 20-inch arch CMPs via an Arizona crossing located west of Brown Street.

The RCFCWCD is the regional flood management authority for the western part of Riverside County. The purpose of the RCFCWCD is to identify flood hazards and problems, regulate floodplains and development, regulate drainage and development, construct and maintain flood control structures and facilities, and complete County watercourse and drainage planning. While RCFCWCD oversees all aspects of flood protection, they collaborate with local agencies on project development and implementation. Stormwater quality and flooding potential in the proposed Project area are described in *Section 3.10 Hydrology and Water Quality*.

Solid Waste

Solid waste services, include waste pickup within the proposed Project area are provided by CR&R Environmental Services and Waste Management of the Inland Empire. Solid waste collected within the Project area is primarily deposited in the Riverside County Waste Management District's Badlands Landfill (31125 Ironwood Avenue, Moreno Valley). (CAL-A 2019.) However, trash haulers can also use other County landfills such as the Lamb Canyon Landfill (16411 Lamb Canyon Road, Beaumont) and El Sobrante Landfill (10910 Dawson Canyon Road, Corona). (CAL-B 2019; CAL-C 2019.)

Utilities

Electrical service in the Project area is provided by Southern California Edison (SCE). Natural gas service in the Project area is provided by the Southern California Gas Company (SoCal Gas). Telecommunications services in the Project vicinity are provided by Frontier Communications. Existing facilities for these utilities are located throughout the Project vicinity.

a) Less than Significant Impact

The proposed Project would construct sewer pipelines, interconnections, and appurtenances. The Project would not require or result in the construction of new or expanded water, wastewater treatment or stormwater drainage, electric power, natural gas, or telecommunications facilities beyond the expansion of EMWD's sewer system as described and analyzed in this IS. Construction of the Project would occur within the paved and unpaved roadways of the Project site and the roadway would be restored to pre-construction conditions, so no permanent change in stormwater drainage would occur. As discussed in *Section 3.14 Population and Housing*, the proposed Project would serve existing and planned communities and would not induce unplanned population or employment growth that would require or result in the construction of new or expanded water, wastewater treatment, stormwater drainage, electrical power, natural gas, or telecommunications facilities. As explained in *Section 3.6 Energy*, operation of the proposed Project would not involve the consumption of electricity. Therefore, the Project would not result in the need to construct new electrical facilities. The environmental impacts of the proposed Project's sewer pipeline and associated above ground appurtenances and valves are evaluated throughout this IS/MND and are anticipated to all be mitigated to a less than significant level.

b) No Impact

The proposed Project involves expansion of EMWD's sewer service to disadvantaged communities of Mead Valley and promote economic development; redirect existing flow to the proposed trunk sewer in order to decommission the Clark Street Lift Station; and provide additional flow to WMWD to produce additional recycled water. Construction of the proposed Project would require a minimal water supply for purposes such as dust control and concrete mixing. Existing sources would be sufficient and no new or expanded supply would be required for construction. Operation of the proposed Project would not induce unplanned population growth that would require or result in the construction of new water treatment facilities or the expansion of existing facilities. EMWD's water supply would accommodate existing water demand and is consistent with planned growth anticipated in the 2020 UWMP. No impact related to sufficient water supplies would occur.

c) No Impact

As discussed under response "3.19 b" above, construction and operation of the proposed Project would not directly or indirectly induce unplanned population or employment growth that would require or result in the construction of a new or expanded wastewater collection infrastructure or treatment services. As discussed in *Section 2.5 Proposed Project Description*, the sewer lines would allow redirect wastewater to WMWD for recycled water production. Therefore, no impacts would occur.

d) Less than Significant Impact

Construction of the proposed Project would generate soil and asphalt waste during installation of underground pipelines, which must be disposed of at a legal landfill.

Construction-generated solid waste would be delivered via private haulers to an a materials recovery facility (MRF) or licensed landfill. There are two state regulations that set standards for solid waste generation: AB 939 mandates 50 percent diversion of solid waste; and AB 341 mandates recycling programs to help reduce GHG emissions. Waste material may be hauled to the El Sobrante Landfill located at 10910 Dawson Canyon Road, Corona, approximately 13.2 miles southwest of the Project site. The El Sobrante Landfill has a remaining capacity of 143,977,170 cubic yards with a daily maximum capacity of 16,054 tons per day (CAL-C 2019.) Therefore, the existing landfill would have sufficient permitted capacity to accommodate construction debris from the proposed Project.

Operation of the proposed Project is not anticipated to generate solid waste in the long-term. Therefore, solid waste generation would be limited to temporary construction activities and would not affect available solid waste disposal capacity in the region. Therefore, impacts would be less than significant.

e) Less than Significant

Construction and operation of the proposed Project would comply with local, State, and federal regulations related to solid waste. While operation of the proposed Project is not anticipated to generate long-term solid waste, construction activities would create debris such as excavated soil and asphalt. Excavated soil would be backfilled to the extent possible, but construction contractor(s) would be required to dispose of excess construction debris in accordance with existing reduction statutes including the California Integrated Waste Management Act of 1989 Assembly Bill 939 (AB 939) and Solid Waste Diversion AB 341 regulations. These regulations require mandatory 50 percent diversion of solid waste (AB 939), and mandatory recycling programs to reduce GHG emissions (AB 341.) Therefore, impacts related to compliance with local, state, and federal reduction statues and regulations related to solid waste would be less than significant.

Mitigation Measures: None required or recommended.

3.20 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?	[ ]	[ ]	[X]	[ ]
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?	[ ]	[ ]	[X]	[ ]
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?	[ ]	[ ]	[X]	[ ]
d) Expose people or structures to significant risks, including downslopes or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	[ ]	[ ]	[ ]	[X]

Discussion

The California Department of Forestry and Fire Protection's Fire and Resource Assessment Program (FRAP) assesses the amount and extent of California's forests and rangelands, analyzes their conditions and identifies alternative management and policy

guidelines. The State Fire Marshal is mandated to classify lands within State Responsibility Areas into Fire Hazard Severity Zones (FHSZs). A portion of the Project site, along Cajalco Road between Barton Street and Carpinus Road, are located directly adjacent to the Moderate, High, and Very High FHSZs. (OSFM 2023.)

The County of Riverside's Emergency Operations Plan (EOP) establishes roles and responsibilities, assigns tasks, and specifies policies and general procedures. The plan includes critical elements of the Standardized Emergency Management System, the National Incident Management System, the Incident Command System, and the National Response Framework. (EOP 2019.)

The Couty of Riverside Multi-Jurisdictional Local Hazard Mitigation Plan (MJLHMP) identies the County's hazards, reviews and assesses past disaster occurrences, estimate the probability of future occurrences, and sets goals to mitigate potential risks to reduce or eliminates long-term risk to people and property from natural and human-caused hazards. (MJLHMP 2023.)

a) Less than Significant Impact

Portions of the western Project site are located within a State Responsibility Area of Moderate, High, and Very High fire hazard severity zones. (OSFM 2023.) These Moderate, High, and Very High fire hazard severity zones are be based on fuel loading, slope, fire weather, and other relevant factors including areas where winds have been identified by the Office of the State Fire Marshal as a major cause of wildfire spread. (OSFM 2023.) The proposed Project would construct potable water pipelines, interconnections, and appurtenances within existing roadways and ROW. Construction of the proposed Project may potentially result in temporary traffic obstructions. However, the Project will implement a TCP as described in *Section 2.7 Environmental Commitments.* The TCP will include provisions to coordinate lane closures, access, and construction work hours in order to minimize potential impacts associated with emergency response. Project operations and routine maintenance and service of underground pipelines and aboveground appurtenances would not impair an emergency response or emergency evacuation plan. Thus, with through compliance with the Project's Environmental Commitments, impacts would be less than significant.

b) Less than Significant

The Project involves construction and operation of underground pipelines and aboveground valves and associated appurtenances. Construction of the Project would not entail grading that would create new or change existing slopes or otherwise change the current level of fire risk that exists within the area. Therefore, impacts regarding the exposure of Project occupants to pollutant concentrations form a wildfire or the uncontrolled spread of a wildfire would be less than significant.

c) Less than Significant

The Project does not include roads, fire breaks, power lines, or installation of any new utilities. As discussed in response "20.b", implementation of the Project would not change the current level of fire risk that exists within the area. Impacts would be less than significant.

d) No Impact

The proposed Project does not include habitable structures, nor would it substantially alter existing drainage patterns. Therefore, there would be no impacts with regard to exposing people or structures to significant wildfire risks.

Mitigation Measures: None required or recommended.

3.21 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 project have the potential to 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, reduce the number or restrict the range of a rare or an endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	[ ]	[X]	[ ]	[ ]
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	[ ]	[ ]	[X]	[ ]

of other current projects, and the effects of probable future projects?				
c) Does the project have Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	[ ]	[X]	[ ]	[ ]

Discussion

a) Less than Significant Impact with Mitigation Incorporated

Potential to Degrade the Quality of Environment: Construction of the Project site does not have the potential to degrade the quality of the environment. As indicated in the foregoing analysis, either no impacts, less than significant impacts, or less than significant impacts with mitigation incorporated would occur with respect to each of the environmental issues analyzed in this Initial Study.

Potential to Impact Biological Resources: As discussed in *Section 3.4, Biological Resources*, implementation of the proposed Project would not:

- substantially reduce the habitat of a fish or wildlife species;
- cause a fish or wildlife population to drop below self-sustaining levels; or
- threaten to eliminate a plant or animal community or restrict the range the range or endangered plant or animal.

The results of the analysis in *Section 3.4, Biological Resources*, analysis indicate that with implementation of **Mitigation Measure BIO-1** through **Mitigation Measure BIO-5** and the Environmental Commitments described in Section 2.7, impacts to biological resources would be less than significant.

Potential to Eliminate Important Examples of the Major Periods of California History or Prehistory: As discussed in *Section 3.4, Cultural Resources*, no known cultural or historical resources are within the Project site. Although no known historical resources would be affected by the proposed Project, construction has the potential to encounter previously unknown archaeological and historical resources. With implementation of **Mitigation Measure CUL-1** through **Mitigation Measure CUL-3**, impacts to cultural resources would be less than significant. Regarding Tribal Cultural Resources, based on the outcome of AB 52 consultation, **Mitigation Measure TRI-1** through **Mitigation Measure TRI-4** would be implemented. Through regulatory compliance and implementation of the aforementioned mitigation measures, impacts to historic and archaeological resources would be less than significant.

b) Less than Significant Impact

Other projects proposed near the Project site include: County of Riverside sponsored road and drainage improvement project along Cajalco Road and EMWD water improvements in the communities of Mead Valley and Good Hope as described below.

The County of Riverside is proposing a road and drainage improvement project along Cajalco Road. The proposed project would widen Cajalco Road, install new storm drains and culverts, and channelize the historical Cajalco Creek drainageway west of Barton Street. Although the County is the lead agency for this project, the channelization of the drainageway between Alexander Street and Brown Street is in accordance with RCFCWCD master planning efforts. The preliminary roadway plans indicate that minor grading will raise the elevation of Cajalco Road. West of Barton Street this project proposes dividing the west and east bound traffic lanes with the east bound lanes traversing the existing Cajalco Creek Crossing and constructing a new bridge over Cajalco Creek for the west bound lanes. (PDR, p. 17.) From Barton Street to Day Street, the County is proposing a new median. The location of the proposed Project was selected, in part, to facilitate future access by placing the sewer alignment outside of the future median. (PDR, p. 17.)

EMWD is proposing water improvements along within the Mead Valley and Good Hope communities. This proposed water improvement project may commence as early as April 2024 and is near the proposed Project site.

As demonstrated by the analysis in this IS, the Project will not result in any impacts that are individually limited, but cumulatively considerable. The Project is consistent with applicable local and regional plans, and the Project does not result in significant air quality emissions. The Project adheres to all other land use plans and policies that have jurisdiction over the Project site and does not contribute to substantial traffic volumes. The Project is not considered growth-inducing as defined by State CEQA Guidelines Section 15126.2(d) and will not induce, either directly or indirectly, population and/or housing growth. Therefore, impacts are less than significant.

c) Less than Significant Impact with Mitigation Incorporated t

Effects on human beings were evaluated as part of the aesthetics, air quality, geology and soils, hazards and hazardous materials, hydrology and water quality, noise, population and housing, and transportation thresholds sections of this IS and found to be less than significant for each of the above sections with implementation of **Mitigation Measure GEO-1 through Mitigation Measure GEO-3, Mitigation Measure NOI-1,** and the Environmental Commitments described in Section 2.7. Based on the analyses and conclusions in this IS, the proposed Project will not cause substantial adverse effects directly or indirectly to human beings. Therefore, potential direct and indirect impacts on human beings that result from the proposed Project are considered less than significant with mitigation incorporated.

4. REPORT PREPARATION

4.1 Report Authors

This report was prepared by EMWD and Albert A Webb Associates. Staff from these agencies and companies that were involved include:

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4.2 References

ALUC 2014 Riverside County Airport Land Use Commission, *March Air Reserve Base/Inland Port Airport Land Use Compatibility Plan*. November 13, 2014. (Available at New Compatibility Plan 2 | Riverside County Airport Land Use Commission (rcaluc.org), accessed on October 16, 2023.)

AQMP 2022 South Coast Air Quality Management District, *2022 Air Quality Management Plan*. Adopted December 2, 2022. (Available at http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2022-air-quality-management-plan/final-2022-aqmp/final-2022-aqmp.pdf?sfvrsn=16, accessed on September 28, 2023.)

ATLAS 2023 Atlas Technical Consultants, LLC, *Geotechnical Investigation Mead Valley Sewer Improvements, Eastern Municipal Water District*. March 3, 2023. (Appendix D.)

CAL 2023 California Department of Transportation, *State Scenic Highways System List*. 2023. (Available at https://dot.ca.gov/programs/design/lap-landscape-architecture-and-community-livability/lap-liv-i-scenic-highways, accessed October 12, 2023.)

CAL-A 2019 California Department of Resources, *Recycling and Recovery Solid Waste Information System: Facility Detail: Badlands Sanitary Landfill (33-AA- 0006)*. October 3, 2023. (Available at, https://www2.calrecycle.ca.gov/SolidWaste/Site/Summary/2367, accessed October 18, 2023.)

CAL-B 2019 California Department of Resources, *Recycling and Recovery Solid Waste Information System: Facility Detail: Lamb Canyon Sanitary Landfill (33-AA-0007)*. October 4, 2023. (Available at https://www2.calrecycle.ca.gov/SolidWaste/Site/Summary/2368, accessed October 18, 2023.)

CAL-C 2019 California Department of Resources, *Recycling and Recovery Solid Waste Information System: El Sobrante Landfill (33-AA-0217)*. September 15, 2023. (Available at https://www2.calrecycle.ca.gov/SolidWaste/Site/Summary/2402, accessed October 18, 2023.)

CAP 2019 County of Riverside, Climate Action Plan Update. 2019. (Available at, https://planning.rctlma.org/sites/g/files/aldnop416/files/migrated/Portals-14-CAP-2019-2019-CAP-Update-Full.pdf, accessed October 13, 2023.)

CARB 2018 California Air Resources Board (CARB). 2018. Community Air Protection Blueprint. (Available at: https://ww2.arb.ca.gov/sites/default/files/2018-10/final_community_air_protection_blueprint_october_2018.pdf accessed October 31, 2023.)

CARB-A 2023 California Air Resources Board, *California Ambient Air Quality Standards,* 2023. (Available at https://ww2.arb.ca.gov/resources/california-ambient-air-quality-standards, accessed on October 30, 2023.)

CARB-B 2023 California Air Resources Board. *CARB Identified Toxic Air Contaminants*, 2023. (Available at https://ww2.arb.ca.gov/resources/documents/carb-identified-toxic-air-contaminants, accessed on October 30, 2023.)

CARB-C 2023 California Air Resource Board, *Overview of Amendments to the In-Use Off-Road Diesel-Fueled Fleets Regulations.* August 23, 2023. (Available at, https://ww2.arb.ca.gov/resources/fact-sheets/overview-amendments-use-road-diesel-fueled-fleets-regulation, accessed on October 14, 2023.)

CDOC-A 2022 California Department of Conservation (CDOC), *California Important Farmland 1984-2020, Interactive Map.* 2022. (Available at https://maps.conservation.ca.gov/dlrp/ciftimeseries/, accessed October 12, 2023.)

CDOC-B 2022 California Department of Conservation (CDOC), *California Williamson Act Enrollment Finder, Interactive Map.* 2022. (Available at https://maps.conservation.ca.gov/dlrp/WilliamsonAct/, accessed October 12, 2023.)

CEC 2017 California Energy Commission (CEC). *Renewables Portfolio Standard Eligibility, Ninth Edition*. (Available at https://efiling.energy.ca.gov/getdocument.aspx?tn=217317, accessed on October 31, 2023.)

DOC 2022 Department of Conservation, *DOC Maps: Geologic Hazards*. 2022. (Available at https://maps.conservation.ca.gov/geologichazards/, accessed on October 16, 2023.)

DOC 2023 Department of Conservation, *SMARA Statutes and Regulations*. 2023. (Available at https://www.conservation.ca.gov/dmr/lawsandregulations, accessed on October 14, 2023)

DTSC 2021 California Department of Toxic Substances Control, *Envirostor Database*. 2023. (Available at https://www.envirostor.dtsc.ca.gov/public/search?cmd=search&reporttype=CORTESE&site_type=CSITES,FUDS&status=ACT,BKLG,COM&reporttitle=HAZARDOUS+WASTE+AND+SUBSTANCES+SITE+LIST+%28CORTESE%29, accessed October 16, 2023.)

DWR 2006 Department of Water Resources, *San Jacinto Groundwater Basin*. January 20, 2006. (Available at https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Bulletin-118/Files/2003-Basin-Descriptions/8_005_SanJacinto.pdf, accessed October 20, 2023.)

EMWD 2015 Eastern Municipal Water District, *General Construction Specifications, Section 02201- Construction Methods & Earthwork,* April 2015. (Available at https://www.emwd.org/engineering-standards-specifications-and-drawings, accessed August 19, 2023.)

EMWD 2020 Eastern Municipal Water District, 2020 *Urban Water Management Plan. a*dopted July 1, 2021. (Available at https://www.emwd.org/sites/main/files/file-

attachments/urbanwatermanagementplan_0.pdf?1625160721, accessed on June, 21 2023.)

EMWD 2021 — Eastern Municipal Water District, *Perris Valley Regional Water Reclamation Facility*. January 2021. (Available at https://www.emwd.org/sites/main/files/file-attachments/pvrwrffactsheet.pdf?1620227213, accessed on October 18, 2023.)

EMWD-A 2023 — Eastern Municipal Water District, *Sustainable Groundwater Management Act*. (Available at https://www.emwd.org/post/sustainable-groundwater-management-act, accessed on October 17, 2023.)

EMWD-B 2023 — Eastern Municipal Water District, *Wastewater Service*. 2023. (Available at https://www.emwd.org/wastewater-service, accessed on October 18, 2023.)

EOP 2019 — County of Riverside, *Emergency Operations Plan EOP*. August 2019. (Available at https://riversidecountyca.iqm2.com/Citizens/Detail_LegiFile.aspx?Frame=&MeetingID=2048&MediaPosition=3715.315&ID=10490&CssClass=, accessed on October 16, 2023.)

FEMA 2008 — Federal Emergency Management Agency, *Flood Insurance Rate Map for Riverside County, California, and Incorporated Areas. Map Numbers 06065C1420G and 06065C1410G*. Effective August 28, 2008. (Available at https://msc.fema.gov/portal/home, accessed on October 17, 2023.)

FEMA 2020 — Federal Emergency Management Agency, *Flood Zones.* July 8, 2020. (Available at https://www.fema.gov/glossary/flood-zones, accessed on October 17, 2023.)

FTA 2018 — Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*. September 2018. (Available online at: https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf, accessed on September 19, 2023.)

FWHA — Federal Highway Administration, *FHWA Roadway Construction Noise Model User's Guide*. January 2006. (Available at https://www.gsweventcenter.com/Draft_SEIR_References/2006_01_Roadway_Construction_Noise_Model_User_Guide_FHWA.pdf, accessed on October 18, 2023.)

GP 2015 Riverside County, *County of Riverside General Plan*. December 8, 2015. (Available at https://planning.rctlma.org/general-plan-and-zoning/riverside-county-general-plan, accessed on October 17, 2023.)

MJLHMP 2023 County of Riverside Emergency Management Department (EMD), *County of Riverside Operational Area Multi-Jurisdictional Local Hazard Mitigation Plan*. April 2023. (Available at https://rivcoready.org/sites/g/files/aldnop181/files/2023-08/MJLHMP%208.7.23.pdf, accessed on October 15, 2023.)

MVAP County of Riverside, *Mead Valley Area Plan*. Revised September 28, 2021. (Available at https://planning.rctlma.org/sites/g/files/aldnop416/files/migrated/Portals-14-genplan-GPA-2022-Compiled-MVAP-4-2022-rev.pdf, accessed August 14, 2023.)

OPR 2018 Office of Planning and Research, *Technical Advisory on Evaluating Transportation Impacts in CEQA.* December 2018. (Available at https://opr.ca.gov/docs/20190122-743_Technical_Advisory.pdf, accessed October 15, 2023.)

ORD655 Riverside County. *Riverside County Ordinance No. 655 Regulating Light Pollution.* 1988. (Available at https://www.rivcocob.org/ords/600/655.htm, accessed October 12, 2023.

OSFM 2023 Office of the State Fire Marshall, *Fire Hazard Severity Zones in State Responsibility Area*. September 29, 2023.(Available at https://osfm.fire.ca.gov/divisions/community-wildfire-preparedness-and-mitigation/wildfire-preparedness/fire-hazard-severity-zones/#explorefhsz, accessed on October 16, 2023.)

PDR 2023 Ardurra, *Mead Valley Cajalco Sewer Project, Preliminary Design Report*. January 2, 2023. (Appendix E.)

RIVORD 348 County of Riverside, *Ordinance No. 348-4997 an Ordinance of the County of Riverside Providing for Land Use Planning and Zoning Regulations and Related Functions.* April 28, 2023. *(*Available at https://planning.rctlma.org/sites/g/files/aldnop416/files/2023-06/Ord348-04-28-2023-FINAL.pdf?ver=2022-03-02-162154-373, accessed on October 13, 2023.)

RIVZ 2023 County of Riverside, *Map My County*. 2023. (Available at https://gis1.countyofriverside.us/Html5Viewer/index.html?viewer=MMC_Public, accessed on October 13, 2023.)

RTA 2023 Riverside Transit Agency, *Maps and Schedules: Line 41*. 2023. (Available at https://www.riversidetransit.com/index.php/riding-the-bus/maps-schedules, accessed on August 14, 2023.)

RWQCB 2015 Santa Ana Regional Water Quality Control Board, *San Jacinto Watershed Fact Sheet*. April 15, 2015. (Available at https://content.rcflood.org/downloads/NPDES/Documents/SA_WAP/AppH_SubwatershedFactSheets.pdf, accessed on September 28, 2023.)

RWQCB 2019 Santa Ana Regional Water Quality Control Board, *Water Quality Control Plan for the Santa Ana River Basin.* January 24, 1995, Updated June 2019. (Available at https://www.waterboards.ca.gov/santaana/water_issues/programs/basin_plan/, accessed on October 17, 2023.)

SCAG 2020 Southern California Association of Governments, Connect *SoCal*. Adopted September 3, 2020. (Available at SCAG Connect SoCal - The 2020-2045 Regional Transportation Plan/ Sustainable Communities Strategy Adopted on September 3, 2020, accessed on October 15, 2023.)

SCAQMD 2008a South Coast Air Quality Management District, *Final Localized Significance Threshold Methodology.* June 2003, Revised July 2008. (Available at Microsoft Word - EJI-4 Final April 2008.doc (aqmd.gov), accessed October 31, 2023.)

SCAQMD 2008b South Coast Air Quality Management District. *Board Meeting Agenda No. 31: Interim CEQA GHG Significance Threshold for Stationary Sources, Rules and Plans*. Available at http://www.aqmd.gov/docs/default-source/ceqa/handbook/greenhouse-gases-(ghg)-ceqa-significance-thresholds/ghgboardsynopsis.pdf?sfvrsn=2, accessed October 31, 2023.)

SCAQMD 2009 South Coast Air Quality Management District, *Final LST Methodology Document, Appendix C – Mass Rate LST Look-up Tables.* Revised October 21, 2009. (Available at http://www.aqmd.gov/docs/default-source/ceqa/handbook/localized-significance-thresholds/appendix-c-mass-rate-lst-look-up-tables.pdf?sfvrsn=2, accessed October 31, 2023.)

SCAQMD 2023 South Coast Air Quality Management District, *South Coast AQMD Air Quality Significance Thresholds*. March 2023. (Available at https://www.aqmd.gov/docs/default-source/ceqa/handbook/south-

coast-aqmd-air-quality-significance-thresholds.pdf?sfvrsn=25, accessed October 31, 2023.)

SCE 2021 Southern California Edison. *2021 Power Content Label.* (Available at https://www.energy.ca.gov/filebrowser/download/4676, accessed October 13, 2023.)

SE 2023 South Environmental, *Cultural Resources Technical Report, Mead Valley Cajalco Sewer Projec*t. October 2023. (Appendix C)

US EPA 2023 U.S. Environmental Protection Agency, *NAAQS Table*, March 15, 2023. (Available at https://www.epa.gov/criteria-air-pollutants/naaqs-table, accessed on October 30, 2023.)

VVUSD 21 Val Verde Unified School District. *Schools Infograph 21-22*. 2021. (Available at vvusd Infograph 21-22-01.png - Google Drive, accessed October 15, 2023.)

WEBB-A Albert A Webb Associates, *Air Quality/Greenhouse Gas Analysis for the Mead Valley Cajalco Sewer Project*. October 31, 2023. (Appendix A.)

WEBB-B 2023 Albert A Webb Associates, *Biological Technical Report For Mead Valley Cajalco Sewer Project*. September 2023. (Appendix B.)

APPENDIX A: CALEEMOD OUTPUT

ALBERT A. WEBB ASSOCIATES

Technical Memorandum

To: Joseph Broadhead, Principal Water Resource Specialist

From: Eliza Laws, Senior Environmental Analyst
Monica Tobias, Associate Environmental Analyst
Noemi Avila, Assistant Environmental Analyst

Date: October 31, 2023

Re: Air Quality/Greenhouse Gas Analysis for the Mead Valley Cajalco Sewer Project

The following air quality assessment was prepared to evaluate whether the expected criteria air pollutant emissions generated as a result of construction and operation of the proposed Project would cause exceedances of the South Coast Air Quality Management District's (SCAQMD) thresholds for air quality in the Project area. The greenhouse gas (GHG) assessment was prepared to evaluate whether the expected criteria GHG emissions generated as a result of construction and operation of the proposed Project would exceed the SCAQMD draft screening significance thresholds. This assessment was conducted within the context of the California Environmental Quality Act (CEQA, California Public Resources Code Sections 21000 et seq.). The methodology follows the *CEQA Air Quality Handbook* prepared by the SCAQMD for quantification of emissions and evaluation of potential impacts to air resources. As recommended by SCAQMD staff, the **Cal**ifornia **E**missions **E**stimator **Mod**el version 2022.1 (CalEEMod) was used to quantify Project-related emissions.

The Eastern Municipal Water District (EMWD) proposes the Mead Valley Cajalco Sewer Project (Project). The Project involves the construction of approximately 12,600 linear feet of 8-inch to 15-inch diameter polyvinyl chloride (PVC) or vitrified clay pipe (VCP) gravity trunk sewer pipeline, in the City of Perris in Riverside County. The Project consists of the construction of sewer line within Cajalco Road from Day Street to Carpinus Street. The Project will also include demolition of the Clark Street Lift Station and the associated sewer connections to re-direct the existing sewer connections to the new Cajalco sewer pipelines.

▪ Regional Significance Thresholds

The thresholds contained in the *SCAQMD CEQA Air Quality Handbook*[1] and posted in a supplemental table as mass daily thresholds on SCAQMD's website[2] are considered regional thresholds and are shown in **Table 1 – SCAQMD CEQA Daily Regional Significance Thresholds**, below. These regional thresholds were developed based on the SCAQMD's treatment of a major stationary source.

[1] South Coast Air Quality Management District, *CEQA Air Quality Handbook*, November 1993. (Available at SCAQMD.)
[2] Air Quality Analysis Handbook (aqmd.gov)

Table 1 – SCAQMD CEQA Daily Regional Significance Thresholds

Emission Threshold	Units	VOC	NO_X	CO	SO_X	PM-10	PM-2.5
Construction	lbs/day	75	100	550	150	150	55
Operation	lbs/day	55	55	550	150	150	55

Air quality impacts can be described in a short- and long-term perspective. Short-term impacts occur during site grading and Project construction and consist of fugitive dust and other particulate matter, as well as exhaust emissions generated by construction-related vehicles. Long-term air quality impacts occur once the Project is in operation. Operational emissions would be primarily from infrequent visits by vehicles driven by existing maintenance personnel and are considered negligible; therefore, only short-term impacts were quantified.

The Project will be required to comply with existing SCAQMD rules for the reduction of fugitive dust emissions. SCAQMD Rule 403 establishes these procedures. Compliance with this rule is achieved through application of standard best management practices in construction and operation activities, such as application of water or chemical stabilizers to disturbed soils, managing haul road dust by application of water, covering haul vehicles, restricting vehicle speeds on unpaved roads to 15 mph, sweeping loose dirt from paved site access roadways, cessation of construction activity when winds exceed 25 mph and establishing a permanent, stabilizing ground cover on finished sites. In addition, projects that disturb 50 or more acres or more of soil or move 5,000 cubic yards of materials per day are required to submit a Fugitive Dust Control Plan or a Large Operation Notification Form to SCAQMD. Based on the size of this Project's disturbance area (approximately 12.82 acres) a Fugitive Dust Control Plan or a Large Operation Notification Form would not be required.

Short-Term Analysis

Short-term emissions from sewer construction were evaluated using the CalEEMod version 2022.1 program. The total construction period estimated for the proposed Project is approximately twenty-months, beginning no sooner than April 2024. The default parameters within CalEEMod were used and these default values reflect a worst-case scenario, which means that Project emissions are expected to be equal to or less than the estimated emissions. In addition to the default values used, assumptions relevant to model inputs for short-term construction emission estimates used are:

- Construction is anticipated to begin no sooner than April 2024. The Project was modeled as a linear road construction project. The first construction activity is trenching which was modeled as grading and excavation. The second construction activity is paving which was modeled as paving. Lastly, the lift station decommissioning/demolition activity was modeled as grubbing and land clearing. The modeled construction schedule for each activity is shown below:

Construction Activity	Start Date	End Date	Total Working Days
Trenching	04/01/2024	09/30/2025	392 days
Paving	10/01/2025	10/15/2025	11 days
Decommissioning/Demolition	10/16/2025	12/16/2025	44 days

- The off-road equipment to be used for each activity is shown below based on input from EMWD. The engine tier for each piece of equipment is calculated using CalEEMod defaults for the statewide fleet average emissions factors. Each piece of equipment is assumed to operate 8 hours per day:

Activity	Off-Road Equipment	Unit Amount
Trenching	Excavators	2
	Rollers	2
	Rubber Tired Loaders	1
	Tractor Loader Backhoes	2
Paving	Pavers	1
	Tractor/Loader/Backhoe	2
	Paving Equipment	1
	Rollers	3
Decommissioning/Demolition	Crushing Prossessing Equipment	1
	Crawler Tractors	1
	Excavators	1

- The approximate 1,560 square feet of existing Clark Street Lift Station facility will be decommissioned and demolished.
- Four (4) one way vendor trips per day were added to the trenching and paving activity to account for material delivery/hauling.
- The Project consists of water pipeline improvements on paved and unpaved surfaces. It was conservatively assumed that approximately 7.18 acres of asphalt pavement would be disturbed.
- To evaluate Project compliance with SCAQMD Rule 403 for fugitive dust control during the demolition phase, the Project utilized the option of watering the demolished area 2 times daily which achieves a control efficiency of 36 percent for PM-10 and PM-2.5 emissions.
- To evaluate Project compliance with SCAQMD Rule 403 for fugitive dust control, the Project utilized the option of watering the Project site three times daily which achieves a control efficiency of 74 percent for PM-10 and PM-2.5 emissions. Two (2) daily vendor trips per day were added to each phase to account for water truck trips.

The results of this analysis are summarized below.

Table 2 –Estimated Maximum Daily Construction Emissions

Construction Activity	Peak Daily Emissions (lb/day)					
	VOC	NO_x	CO	SO_2	PM-10	PM-2.5
SCAQMD Daily Construction Thresholds	**75**	**100**	**550**	**150**	**150**	**55**
2024	1.07	8.06	12.50	0.02	0.64	0.40
2025	34.30	8.00	52.10	0.02	1.12	0.70
Exceeds Threshold?	**No**	**No**	**No**	**No**	**No**	**No**

Note: See the detailed model output reports attached herewith. Numbers are the maximum of summer or winter emissions in a given year and may not match due to rounding within the model.

As shown in the table above, the emissions from construction of the Project are below the SCAQMD Daily construction thresholds for all criteria pollutants.

▪ Localized Significance Threshold Analysis

Background

As part of the SCAQMD's environmental justice program, attention has been focused on localized effects of air quality. Staff at SCAQMD has developed localized significance threshold (LST)

methodology[3] that can be used by public agencies to determine whether or not a project may generate significant adverse localized air quality impacts (both short- and long-term). LSTs represent the maximum emissions from a project that will not cause or contribute to an exceedance of the state ambient air quality standard, and are developed based on the ambient concentrations of that pollutant for each source receptor area (SRA). The Project is located within SRA 24.

Short-Term Analysis

According to the LST methodology, only on-site emissions need to be analyzed. Emissions associated with vendor and worker trips are mobile source emissions that occur off site. The emissions analyzed under the LST methodology are NO_2, CO, PM-10, and PM-2.5. SCAQMD has provided LST lookup tables to allow users to readily determine if the daily emissions for proposed construction or operational activities could result in significant localized air quality impacts for projects five acres or smaller. Although the Project disturbs approximately 12.82 acres, the Project is linear and will progress in a linear fashion and disturb a smaller area per day. To be conservative, the one-acre LST lookup tables were utilized to estimate the construction emissions.

The LST thresholds are estimated using the maximum daily disturbed area (in acres) and the distance of the Project to the nearest sensitive receptors (in meters). The closest sensitive receptors are residences adjacent to the Project alignment. According to LST methodology, projects with boundaries closer than 25 meters to the nearest receptor should use the LSTs for receptors located at 25 meters. Therefore, a receptor distance of 25 meters (82 feet) was used to ensure a conservative analysis. The results are summarized below.

Table 3 – LST Results for Daily Construction Emissions

Activity	Peak Daily Emissions (lb/day)			
	NO_X	CO	PM-10	PM-2.5
LST for 1-acre at 25 meters	**118**	**602**	**4**	**3**
Trenching – 2024	**7.74**	11.00	0.35	0.33
Trenching - 2025	7.17	11.00	0.30	0.27
Paving – 2025	7.71	10.80	0.34	0.31
Decommissioning/Demolition – 2025	4.24	**51.60**	**0.94**	**0.65**
Maximum	**7.74**	**51.60**	**0.94**	**0.65**
Exceeds Threshold?	**No**	**No**	**No**	**No**

Note: Maximums are the greater of either trenching, paving, or decommissioning/demolition because these activities do not overlap. Maximums are shown in bold.

Emissions from construction of the Project will be below the LST established by SCAQMD for the Project.

Long-Term Analysis

This Project involves sewer pipeline construction and improvements, with no stationary sources of emissions present. According to SCAQMD LST methodology, LSTs would apply to the operational phase of a project, if the project includes stationary sources, or attracts mobile sources that may spend long periods queuing and idling at the site; such as warehouse/transfer facilities. The proposed Project

[3] South Coast Air Quality Management District, *Final Localized Significance Threshold Methodology*, Revised July 2008. (Available at http://www.aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook/localized-significance-thresholds, accessed October 2023.)

does not include such uses. Therefore, due to the lack of stationary source emissions, no long-term LST analysis is needed.

▪ Greenhouse Gas Analysis

Greenhouse gases (GHG) are not presented in lbs/day like criteria pollutants; they are typically evaluated on an annual basis using the metric system. Additionally, unlike the criteria pollutants, GHG do not have adopted significance thresholds associated with them at this time. Several agencies, at various levels, have proposed draft GHG significance thresholds for use in CEQA documents. SCAQMD has been working on GHG thresholds for development projects. The most recent draft proposal was in September 2010[4] and included significance thresholds for residential, commercial, and mixed-use projects at 3,500, 1,400, and 3,000 metric tonnes per year of carbon dioxide equivalents ($MTCO_2E$/yr), respectively. Alternatively, a lead agency has the option to use 3,000 $MTCO_2E$/yr as a threshold for all non-industrial projects. Although both options are recommended by SCAQMD, a lead agency is advised to use only one option and to use it consistently. In December 2008, the SCAQMD adopted a threshold of 10,000 $MTCO_2E$/yr for stationary source projects where SCAQMD is the lead agency. The SCAQMD significance thresholds evaluate construction emissions by amortizing them over an expected project life of 30 years.

The CalEEMod output results for construction-related GHG emissions present the GHG emissions estimates for the Project for CO_2, methane (CH_4), nitrous oxide (N_2O), refrigerants (R) and CO_2E.[5]

Short-Term Analysis

Construction Related Emissions

The CalEEMod model calculates GHG emissions from fuel usage by construction equipment and construction-related activities, like construction worker trips, for the Project. CalEEMod also calculates the indirect GHG emissions related to electricity consumption (CalEEMod Version 2022.1 User's Guide, p. 2).

Table 4 – Project Construction Equipment GHG Emissions

Year	Metric Tons per year (MT/yr)				
	Total CO_2	Total CH_4	Total N_2O	Total R	Total CO_2E
2024	184	0.01	0.00	0.06	186
2025	210	0.01	0.01	0.07	212
Total	**394**	**0.02**	**0.01**	**0.13**	**398**
				Amortized	**13.27**

Evaluation of the table above indicates that an estimated 398 $MTCO_2E$ will occur from Project construction equipment over the course of the estimated approximately twenty-month construction period, which is approximately 13.27 $MTCO_2E$ amortized for a project lifetime of 30 years.

The proposed Project does not fit into the categories provided (industrial, commercial, and residential) in either the draft thresholds from SCAQMD. The Project's GHG emissions do not exceed any of the SCAQMD recommended screening levels. Due to the estimated amount of emissions from Project construction, and negligible operational emissions from the infrequent visits by vehicles related to the

[4] http://www.aqmd.gov/docs/default-source/ceqa/handbook/greenhouse-gases-(ghg)-ceqa-significance-thresholds/year-2008-2009/ghg-meeting-15/ghg-meeting-15-main-presentation.pdf?sfvrsn=2

[5] CO_2E is the sum of CO_2 emissions estimated plus the sum of CH_4 and N_2O and refrigerant emissions estimated multiplied by their respective global warming potential (GWP).

sewer pipeline improvements, the proposed Project will not generate GHG emissions that exceed the draft screening thresholds.

▪ Conclusion

The conclusion of this analysis indicates that the proposed Project's construction emissions will not exceed criteria pollutant thresholds established by SCAQMD on a regional or localized level. The Project will also not generate GHG emissions that exceed the GHG screening thresholds recommended by SCAQMD. No mitigation is required.

Should you have any questions, please contact me at (951) 686-1070.

CALEEMOD OUTPUT FILES

Mead Valley Cajalco Sewer Project Detailed Report

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5. Activity Data

5.1. Construction Schedule

5.2. Off-Road Equipment

5.2.1. Unmitigated

5.3. Construction Vehicles

5.3.1. Unmitigated

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

5.5. Architectural Coatings

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

5.6.2. Construction Earthmoving Control Strategies

5.7. Construction Paving

5.8. Construction Electricity Consumption and Emissions Factors

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

5.18.2. Sequestration

5.18.2.1. Unmitigated

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

6.2. Initial Climate Risk Scores

6.3. Adjusted Climate Risk Scores

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

7.2. Healthy Places Index Scores

7.3. Overall Health & Equity Scores

7.4. Health & Equity Measures

7.5. Evaluation Scorecard

7.6. Health & Equity Custom Measures

8. User Changes to Default Data

1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	Mead Valley Cajalco Sewer Project
Construction Start Date	4/1/2024
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	2.50
Precipitation (days)	9.00
Location	33.83705988575832, -117.31763542766298
County	Riverside-South Coast
City	Unincorporated
Air District	South Coast AQMD
Air Basin	South Coast
TAZ	5461
EDFZ	11
Electric Utility	Southern California Edison
Gas Utility	Southern California Gas
App Version	2022.1.1.20

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	2.38	Mile	12.8	0.00	—	—	—	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

No measures selected

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

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

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1.26	1.07	8.04	12.5	0.02	0.36	0.28	0.64	0.33	0.07	0.40	—	2,087	2,087	0.08	0.05	1.52	2,105
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	34.6	34.3	8.06	52.1	0.02	0.80	0.32	1.12	0.64	0.07	0.70	—	2,067	2,067	0.08	0.05	0.04	2,084
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	4.83	4.69	4.78	13.1	0.01	0.27	0.20	0.46	0.23	0.04	0.28	—	1,269	1,269	0.05	0.03	0.40	1,280
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.88	0.86	0.87	2.39	< 0.005	0.05	0.04	0.08	0.04	0.01	0.05	—	210	210	0.01	0.01	0.07	212

2.2. Construction Emissions by Year, Unmitigated

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

Year	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

2024	1.26	1.07	8.04	12.5	0.02	0.36	0.28	0.64	0.33	0.07	0.40	—	2,087	2,087	0.08	0.05	1.52	2,105
2025	1.17	0.98	7.45	12.4	0.02	0.30	0.28	0.58	0.28	0.07	0.34	—	2,079	2,079	0.08	0.05	1.43	2,097
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	1.26	1.06	8.06	12.2	0.02	0.36	0.28	0.64	0.33	0.07	0.40	—	2,067	2,067	0.08	0.05	0.04	2,084
2025	34.6	34.3	8.00	52.1	0.02	0.80	0.32	1.12	0.64	0.07	0.70	—	2,059	2,059	0.08	0.05	0.04	2,076
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.68	0.57	4.34	6.59	0.01	0.19	0.15	0.34	0.18	0.04	0.21	—	1,114	1,114	0.04	0.03	0.35	1,123
2025	4.83	4.69	4.78	13.1	0.01	0.27	0.20	0.46	0.23	0.04	0.28	—	1,269	1,269	0.05	0.03	0.40	1,280
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.12	0.10	0.79	1.20	< 0.005	0.03	0.03	0.06	0.03	0.01	0.04	—	184	184	0.01	< 0.005	0.06	186
2025	0.88	0.86	0.87	2.39	< 0.005	0.05	0.04	0.08	0.04	0.01	0.05	—	210	210	0.01	0.01	0.07	212

3. Construction Emissions Details

3.1. Linear, Grubbing & Land Clearing (2025) - Unmitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	34.6	34.3	4.24	51.6	0.01	0.80	—	0.80	0.64	—	0.64	—	568	568	0.02	< 0.005	—	570

Dust From Material Movement	—	—	—	—	—	—	0.14	0.14	—	0.01	0.01	—	—	—	—	—	—	—
Demolition	—	—	—	—	—	—	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	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	4.17	4.13	0.51	6.22	< 0.005	0.10	—	0.10	0.08	—	0.08	—	68.5	68.5	< 0.005	< 0.005	—	68.7
Dust From Material Movement	—	—	—	—	—	—	0.02	0.02	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Demolition	—	—	—	—	—	—	< 0.005	< 0.005	—	< 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	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.76	0.75	0.09	1.14	< 0.005	0.02	—	0.02	0.01	—	0.01	—	11.3	11.3	< 0.005	< 0.005	—	11.4
Dust From Material Movement	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Demolition	—	—	—	—	—	—	< 0.005	< 0.005	—	< 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	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04	0.03	0.04	0.44	0.00	0.00	0.10	0.10	0.00	0.02	0.02	—	97.2	97.2	< 0.005	< 0.005	0.01	98.4
Vendor	0.01	< 0.005	0.21	0.06	< 0.005	< 0.005	0.05	0.05	< 0.005	0.01	0.02	—	184	184	< 0.005	0.03	0.01	192
Hauling	< 0.005	< 0.005	0.03	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	28.2	28.2	< 0.005	< 0.005	< 0.005	29.5
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.06	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	11.9	11.9	< 0.005	< 0.005	0.02	12.0
Vendor	< 0.005	< 0.005	0.03	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	22.1	22.1	< 0.005	< 0.005	0.03	23.2
Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	3.40	3.40	< 0.005	< 0.005	< 0.005	3.56
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.96	1.96	< 0.005	< 0.005	< 0.005	1.99
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	3.66	3.66	< 0.005	< 0.005	< 0.005	3.84
Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.56	0.56	< 0.005	< 0.005	< 0.005	0.59

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	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.16	0.97	7.74	11.0	0.02	0.35	—	0.35	0.33	—	0.33	—	1,649	1,649	0.07	0.01	—	1,654
Dust From Material Movement	—	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.16	0.97	7.74	11.0	0.02	0.35	—	0.35	0.33	—	0.33	—	1,649	1,649	0.07	0.01	—	1,654
Dust From Material Movement	—	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.62	0.52	4.17	5.93	0.01	0.19	—	0.19	0.18	—	0.18	—	887	887	0.04	0.01	—	890
Dust From Material Movement	—	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.11	0.10	0.76	1.08	< 0.005	0.03	—	0.03	0.03	—	0.03	—	147	147	0.01	< 0.005	—	147
Dust From Material Movement	—	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.10	0.09	0.08	1.46	0.00	0.00	0.23	0.23	0.00	0.05	0.05	—	252	252	0.01	0.01	1.00	256

Vendor	0.01	0.01	0.21	0.07	< 0.005	< 0.005	0.05	0.05	< 0.005	0.01	0.02	—	186	186	< 0.005	0.03	0.52	195
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.09	0.08	0.10	1.10	0.00	0.00	0.23	0.23	0.00	0.05	0.05	—	231	231	0.01	0.01	0.03	234
Vendor	0.01	0.01	0.22	0.07	< 0.005	< 0.005	0.05	0.05	< 0.005	0.01	0.02	—	186	186	< 0.005	0.03	0.01	195
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.05	0.05	0.05	0.63	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	126	126	0.01	< 0.005	0.23	128
Vendor	< 0.005	< 0.005	0.12	0.04	< 0.005	< 0.005	0.03	0.03	< 0.005	0.01	0.01	—	100	100	< 0.005	0.02	0.12	105
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.11	0.00	0.00	0.02	0.02	0.00	0.01	0.01	—	20.9	20.9	< 0.005	< 0.005	0.04	21.2
Vendor	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	16.6	16.6	< 0.005	< 0.005	0.02	17.4
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.5. 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	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.07	0.90	7.17	11.0	0.02	0.30	—	0.30	0.27	—	0.27	—	1,649	1,649	0.07	0.01	—	1,654

Dust From Material Movement	—	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.07	0.90	7.17	11.0	0.02	0.30	—	0.30	0.27	—	0.27	—	1,649	1,649	0.07	0.01	—	1,654
Dust From Material Movement	—	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.57	0.48	3.83	5.86	0.01	0.16	—	0.16	0.15	—	0.15	—	881	881	0.04	0.01	—	884
Dust From Material Movement	—	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.10	0.09	0.70	1.07	< 0.005	0.03	—	0.03	0.03	—	0.03	—	146	146	0.01	< 0.005	—	146
Dust From Material Movement	—	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.09	0.08	0.08	1.35	0.00	0.00	0.23	0.23	0.00	0.05	0.05	—	247	247	0.01	0.01	0.91	250
Vendor	0.01	< 0.005	0.20	0.06	< 0.005	< 0.005	0.05	0.05	< 0.005	0.01	0.02	—	184	184	< 0.005	0.03	0.52	193
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08	0.07	0.08	1.02	0.00	0.00	0.23	0.23	0.00	0.05	0.05	—	227	227	0.01	0.01	0.02	230
Vendor	0.01	< 0.005	0.21	0.06	< 0.005	< 0.005	0.05	0.05	< 0.005	0.01	0.02	—	184	184	< 0.005	0.03	0.01	192
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04	0.04	0.05	0.58	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	123	123	0.01	< 0.005	0.21	124
Vendor	< 0.005	< 0.005	0.11	0.03	< 0.005	< 0.005	0.03	0.03	< 0.005	0.01	0.01	—	98.1	98.1	< 0.005	0.01	0.12	103
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.11	0.00	0.00	0.02	0.02	0.00	0.01	0.01	—	20.3	20.3	< 0.005	< 0.005	0.03	20.6
Vendor	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	—	16.2	16.2	< 0.005	< 0.005	0.02	17.0
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.7. Linear, Paving (2025) - Unmitigated

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

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

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.06	0.89	7.71	10.8	0.01	0.34	—	0.34	0.31	—	0.31	—	1,620	1,620	0.07	0.01	—	1,625
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.03	0.23	0.33	< 0.005	0.01	—	0.01	0.01	—	0.01	—	48.8	48.8	< 0.005	< 0.005	—	49.0
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	< 0.005	0.04	0.06	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	8.08	8.08	< 0.005	< 0.005	—	8.11
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	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08	0.07	0.08	1.02	0.00	0.00	0.23	0.23	0.00	0.05	0.05	—	227	227	0.01	0.01	0.02	230
Vendor	0.01	< 0.005	0.21	0.06	< 0.005	< 0.005	0.05	0.05	< 0.005	0.01	0.02	—	184	184	< 0.005	0.03	0.01	192
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.03	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	6.92	6.92	< 0.005	< 0.005	0.01	7.02
Vendor	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	5.53	5.53	< 0.005	< 0.005	0.01	5.79
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.15	1.15	< 0.005	< 0.005	< 0.005	1.16
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.92	0.92	< 0.005	< 0.005	< 0.005	0.96
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

4. Operations Emissions Details

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

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

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

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

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

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

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

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

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

Sequest	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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	10/16/2025	12/16/2025	5.00	44.0	3
Linear, Grading & Excavation	Linear, Grading & Excavation	4/1/2024	9/30/2025	5.00	392	1
Linear, Paving	Linear, Paving	10/1/2025	10/15/2025	5.00	11.0	2

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	Crushing/Proc. Equipment	Gasoline	Average	1.00	8.00	12.0	0.85
Linear, Grubbing & Land Clearing	Excavators	Diesel	Average	1.00	8.00	36.0	0.38
Linear, Grubbing & Land Clearing	Crawler Tractors	Diesel	Average	1.00	8.00	87.0	0.43
Linear, Grading & Excavation	Excavators	Diesel	Average	2.00	8.00	36.0	0.38
Linear, Grading & Excavation	Rollers	Diesel	Average	2.00	8.00	36.0	0.38
Linear, Grading & Excavation	Rubber Tired Loaders	Diesel	Average	1.00	8.00	150	0.36
Linear, Grading & Excavation	Tractors/Loaders/Backhoes	Diesel	Average	2.00	8.00	84.0	0.37
Linear, Paving	Pavers	Diesel	Average	1.00	8.00	81.0	0.42
Linear, Paving	Tractors/Loaders/Backhoes	Diesel	Average	2.00	8.00	84.0	0.37
Linear, Paving	Paving Equipment	Diesel	Average	1.00	8.00	89.0	0.36
Linear, Paving	Rollers	Diesel	Average	3.00	8.00	36.0	0.38

5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Linear, Grading & Excavation	—	—	—	—
Linear, Grading & Excavation	Worker	17.5	18.5	LDA,LDT1,LDT2
Linear, Grading & Excavation	Vendor	6.00	10.2	HHDT,MHDT
Linear, Grading & Excavation	Hauling	0.00	20.0	HHDT

Linear, Grading & Excavation	Onsite truck	—	—	HHDT
Linear, Paving	—	—	—	—
Linear, Paving	Worker	17.5	18.5	LDA,LDT1,LDT2
Linear, Paving	Vendor	6.00	10.2	HHDT,MHDT
Linear, Paving	Hauling	0.00	20.0	HHDT
Linear, Paving	Onsite truck	—	—	HHDT
Linear, Grubbing & Land Clearing	—	—	—	—
Linear, Grubbing & Land Clearing	Worker	7.50	18.5	LDA,LDT1,LDT2
Linear, Grubbing & Land Clearing	Vendor	6.00	10.2	HHDT,MHDT
Linear, Grubbing & Land Clearing	Hauling	0.41	20.0	HHDT
Linear, Grubbing & Land Clearing	Onsite truck	—	—	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Non-applicable. No control strategies activated by user.

5.5. Architectural Coatings

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

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (cy)	Material Exported (cy)	Acres Graded (acres)	Material Demolished (Building Square Footage)	Acres Paved (acres)
Linear, Grubbing & Land Clearing	—	—	12.8	1,561	—
Linear, Grading & Excavation	—	—	12.8	0.00	—

5.6.2. Construction Earthmoving Control Strategies

Control Strategies Applied	Frequency (per day)	PM10 Reduction	PM2.5 Reduction
Water Exposed Area	3	74%	74%
Water Demolished Area	2	36%	36%

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt
Road Construction	12.8	56%

5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

Year	kWh per Year	CO2	CH4	N2O
2024	0.00	532	0.03	< 0.005
2025	0.00	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)

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

Climate Hazard	Result for Project Location	Unit
Temperature and Extreme Heat	28.8	annual days of extreme heat
Extreme Precipitation	2.00	annual days with precipitation above 20 mm
Sea Level Rise	—	meters of inundation depth
Wildfire	8.20	annual hectares burned

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about ¾ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (Radke et al., 2017, CEC-500-2017-008), and consider inundation location and depth for the San Francisco Bay, the Sacramento-San Joaquin River Delta and California coast resulting different increments of sea level rise coupled with extreme storm events. Users may select from four scenarios to view the range in potential inundation depth for the grid cell. The four scenarios are: No rise, 0.5 meter, 1.0 meter, 1.41 meters
Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

6.2. Initial Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	3	0	0	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A

Sea Level Rise	1	0	0	N/A
Wildfire	1	0	0	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	0	0	0	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

6.3. Adjusted Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	3	1	1	3
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	1	1	1	2
Wildfire	1	1	1	2
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	1	1	1	2

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Exposure Indicators	—
AQ-Ozone	91.1
AQ-PM	67.9
AQ-DPM	8.08
Drinking Water	76.1
Lead Risk Housing	2.41
Pesticides	18.2
Toxic Releases	58.2
Traffic	16.6
Effect Indicators	—
CleanUp Sites	37.6
Groundwater	30.9
Haz Waste Facilities/Generators	16.6
Impaired Water Bodies	0.00
Solid Waste	23.0
Sensitive Population	—
Asthma	43.7
Cardio-vascular	52.3
Low Birth Weights	15.5
Socioeconomic Factor Indicators	—
Education	30.0
Housing	14.7

Linguistic	2.81
Poverty	12.2
Unemployment	7.14

7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Economic	—
Above Poverty	77.55678173
Employed	38.00846914
Median HI	85.12767869
Education	—
Bachelor's or higher	34.23585269
High school enrollment	26.43397921
Preschool enrollment	8.17400231
Transportation	—
Auto Access	73.42486847
Active commuting	15.02630566
Social	—
2-parent households	65.73848325
Voting	49.13383806
Neighborhood	—
Alcohol availability	93.71230592
Park access	9.303220839
Retail density	5.979725395
Supermarket access	2.399589375
Tree canopy	8.225330425

Housing	—
Homeownership	97.06146542
Housing habitability	91.50519697
Low-inc homeowner severe housing cost burden	85.15334274
Low-inc renter severe housing cost burden	50.78916977
Uncrowded housing	87.19363531
Health Outcomes	—
Insured adults	74.51559091
Arthritis	0.0
Asthma ER Admissions	54.9
High Blood Pressure	0.0
Cancer (excluding skin)	0.0
Asthma	0.0
Coronary Heart Disease	0.0
Chronic Obstructive Pulmonary Disease	0.0
Diagnosed Diabetes	0.0
Life Expectancy at Birth	38.4
Cognitively Disabled	4.9
Physically Disabled	41.1
Heart Attack ER Admissions	48.4
Mental Health Not Good	0.0
Chronic Kidney Disease	0.0
Obesity	0.0
Pedestrian Injuries	70.9
Physical Health Not Good	0.0
Stroke	0.0
Health Risk Behaviors	—

Binge Drinking	0.0
Current Smoker	0.0
No Leisure Time for Physical Activity	0.0
Climate Change Exposures	—
Wildfire Risk	33.4
SLR Inundation Area	0.0
Children	72.4
Elderly	47.3
English Speaking	61.7
Foreign-born	17.2
Outdoor Workers	43.1
Climate Change Adaptive Capacity	—
Impervious Surface Cover	93.8
Traffic Density	13.4
Traffic Access	23.0
Other Indices	—
Hardship	33.6
Other Decision Support	—
2016 Voting	64.2

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	16.0
Healthy Places Index Score for Project Location (b)	55.0
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	No
Project Located in a Low-Income Community (Assembly Bill 1550)	No
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.
b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

7.4. Health & Equity Measures

No Health & Equity Measures selected.

7.5. Evaluation Scorecard

This table summarizes the points earned for each health and equity measure category, and the total possible points for each category. If N/A is selected for any measure(s), the total possible points in that category are reduced accordingly. The points for each category are then weighted on a 15-point scale to determine the score per category and a total weighted score.

Category	Number of Applicable Measures	Total Points Earned by Applicable Measures	Max Possible Points	Weighted Score
Community-Centered Development	4.00	0.00	20.0	0.00
Inclusive Engagement	5.00	0.00	25.0	0.00
Accountability	0.00	0.00	0.00	0.00
Construction Equity	6.00	0.00	30.0	0.00
Public Health and Air Quality	2.00	0.00	10.0	0.00
Inclusive Economics & Prosperity	3.00	0.00	15.0	0.00
Inclusive Communities	3.00	0.00	15.0	0.00
Total	23.0	0.00	115	0.00

Based on the weighted score of 0 out of a total 115 possible points, your project qualifies for the Acorn equity award level.
Organization(s) consulted by the user to complete the Health & Equity Scorecard:



7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

8. User Changes to Default Data

Screen	Justification
Construction: Construction Phases	Per District.
Construction: Off-Road Equipment	Per District.
Construction: Demolition	Demolishing of existing Lift Station
Construction: Trips and VMT	Per District assumed a total of 6 vendor trucks for each of the construction activities (2 for water trucks per Rule 403 and 4 for material delivery and misc. hauling) Changed Grubbing and Land Clearing vendor trips from 0 to 6; updated Grading and Excavation vendor trips from 1 to 6; updated Paving vendor trips from 0 to 6.
Construction: Paving	7.186 acres is project alignment 5.63 acres is staging areas

APPENDIX B: BIOLOGICAL TECHNICAL REPORT

BIOLOGICAL TECHNICAL REPORT

For:

Mead Valley Cajalco Sewer Project



Prepared By:

ALBERT A. WEBB ASSOCIATES

September 2023

W.O. 2022-0203

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EXECUTIVE SUMMARY

Albert A Webb Associates (WEBB) has completed this biological technical report for the Mead Valley Cajalco Sewer Project (Project) as requested by Eastern Municipal Water District (EMWD). EMWD is proposing to construct a new gravity trunk sewer line within Cajalco Road in the County Riverside, California.

The main objective of this report is to provide an assessment of the existing biological conditions within the 7.2-acre Project footprint which is wholly within Cajalco Road, 5.6-acre staging areas, as well as the 79.3-acre biological study area (BSA) defined as a 100-foot wide buffer zone around the Project footprint and staging areas. This report also includes an analysis of potential impacts to sensitive biological resources and potentially jurisdictional resources, ensuring compliance with local, state, and federal policies. This report serves as the necessary biological resources documentation for EMWD's review process under the California Environmental Quality Act (CEQA).

During the period between February 2023 and August 2023, WEBB conducted several surveys, including a general biological assessment, potential jurisdictional aquatic features assessment, burrowing owl focused surveys, and focused least Bell's vireo surveys. The BSA comprises six land cover types and vegetation communities: urban/developed lands, disturbed habitat, non-native grasslands, eucalyptus woodland, southern riparian woodland, and emergent wetland; however, the Project footprint consists of only three cover types: urban/developed lands, disturbed habitat, and non-native grassland.

Within the Project footprint, several corrugated steel culverts are located within Cajalco Road, underground, intersecting the Project alignment at different points. Additionally, potentially jurisdictional aquatic features were observed outside the Project footprint but within the BSA, which are potentially under the regulatory jurisdiction of the U.S. Army Corps of Engineers (USACE), the Regional Water Quality Control Board (RWQCB), and the California Department of Fish and Wildlife (CDFW). The current Project design will have no direct impacts to these potentially jurisdictional aquatic resources. In the event the Project design changes to intersect with these areas, permits may be needed.

The Project does not propose any permanent impacts, but temporary impacts related to construction equipment and operating along Cajalco Road within the Project alignment are anticipated for urban/developed lands, disturbed habitat, and non-native grasslands. While no special-status species were observed within the Project footprint, least Bell's vireo was detected in riparian habitat located adjacent to Project alignment. Potential significant indirect impacts have been identified for burrowing owls, least Bell's vireo, and nesting bird species, unless the recommendations included herein are not implemented. This report proposes specific measures to address these potential impacts, ensuring their reduction to below a level of significance.

Although the Project is located within the boundaries of the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP), EMWD is not a permittee under the MSHCP and is not obtaining coverage as a Participating Special Entity (PSE) through the Western Riverside

County Regional Conservation Authority (RCA). However, the Project is consistent with the guidelines of the MSHCP. The Project also falls within the boundaries of the adopted Habitat Conservation Plan for Stephens' kangaroo rat but is exempt from paying development fees, as no impacts are proposed within the designated core reserves or within suitable habitat.

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1.0 INTRODUCTION

This report presents the findings of a biological resources study conducted by Albert A. Webb Associates (WEBB) for the Mead Valley Cajalco Sewer Project (Project) proposed by the Eastern Municipal Water District (EMWD) located in unincorporated Riverside County, California. The purpose of the study is to provide the EMWD, resource agencies, and the public with current biological data required for the review of the project under the California Environmental Quality Act (CEQA), as well as to ensure compliance with federal, state, and local regulations.

The report provides an overview of the Project alignment's existing biological conditions, including vegetation communities and sensitive habitat types, soils, potentially jurisdictional waters, and the presence or potential presence of special-status species. Additionally, the report assesses the impacts of the Project and proposes recommendations to address any significant adverse effects on special-status biological resources that are expected to occur as a result of Project implementation. Throughout this report, the Project alignment, including the staging areas, will collectively be referred to as the "Project," unless otherwise specified.

1.1 Project Location

The proposed Project is located in Riverside County, California, (Figure-1 Regional Map; all figures are provided in Appendix A). The Project is located within Cajalco Road, approximately 2 miles west of I-215 and 5 miles east of Lake Mathews (Figure 2- Project Vicinity). The Project alignment falls within Sections 8, 9, 10, and 11 of Township 4 South, Range 4 West, as depicted in the Steele Peak 7.5-minute quadrangle map. Cajalco Road is a public right-of-way and therefore does not have Assessor Parcel Numbers (APNs) assigned to it, however three staging areas related to the Project can be identified by the following APNs: 318-140-030, 317-060-043, 318-120-039, and 318-120-038 (Figure 2a-Project Site).

1.2 Project Description

EMWD is proposing to construct new a gravity trunk sewer line within Cajalco Road in Riverside County. The proposed Project alignment is within the EMWD and Western Municipal Water District's service areas, however EMWD will be the Lead Agency under the California Environmental Quality Act (CEQA).

The proposed Project entails the construction of approximately 12,600 linear feet of 8-inch to 15-inch diameter polyvinyl chloride (PVC) or vitrified clay pipe (VCP) gravity trunk sewer pipeline as well as 4-to-5-foot manholes along Cajalco Road. The Project gravity sewer line will be located entirely within the existing right of way of Cajalco Road. Once the sewer line is completed, EMWD will then demolish and decommission the existing Clark Street Sewer Lift Station located at the intersection of Clark Street and Cajalco Road.

Construction methods will include open excavation trenching techniques for the pipeline and the use of jack and bore trenchless techniques to avoid storm drain crossings, wherever

possible. Ground excavation will be at a minimum of 4-feet, but not to exceed 20 feet in depth. Table 1 summarizes the different Project areas evaluated in this study.

Table 1. Project Areas

Project Segment	Area (acres)
Project Footprint	7.2
Staging Areas	5.6
Biological Study Area (100-ft buffer)	79.3
Burrowing Owl Study Area (500-ft buffer)	376.5

2.0 METHODS

2.1 Literature Review

Literature and authoritative database queries were performed to assist in determining the presence or potential occurrences of special-status plant and animal species on the Project alignment or vicinity of the Project alignment. The following resources were reviewed:

- U.S. Geological Survey (USGS) 7.5-minute topographic quadrangles (Perris, Lake Mathews, Steele Peak, Riverside West, Riverside East, Sunnymead, Alberhill, Lake Elsinore, Romoland) (USGS 2023A)
- U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Web Soil Survey (USDA 2023)
- Western Riverside Multiple Species Habitat Conservation Plan (MSHCP 2004)
- California Department of Fish Wildlife (CDFW) California Natural Diversity Database (CNDDB) (CNDDB 2023)
- the California Native Plant Society's (CNPS) Inventory of Rare and Endangered Vascular Plants (CNPS 2023)
- U.S Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPAC 2023A)
- USFWS National Wetlands Inventory (USFWS 2023B)
- USGS National Hydrography Dataset (USGS 2023B)

2.2 General Biological Survey

On February 22nd, 2023 and February 27th, 2023, WEBB Senior Biologist Marshall Paymard and WEBB Environmental Analyst Virginia Waters, conducted a reconnaissance-level field assessment of the proposed Project footprints, including a 100-foot survey buffer, herein defined as the biological study area (BSA). The field assessment was conducted on-foot to systematically assess and document the BSA for sensitive biota and their habitats, including other environmental attributes such as: topography, soil type, water features, and vegetation

communities. Table 1 below provides the date, time, and average weather conditions for the extent of the field assessments.

Table 2. General Biological Field Survey Conditions

Date/Time	Climatic Conditions
February 22nd 2023 / 0630-1308	Air Temperature: 45-60°F; Wind: 0-1 miles per hour (MPH); Cloud Cover: 10%
February 27th, 2021 / 1200-1600	Air Temperature: 63-64°F; Wind: 0-1 MPH; Cloud Cover: 40%

Vegetation Community and Land Cover Mapping

Vegetation communities and land cover types present in the BSA were mapped directly in the field on a 200-foot scale, aerial satellite imagery-based field map. Following completion of the field assessment, all vegetation communities were digitized and quantified using ArcGIS Pro software. Vegetation communities were mapped according to Holland (1986).

Plants

Plant species observed during the field assessment of the BSA were identified by morphology and recorded in a standard field notebook. Plant species that could not be identified immediately in the field were identified in the laboratory using taxonomic keys. Latin and common names for plant species included in this report follow, The Jepson Manual: Vascular Plants of California (Baldwin et al. 2012).

Wildlife

Wildlife species detected during field assessments by sight, calls, tracks, scat, or other signs were recorded in a standard field notebook. General information regarding wildlife species present in the region was obtained Center of North American Herpetology (2023) for amphibians and reptiles, the American Ornithologists' Union (2023) for birds, the North American Butterfly Association (NABA 2023) for butterflies, and Bradley et al. (2014) for mammals.

Jurisdictional Non-Wetland Waters and Wetlands

Satellite aerial imagery and USGS topographic maps were reviewed prior to the field survey to detect any potential Waters of the United States, including wetlands, under the jurisdiction of the U.S. Army Corps of Engineers (USACE), pursuant to Section 404 of the federal Clean Water Act; Waters of the State under the jurisdiction of the California Regional Water Quality Control Board (RWQCB), pursuant to Section 401 of the federal Clean Water Act and the Porter–Cologne Act; and Streambeds under the jurisdiction of California Department of Fish and Wildlife (CDFW), pursuant to Section 1602 of the California Fish and Game Code. All potential jurisdictional resources, if present in the BSA, were mapped in the field and then digitized using ArcGIS Pro software.

2.3 Focused Surveys for Special-Status Biological Resources

Special-status biological resources are defined herein as follows: plant or animal species listed or proposed for listing as threatened or endangered under the Federal Endangered Species Act (ESA) or candidates for possible future listing as threatened or endangered under the ESA; plants and animals considered by CDFW to be rare, threatened, endangered, or a Species of Special Concern (SSC) in California, which includes plants and animals tracked by CNDDB, and plants tracked by the CNPS as California Rare Plant Rank (CRPR) 1, 2, 3, or 4; plants and animals considered locally significant in local or regional plans, policies, or ordinances; habitat areas or plant communities that are unique, are of relatively limited distribution, or are of particular value to wildlife; jurisdictional wetlands and non-wetland waters; and, wildlife corridors and habitat linkages.

A list of special-status plants and wildlife species evaluated for the BSA is provided as Appendix B to this report; the animal list is derivative of a nine-quad search performed in CNDDB (CNDDB 2023) and the plant list is derivative of a nine-quad search performed in CNDDB (2023) and CNPS (2023).

WEBB biologists performed focused surveys within the Project footprint and corresponding 500-foot survey buffer for California Species of Special Concern (SSC) burrowing owl (*Athene cunicularia*), and the State/Federally endangered least Bell's vireo (*Vireo bellii pusillus*). The survey methods and limitations (if any) of each focused survey completed are discussed below.

2.3.1 Habitat Assessment/Focused Survey(s): Burrowing Owl

Burrowing owl is a CDFW SSC and a MSHCP covered species. WEBB Senior Biologist, Marshall Paymard, and WEBB Environmental Analyst, Virginia Waters, conducted a burrowing owl habitat assessment, followed by focused surveys in suitable habitat within the Project footprint, including a 500-foot survey buffer, herein defined as the burrowing owl study area. The habitat assessment and focused surveys were conducted in accordance with the survey guidelines as outlined in Appendix D of the Staff Report on Burrowing Owl Mitigation (CDFG 2012).

The surveyors slowly walked transects no greater than 20 meters apart through all areas of potentially suitable habitat located in the burrowing owl study area, visually searching for suitable burrows or burrow surrogates (dimensions of >11centimeters in diameter and >150 centimeters in depth), burrowing owl sign (i.e., pellets with regurgitated fur, bones, and insect parts; whitewash; or feathers), and burrowing owl individuals, with the aid of binoculars. All potentially suitable burrows observed were documented, and suitable habitat was identified. Post completion of the habitat assessment, suitable burrowing owl habitat areas were refined so that the subsequent surveys were conducted in the approximately 53-acres of suitable habitat. As shown in Table 2, following the habitat assessment, four subsequent surveys were conducted, with at least one site visit between February 15th and April 15th, and a minimum of three survey visits, at least three weeks apart, between April 15th and July 15th, with at least one visit after June 15th.

Table 3. Schedule of Burrowing Owl Habitat Assessments and Focused Surveys

Date/Time	Surveyor	Type	Climatic Conditions
February 22nd 2023 / 0630-1308	Marshall Paymard, Virginia Waters	Habitat Assessment	Air Temperature: 45-60°F; Wind: 0-1 MPH; Cloud Cover:10%
March 8th, 2023 / 0630-1006	Marshall Paymard, Virginia Waters	Focused Survey #1	Air Temperature: 48-52°F; Wind: 0-1 MPH; Cloud Cover: 0%
April 20th, 2023 / 0545-1000	Marshall Paymard, Virginia Waters	Focused Survey #2	Air Temperature: 50-63°F; Wind: 0-1 MPH; Cloud Cover: 0%
May 24th, 2023 / 0545-1000	Marshall Paymard, Virginia Waters	Focused Survey #3	Air Temperature: 52-66°F; Wind: 0-1 MPH; Cloud Cover: 0%
June 27th, 2023 / 0630-0900	Marshall Paymard, Virginia Waters	Focused Survey #4	Air Temperature: 70°F; Wind:2-5 MPH; Cloud Cover: 0%
Source: *Focused Burrowing Owl Survey Report for Mead Valley Cajalco Sewer Project*, Albert A. Webb Associates, September 2023 (located in Appendix D).			

2.3.2 Habitat Assessment and Focused Survey(s): Least Bell's Vireo

Least Bell's vireo (LBV) is both State and Federally listed as endangered and is an MSHCP covered species. An LBV habitat assessment and protocol surveys were conducted in accordance with the USFWS Survey Guidelines (USFWS 2001) within the approximately 5-acres of suitable habitat located within 500-feet of the Project footprint. As shown in Table 3, a habitat assessment, and a total of eight focused LBV surveys were conducted by qualified WEBB biologist, Marshall Paymard, with assistance from WEBB environmental analyst, Virginia Waters, between April 10th to July 31st. All surveys were conducted between dawn and 11:00 a.m. during weather conditions conducive for species detection. Pursuant to the USFWS survey guidelines, no recorded vocalizations were used to initiate call-back. All LBV and brown-headed cowbird (*Molothrus ater*) locations were mapped on a map and digitized using GIS software.

Table 4. Schedule of Least Bell's Vireo Surveys

Date/Time	Surveyor	Type and Survey #	Climatic Conditions
February 27th, 2023 / 0800-1200	Marshall Paymard, Virginia Waters	Habitat Assessment	Not recorded.
April 12th, 2023 / 0620-1100	Marshall Paymard, Virginia Waters	Focused Survey #1	Air Temperature: 56-64°F; Wind: 0-1 MPH; Cloud Cover: 25%
May 3rd, 2023 / 0630-1006	Marshall Paymard, Virginia Waters	Focused Survey #2	Air Temperature: 48-55°F; Wind: 0-1 MPH; Cloud Cover: 50%

Date/Time	Surveyor	Type and Survey #	Climatic Conditions
May 22nd, 2023 / 0632-1100	Marshall Paymard, Virginia Waters	Focused Survey #3	Air Temperature: 56-62°F; Wind: 0-2 MPH; Cloud Cover: 0%
June 10th, 2023 / 0633-1100	Marshall Paymard, Virginia Waters	Focused Survey #4	Air Temperature: 68-70°F; Wind: 2-5 MPH; Cloud Cover: 0%
June 21st, 2023 / 0615-1056	Marshall Paymard, Virginia Waters	Focused Survey #5	Air Temperature: 68-70°F; Wind: 2-5 MPH; Cloud Cover: 0%
July 1st , 2023 / 0632-1058	Marshall Paymard, Virginia Waters	Focused Survey #6	Air Temperature: 62-70°F; Wind: 2-5 MPH; Cloud Cover: 0%
July 12th, 2023 / 0638-1047	Marshall Paymard	Focused Survey #7	Air Temperature: 68-76°F; Wind: 1-3 MPH; Cloud Cover: 0%
July 31st, 2023 / 0630-1025	Marshall Paymard, Virginia Waters	Focused Survey #8	Air Temperature: 68-70°F; Wind: 2-5 MPH; Cloud Cover: 0%
Source: *2023 Least bell's vireo Survey Summary Report for the Mead Valley Cajalco Sewer Project, Riverside County California,* Albert A. Webb Associates. August 22, 2023 (located in Appendix D).			

2.4 Survey Limitations

Regarding LBV, although LBV vocalizations could be heard during the surveys, suitable habitat is located in close proximity of Cajalco Road, which generates significant ambient noise levels. Consequently, LBV detections in the proximity of Cajalco Road could have been intermittently obscured during periods of heightened ambient noise levels during peak traffic hours.

3.0 REGULATORY SETTING

3.1 Federal Regulations

Federal Endangered Species Act (FESA)

The Federal Endangered Species Act (FESA) provides a program for the conservation of threatened and endangered plants and animals and the habitats in which they are found. The lead federal agencies for implementing FESA are the USFWS and the U.S National Oceanic and Atmospheric Administration (NOAA) Fisheries Service. Actions that jeopardize endangered or threatened species and the habitats upon which they rely are considered a “take” under the FESA. Section 9(a) of the FESA defines take as “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct.” “Harm” and “harass” are further defined in federal regulations and case law to include actions that adversely impair or disrupt a listed species’ behavioral patterns.

FESA Section 7 is called "Interagency Cooperation," and it is the mechanism by which Federal agencies ensure the actions they take, including those they fund or authorize, do not jeopardize the existence of any listed species. A Section 7 consultation (formal or informal) is required when there is a nexus between endangered species’ use of a site and there is an associated federal action for a proposed impact.

Under the provisions of FESA Section 10(a), permits may be issued for the incidental take of endangered or threatened species, accompanied by the preparation of a Habitat Conservation Plan (HCP), regardless of the presence of a federal nexus. The term "incidental" denotes taking that is secondary to, and not the primary purpose of, a lawful activity. To obtain Section 10(a) permits, an HCP must be submitted, demonstrating how the taking will be minimized and ensuring the species' survival. For instance, the MSHCP serves as a regional HCP developed in accordance with FESA Section 10(a), allowing for the take of listed species, provided the project is in compliance with the MSHCP.

The USFWS designates critical habitat for endangered and threatened species. Critical habitat is the specific areas within the geographic area, occupied by the species at the time it was listed, that contain the physical or biological features that are essential to the conservation of endangered and threatened species and that may need special management or protection. Critical habitat may also include areas that were not inhabited by the species at the time of listing but are crucial to its conservation. Critical habitat designations affect only Federal agency actions or federally funded or permitted activities. Critical habitat designations do not affect activities by private landowners if there is no Federal “nexus”, or no Federal funding or authorization associated with a project. Federal agencies are required to avoid “destruction” or “adverse modification” of designated critical habitat.

Migratory Bird Treaty Act (MBTA)

The Migratory Bird Treaty Act (MBTA) prohibits the take of protected migratory bird species without prior authorization by the USFWS. Additionally, Executive Order 13186, “Responsibilities of Federal Agencies to Protect Migratory Birds,” requires that any project with

federal involvement address impacts of federal actions on migratory birds with the purpose of promoting conservation of migratory bird populations (66 FR 3853–3856). The list of migratory bird species protected by the law is primarily based on bird families and species included in the four international treaties (Canada 1916, Mexico 1936, Japan 1972, and Russia 1976). In the Code of Federal Regulations one can locate this list under Title 50 Part 10.13 (10.13 list). The 10.13 list was updated in 2020, incorporating the most current scientific information on taxonomy and natural distribution.

A migratory bird species is included on the list if it meets one or more of the following:

- It occurs in the United States or U.S. territories as the result of natural biological or ecological processes and is currently, or was previously listed as, a species or part of a family protected by one of the four international treaties or their amendments.
- Revised taxonomy results in it being newly split from a species that was previously on the list, and the new species occurs in the United States or U.S. territories as the result of natural biological or ecological processes.
- New evidence exists for its natural occurrence in the United States or U.S. territories resulting from natural distributional changes and the species occurs in a protected family.

The Migratory Bird Treaty Reform Act of 2004 (MBTRA) amended the MBTA by stating the MBTA applies only to migratory bird species that are native to the United States or U.S. territories, and that a native migratory bird species is one that is present as a result of natural biological or ecological processes (USFWS 2023C). The MBTRA requires the USFWS to publish a list of all non-native, human-introduced bird species to which the MBTA does not apply, and an updated list was published in 2020. The 2020 update identifies species belonging to biological families referred to in treaties the MBTA implements but are not protected because their presence in the United States or U.S. territories is solely the result of intentional or unintentional human-assisted introductions (USFWSC 2023).

In general, the MBTA is used to place restrictions on disturbance of active bird nests during the nesting season (generally February 1 to August 31). In addition, the USFWS commonly places restrictions on disturbances allowed near active raptor nests. Currently, birds are considered to be nesting under the MBTA when there are eggs or chicks, which are dependent are on the nest.

Clean Water Act

Section 404 of the Clean Water Act (CWA) establishes a program to regulate the discharge of dredged or fill material into waters of the United States, including wetlands. Activities in waters of the United States regulated under this program include fill for development, water resource projects (such as dams and levees), infrastructure development (such as highways and airports) and mining projects (EPA 2023). Section 404 requires a permit before dredged or fill material may be discharged into waters of the United States, unless the activity is exempt from Section 404 regulation (e.g., certain farming and forestry activities).

Proposed activities are regulated through a permit review process. An individual permit is required for potentially significant impacts. Individual permits are reviewed by the U.S. Army Corps of Engineers or an approved State/Tribal 404(g) Program which evaluates applications under a public interest review, as well as the environmental criteria set forth in the CWA Section 404(b)(1) Guidelines, regulations promulgated by EPA (EPA 2023).

For most discharges that will have only minimal adverse effects, a general permit may be suitable. General permits are issued on a nationwide, regional, or state basis for particular categories of activities. The general permit process eliminates individual review and allows certain activities to proceed with little or no delay, provided that the general or specific conditions for the general permit are met. For example, minor road activities, utility line backfill, and bedding are activities that can be considered for a general permit (EPA 2023).

3.2 State Regulations

California Endangered Species Act (CESA)

Originally enacted in 1970, CESA was repealed and replaced by an updated version in 1984 and amended in 1997. Plant and animal species may be designated threatened or endangered under CESA after a formal listing process by the California Fish and Game Commission (CDFW 2023). Approximately 250 species are currently listed under CESA. A CESA-listed species, or any part or product of the plant or animal, may not be imported into the state, exported out of the state, “taken” (i.e., killed), possessed, purchased, or sold without proper authorization. CESA Section 2053 requires that state agencies may not approve projects that will jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat essential to the continued existence of those species if there are reasonable and prudent alternatives available consistent with conserving the species or its habitat which would prevent jeopardy (CDFW 2023). The CESA authorizes that private entities may “take” plant or wildlife species listed as endangered or threatened under the FESA and CESA, pursuant to a federal Incidental Take Permit if the CDFW certifies that the incidental take is consistent with CESA (CFG Code Section 2080.1[a]). For state-only listed species, Section 2081 of CFG Code authorizes the CDFW to issue an Incidental Take Permit for state listed threatened and endangered species if specific criteria are met. “Take” is defined in Section 86 of the California Fish and Game Code as “hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill.” The California ESA allows for take incidental to otherwise lawful development projects.

California Environmental Quality Act (CEQA)

The California Environmental Quality Act (CEQA) serves to: inform governmental decision makers and the public about the potential significant environmental effects of proposed activities; identify ways that environmental damage can be avoided or significantly reduced; prevent significant, avoidable damage to the environment by requiring feasible project alternatives and mitigation measures; and disclose to the public the reasons for a governmental approval despite the project causing significant environmental effects. Moreover, CEQA affords protections to threatened and endangered species that are not listed on the federal or state list of protected species, and may consider some species as, rare or

endangered if the species can be shown to meet certain specified criteria. CEQA Guidelines Section 15380(b)(1) defines endangered animals or plants as species or subspecies whose "survival and reproduction in the wild are in immediate jeopardy from one or more causes, including loss of habitat, change in habitat, overexploitation, predation, competition, disease, or other factors" (14 CCR 15000 et seq.). A rare animal or plant is defined in CEQA Guidelines Section 15380(b)(2) as a species that, although not presently threatened with extinction, exists "in such small numbers throughout all or a significant portion of its range that it may become endangered if its environment worsens; or …the species is likely to become endangered within the foreseeable future throughout all or a significant portion of its range and may be considered 'threatened' as that term is used in the Federal Endangered Species Act." Additionally, an animal or plant may be presumed to be endangered, rare, or threatened if it meets the criteria for listing, as defined further in CEQA Guidelines Section 15380(c). CEQA also requires identification of a project's potentially significant impacts on riparian habitats (such as wetlands, bays, estuaries, and marshes) and other sensitive natural communities, including habitats occupied by endangered, rare, and threatened species.

Native Plant Protection Act

The Native Plant Protection Act (NPPA) was enacted in 1977 and allows the Fish and Game Commission to designate native plants as rare or endangered. There are 64 species, subspecies, and varieties of plants that are protected as rare under the NPPA. The NPPA prohibits take of endangered or rare native plants, unless authorized by CDFW via a permit or other agreement pursuant to the applicable regulations, or under certain other limited circumstances. The CESA of 1984 (Fish and Game Code Section 2050-2116) provided further protection for rare and endangered plant species, but the NPPA remains part of the California Fish and Game Code (California Fish and Game Code §§ 1900-1913).

Fully Protected Species

The State of California first began to designate species as "fully protected" prior to the creation of the FESA and the CESA. The designation and protection of fully protected species is established by FGC sections 3511, 4700, 5050, and 5515. Except in very limited circumstances such as pursuant to necessary scientific research, including efforts to recover a species, or an approved Natural Community Conservation Plan (NCCP), fully protected species may not be taken or possessed.

California Fish and Game Code

The California Fish and Game Code regulates the taking of birds, mammals, fish, amphibians, and reptiles, as well as natural resources such as wetlands and waters of the state. According to Section 3503, it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto. Section 3503.5 states that it is unlawful to take, possess, or destroy any birds in the orders Falconiformes or Strigiformes (birds of prey) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto. Section 3513 states that is unlawful to take or possess any migratory nongame bird as designated in the MBTA or any part of such migratory nongame bird except as provided by

rules and regulations adopted by the Secretary of the Interior under provisions of the MBTA. CDFW currently defines an active nest as one that is under construction or in use and includes existing nests that are being modified. For example, if a hawk is adding to, or maintaining an existing stick nest in a tree, then the nest is deemed active and protected under these Fish and Game Code Sections.

In Section 1602 of the Fish and Game Code, the CDFW regulates all diversions, obstructions, or changes to the natural flow or bed, channel, or bank of any river, stream, or lake that supports fish or wildlife. A Streambed Alteration Agreement is required for impacts to jurisdictional wetlands in accordance with Section 1602 of the California Fish and Game Code.

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act (the Act) is a California state law that was enacted in 1969 to protect and manage the state's water resources. The intent of the Porter–Cologne Water Quality Control Act is to protect water quality and the beneficial uses of water, and it applies to both surface water and groundwater. The Act establishes a framework for regulating discharges of pollutants into the state's waters and provides for the issuance of permits to regulate discharges. Under this Act, the State Water Resources Control Board (SWRCB) develops statewide water quality plans, and the Regional Water Quality Control Boards (RWQCB) develop basin plans that identify beneficial uses, water quality objectives, and implementation plans. The RWQCBs have the primary responsibility to implement the provisions of both statewide and basin plans.

Projects with impacts to jurisdictional waters must demonstrate compliance with the goals of the Act by developing Stormwater Pollution Prevention Plans, Standard Urban Storm Water Mitigation Plans, and other measures to obtain a CWA Section 401 certification.

Under the Porter-Cologne Act, the SWRCB and the RWQCBs have the authority to:

- Regulate the discharge of pollutants into the state's waters.
- Establish water quality objectives and standards for surface waters.
- Develop and implement programs to protect and improve water quality.
- Conduct investigations and take enforcement actions to prevent violations of water quality standards and regulations.
- Regulate the use of groundwater to prevent contamination of surface waters.
- Regulate activities that may impact the quality of the state's waters, such as land use activities and mining operations.

3.3 Local Regulations

Western Riverside County Multiple Species Habitat Conservation Plan

The Western Riverside County MSHCP is a long-term conservation plan designed to protect and manage a diverse array of plant and animal species and their habitats in western Riverside County, California. The MSHCP was developed through a collaborative effort between federal, state, and local agencies, along with conservation groups, landowners, and other stakeholders.

The plan covers an area of over 1.26 million acres and provides for the conservation and management of over 146 plant and animal species. The MSHCP includes several conservation measures, such as habitat restoration, enhancement, and creation, as well as the preservation of key wildlife corridors and the acquisition of conservation easements and fee title interests. The MSHCP also includes provisions for monitoring and adaptive management to ensure that the conservation measures are effective in achieving their intended goals.

The Project proponent is not a permittee to the MSHCP, and as such is not subject to the requirements of the MSHCP, nor is subject to the benefits of the MSHCP. However, in accordance with CEQA, the Project must remain in compliance with the local adopted plans, such as the MSHCP. An MSHCP Consistency Analysis is provided below in Section 6 of this report.

Stephen's Kangaroo Rat Habitat Conservation Plan

The Habitat Conservation Plan (HCP) specifically developed for Stephens' kangaroo rat (SKR) outlines the strategies for conservation, mitigation, and monitoring of this species and its habitat. The HCP designates seven core reserves that are dedicated to the conservation of SKR and its associated habitat. Within these core reserves, measures are implemented to ensure the long-term survival and protection of the species.

The SKR HCP includes a 30-year incidental take authorization, which allows for limited and regulated impacts on SKR populations and their habitats within the designated boundaries. The authorized areas include lands within the County of Riverside, encompassing the cities of Corona, Hemet, Lake Elsinore, Moreno Valley, Murrieta, Perris, Riverside, and Temecula.

4.0 RESULTS

4.1 Land Uses

The BSA is a 100-foot buffer around the Project footprint and staging areas that totals an area of 79.3-acres. The land uses around the Project are comprised of paved roadway with associated disturbed shoulders, single-family homes, commercial businesses, and disturbed lots. The BSA exhibits characteristics of semi-rural residential development, with mixed disturbed lots and ornamental tree plantings. The Project alignment is 7.2 acres and staging areas are another 5.6-acres and are all included in the BSA.

4.2 Soils

The NRCS Web Soil Survey (USDA 2023) identifies 13 soil map units in the BSA (Figure 3- USDA Soils). The soils present in the BSA are as follows:

- CkF2 Cieneba rocky sandy loam, 15 to 50 percent slopes, eroded
- MmC2 Monserate sandy loam, 5 to 8 percent slopes, eroded
- VsD2 Vista coarse sandy loam, 8 to 15 percent slopes, eroded
- MmB Monserate sandy loam, 0 to 5 percent slopes
- FaD2 Fallbrook sandy loam, 8 to 15 percent slopes, eroded
- FfC2 Fallbrook fine sandy loam, 2 to 8 percent slopes, eroded
- HcC Hanford coarse sandy loam, 2 to 8 percent slopes
- PaC2 Pachappa fine sandy loam, 2 to 8 percent slopes, eroded
- FbC2 Fallbrook sandy loam, shallow, 5 to 8 percent slopes, eroded
- ChC Cieneba sandy loam, 5 to 8 percent slopes
- ChD2 Cieneba sandy loam, 8 to 15 percent slopes, eroded
- MmD2 Monserate sandy loam, 8 to 15 percent slopes, eroded
- GyC2 Greenfield sandy loam, 2 to 8 percent slopes, eroded

4.3 Vegetation and Land Cover Types

The BSA contains a total of six land cover types and vegetation communities; including, urban/developed lands, disturbed habitat, non-native grasslands, eucalyptus woodland, southern riparian woodland, and emergent wetland (see Figures 4A thru 4J-Vegetation Communities and Land Cover Types). The land cover types and vegetation communities are discussed in detail below and summarized in Table 4. Representative photos are provided in Appendix C.

Table 5. Vegetation Communities and Land Cover Types

Vegetation Community/ Land Cover Type	Acres Within the Project Footprint	Acres Within the Project Staging Areas	Acres Within the BSA
Urban/Developed (URB/DEV)	7.00	5.6	43.08
Disturbed Habitat (DH)	0.13	0	15.23
Non-Native Grassland (NNG)	0.06	0.01	18.96

Vegetation Community/ Land Cover Type	Acres Within the Project Footprint	Acres Within the Project Staging Areas	Acres Within the BSA
Eucalyptus Woodland (EUC)	0	0	0.52
Southern Riparian Woodland (SRWD)	0	0	1.43
Emergent Wetland (EW)	0	0	0.03
Totals	**7.2***	**5.6**	**79.3***

*Acres may not sum due to rounding

Urban/Developed Lands (DEV)

According to Holland (1986), urban/developed lands refer to areas that have undergone construction or significant physical alterations, to an extent that native vegetation is no longer supported. These lands are typically characterized by the presence of permanent or semi-permanent structures, pavement, hardscape, and landscaped areas featuring various ornamental plants.

The BSA is occupied by 43.08 acres of urban/developed lands. These lands are characterized by single-family residences and commercial businesses, accompanied by ornamental plantings, paved roads, concrete sidewalks, and semi-permanent structures such as trailers, sheds, and graveled lots. Notable tree species commonly found in this classification include the Peruvian pepper tree (*Schinus molle*).

Disturbed Habitat (DH)

Disturbed habitat refers to areas that have not been developed but have experienced physical disturbances caused by human activities. These areas still have a soil substrate and are primarily covered by non-native species (Holland 1986).

Within the BSA, a total of 15.23 acres of disturbed habitat is present. Disturbed habitat refers to areas that retain a soil or earthen ground substrate and If vegetation is present, it is predominantly composed of ruderal species such as cheeseweed (*Malva parviflora*), foxtail barley (*Hordeum murinum*), *Bromus spp*. and *Erodium spp*. Disturbed habitat occurs in the BSA primarily along the shoulders of Cajalco Road and within vacant earthen lots.

Non-Native Grasslands (NNG)

Non-native grasslands are associated with the dominance of grasses, annual forbs, and often associated with numerous species of showy-flowered native annual forbs, especially in years of favorable rainfall (Holland 1986). Common indicator species of non-native grasslands are *Erodium spp.*, *Brassica spp.*, *Avena spp., and Bromus spp*.

A total of 18.96 acres of non-native grasslands occurs in the BSA, primarily along the peripheral segments Cajalco Road. This community is dominated by red stemmed filaree (*Erodium cicutarium*), foxtail barley, London rocket (*Sisymbrium irio*), and stinknet (*Oncosiphon*

piluliferis), with occasional patches at low percent cover of *Amsinckia spp*., and *Plagiobothrys spp*.

Eucalyptus Woodland (EUC)

Eucalyptus habitats range from single-species thickets with little or no shrub understory to scattered trees over a well-developed herbaceous and shrubby understory (Holland 1986).

A total of 0.52-acre of eucalyptus woodlands occurs in the BSA as a sparse stands of red gum eucalyptus (*Eucalyptus camaldulensis*).

Southern Riparian Woodland (SRWD)

Moderate-density riparian woodlands, characterized by the prevalence of small trees or shrubs, alongside isolated taller riparian trees, are commonly found in site locations influenced by major river systems experiencing flood scour, as well as smaller major tributaries. These woodlands exhibit distinct species compositions, including broom baccharis (*Baccharis sarothroides)*, western sycamore (*Platanus racemosa)*, various species of *Populus*, *Salix spp*., and *Sambucus spp*.

A total of 1.43 acres of southern riparian woodland occurs primarily in the western portion of the BSA. This community is dominated by black willow (*Salix gooddingii*), with occasional stands of arroyo willow (*Salix lasiolepsis*). It is important to highlight that this community has experienced substantial disturbance within the south-western portion of the BSA, due to past fire incidents and subsequent clearing activities by heavy equipment, such as bulldozers.

Emergent Wetland (EWTL)

Emergent wetland is typically characterized by low-growing, perennial wetland species, is commonly found in a variety of habitats including channels, seeps and springs, floodplains, lake and river margins, as well as different basins such as pools, ponds, palustrine lakes, montane meadows, and dune swales. These wetlands can occur in both freshwater and alkali environments. These wetlands often emerge in previously disturbed areas, although disturbance is not a requirement for the establishment of this vegetation community.

A total of 0.03-acre of emergent wetland occurs in the BSA (“Feature I”) at northeast corner of Clark Street and Cajalco Road within a concrete lined v-ditch channel. The community is dominated by narrowleaf cattail (*Typha domingensis*).

4.4 Common Plants

Common plant species observed in the BSA were typical of disturbed habitat and included: foxtail barley, common fiddleneck, London rocket, red stemmed filaree, Peruvian pepper tree, and cheeseweed.

4.5 Common Wildlife

Common wildlife species observed in the BSA include: American crow (*Corvus brachyrhynchos*), red-tailed hawk (*Buteo jamaicensis*), mourning dove (*Zenaida macroura*), western fence lizard (S*celoporus occidentalis*), house finch (*Haemorhous mexicanus*), and song sparrow (*Melospiza melodia*).

4.5.1 Nesting Birds

The BSA contains numerous surfaces, structures, and vegetation that could provide suitable ground nesting habitat and tree nesting habitat for bird species protected under the MBTA and the Fish and Game Code.

4.6 Jurisdictional Non-Wetland Waters and Wetlands

Several potentially jurisdictional aquatic features occur within the BSA (see Figures 5A thru 5J-Potentially Jurisdictional Aquatic Features). These features are described in detail below:

Feature A

Feature A is an ephemeral channel that transports water from offsite areas north of Cajalco Road to the south, facilitated by a single 12-inch corrugated steel culvert. The vegetation within Feature A consists of upland species such as foxtail barley and stinknet. Within BSA, this feature covers an area of 0.01-acre and spans approximately 307 linear feet.

Feature B

Feature B is an unnamed ephemeral channel that conveys flows from the offsite areas north of Cajalco Road to the south of Cajalco Road, via two underground 3-foot diameter corrugated steel culverts. The banks of Feature B north of Cajalco Road and segments south of Cajalco Road are dominated by black willow. It should be noted that portions of Feature B located in the south of the BSA have been recently disturbed by fire and heavy equipment. Within the BSA, this feature occupies an area of 0.01-acre and extends approximately 370 linear feet.

Feature C

Feature C is an unvegetated ephemeral swale that receives runoff from the roadside and direct precipitation. Following a rainfall event, ponding occurs in Feature C; however, it lacks other characteristics associated with vernal pools, such as specific soils and vernal pool plant species; but it is suitable habitat for fairy shrimp. Located just south of Cajalco Road, on the east side of Barton Street, this feature has an approximate size of 0.02-acre and encompasses approximately 156.5 linear feet.

Feature D

Feature D is an ephemeral channel that carries flows southward along the west side of Alexander Street, crossing Cajalco Road through an underground single concrete box-culvert. Within the BSA, this feature covers an area of 0.01-acre and spans approximately 268 linear feet.

Feature E

Feature E is an ephemeral pool that becomes inundated after significant rain events and drains southward under Cajalco Road through a 2-foot diameter corrugated steel culvert. The feature pools in both locations, north and south, of Cajalco Road, eventually infiltrating the ground surface or evaporating. Within the BSA, this feature occupies an area of 0.51-acre and extends approximately 1,100 linear feet. The pool lacks the soils and plant characteristics of vernal pools but it is suitable habitat for fairy shrimp.

Feature F

Feature F is an ephemeral channel that forms a pool just north of Cajalco Road. It then flows south through a concrete box culvert, exiting south of the Road. Upon leaving the culvert, the flow is once again pooled just south of Cajalco Road. When the pool reaches capacity, the flow continues south through a heavily disturbed earthen channel. The pool lacks the soils and plant characteristics of vernal pools but it is suitable habitat for fairy shrimp. Within the BSA, this feature occupies an area of 0.07-acre and spans approximately 545 linear feet.

Feature G

Feature G is an ephemeral channel that enters the BSA from the north and transports flows southward through sheet flow, into an earthen ditch, which then pools, and eventually continues south via a concrete box culvert beneath Cajalco Road. The flow then pools again just south of Cajalco Road and eventually continues south, outside of the BSA, within a shallow channelized earthen feature. The pool lacks the soils and plant characteristics of vernal pools but it is suitable habitat for fairy shrimp. Within the BSA, this feature covers an area of 0.16-acre and extends approximately 1,505 linear feet.

Feature H

Feature H is an ephemeral channel that carries water westward from roadside runoff, via an underground 8-inch diameter corrugated steel culvert that crosses under Haines Street, which then pools just west of Haines Street, and then continues off-site via and an earthen channelized feature. Within the BSA, this feature occupies an area of 0.08-acre and spans approximately 913 linear feet.

Feature I

Feature I is an ephemeral channel that receives roadside run-off flow from Clark Street and flows east via a concrete lined v-ditch, which eventually pools in a boulder laden concrete basin, and then flows south underneath Cajalco Road via a concrete box culvert. Once flows reach south of Cajalco Road, they pool within a boulder laden earthen basin, just south of Cajalco Road. A 0.02-acre segment of Feature I located on the northside Cajalco Road is a potential jurisdictional wetland (Emergent Wetland) dominated by narrow leaf cattail. The feature exhibits water ponding, hydrophytic vegetation (cattails), including some riparian species (*Salix spp*.). The pool is suitable habitat for fairy shrimp. Within the BSA, Feature I occupies an area of 0.09-acre and spans approximately 695 linear feet.

4.6.1 Areas of Pooling

No vernal pools were identified in the Project footprint. Several unvegetated ephemeral pools are located in the BSA but adjacent and outside of the Project impact footprint. These pools are ephemeral in nature and have been anthropogenically created as a result from ponding underneath culverts. None of the pools documented exhibit characteristics of vernal pools (i.e., soils and vegetation). However, they are suitable habitat for fairy shrimp species. No fairy shrimp sampling surveys were conducted because EMWD is committed to staying within the Project footprint which will avoid these areas. In the even the Project design changes to impact an area of pooling, then surveys would be required.

4.7 Special-Status Biological Resources

4.7.1 Sensitive Vegetation Communities

CDFW assesses the rarity of vegetation communities, also known as natural communities, using the NatureServe's Heritage Methodology. This methodology evaluates communities at both the Global level, encompassing their full natural range within and outside of California, and the State level, focusing specifically on their occurrence within California. Each community is assigned a single rank, denoted as G (global) and S (state), on a scale of 1 to 5. A rank of 1 indicates a community that is very rare and threatened, while a rank of 5 signifies a community that is demonstrably secure.

When a vegetation community receives a Rarity Ranking of S1 (critically imperiled), S2 (imperiled), or S3 (vulnerable), the CDFW considers it a sensitive natural community. These sensitive communities are to be addressed during the environmental review process of CEQA and its equivalent regulations.

Vegetation community descriptions used by the CDFW follow the National Vegetation Classification System (NVCS) using the Manual of California Vegetation (MCV), 2nd Edition (Sawyer et al. 2009). The MCV classifies vegetation communities based on floristic and structural details that are represented as alliances and associations. Vegetation communities mapped within the BSA, and described within this report, follow the descriptions and classifications as defined in Holland (1986). However, all Holland (1986) classifications used in this report were translated to the comparable classification unit under MCV to determine the sensitivity of the vegetation community being analyzed. If a natural community described under Holland (1986) did not have an appropriate direct translation within MCV, then professional judgement was used by the biologist to find the best corresponding association or alliance that would not jeopardize the conservation value of the vegetation community being analyzed.

Southern riparian woodland and emergent wetland are considered sensitive vegetation communities. Impacts to this community would require mitigation, however no impacts are proposed to this community from Project implementation.

4.7.2 Special-Status Plant Species

Special status plant species are defined herein as, plants listed or proposed for listing as threatened or endangered under the Federal Endangered Species Act (ESA) or candidates for possible future listing as threatened or endangered under the ESA; plants considered by CDFW to be "rare, threatened or endangered in California", which includes plants tracked by the California Natural Diversity Database (CNDDB) and the California Native Plant Society (CNPS) as California Rare Plant Rank (CRPR) 1 or 2; plants that may warrant consideration on the basis of declining trends, recent taxonomic information, or other factors, which may include plants tracked by the CNDDB and CNPS as CRPR 3 or 4; and plants considered locally significant or plants that are not rare from a statewide perspective but are rare or uncommon in a local context such as within a county or region, or as designated in local or regional plans (e.g., MSHCP), policies, or ordinances.

No special-status plant species were observed during the general habitat assessment, or focused surveys, which were conducted during the bloom periods for special-status plant species known to occur in the Project vicinity. Most of the BSA and all of the impact footprint is composed of urban/developed lands that lack suitable habitat for special-status plants.

4.7.3 Special-Status Wildlife Species

Special-status wildlife species are defined herein as, animal species listed or proposed for listing as threatened or endangered under the Federal Endangered Species Act (ESA) or candidates for possible future listing as threatened or endangered under the ESA; animals considered by CDFW to be "rare, threatened, endangered, or a Species of Special Concern (SSC) in California", which includes animals tracked by the California Natural Diversity Database (CNDDB); and, animals considered locally significant in local or regional plans, policies, or ordinances.

Focused least Bell's vireo and burrowing owl surveys were conducted in suitable habitat located within 500-feet of the Project footprint. Results of the focused surveys were positive for least Belle's vireo and negative for burrowing owl. A brief discussion of the natural history of these species and the focused survey results are provided below.

Burrowing Owl Focused Surveys

The burrowing owl is a small, long-legged, ground-dwelling bird species, well-adapted to open, relatively flat expanses that prefers habitat generally typified by short, sparse vegetation with few shrubs, level to gentle topography and well-drained soils (DFG 2016). Unique amongst American raptors, the burrowing owl requires underground burrows or other cavities for nesting during the breeding season and for roosting and cover, year-round (DFG 2016). Burrows used by the owls are usually dug by other species, in particular the California ground squirrel and the round-tailed ground squirrel, which are described as host burrowers. They may also use pipes, culverts, and nest boxes where burrows are scarce, these structures are typically referred to as burrow surrogates.

No burrowing owl or burrowing owl sign was detected during the 2023 focused burrowing owl surveys and therefore burrowing owl is presumed to be absent from the burrowing owl study

area (Project footprint and 150-meter survey buffer). A total of 79 burrows suitable for burrowing owl were recorded within the mapped approximately 55-acres of suitable burrowing owl habitat (Figure 6- Burrowing Owl Survey Results). The burrowing owl focused survey results are summarized in Table 5, below and the focused burrowing owl survey report is included in Appendix D to this report.

Table 6. Burrowing Owl Survey Results

Date/Time	Surveyor	Type	Results
February 22nd 2023 / 0630-1308	Marshall Paymard, Virginia Waters	Habitat Assessment	Suitable habitat identified.
March 8th, 2023 / 0630-1006	Marshall Paymard, Virginia Waters	Focused Survey #1	No burrowing owl or sign detected.
April 20th, 2023 / 0545-1000	Marshall Paymard, Virginia Waters	Focused Survey #2	No burrowing owl or sign detected.
May 24th, 2023 / 0545-1000	Marshall Paymard, Virginia Waters	Focused Survey #3	No burrowing owl or sign detected.
June 27th, 2023 / 0630-0900	Marshall Paymard, Virginia Waters	Focused Survey #4	No burrowing owl or sign detected.

Source: *Focused Burrowing Owl Survey Report for Mead Valley Cajalco Sewer Project*, Albert A. Webb Associates, September 2023 (located in Appendix D).

Least Bell's Vireo Focused Surveys

The least Bell's vireo (*Vireo bellii pusillus*) is a small migratory bird that historically inhabited the California Central Valley and the central California Coast ranges. This species gained endangered status in 1986 due to the progressive loss of its habitat over time. A significant factor affecting its nesting productivity is the detrimental impact of brood parasitism by brown-headed cowbirds, a species that invaded California in the early 1900s. Brown-headed cowbirds are notorious for depositing their eggs in the nests of other bird species, thus ensuring the survival of their own offspring while endangering the survival of the host species' young.

The breeding habitat of the least Bell's vireo mainly comprises riparian woodlands dominated by willows. However, it also forages and occasionally nests in nearby mulefat scrub, oak woodlands, and chaparral. In desert areas, it can be found in mesquite thickets. The primary diet of the least Bell's vireo consists of insects and spiders, which it gathers by carefully examining leaves and branches.

Least Bell's vireo was detected within 500-feet of the Project footprint during the 2023 surveys. One least Bell's vireo pair (male and female, adult) and one adult territorial male were identified within approximately 5-acres of southern riparian woodland located on the north and south sides of the Project footprint (Figure 7-LBV Survey Results). The brown-headed cowbird

(*Molothrus ater*) was also detected during a single survey within the southern riparian woodland habitat located on the north side of Cajalco Road (Figure 7-LBV Survey Results), least Bell's Vireo Survey Results). It should be noted that the riparian corridor is bisected by the existing Project footprint (Cajalco Road) and has sustained heavy disturbance from fire and heavy equipment use in the southern portion of its occurrence. Further details regarding the least Bell's vireo surveys can be found in the *Least Bell's Vireo Focused Survey Report for the Cajalco Sewer Project,* Appendix D of this report.

4.8 Wildlife Corridors and Habitat Linkages

Wildlife corridors are linear features that join large spans of natural open space that enable the movement of animals throughout the landscape. Habitat linkages are areas that provide connectivity between habitat patches as well as opportunities for foraging, reproduction, and dispersal habitat for plants and animals. Habitat linkages help minimize the effects of habitat fragmentation as they function as steppingstones for wildlife dispersal.

The Project alignment is not located within designated wildlife corridors or habitat linkages identified in the South Coast Missing Linkages analysis conducted by South Coast Wildlands (2008). The proposed Project is located on the existing Cajalco Road, providing limited to no connectivity to undeveloped areas with naturalized habitat.

5.0 IMPACTS ANALYSIS

The purpose of the impact analysis presented in this report is to accurately identify potential direct and indirect impacts that may arise from the implementation of the Project. The analysis has been conducted in accordance with the requirements of CEQA.

Pursuant to the CEQA Guidelines, three types of impacts or effects are defined:

Direct impacts, also known as primary effects, are actions caused by the Project that occur at the same time and place. These impacts involve the loss, modification, or disturbance of habitats, directly affecting the flora and fauna within those habitats. Additionally, direct impacts encompass the destruction of individual plants or animals. Permanent impacts are direct impacts.

Indirect impacts, also referred to as secondary effects, are reasonably foreseeable and caused by the Project but occur at different times or locations. The CEQA Guidelines describe indirect impacts as follows: "An indirect physical change in the environment is a physical change... which is not immediately related to the project but which is caused indirectly by the project. If a direct physical change in the environment in turn causes another change in the environment, then the other change is an indirect change in the environment" (Section 15064 (d)(2)). Examples of indirect impacts include increased ambient levels of noise or light, predation by domestic pets, competition with exotic plants and animals, introduction of toxins (including pesticides), and human disturbances such as hiking, off-road vehicle use, or unauthorized dumping. Temporary impacts are indirect impacts.

Cumulative impacts or effects refer to the combined effects of two or more individual impacts that, when considered together, are substantial or contribute to the amplification of other environmental impacts. Cumulative impacts can arise from multiple effects of the same Project or from several different projects. They can result from individually minor but collectively significant actions occurring over a period of time.

The impact analysis in this report examines these three types of impacts to provide a comprehensive understanding of the potential consequences associated with the Project.

5.1 Impacts to Vegetation Communities and Land Cover Types

5.1.1 Direct Impacts

The 7.2-acre Project impact footprint and 5.6-acre staging areas encompass three vegetation communities and land cover types: urban/developed lands, disturbed habitat, and non-native grasslands. Although southern riparian woodland, emergent wetland, and eucalyptus woodland are present in the BSA, and southern riparian woodland and emergent wetland are recognized as sensitive vegetation communities, these sensitive communities are outside the Project impact footprint. As a result, there will be no direct adverse effects on the sensitive vegetation communities caused by the implementation of the Project.

5.1.2 Indirect Impacts

Two types of sensitive vegetation communities are present in the BSA (but not within the Project footprint): southern riparian woodland and emergent wetland. Although no direct impacts are anticipated to occur to sensitive vegetation communities, recommendations **BIO-1** and **BIO-5** as outlined in Section 7 of this report should be implemented. These measures will help ensure that no accidental impacts occur to sensitive vegetation communities located in the Project vicinity.

Indirect impacts to vegetation communities and land cover types are quantified and summarized in Table 6 (see Figures 8A thru 8J- Project Impacts).

Table 7. Summary of Impacts to Vegetation Communities and Land Cover Types

Vegetation Community/ Land Cover Type	Direct Impacts (acres)	Indirect Impacts (acres)
Urban/Developed (URB/DEV)	0.00	12.63
Disturbed Habitat (DH)	0.00	0.13
Non-Native Grassland (NH)	0.00	0.06
Eucalyptus Woodland (EUC)	0.00	0.0
Southern Riparian Woodland(1)	0.00	0.0
Emergent Wetland(1)	0.00	0.0
Total	**0.0**	***12.8**

*Acres may not sum due to rounding
(1) Sensitive vegetation communities.

5.2 Impacts to Special-Status Plant Species

5.2.1 Direct Impacts

The Project impact footprint is positioned on urban/developed lands, which do not provide suitable habitat for special-status plants. Consequently, no special-status plants were identified during the biological assessments or focused wildlife surveys conducted within the BSA. Therefore, no direct impacts are expected to occur to special-status plant species as a result of Project implementation.

5.2.2 Indirect Impacts

No special-status plants occur in the Project impact footprint, or within Project BSA. As such, no indirect impacts are anticipated to occur to special-status plants.

5.3 Impacts to Special-Status Wildlife Species

5.3.1 Direct Impacts

Project surveys found no suitable habitat for burrowing owl and least Bell's vireo is present in the Project impact footprint; however, suitable habitat is present in the BSA as discussed below under "Indirect Impacts."

5.3.2 Indirect Impacts

Focused surveys were conducted in areas of suitable habitat in the BSA for burrowing owl and least Bell's vireo (see reports in Appendix D). Focused survey results found no burrowing owl present within the burrowing owl survey area (500-foot buffer of the Project footprint); however, in the event burrowing owl colonize suitable burrows within the BSA prior to construction, recommendations **BIO-1, BIO-2, BIO-5, and BIO-6** would reduce indirect impacts to burrowing owl.

Focused survey results found least Bell's vireo individuals and pairs within suitable habitat adjacent to the Project footprint within the BSA. Therefore, indirect and temporary construction impacts to this species are possible during vireo breeding season (March 15-July 31st). Recommendations **BIO-1, BIO-3, BIO-5, and BIO-6** will reduce indirect impacts to least Bell's vireo.

5.4 Impacts to Jurisdictional Non-Wetland Waters and Wetlands

5.4.1 Direct Impacts

Multiple potentially jurisdictional aquatic features in the form of underground corrugated steel road culverts intersect the Project footprint along Cajalco Road. However, the Project has been designed to avoid potentially jurisdictional areas during Project construction. This will be achieved by utilizing the trenchless installation method of jack-and-bore to install the new pipeline beneath the existing road culverts. The launching and receiving pit locations will be strategically placed in upland areas, offset at least five feet on each side of the existing drainage.

It is important to note that jack-and-bore technology does not involve the use of a directional drill auger or fluid that could be unintentionally released during operation, thereby eliminating the risk of a potential frac-out event. The proposed jack-and-bore activities are not expected to result in any inadvertent drill fluid release or frac-out, and therefore no associated impacts are anticipated. Consequently, there will be no direct impacts on aquatic features as a result of the Project. Use of the jack-and-bore method ensures the protection of the drainage features while successfully installing the pipeline.

Moreover, with implementation of recommendations **BIO-1**, **BIO-4**, and **BIO-5**, direct impacts to potentially jurisdictional aquatic features within the Project footprint will be prevented.

5.4.2 Indirect Impacts

Indirect impacts to potentially jurisdictional aquatic features in the BSA may occur as a result of Project implementation if the appropriate measures are not taken. As such, with incorporation of recommendations **BIO-1**, **BIO-4**, and **BIO-5,** indirect impacts to aquatic features will be avoided.

5.5 Impacts to Wildlife Corridors and Habitat Linkages

5.5.1 Direct Impacts

No wildlife corridors or linkages occur within the Project footprint and BSA. As such, no direct impacts or interferences are anticipated to occur to wildlife corridors and habitat linkages.

5.5.2 Indirect Impacts

No wildlife corridors or linkages occur within the BSA. As such, no indirect impacts or indirect interferences are anticipated to occur to wildlife corridors and habitat linkages.

5.6 Impacts to Nesting Birds

The BSA encompasses various surfaces, structures, and vegetation that offer potential nesting habitat for bird species protected under the MBTA and the Fish and Game Code. Construction activities associated with the Project have the potential to indirectly disrupt nesting and breeding birds inhabiting trees and shrubs within BSA. Potential impacts on migratory birds resulting from construction of the Project may include the destruction of eggs or occupied nests, mortality of young birds, and abandonment of nests containing eggs or young birds prior to their ability to fly (fledge). Therefore, with implementation of recommendations **BIO-5** and **BIO-6**, potential direct and indirect impacts to nesting birds can be effectively minimized to a level that is considered less than significant.

5.7 Cumulative Impacts

It is anticipated that the proposed Project will not result in cumulative impacts on the biological resources within the Project alignment or the surrounding region. This conclusion is based on several factors. Firstly, the Project is situated within an already established roadway. Secondly, the impacts associated with the Project will all be temporary in nature and will occur in pre-existing paved and disturbed locations. Therefore, the overall cumulative effects on the biological resources are expected to be minimal.

6.0 Regional Resource Planning/MSHCP Consistency Analysis

In accordance with CEQA guidelines Appendix G, EMWD as the lead CEQA agency is obligated to disclose any potential conflicts between their Project and an existing Habitat Conservation Plan (HCP). Thus, this section will demonstrate the Project's consistency with the MSHCP. Specifically, this section will review how the Project aligns with Section 6.0 of the MSHCP, ensuring a thorough assessment of its adherence to the prescribed guidelines and requirements set forth in the MSHCP.

6.1 Reserve Assembly Analysis

The proposed Project does not occur in a Criteria Area and therefore a Reserve Assembly Analysis is not required. The Project will not conflict with Section 3.0 of the MSCHP.

6.2 Public Quasi-Public Lands in Reserve Assembly Analysis

The proposed Project does not occur in, or adjacent to, PQP Lands. No direct or indirect impacts will occur to PQP lands.

6.3 Riparian/Riverine Areas and Vernal Pools (MSHCP Section 6.1.2)

6.3.1 Riparian/ Riverine Areas

Riparian/riverine areas are lands which contain habitat dominated by trees, shrubs, persistent emergents, or emergent mosses and lichens, which occur close to or which depend upon soil moisture from a nearby fresh water source; or areas with fresh water flow during all or a portion of the year (MSHCP 2004).

MSHCP riparian/riverine resources were assessed during the biological assessment, as described in Section 2.2 of this report. No riparian habitat occurs in the Project impact footprint and therefore no direct impacts to MSHCP riparian habitat is proposed. Riverine features do intersect the Project footprint via underground corrugated steel culverts and are also located adjacent to the Project footprint; however, as described above in section 5.4 of this report, no direct impacts to riverine resources are anticipated to occur through the use of jack and bore drilling. Indirect impacts are possible if construction goes beyond the Project footprint. By incorporating recommendations **BIO-1, BIO-4,** and **BIO-5**, potential indirect impacts to MSHCP riparian/riverine features will be reduced.

6.3.2 Vernal Pools

Vernal pools are seasonal wetlands that occur in depression areas that have wetland indicators of all three parameters (soils, vegetation and hydrology) during the wetter portion of the growing season but normally lack wetlands indicators of hydrology and/or vegetation during the drier portion of the growing season. Obligate hydrophytes and facultative wetlands plant

species are normally dominant during the wetter portion of the growing season, while upland species (annuals) may be dominant during the drier portion of the growing season.

No vernal pools were identified in the Project footprint. Several unvegetated ephemeral pools are located in the BSA but adjacent and outside of the Project impact footprint. These pools are ephemeral in nature and have been anthropogenically created as a result from ponding underneath culverts. None of the pools documented exhibit characteristics of vernal pools (i.e., soils and vegetation). With recommendations **BIO-1, BIO-4**, **and BIO-5**, indirect impacts to aquatic features located in the BSA are reduced.

6.3.3 Fairy Shrimp

The biological surveys identified several unvegetated ephemeral pools located outside of the Project footprint and therefore will not be impacted by Project construction. No fairy shrimp surveys were conducted as part of the Project evaluation. With incorporation recommendations **BIO-1**, **BIO-4**, and **BIO-5**, indirect impacts to aquatic resources will be further prevented.

6.3.4 Riparian Birds

As described in Section 4.7.3 of this report, least Bell's vireo was detected within riparian habitat located adjacent to the Project footprint. However, no direct impacts are proposed to riparian habitat. With incorporation of recommendations **BIO-1**, **BIO-3**, **BIO-5, and BIO-6** potential indirect impacts to breeding riparian birds including least Bell's vireo will be further reduced.

6.4 Narrow Endemic Plant Species (MSHCP Section 6.1.3)

The Project is not located in a Narrow Endemic Plant Species Survey Area. The Project would not conflict with Section 6.1.3 of the MSHCP.

6.5 Additional Survey Needs and Procedures (MSHCP Section 6.3.2)

6.5.1 Criteria Area Plant Species

The proposed Project is not located in a survey area for Criteria Area Plant species. The Project would not conflict with Section 6.3.2 of the MSHCP.

6.5.2 Amphibians

The proposed Project is not located in a survey area for amphibians. The Project would not conflict with Section 6.3.2 of the MSHCP.

6.5.3 Burrowing Owl

The proposed Project is located adjacent to and within mapped MSHCP survey areas for burrowing owl. As described in Section 4.7.3, WEBB Senior Biologist, Marshall Paymard, and WEBB Environmental Analyst, Virginia Waters, conducted a burrowing owl habitat assessment, followed by focused surveys in suitable habitat within the Project footprint, including a 500-foot

survey buffer, defined as the burrowing owl study area. The habitat assessment and focused surveys were conducted in accordance with the survey guidelines outlined in Appendix D of the Staff Report on Burrowing Owl Mitigation (CDFG 2012).

As shown in Table 7, following the habitat assessment, four subsequent surveys were conducted, with at least one site visit between February 15th and April 15th, and a minimum of three survey visits, at least three weeks apart, between April 15th and July 15th, with at least one visit after June 15th.

Table 8. Schedule of Burrowing Owl Habitat Assessments and Focused Surveys

Date/Time	Surveyor	Type	Climatic Conditions
February 22nd 2023 / 0630-1308	Marshall Paymard, Virginia Waters	Habitat Assessment	Air Temperature: 45-60°F; Wind: 0-1 MPH; Cloud Cover:10%
March 8th, 2023 / 0630-1006	Marshall Paymard, Virginia Waters	Focused Survey #1	Air Temperature: 48-52°F; Wind: 0-1 MPH; Cloud Cover: 0%
April 20th, 2023/ 0545-1000	Marshall Paymard, Virginia Waters	Focused Survey #2	Air Temperature: 50-63°F; Wind:0-1 MPH; Cloud Cover: 0%
May 24th, 2023/ 0545-1000	Marshall Paymard, Virginia Waters	Focused Survey #3	Air Temperature: 52-66°F; Wind: 0-1 MPH; Cloud Cover: 0%
June 27th, 2023/ 0630-0900	Marshall Paymard, Virginia Waters	Focused Survey #4	Air Temperature: 68-70°F; Wind: 2-5 MPH; Cloud Cover: 0%
Source: *Focused Burrowing Owl Survey Report for Mead Valley Cajalco Sewer Project*, Albert A. Webb Associates, September 2023 (located in Appendix D).			

A total of 79 suitable burrows were recorded within the burrowing owl study area; however no burrowing owl sign (i.e., pellets, whitewash, prey remains, feathers, tracks, nest burrow decoration materials, or animal manure) was observed at any of the burrows (Figure 6-Burrowing Owl Survey Results). Burrowing owl was not detected during the 2023 focused surveys and is presumed to be absent from the burrowing owl study area.

Impacts

No permanent, temporary, direct, or indirect impacts are proposed to burrowing owl. Burrowing owls are presumed absent from the burrowing owl study area.

Burrowing Owl Recommendations

Due to the presence of suitable habitat within the burrowing owl study area (500-foot buffer of Project footprint) and because burrowing owls may colonize the burrowing owl study area between the time surveys were conducted and the commencement of construction, a pre-construction take avoidance survey(s) shall be conducted in accordance with the Staff Report

on Burrowing Owl Mitigation (DFG 2012) as described in **BIO-2**. The initial take avoidance survey should be conducted no less than 14 days prior to ground disturbance and the second take avoidance survey should be conducted within 24 hours prior to ground disturbance. Both surveys should be performed between morning civil twilight and 10:00 AM, or two hours before sunset until evening civil twilight, walking transects at no greater 20 meters apart within the Project alignment, in suitable foraging habitat within the 150-meters of the Project alignment. If an active burrowing owl burrow is located during the pre-construction burrowing owl survey; the appropriate CDFW office shall be notified and a no-construction buffer should be demarcated in the field of at least 500-feet, or at a distance determined appropriate by the Project biologist. After completion of the burrowing owl take avoidance surveys, a letter report shall be prepared to describe the survey methods, results, and further recommendations, if any.

6.5.4 Mammals

The proposed Project is not located in a survey area for mammals. The Project would not conflict with Section 6.3.2 of the MSHCP.

6.6 Information on Other Species

6.6.1 Delhi Sands Flower Loving Fly

The proposed Project is not located within an area with mapped Delhi soils. No suitable habitat is present for this species within the BSA or Project footprint. The Project would not conflict with Section 6.3.2 of the MSHCP.

6.6.2 Coastal California Gnatcatcher

The proposed Project is not located within an area occupied by coastal California gnatcatcher. No suitable habitat is present for this species within the BSA or Project footprint. The Project would not conflict with Section 6.3.2 of the MSHCP.

6.7 Urban/Wildlands Interface (MSHCP Section 6.1.4)

The proposed Project does not have any adjacency or on-site connection to existing conservation areas or lands designated for conservation purposes. The Project will not conflict with Section 6.1.4 of the MSHCP.

6.8 Stephens Kangaroo Rat Habitat Conservation Plan

The Habitat Conservation Plan (HCP) specifically developed for Stephens' kangaroo rat (SKR) outlines the strategies for conservation, mitigation, and monitoring of this species and its habitat. The HCP designates seven core reserves that are dedicated to the conservation of SKR and its associated habitat. Within these core reserves, measures are implemented to ensure the long-term survival and protection of the species.

The HCP includes a 30-year incidental take authorization, which allows for limited and regulated impacts on SKR populations and their habitats within the designated boundaries.

The authorized areas include lands within the County of Riverside, encompassing the cities of Corona, Hemet, Lake Elsinore, Moreno Valley, Murrieta, Perris, Riverside, and Temecula.

The proposed Project falls within the jurisdiction of the SKR HCP. However, it is important to note that the Project does not propose to remove or alter SKR habitat and therefore is exempt from paying mitigation fees. The proposed Project includes the installation of a sewer line within developed and disturbed public rights-of-way that would be returned to pre-project conditions.

7.0 RECOMMENDATIONS

The following discussion provides project-specific mitigation/avoidance measures to reduce potential impacts to special-status resources to a less than significant level.

BIO-1 Temporary Construction Fencing

To protect biologically sensitive areas adjacent to the construction footprint (i.e., suitable habitat for least Bell's vireo and potentially jurisdictional aquatic features) from indirect and inadvertent disturbances, temporary construction fencing will be installed at the limits of Project impacts (refer to Figures 8A – 8J for locations of potentially jurisdictional aquatic features [Features A-I] and least Bell's vireo suitable habitat [southern riparian woodland, SRWD]). The installation of the fencing will be carefully executed by a Project biologist to ensure that it does not adversely affect the sensitive areas that need to be preserved. In the event that work extends beyond the fenced areas or occurs within sensitive habitat areas, all activities will immediately cease until the issue has been resolved to the satisfaction of the Eastern Municipal Water District (EMWD). Any impacts that occur to sensitive areas beyond the approved fence will be addressed through mitigation measures determined by EMWD in coordination with relevant authorities, such as the USFWS, USACE, RWQCB, and/or the CDFW, as applicable based on jurisdiction. Upon completion of the project, the temporary construction fencing will be removed from the site.

BIO-2 Burrowing Owl Pre Construction Survey

An initial burrowing owl take avoidance survey shall be conducted in suitable habitat no less than 14 days prior to initiating ground disturbance activities using the recommended methods described in the Staff Report on Burrowing Owl Mitigation. (Refer to Figure 6 for location of burrowing owl suitable habitat.) Additionally, a final burrowing owl survey shall be conducted in suitable habitat within 24 hours prior to any ground disturbance related activities. If active nests are identified within the burrowing owl survey area during the pre-construction survey, the nests shall be avoided and an appropriate no-work buffer shall demarcated in the field at a defined distance deemed adequate by the Project biologist. If Project construction cannot avoid the active burrowing owl area, the CDFW shall be consulted and the appropriate mitigation will need to be negotiated.

BIO-3 Least Bell's Vireo

Construction activities should avoid the off-site riparian habitat within 300 feet from Project construction, from March 15 to July 31, which corresponds to the least Bell's vireo breeding season. (Refer to Figure 7 for location of vireo suitable habitat.) If it is infeasible to avoid construction during this timeframe, a qualified biologist shall conduct surveys for the least Bell's vireo and noise monitoring should be conducted for any activities within 300 feet of occupied habitat. In the event that noise levels are found to potentially adversely affect the least Bell's vireo, appropriate noise attenuation measures should be implemented. This may involve installing a sound wall or employing other methods to minimize noise disturbances. If it is determined that noise levels cannot be adequately mitigated and may harm the least Bell's

vireo breeding cycle, construction activities within 300 feet of occupied habitat should be temporarily halted until after July 31, when the breeding season has concluded.

BIO-4 SWPPP Plan

In order to limit indirect impacts and protect aquatic features located adjacent to the Project footprint, a Storm Water Pollution Prevention Plan (SWPPP) shall be prepared. The SWPPP should include the following, but not limited to:

Best management practices (BMPs): Identify and implement appropriate BMPs to control erosion, manage stormwater runoff, and minimize the release of pollutants offsite. Examples of BMPs include sediment and erosion control measures, including fiber rolls and silt fencing placed around off-site aquatic features in a manner to deter sediment deposition and potential pollutant run-off.

Pollution prevention: Implement measures to prevent the discharge of pollutants into storm drains or nearby water bodies. This may include proper storage and handling of construction materials, spill prevention and response procedures, and regular site clean-up.

Field personal training: Provide training to construction personnel on the SWPPP requirements, BMP implementation, and the importance of preventing pollution. Ensure all employees are aware of their responsibilities in implementing the SWPPP.

Monitoring and reporting: Establish procedures for monitoring the effectiveness of the SWPPP, including regular inspections and reporting any incidents or deviations from the plan. Make necessary adjustments to the plan as needed.

BIO-5 Biological Monitoring

To ensure compliance with project approvals and protection of aquatic resources and sensitive biological resources, a pre-construction environmental training session will be conducted by a qualified biologist for all construction personnel (i.e., Workers Environmental Awareness Training). This training will provide personnel with comprehensive information about the resources present within the Project vicinity and the specific avoidance measures that must be followed. The purpose is to enhance worker awareness and understanding of the importance of protecting these resources during construction activities. Additionally, the qualified biologist will conduct periodic monitoring of the construction limits to ensure that designated avoidance areas are clearly delineated with the installation of temporary fencing. The biologist will also verify that the fencing remains intact and effectively prevents any encroachment or disturbance in the protected areas.

BIO-6 Nesting Bird and Raptor Avoidance

If Project construction cannot be avoided during the avian nesting season (February 1st to August 31st), a qualified biologist will conduct a nesting bird survey within 72 hours prior to commencement of construction within a specified area to determine if active nests of species protected by the MBTA or the California Fish and Game Code are present in the construction

zone and appropriate survey buffer defined as, 500-feet for raptor species, and 100-feet for passerines. If active nests are located during the nesting bird survey; a no-construction buffer will be demarcated in the field at a distance defined by the Project biologist. The no-construction buffers will be applied until it is determined by the biologist that the nesting cycle is completed or the nests are no longer active. If a previously surveyed area is left vacant (i.e., no construction work performed) for more than 72 hours, an additional nesting bird survey shall be conducted in those areas prior to commencement of construction to ensure no active nests are present.

8.0 REFERENCES

American Ornithologist Union (AOU). 2023. Checklist of North American Birds (online). American Ornithological Society. https://checklist.americanornithology.org/taxa/. [accessed May 2023]

Baldwin, B. G., D. H. Goldman, D. J. Keil, R. Patterson, T. J. Rosatti, and D. H. Wilken, editors. 2012. The Jepson Manual: Vascular Plants of California, Second Edition. University of California Press, Berkeley, California. 1400 pp.

Bradley, R.D., Ammerman, L.K., Baker, R.J., Bradley, L.C., Cook, J.A., Dowler, R.C., Jones, C., Schmidly, D.F., Stangl, F.B., Van Den Bussche, R.A., and Wursig, N. 2014. Revised Checklist of North American Mammals North of Mexico, 2014. Occasional Papers. Museum of Texas Tech University, Number 327

CDFW 2023. California Endangered Species Act. https://wildlife.ca.gov/Conservation/CESA/Permitting [accessed May 2023]

Center for North American Herpetology (CNAH). 2023. http://www.cnah.org/. [accessed May 2023].

CNDDB. 2023. California Natural Diversity Data Base RareFind 5. https://apps.wildlife.ca.gov/rarefind/view/RareFind.aspx [accessed May 2023].

California Native Plant Society, Rare Plant Program. 2023. Rare Plant Inventory (online edition, v9.5). Website https://www.rareplants.cnps.org [accessed May 2023].

DFG.2012. Staff Report on Burrowing Owl Mitigation. State of California Natural Resources Agency Department of Fish and Game

EPA.2023. Summary of the Clean Water Act. https://www.epa.gov/laws-regulations/summary-clean-water-act [accessed May 2023).

Holland.1986. Draft Vegetation Communities of San Diego County. Based on “Preliminary Descriptions of the Terrestrial Natural Communities of California”.

MSHCP 2004. Western Riverside County Multiple Species Habitat Conservation Plan.

NABA.2023. North American Butterfly Association. https://www.naba.org/ [accessed May 2023].

Sawyer, J., T. Keeler-Wolf, and J. Evans. 2009. A Manual of California Vegetation, Second 2nd Edition.

South Coast Wildlands. 2008. South Coast missing linkages: A wildland network for the South Coast ecoregion. Retrieved from: http://www.scwildlands.org/reports/SCMLRegionalReport.pdf. March 2008.

USDA (U.S. Department of Agriculture). 2023. Web Soil Survey. USDA, Natural Resources Conservation Service. http://websoilsurvey.nrcs.usda.gov [accessed May 2023].

USGS.2023A. United States Geological Service (USGS), 1979. 7.5-Minute Quadrangle Map, Perris, Lake Mathews, Steele Peak, Riverside West, Riverside East, Sunnymead, Alberhill, Lake Elsinore, Romoland, California

USGS.2023B. United States Geological Service (USGS), National Hydrography Dataset. https://www.usgs.gov/national-hydrography/national-hydrography-dataset [accessed May 2023)

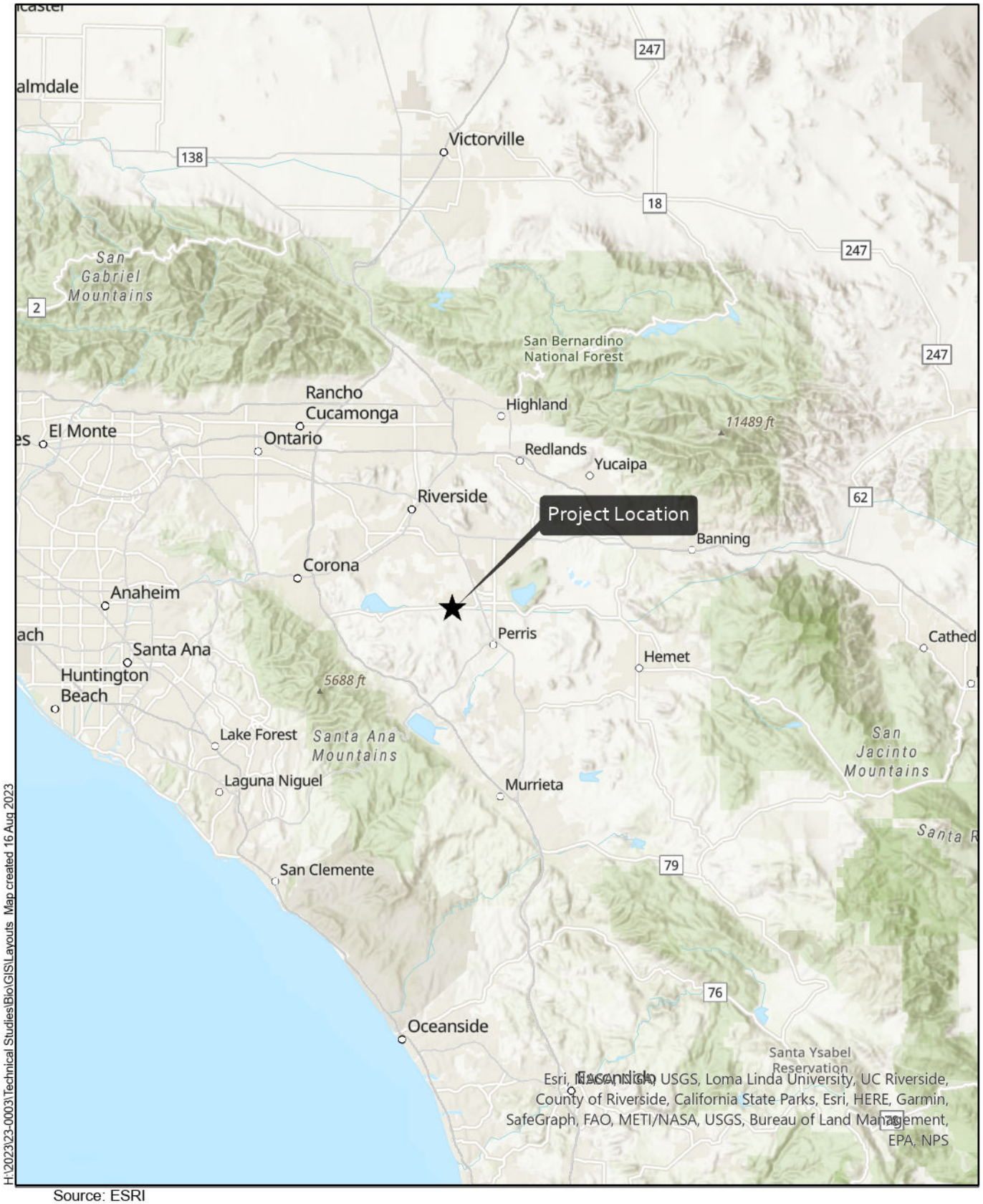
USFWS 2023A. Information for Planning and Consultation (IPaC). U.S. Fish and Wildlife Service. https://ipac.ecosphere.fws.gov /[accessed May 2023].

USFWS 2023B. National Wetlands Inventory [accessed May 2023]. https://www.fws.gov/program/national-wetlands-inventory/wetlands-mapper

USFWS 2023C. Migratory Bird Treaty Act of 1918. https://www.fws.gov/law/migratory-bird-treaty-act-1918. [accessed May 2023)

USFWS.2017. USFWS Survey Guidelines for Listed Large Branchiopods

APPENDIX A



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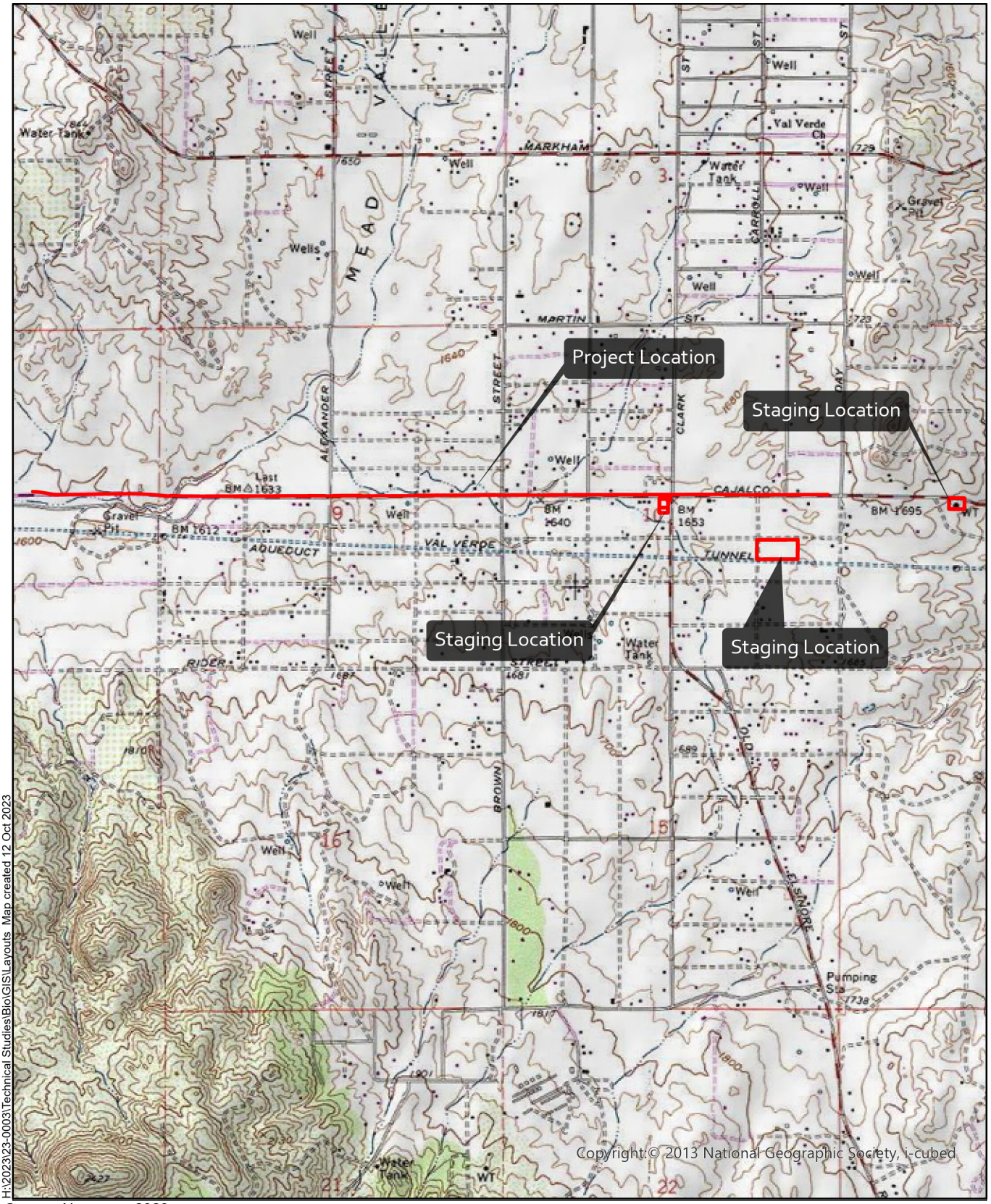
Source: ESRI

0 100 200 300 Feet

Figure 1- Regional Map

Mead Valley Cajalco Sewer Project

ALBERT A. WEBB ASSOCIATES



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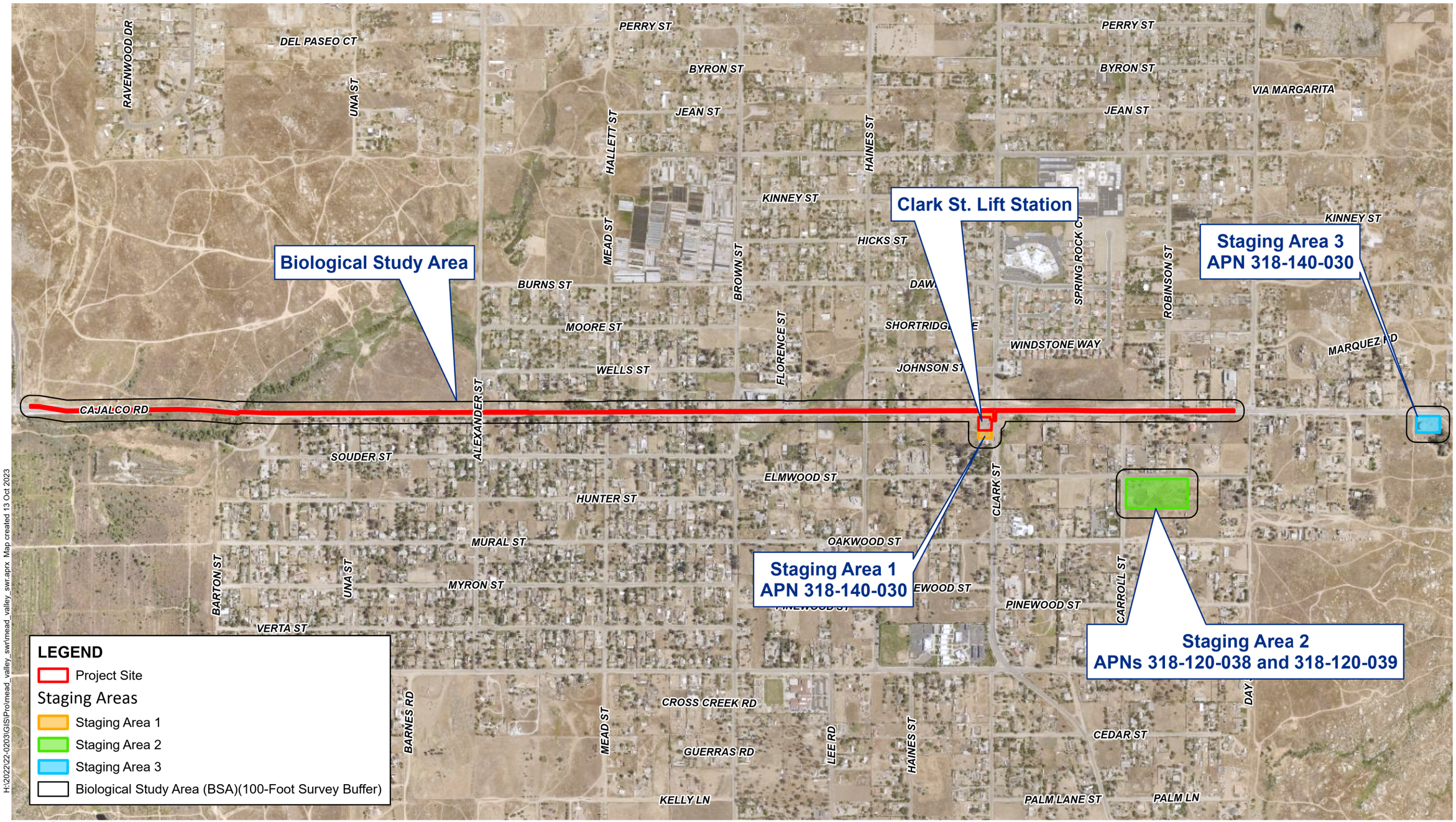
Source: Nearmap, 2023.

0 100 200 300 Feet

Figure 2 - Vicinity Map

Mead Valley Cajalco Sewer Project

ALBERT A. WEBB ASSOCIATES



Source: Riverside GIS, 2020.

Figure 2A - Project Site
Mead Valley Cajalco Sewer Project

ALBERT A. WEBB ASSOCIATES

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Byron St
Jean St
Martin St
Alexander St
Brown St
Haines St
Kinney St
Hicks St
Burns St
Dawes St
Mead St
Florence St
Wells St
Souder St
Hunter St
Una St
Elmwood St
Tomas Rivera Middle School
Carroll St
Day St
Manuel L. Real Elementary School
Robinson St
Marquez Rd
Cajalco Rd
Oakwood St
Mead Valley
Mead Valley FS
Pinewood St
Columbia Elementary School
Rider St
Cedar St
Kelly Ln
Palm Lane St

HcC MmC2 HcC PaC2 VsD2 CkF2 CkF2 CkF2 ChD2 CkF2 GyC2 CkF2 FaD2 MmB MmD2 MmC2 GyC2 MmC2 MmC2 MmB ChC MmB PaC2 MmB FfC2 ChC CkF2 VsD2 HcC FbC2 ChC

Legend

- Biological Study Area (BSA)
- Cieneba rocky sandy loam, 15 to 50 percent slopes, eroded,CkF2
- Cieneba sandy loam, 5 to 8 percent slopes,ChC
- Cieneba sandy loam, 8 to 15 percent slopes, eroded,ChD2
- Fallbrook fine sandy loam, 2 to 8 percent slopes, eroded,FfC2
- Fallbrook sandy loam, 8 to 15 percent slopes, eroded,FaD2
- Fallbrook sandy loam, shallow, 5 to 8 percent slopes, eroded,FbC2
- Greenfield sandy loam, 2 to 8 percent slopes, eroded,GyC2
- Hanford coarse sandy loam, 2 to 8 percent slopes,HcC
- Monserate sandy loam, 0 to 5 percent slopes,MmB
- Monserate sandy loam, 5 to 8 percent slopes, eroded,MmC2
- Monserate sandy loam, 8 to 15 percent slopes, eroded,MmD2
- Pachappa fine sandy loam, 2 to 8 percent slopes, eroded,PaC2
- Vista coarse sandy loam, 8 to 15 percent slopes, eroded,VsD2

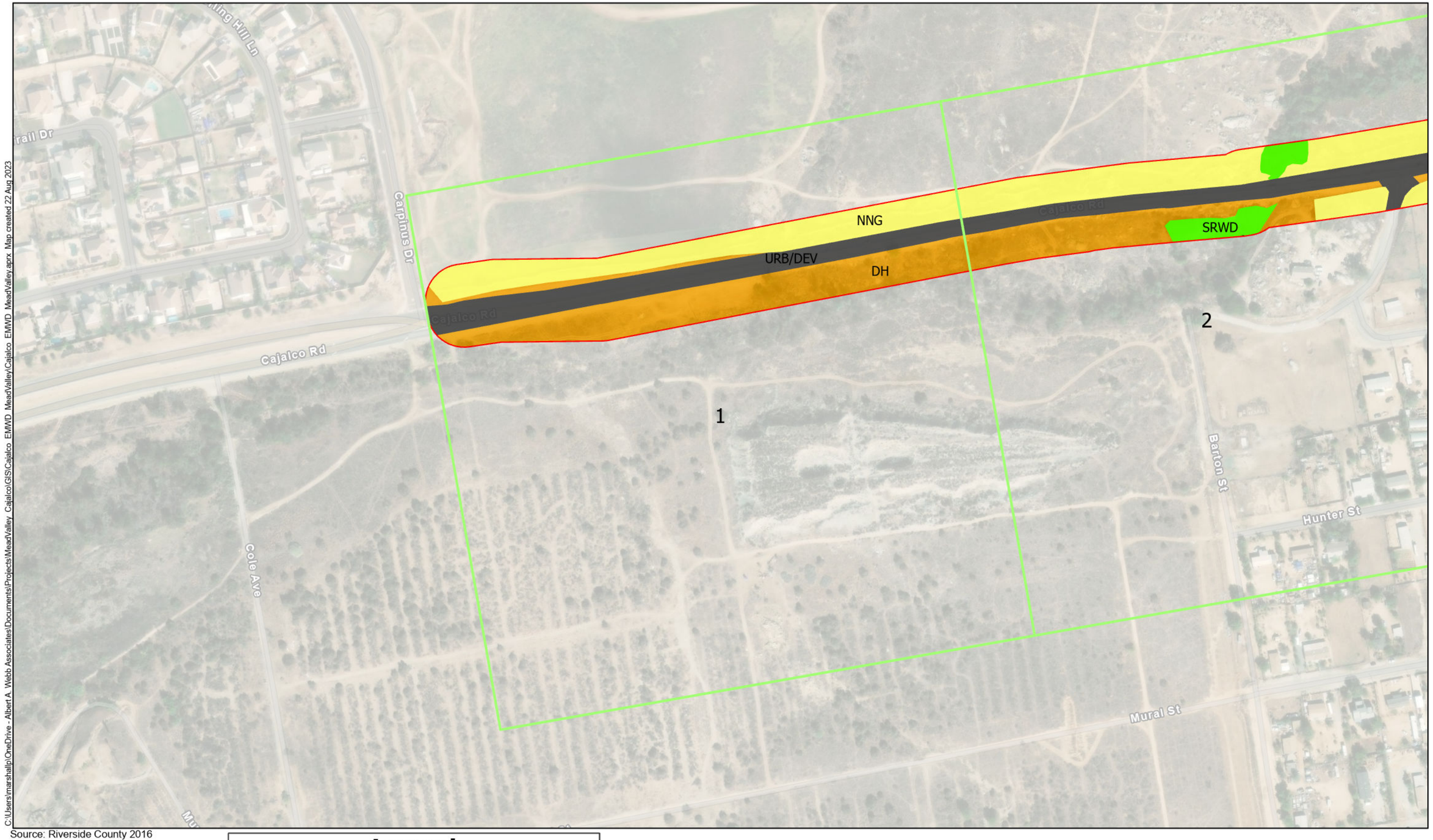
Esri Community Maps Contributors, Loma Linda University, UC Riverside, County of Riverside, California State Parks, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, US Census Bureau, USDA, Maxar

Source: Riverside County 2016

0 350 700 1,400 Feet

Figure 3- USDA Soils
Mead Valley Cajalco Sewer Project

ALBERT A. WEBB ASSOCIATES



Source: Riverside County 2016

0 90 180 360 Feet

Legend

- Biological Study Area (BSA)
- Southern Riparian Woodland (SRWD)
- Urban/Developed (URB/DEV)
- Non Native Grassland (NNG)
- Disturbed Habitat (DH)

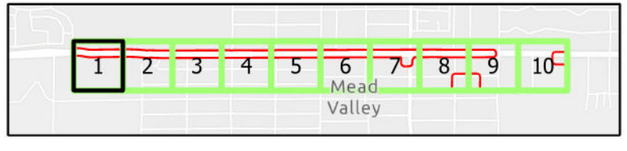
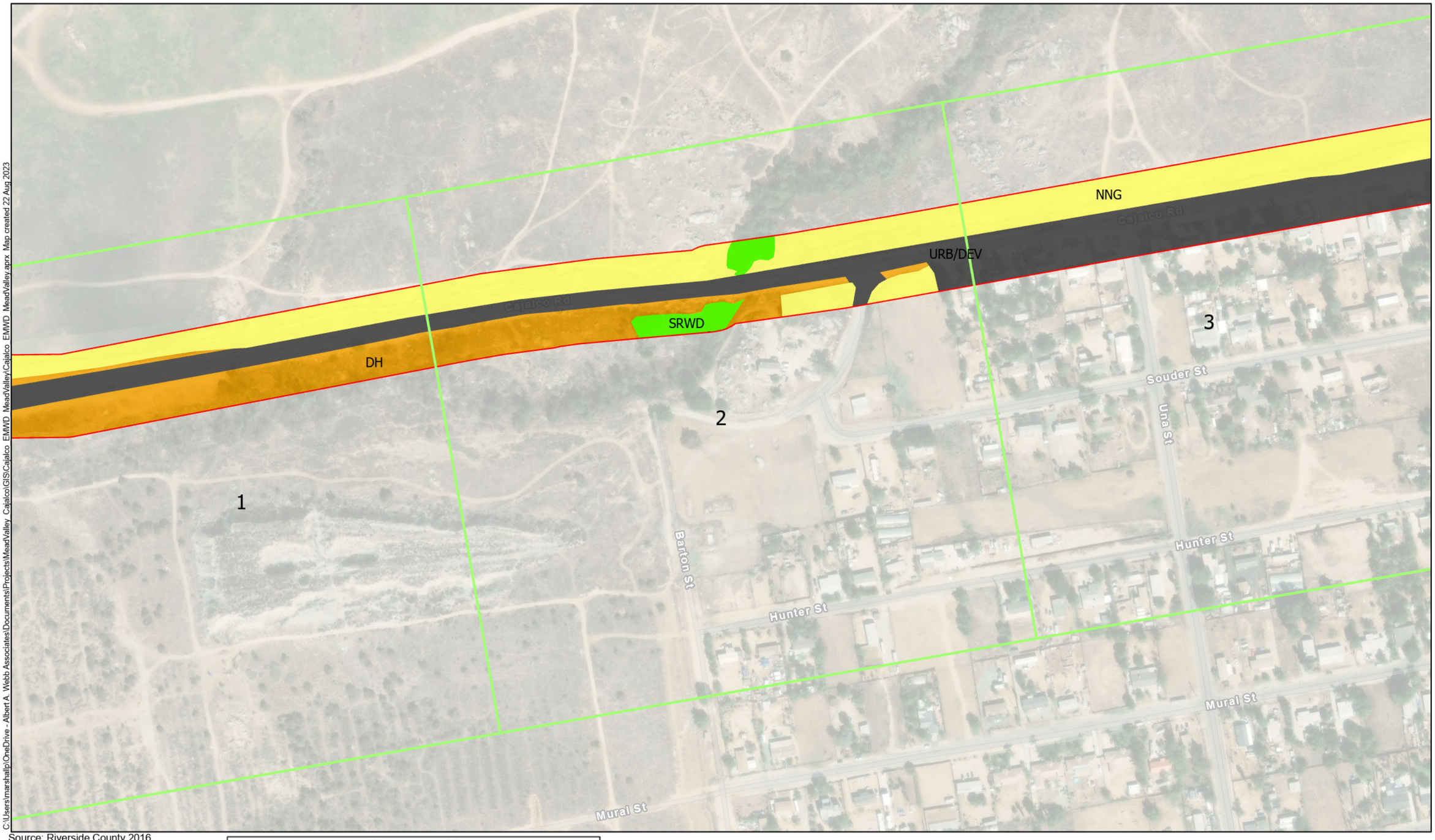


Figure 4A- Vegetation and Land Cover Types

Mead Valley Cajalco Sewer Project

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Source: Riverside County 2016

0 90 180 360 Feet

Legend

- Biological Study Area (BSA)
- Southern Riparian Woodland (SRWD)
- Urban/Developed (URB/DEV)
- Non Native Grassland (NNG)
- Disturbed Habitat (DH)

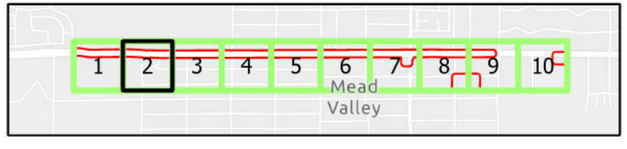
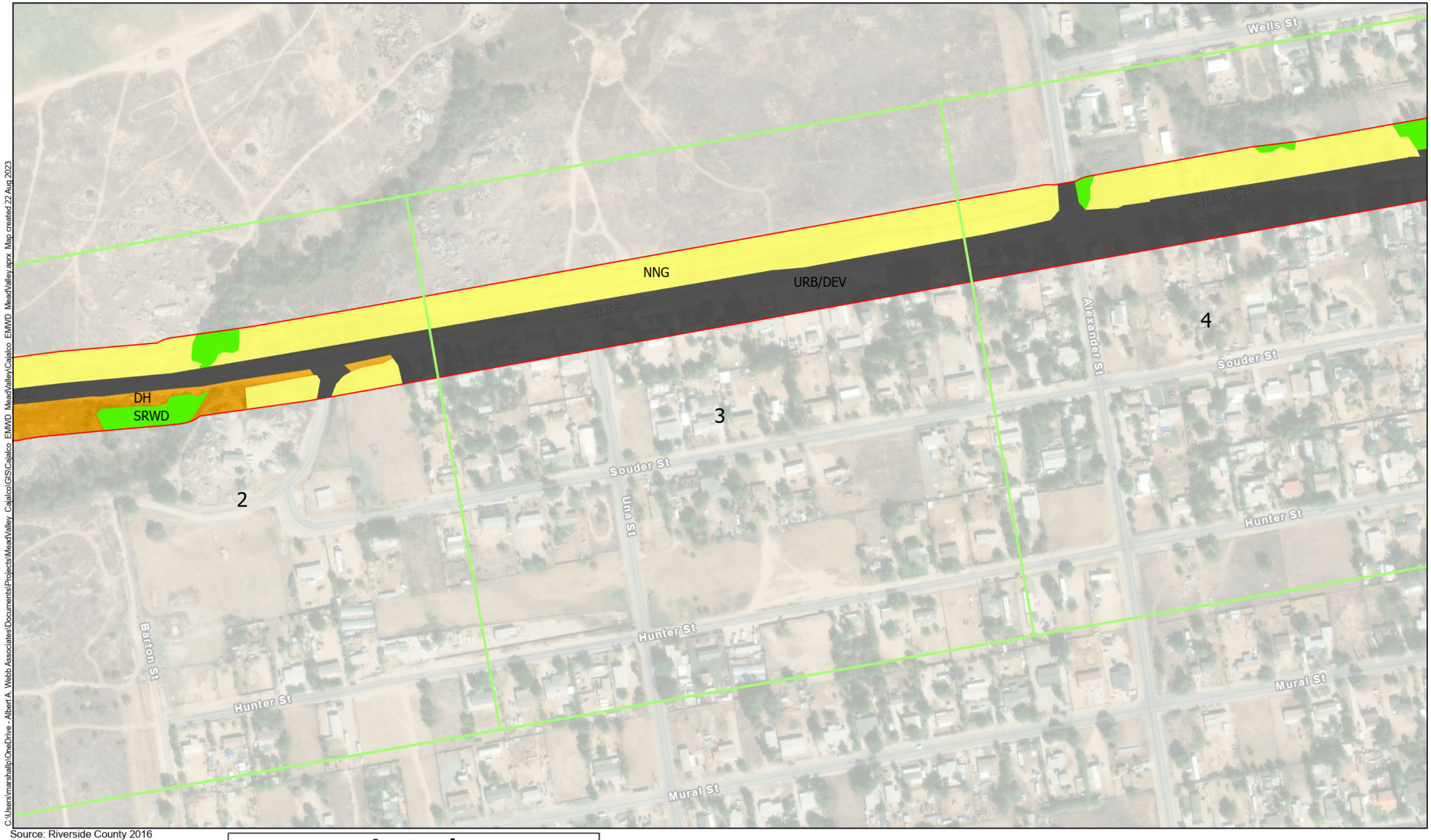


Figure 4B- Vegetation and Land Cover Types

Mead Valley Cajalco Sewer Project

ALBERT A. WEBB ASSOCIATES



C:\Users\marshallp\OneDrive - Albert A. Webb Associates\Documents\Projects\MeadValley_Cajalco\GIS\Cajalco_EMWD_MeadValley\Cajalco_EMWD_MeadValley.aprx Map created 22 Aug 2023

Source: Riverside County 2016

0 90 180 360 Feet

Legend

- Biological Study Area (BSA)
- Southern Riparian Woodland (SRWD)
- Urban/Developed (URB/DEV)
- Non Native Grassland (NNG)
- Disturbed Habitat (DH)

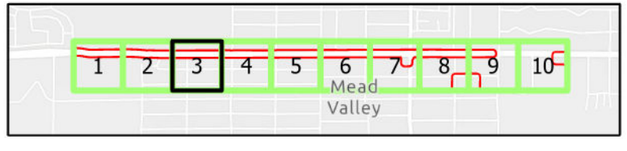


Figure 4C- Vegetation and Land Cover Types

Mead Valley Cajalco Sewer Project

ALBERT A. WEBB ASSOCIATES

C:\Users\marshallp\OneDrive - Albert A. Webb Associates\Documents\Projects\MeadValley_Cajalco\GIS\Cajalco_EMWD_MeadValley\Cajalco_EMWD_MeadValley.aprx Map created 22 Aug 2023

Wells St
Cajalco Rd
SRWD
URB/DEV
NNG
DH
Alexander St
Mead St
Souder St
Una St
Hunter St
Mural St
3
4
5

Source: Riverside County 2016

Legend

- Biological Study Area (BSA)
- Southern Riparian Woodland (SRWD)
- Urban/Developed (URB/DEV)
- Non Native Grassland (NNG)
- Disturbed Habitat (DH)

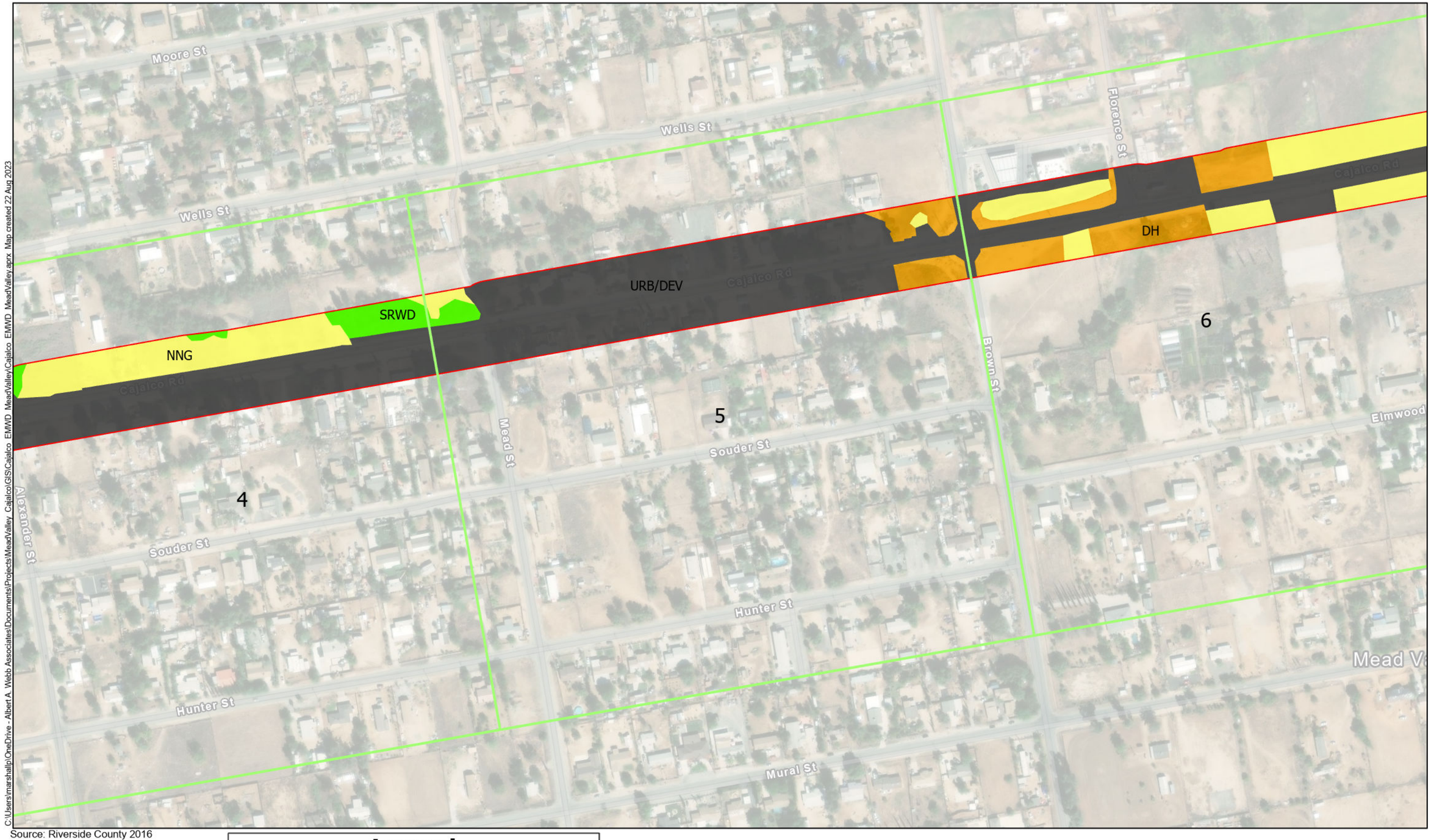
0 90 180 360 Feet

1 2 3 4 5 6 7 8 9 10
Mead Valley

Figure 4D- Vegetation and Land Cover Types

Mead Valley Cajalco Sewer Project

ALBERT A. WEBB ASSOCIATES



Source: Riverside County 2016

0 90 180 360 Feet

Legend

- Biological Study Area (BSA)
- Southern Riparian Woodland (SRWD)
- Urban/Developed (URB/DEV)
- Non Native Grassland (NNG)
- Disturbed Habitat (DH)

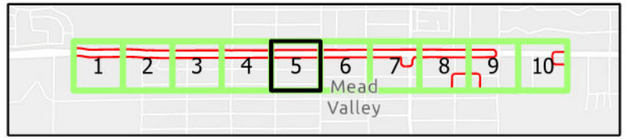
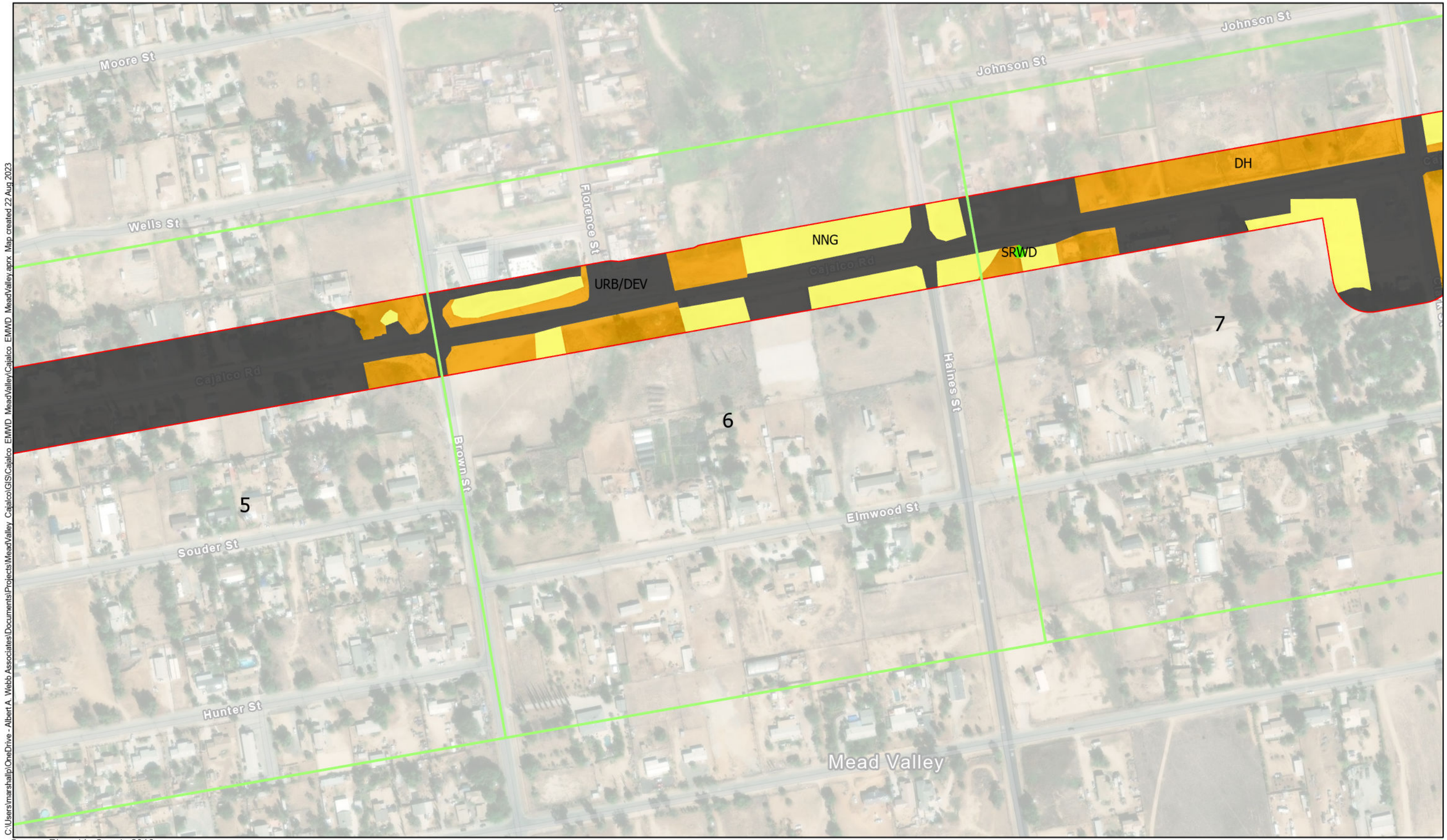


Figure 4E- Vegetation and Land Cover Types

Mead Valley Cajalco Sewer Project

ALBERT A. WEBB ASSOCIATES



Source: Riverside County 2016

0 90 180 360 Feet

Legend

- Biological Study Area (BSA)
- Southern Riparian Woodland (SRWD)
- Urban/Developed (URB/DEV)
- Non Native Grassland (NNG)
- Disturbed Habitat (DH)

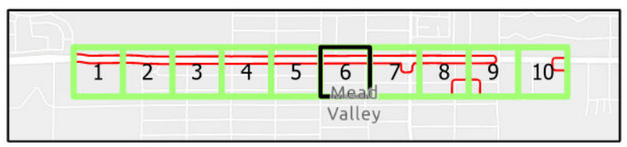


Figure 4F- Vegetation and Land Cover Types

Mead Valley Cajalco Sewer Project

ALBERT A. WEBB ASSOCIATES

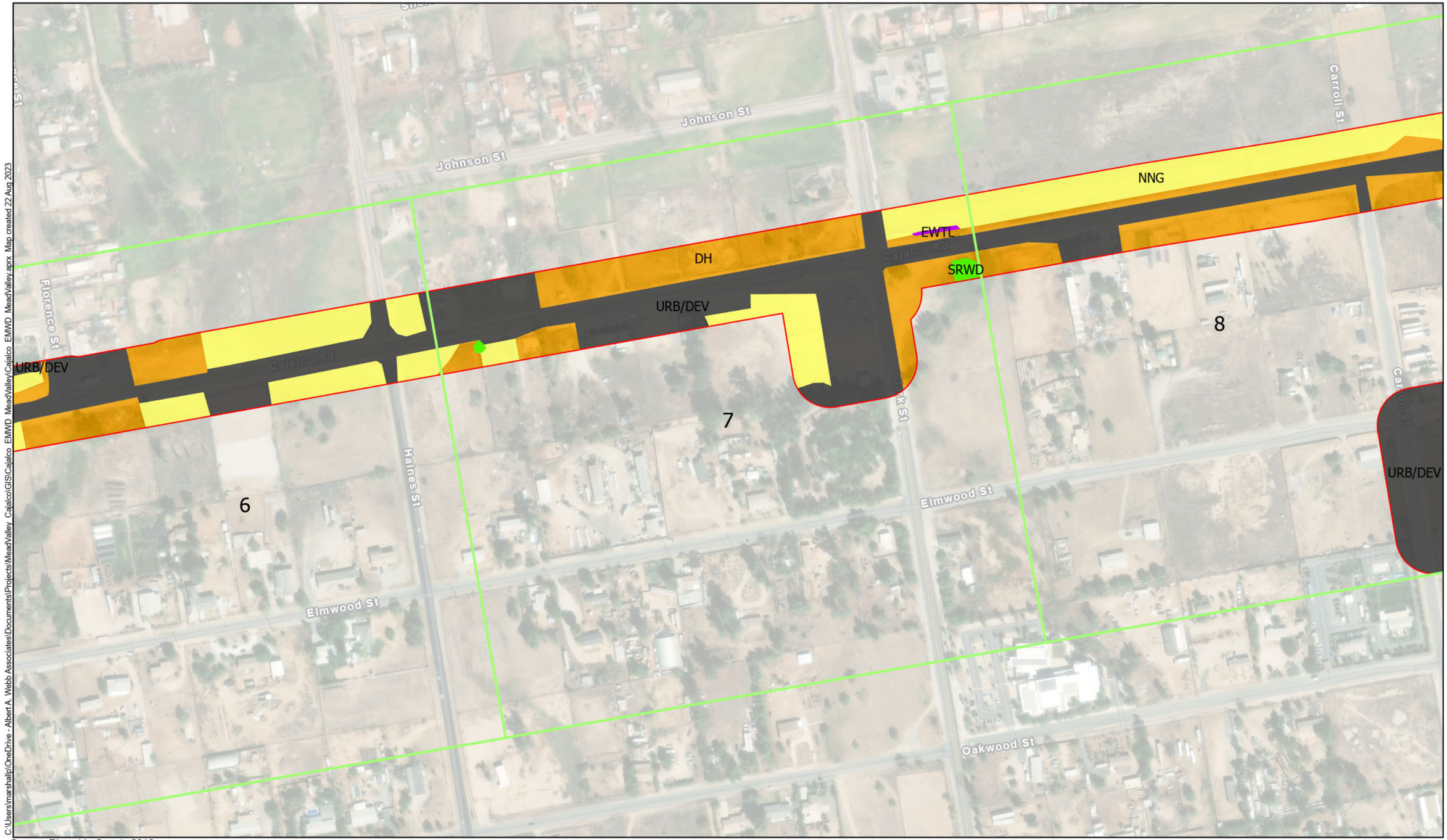


Figure 4G- Vegetation and Land Cover Types

Mead Valley Cajalco Sewer Project

ALBERT A. WEBB ASSOCIATES



Source: Riverside County 2016

0 90 180 360 Feet

Legend

- Biological Study Area (BSA)
- Emergent Wetland (EWTL)
- Southern Riparian Woodland (SRWD)
- Urban/Developed (URB/DEV)
- Non Native Grassland (NNG)
- Disturbed Habitat (DH)

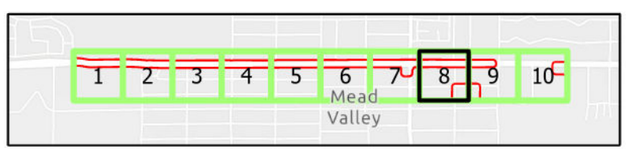
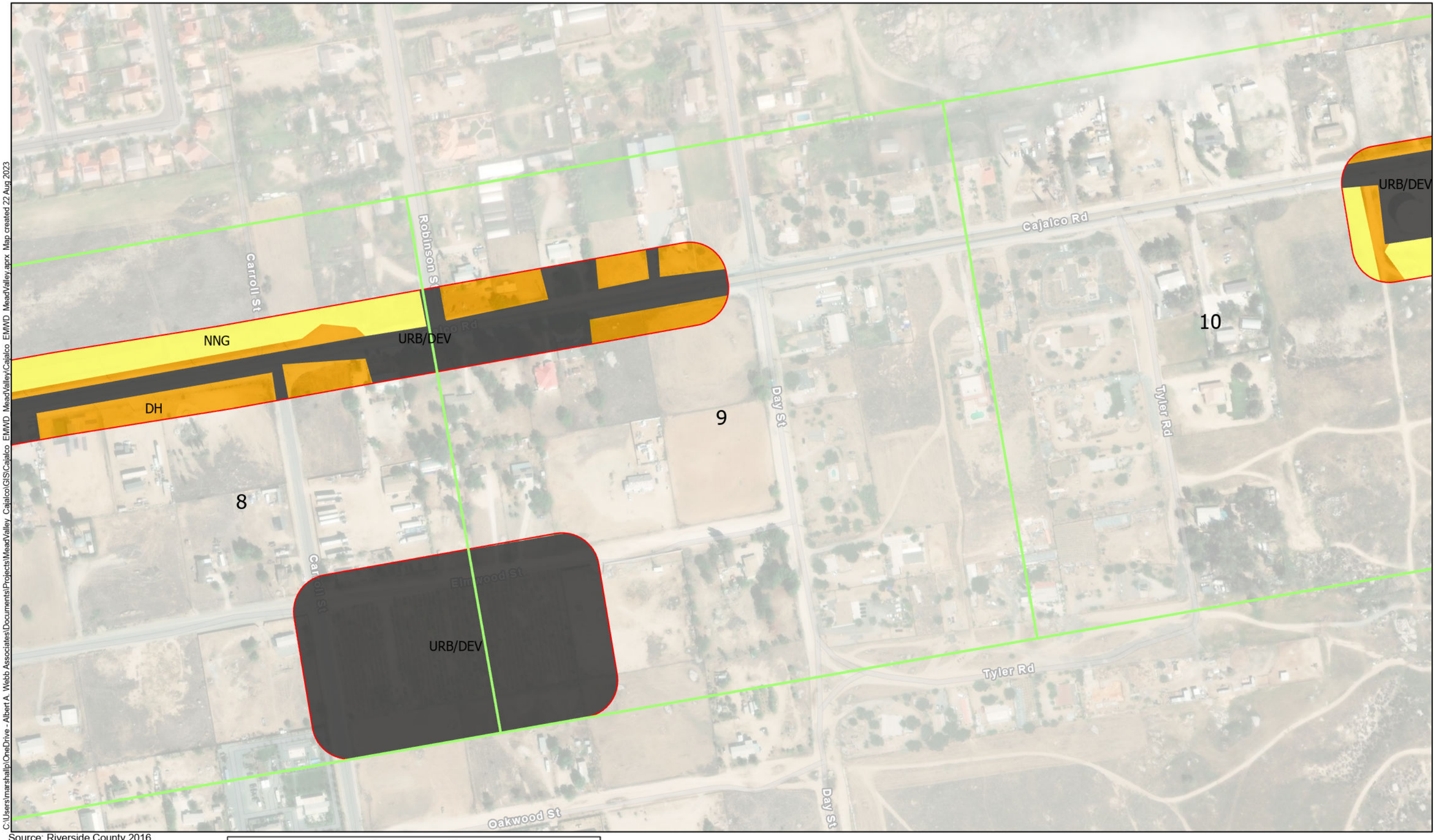


Figure 4H- Vegetation and Land Cover Types

Mead Valley Cajalco Sewer Project

ALBERT A. WEBB ASSOCIATES

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Source: Riverside County 2016

0 90 180 360 Feet

Legend

- Biological Study Area (BSA)
- Urban/Developed (URB/DEV)
- Non Native Grassland (NNG)
- Disturbed Habitat (DH)

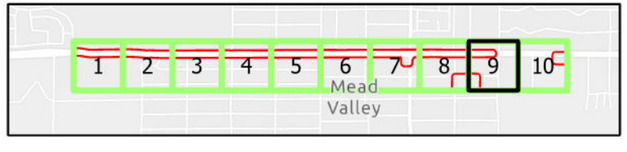


Figure 4I- Vegetation and Land Cover Types

Mead Valley Cajalco Sewer Project

ALBERT A. WEBB ASSOCIATES

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Marquez Rd

Decker Rd

Cajalco Rd

URB/DEV

NNG

EUC

URB/DEV

DH

10

9

D St

Tyler Rd

Anderson Rd

URB/DEV

Tyler Rd

Source: Riverside County 2016

0 90 180 360 Feet

Legend

- Biological Study Area (BSA)
- Eucalyptus Woodland (EUC)
- Urban/Developed (URB/DEV)
- Non Native Grassland (NNG)
- Disturbed Habitat (DH)

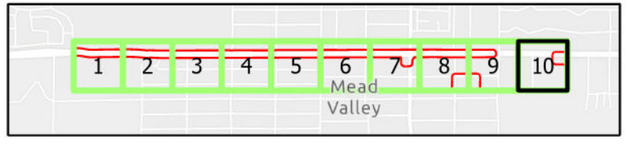


Figure 4J- Vegetation and Land Cover Types

Mead Valley Cajalco Sewer Project

ALBERT A. WEBB ASSOCIATES



Source: Riverside County 2016

0 90 180 360 Feet

Legend

- Biological Study Area (BSA)
- Aquatic Features
- Culverts

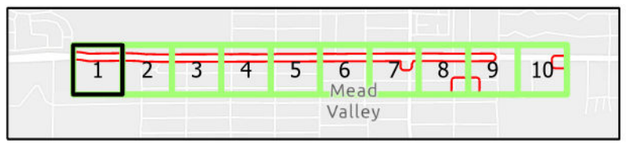


Figure 5A- Potentially Jurisdictional Aquatic Resources

Mead Valley Cajalco Sewer Project

ALBERT A. WEBB ASSOCIATES



Source: Riverside County 2016

0 90 180 360 Feet

Legend

- Biological Study Area (BSA)
- Aquatic Features
- Culverts

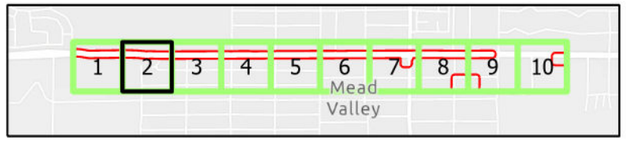
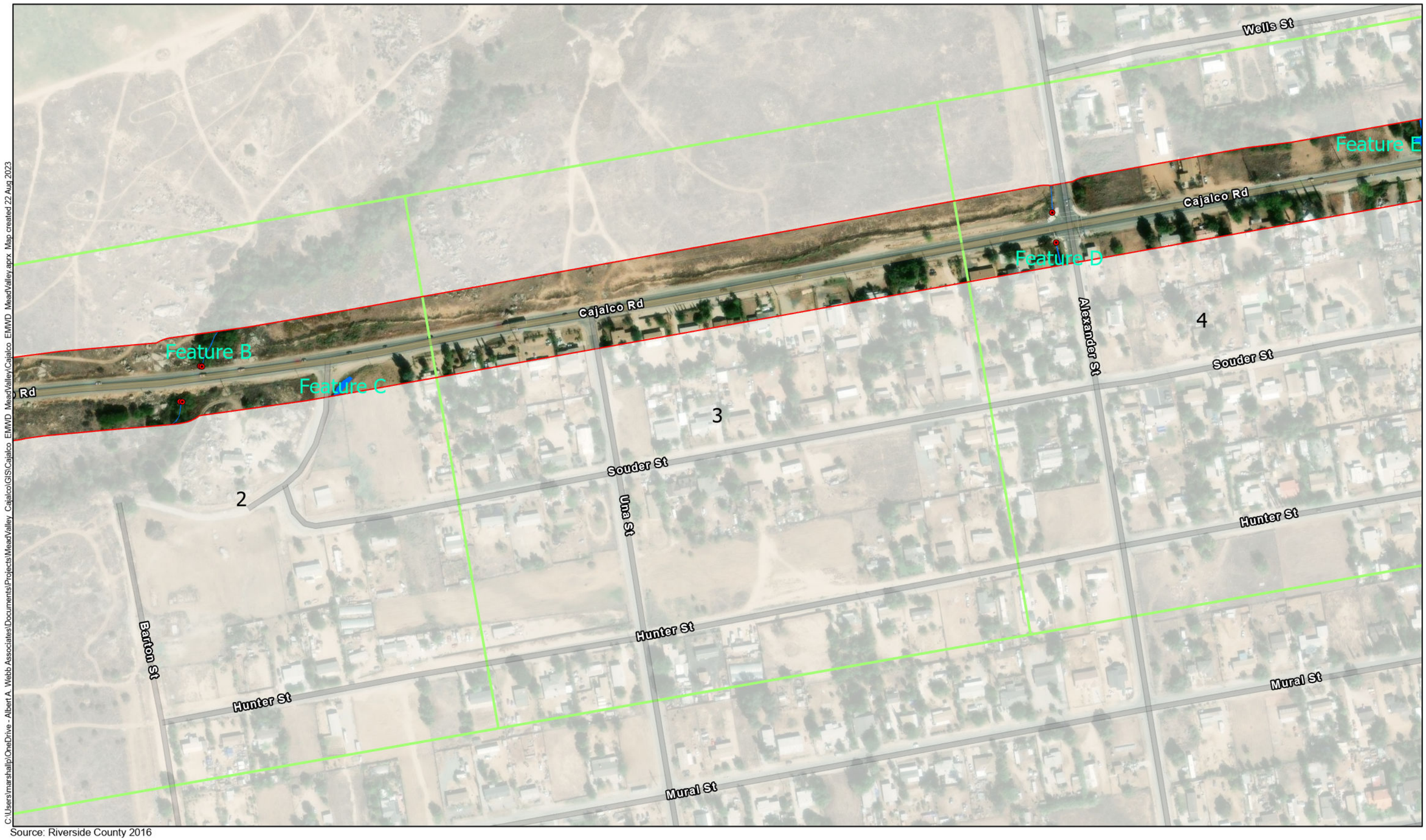


Figure 5B- Potentially Jurisdictional Aquatic Resources

Mead Valley Cajalco Sewer Project

ALBERT A. WEBB ASSOCIATES



Source: Riverside County 2016

0 90 180 360 Feet

Legend

- Biological Study Area (BSA)
- Aquatic Features
- Culverts

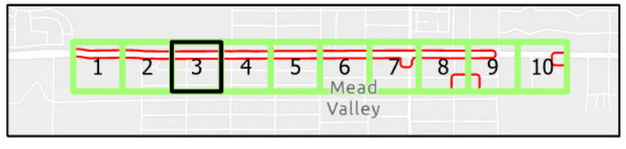


Figure 5C- Potentially Jurisdictional Aquatic Resources

Mead Valley Cajalco Sewer Project

ALBERT A. WEBB ASSOCIATES



Source: Riverside County 2016

C:\Users\marshallp\OneDrive - Albert A. Webb Associates\Documents\Projects\MeadValley_Cajalco\GIS\Cajalco_EMWD_MeadValley\Cajalco_EMWD_MeadValley.aprx Map created 22 Aug 2023

0 90 180 360 Feet

Legend

- Biological Study Area (BSA)
- Aquatic Features
- Culverts

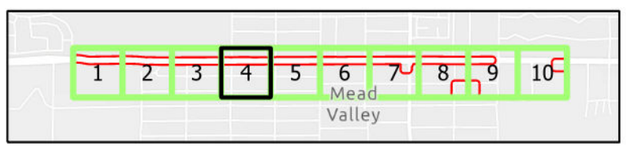


Figure 5D- Potentially Jurisdictional Aquatic Resources

Mead Valley Cajalco Sewer Project

ALBERT A. WEBB ASSOCIATES



Source: Riverside County 2016

0 90 180 360 Feet

Legend

- Biological Study Area (BSA)
- Aquatic Features
- Culverts

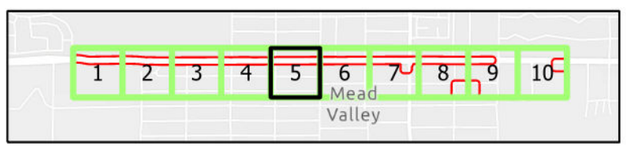


Figure 5E- Potentially Jurisdictional Aquatic Resources

Mead Valley Cajalco Sewer Project

ALBERT A. WEBB ASSOCIATES



Source: Riverside County 2016

0 90 180 360 Feet

Legend

- Biological Study Area (BSA)
- Aquatic Features
- Culverts

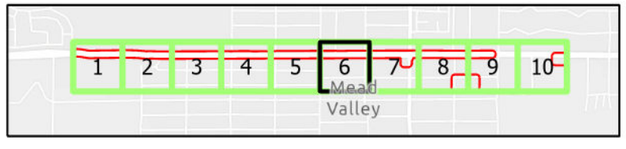


Figure 5F- Potentially Jurisdictional Aquatic Resources

Mead Valley Cajalco Sewer Project

ALBERT A. WEBB ASSOCIATES



0 90 180 360 Feet

Legend

- Biological Study Area (BSA)
- Aquatic Features
- Culverts

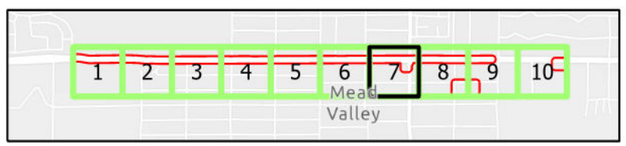


Figure 5G- Potentially Jurisdictional Aquatic Resources

Mead Valley Cajalco Sewer Project

ALBERT A. WEBB ASSOCIATES

Short Ridge St
Windstone Way
Johnson St
Carroll St
Robinson St
Cajalco Rd
Feature 1
Cajalco Rd
8
9
Day St
7
Clark St
Elmwood St
Carroll St
Elmwood St
Oakwood St
Day St

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Source: Riverside County 2016

0 90 180 360 Feet

Legend

- Biological Study Area (BSA)
- Aquatic Features
- Culverts

1 2 3 4 5 6 7 8 9 10
Mead Valley

Figure 5H- Potentially Jurisdictional Aquatic Resources

Mead Valley Cajalco Sewer Project

ALBERT A. WEBB ASSOCIATES



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Source: Riverside County 2016

0 90 180 360 Feet

Legend

Biological Study Area (BSA)

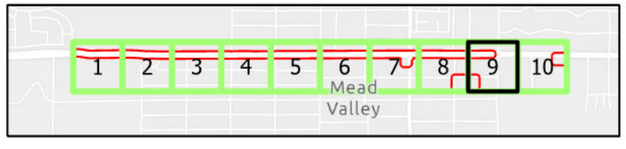


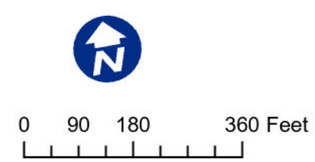
Figure 5I- Potentially Jurisdictional Aquatic Resources

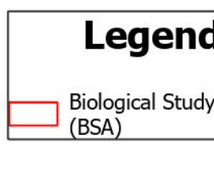
Mead Valley Cajalco Sewer Project

ALBERT A. WEBB ASSOCIATES



Source: Riverside County 2016





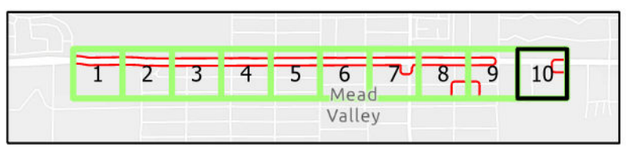
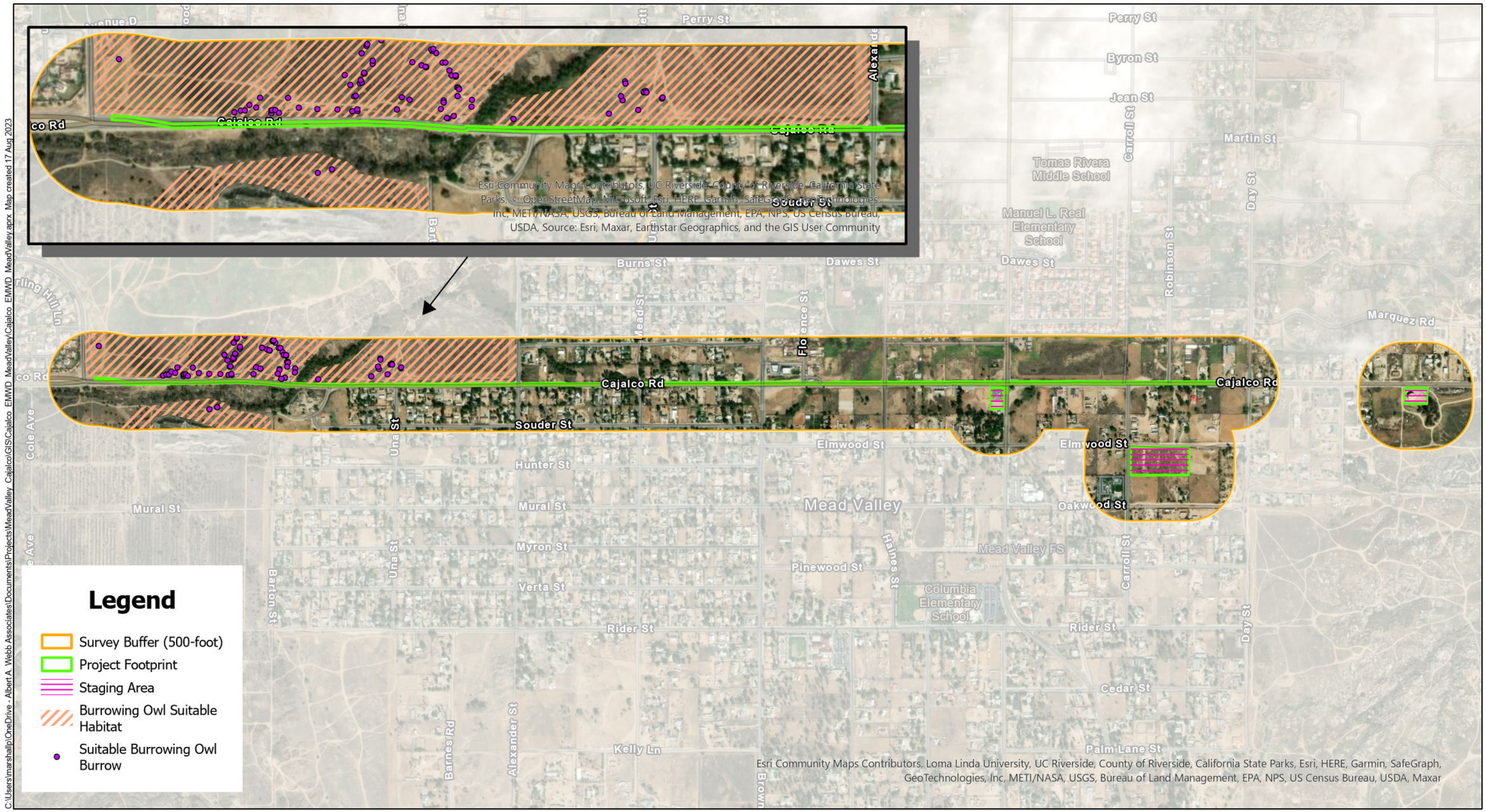


Figure 5J- Potentially Jurisdictional Aquatic Resources

Mead Valley Cajalco Sewer Project

ALBERT A. WEBB ASSOCIATES



Source: Riverside County 2016

Figure 6- Burrowing Owl Survey Results

Mead Valley Cajalco Sewer Project

ALBERT A. WEBB ASSOCIATES



Source: Riverside County 2016

Figure 7- LBVI Survey Results
Mead Valley Cajalco Sewer Project

ALBERT A. WEBB ASSOCIATES



Source: Riverside County 2016

0 90 180 360 Feet

Legend

- Temporary Impacts
- Biological Study Area (BSA)
- Aquatic Features
- Southern Riparian Woodland (SRWD)
- Urban/Developed (URB/DEV)
- Non Native Grassland (NNG)
- Disturbed Habitat (DH)

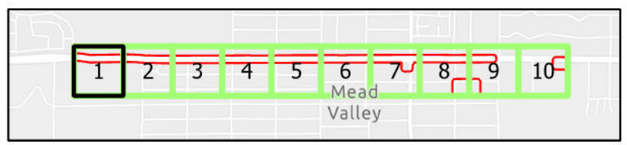
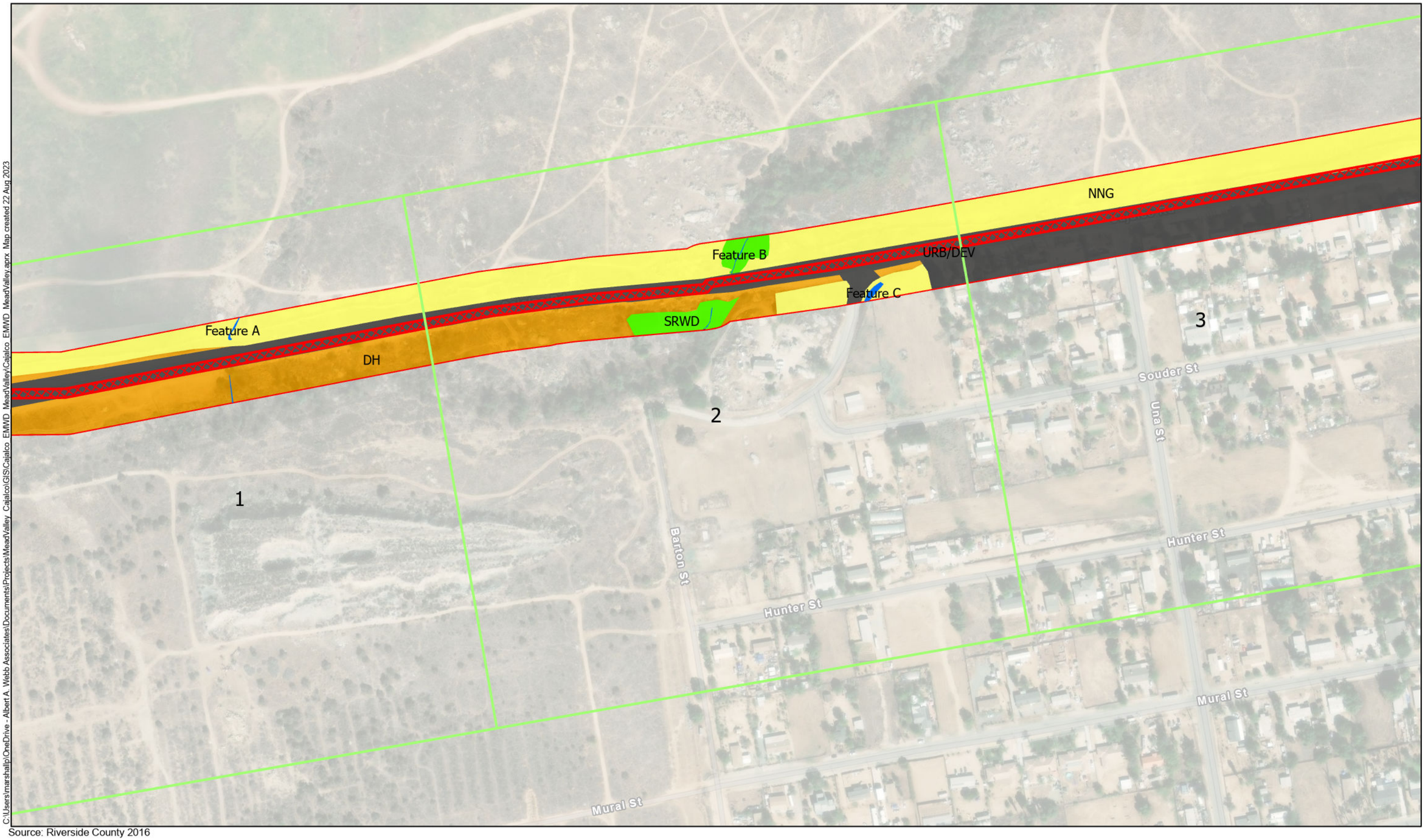


Figure 8A- Project Impacts

Mead Valley Cajalco Sewer Project

ALBERT A. WEBB ASSOCIATES



Source: Riverside County 2016

0 90 180 360 Feet

Legend

- Temporary Impacts
- Biological Study Area (BSA)
- Aquatic Features
- Southern Riparian Woodland (SRWD)
- Urban/Developed (URB/DEV)
- Non Native Grassland (NNG)
- Disturbed Habitat (DH)

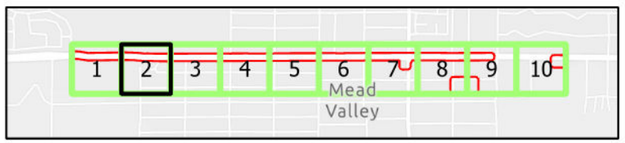
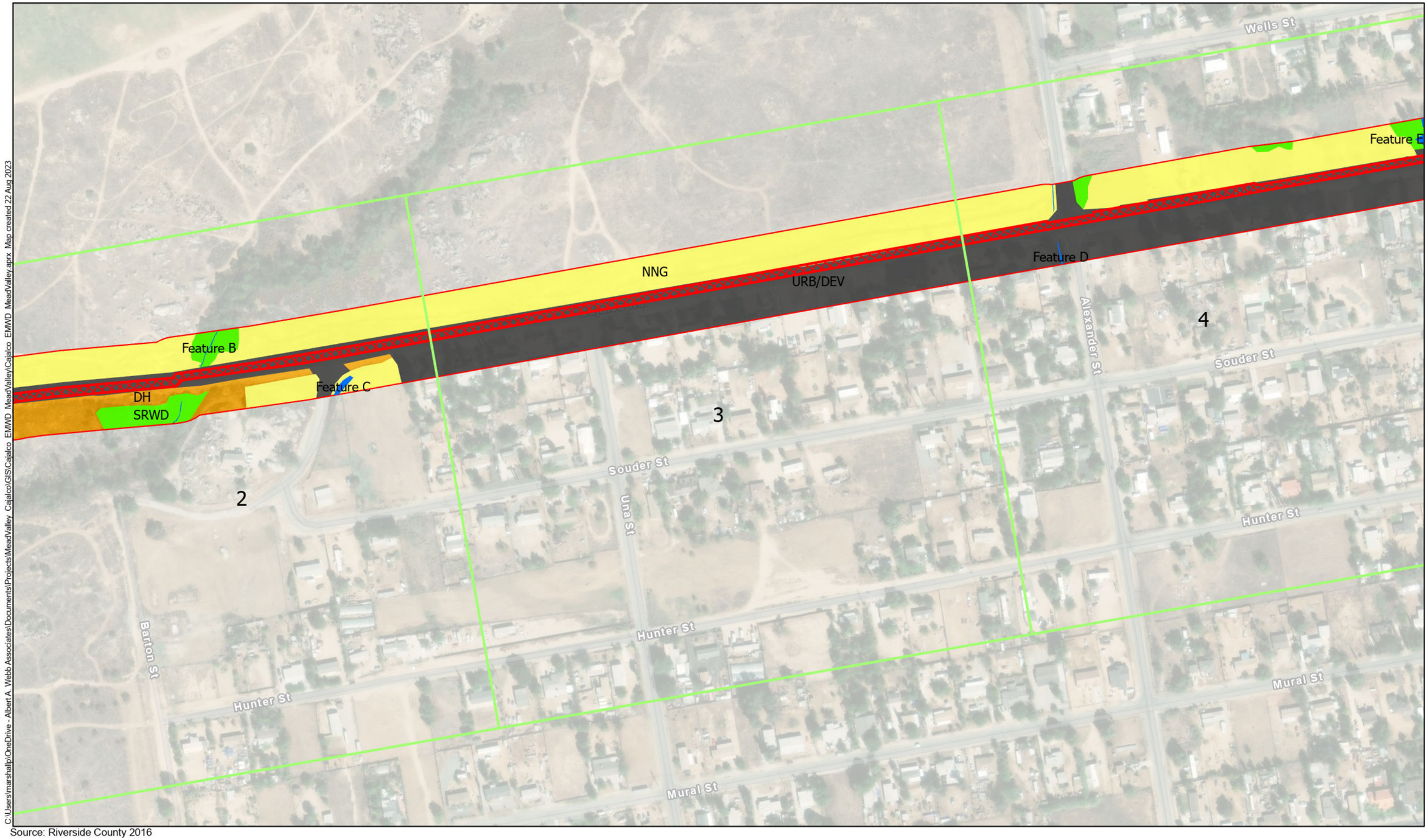


Figure 8B- Project Impacts

Mead Valley Cajalco Sewer Project

ALBERT A. WEBB ASSOCIATES



Source: Riverside County 2016

0 90 180 360 Feet

Legend

- Temporary Impacts
- Biological Study Area (BSA)
- Aquatic Features
- Southern Riparian Woodland (SRWD)
- Urban/Developed (URB/DEV)
- Non Native Grassland (NNG)
- Disturbed Habitat (DH)

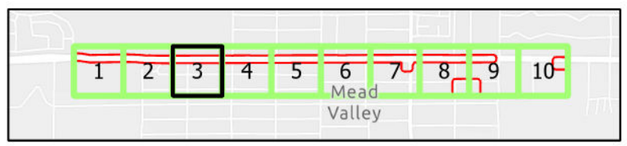


Figure 8C- Project Impacts

Mead Valley Cajalco Sewer Project

ALBERT A. WEBB ASSOCIATES

C:\Users\marshallp\OneDrive - Albert A. Webb Associates\Documents\Projects\MeadValley_Cajalco\GIS\Cajalco_EMWD_MeadValley\Cajalco_EMWD_MeadValley.aprx Map created 22 Aug 2023

Wells St
Feature F DH
Feature E
SRWD
URB/DEV
NNG
Feature D
Alexander St
Mead St
Souder St
Una St
Hunter St
Mural St
3
4
5

Source: Riverside County 2016

0 90 180 360 Feet

Legend

- Temporary Impacts
- Biological Study Area (BSA)
- Aquatic Features
- Southern Riparian Woodland (SRWD)
- Urban/Developed (URB/DEV)
- Non Native Grassland (NNG)
- Disturbed Habitat (DH)

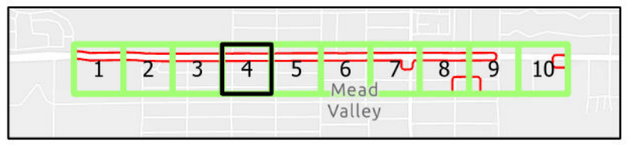
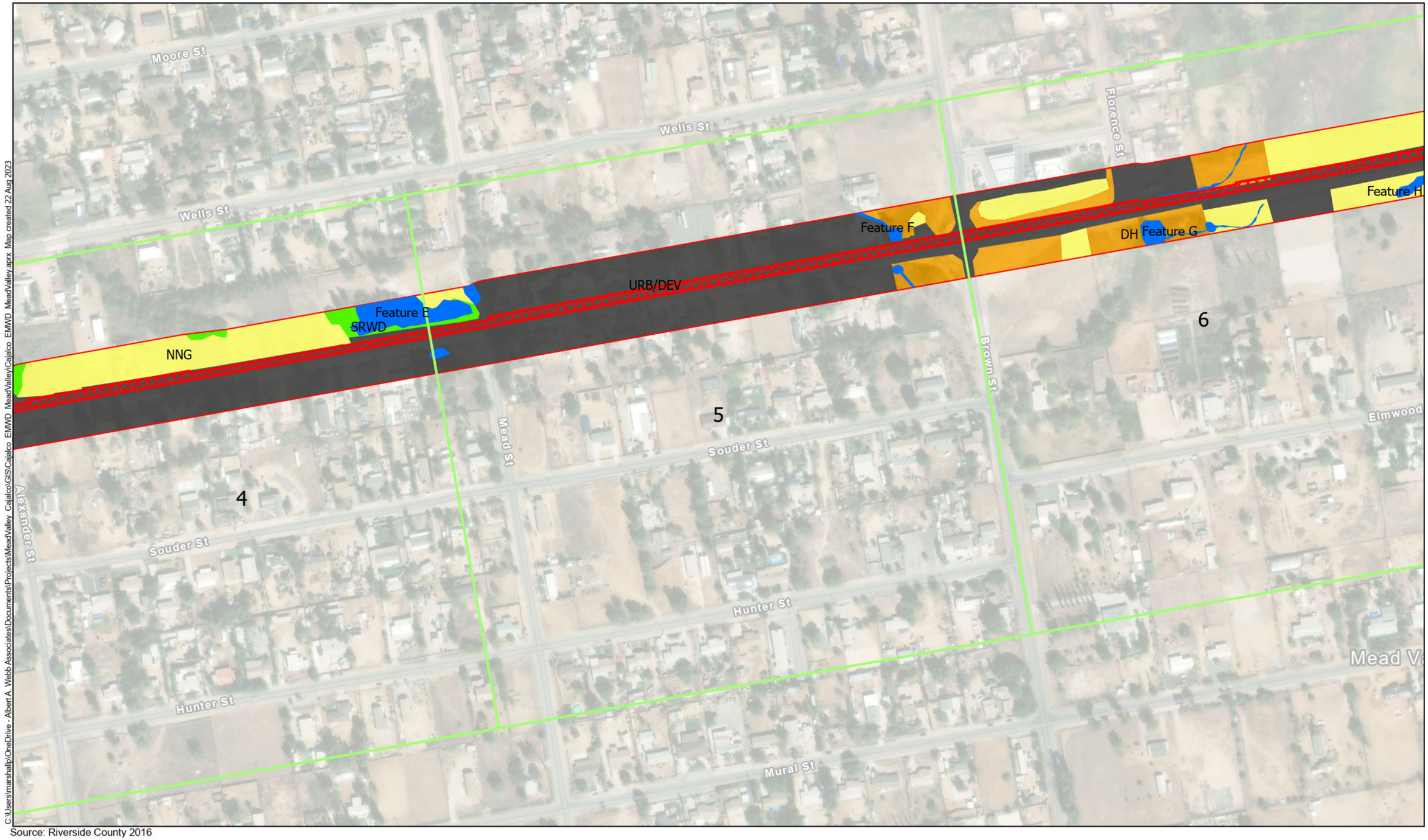


Figure 8D- Project Impacts

Mead Valley Cajalco Sewer Project

ALBERT A. WEBB ASSOCIATES



Source: Riverside County 2016

0 90 180 360 Feet

Legend

- Temporary Impacts
- Biological Study Area (BSA)
- Aquatic Features
- Southern Riparian Woodland (SRWD)
- Urban/Developed (URB/DEV)
- Non Native Grassland (NNG)
- Disturbed Habitat (DH)

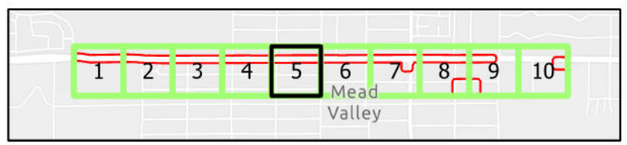
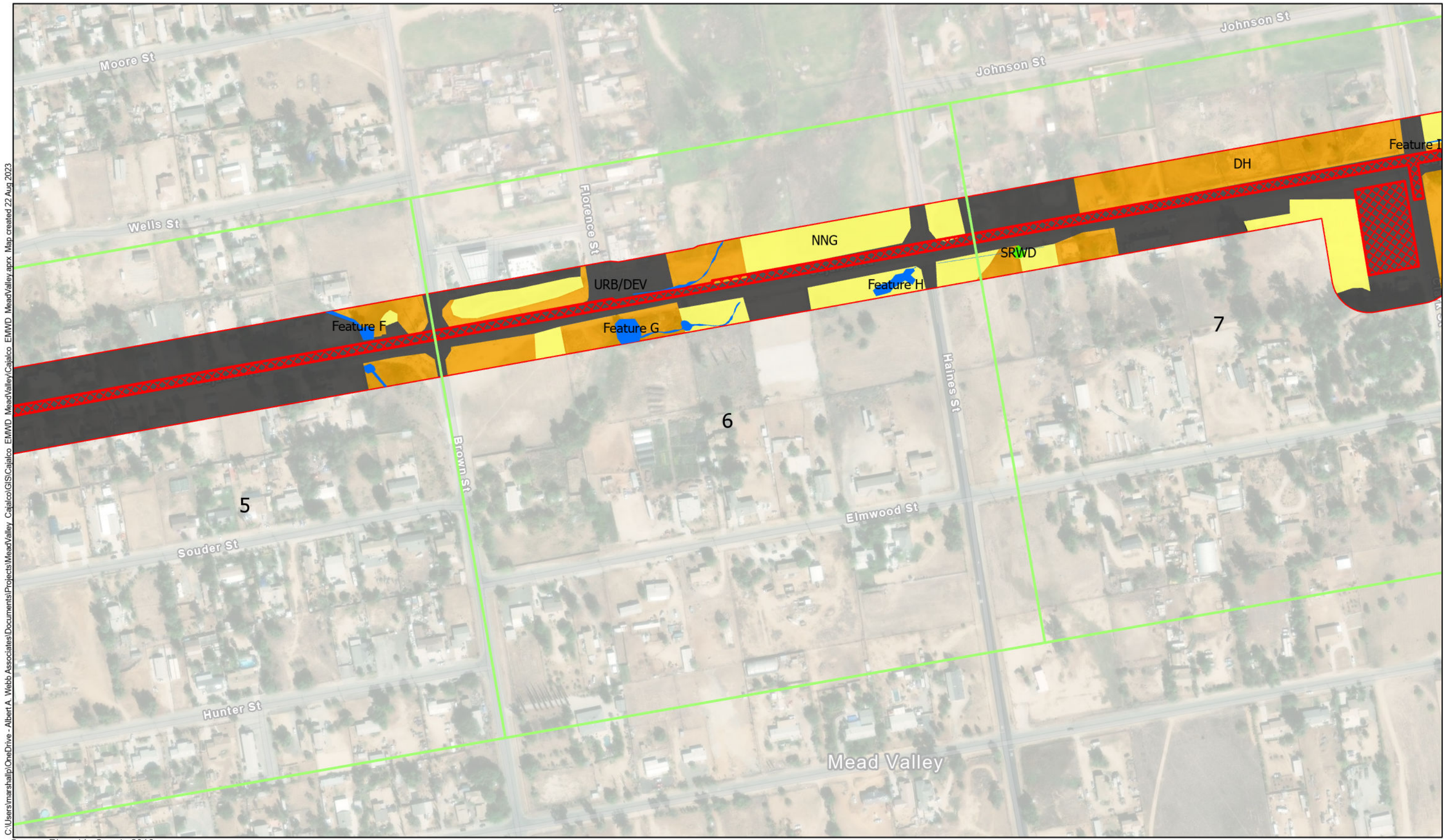


Figure 8E- Project Impacts

Mead Valley Cajalco Sewer Project

ALBERT A. WEBB ASSOCIATES



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Source: Riverside County 2016

0 90 180 360 Feet

Legend

- Temporary Impacts
- Biological Study Area (BSA)
- Aquatic Features
- Southern Riparian Woodland (SRWD)
- Urban/Developed (URB/DEV)
- Non Native Grassland (NNG)
- Disturbed Habitat (DH)

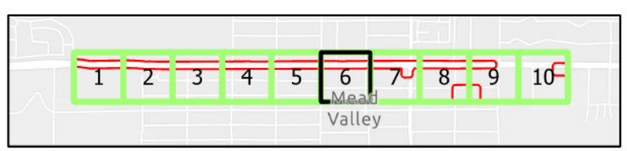
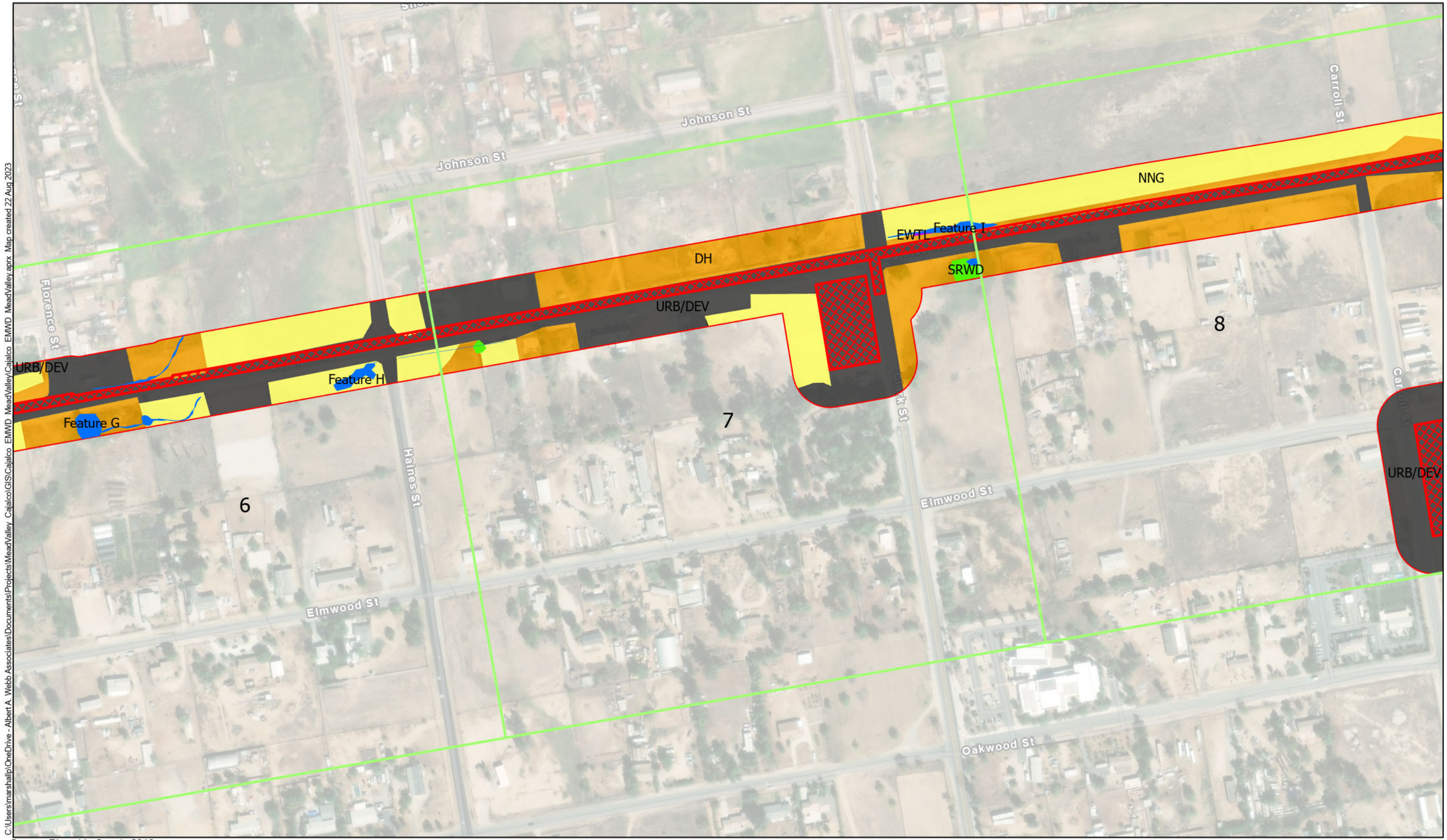


Figure 8F- Project Impacts

Mead Valley Cajalco Sewer Project

ALBERT A. WEBB ASSOCIATES



Source: Riverside County 2016

0 90 180 360 Feet

Legend

- Temporary Impacts
- Biological Study Area (BSA)
- Aquatic Features
- Emergent Wetland
- Southern Riparian Woodland (SRWD)
- Urban/Developed (URB/DEV)
- Non Native Grassland (NNG)
- Disturbed Habitat (DH)

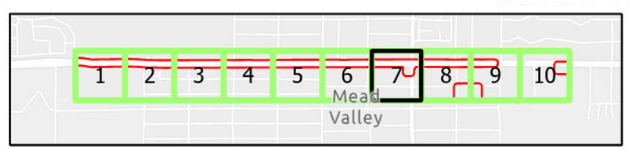
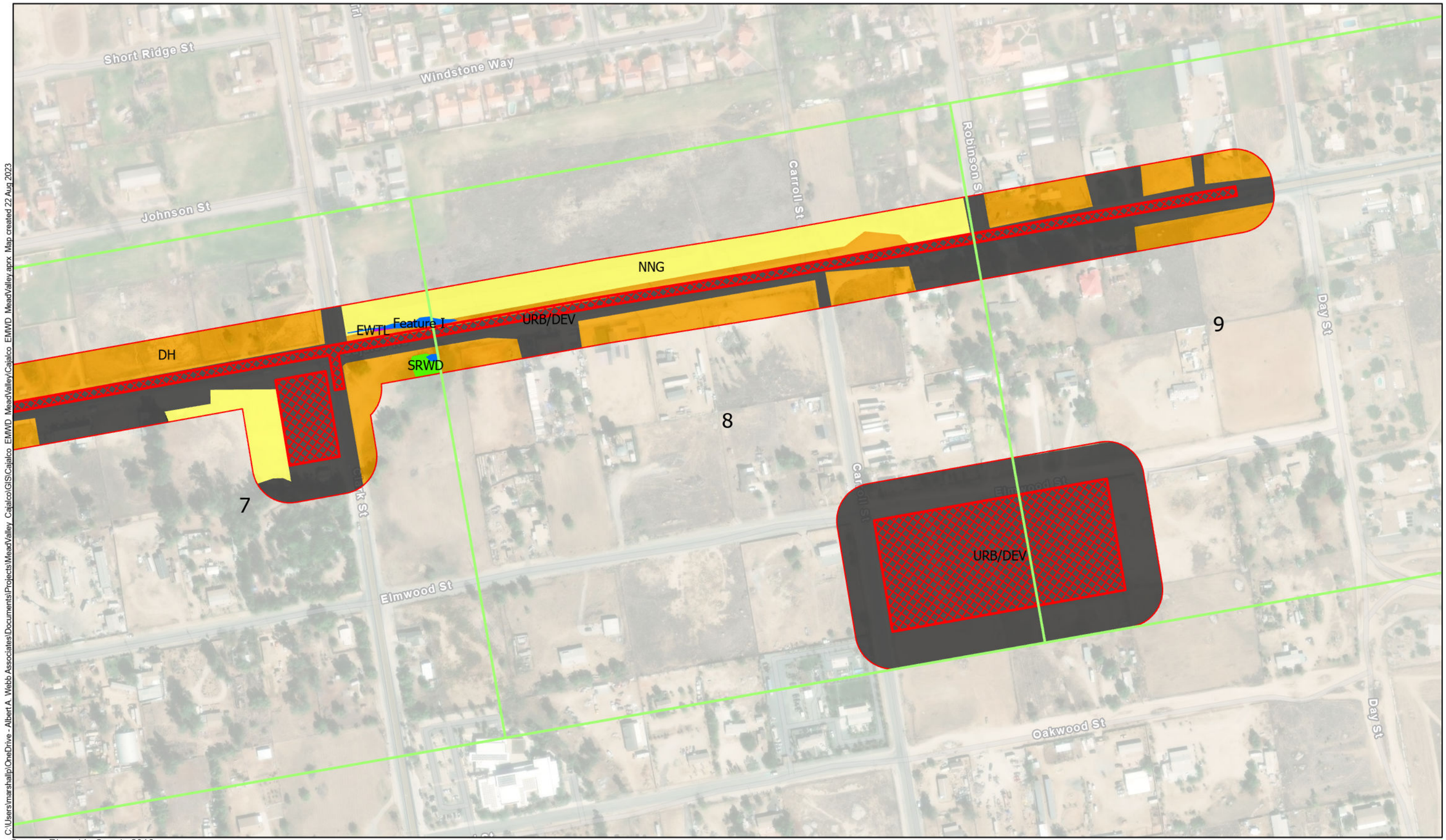


Figure 8G- Project Impacts

Mead Valley Cajalco Sewer Project

ALBERT A. WEBB ASSOCIATES



Source: Riverside County 2016

0 90 180 360 Feet

Legend

- Temporary Impacts
- Biological Study Area (BSA)
- Aquatic Features
- Emergent Wetland
- Southern Riparian Woodland (SRWD)
- Urban/Developed (URB/DEV)
- Non Native Grassland (NNG)
- Disturbed Habitat (DH)

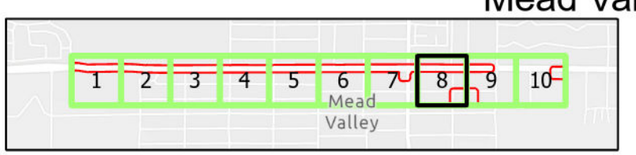
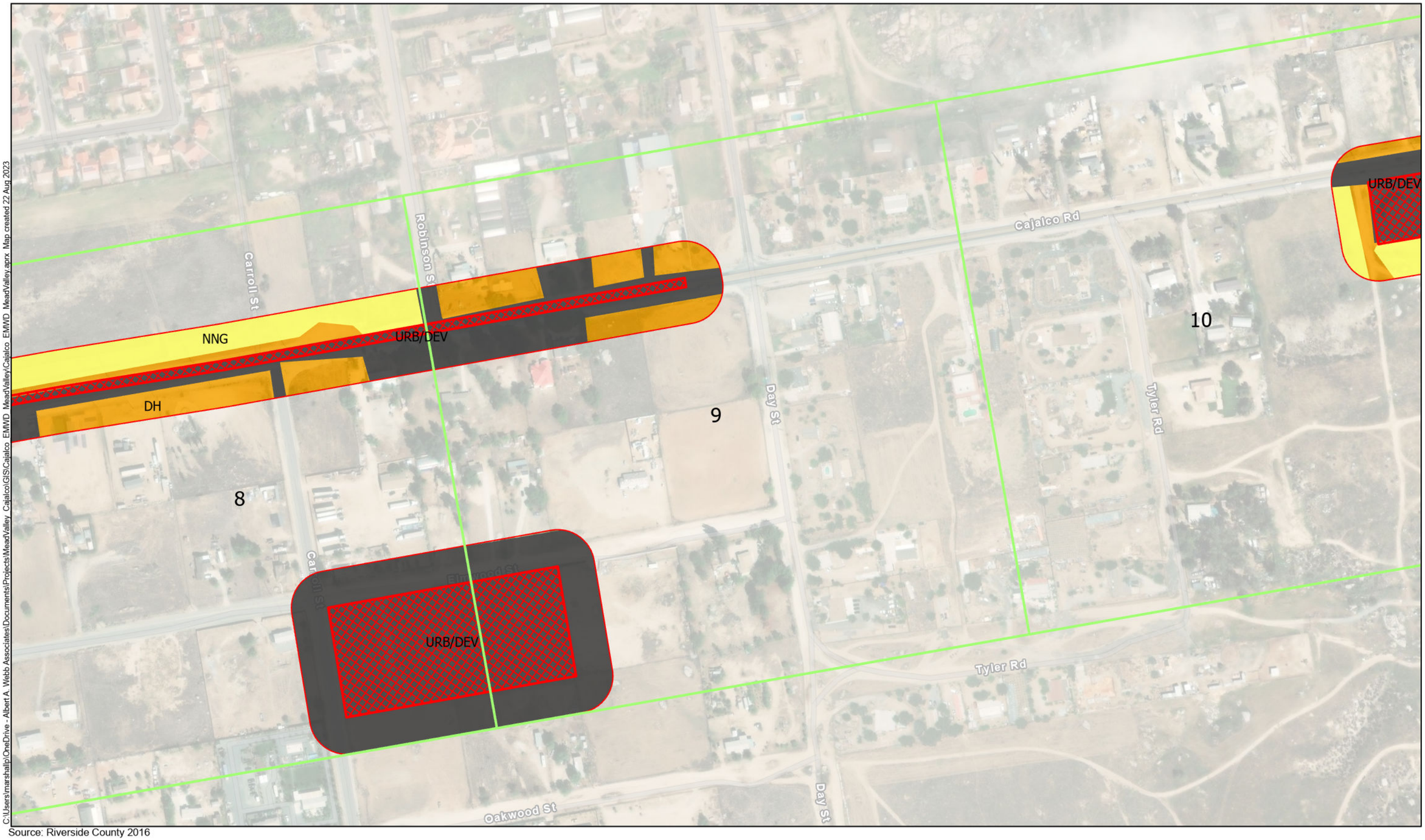


Figure 8H- Project Impacts

Mead Valley Cajalco Sewer Project

ALBERT A. WEBB ASSOCIATES



Source: Riverside County 2016

0 90 180 360 Feet

Legend

- Temporary Impacts
- Biological Study Area (BSA)
- Urban/Developed (URB/DEV)
- Non Native Grassland (NNG)
- Disturbed Habitat (DH)

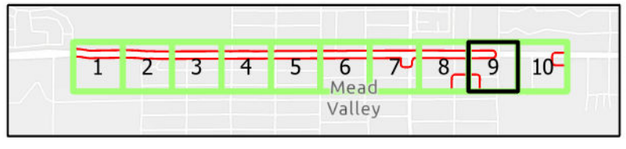
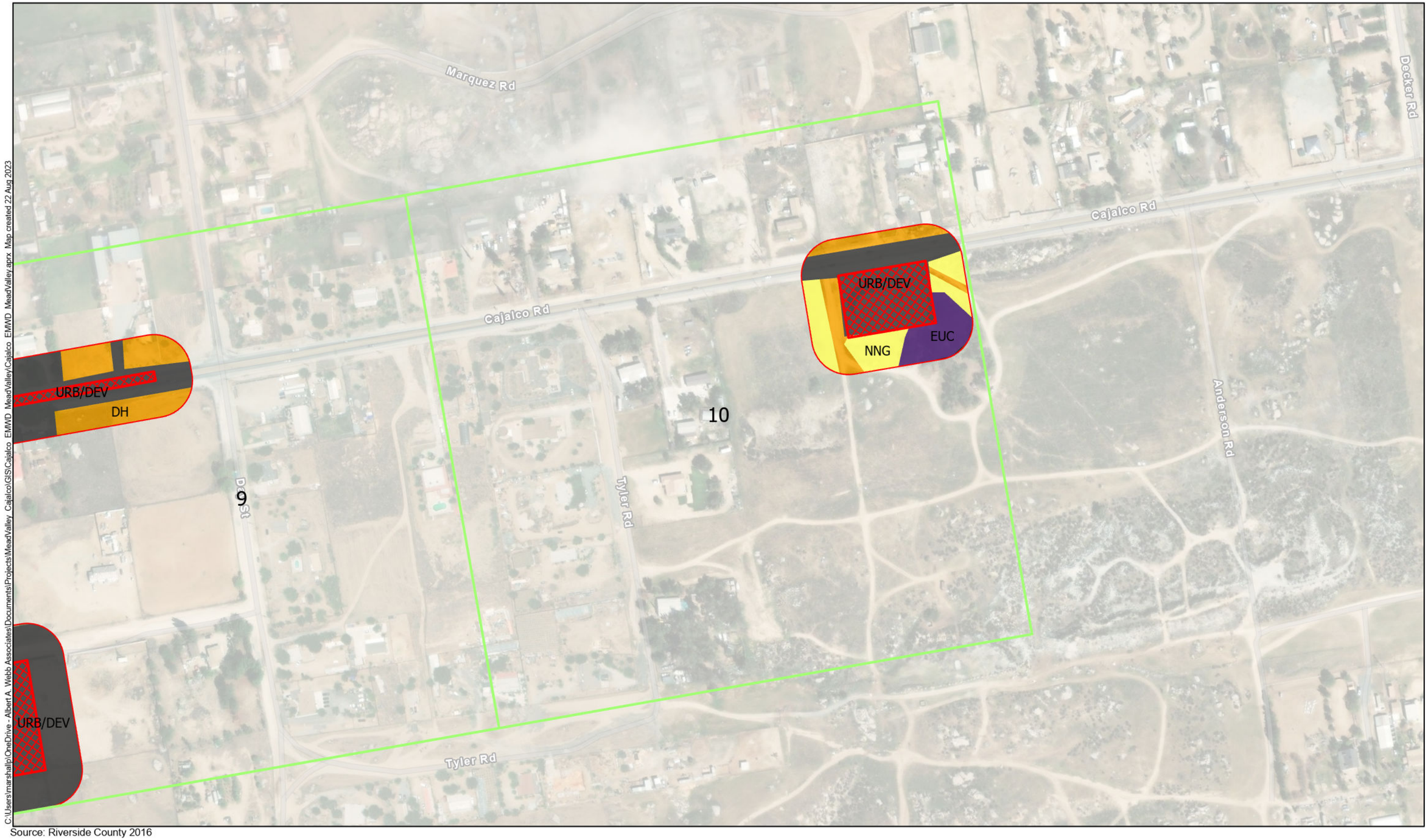


Figure 8I- Project Impacts

Mead Valley Cajalco Sewer Project

ALBERT A. WEBB ASSOCIATES



Source: Riverside County 2016

0 90 180 360 Feet

Legend

- Temporary Impacts
- Biological Study Area (BSA)
- Eucalyptus Woodland (EUC)
- Urban/Developed (URB/DEV)
- Non Native Grassland (NNG)
- Disturbed Habitat (DH)

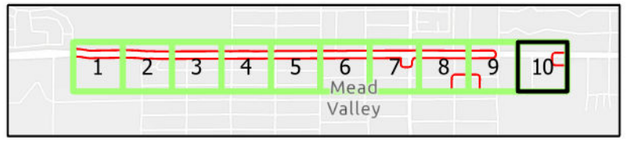
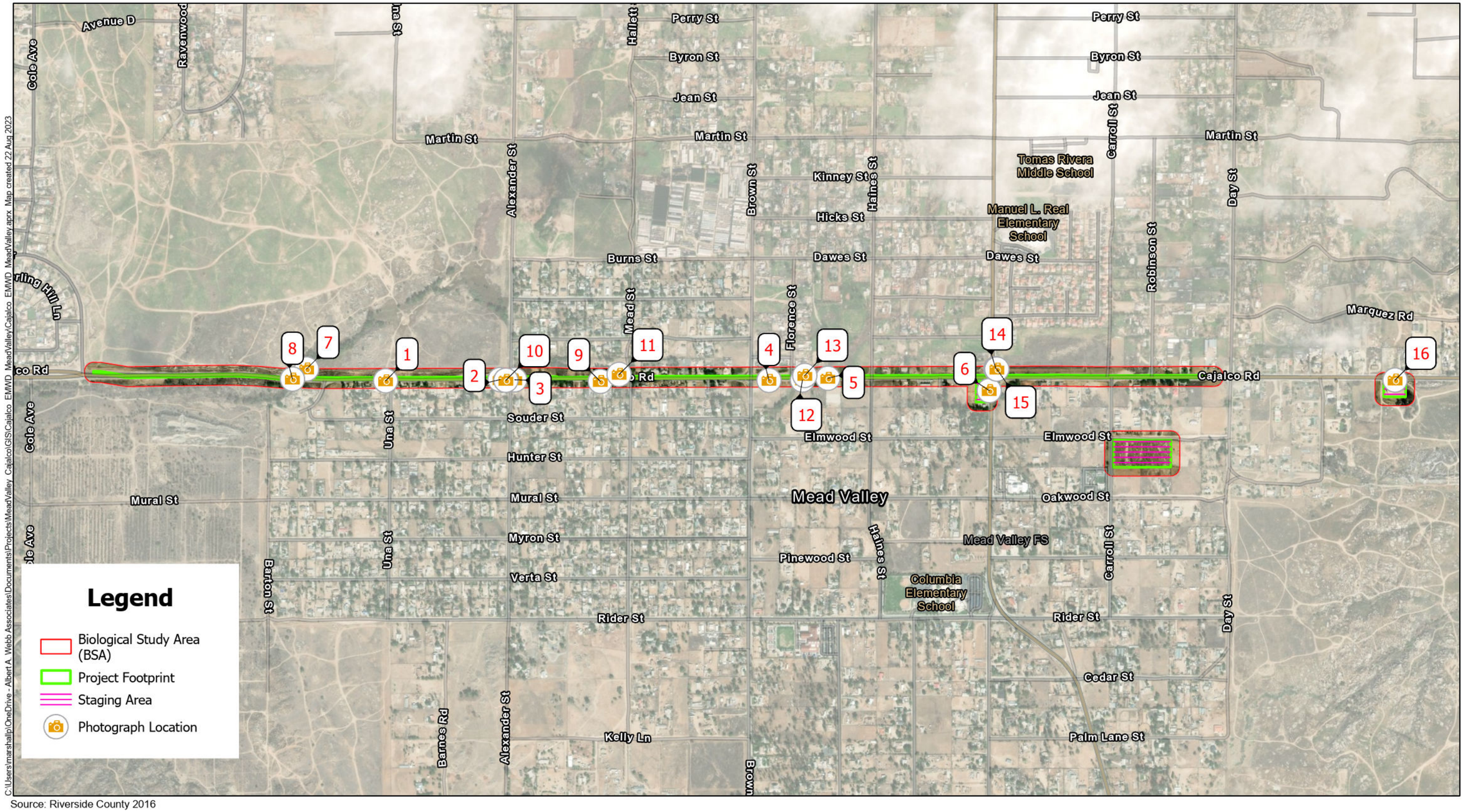


Figure 8J- Project Impacts
Mead Valley Cajalco Sewer Project

ALBERT A. WEBB ASSOCIATES

APPENDIX B



Source: Riverside County 2016

Appendix B- Photo Index

Mead Valley Cajalco Sewer Project

ALBERT A. WEBB ASSOCIATES

Albert A. Webb Associates PHOTOGRAPHIC RECORD	
Client: EMWD	**Job Number:** 2022-0203
Site Name: Mead Valley Cajalco Sewer Project	**Location:** County of Riverside CA
Photographer: Marshall Paymard	**Date:** April 20, 2023

Photograph No. 1

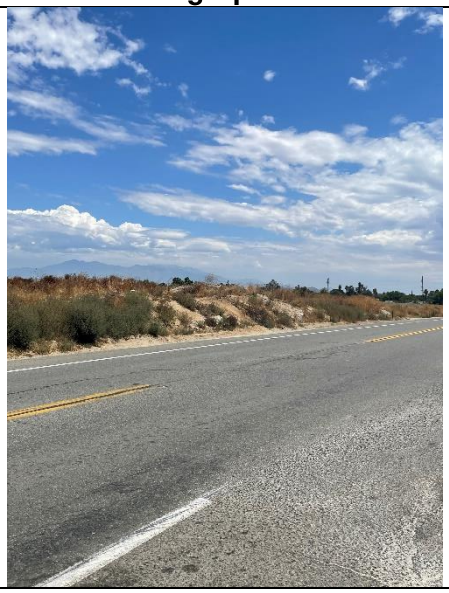


Photo 1: Facing northeast in the BSA.

Photograph No. 2

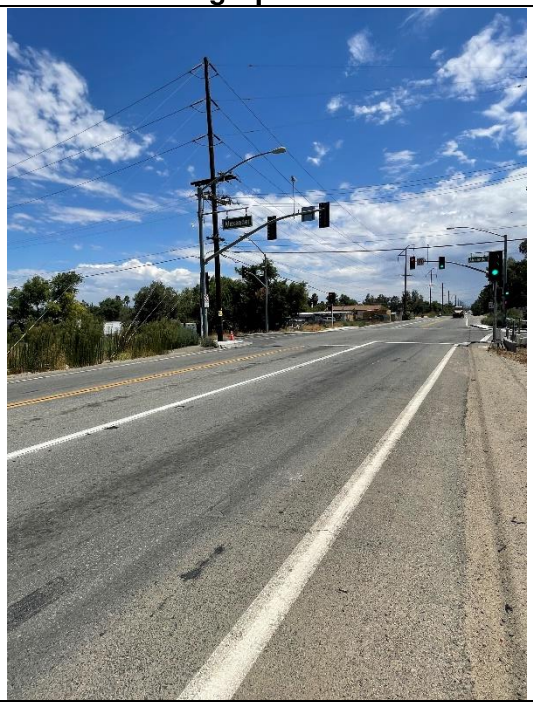


Photo 2: Facing east in the BSA.

Albert A. Webb Associates PHOTOGRAPHIC RECORD	
Client: EMWD	**Job Number:** 2022-0203
Site Name: Mead Valley Cajalco Sewer Project	**Location:** County of Riverside CA
Photographer: Marshall Paymard	**Date:** April 20, 2023

Photograph No. 3



Photo 3 Facing northeast in the BSA.

Photograph No. 4

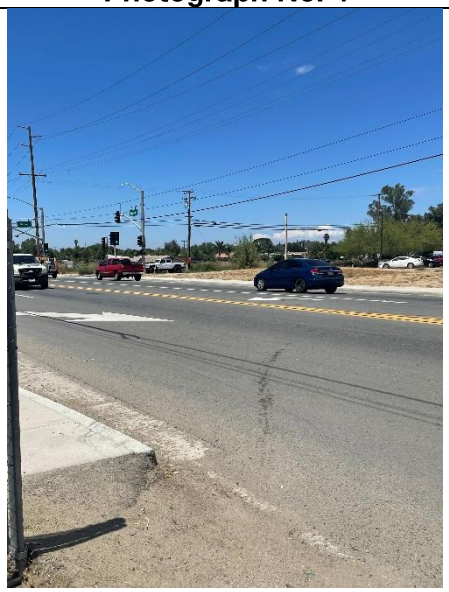


Photo 4: Facing southwest in the BSA.

Albert A. Webb Associates PHOTOGRAPHIC RECORD	
Client: EMWD	**Job Number:** 2022-0203
Site Name: Mead Valley Cajalco Sewer Project	**Location:** County of Riverside CA
Photographer: Marshall Paymard	**Date:** April 20, 2023

Photograph No. 5

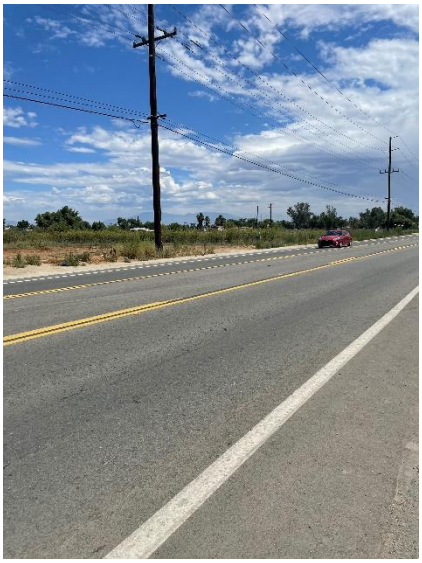


Photo 5: Facing northeast in the BSA.

Photograph No. 6

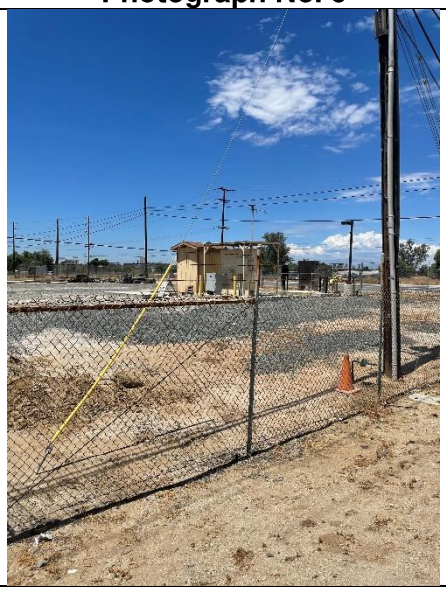


Photo 6: Facing southwest towards staging areas.

Albert A. Webb Associates PHOTOGRAPHIC RECORD	
Client: EMWD	**Job Number:** 2022-0203
Site Name: Mead Valley Cajalco Sewer Project	**Location:** County of Riverside CA
Photographer: Marshall Paymard	**Date:** April 20, 2023

Photograph No. 7

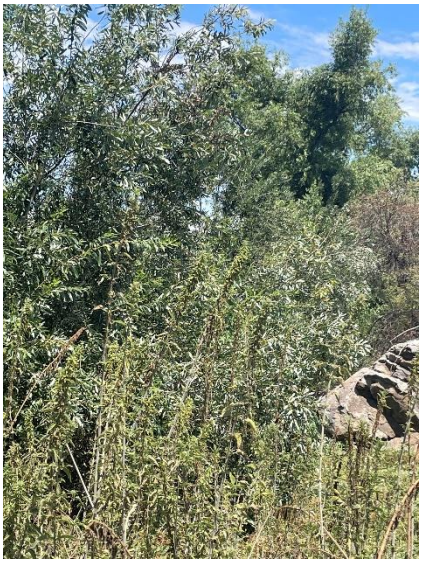


Photo 7: Facing north in the BSA.

Photograph No. 8



Photo 8: Facing south in the BSA.

Photograph No. 9

Photo 9: Facing northeast in staging area.
Photograph No. 10

Photo 10: Facing east in the BSA (Feature D)

Photograph No. 11

Photo11: Facing northeast in BSA (Feature E)
Photograph No. 12

Photo 12: Facing south (Feature G)

Photograph No. 13



Photo 13: Facing east (Feature G)

Photograph No. 14



Photo 14: Facing east (Feature I)

Photograph No. 15

Photo 15: Facing south (Feature I)
Photograph No. 16

Photo 16: Facing south (staging area)

APPENDIX C

APPENDIX C-Wildlife Species Potential to Occur Table

Species	Status: Federal/State/CDFW*	Habitat/Micro Habitat	Potential to Occur
Amphibians			
Spea hammondii western spadefoot	None/SSC	Cismontane woodland, Coastal scrub, Valley & foothill grassland, Vernal pool, Wetland. Vernal pools are essential for breeding and egg-laying.	No suitable habitat is present.
Birds			
Accipiter cooperii cooper's hawk	None/WL	Cismontane woodland, riparian forest, riparian woodland, upper montane coniferous forest. Nest sites mainly in riparian growths of deciduous trees, as in canyon bottoms on river flood-plains; also, live oaks.	No suitable habitat is present.
Agelaius tricolor *tricolored* blackbird	None/Threatened	Freshwater marsh, marsh & swamp, swamp, wetland. Requires open water, protected nesting substrate, and foraging area with insect prey within a few km of the colony.	No suitable habitat is present.
Aimophila ruficeps canescens southern California rufous-crowned sparrow	None/WL	Chaparral, coastal scrub. frequents relatively steep, often rocky hillsides with grass and forb patches.	No suitable habitat is present.
Aquila chrysaetos golden eagle	None/FP	Broadleaved upland forest, cismontane woodland, coastal prairie, great basin grassland, great basin scrub, lower montane coniferous forest, pinon & juniper woodlands, upper montane coniferous forest, valley & foothill grassland. Cliff-walled canyons provide nesting habitat in most parts of range; also, large trees in open areas.	No suitable habitat is present.

APPENDIX C-Wildlife Species Potential to Occur Table

Artemisiospiza belli belli Bell's sparrow	None/WL	Chaparral, coastal scrub.	No suitable habitat is present.
Asio otus long-eared owl	None/SSC	Cismontane woodland, great basin scrub, riparian forest, riparian woodland, upper montane coniferous forest. Require adjacent open land, productive of mice and the presence of old nests of crows, hawks, or magpies for breeding.	No suitable habitat is present.
Athene cunicularia burrowing owl	None/SSC	Coastal prairie, coastal scrub, great basin grassland, great basin scrub, Mojavean desert scrub, Sonoran desert scrub, valley & foothill grassland. Subterranean nester, dependent upon burrowing mammals, most notably, the California ground squirrel.	No suitable habitat is present in the Project footprint. Focused surveys conducted within 500-feet of Project. Species is absent.
Buteo regalis ferruginous hawk	None/WL	Great Basin grassland, great basin scrub, pinon & juniper woodlands, valley & foothill grassland.	No suitable habitat is present.
Buteo swainsoni Swainson's hawk	None/Threatened	Great Basin grassland, riparian forest, riparian woodland, valley & foothill grassland. Requires adjacent suitable foraging areas such as grasslands, or alfalfa or grain fields supporting rodent populations.	No suitable habitat is present.
Charadrius nivosus nivosus western snowy plover	Threatened/SSC	Great Basin standing waters, Sand shore, Wetland. Needs sandy, gravelly or friable soils for nesting.	No suitable habitat is present.

Coccyzus americanus occidentalis western yellow-billed cuckoo	Threatened/Endangered	Riparian forest. Nests in riparian jungles of willow, often mixed with cottonwoods, with lower story of blackberry, nettles, or wild grape.	No suitable habitat is present.
Coturnicops noveboracensis yellow rail	None/SSC	Freshwater marsh, meadow & seep. Freshwater marshlands.	No suitable nesting is habitat present.
Elanus leucurus white-tailed kite	None/FP	Cismontane woodland, marsh & swamp, Riparian woodland, valley & foothill grassland, wetland. Open grasslands, meadows, or marshes for foraging close to isolated, dense-topped trees for nesting and perching.	No suitable nesting is habitat present.
Eremophila alpestris actia California horned lark	None/WL	Marine intertidal & splash zone communities, meadow & seep. Short-grass prairie, "bald" hills, mountain meadows, open coastal plains, fallow grain fields, alkali flats.	No suitable habitat is present.
Haliaeetus leucocephalus bald eagle	Delisted/Endangered,FP	Lower montane coniferous forest, old growth. Nests in large, old-growth, or dominant live tree with open branches, especially ponderosa pine. Roosts communally in winter.	No suitable habitat is present.
Icteria virens yellow-breasted chat	None/SSC	Riparian forest, riparian scrub, riparian woodland. nests in low, dense riparian, consisting of willow, blackberry, wild grape; forages and nests within 10 ft of ground.	Not detected during focused LBVI Surveys. Presumed Absent.
Lanius ludovicianus loggerhead shrike	None/SSC	Broadleaved upland forest, desert wash, Joshua tree woodland, Mojavean desert scrub, pinon & juniper woodlands, riparian woodland, Sonoran desert scrub. Prefers open country for hunting, with perches for scanning, and fairly dense shrubs and brush for nesting.	No suitable habitat is present.

Laterallus jamaicensis coturniculus California black rail	None/Threatened,FP	Brackish marsh, freshwater marsh, marsh & swamp, salt marsh, wetland. Needs water depths of about 1 inch that do not fluctuate during the year and dense vegetation for nesting habitat.	No suitable nesting is habitat present.
Pandion haliaetus osprey	None/ WL	Riparian forest. Large nests built in tree-tops within 15 miles of a good fish-producing body of water.	No suitable habitat is present.
Plegadis chihi white-faced ibis	None/WL	Marsh & swamp, wetland. Dense tule thickets for nesting, interspersed with areas of shallow water for foraging.	No suitable habitat is present.
Polioptila californica californica coastal California gnatcatcher	Threatened/SSC	Coastal bluff scrub, Coastal scrub. Low, coastal sage scrub in arid washes, on mesas and slopes.	No suitable habitat is present.
Setophaga petechia yellow warbler	None/SSC	Riparian forest, riparian scrub, riparian woodland. Frequently found nesting and foraging in willow shrubs and thickets, and in other riparian plants including cottonwoods, sycamores, ash, and alders.	Not detected during focused LBVI Surveys. Presumed Absent.
Spinus lawrencei Lawrence's goldfinch	None/None	Broadleaved upland forest, chaparral, Pinon & juniper woodlands, Riparian woodland. Closely associated with oaks.	Not detected during focused LBVI Surveys. Presumed Absent.
Vireo bellii pusillus least Bell's vireo	Endangered/Endangered	Riparian forest, riparian scrub, riparian woodland. Nests placed along margins of bushes or on twigs projecting into pathways, usually willow*, Baccharis*, mesquite.	Focused surveys conducted. LBVI is present outside of Project footprint.
Crustaceans			
Streptocephalus woottoni Riverside fairy shrimp	Endangered/None	Coastal scrub, valley & foothill grassland, vernal pool, wetland. Inhabit seasonally astatic pools filled by winter/spring rains. Hatch in warm water later in the season.	No suitable habitat is present.

APPENDIX C-Wildlife Species Potential to Occur Table

Fish			
Catostomus santaanae Santa Ana sucker	Threatened/None	Aquatic, south coast flowing waters. Habitat generalists, but prefer sand-rubble-boulder bottoms, cool, clear water, and algae.	No suitable habitat is present.
Gila orcuttii arroyo chub	None/SSC	Aquatic, south coast flowing waters. Slow water stream sections with mud or sand bottoms. Feeds heavily on aquatic vegetation and associated invertebrates.	No suitable habitat is present.
Oncorhynchus mykiss irideus pop 10 steelhead - southern California DPS	Endangered/Candidate Endangered	Aquatic, south coast flowing waters. Southern steelhead likely have greater physiological tolerances to warmer water and more variable conditions.	No suitable habitat is present.
Rhinichthys osculus ssp.8 Santa Ana speckled dace	None/SSC	Aquatic, south coast flowing waters. Requires permanent flowing streams with summer water temps of 17-20 C. Usually inhabits shallow cobble and gravel riffles.	No suitable habitat is present.
Insect			
Bombus crotchii Crotch bumble bee	None/Candidate Endangered	Grasslands, shrublands, and chapparal. Food plant genera include *Antirrhinum, Phacelia, Clarkia, Dendromecon, Eschscholzia, and Eriogonum*.	No suitable habitat is present.
Ceratochrysis longimala Desert cuckoo wasp	None/None	Arid regions.	No suitable habitat is present.
Cicindela senilis frosti senile tiger beetle	None/None	Mud shore/flats, wetland. Inhabits dark-colored mud in the lower zone and dried salt pans in the upper zone.	No suitable habitat is present.
Eugnosta busckana Busck's gallmoth	None/None	Coastal dunes, coastal scrub.	No suitable habitat is present.
Euphydryas editha quino quino checkerspot butterfly	Endangered/None	Chaparral, coastal scrub. Hills and mesas near the coast. Need high densities of food plants *Plantago erecta, P. insularis*, and *Orthocarpus purpurescens*.	No suitable habitat is present.

Neolarra alba white cuckoo bee	None/None	(blank). Cleptoparasitic in the nests of perdita bees.	No suitable habitat is present.
Mammals			
Chaetodipus californicus femoralis Dulzura pocket mouse	None/ SSC	Chaparral, Coastal scrub, valley & foothill grassland. Attracted to grass-chaparral edges.	No suitable habitat is present.
Chaetodipus fallax fallax northwestern San Diego pocket mouse	None/ SSC	Chaparral, coastal scrub. Sandy, herbaceous areas, usually in association with rocks or coarse gravel.	No suitable habitat is present.
Dipodomys merriami parvus San Bernardino kangaroo rat	Endangered/ Candidate Endangered	Coastal scrub. Needs early to intermediate seral stages.	No suitable habitat is present.
Dipodomys stephensi Stephens' kangaroo rat	Threatened/Threatened	Coastal scrub, valley & foothill grassland. Prefers buckwheat, chamise, brome grass and filaree. Will burrow into firm soil.	No suitable habitat is present.
Eumops perotis californicus western mastiff bat	None /SSC	Chaparral, cismontane woodland, Coastal scrub, valley & foothill grassland. Roosts in crevices in cliff faces, high buildings, trees and tunnels.	No suitable roosting is habitat present.
Lasiurus xanthinus western yellow bat	None /SSC	Desert wash. Roosts in trees, particularly palms. Forages over water and among trees.	No suitable roosting is habitat present.
Lepus californicus bennettii San Diego black-tailed jackrabbit	None/None	Coastal scrub. Coastal sage scrub habitats in Southern California.	No suitable habitat is present.
Myotis yumanensis Yuma myotis	None/None	Lower montane coniferous forest, riparian forest, riparian woodland, Upper montane coniferous forest. Distribution is closely tied to bodies of water. Maternity colonies in caves, mines, buildings or crevices.	No suitable habitat is present.
Neotoma lepida intermedia San Diego desert woodrat	None /SSC	Coastal scrub. Moderate to dense canopies preferred. They are particularly abundant in rock outcrops, rocky cliffs, and slopes.	No suitable habitat is present.

Nyctinomops femorosaccus pocketed free-tailed bat	None/ SSC	Joshua tree woodland, Pinon & juniper woodlands, riparian scrub, Sonoran desert scrub. Rocky areas with high cliffs.	No suitable roosting is habitat present.
Onychomys torridus ramona southern grasshopper mouse	None/ SSC	Chenopod scrub.	No suitable habitat is present.
Perognathus longimembris brevinasus Los Angeles pocket mouse	None /SSC	Coastal scrub. Open ground with fine, sandy soils. May not dig extensive burrows, hiding under weeds and dead leaves instead.	No suitable habitat is present.
Taxidea taxus American badger	None/SSC	Alkali marsh, broadleaved upland forest, chaparral, chenopod scrub, cismontane woodland, closed-cone coniferous forest, coastal prairie, coastal scrub, desert dunes, desert wash, freshwater marsh, grassland, lower montane coniferous forest, Mojavean desert scrub, Montane dwarf scrub, Pavement plain, Needs sufficient food, friable soils and open, uncultivated ground. Preys on burrowing rodents. Digs burrows.	No suitable habitat is present.
Reptiles			
Anniella stebbinsi Southern California legless lizard	None /SSC	Broadleaved upland forest, chaparral, coastal dunes, coastal scrub. Variety of habitats; generally in moist, loose soil. They prefer soils with a high moisture content.	No suitable habitat is present.
Arizona elegans occidentalis California glossy snake	None /SSC	Generalist reported from a range of scrub and grassland habitats, often with loose or sandy soils.	No suitable habitat is present.

Aspidoscelis hyperythra orange-throated whiptail	None /WL	Chaparral, cismontane woodland, coastal scrub. Prefers washes and other sandy areas with patches of brush and rocks. Perennial plants necessary for its major food: termites.	No suitable habitat is present.
Aspidoscelis tigris stejnegeri coastal whiptail	None /SSC	Ground may be firm soil, sandy, or rocky.	No suitable habitat is present.
Crotalus ruber red-diamond rattlesnake	None /SSC	Chaparral, Mojavean desert scrub, Sonoran desert scrub. Occurs in rocky areas and dense vegetation. Needs rodent burrows, cracks in rocks or surface cover objects.	No suitable habitat is present.
Diadophis punctatus modestus San Bernardino ringneck snake	None/ None	Avoids moving through open or barren areas by restricting movements to areas of surface litter or herbaceous veg.	No suitable habitat is present.
Emys marmorata western pond turtle	None/SSC	Aquatic, Artificial flowing waters, Klamath/North coast flowing waters, Klamath/North coast standing waters, Marsh & swamp, Sacramento/San Joaquin flowing waters, Sacramento/San Joaquin standing waters, South coast flowing waters, South coast standing waters, Wetland. Needs basking sites and suitable (sandy banks or grassy open fields) upland habitat up to 0.5 km from water for egg-laying.	No suitable habitat is present.
Phrynosoma blainvillii coast horned lizard	None/SSC	Chaparral, cismontane woodland, coastal bluff scrub, coastal scrub, desert wash, pinon & juniper woodlands, riparian scrub, riparian woodland, valley & foothill grassland. Open areas for sunning, bushes for cover, patches of loose soil for burial, and abundant supply of ants and other insects.	No suitable habitat is present.

Salvadora hexalepis virgultea coast patch-nosed snake	None /SSC	Coastal scrub. Require small mammal burrows for refuge and overwintering sites.	No suitable habitat is present.
State/CDFW Classification • FP: Fully Protected • S: Sensitive • SSC: Species of Special Concern • WL: Watch List			

APPENDIX C-Special-Status Plants Evaluated for the Project Site

Scientific Name /Common Name	CRPR/CESA/FESA	Blooming Period/ Elevation Range (AMSL; in feet)	Habitat/Micro Habitat	Occurrence
Abronia villosa var. aurita chaparral sand-verbena	1B.1/None/None	(Jan)Mar-Sep/ 245-5250	Chaparral, Coastal scrub, Desert dunes. Sandy substrates.	No suitable habitat. Not expected to occur.
Allium marvinii Yucaipa onion	1B.2/None/None	Apr-May/ 2495-3495	Chaparral (clay, openings).	No suitable habitat. Not expected to occur.
Allium munzii Munz's onion	1B.1/CT/FE	Mar-May/ 975-3510	Chaparral, Cismontane woodland, Coastal scrub, Pinyon and juniper woodland, Valley and foothill grassland. Clay, Mesic	No suitable habitat. Not expected to occur.
Ambrosia pumila San Diego ambrosia	1B.1/None/FE	Apr-Oct/ 65-1360	Chaparral, Coastal scrub, Valley and foothill grassland, Vernal pools. Alkaline (sometimes), Clay (sometimes), Disturbed areas (often), Loam (sometimes), Sandy (sometimes)	No suitable habitat. Not expected to occur.
Arctostaphylos rainbowensis Rainbow manzanita	1B.1/None/None	Dec-Mar/ 675-2200	Chaparral.	No suitable habitat. Not expected to occur.

APPENDIX C-Special-Status Plants Evaluated for the Project Site

Arenaria paludicola marsh sandwort	1B.1/CE/FE	May-Aug/ 10-560	Marshes and swamps (brackish, freshwater). Openings, Sandy	No suitable habitat. Not expected to occur.
Artemisia palmeri San Diego sagewort	4.2/None/None	(Feb)May-Sep/ 15-3000	Chaparral, Coastal scrub, Riparian forest, Riparian scrub, Riparian woodland. Mesic, Sandy	No suitable habitat. Not expected to occur.
Asplenium vespertinum western spleenwort	4.2/None/None	Feb-Jun/ 590-3280	Chaparral, Cismontane woodland, Coastal scrub. Rocky	No suitable habitat. Not expected to occur.
Atriplex coronata var. notatior San Jacinto Valley crownscale	1B.1/None/FE	Apr-Aug/ 455-1640	Playas, Valley and foothill grassland (mesic), Vernal pools. Alkaline	No suitable habitat. Not expected to occur.
Atriplex parishii Parish's brittlescale	1B.1/None/None	Jun-Oct/ 80-6235	Chenopod scrub, Playas, Vernal pools. Alkaline	No suitable habitat. Not expected to occur.
Atriplex serenana var. davidsonii Davidson's saltscale	1B.2/None/None	Apr-Oct/ 35-655	Coastal bluff scrub, Coastal scrub. Alkaline	No suitable habitat. Not expected to occur.
Berberis nevinii Nevin's barberry	1B.1/CE/FE	(Feb)Mar-Jun/ 230-2705	Chaparral, Cismontane woodland, Coastal scrub, Riparian scrub. Gravelly (sometimes), Sandy (sometimes)	No suitable habitat. Not expected to occur.

Brodiaea filifolia thread-leaved brodiaea	1B.1/CE/FT	Mar-Jun/ 80-3675	Chaparral (openings), Cismontane woodland, Coastal scrub, Playas, Valley and foothill grassland, Vernal pools. Clay (often)	No suitable habitat. Not expected to occur.
Calochortus plummerae Plummer's mariposa-lily	4.2/None/None	May-Jul/ 330-5580	Chaparral, Cismontane woodland, Coastal scrub, Lower montane coniferous forest, Valley and foothill grassland. Granitic, Rocky	No suitable habitat. Not expected to occur.
Calochortus weedii var. intermedius intermediate mariposa-lily	1B.2/None/None	May-Jul/ 345-2805	Chaparral, Coastal scrub, Valley and foothill grassland. Rocky	No suitable habitat. Not expected to occur.
Carex buxbaumii Buxbaum's sedge	4.2/None/None	Mar-Aug/ 10-10825	Bogs and fens, Marshes and swamps, Meadows and seeps (mesic).	No suitable habitat. Not expected to occur.
Caulanthus simulans Payson's jewelflower	4.2/None/None	(Feb)Mar-May(Jun)/ 295-7220	Chaparral, Coastal scrub. Granitic, Sandy	No suitable habitat. Not expected to occur.
Centromadia pungens ssp. laevis smooth tarplant	1B.1/None/None	Apr-Sep/ 0-2100	Chenopod scrub, Meadows and seeps, Playas, Riparian woodland, Valley and foothill grassland. Alkaline	No suitable habitat. Not expected to occur.

APPENDIX C-Special-Status Plants Evaluated for the Project Site

Chloropyron maritimum ssp. maritimum salt marsh bird's-beak	1B.2/CE/FE	May-Oct(Nov)/ 0-100	Coastal dunes, Marshes and swamps (coastal salt).	No suitable habitat. Not expected to occur.
Chorizanthe leptotheca Peninsular spineflower	4.2/None/None	May-Aug/ 985-6235	Chaparral, Coastal scrub, Lower montane coniferous forest. Granitic	No suitable habitat. Not expected to occur.
Chorizanthe parryi var. parryi Parry's spineflower	1B.1/None/None	Apr-Jun/ 900-4005	Chaparral, Cismontane woodland, Coastal scrub, Valley and foothill grassland. Openings, Rocky (sometimes), Sandy (sometimes)	No suitable habitat. Not expected to occur.
Chorizanthe polygonoides var. longispina long-spined spineflower	1B.2/None/None	Apr-Jul/ 100-5020	Chaparral, Coastal scrub, Meadows and seeps, Valley and foothill grassland, Vernal pools. Clay (often)	No suitable habitat. Not expected to occur.
Chorizanthe xanti var. leucotheca white-bracted spineflower	1B.2/None/None	Apr-Jun/ 985-3935	Coastal scrub (alluvial fans), Mojavean desert scrub, Pinyon and juniper woodland. Gravelly (sometimes), Sandy (sometimes)	No suitable habitat. Not expected to occur.

APPENDIX C-Special-Status Plants Evaluated for the Project Site

Clinopodium chandleri San Miguel savory	1B.2/None/None	Mar-Jul/ 395-3525	Chaparral, Cismontane woodland, Coastal scrub, Riparian woodland, Valley and foothill grassland. Gabbroic (sometimes), Rocky (sometimes)	No suitable habitat. Not expected to occur.
Convolvulus simulans small-flowered morning-glory	4.2/None/None	Mar-Jul/ 100-2430	Chaparral (openings), Coastal scrub, Valley and foothill grassland. Clay, Seeps, Serpentinite	No suitable habitat. Not expected to occur.
Deinandra paniculata paniculate tarplant	4.2/None/None	(Mar)Apr-Nov/ 80-3085	Coastal scrub, Valley and foothill grassland, Vernal pools. Sandy (sometimes), Vernally Mesic (usually)	No suitable habitat. Not expected to occur.
Diplacus clevelandii Cleveland's bush monkeyflower	4.2/None/None	Apr-Jul/ 1475-6560	Chaparral, Cismontane woodland, Lower montane coniferous forest. Disturbed areas (often), Gabbroic, Openings, Rocky	No suitable habitat. Not expected to occur.
Dodecahema leptoceras slender-horned spineflower	1B.1/CE/FE	Apr-Jun/ 655-2495	Chaparral, Cismontane woodland, Coastal scrub (alluvial fans). Sandy	No suitable habitat. Not expected to occur.

Dudleya multicaulis many-stemmed dudleya	1B.2/None/None	Apr-Jul/ 50-2590	Chaparral, Coastal scrub, Valley and foothill grassland. Clay (often)	No suitable habitat. Not expected to occur.
Dudleya viscida sticky dudleya	1B.2/None/None	May-Jun/ 35-1805	Chaparral, Cismontane woodland, Coastal bluff scrub, Coastal scrub. Rocky	No suitable habitat. Not expected to occur.
Eriastrum densifolium ssp. sanctorum Santa Ana River woollystar	1B.1/CE/FE	Apr-Sep/ 300-2000	Chaparral, Coastal scrub (alluvial fans). Gravelly (sometimes), Sandy (sometimes)	No suitable habitat. Not expected to occur.
Erythranthe diffusa Palomar monkeyflower	4.3/None/None	Apr-Jun/ 4005-6005	Chaparral, Lower montane coniferous forest. Gravelly (sometimes), Sandy (sometimes)	No suitable habitat. Not expected to occur.
Harpagonella palmeri Palmer's grapplinghook	4.2/None/None	Mar-May/ 65-3135	Chaparral, Coastal scrub, Valley and foothill grassland. Clay, Openings	No suitable habitat. Not expected to occur.
Hesperocyparis forbesii Tecate cypress	1B.1/None/None	/ 260-4920	Chaparral, Closed-cone coniferous forest. Clay, Gabbroic (sometimes)	No suitable habitat. Not expected to occur.
Hordeum intercedens vernal barley	3.2/None/None	Mar-Jun/ 15-3280	Coastal dunes, Coastal scrub, Valley and foothill grassland (depressions, saline flats), Vernal pools.	No suitable habitat. Not expected to occur.

APPENDIX C-Special-Status Plants Evaluated for the Project Site

Horkelia cuneata var. puberula mesa horkelia	1B.1/None/None	Feb-Jul(Sep)/ 230-2660	Chaparral (maritime), Cismontane woodland, Coastal scrub. Gravelly (sometimes), Sandy (sometimes)	No suitable habitat. Not expected to occur.
Juglans californica Southern California black walnut	4.2/None/None	Mar-Aug/ 165-2955	Chaparral, Cismontane woodland, Coastal scrub, Riparian woodland.	No suitable habitat. Not expected to occur.
Lasthenia glabrata ssp. coulteri Coulter's goldfields	1B.1/None/None	Feb-Jun/ 5-4005	Marshes and swamps (coastal salt), Playas, Vernal pools.	No suitable habitat. Not expected to occur.
Lepechinia cardiophylla heart-leaved pitcher sage	1B.2/None/None	Apr-Jul/ 1705-4495	Chaparral, Cismontane woodland, Closed-cone coniferous forest.	No suitable habitat. Not expected to occur.
Lepidium virginicum var. robinsonii Robinson's pepper-grass	4.3/None/None	Jan-Jul/ 5-2905	Chaparral, Coastal scrub.	No suitable habitat. Not expected to occur.
Lilium humboldtii ssp. ocellatum ocellated Humboldt lily	4.2/None/None	Mar-Jul(Aug)/ 100-5905	Chaparral, Cismontane woodland, Coastal scrub, Lower montane coniferous forest, Riparian woodland. Openings	No suitable habitat. Not expected to occur.

APPENDIX C-Special-Status Plants Evaluated for the Project Site

Microseris douglasii ssp. platycarpha small-flowered microseris	4.2/None/None	Mar-May/ 50-3510	Cismontane woodland, Coastal scrub, Valley and foothill grassland, Vernal pools. Clay	No suitable habitat. Not expected to occur.
Monardella hypoleuca ssp. intermedia intermediate monardella	1B.3/None/None	Apr-Sep/ 1310-4100	Chaparral, Cismontane woodland, Lower montane coniferous forest (sometimes).	No suitable habitat. Not expected to occur.
Monardella macrantha ssp. Hallii Hall's monardella	1B.3/None/None	Jun-Oct/ 2395-7200	Broadleafed upland forest, Chaparral, Cismontane woodland, Lower montane coniferous forest, Valley and foothill grassland.	No suitable habitat. Not expected to occur.
Myosurus minimus ssp. apus little mousetail	3.1/None/None	Mar-Jun/ 65-2100	Valley and foothill grassland, Vernal pools (alkaline).	No suitable habitat. Not expected to occur.
Navarretia fossalis spreading navarretia	1B.1/None/FT	Apr-Jun/ 100-2150	Chenopod scrub, Marshes and swamps (shallow freshwater), Playas, Vernal pools.	No suitable habitat. Not expected to occur.
Orcuttia californica California Orcutt grass	1B.1/CE/FE	Apr-Aug/ 50-2165	Vernal pools.	No suitable habitat. Not expected to occur.
Phacelia keckii Santiago Peak phacelia	1B.3/None/None	May-Jul/ 1790-5250	Chaparral, Closed-cone coniferous forest.	No suitable habitat. Not expected to occur.

APPENDIX C-Special-Status Plants Evaluated for the Project Site

Phacelia stellaris Brand's star phacelia	1B.1/None/None	Mar-Jun/ 5-1310	Coastal dunes, Coastal scrub.	No suitable habitat. Not expected to occur.
Polygala cornuta var. fishiae Fish's milkwort	4.3/None/None	May-Aug/ 330-3280	Chaparral, Cismontane woodland, Riparian woodland.	No suitable habitat. Not expected to occur.
Pseudognaphalium leucocephalum white rabbit-tobacco	2B.2/None/None	(Jul)Aug-Nov(Dec)/ 0-6890	Chaparral, Cismontane woodland, Coastal scrub, Riparian woodland. Gravelly, Sandy	No suitable habitat. Not expected to occur.
Quercus engelmannii Engelmann oak	4.2/None/None	Mar-Jun/ 165-4265	Chaparral, Cismontane woodland, Riparian woodland, Valley and foothill grassland.	No suitable habitat. Not expected to occur.
Romneya coulteri Coulter's matilija poppy	4.2/None/None	Mar-Jul(Aug)/ 65-3935	Chaparral, Coastal scrub. Burned areas (often)	No suitable habitat. Not expected to occur.
Senecio aphanactis chaparral ragwort	2B.2/None/None	Jan-Apr(May)/ 50-2625	Chaparral, Cismontane woodland, Coastal scrub. Alkaline (sometimes)	No suitable habitat. Not expected to occur.
Symphyotrichum defoliatum San Bernardino aster	1B.2/None/None	Jul-Nov/ 5-6695	Cismontane woodland, Coastal scrub, Lower montane coniferous forest, Marshes and swamps, Meadows and seeps, Valley and foothill grassland (vernally mesic). Streambanks	No suitable habitat. Not expected to occur.
Texosporium sancti-jacobi woven-spored lichen	3/None/None	na/na 195-2165	Chaparral (openings).	No suitable habitat. Not expected to occur.

APPENDIX C-Special-Status Plants Evaluated for the Project Site

Tortula californica California screw moss	1B.2/None/None	na/na 35-4790	Chenopod scrub, Valley and foothill grassland. Sandy	No suitable habitat. Not expected to occur.
Trichocoronis wrightii var. wrightii Wright's trichocoronis	2B.1/None/None	May-Sep/ 15-1425	Marshes and swamps, Meadows and seeps, Riparian forest, Vernal pools. Alkaline	No suitable habitat. Not expected to occur.
Viguiera laciniata San Diego County viguiera	4.3/None/None	Feb-Jun (Aug)/ 195-2460	Chaparral, Coastal scrub.	No suitable habitat. Not expected to occur.

CRPR-CALIFORNIA RARE PLANT RANK

1A- Plants presumed extirpated in California and either rare or extinct elsewhere

1B- Plants rare, threatened, or endangered in California and elsewhere

2A- Plants presumed extirpated in California but common elsewhere

2B- Plants rare, threatened, or endangered in California but more common elsewhere

3- Review List: Plants about which more information is needed

4- Watch List: Plants of limited distribution

0.1-Seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat)

0.2-Moderately threatened in California (20-80% occurrences threatened / moderate degree and immediacy of threat)

0.3-Not very threatened in California (less than 20% of occurrences threatened / low degree and immediacy of threat or no current threats known)

STATE DESIGNATIONS

CE-STATE ENDANGERED

FEDERAL DESIGNATION

APPENDIX C-Special-Status Plants Evaluated for the Project Site

FE-FEDERALLY ENDANGERED

FT- FEDERALLY THREATENED

APPENDIX D

Focused Burrowing Owl Survey Report

For:

Mead Valley Cajalco Sewer Project

Prepared By:

ALBERT A. WEBB ASSOCIATES

September 2023

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Introduction

This report presents the findings of focused burrowing owl survey(s) conducted by Albert A. Webb Associates (WEBB) for the Mead Valley Cajalco Sewer Project (Project) proposed by the Eastern Municipal Water District (EMWD) located in the County of Riverside, California. The purpose of this report is to provide the EMWD, resource agencies, and the public with the methods and results of the focused burrowing owl surveys conducted for the Project, as well as to ensure compliance with state and local regulations.

The proposed Project entails the construction of approximately 12,600 linear feet of 8-inch to 15-inch diameter polyvinyl chloride (PVC) or vitrified clay pipe (VCP) gravity trunk sewer pipeline as well as 4-to-5-foot manholes along Cajalco Road. The Project gravity sewer line will be located entirely within the existing right of way of Cajalco Road. Once the sewer line is completed, EWMD will then demolish and decommission the existing Clark Street Sewer Lift Station located at the intersection of Clark Street and Cajalco Road. The existing roadway is paved.

Project Site Location

The proposed Project is located in the County of Riverside, California (Figure-1 Regional Map; all figures are provided in Appendix A). The Project is primarily sited along Cajalco Expressway, approximately 2 miles west of I-215 and 5 miles east of Lake Mathews (Figure 2- Project Vicinity). The Project site falls within Sections 8, 9, 10, and 11 of Township 4 South, Range 4 West, as depicted in the Steele Peak 7.5-minute quadrangle map. Cajalco Expressway does not have Assessor Parcel Numbers (APNs) associated with it, three staging areas related to the Project can be identified by the following APNs: 318-140-030, 317-060-043, 318-120-039, and 318-120-038.

Throughout this report, the Project alignment, including the staging areas, will collectively be referred to as the "Project," unless otherwise specified.

Project Site Description

The Project site covers an area of approximately 12.81 acres and comprises three distinct land cover types and vegetation communities: urban/developed lands, disturbed habitat, and non-native grasslands. Among these communities, only one vegetation type, non-native grasslands, was found within suitable burrowing owl (BUOW) habitat located within the BUOW study area, which is defined as the Project footprint, including all areas within 500-feet of the Project footprint (Figure 3 – Burrowing Owl Survey Results). The non-native grasslands is primarily composed of species such as red-stemmed filaree (*Erodium cicutarium*), foxtail barley, London rocket (*Sisymbrium irio*), and stinknet (*Oncosiphon piluliferis*). Additionally, there are occasional patches at low percent cover of *Amsinckia spp*. and *Plagiobothrys spp*. Representative photographs of the Project are provided in Appendix B.

Burrowing Owl Biology

The burrowing owl, a small bird of prey and is primarily found in arid and open habitats. It prefers areas with short vegetation, bare ground, sloping terrain, and well-drained soils. The range of suitable burrowing owl habitats is extensive and includes diverse environments such as grasslands, deserts, and human-altered landscapes like agricultural fields, vacant lots, pastures, fallow fields, and golf courses (Klute et al., 2003). However, habitats with tall or dense cover are generally unsuitable for burrowing owls, as they require good visibility at their nest sites, likely as a protective measure against predators.

The key criterion for suitable habitat is the presence of appropriate burrows. Burrowing owls rely on underground burrows that are typically created by burrowing mammals such as California ground squirrels (*Spermophilus beecheyi*), coyotes (*Canis latrans*), and American badgers (*Taxidea taxus*) for nesting and roosting. They may also use other natural or man-made cavities like rock piles, pipes, culverts, refuse piles, or artificial burrows. Burrowing owls show a preference for nesting in areas with a high density of suitable burrows, which likely serve as escape routes for both adult and young owls (Poulin et al., 2011). Many adult burrowing owls exhibit strong fidelity to their nesting sites, returning year after year (CDFG, 2012). They have a semi-colonial behavior, often gathering with other owls in winter and forming loose colonies for nesting. The density of nests can vary depending on the availability of suitable burrows and prey resources.

Methods

The habitat assessment and focused surveys were conducted in accordance with the survey guidelines as outlined in Appendix D of the Staff Report on Burrowing Owl Mitigation (CDFG 2012). Prior to conducting the BUOW habitat assessment, WEBB consulted the California Natural Diversity Database (CNDDB) to determine the nearest BUOW occurrence(s).

Following the CNDDB search, on February 22nd, 2023, WEBB Senior Biologist, Marshall Paymard and Environmental Analyst, Virginia Waters, conducted a habitat assessment within the BUOW study area to determine whether the Project site supports suitable BUOW habitat. The surveyors slowly walked transects no greater than 20 meters apart through all areas of potentially suitable habitat located in the BUOW study area, visually searching for suitable burrows or burrow surrogates (dimensions of >11centimeters in diameter and >150 centimeters in depth), burrowing owl sign (i.e., pellets with regurgitated fur, bones, and insect parts; whitewash; or feathers), and burrowing owl individuals, with the aid of binoculars. All potentially suitable burrows observed were documented, and suitable habitat was identified. Post completion of the habitat assessment, suitable burrowing owl habitat areas were refined so that the subsequent surveys were conducted within the identified suitable habitat.

As shown in Table 1, following the habitat assessment, four subsequent surveys were conducted using the methods as described above, with at least one site visit being conducted between February 15th and April 15th, and a minimum of three survey visits being conducted at least three weeks apart, between April 15th and July 15th, with at least one visit conducted after June 15th.

Table 1. Schedule of Burrowing Owl Habitat Assessments and Focused Surveys

Date/Time	Surveyor	Type	Climatic Conditions
February 22nd 2023/ 0630-1308	Marshall Paymard, Virginia Waters	Habitat Assessment	Air Temperature: 45-60°F; Wind:0-1 miles per hour (MPH); Cloud Cover:10%
March 8th, 2023/ 0630-1006	Marshall Paymard, Virginia Waters	Focused Survey #1	Air Temperature: 48-52°F; Wind:0-1 MPH; Cloud Cover: 0%
April 20th, 2023/ 0545-1000	Marshall Paymard, Virginia Waters	Focused Survey #2	Air Temperature: 50-63°F; Wind:0-1 MPH; Cloud Cover: 0%
May 24th, 2023/ 0545-1000	Marshall Paymard, Virginia Waters	Focused Survey #3	Air Temperature: 52-66°F; Wind:0-1 MPH; Cloud Cover: 0%
June 27th, 2023/ 0630-0900	Marshall Paymard, Virginia Waters	Focused Survey #4	Air Temperature: 70°F; Wind:2-5 MPH; Cloud Cover: 0%

Results

A total of approximately 55-acres of habitat suitable for BUOW was identified within the BUOW study area (Figure 3- Burrowing Owl Survey Results). No suitable BUOW habitat, BUOW, or BUOW sign was identified within the Project footprint. Further, as shown in Table 2, no BUOW or BUOW sign was observed in the BUOW study area. A total of 79 suitable burrows were recorded within the BUOW study area (Figure 3- Burrowing Owl Survey Results), with the primary host fossorial mammal being the California ground squirrel, and several surrogate burrows being identified within crevices granitic boulder outcrops.

There are no CNDDB records of BUOW within the Project footprint or BUOW study area. The nearest BUOW record is from June 6th, 2006 (Occurrence No.882) and is located approximately 400-feet from the edge of the north-eastern BUOW study area. This record describes an observation of 14 adults and 3 or more juveniles.

Table 2. Burrowing Owl Survey Results

Date/Time	Surveyor	Type	Results
February 22nd 2023/ 0630-1308	Marshall Paymard, Virginia Waters	Habitat Assessment	Suitable habitat identified.
March 8th, 2023/ 0630-1006	Marshall Paymard, Virginia Waters	Focused Survey #1	No burrowing owl or sign detected.

April 20th, 2023/ 0545-1000	Marshall Paymard, Virginia Waters	Focused Survey #2	No burrowing owl or sign detected.
May 24th, 2023/ 0545-1000	Marshall Paymard, Virginia Waters	Focused Survey #3	No burrowing owl or sign detected.
June 27th, 2023/ 0630-0900	Marshall Paymard, Virginia Waters	Focused Survey #4	No burrowing owl or sign detected.

Conclusion

No BUOW or sign was detected during the 2023 focused survey effort for BUOW. However, suitable habitat is present in the BUOW study area. Although no BUOW was detected during the focused survey(s), BUOW may colonize the BUOW study area prior to the commencement of construction. As such, BUOW take avoidance survey(s) are recommended. The initial survey should be conducted in suitable habitat no less than 14 days prior to initiating ground disturbance activities using the recommended methods described in the Staff Report on Burrowing Owl Mitigation. Additionally, a final BUOW survey shall be conducted in suitable habitat within 24 hours prior to any ground disturbance related activities. If active nests are identified within the burrowing owl survey area during the pre-construction survey, the nests should be avoided and an appropriate no-work buffer shall demarcated in the field at a defined distance deemed adequate by the Project biologist. If Project construction cannot avoid the active BUOW area, the CDFW shall be consulted, and the appropriate mitigation will need to be negotiated.

References

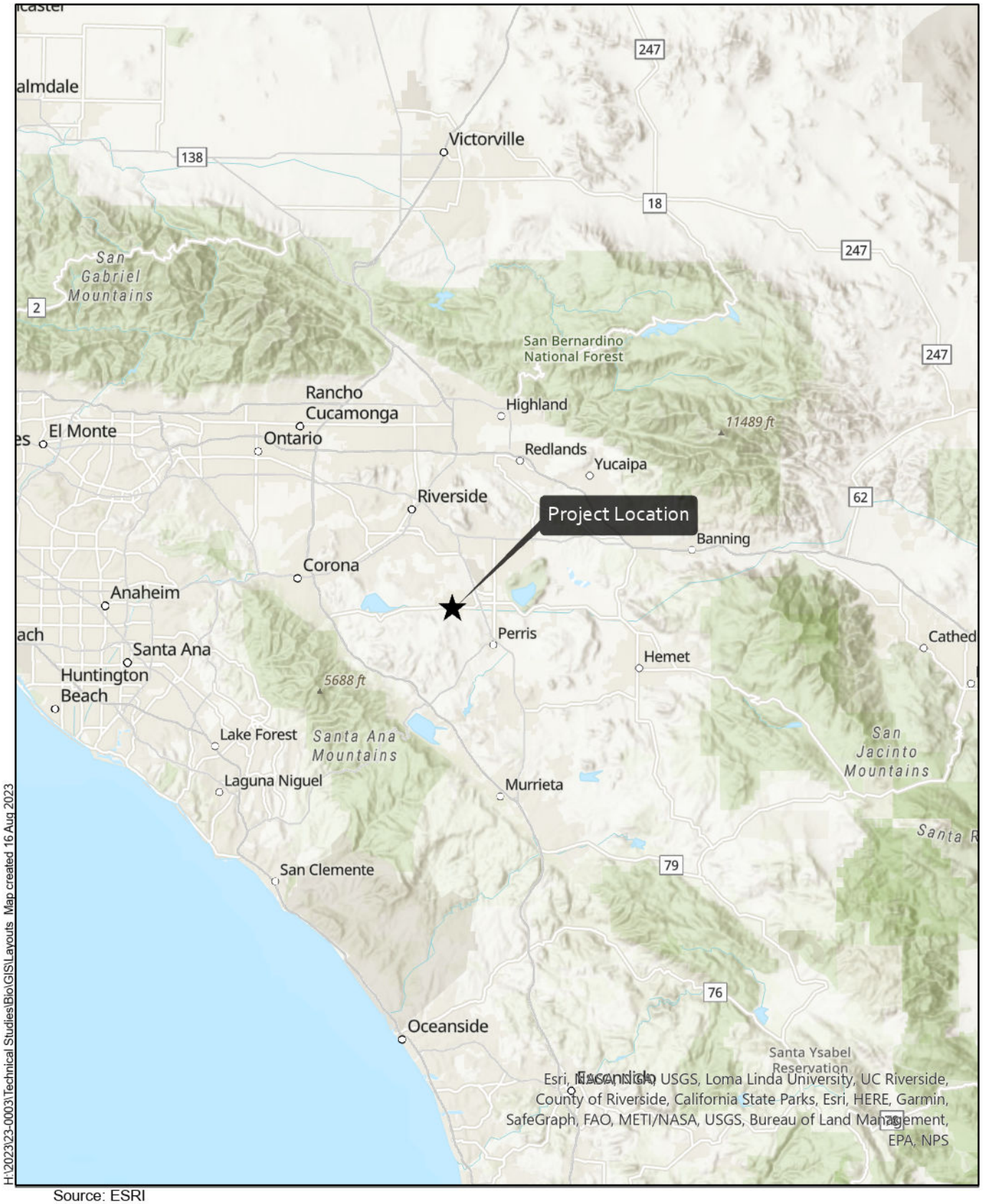
CDFW 2023. California Endangered Species Act. https://wildlife.ca.gov/Conservation/CESA/Permitting [accessed May 2023]

CNDDB. 2023. California Natural Diversity Data Base RareFind 5. https://apps.wildlife.ca.gov/rarefind/view/RareFind.aspx [accessed May 2023].

CDFG. 2012. Staff Report on Burrowing Owl Mitigation. State of California Natural Resources Agency Department of Fish and Game

Klute, D.S., L.W. Ayers, M.T. Green, W.H. Howe, S.L. Jones, J.A. Shaffer, S.R. Sheffield, and T.S. Zimmerman. 2003. Status assessment and conservation plan for the western burrowing owl in the United States. Biological Technical Publication FWS/BTP-R6001-2003. U.S. Department of Interior, Fish and Wildlife Service, Washington, D.C. 120 pp.

Poulin, Ray, L. Danielle Todd, E.A. Haug, B.A. Millsap and M.S. Martell. 2011. Burrowing owl (*Athene cunicularia*). The Birds of North America Online (A. Poole, editor). Cornell Lab of Ornithology, Ithaca, New York. Retrieved July 2, 2013, from: http://bna.birds.cornell.edu/bna/species/061.



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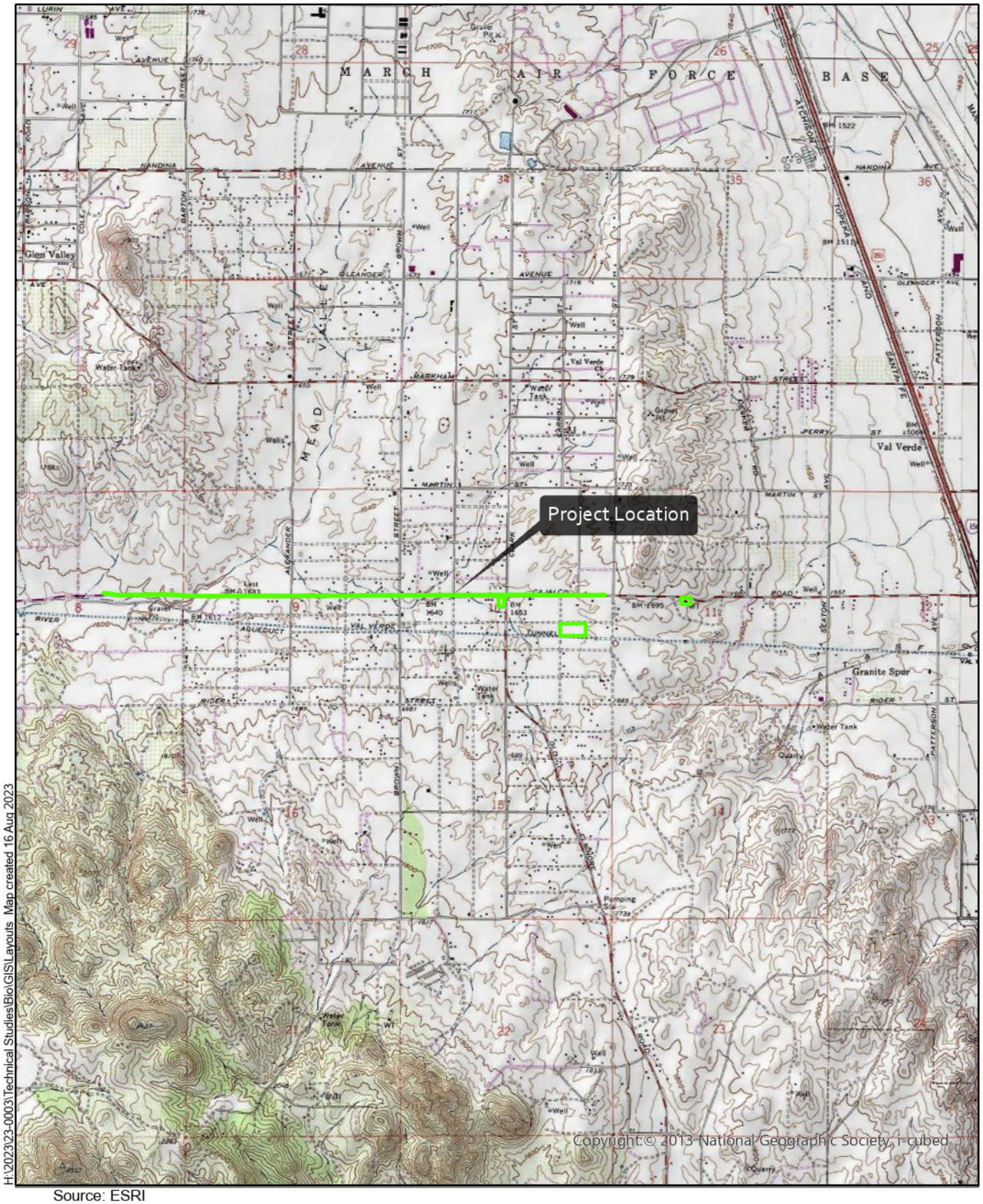
Source: ESRI

0 100 200 300 Feet

Figure 1- Regional Map

Mead Valley Cajalco Sewer Project

ALBERT A. WEBB ASSOCIATES



H:\2023\23-0003\Technical Studies\Bio\GIS\Layouts Map created 16 Aug 2023

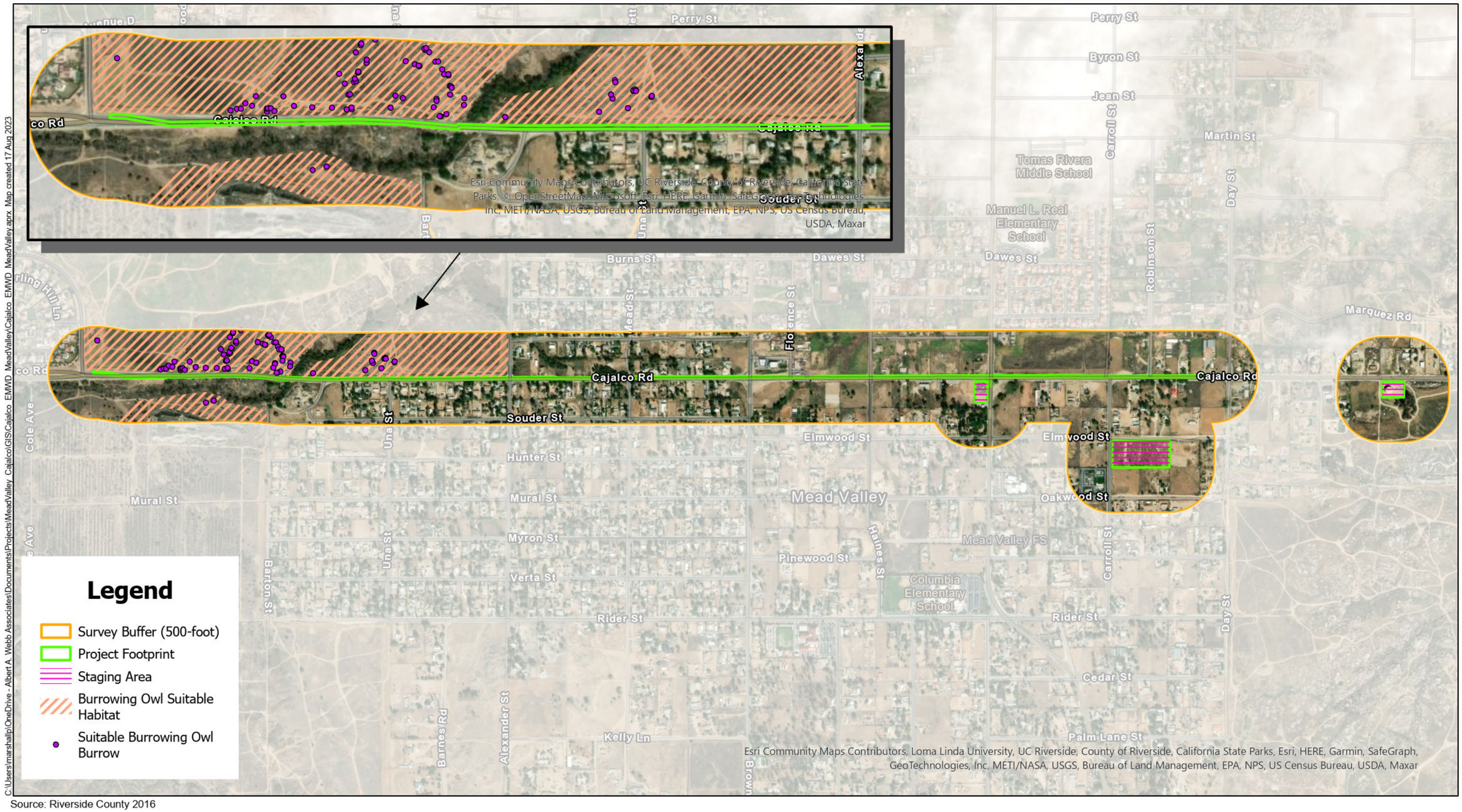
Source: ESRI

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Figure 2- Vicinity Map

Mead Valley Cajalco Sewer Project

ALBERT A. WEBB ASSOCIATES



Source: Riverside County 2016

Figure 3- Burrowing Owl Survey Results

Mead Valley Cajalco Sewer Project

ALBERT A. WEBB ASSOCIATES



Source: Riverside County 2016

0 375 750 1,500 Feet

Appendix B- Photo Index

Mead Valley Cajalco Sewer Project

ALBERT A. WEBB ASSOCIATES

Albert A. Webb Associates
PHOTOGRAPHIC RECORD

Client: EMWD	**Job Number:** 2022-0203
Site Name: Mead Valley Cajalco Sewer Project	**Location:** County of Riverside CA
Photographer: Marshall Paymard	**Date:** April 20, 2023

Photograph No. 1



Photo 1: Facing northeast in burrowing owl study area (north of Cajalco Expressway).

Photograph No. 2



Photo 2: Facing east in burrowing owl study area (north of Cajalco Expressway).

Albert A. Webb Associates PHOTOGRAPHIC RECORD	
Client: EMWD	**Job Number:** 2022-0203
Site Name: Mead Valley Cajalco Sewer Project	**Location:** County of Riverside CA
Photographer: Marshall Paymard	**Date:** April 20, 2023

Photograph No. 3



Photo 3 Facing west in burrowing owl study area (north of Cajalco Expressway).

Photograph No. 4



Photo 4: Facing east in burrowing owl study area (north of Cajalco Expressway).

Albert A. Webb Associates PHOTOGRAPHIC RECORD	
Client: EMWD	**Job Number:** 2022-0203
Site Name: Mead Valley Cajalco Sewer Project	**Location:** County of Riverside CA
Photographer: Marshall Paymard	**Date:** April 20, 2023

Photograph No. 5



Photo 5: Facing west in burrowing owl study area (north of Cajalco Expressway).

Photograph No. 6



Photo 6: Facing east in burrowing owl study area (north of Cajalco Expressway).

Albert A. Webb Associates PHOTOGRAPHIC RECORD	
Client: EMWD	**Job Number:** 2022-0203
Site Name: Mead Valley Cajalco Sewer Project	**Location:** County of Riverside CA
Photographer: Marshall Paymard	**Date:** April 20, 2023

Photograph No. 7



Photo 7: Facing west in burrowing owl study area (north of Cajalco Expressway).

Photograph No. 8



Photo 8: Facing west in burrowing owl study area (north of Cajalco Expressway).

Photograph No. 9

Photo 9: Facing west in burrowing owl study area (north of Cajalco Expressway).
Photograph No. 10

Photo 10: Facing northeast in burrowing owl study area (north of Cajalco Expressway).

ALBERT A. WEBB ASSOCIATES

Memorandum

TO: Ms. Stacey Love, Recovery Permits Coordinator, Carlsbad Fish and Wildlife Office

FROM: Marshall Paymard, Senior Biologist, Albert A. Webb Associates

DATE: August 22, 2023

PROJECT: Mead Valley Cajalco Sewer Project

RE: 2023 Least Bell's Vireo Survey Summary Report for the Mead Valley Cajalco Sewer Project, Riverside County California

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Ms. Love:

This letter report summarizes the results of the 2023 protocol-level presence/absence survey(s) for the federally and state listed endangered least Bell's vireo (*Vireo belli pusillus*), for the Mead Valley Cajalco Sewer Project (Project). Albert A. Webb Associates (WEBB) was contracted by Eastern Municipal Water District (EMWD) to evaluate the potential impacts of the proposed Project located in Riverside County, California.

Project Description and Location

The proposed Project is located in Riverside County, California, (Figure-1 Regional Map; all figures are provided in Attachment A). The Project is primarily sited along Cajalco Expressway, approximately 2 miles west of I-215 and 5 miles east of Lake Mathews (Figure 2- Project Vicinity). The Project site falls within Sections 8, 9, 10, and 11 of Township 4 South, Range 4 West, as depicted in the Steele Peak 7.5-minute quadrangle map. Although Cajalco Expressway does not have Assessor Parcel Numbers (APNs) assigned, three Project associated staging areas can be identified by the following APNs: 318-140-030, 317-060-043, 318-120-039, and 318-120-038. Throughout this report, the Project alignment, including the staging areas, will collectively be referred to as the "Project," unless otherwise specified.

Least Bell's Vireo Natural History

The least Bell's vireo (LBVI) was officially recognized as an endangered subspecies of Bell's vireo by the California Department of Fish and Game (CDFG) in 1980 and federally listed as endangered by the U.S. Fish and Wildlife Service (USFWS) in 1986. This subspecies is mainly found in coastal and inland regions of southern California and Baja California, Mexico, while its winter range extends along the Pacific coast from northern Mexico to northern Nicaragua.

The LBVI is a small, gray songbird with pale yellow hues on its sides, featuring two faint wing bars and a subtle eye ring. It prefers nesting in low, dense, scrubby vegetation found in early successional areas that heavily rely on riparian environments. Suitable habitats encompass willow woodlands, dense mule fat, scrub oak, coastal chaparral, and mesquite patches with dense understories in their early stages. The

LBVI constructs a suspended cup nest approximately 0.5 to 2.0 meters above the ground and typically lays four eggs per nest, often producing two broods in a single breeding season. Its primary diet on the breeding grounds consists of insects and small spiders.

The main contributing factors to the decline of LBVI populations are the loss and degradation of their habitats and nest parasitism by the brown-headed cowbird (*Molothrus ater;* BHCO). The destruction of habitat, especially along streams and rivers due to development, agriculture, flood control projects, logging, and intensive cattle grazing, poses the most significant threat to the survival of the LBVI. Additionally, BHCO parasitism significantly impacts population declines, as BHCO lay their eggs in unsuspecting LBVI nests, leading to the LBVI's raising the BHCO chick as their own. Due to the BHCO chick hatching earlier and growing much faster, it outcompetes the LBVI chicks, often leading to nest failure.

Despite historical population losses, recent trends indicate that populations are rebounding, with the LBVI returning to some of its former habitats and colonizing new areas.

Methods

Habitat Assessment

On February 27th, 2023, an initial habitat assessment was carried out by Webb Senior Biologist, Marshall Paymard, and WEBB Environmental Analyst, Virginia Waters, to evaluate potential suitable habitats for the LBVI within the Project footprint, including a 500-foot survey buffer (Figure 3-LBVI Survey Results). During this assessment, all vegetation communities in the area were carefully surveyed and analyzed for their suitability as habitat for the species. Specifically, the objective of the LBVI habitat assessment was to ascertain the suitability and spatial extent of vegetation communities and habitat types associated with LBVI within 500- feet of the proposed Project limits.

Focused Surveys

Following the habitat assessment, survey areas were refined to LBVI suitable habitat located within the 500-foot survey buffer. As shown on Table 1, between April 12, 2023 and July 31, 2023, LBVI habitat was surveyed on-foot during eight separate occasions, following the survey protocol suggested by the US Fish and Wildlife Service (USFWS 2001). The protocol recommends conducting surveys at intervals of at least 10 days, between April 10th -July 31st, allowing for the detection of various LBVI individuals, such as late and early arrivals, females, territorial males, non-vocal birds of both sexes, and nesting pairs. All surveys took place between dawn and 11:00 am, avoiding extreme weather conditions like abnormal temperatures, strong winds, and precipitation. Careful consideration was given to selecting appropriate survey stations and transects that provided the best chances of hearing or seeing LBVI without causing disturbances to any birds. No recorded vocalizations or playback was used by the biologist during any of the surveys.

The surveys were conducted by WEBB's qualified Senior Biologist, Marshall Paymard, who is familiar with LBVI songs, whisper songs, calls, scolds, and the distinguishment of characteristics between adult and juvenile plumages. All LBVI detections, including vocalizations, foraging behavior, nesting behavior, etc., were recorded using handheld GPS units. The collected information included details on the numbers and locations of paired or unpaired territorial males, the ages and sexes of all observed birds, and nesting behavior. Moreover, any observed brown-headed cowbirds and their numbers and locations were also documented during the surveys.

Table 1. Schedule of Least Belle's Vireo Survey(s)

Date/Time	Surveyor	Type and Survey #	Climatic Conditions
February 27th, 2023/0800-1200	Marshall Paymard, Virginia Waters	Habitat Assessment	Not recorded.
April 12th, 2023/ 0620-1100	Marshall Paymard, Virginia Waters	Focused Survey #1	Air Temperature: 56-64°F; Wind:0-1 MPH; Cloud Cover: 25%
May 3rd, 2023/ 0630-1006	Marshall Paymard, Virginia Waters	Focused Survey #2	Air Temperature: 48-55°F; Wind:0-1 MPH; Cloud Cover: 50%
May 22nd, 2023/ 0632-1100	Marshall Paymard, Virginia Waters	Focused Survey #3	Air Temperature: 56-62°F; Wind:0-2 MPH; Cloud Cover: 0%
June 10th, 2023/ 0633-1100	Marshall Paymard, Virginia Waters	Focused Survey #4	Air Temperature: 68-70°F; Wind:2-5 MPH; Cloud Cover: 0%
June 21st, 2023/ 0615-1056	Marshall Paymard, Virginia Waters	Focused Survey #5	Air Temperature: 68-70°F; Wind:2-5 MPH; Cloud Cover: 0%
July 1st , 2023/ 0632-1058	Marshall Paymard, Virginia Waters	Focused Survey #6	Air Temperature: 62-70°F; Wind:2-5 MPH; Cloud Cover: 0%
July 12th, 2023/ 0638-1047	Marshall Paymard	Focused Survey #7	Air Temperature: 68-76°F; Wind:1-3 MPH; Cloud Cover: 0%
July 31st, 2023/ 0630-1025	Marshall Paymard, Virginia Waters	Focused Survey #8	Air Temperature: 68-70°F; Wind:2-5 MPH; Cloud Cover: 0%

Results

Habitat Assessment

The habitat assessment resulted in approximately 5-acres of LBVI suitable habitat, represented by southern riparian woodland, being documented within 500-feet of the Project impact footprint (Figure 3- LBVI Survey Results). The suitable habitat is represented by a southern riparian woodland, primarily consisting of black willow (*Salix gooddingii*), with occasional stands of arroyo willow (*Salix lasiolepsis*). Photographs are provided in Attachment B of this report.

Focused Surveys

As shown on Table 2, LBVI and BHCO were detected within suitable habitat located within 500- feet of the Project footprint during the 2023 survey efforts (Figure 3- LBVI Survey Results). In total, one LBVI pair was detected during several surveys within the southern riparian woodland located to the north of Cajalco

Expressway (Figure 3- LBVI Survey Results). Additionally, a single territorial adult male was heard vocalizing during several surveys within the southern riparian woodland habitat located to the south of Cajalco Expressway (Figure 3- LBVI Survey Results). The LBVI pair located on the northside of Cajalco Expressway was observed carrying nesting materials to and from an unknown location within the riparian corridor. A BHCO was observed once during the initial survey on April 12th 2023, vocalizing on a *Salix sp*. It should be noted that due to the density of the vegetation and intent of the LBVI survey, WEBB biologists did not actively pursue any LBVI and strictly utilized passive survey methods to ensure no LBVI were distracted or disturbed by their presence. No other sensitive species were observed during the 2023 LBVI surveys.

Table 2. Least Belle's Vireo Focused Survey Results

Date/Time	LBVI/BHCO Detected	Behaviors Observed
April 12th, 2023/ 0620-1006	YES/Yes	**North of Cajalco Exp**: Single LBVI male observed vocalizing on *Salix sp*. Single BHCO observed vocalizing within male LBVI territory. **South of Cajalco Exp**: None.
May 3rd, 2023/ 0630-1006	Yes/No	**North of Cajalco Exp**: Single Adult LBVI male observed vocalizing on *Salix sp.* **South of Cajalco Exp**: Single unpaired LBVI male observed vocalizing on *Salix sp.*
May 22nd, 2023/ 0632-1100	Yes/No	**North of Cajalco Exp** Adult LBVI pair observed with nesting material. **South of Cajalco Exp**: Single unpaired LBVI male observed vocalizing on *Salix sp.*
June 10th, 2023/ 0633-1100	Yes/No	**North of Cajalco Exp**: Adult pair observed within canopy. Male heard vocalizing. **South of Cajalco Exp**: Single unpaired LBVI male observed vocalizing on *Salix sp.*
June 21st, 2023/ 0615-1056	Yes/No	**North of Cajalco Exp**: Adult LBVI male heard vocalizing. **South of Cajalco Exp**: Single unpaired LBVI male observed vocalizing on *Salix sp.*
July 1st , 2023/ 0632-1058	Yes/No	**North of Cajalco Exp**: LBVI male heard vocalizing. Adult pair observed within canopy. **South of Cajalco Exp**: Single unpaired LBVI male observed vocalizing on *Salix sp.*

July 12th, 2023/ 0638-1047	Yes/No	**North of Cajalco Exp**: LBVI male heard vocalizing. **South of Cajalco Exp**: Single unpaired LBVI male observed vocalizing on *Salix sp.*
July 31st, 2023/ 0630-1025	Yes/No	**North of Cajalco Exp**: No LBVI detected. **South of Cajalco Exp**: Single unpaired LBVI male observed vocalizing on *Salix sp.*

Conclusions

The survey results indicate the presence of one breeding pair of LBVI within the southern riparian woodland habitat located north of Cajalco Road, within the designated 500-foot survey buffer (Figure 3-LBVI Survey Results). Additionally, a potentially solitary, adult territorial male has been identified in the southern riparian woodland south of Cajalco Expressway (Figure 3-LBVI Survey Results). Furthermore, it is worth noting that segments of riparian habitat in the survey area, specifically those south of Cajalco Expressway, have experienced disturbance due to fire and associated earth-moving activities within the last two years, leading to a decline in suitable LBVI habitat in the Project vicinity at the time of the 2023 surveys. No other sensitive species were observed during the 2023 LBVI surveys.

Should you have any questions regarding this report or require additional information, please do not hesitate to contact me at (951) 675-6699 or marshallpaymard@gmail.com
Sincerely,

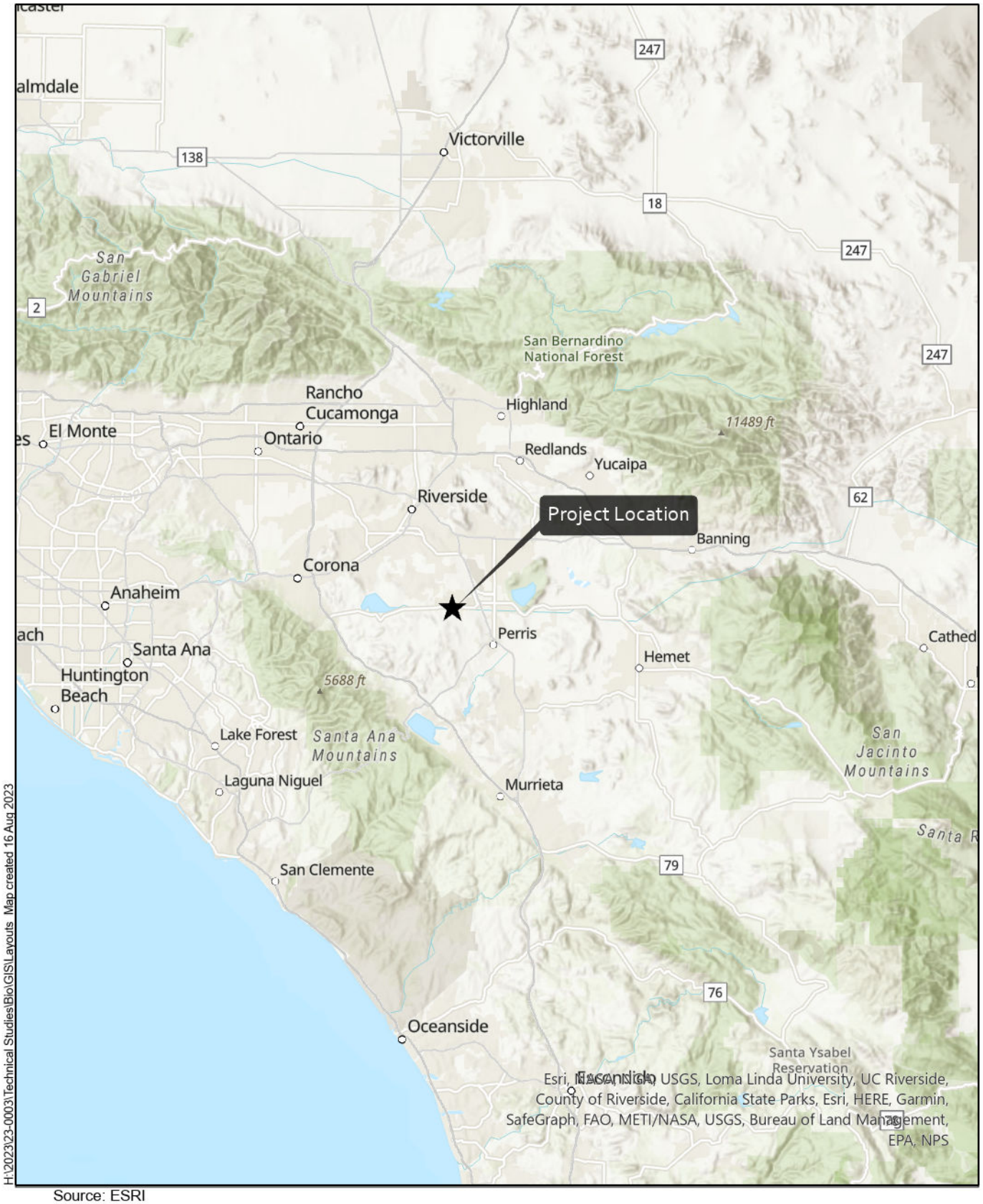


_____

Marshall Paymard
Senior Biologist
Albert A. Webb Associates

Citations

USFWS. 2001. Least Bell's Survey Guidelines. U.S. Fish and Wildlife Service, Ecological Services, Carlsbad Fish and Wildlife Service, California



H:\2023\23-0003\Technical Studies\Bio\GIS\Layouts Map created 16 Aug 2023

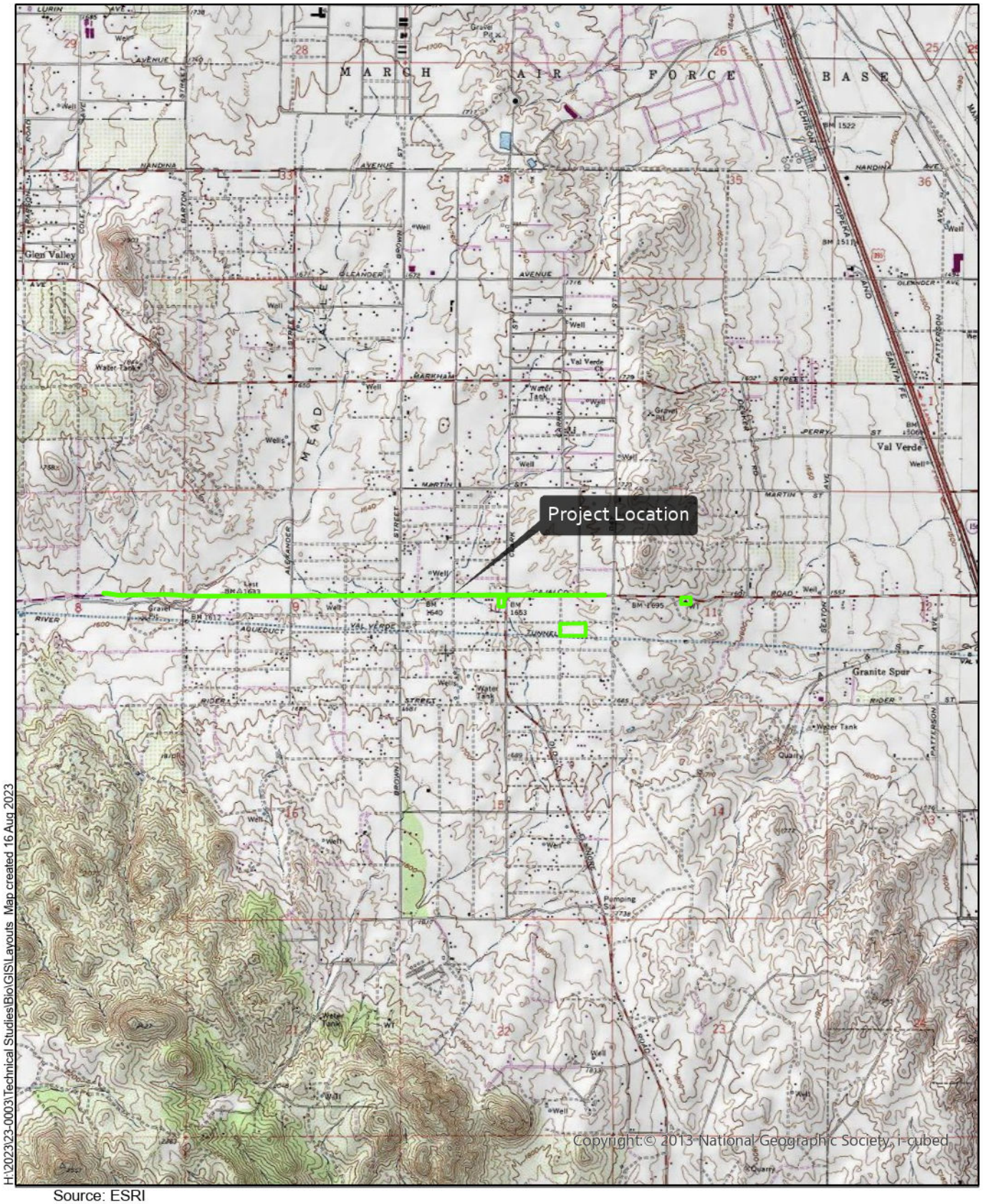
Source: ESRI

0 100 200 300 Feet

Figure 1- Regional Map

Mead Valley Cajalco Sewer Project

ALBERT A. WEBB ASSOCIATES



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Source: ESRI

0 100 200 300 Feet

Figure 2- Vicinity Map

Mead Valley Cajalco Sewer Project

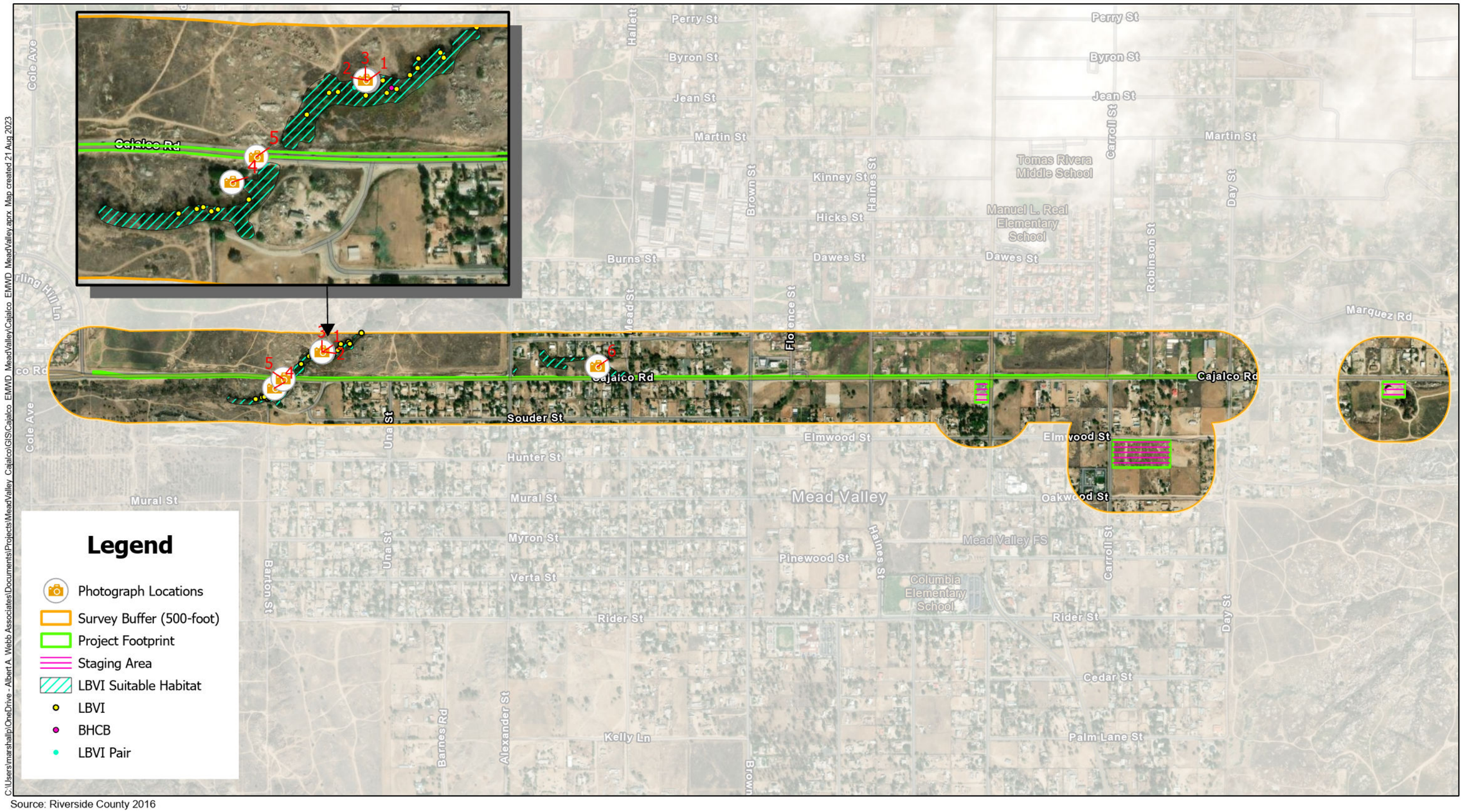
ALBERT A. WEBB ASSOCIATES



Source: Riverside County 2016

Figure 3- LBVI Survey Results
Mead Valley Cajalco Sewer Project

ALBERT A. WEBB ASSOCIATES



C:\Users\marshallp\OneDrive - Albert A. Webb Associates\Documents\Projects\MeadValley Cajalco\GIS\Cajalco_EMWD_MeadValley\Cajalco_EMWD_MeadValley.aprx Map created 21 Aug 2023

Source: Riverside County 2016

Appendix B- Photo Index

Mead Valley Cajalco Sewer Project

ALBERT A. WEBB ASSOCIATES

Albert A. Webb Associates PHOTOGRAPHIC RECORD	
Client: EMWD	**Job Number:** 2022-0203
Site Name: Mead Valley Cajalco Sewer Project	**Location:** County of Riverside CA
Photographer: Marshall Paymard	**Date:** June 2, 2023

Photograph No. 1



Photo 1: Facing northwest in southern riparian woodland habitat (north of Cajalco Expressway).

Photograph No. 2



Photo 2: Facing southeast, southern riparian woodland habitat (north of Cajalco Expressway).

Albert A. Webb Associates PHOTOGRAPHIC RECORD	
Client: EMWD	**Job Number:** 2022-0203
Site Name: Mead Valley Cajalco Sewer Project	**Location:** County of Riverside CA
Photographer: Marshall Paymard	**Date:** June 2, 2023

Photograph No. 3



Photo 3: Facing north, southern riparian woodland habitat (north of Cajalco Expressway).

Photograph No. 4



Photo 4: Facing southeast, southern riparian woodland habitat (south of Cajalco Expressway).

Albert A. Webb Associates PHOTOGRAPHIC RECORD	
Client: EMWD	**Job Number:** 2022-0203
Site Name: Mead Valley Cajalco Sewer Project	**Location:** County of Riverside CA
Photographer: Marshall Paymard	**Date:** June 2, 2023

Photograph No. 5



Photo 5: Facing south, southern riparian woodland habitat (south of Cajalco Expressway).

Photograph No. 6



Photo 6: Facing southeast. southern riparian woodland habitat (north of Cajalco Expressway).

APPENDIX C: CULTURAL RESOURCES ASSESSMENT (CONFIDENTIAL)

APPENDIX D: GEOTECHNICAL INVESTIGATION REPORT



GEOTECHNICAL INVESTIGATION

EASTERN MUNICIPAL WATER DISTRICT
MEAD VALLEY SEWER IMPROVEMENTS

Riverside County, California

PREPARED FOR:

Mr. Nate Olivas
Eastern Municipal Water District
2270 Trumble Road
Perris, California 92570

PREPARED BY:

Atlas Technical Consultants LLC
6280 Riverdale Street
San Diego, California 92120

March 3, 2023

6280 Riverdale Street
San Diego, CA 92120
(877) 215-4321 | oneatlas.com

March 3, 2023

Atlas No. 190063P4.2
Report No. 1962-1

MR. NATE OLIVAS
EASTERN MUNICIPAL WATER DISTRICT
2270 TRUMBLE ROAD
PERRIS, CALIFORNIA 92570

Subject: **Geotechnical Investigation**
Mead Valley Sewer Improvements
Eastern Municipal Water District
Riverside County, California

Dear Mr. Olivas,

In accordance with your request and our proposal No. 22-04013R2, Atlas performed a geotechnical investigation to assess the geologic conditions for the project, including potential geologic hazards, and to provide recommendations based on our findings. Our investigation consisted of a review of readily available geologic literature, site reconnaissance, exploratory borings, limited hydrogeologic testing and analysis, geotechnical laboratory testing, and the preparation of this report.

We appreciate the opportunity to be of service on this project. Should you have any questions related to this report, please contact the undersigned at your convenience.

Respectfully submitted,
Atlas Technical Consultants LLC

Jason Dale, EIT
Project Manager

Doug Skinner, PG 2472
Senior Engineering Geologist

Morteza Mirshekari, PhD, PE C92374
Senior Engineer

GT:SD:JRD:MM:ER:ds
Distribution: olivasn@emwd.org

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APPENDICES

Appendix I Subsurface Exploration
Appendix II Laboratory Testing
Appendix III Seismic Refraction Study

1. INTRODUCTION

This report presents the results of the geotechnical investigation Atlas performed for the subject project. It is our understanding the project will consist of the design and construction of approximately 3½ miles of new sewer pipeline along Cajalco Road in Riverside County, California. Figure 1 presents the site vicinity.

2. SCOPE OF WORK

2.1 Investigations and Monitoring Wells

Atlas performed a geologic investigation to address potential geologic hazards and geotechnical conditions that could impact the proposed construction. Pertinent documents reviewed included published reports and mapping, aerial photographs, in-house geotechnical reports, and available reports by others. Atlas explored subsurface conditions by drilling thirteen (13) borings to depths of up to approximately 41½ feet below the existing ground surface using limited access and truck-mounted drill rigs equipped with a hollow stem auger in September 2022. Additionally, in January 2023, Atlas installed two temporary groundwater monitoring wells to depths of about 40 feet below ground surface using limited access and truck-mounted drill rigs equipped with a hollow stem auger and coring capabilities. Figure 2 presents the approximate locations and depths of the borings and monitoring wells.

An Atlas engineer and geologist logged the borings and collected samples of the material encountered for geotechnical laboratory testing. Soils and rocks recovered during the field investigation were observed in the field for soil and/or groundwater contamination with visual and olfactory methods. Soils were classified according to the Unified Soil Classification System illustrated in the Subsurface Exploration Legend (Appendix I). The rocks encountered were classified in general accordance with the California Department of Transportation (Caltrans) rock classification system. The boring logs and well design diagrams are presented in Appendix I.

2.2 Laboratory Testing

Selected samples from the exploratory borings were tested to evaluate pertinent soil classification and engineering properties. The laboratory testing consisted of in-situ moisture and density, particle-size distribution, percent finer than #200 sieve, corrosivity, direct shear, expansion index, Atterberg limits, R-value, and unconfined compressive strength. The laboratory testing standards and results are presented in Appendix II.

2.3 Geophysical Survey

Atlas performed a seismic refraction study at select locations along the proposed alignment to develop subsurface velocity profiles to assess depth of bedrock and apparent rippability of the subsurface materials on January 3 and 4, 2023. The seismic refraction study is presented in Appendix III.

2.4 Analysis and Report Preparation

The results of the field and laboratory tests were evaluated to develop conclusions and recommendations regarding the geotechnical aspects of the proposed project. The report includes the following:

- A plot plan showing the boring locations
- Exploration logs with soil characterization detailing the subsurface conditions noted at the boring locations
- A description of the above ground geologic conditions
- Groundwater levels and the necessity for dewatering
- Excavation characteristics of the subsurface materials encountered
- Backfill recommendations and the suitability of excavated materials for use as backfill and bedding
- Allowable temporary excavation side slope and shoring recommendations
- Lateral earth pressures and resistance to lateral loads
- Support for the pipeline
- Potential pipeline settlements
- Appropriate types of bedding and backfill materials as well as placement and compaction procedures
- Soil modulus E' for pipeline design
- Subgrade compaction beneath pavements
- New flexible pavement structural sections
- Corrosivity of earth materials

3. SITE AND PROJECT DESCRIPTION

The project alignment is along Cajalco Road between Wood Road and Robinson Street in Riverside County, California. The site topography generally descends towards the east, with site elevations along the alignment ranging from approximately 1577 to 1671 above mean sea level. Preliminary project documents indicate that proposed invert elevations extend to between 8 and 16 feet below the existing ground surface.

4. GEOLOGY AND SUBSURFACE CONDITIONS

The site is located within the Peninsular Ranges Geomorphic Province of California, which stretches from the Los Angeles basin south into Baja California. This province is characterized as a series of northwest-trending mountain ranges separated by subparallel fault zones and a coastal plain of subdued landforms. The mountain ranges are underlain primarily by Mesozoic metamorphic rocks that were intruded by plutonic rocks of the southern California batholith, while the coastal plain is underlain by subsequently deposited marine and non-marine sedimentary

formations. The site is located in the coastal plain. The materials observed in our borings consisted of fill, very old axial-channel deposits, young wash deposits, and Val Verde tonalite (granitic rock). Figure 3 presents the regional geology, and descriptions of the materials encountered are provided below.

Fill (Qf): Fill was encountered in some of our borings below the existing ground surface and extends to depths of up to approximately 5 feet below ground surface. The fill materials encountered generally consisted of moist, medium dense sandy silt, silty sand, and clayey sand. Debris and boulders may be encountered.

Very old axial-channel deposits (Qvoa): Very old axial-channel deposits were encountered in a number of our borings at both existing ground surface and below the fill and extends up to about 24 feet below ground surface. The materials encountered generally consisted of moist, loose to medium dense poorly graded sand with silt, and loose to dense silty and clayey sand.

Young wash deposits (Qywa): Young wash deposits were encountered below fill in Borings B-12S and B-13S and extends to a depth of up to approximately 18 feet below ground surface. The materials encountered generally consisted of moist, medium dense to very dense silty and clayey sand.

Val Verde tonalite (Kvt): Val Verde tonalite was encountered in each of the borings below the surficial soils and extends to the total depths explored. The materials encountered generally consisted of intensely weathered to decomposed, soft to moderately hard igneous rock. The drilled cuttings could be characterized as moist to wet, poorly graded sand with silt or clay, silty and clayey sand, sandy silt, and hard, lean clay with sand. Gravels and cobbles may be expected. Encountering boulders is also possible.

Groundwater: Groundwater was observed as shallow as 13 feet below existing ground surface. Available literature indicates the groundwater could be shallower than approximately 10 feet below ground surface near Boring B-15S (SWRCB, 2022). It should be recognized that groundwater conditions may vary at a site over time. Fluctuations in the groundwater level may occur due to variations in ground surface topography, subsurface geologic conditions and structure, rainfall, irrigation, broken pipes, changes in site drainage, and other factors. These types of conditions can be most effectively assessed at the time of construction. Table 1 presents the observed groundwater levels relative to the ground surface.

To assist in assessing groundwater levels during construction, temporary groundwater monitoring wells were installed at boring locations B-2S and B-6S to observe the groundwater activity. The monitoring wells should be periodically monitored, and groundwater elevations be recorded by a qualified individual.

Table 1: Observed Groundwater Level

Boring Location	Depth to Encountered Groundwater (ft)	Boring Location	Depth to Encountered Groundwater (ft)
B-1S	22	B-9S	25
B-2S*	13	B-10S	27
B-3S	26	B-11S	Not encountered
B-4S	18	B-12S	39
B-5S	33	B-13S	Not encountered
B-6S*	14	B-14S	29
B-7S	37	B-15S	28
B-8S	Not encountered	*Empty*	

***Indicates monitoring well was installed. See Appendix I for installation details.**

4.1 Geologic Hazards

4.1.1 Fault-Rupture Hazard

Faulting in the Riverside County area is dominantly characterized by a series of Quaternary-age and older fault zones that typically consist of several individual echelon faults, generally striking in a northerly to northwesterly direction. Active fault zones are those that have shown conclusive evidence of faulting during the Holocene Epoch (the most recent 11,000 years) while potentially active fault zones have demonstrated movement during the Pleistocene Epoch (11,000 to 2.6 million years before the present) but no evidence of movement during Holocene time. Faults that can be shown to have experienced no movement within the Holocene or Pleistocene Epochs are generally considered to be inactive. The closest active fault, the Glen Ivy North fault, is about 10 miles west of the site (Jennings, 2010). Figure 4 presents the California fault activity. The project alignment is not located in an Alquist-Priolo Earthquake Fault Zone. No signs of faulting and no active faults are known to underlie or project toward the site. The probability of fault rupture is considered negligible.

4.1.2 CBC Seismic Design Parameters

A geologic hazard likely to affect the project is ground shaking because of movement along an active fault zone in the vicinity of the subject site (USGS, 2020). Based on the subsurface conditions encountered during our investigation and available online resources (Wills et al. 2015), the alignment could generally be classified as Site Class C. The mapped site coefficients and adjusted earthquake spectral response parameters in accordance with the 2022 CBC are presented below in Table 2. Please note that the seismic parameters are provided for the approximate coordinates tabulated for the site.

Table 2: 2022 California Building Code / ASCE 7-16 Site Specific Seismic Parameters

Site Coordinates	
Latitude	Longitude
33.8391°	-117.2819°
Site Coefficients and Spectral Response Acceleration Parameters	**Values**
Site Class	C – Very Dense Soil
Site Coefficients, F_a	1.2
Site Coefficients, F_v	1.446
Spectral Response Acceleration at Short Period, S_s	1.5g
Spectral Response Acceleration at 1-Second Period, S_1	0.554g
Design Spectral Acceleration at Short Period, S_{DS}	1.2g
Design Spectral Acceleration at 1-Second Period, S_{D1}	0.534g
Site Modified Peak Ground Acceleration, PGA_M	0.6g

4.1.3 Liquefaction and Dynamic Settlement

Liquefaction occurs when loose, saturated, generally fine sands and silts are subjected to strong ground shaking. The soils lose shear strength and become liquid, potentially resulting in large total and differential ground surface settlement as well as possible lateral spread during an earthquake. Liquefiable material is not mapped along the project alignment. Because of the relatively dense soils and depth to groundwater, it is our opinion that the potential liquefaction and dynamic settlement significantly affecting the proposed project is low.

4.1.4 Flooding, Tsunamis, and Seiches

Flood Insurance Rate Maps via the Federal Emergency Management Agency (FEMA) Flood Hazard Map online database were reviewed to evaluate if the subject site is located within an area susceptible to flooding (FEMA, 2022). The project site is designated as Flood Hazard Zone A, which designates the areas with a 1% annual chance of flooding. Published depth or base flood elevations are not provided for Zone A. The potential for flooding should be appropriately considered.

The site is not located within a mapped area on the State of California Tsunami Inundation Maps (CDC, 2022b). Seiches are periodic oscillations in large bodies of water such as lakes, harbors, bays, or open reservoirs. The site is not located adjacent to any bodies of water subject to seiches.

4.1.5 Landslides and Slope Stability

There are no mapped or known landslides underlying or adjacent to the project site (CDC, 2021a). Additionally, evidence of slope instabilities or landslides was not observed at the time of our site reconnaissance. The potential for slope instabilities or landslides to affect the site is considered low.

4.1.6 Subsidence

The project is not located in an area of known subsidence associated with fluid withdrawal (groundwater or petroleum) (USGS, 2022). Due to this, as well as the presence of very dense deposits, the potential for subsidence is low.

4.1.7 Hydro-Consolidation

Hydro-consolidation can occur in recently deposited sediments (less than 10,000 years old) that were deposited in a semi-arid environment. Examples of such sediments are eolian sands, alluvial fan deposits, and mudflow sediments deposited during flash floods. The pore spaces between the particle grains can re-adjust when inundated by groundwater, causing the material to consolidate. Due to the relatively dense and moist nature of the material encountered beneath the site, the potential for hydro-consolidation occurrence in the subsurface layers is considered low.

5. CONCLUSIONS

Based on the results of our investigation, we consider the project feasible from a geotechnical standpoint provided that the recommendations of this report are followed. In our opinion, the site conditions are suitable to install the pipelines using traditional open excavation trenching techniques; however, the contractor should be prepared for excavating in very dense granular materials, as well as igneous rock formations. The presence of cobbles and boulders are also expected at the site. There are no known geologic hazards of sufficient magnitude that preclude the intended improvements. The main geotechnical considerations affecting the project is the potential for difficult trench excavations and potentially groundwater. The materials anticipated below the pipeline depths are generally expected to provide good pipeline support. However, dewatering is anticipated depending on the elevation of groundwater at the time of construction.

6. RECOMMENDATIONS

The remainder of this report presents recommendations regarding earthwork construction as well as preliminary geotechnical recommendations for the design of the proposed improvements. These recommendations are based on empirical and analytical methods typical of the standard-of-practice in southern California. If these recommendations appear not to address a specific feature of the project, please contact our office for additions or revisions to the recommendations.

6.1 Earthwork

Grading and earthwork should be conducted in accordance with the local standards and the recommendations of this report. The following recommendations are provided regarding specific aspects of the proposed earthwork construction. These recommendations should be considered subject to revision based on field conditions observed by our office during construction.

6.1.1 Site Preparation

Site preparation should begin with the removal of existing improvements, vegetation, and debris. Subsurface improvements that are to be abandoned should be removed, and the resulting excavations should be backfilled and compacted in accordance with the recommendations of this report. Pipeline abandonment can consist of capping or rerouting at the project perimeter and removal within the project perimeter. If appropriate, abandoned pipelines can be filled with grout or slurry as recommended by and observed by the geotechnical consultant.

6.1.2 Excavation Characteristics

It is anticipated that excavation can be achieved with heavy-duty earthwork equipment in good working order. Excavations in fill may be locally unstable and may contain construction debris, cobbles, or boulders. Difficult drilling and excavation should be anticipated in areas with dense to very dense granular materials and/or igneous rock. The contractor should mobilize equipment capable of excavating granitic materials with variable fracturing, weathering, rock abrasiveness, and strength/hardness rock conditions. Rock breakers, carbide tipped teeth, or carbide/diamond tipped coring equipment may be required to excavate/drill hard rock materials.

6.1.3 Oversized Material

Excavations may generate oversized material. Oversized material is defined as rocks or cemented clasts greater than 6 inches in largest dimension. Oversized material should be broken down to no greater than 6 inches in the largest dimension for use within non-structural fill, such as landscape fill, or disposed of off site in accordance with regulatory requirements.

6.1.4 Temporary Excavations

Temporary excavations 4 feet deep or less can be made vertically. Temporary excavations deeper than 4 feet should not be steeper than 1½:1 (horizontal: vertical), per Cal/OSHA Type C soil classification. Excavations in competent bedrock can be made vertically. Unweathered (i.e., fresh), unfractured rock is considered competent. The faces of temporary slopes should be inspected daily by the contractor's competent person before personnel are allowed to enter the excavation. Zones of potential instability, sloughing, or raveling should be brought to the attention of the engineer and corrective action implemented before personnel begin working in the trench.

Slopes steeper than those described above will require shoring. Soldier piles and lagging, corrugated metal pipe, internally braced shoring such as trench boxes or speed shoring could be used. If trench boxes or metal pipe are used, the soil immediately adjacent to the shoring is not directly supported. Ground surface deformations adjacent to the excavation could be greater when these methods are used compared to other methods of shoring leading to distress to overlying improvements.

If open trenches are to be maintained during the rainy season, berms are recommended along the tops of the trenches to prevent runoff water from entering the excavation.

6.1.5 Temporary Shoring

For design of cantilevered shoring, an active soil pressure equal to a fluid weighing 40 pounds per cubic foot (pcf) can be used for level retained ground or 65 pcf for 2:1 (horizontal:vertical) sloping ground. A passive soil pressure equal to a fluid weighing 330 pcf can be used for the design of cantilevered shoring. These values assume that shoring will take place above the groundwater level. The passive pressure should be reduced by one half below the groundwater table. The surcharge loads on shoring from traffic and construction equipment adjacent to the excavation can be modeled by assuming an additional 2 feet of soil behind the shoring.

6.1.6 Temporary Dewatering

During our geotechnical investigation, groundwater was observed as shallow as 13 feet below existing ground surface (see Table 1). Available literature indicates the groundwater could be shallower than approximately 10 feet. Additionally, groundwater seepage may occur locally along the project alignment due to local irrigation or following heavy rain. Shallow groundwater may impact project construction. An experienced and qualified specialty contractor should evaluate the need and design of a dewatering system, as appropriate. The contractor's geotechnical engineer should review proposed dewatering system designs.

6.1.7 Remedial Grading – Manhole Foundations

Proposed manhole foundations can be supported by firm and unyielding formational material, 2 feet of compacted fill, or geogrid. If placed on compacted fill, the on-site soils should be excavated to a depth of at least 2 feet below planned subgrade elevation. If competent, formational materials are exposed, excavation need not be performed. An Atlas representative should observe conditions exposed in the bottom of excavations to evaluate whether additional excavation is recommended.

6.1.8 Expansive Soil

The on-site materials tested have expansion indices ranging from 18 to 38, classified as very low to low expansion potential. The grading and foundation recommendations presented in this report assume materials with a low expansion potential.

6.1.9 Compacted Fill

On-site materials, except for soil containing roots, debris, and rock greater than 6 inches, can be used as compacted fill or trench backfill. Fill and backfill should be placed in horizontal lifts at a thickness appropriate for the equipment spreading, mixing, and compacting the material, but generally should not exceed 8 inches in loose thickness. Fill and backfill should be moisture conditioned within 2% of optimum moisture content and compacted to at least 90% relative compaction. The top 12 inches of subgrade beneath pavement should be compacted to at least 95%. The maximum dry density and optimum moisture content for evaluating relative compaction should be obtained using ASTM D1557.

6.1.10 Imported Soil

Imported soil should consist of predominately granular soil, free of organic matter, and rocks less than 6 inches. Imported soil should be observed and, if appropriate, tested by Atlas prior to transport to the site.

6.1.11 Bottom Stabilization

In areas where wet, soft, or yielding excavations bottoms are encountered, a geogrid reinforced soil mat could be installed to provide support for proposed manhole foundation construction. To stabilize soft or yielding bottoms, Atlas recommends placing one layer of Tensar® Triax TX-160 reinforcing geogrid or equivalent on the removal surface (e.g. excavation bottom) followed by at least 6 inches of aggregate base compacted using lightweight equipment to a relative compaction of 90%. A second layer of geogrid followed by at least 6 inches of compacted based should be placed. If yielding is still observed upon proof rolling, an additional layer of geogrid should be placed on the compacted base followed by at least 6 inches of aggregate base.

6.1.12 Grading Plan Review

Atlas should review the grading plans and earthwork specifications to ascertain whether the intent of the recommendations contained in this report have been implemented, and that no revised recommendations are needed due to changes in the development scheme.

6.2 Pipelines

6.2.1 Pipeline Support

It is anticipated that most of the materials along the pipeline alignment will provide adequate support for the pipe, although loose, soft, and otherwise unsuitable materials could be encountered. Unsuitable materials encountered near trench bottom levels should be excavated to competent material as determined by the geotechnical consultant. The excavated materials can be replaced with compacted fill or with pipe bedding material, as described below. Unsuitable materials should be removed from the full width of the trench. The bottoms of the excavations should be observed by the geotechnical consultant prior to placement of pipe bedding.

6.2.2 Backfill

Utility trench sections should conform to the minimum requirements of the EMWD and local jurisdictions. Backfill should be placed in loose lifts not exceeding 6 to 8 inches in thickness, moisture conditioned to near optimum moisture content, and compacted to at least 90% relative compaction.

On-site materials, except for soil containing roots, debris, and rock greater than 6 inches, can be used as compacted fill or trench backfill, provided that they have an expansion index of 50 or less. The maximum dry density and optimum moisture content for the evaluation of relative compaction should be determined in accordance with ASTM D1557.

6.2.3 Pipe Bedding

Pipe bedding as specified in the “Greenbook” can be used. Bedding material should consist of clean sand having a sand equivalent not less than 30 and should extend to at least 12 inches above the top of pipe. Alternative materials meeting the intent of the bedding specifications are also acceptable. Samples of materials proposed for use as bedding should be provided to the engineer for inspection and testing before the material is imported for use on the project. The on-site materials are not expected to meet “Greenbook” bedding specifications. The pipe bedding material should be placed over the full width of the trench. After placement of the pipe, the bedding should be brought up uniformly on both sides of the pipe to reduce the potential for unbalanced loads. No voids or uncompacted areas should be left beneath the pipe haunches. Ponding or jetting the pipe bedding should not be allowed.

6.2.4 Thrust Blocks

For level ground conditions, a passive earth pressure of 330 pounds per square foot (psf) per foot of depth below the lowest adjacent final grade can be used to compute allowable thrust block resistance. A value of 140 psf per foot should be used below groundwater level, if encountered.

6.2.5 Modulus of Soil Reaction

A modulus of soil reaction (E’) of 1,000 pounds per square inch can be used to evaluate the deflection of buried flexible pipelines. This value assumes that granular bedding material is placed adjacent to the pipe and is compacted to at least 90% relative compaction.

6.3 Manholes

6.3.1 Foundations

The planned manholes can be supported on mat foundations with bottom levels on compacted fill, reinforced geogrid mats, or competent formational material.

Thickness and reinforcement of the mat foundation should be in accordance with the recommendations of the project structural engineer. Mat foundations typically experience some deflection due to loads placed on the mat and the reaction of the soils underlying the mat. A design modulus of subgrade reaction, K, of 150 pounds per cubic inch (pci) may be used in evaluating such deflections on dense to very dense granular soils or formational materials, and 75 pci on other loose soils. These values are based on an area of one square foot and should be adjusted for large mats. Adjusted values of the modulus of subgrade reaction, K_{BxB}, can be obtained from the following equation for square mats of various widths:

$$K_{B\times B} = K\left[\frac{\mathrm{B}+1}{2\mathrm{B}}\right]^2 (pci)$$

Where, B is the width of the mat in feet.

Where the mat slab is rectangular, adjusted values of the modulus of subgrade reaction, K', can be obtained from the following equation:

$$K' = \frac{K_{B\times B}(1 + 0.5\left(\frac{B}{L}\right))}{1.5}(pci)$$

Where, B is the width and L is the length of the mat in feet.

6.3.2 Allowable Soil Bearing Pressure

The planned manholes can be supported on mat foundations with bottom levels on compacted fill, reinforced geogrid mats, or competent formational material. An allowable bearing capacity of 3,000 psf can be used. The bearing value can be increased by ⅓ when considering short term loads.

Lateral loads will be resisted by friction between the bottoms of footings and passive pressure on the faces of footings and other structural elements below grade. An allowable coefficient of friction of 0.30 can be used. Passive pressure can be computed using a lateral pressure value of 300 psf per foot of depth below the ground surface for level ground conditions. Reductions for sloping ground should be made. The passive pressure can be increased by ⅓ when considering the total of loads, including wind or seismic forces. The upper 1 foot of soil should not be relied on for passive support unless the ground is covered with pavements or slabs.

6.3.3 Manhole Backfill

Manhole backfill should consist of granular, free-draining material having a sand equivalent of 20 or more. The backfill zone is defined by a 1:1 plane projected upward from the bottom of the manhole. Expansive or clayey soil should not be used. Backfill should be compacted to at least 90% relative compaction. Backfill should not be placed until the manhole walls have achieved adequate structural strength. Compaction of manhole backfill will be necessary to minimize settlement of the backfill and overlying settlement-sensitive improvements. However, some settlement should still be anticipated. Alternatively, a controlled low-strength material such as sand cement slurry may be considered for backfill. The controlled low-strength material should be thoroughly consolidated, have a maximum slump of 4 inches, and the slurry combined graded should meet the requirements of the local authority with jurisdiction.

6.4 Preliminary Pavement Section Recommendations

Atlas utilized the Caltrans Highway Design Manual (Caltrans, 2020) to prepare preliminary recommendations for flexible pavements. An R-value of 13 and assumed Traffic Indexes of 7, 9, and 11 were used for the design of preliminary pavement sections. The actual subgrade support characteristics should be evaluated after grading and final pavement sections are provided. Table 3 presents recommended flexible structural sections for the assumed Traffic Indexes and subgrade R-value:

Table 3: Preliminary Pavement Structural Sections

Traffic Type	Traffic Index	AC[1] over AB[2] (inches)	Full Depth AC (inches)
Roadways	7.0	6 over 10	11
	9.0	6 over 18	16
	11.0	10 over 18	22

[1] AC: Asphalt Concrete
[2] AB: Aggregate Base

The top 12 inches of subgrade should be scarified, moisture conditioned to near optimum moisture content, and compacted to at least 95% relative compaction (ASTM D1557). Soft or yielding areas should be removed and replaced with compacted fill or aggregate base. Aggregate base and asphalt concrete should conform to the Caltrans Standard Specifications and should be compacted to at least 95% relative compaction. Aggregate base should have an R-value of not less than 78. All materials and methods of construction should conform to good engineering practices and Caltrans standard specifications.

6.5 Soil Corrosivity

Representative samples of the on-site soils from the project alignment were tested to evaluate corrosion potential. The test results are presented in Appendix II. The project design engineer can use the sulfate results in conjunction with ACI 318 to specify the water/cement ratio, compressive strength and cementitious material types for concrete exposed to soil. A corrosion engineer should be contacted to provide specific corrosion control recommendations.

6.6 Geotechnical Engineering During Construction

The geotechnical engineer should review project plans and specifications prior to bidding and construction to check that the intent of the recommendations in this report has been incorporated. Observations and tests should be performed during construction. Atlas recommends a geotechnical engineer or engineering geologist be on site to observe tunneling operations. If the conditions encountered during construction differ from those anticipated based on the subsurface exploration program, the presence of the geotechnical engineer during construction will enable an evaluation of the exposed conditions and modifications of the recommendations in this report or development of additional recommendations in a timely manner.

7. CLOSURE

Atlas should be advised of changes in the project scope so that the recommendations contained in this report can be evaluated with respect to the revised plans. Changes in recommendations will be verified in writing. The findings in this report are valid as of the date of this report. Changes in the condition of the site can occur with the passage of time, whether they are due to natural processes or work on this or adjacent areas. In addition, changes in the standards of practice and government regulations can occur. Thus, the findings in this report may be invalidated wholly or

in part by changes beyond our control. This report should not be relied upon after a period of two years without a review by us verifying the suitability of the conclusions and recommendations to site conditions at that time.

In the performance of our professional services, we comply with that level of care and skill ordinarily exercised by members of our profession currently practicing under similar conditions and in the same locality. The client recognizes that subsurface conditions may vary from those encountered at the boring locations and that our data, interpretations, and recommendations are based solely on the information obtained by us. We will be responsible for those data, interpretations, and recommendations, but shall not be responsible for interpretations by others of the information developed. Our services consist of professional consultation and observation only, and no warranty of any kind whatsoever, express or implied, is made or intended in connection with the work performed or to be performed by us, or by our proposal for consulting or other services, or by our furnishing of oral or written reports or findings.

8. REFERENCES

California Department of Conservation (CDC), 2022a, Landslide Inventory Interactive Map, accessed in December: https://maps.conservation.ca.gov/cgs/lsi/app/

California Department of Conservations (CDC), 2022b, California Tsunami Maps and Data, accessed in December: https://www.conservation.ca.gov/cgs/tsunami/maps

California Department of Transportation (Caltrans), 2018, Standard Specifications.

California Department of Transportation (Caltrans), 2020, Highway Design Manual, accessed in December: https://dot.ca.gov/programs/design/manual-highway-design-manual-hdm

California Emergency Management Agency, California Geological Survey, University of Southern California (Cal EMA), 2009, Tsunami Inundation Map for Emergency Planning, June 1.

Federal Emergency Management Agency (FEMA), 2022, FEMA Flood Map Service Center, accessed in December: https://msc.fema.gov/portal/home

Historic Aerials, 2022, https://historicaerials.com/viewer, accessed in December.

International Code Council (2018), 2019 California Building Code, California Code of Regulations, Title 24, Part 2, Volume 2 of 2, Based on the 2018 International Existing Building Code, Effective January 1, 2020.

Jennings, C.W. and Bryant, W.A., 2010, Fault Activity Map of California, California Geologic Survey, Geologic Data Map No. 6.

Morton, D.M. and Miller, F.K., 2006, Geologic map of the San Bernadino and Santa Ana 30’ x 60’ Quadrangles, California, U.S. Geological Survey, Scale 1:100,000.

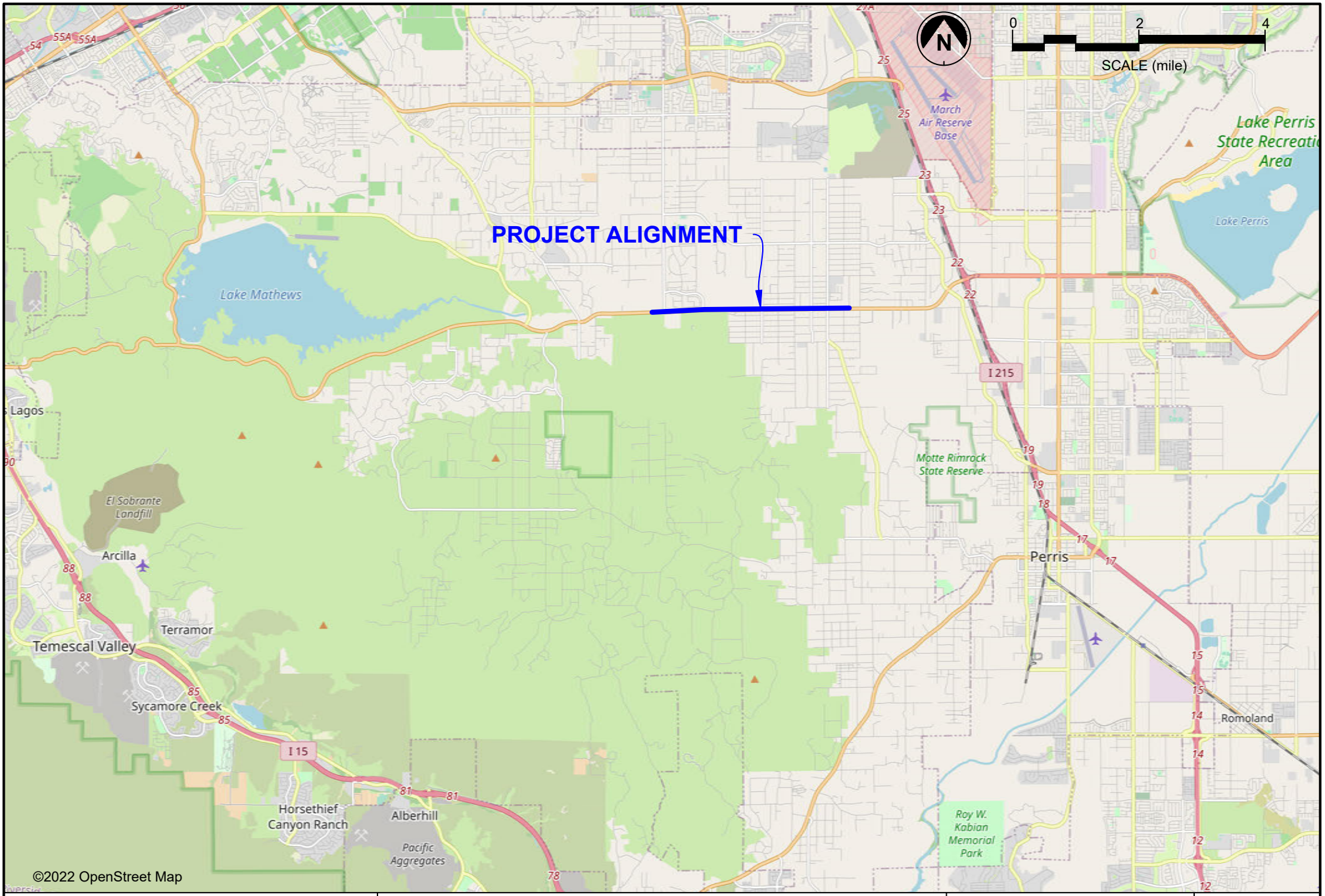
State Water Resources Control Board (SWRCB), 2022, Geotracker, accessed in December: https://geotracker.waterboards.ca.gov/

Structural Engineers Association of California (SEAOC), 2020, OSHPD Seismic Design Maps, accessed in May 2022: https://seismicmaps.org

U.S. Geological Survey (USGS), 2020a, USGS Earthquake Scenario Map, accessed in May 2022: https://earthquake.usgs.gov/scenarios/catalog/bssc2014/

U.S. Geological Survey (USGS), 2020b, USGS Geologic Hazards Science Center, U.S. Quaternary Faults, accessed in May 2022: https://usgs.maps.arcgis.com/apps/webappviewer/

U.S. Geological Survey (USGS), 2022, Areas of Land Subsidence in California, accessed in December: https://ca.water.usgs.gov/land_subsidence/california-subsidence-areas.html



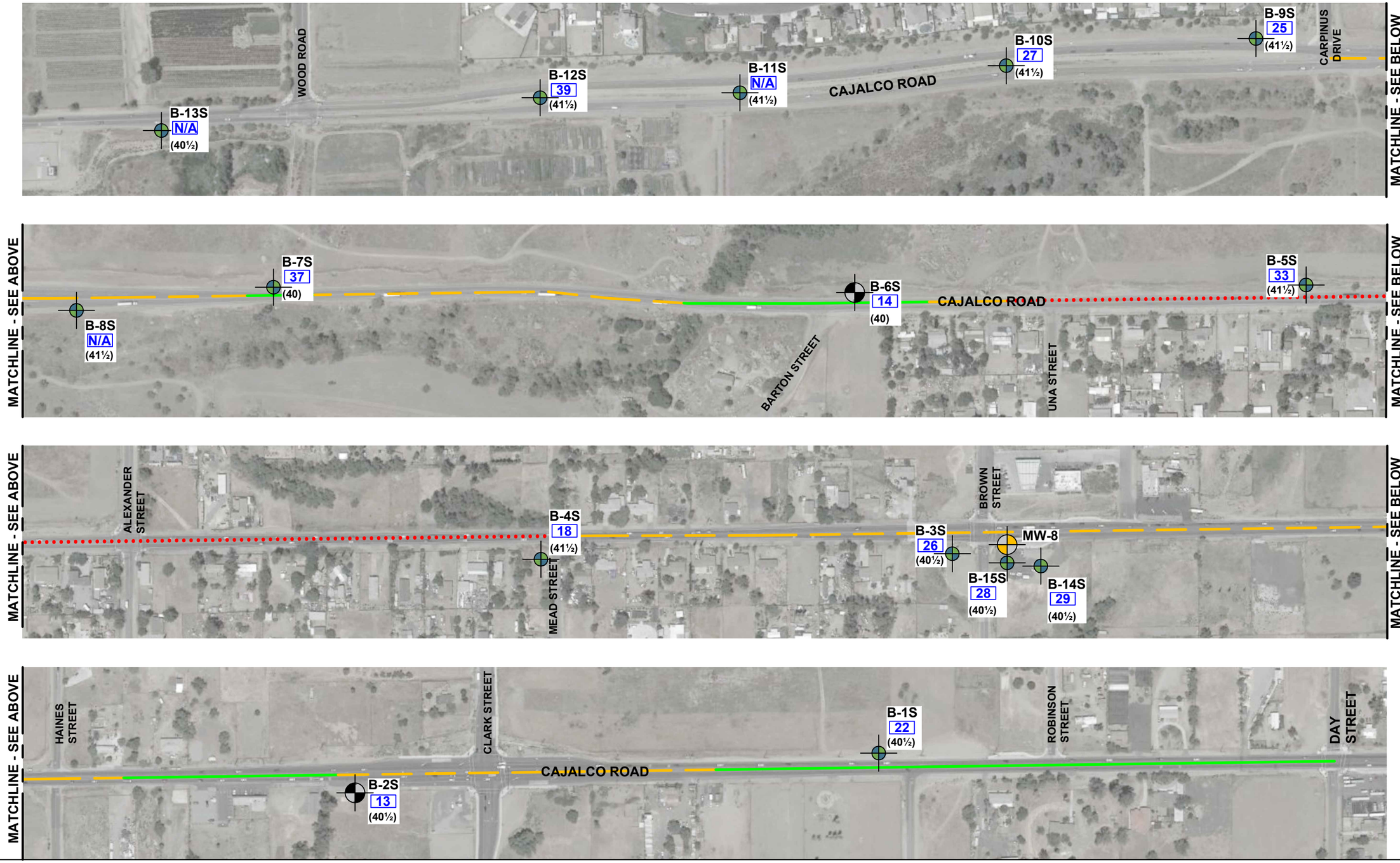
ATLAS

SITE VICINITY MAP

Mead Valley Sewer Improvements
Riverside County, California

Date: March, 2023
By: CGI
Job No.: 190063P4.2 (1962)

Figure: 1



LEGEND:

- **B-15S (40½)** — Location of Boring (Depth in Feet)
- **B-6S (40)** — Location of Monitoring Well (Proposed Depth in Feet)
- **MW-8** — Location of Monitoring Well by Others (ACCESS, 2022*)
- **39** — Depth to Encountered Groundwater (in Feet)
- 8-10 (Depth in Feet to Invert)
- 10-13 (Depth in Feet to Invert)
- 13-16 (Depth in Feet to Invert)

N

0 300 600

SCALE (feet)

NOTE: All Locations are approximate.

***Reference:** ACCESS (2022), Groundwater Monitoring Report, Mobil Baldwin, 21020 Cajalco Road, Perris California, dated July 29

ARDURRA, Mead Valley Cajalco SWR Prelim Design - Plan and Profile, Received February 2023

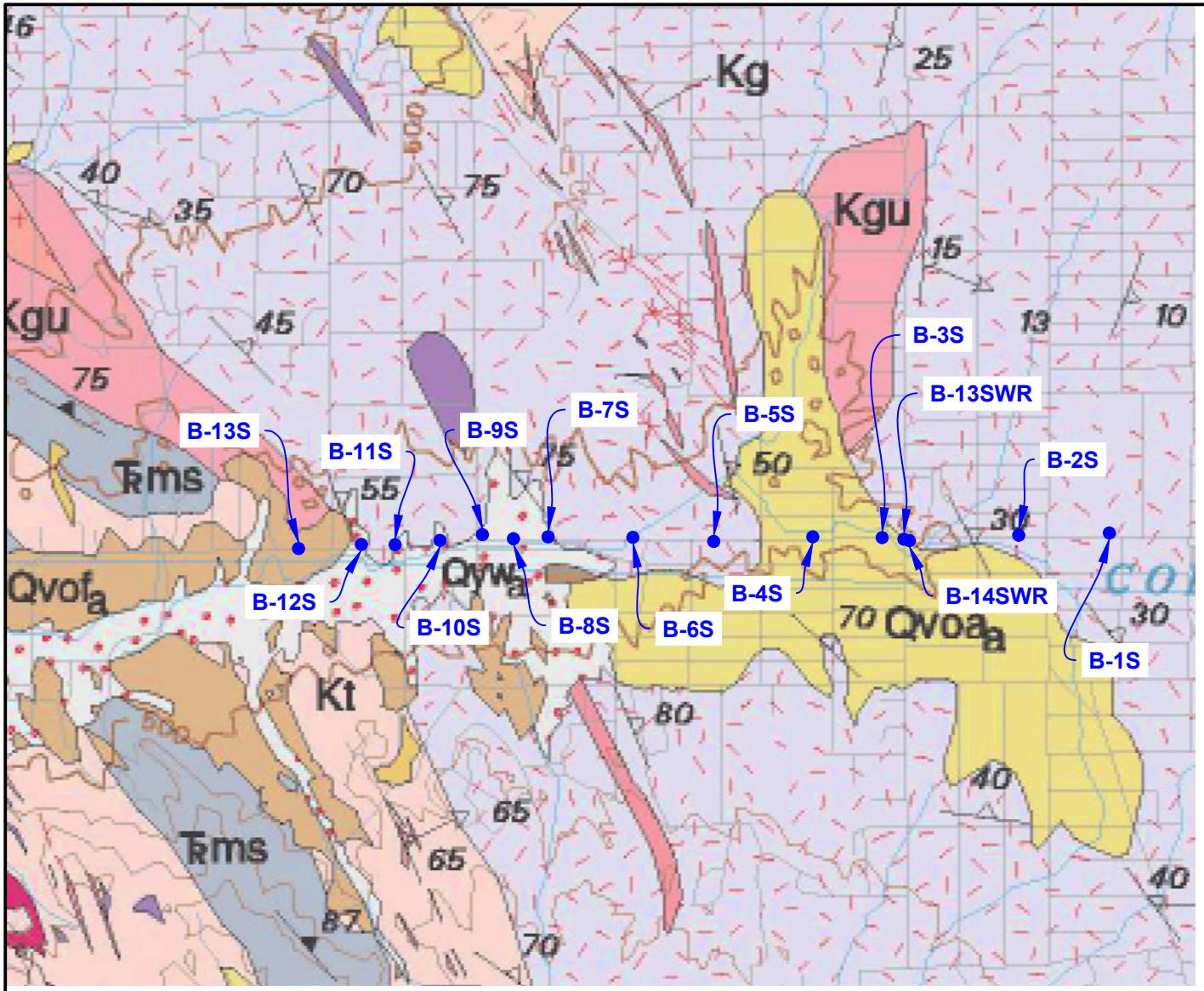
SUBSURFACE EXPLORATION MAP

Mead Valley Sewer Improvements
Riverside County, California

Date: March, 2023
By: CGI
Job No.: 190063P4.2 (1962)

ATLAS

Figure:
2



EXPLANATION:

Qyw_a	Young wash deposits (Holocene and late Pleistocene)
$Qvoa_a$	Very old axial-channel deposits (middle to early Pleistocene)
$Qvof_a$	Very old alluvial-fan deposits (middle to early Pleistocene)
Kg	Granitic dikes (Cretaceous)
Kvt	Val Verde tonalite
Kvti	Inclusion-rich tonalite
kgb	Gabbro, undifferentiated (Cretaceous)
kpd	Granitic pegmatite dikes
kgu	Granite, undifferentiated (Cretaceous)
kt	Tonalite, undifferentiated (Cretaceous)
T_Rms	Schist

N

0 3,000 6,000

SCALE (feet)

NOTE: All locations are approximate.

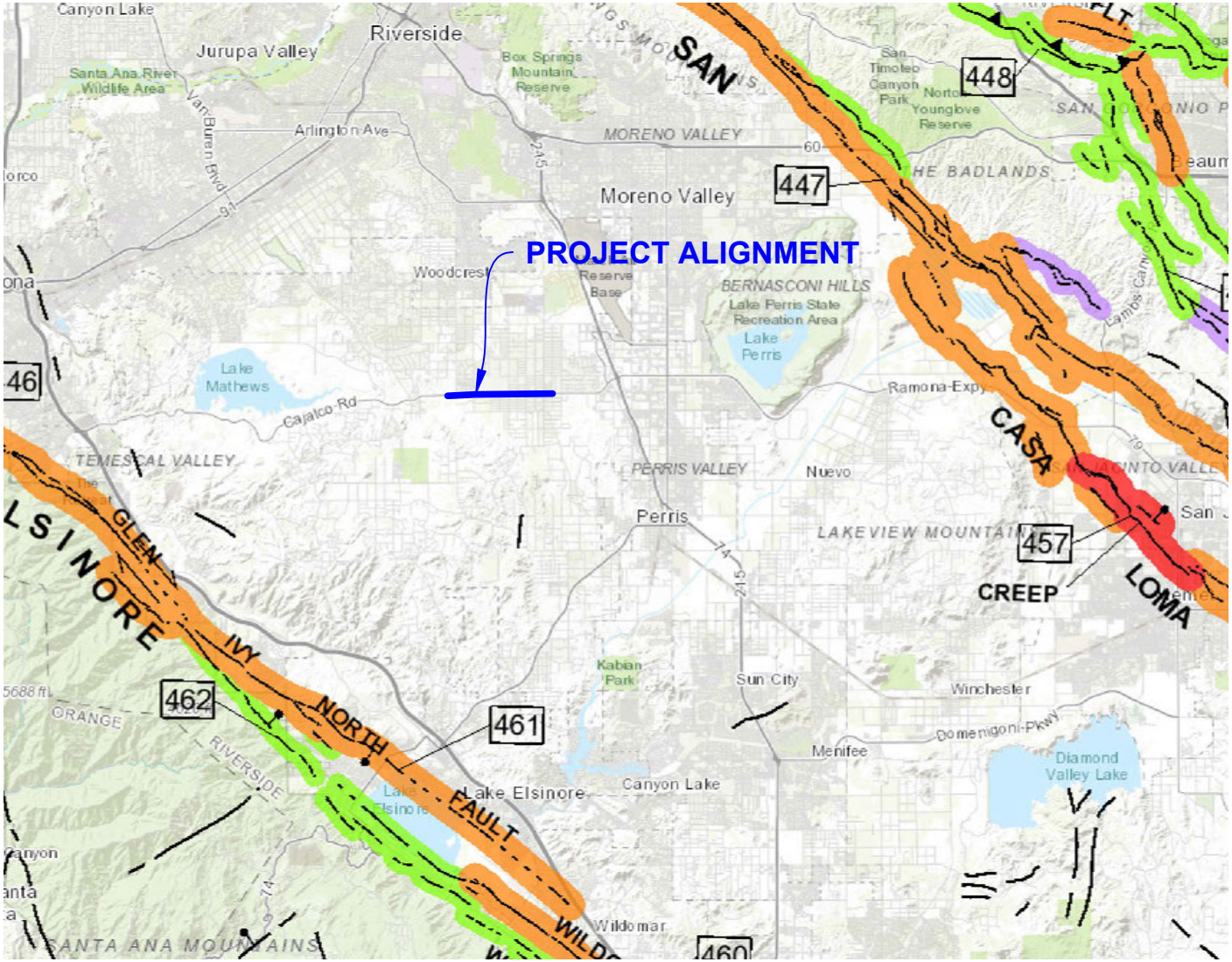
Reference:
Morton, D.M. and Miller, F.K., 2006, Geologic map of the San Bernardino and Santa Ana 30' x 60' quadrangles, California, U.S. Geological Survey, 1:100,000.

ATLAS

REGIONAL GEOLOGY MAP
Mead Valley Sewer Improvements
Riverside County, California

Date: March, 2023
By: CGI
Job No.: 190063P4.2 (1962)

Figure: 3



EXPLANATION:

Fault along which historic (last 200 years) displacement has occurred

Holocene fault displacement (during past 11,700 years) without historic record.

Late Quaternary fault displacement (during past 700,000 years).

Quaternary fault (age undifferentiated).

Pre-Quaternary fault (older than 1.6 million years) or fault without recognized Quaternary displacement.

Low angle fault (barbs on upper plate).

447	Claremont fault - San Jacinto fault zone (concealed)
448	Cherry Valley fault - San Gorgonio Pass fault zone (concealed)
457	Casa Loma fault - San Jacinto fault zone (concealed)
461	Glen Ivy North fault - Elsinore fault zone (concealed)
462	Glen Ivy South fault - Elsinore fault zone (concealed)

N

0 5 10

SCALE (miles)

Reference:
Jennings, C.W., Bryant W.A., Fault Activity Map of California (2010), maps.conservation.ca.gov/cgs/fam; Accessed November, 2022

ATLAS

CALIFORNIA FAULT ACTIVITY MAP
Mead Valley Sewer Improvements
Riverside County, California

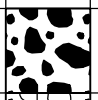
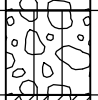
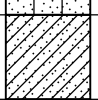
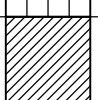
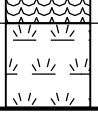
Date: March, 2023
By: CGI
Job No.: 190063P4.2 (1962)

Figure: 4

APPENDIX I
SUBSURFACE EXPLORATION

Relatively undisturbed samples were obtained using a modified California (CAL) sampler, which is a ring-lined split tube sampler with a 3-inch outer diameter and 2½-inch inner diameter. Standard Penetration Tests (SPT) were performed using a 2-inch outer diameter and 1⅜-inch inner diameter split tube sampler. The CAL and SPT samplers were driven with a 140-pound weight dropping 30 inches. The number of blows needed to drive the samplers the final 12 inches of an 18-inch drive is noted on the boring logs as “Driving Resistance (blows/ft. of drive).” SPT and CAL sampler refusal was encountered when 50 blows were applied during any one of the three 6-inch intervals, a total of 100 blows was applied, or there was no discernible sampler advancement during the application of 10 successive blows. The SPT penetration resistance was normalized to a safety hammer (cathead and rope) with a 60% energy transfer ratio in accordance with ASTM D6066. The normalized SPT penetration resistance is noted on the boring logs as “N60.” When auger refusal was encountered the drill rig used a diamond HQ core bit for rock coring to advance through the rock and recover rock core for identification and testing. Disturbed bulk samples were obtained from the SPT sampler and the drill cuttings. The soils are classified in accordance with the Unified Soil Classification System. The rock encountered were classified in accordance with the Caltrans rock classification system.

To assist in assessing groundwater levels during construction, temporary groundwater monitoring wells were installed at boring locations B-2S and B-6S to observe the groundwater activity. The monitoring wells should be periodically monitored, and groundwater elevations be recorded by a qualified individual. A diagram presenting the well construction is presented in Appendix I.

MAJOR DIVISIONS					TYPICAL NAMES
COARSE-GRAINED SOILS MORE THAN HALF IS COARSER THAN NO. 200 SIEVE	GRAVELS MORE THAN HALF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE	CLEAN GRAVELS WITH LESS THAN 15% FINES	GW		WELL-GRADED GRAVELS WITH OR WITHOUT SAND
			GP		POORLY GRADED GRAVELS WITH OR WITHOUT SAND
		GRAVELS WITH 15% OR MORE FINES	GM		SILTY GRAVELS WITH OR WITHOUT SAND
			GC		CLAYEY GRAVELS WITH OR WITHOUT SAND
	SANDS MORE THAN HALF COARSE FRACTION IS FINER THAN NO. 4 SIEVE SIZE	CLEAN SANDS WITH LESS THAN 15% FINES	SW		WELL-GRADED SANDS WITH OR WITHOUT GRAVEL
			SP		POORLY GRADED SANDS WITH OR WITHOUT GRAVEL
		SANDS WITH 15% OR MORE FINES	SM		SILTY SANDS WITH OR WITHOUT GRAVEL
			SC		CLAYEY SANDS WITH OR WITHOUT GRAVEL
FINE-GRAINED SOILS MORE THAN HALF IS FINER THAN NO. 200 SIEVE	SILTS AND CLAYS LIQUID LIMIT 50% OR LESS		ML		INORGANIC SILTS OF LOW TO MEDIUM PLASTICITY WITH OR WITHOUT SAND OR GRAVEL
			CL		INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY WITH OR WITHOUT SAND OR GRAVEL
			OL		ORGANIC SILTS OR CLAYS OF LOW TO MEDIUM PLASTICITY WITH OR WITHOUT SAND OR GRAVEL
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50%		MH		INORGANIC SILTS OF HIGH PLASTICITY WITH OR WITHOUT SAND OR GRAVEL
			CH		INORGANIC CLAYS OF HIGH PLASTICITY WITH OR WITHOUT SAND OR GRAVEL
			OH		ORGANIC SILTS OR CLAYS OF HIGH PLASTICITY WITH OR WITHOUT SAND OR GRAVEL
HIGHLY ORGANIC SOILS			PT		PEAT AND OTHER HIGHLY ORGANIC SOILS

SAMPLE SYMBOLS

SAMPLE TYPES

- Bulk Sample
- CAL — Modified California Sampler
- SPT — Standard Penetration Test

LABORATORY SYMBOLS

- AL - ATTERBERG LIMITS
- CON - CONSOLIDATION
- COR - CORROSIVITY TESTING
- DS - DIRECT SHEAR
- ENV - ENVIRONMENTAL, SOIL
- GW - ENVIRONMENTAL, GROUNDWATER
- RV - R-VALUE
- PD - PARTICLE-SIZE DISTRIBUTION
- UC - UNCONFINED COMPRESSIVE STRENGTH
- WA - No. 200 WASH (% PASSING No. 200 SIEVE)

GROUNDWATER SYMBOLS

WATER LEVEL AT TIME OF EXCAVATION OR AS INDICATED

RELATIVE DENSITY OF COHESIONLESS SOILS		CONSISTENCY OF COHESIVE SOILS		
RELATIVE DENSITY	SPT N60 BLOWS/FOOT	CONSISTENCY	SPT N60 BLOWS/FOOT	POCKET PENETROMETER MEASUREMENT (TSF)
VERY LOOSE	0 - 4	VERY SOFT	0 - 2	0 - 0.25
LOOSE	4 - 10	SOFT	2 - 4	0.25 - 0.50
MEDIUM DENSE	10 - 30	MEDIUM STIFF	4 - 8	0.50 - 1.0
DENSE	30 - 50	STIFF	8 - 15	1.0 - 2.0
VERY DENSE	OVER 50	VERY STIFF	15 - 30	2.0 - 4.0
		HARD	OVER 30	OVER 4.0

NUMBER OF BLOWS OF 140 LB HAMMER FALLING 30 INCHES TO DRIVE A 2 INCH O.D. (1-3/8 INCH I.D.) SPLIT-BARREL SAMPLER THE LAST 12 INCHES OF AN 18-INCH DRIVE (ASTM-1586 STANDARD PENETRATION TEST).
IF THE SEATING INTERVAL (1st 6 INCH INTERVAL) IS NOT ACHEIVED, N IS REPORTED AS REF.

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SUBSURFACE EXPLORATION LEGEND

LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	B-1S
Mead Valley Sewer Improvements	1962.000-1	

SITE	START	END	SHEET NO.
Riverside County, CA	9/21/22	9/21/22	1

DRILLING COMPANY	DRILL METHOD	LOGGED BY	REVIEWED BY
Baja Exploration	Hollow Stem Auger	HK	DAS/MM

DRILLING EQUIPMENT	BORING DIA. (in.)	TOTAL DEPTH (ft)	GROUND ELEV. (ft)
CME-75	8	40.5	1670

DEPTH/ELEV. GROUND WATER (ft)
- ▽ AT TIME OF DRILLING 22.00 ft / Elev 1648.00 ft
- ▼ AT END OF DRILLING ---
- ▼ AFTER DRILLING ---

SAMPLING METHOD: 140-lb Hammer, 30-in Drop

NOTES: Hammer Efficiency = 80.0% N_{60}~1.33N_{SPT}

ELEVATION (ft)	DEPTH (ft)	BULK SAMPLE	DRIVE SAMPLE	BLOWS PER FOOT	N_{60}	MOISTURE (%)	DRY DENSITY (pcf)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION	LAB TESTS
									VERY OLD AXIAL-CHANNEL DEPOSITS (Qvoa): POORLY GRADED SAND with SILT (SP-SM), loose to medium dense, brown, moist, fine to coarse grained.	
1665	5		CAL	50/5		3.6	109.5		**VAL VERDE TONALITE (Kvt)**: IGNEOUS ROCK (QUARTZ DIORITE), grayish brown, intensely weathered to decomposed, soft to moderately hard; (Poorly Graded SAND with SILT (SP-SM), very dense, moist, fine to medium grained).	DS WA
1660	10		CAL	50/6						
1655	15		CAL	50/6						
1650	20		CAL	50/6					Wet, fine to coarse grained. Dark brown; (POORLY GRADED SAND with CLAY (SP-SC), very dense, moist, fine to medium grained). ▽ Groundwater observed at 22 feet.	

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Figure
I-1

ATLAS LOG REPORT - - 3/3/23 10:53 - \\SD.SCST.COM\DFS_ROOT\DATA\CLIENTS\EASTERN MUNICIPAL WATER DISTRICT\190063P4 - EMWD, AS-NEEDED ENGINEERING NON-DESIGN SERVICES\190063P4.2 - EMWD, GOOD HOPE & MEAD VALLEY WATER SI

LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	
Mead Valley Sewer Improvements	1962.000-1	**B-1S**

SITE	START	END	SHEET NO.
Riverside County, CA	9/21/22	9/21/22	2

DRILLING COMPANY	DRILL METHOD	LOGGED BY	REVIEWED BY
Baja Exploration	Hollow Stem Auger	HK	DAS/MM

DRILLING EQUIPMENT	BORING DIA. (in.)	TOTAL DEPTH (ft)	GROUND ELEV. (ft)
CME-75	8	40.5	1670

DEPTH/ELEV. GROUND WATER (ft)
- ▽ **AT TIME OF DRILLING** 22.00 ft / Elev 1648.00 ft
- ▼ **AT END OF DRILLING** ---
- ▼ **AFTER DRILLING** ---

SAMPLING METHOD
140-lb Hammer, 30-in Drop

NOTES
Hammer Efficiency = 80.0% N_{60}~1.33N_{SPT}

ELEVATION (ft)	DEPTH (ft)	BULK SAMPLE	DRIVE SAMPLE	BLOWS PER FOOT	N_{60}	MOISTURE (%)	DRY DENSITY (pcf)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION	LAB TESTS
			SPT	50/6					Dark brown; (POORLY GRADED SAND with CLAY (SP-SC), very dense, moist, fine to medium grained). *(continued)* (Micaceous).	
									Hard drilling.	
1640	30		SPT	50/2					Grayish brown; (fine to coarse grained).	
1635	35		SPT	50/2					(Increase in fine content).	
1630	40		SPT	50/2						
									BORING TERMINATED AT 40½ FEET Groundwater observed at 22 Feet	
1625	45									

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Figure
I-2

ATLAS LOG REPORT - - 3/3/23 10:53 - \\SD.SCST.COM\DFS_ROOT\DATA\CLIENTS\EASTERN MUNICIPAL WATER DISTRICT\190063P4 - EMWD, AS-NEEDED ENGINEERING NON-DESIGN SERVICES\190063P4.2 - EMWD, GOOD HOPE & MEAD VALLEY WATER SI

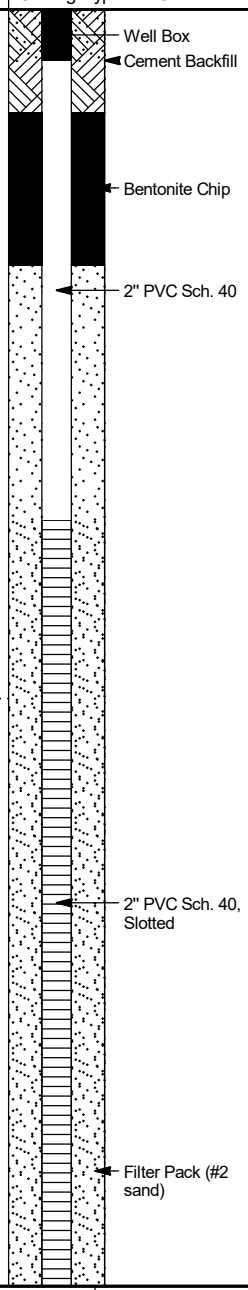
LOG OF MONITOR WELL

ATLAS PROJECT NAME	Mead Valley Sewer Improvements	**ATLAS PROJECT NUMBER**	1962.000-1
B-2S			
SITE	Riverside County, CA	**START**	1/11/23
END	1/11/23	**SHEET NO.**	3
DRILLING COMPANY	Baja Exploration	**DRILL METHOD**	Hollow Stem Auger
LOGGED BY	SD	**REVIEWED BY**	DAS/MM
DRILLING EQUIPMENT	CME-95	**BORING DIA. (in.)**	8
TOTAL DEPTH (ft)	40.5	**GROUND ELEV. (ft)**	1654
DEPTH/ELEV. GROUND WATER (ft)	▽ AT TIME OF DRILLING 13.00 ft / Elev 1641.00 ft		
SAMPLING METHOD	140-lb Hammer, 30-in Drop	**NOTES**	Hammer Efficiency = 80.0% N_{60}~1.33N_{SPT}
▼ AT END OF DRILLING ---			
▼ AFTER DRILLING ---			

ELEVATION (ft)	DEPTH (ft)	BULK SAMPLE	DRIVE SAMPLE	BLOWS PER FOOT	N_{60}	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION
1650	5		SPT	18	24		**VERY OLD AXIAL-CHANNEL DEPOSITS (Qvoa)** : CLAYEY SAND (SC), medium dense, reddish brown, moist, fine grained sand.
							Dense.
1645	10		SPT	52	69		Very dense, weakly cemented, decreased fines.
							▽ Groundwater observed at 13 feet.
1640	15		SPT	57	76		**VAL VERDE TONALITE (Kvt)**: IGNEOUS ROCK (QUARTZ DIORITE), pale brown, intensely weathered to decomposed, soft to moderately hard; (CLAYEY SAND (SC), very dense, moist, fine to medium grained, weakly cemented).
1635	20		SPT	62	83		(Increased fines)
1630							

WELL DIAGRAM

Casing Type: PVC



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Figure

I-3

ATLAS LOG REPORT - - 3/3/23 10:53 - \\SD.SCST.COM\DFS_ROOT\DATA\CLIENTS\EASTERN MUNICIPAL WATER DISTRICT\190063P4 - EMWD, AS-NEEDED ENGINEERING NON-DESIGN SERVICES\190063P4.2 - EMWD, GOOD HOPE & MEAD VALLEY WATER SI

LOG OF MONITOR WELL

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	B-2S
Mead Valley Sewer Improvements	1962.000-1	

SITE	START	END	SHEET NO.
Riverside County, CA	1/11/23	1/11/23	4

DRILLING COMPANY	DRILL METHOD	LOGGED BY	REVIEWED BY
Baja Exploration	Hollow Stem Auger	SD	DAS/MM

DRILLING EQUIPMENT	BORING DIA. (in.)	TOTAL DEPTH (ft)	GROUND ELEV. (ft)
CME-95	8	40.5	1654

DEPTH/ELEV. GROUND WATER (ft)
- ▽ AT TIME OF DRILLING 13.00 ft / Elev 1641.00 ft
- ▼ AT END OF DRILLING ---
- ▼ AFTER DRILLING ---

SAMPLING METHOD: 140-lb Hammer, 30-in Drop

NOTES: Hammer Efficiency = 80.0% N_{60}~1.33N_{SPT}

ELEVATION (ft)	DEPTH (ft)	BULK SAMPLE	DRIVE SAMPLE	BLOWS PER FOOT	N_{60}	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION	WELL DIAGRAM
			SPT	62	83		**VAL VERDE TONALITE (Kvt)**: IGNEOUS ROCK (QUARTZ DIORITE), pale brown, intensely weathered to decomposed, soft to moderately hard; (CLAYEY SAND (SC), very dense, moist, fine to medium grained, weakly cemented). *(continued)*	
1625	30		SPT	74	99		(SILTY SAND (SM), very dense, yellowish brown and gray, moist, fine to medium grained.)	2" PVC Sch. 40, Slotted
1620	35		SPT	50/5	67/5		Moderately soft to moderately hard; (Moderately cemented.)	
1615	40		SPT	50/6			(Strongly cemented.)	
1610	45						**BORING TERMINATED AT 40½ FEET** Groundwater observed at 13 Feet	
1605								

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Figure
I-4

ATLAS LOG REPORT - - 3/3/23 10:53 - \\SD.SCST.COM\DFS_ROOT\DATA\CLIENTS\EASTERN MUNICIPAL WATER DISTRICT\190063P4 - EMWD, AS-NEEDED ENGINEERING NON-DESIGN SERVICES\190063P4.2 - EMWD, GOOD HOPE & MEAD VALLEY WATER SI

LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	
Mead Valley Sewer Improvements	1962.000-1	**B-3S**

SITE	START	END	SHEET NO.
Riverside County, CA	9/29/22	9/29/22	5

DRILLING COMPANY	DRILL METHOD	LOGGED BY	REVIEWED BY
Baja Exploration	Hollow Stem Auger	SD	DAS/MM

DRILLING EQUIPMENT	BORING DIA. (in.)	TOTAL DEPTH (ft)	GROUND ELEV. (ft)
CME-75	8	40.5	1638

DEPTH/ELEV. GROUND WATER (ft)
- ▽ AT TIME OF DRILLING 26.00 ft / Elev 1612.00 ft
- ▼ AT END OF DRILLING ---
- ▼ AFTER DRILLING ---

SAMPLING METHOD: 140-lb Hammer, 30-in Drop

NOTES: Hammer Efficiency = 80.0% N_{60}~1.33N_{SPT}

ELEVATION (ft)	DEPTH (ft)	BULK SAMPLE	DRIVE SAMPLE	BLOWS PER FOOT	N_{60}	MOISTURE (%)	DRY DENSITY (pcf)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION	LAB TESTS
1635	0								**VERY OLD AXIAL-CHANNEL DEPOSITS (Qvoa)** : CLAYEY SAND (SC), medium dense, reddish brown, moist, fine grained sand.	AL EI RV WA
	5		CAL	24						
1630										
	10		CAL	50/6		5.7	115.2		**VAL VERDE TONALITE (Kvt)**: IGNEOUS ROCK (QUARTZ DIORITE), brownish gray, intensely weathered to decomposed, soft to moderately hard; (SILTY SAND (SM), very dense, moist, fine to coarse grained).	
1625										
	15		CAL	50/6					(Decrease in fines content).	
1620										
	20		CAL	50/6					Greenish gray; (fine to medium grained).	
1615										

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Figure

I-5

ATLAS LOG REPORT - - 3/3/23 10:53 - \\SD.SCST.COM\DFS_ROOT\DATA\CLIENTS\EASTERN MUNICIPAL WATER DISTRICT\190063P4 - EMWD, AS-NEEDED ENGINEERING NON-DESIGN SERVICES\190063P4.2 - EMWD, GOOD HOPE & MEAD VALLEY WATER SI

LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	
Mead Valley Sewer Improvements	1962.000-1	**B-3S**

SITE	START	END	SHEET NO.
Riverside County, CA	9/29/22	9/29/22	6

DRILLING COMPANY	DRILL METHOD	LOGGED BY	REVIEWED BY
Baja Exploration	Hollow Stem Auger	SD	DAS/MM

DRILLING EQUIPMENT	BORING DIA. (in.)	TOTAL DEPTH (ft)	GROUND ELEV. (ft)
CME-75	8	40.5	1638

DEPTH/ELEV. GROUND WATER (ft)
- ▽ AT TIME OF DRILLING 26.00 ft / Elev 1612.00 ft
- ▼ AT END OF DRILLING ---
- ▼ AFTER DRILLING ---

SAMPLING METHOD: 140-lb Hammer, 30-in Drop

NOTES: Hammer Efficiency = 80.0% N_{60}~1.33N_{SPT}

ELEVATION (ft)	DEPTH (ft)	BULK SAMPLE	DRIVE SAMPLE	BLOWS PER FOOT	N_{60}	MOISTURE (%)	DRY DENSITY (pcf)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION	LAB TESTS
			SPT	50/6					**VAL VERDE TONALITE (Kvt)**: IGNEOUS ROCK (QUARTZ DIORITE), brownish gray, intensely weathered to decomposed, soft to moderately hard; (SILTY SAND (SM), very dense, moist, fine to coarse grained). *(continued)* (Increase in fines content). Groundwater observed at 26 feet.	
1610										
	30		SPT	50/5						
1605										
	35		SPT	50/6					(Increase in fines content).	
1600										
	40		SPT	50/4						
									BORING TERMINATED AT 40½ FEET Groundwater observed at 26 Feet	
1595										
	45									
1590										

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Figure

I-6

ATLAS LOG REPORT - - 3/3/23 10:53 - \\SD.SCST.COM\DFS_ROOT\DATA\CLIENTS\EASTERN MUNICIPAL WATER DISTRICT\190063P4 - EMWD, AS-NEEDED ENGINEERING NON-DESIGN SERVICES\190063P4.2 - EMWD, GOOD HOPE & MEAD VALLEY WATER SI

LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	
Mead Valley Sewer Improvements	1962.000-1	**B-4S**

SITE	START	END	SHEET NO.
Riverside County, CA	9/27/22	9/27/22	7

DRILLING COMPANY	DRILL METHOD	LOGGED BY	REVIEWED BY
Baja Exploration	Hollow Stem Auger	SD	DAS/MM

DRILLING EQUIPMENT	BORING DIA. (in.)	TOTAL DEPTH (ft)	GROUND ELEV. (ft)
CME-75	8	41.5	1639

DEPTH/ELEV. GROUND WATER (ft)
- ▽ AT TIME OF DRILLING 18.00 ft / Elev 1621.00 ft
- ▼ AT END OF DRILLING ---
- ▼ AFTER DRILLING ---

SAMPLING METHOD: 140-lb Hammer, 30-in Drop

NOTES: Hammer Efficiency = 80.0% N_{60}~1.33N_{SPT}

ELEVATION (ft)	DEPTH (ft)	BULK SAMPLE	DRIVE SAMPLE	BLOWS PER FOOT	N_{60}	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION	LAB TESTS
							FILL (Qf): SANDY SILT (ML), medium dense, brown, moist, fine grained.	
							VAL VERDE TONALITE (Kvt): IGNEOUS ROCK (QUARTZ DIORITE), light brown, intensely weathered to decomposed, soft to moderately hard; (SILTY SAND (SM), dense, moist, fine to medium grained).	
1635	5		CAL	42				PD
1630	10		CAL	47			(Increase in medium to coarse grained sand).	
1625	15		CAL	53			Light brown.	
						▽	Groundwater observed at 18 feet.	
1620	20		CAL	49			(Weakly cemented, increase in palgioclase feldspar).	
							Grayish to yellowish brown; (POORLY GRADED SAND (SP), dense, wet, fine to coarse grained).	
1615								

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Figure

I-7

ATLAS LOG REPORT - - 3/3/23 10:53 - \\SD.SCST.COM\DFS_ROOT\DATA\CLIENTS\EASTERN MUNICIPAL WATER DISTRICT\190063P4 - EMWD, AS-NEEDED ENGINEERING NON-DESIGN SERVICES\190063P4.2 - EMWD, GOOD HOPE & MEAD VALLEY WATER SI

LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	
Mead Valley Sewer Improvements	1962.000-1	**B-4S**

SITE	START	END	SHEET NO.
Riverside County, CA	9/27/22	9/27/22	8

DRILLING COMPANY	DRILL METHOD	LOGGED BY	REVIEWED BY
Baja Exploration	Hollow Stem Auger	SD	DAS/MM

DRILLING EQUIPMENT	BORING DIA. (in.)	TOTAL DEPTH (ft)	GROUND ELEV. (ft)
CME-75	8	41.5	1639

DEPTH/ELEV. GROUND WATER (ft)
- ▽ **AT TIME OF DRILLING** 18.00 ft / Elev 1621.00 ft
- ▼ **AT END OF DRILLING** ---
- ▼ **AFTER DRILLING** ---

SAMPLING METHOD: 140-lb Hammer, 30-in Drop

NOTES: Hammer Efficiency = 80.0% N_{60}~1.33N_{SPT}

ELEVATION (ft)	DEPTH (ft)	BULK SAMPLE	DRIVE SAMPLE	BLOWS PER FOOT	N_{60}	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION	LAB TESTS
			SPT	36	48		Grayish to yellowish brown; (POORLY GRADED SAND (SP), dense, wet, fine to coarse grained). *(continued)*	
1610	30		CAL	42			Yellowish brown; (POORLY GRADED SAND with SILT (SP-SM), dense, wet, fine to coarse grained).	
1605	35		SPT	51	68		(SILTY SAND (SM), very dense, wet, fine to coarse grained).	
1600	40		SPT	65	87		(Increase in fines content).	
1595	45						**BORING TERMINATED AT 41½ FEET** Groundwater observed at 18 Feet	
1590								

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Figure

I-8

ATLAS LOG REPORT - - 3/3/23 10:53 - \\SD.SCST.COM\DFS_ROOT\DATA\CLIENTS\EASTERN MUNICIPAL WATER DISTRICT\190063P4 - EMWD, AS-NEEDED ENGINEERING NON-DESIGN SERVICES\190063P4.2 - EMWD, GOOD HOPE & MEAD VALLEY WATER SI

LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	B-5S
Mead Valley Sewer Improvements	1962.000-1	

SITE	START	END	SHEET NO.
Riverside County, CA	9/27/22	9/27/22	9

DRILLING COMPANY	DRILL METHOD	LOGGED BY	REVIEWED BY
Baja Exploration	Hollow Stem Auger	SD	DAS/MM

DRILLING EQUIPMENT	BORING DIA. (in.)	TOTAL DEPTH (ft)	GROUND ELEV. (ft)
CME-75	8	41.5	1634

DEPTH/ELEV. GROUND WATER (ft)
- AT TIME OF DRILLING 33.00 ft / Elev 1601.00 ft
- AT END OF DRILLING ---
- AFTER DRILLING ---

SAMPLING METHOD: 140-lb Hammer, 30-in Drop

NOTES: Hammer Efficiency = 80.0% N_{60}~1.33N_{SPT}

ELEVATION (ft)	DEPTH (ft)	BULK SAMPLE	DRIVE SAMPLE	BLOWS PER FOOT	N_{60}	MOISTURE (%)	DRY DENSITY (pcf)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION	LAB TESTS
									FILL (Qf): SILTY SAND (SM), medium dense, brown, moist, fine to medium grained, low plasticity.	
1630	5		CAL	43		10.6	129.3		**VERY OLD AXIAL-CHANNEL DEPOSITS (Qvoa)**: CLAYEY SAND (SC), dense, light brown, moist, fine to medium grained, low plasticity, white mottling, micaceous. Fine grained, weakly cemented, more micaceous.	WA
1625	10		CAL	80/12"					**VAL VERDE TONALITE (Kvt)**: IGNEOUS ROCK (QUARTZ DIORITE), light reddish brown, intensely weathered to decomposed, soft to moderately hard; (CLAYEY SAND (SC), very dense, moist, fine to coarse grained, moderately cemented).	
1620	15		CAL	50/6					(Decrease in fines).	
1615	20		CAL	82/9"					(Increase in moisture).	
1610									Reddish brown; (SANDY SILT (ML), very dense, moist, fine to medium grained).	

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Figure

I-9

ATLAS LOG REPORT - - 3/3/23 10:53 - \\SD.SCST.COM\DFS_ROOT\DATA\CLIENTS\EASTERN MUNICIPAL WATER DISTRICT\190063P4 - EMWD, AS-NEEDED ENGINEERING NON-DESIGN SERVICES\190063P4.2 - EMWD, GOOD HOPE & MEAD VALLEY WATER SI

LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	B-5S
Mead Valley Sewer Improvements	1962.000-1	

SITE	START	END	SHEET NO.
Riverside County, CA	9/27/22	9/27/22	10

DRILLING COMPANY	DRILL METHOD	LOGGED BY	REVIEWED BY
Baja Exploration	Hollow Stem Auger	SD	DAS/MM

DRILLING EQUIPMENT	BORING DIA. (in.)	TOTAL DEPTH (ft)	GROUND ELEV. (ft)
CME-75	8	41.5	1634

DEPTH/ELEV. GROUND WATER (ft)
- ▽ AT TIME OF DRILLING 33.00 ft / Elev 1601.00 ft
- ▼ AT END OF DRILLING ---
- ▼ AFTER DRILLING ---

SAMPLING METHOD: 140-lb Hammer, 30-in Drop

NOTES: Hammer Efficiency = 80.0% N_{60}~1.33N_{SPT}

ELEVATION (ft)	DEPTH (ft)	BULK SAMPLE	DRIVE SAMPLE	BLOWS PER FOOT	N_{60}	MOISTURE (%)	DRY DENSITY (pcf)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION	LAB TESTS
									Reddish brown; (SANDY SILT (ML), very dense, moist, fine to medium grained). *(continued)*	
			SPT	50	67					
1605									(Increase in sand content).	
	30									
			SPT	45	60				Yellowish brown, (SILTY SAND (SM), very dense, moist, fine to medium grained).	
								▽	Groundwater observed at 33 feet.	
1600										
	35								(Poorly Graded SAND (SP), medium dense, wet, fine to coarse grained).	
			CAL	34						
1595										
	40									
			SPT	33	44				Reddish brown; (LEAN CLAY with SAND (CL), hard, wet, fine to medium grained).	
									BORING TERMINATED AT 41½ FEET Groundwater observed at 33 Feet	
1590										
	45									
1585										

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Figure

I-10

ATLAS LOG REPORT - - 3/3/23 10:53 - \\SD.SCST.COM\DFS_ROOT\DATA\CLIENTS\EASTERN MUNICIPAL WATER DISTRICT\190063P4 - EMWD, AS-NEEDED ENGINEERING NON-DESIGN SERVICES\190063P4.2 - EMWD, GOOD HOPE & MEAD VALLEY WATER SI

LOG OF MONITOR WELL

ATLAS PROJECT NAME	Mead Valley Sewer Improvements	**ATLAS PROJECT NUMBER**	1962.000-1
B-6S			
SITE	Riverside County, CA	**START** 1/11/23	**END** 1/13/23
SHEET NO.	11		
DRILLING COMPANY	Baja Exploration	**DRILL METHOD**	Hollow Stem Auger wt HQ rock coring
LOGGED BY	SD	**REVIEWED BY**	DAS/MM
DRILLING EQUIPMENT	CME-95	**BORING DIA. (in.)**	8
TOTAL DEPTH (ft)	40	**GROUND ELEV. (ft)**	1618
DEPTH/ELEV. GROUND WATER (ft)			
AT TIME OF DRILLING	14.00 ft / Elev 1604.00 ft		
AT END OF DRILLING	---		
AFTER DRILLING	---		
SAMPLING METHOD	140-lb Hammer, 30-in Drop	**NOTES**	Hammer Efficiency = 80.0% N_{60}~1.33N_{SPT}

ELEVATION (ft)	DEPTH (ft)	BULK SAMPLE	DRIVE SAMPLE	BLOWS PER FOOT	N_{60}	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION	LAB TESTS	WELL DIAGRAM
									Casing Type: PVC
							VERY OLD AXIAL-CHANNEL DEPOSITS (Qvoa): CLAYEY SAND (SC), medium dense, reddish brown, moist, fine to coarse grained.		Well Box; Cement Backfill
1615									Bentonite Chip
	5		SPT	4	5		SILTY SAND (SM), loose, brown, moist, fine grained.		2" PVC Sch. 40
1610									
	10		SPT	9	12		Medium dense.		
1605									
							▽ Groundwater observed at 14 feet		
	15		SPT	36	48		CLAYEY SAND (SC), very dense, grayish yellow, moist, fine to coarse grained.		2" PVC Sch. 40, Slotted
1600							**VAL VERDE TONALITE (Kvt)**: IGNEOUS ROCK (QUARTZ DIORITE), grayish brown, intensely weathered to decomposed, soft to moderately hard; (SILTY SAND (SM), very dense, moist, fine to medium grained).		
	20		SPT	50/3"	67/3"				
1595									Filter Pack (#2 sand)

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Figure

I-11

ATLAS LOG REPORT - - 3/3/23 10:53 - \\SD.SCST.COM\DFS_ROOT\DATA\CLIENTS\EASTERN MUNICIPAL WATER DISTRICT\190063P4 - EMWD, AS-NEEDED ENGINEERING NON-DESIGN SERVICES\190063P4.2 - EMWD, GOOD HOPE & MEAD VALLEY WATER SI

LOG OF MONITOR WELL

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	
Mead Valley Sewer Improvements	1962.000-1	**B-6S**

SITE	START	END	SHEET NO.
Riverside County, CA	1/11/23	1/13/23	12

DRILLING COMPANY	DRILL METHOD	LOGGED BY	REVIEWED BY
Baja Exploration	Hollow Stem Auger wt HQ rock coring	SD	DAS/MM

DRILLING EQUIPMENT	BORING DIA. (in.)	TOTAL DEPTH (ft)	GROUND ELEV. (ft)
CME-95	8	40	1618

DEPTH/ELEV. GROUND WATER (ft)
- ▽ AT TIME OF DRILLING 14.00 ft / Elev 1604.00 ft
- ▼ AT END OF DRILLING ---
- ▼ AFTER DRILLING ---

SAMPLING METHOD: 140-lb Hammer, 30-in Drop

NOTES: Hammer Efficiency = 80.0% N_{60}~1.33N_{SPT}

ELEVATION (ft)	DEPTH (ft)	BULK SAMPLE	DRIVE SAMPLE	BLOWS PER FOOT	N_{60}	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION	LAB TESTS	WELL DIAGRAM
1590			SPT	90/12"	120/12"		**VAL VERDE TONALITE (Kvt)**: IGNEOUS ROCK (QUARTZ DIORITE), grayish brown, intensely weathered to decomposed, soft to moderately hard; (SILTY SAND (SM), very dense, moist, fine to medium grained). *(continued)*		
	30		SPT	20/5"	27/5"				
1585							Switched to rock coring on 01/13/23 Fresh to slightly weathered, soft to moderately hard, slightly to moderately fractured.		2" PVC Sch. 40, Slotted
	35		RC						
1580			RC				RQD = 98 Recovery = 100	UC	
	40						**BORING TERMINATED AT 40 FEET** Groundwater observed at 14 Feet		
1575									
	45								
1570									

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Figure
I-12

ATLAS LOG REPORT - - 3/3/23 10:53 - \\SD.SCST.COM\DFS_ROOT\DATA\CLIENTS\EASTERN MUNICIPAL WATER DISTRICT\190063P4 - EMWD, AS-NEEDED ENGINEERING NON-DESIGN SERVICES\190063P4.2 - EMWD, GOOD HOPE & MEAD VALLEY WATER SI

LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	B-7S
Mead Valley Sewer Improvements	1962.000-1	

SITE	START	END	SHEET NO.
Riverside County, CA	9/22/22	9/22/22	13

DRILLING COMPANY	DRILL METHOD	LOGGED BY	REVIEWED BY
Baja Exploration	Hollow Stem Auger	HK	DAS/MM

DRILLING EQUIPMENT	BORING DIA. (in.)	TOTAL DEPTH (ft)	GROUND ELEV. (ft)
CME-75	8	40	1597

DEPTH/ELEV. GROUND WATER (ft)
- ▽ AT TIME OF DRILLING 37.00 ft / Elev 1560.00 ft
- ▼ AT END OF DRILLING ---
- ▼ AFTER DRILLING ---

SAMPLING METHOD: 140-lb Hammer, 30-in Drop

NOTES: Hammer Efficiency = 80.0% N_{60}~1.33N_{SPT}

ELEVATION (ft)	DEPTH (ft)	BULK SAMPLE	DRIVE SAMPLE	BLOWS PER FOOT	N_{60}	MOISTURE (%)	DRY DENSITY (pcf)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION	LAB TESTS
1595	0								**VERY OLD AXIAL-CHANNEL DEPOSITS (Qvoa)**: SILTY SAND (SM), loose to medium dense, brown, moist, fine to coarse grained.	
	5		CAL	29					Medium dense, slightly micaceous.	
1590										
	10		CAL	15		9.6	112.9		Trace gravel.	WA
1585										
	15		CAL	19					Increase in moisture.	
1580										
	20		CAL	50/6					**VAL VERDE TONALITE (Kvt)**: IGNEOUS ROCK (QUARTZ DIORITE), grayish brown, intensely weathered to decomposed, soft to moderately hard; (Poorly Graded SAND (SP), very dense, moist, fine to medium grained).	
1575										

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LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	
Mead Valley Sewer Improvements	1962.000-1	**B-7S**

SITE	START	END	SHEET NO.
Riverside County, CA	9/22/22	9/22/22	14

DRILLING COMPANY	DRILL METHOD	LOGGED BY	REVIEWED BY
Baja Exploration	Hollow Stem Auger	HK	DAS/MM

DRILLING EQUIPMENT	BORING DIA. (in.)	TOTAL DEPTH (ft)	GROUND ELEV. (ft)
CME-75	8	40	1597

DEPTH/ELEV. GROUND WATER (ft)
- ▽ **AT TIME OF DRILLING** 37.00 ft / Elev 1560.00 ft
- ▼ **AT END OF DRILLING** ---
- ▼ **AFTER DRILLING** ---

SAMPLING METHOD: 140-lb Hammer, 30-in Drop

NOTES: Hammer Efficiency = 80.0% N_{60}~1.33N_{SPT}

ELEVATION (ft)	DEPTH (ft)	BULK SAMPLE	DRIVE SAMPLE	BLOWS PER FOOT	N_{60}	MOISTURE (%)	DRY DENSITY (pcf)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION	LAB TESTS
1570			SPT	50/6					**VAL VERDE TONALITE (Kvt)**: IGNEOUS ROCK (QUARTZ DIORITE), grayish brown, intensely weathered to decomposed, soft to moderately hard; (Poorly Graded SAND (SP), very dense, moist, fine to medium grained). *(continued)*	
	30		SPT	50/6					Hard drilling.	
1565										
	35		SPT	50/4					Groundwater observed at 37 feet.	
1560									(Increase in coarse material).	
	40								**BORING TERMINATED AT 40 FEET** Groundwater observed at 37 Feet	
1555										
	45									
1550										

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Figure

I-14

ATLAS LOG REPORT - - 3/3/23 10:53 - \\SD.SCST.COM\DFS_ROOT\DATA\CLIENTS\EASTERN MUNICIPAL WATER DISTRICT\190063P4 - EMWD, AS-NEEDED ENGINEERING NON-DESIGN SERVICES\190063P4.2 - EMWD, GOOD HOPE & MEAD VALLEY WATER SI

LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	
Mead Valley Sewer Improvements	1962.000-1	**B-8S**

SITE	START	END	SHEET NO.
Riverside County, CA	9/22/22	9/22/22	15

DRILLING COMPANY	DRILL METHOD	LOGGED BY	REVIEWED BY
Baja Exploration	Hollow Stem Auger	HK	DAS/MM

DRILLING EQUIPMENT	BORING DIA. (in.)	TOTAL DEPTH (ft)	GROUND ELEV. (ft)	DEPTH/ELEV. GROUND WATER (ft)
CME-75	8	41.5	1593	▽ AT TIME OF DRILLING ---
				▼ AT END OF DRILLING ---
				▼ AFTER DRILLING ---

SAMPLING METHOD	NOTES
140-lb Hammer, 30-in Drop	Hammer Efficiency = 80.0% N_{60}~1.33N_{SPT}

ELEVATION (ft)	DEPTH (ft)	BULK SAMPLE	DRIVE SAMPLE	BLOWS PER FOOT	N_{60}	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION	LAB TESTS
1590	0						**VERY OLD AXIAL-CHANNEL DEPOSITS (Qvoa)**: CLAYEY SAND (SC), loose to medium dense, brown, moist, fine to coarse grained.	AL WA
	5		CAL	23			**VAL VERDE TONALITE (Kvt)**: Grayish brown, intensely weathered to decomposed, soft to moderately hard; (CLAYEY SAND (SC), medium dense, moist, fine to coarse grained).	
1585								
	10		CAL	36			Dense.	WA
1580								
	15		CAL	66			Brown, (SILTY SAND (SM), very dense, moist, fine to coarse grained).	
1575								
	20		CAL	50/6				
1570								

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Figure

I-15

ATLAS LOG REPORT - - 3/3/23 10:53 - \\SD.SCST.COM\DFS_ROOT\DATA\CLIENTS\EASTERN MUNICIPAL WATER DISTRICT\190063P4 - EMWD, AS-NEEDED ENGINEERING NON-DESIGN SERVICES\190063P4.2 - EMWD, GOOD HOPE & MEAD VALLEY WATER SI

LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	
Mead Valley Sewer Improvements	1962.000-1	**B-8S**

SITE	START	END	SHEET NO.
Riverside County, CA	9/22/22	9/22/22	16

DRILLING COMPANY	DRILL METHOD	LOGGED BY	REVIEWED BY
Baja Exploration	Hollow Stem Auger	HK	DAS/MM

DRILLING EQUIPMENT	BORING DIA. (in.)	TOTAL DEPTH (ft)	GROUND ELEV. (ft)
CME-75	8	41.5	1593

DEPTH/ELEV. GROUND WATER (ft)
- ▽ AT TIME OF DRILLING ---
- ▼ AT END OF DRILLING ---
- ▼ AFTER DRILLING ---

SAMPLING METHOD: 140-lb Hammer, 30-in Drop

NOTES: Hammer Efficiency = 80.0% N_{60}~1.33N_{SPT}

ELEVATION (ft)	DEPTH (ft)	BULK SAMPLE	DRIVE SAMPLE	BLOWS PER FOOT	N_{60}	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION	LAB TESTS
							Brown, (SILTY SAND (SM), very dense, moist, fine to coarse grained). *(continued)*	
			SPT	48	64			
1565								
	30							
			SPT	42	56			
1560								
	35							
			SPT	72/11"	96/11"		Hard drilling.	
1555							(Increase in moisture and coarse material).	
	40							
			SPT	19	25		(Medium dense).	
							BORING TERMINATED AT 41½ FEET Groundwater and Seepage not observed	
1550								
	45							
1545								

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Figure

I-16

ATLAS LOG REPORT - - 3/3/23 10:53 - \\SD.SCST.COM\DFS_ROOT\DATA\CLIENTS\EASTERN MUNICIPAL WATER DISTRICT\190063P4 - EMWD, AS-NEEDED ENGINEERING NON-DESIGN SERVICES\190063P4.2 - EMWD, GOOD HOPE & MEAD VALLEY WATER SI

LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	B-9S
Mead Valley Sewer Improvements	1962.000-1	

SITE	START	END	SHEET NO.
Riverside County, CA	9/22/22	9/22/22	17

DRILLING COMPANY	DRILL METHOD	LOGGED BY	REVIEWED BY
Baja Exploration	Hollow Stem Auger	HK	DAS/MM

DRILLING EQUIPMENT	BORING DIA. (in.)	TOTAL DEPTH (ft)	GROUND ELEV. (ft)
CME-75	8	41.5	1593

DEPTH/ELEV. GROUND WATER (ft)
- ▽ AT TIME OF DRILLING 25.00 ft / Elev 1568.00 ft
- ▼ AT END OF DRILLING ---
- ▼ AFTER DRILLING ---

SAMPLING METHOD: 140-lb Hammer, 30-in Drop

NOTES: Hammer Efficiency = 80.0% N_{60}~1.33N_{SPT}

ELEVATION (ft)	DEPTH (ft)	BULK SAMPLE	DRIVE SAMPLE	BLOWS PER FOOT	N_{60}	MOISTURE (%)	DRY DENSITY (pcf)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION	LAB TESTS
1590	0								**VERY OLD AXIAL-CHANNEL DEPOSITS (Qvoa)**: SILTY SAND (SM), loose to medium dense, brown, moist, fine to coarse grained, roots, angular gravels.	RV WA
	5		CAL	40					CLAYEY SAND (SC), brown, dense, moist, fine to coarse grained, micaceous.	EI
1585										
	10		CAL	22		9.0	112.4		Medium dense.	DS WA
1580										
	15		CAL	17					Trace gravel.	
1575										
	20		CAL	11					Loose, increase in moisture.	
1570										

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Figure

I-17

ATLAS LOG REPORT - - 3/3/23 10:53 - \\SD.SCST.COM\DFS_ROOT\DATA\CLIENTS\EASTERN MUNICIPAL WATER DISTRICT\190063P4 - EMWD, AS-NEEDED ENGINEERING NON-DESIGN SERVICES\190063P4.2 - EMWD, GOOD HOPE & MEAD VALLEY WATER SI

LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	
Mead Valley Sewer Improvements	1962.000-1	**B-9S**

SITE	START	END	SHEET NO.
Riverside County, CA	9/22/22	9/22/22	18

DRILLING COMPANY	DRILL METHOD	LOGGED BY	REVIEWED BY
Baja Exploration	Hollow Stem Auger	HK	DAS/MM

DRILLING EQUIPMENT	BORING DIA. (in.)	TOTAL DEPTH (ft)	GROUND ELEV. (ft)
CME-75	8	41.5	1593

DEPTH/ELEV. GROUND WATER (ft)
- ▽ AT TIME OF DRILLING 25.00 ft / Elev 1568.00 ft
- ▼ AT END OF DRILLING ---
- ▼ AFTER DRILLING ---

SAMPLING METHOD: 140-lb Hammer, 30-in Drop

NOTES: Hammer Efficiency = 80.0% N_{60}~1.33N_{SPT}

ELEVATION (ft)	DEPTH (ft)	BULK SAMPLE	DRIVE SAMPLE	BLOWS PER FOOT	N_{60}	MOISTURE (%)	DRY DENSITY (pcf)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION	LAB TESTS
			CAL	36					**VAL VERDE TONALITE (qdi)**: IGNEOUS ROCK (QUARTZ DIORITE), olive gray, intensely weathered to decomposed, soft to moderately hard; (POORLY GRADED SAND (SP), dense, wet, fine to medium grained). *(continued)* Groundwater observed at 25 feet.	
1565	30		SPT	34	45					
1560										
	35		SPT	56	75				(Very dense).	
1555										
	40		SPT	85/12"	113/12"					
1550									**BORING TERMINATED AT 41½ FEET** Groundwater observed at 25 Feet	
	45									
1545										

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Figure

I-18

ATLAS LOG REPORT - - 3/3/23 10:53 - \\SD.SCST.COM\DFS_ROOT\DATA\CLIENTS\EASTERN MUNICIPAL WATER DISTRICT\190063P4 - EMWD, AS-NEEDED ENGINEERING NON-DESIGN SERVICES\190063P4.2 - EMWD, GOOD HOPE & MEAD VALLEY WATER SI

LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	
Mead Valley Sewer Improvements	1962.000-1	**B-10S**

SITE	START	END	SHEET NO.
Riverside County, CA	9/23/22	9/23/22	19

DRILLING COMPANY	DRILL METHOD	LOGGED BY	REVIEWED BY
Baja Exploration	Hollow Stem Auger	HK	DAS/MM

DRILLING EQUIPMENT	BORING DIA. (in.)	TOTAL DEPTH (ft)	GROUND ELEV. (ft)
CME-75	8	41.5	1587

DEPTH/ELEV. GROUND WATER (ft)
- ▽ AT TIME OF DRILLING 27.00 ft / Elev 1560.00 ft
- ▼ AT END OF DRILLING ---
- ▼ AFTER DRILLING ---

SAMPLING METHOD: 140-lb Hammer, 30-in Drop

NOTES: Hammer Efficiency = 80.0% N_{60}~1.33N_{SPT}

ELEVATION (ft)	DEPTH (ft)	BULK SAMPLE	DRIVE SAMPLE	BLOWS PER FOOT	N_{60}	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION
1585	0						**FILL (Qf)**: SILTY SAND (SM), medium dense, brown, moist, fine to medium grained, low plasticity, trace gravel.
	5		CAL	27			**VAL VERDE TONALITE (Kvt)**: IGNEOUS ROCK (QUARTZ DIORITE), olive gray, intensely weathered to decomposed, soft to moderately hard; (POORLY GRADED SAND (SP), very dense, moist, fine to medium grained).
1580							
	10		CAL	50/6			(Very dense, weakly cemented).
1575							
	15		CAL	50/5			Light brown; (increase in moisture).
1570							
	20		CAL	50/6			
1565							

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Figure

I-19

ATLAS LOG REPORT - - 3/3/23 10:53 - \\SD.SCST.COM\DFS_ROOT\DATA\CLIENTS\EASTERN MUNICIPAL WATER DISTRICT\190063P4 - EMWD, AS-NEEDED ENGINEERING NON-DESIGN SERVICES\190063P4.2 - EMWD, GOOD HOPE & MEAD VALLEY WATER SI

LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	
Mead Valley Sewer Improvements	1962.000-1	**B-10S**

SITE	START	END	SHEET NO.
Riverside County, CA	9/23/22	9/23/22	20

DRILLING COMPANY	DRILL METHOD	LOGGED BY	REVIEWED BY
Baja Exploration	Hollow Stem Auger	HK	DAS/MM

DRILLING EQUIPMENT	BORING DIA. (in.)	TOTAL DEPTH (ft)	GROUND ELEV. (ft)
CME-75	8	41.5	1587

DEPTH/ELEV. GROUND WATER (ft)
- ▽ **AT TIME OF DRILLING** 27.00 ft / Elev 1560.00 ft
- ▼ **AT END OF DRILLING** ---
- ▼ **AFTER DRILLING** ---

SAMPLING METHOD: 140-lb Hammer, 30-in Drop

NOTES: Hammer Efficiency = 80.0% N_{60}~1.33N_{SPT}

ELEVATION (ft)	DEPTH (ft)	BULK SAMPLE	DRIVE SAMPLE	BLOWS PER FOOT	N_{60}	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION
1560			SPT	52	69		**VAL VERDE TONALITE (Kvt)**: IGNEOUS ROCK (QUARTZ DIORITE), olive gray, intensely weathered to decomposed, soft to moderately hard; (POORLY GRADED SAND (SP), very dense, moist, fine to medium grained). *(continued)* (Increase in coarse material). Groundwater observed at 27 feet.
	30		SPT	50	67		
1555							
	35		SPT	51	68		
1550							
	40		SPT	80/12"	107/12"		(Strongly cemented).
1545							**BORING TERMINATED AT 41½ FEET** Groundwater observed at 27 Feet
	45						
1540							

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Figure
I-20

ATLAS LOG REPORT - - 3/3/23 10:53 - \\SD.SCST.COM\DFS_ROOT\DATA\CLIENTS\EASTERN MUNICIPAL WATER DISTRICT\190063P4 - EMWD, AS-NEEDED ENGINEERING NON-DESIGN SERVICES\190063P4.2 - EMWD, GOOD HOPE & MEAD VALLEY WATER SI

LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	B-11S
Mead Valley Sewer Improvements	1962.000-1	

SITE	START	END	SHEET NO.
Riverside County, CA	9/23/22	9/23/22	21

DRILLING COMPANY	DRILL METHOD	LOGGED BY	REVIEWED BY
Baja Exploration	Hollow Stem Auger	HK	DAS/MM

DRILLING EQUIPMENT	BORING DIA. (in.)	TOTAL DEPTH (ft)	GROUND ELEV. (ft)
CME-75	8	41.5	1587

DEPTH/ELEV. GROUND WATER (ft)
- ▽ AT TIME OF DRILLING ---
- ▼ AT END OF DRILLING ---
- ▼ AFTER DRILLING ---

SAMPLING METHOD: 140-lb Hammer, 30-in Drop

NOTES: Hammer Efficiency = 80.0% N_{60}~1.33N_{SPT}

ELEVATION (ft)	DEPTH (ft)	BULK SAMPLE	DRIVE SAMPLE	BLOWS PER FOOT	N_{60}	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION	LAB TESTS
1585	0						**FILL (Qf)**: SILTY SAND (SM), medium dense, brown, moist, fine to medium grained, trace gravel, asphalt fragments.	COR
	5		CAL	37			**VAL VERDE TONALITE (Kvt)**: IGNEOUS ROCK (QUARTZ DIORITE), brown, intensely weathered to decomposed, soft to moderately hard; (SILTY SAND (SM), dense, moist, fine to medium grained).	PD
1580								
	10		CAL	30			(Medium dense, weakly cemented).	
1575								
	15		CAL	74			(Very dense, increase in moisture).	
1570								
	20		CAL	50/4			(Increase in coarse material).	
1565								

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Figure
I-21

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LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	B-11S
Mead Valley Sewer Improvements	1962.000-1	

SITE	START	END	SHEET NO.
Riverside County, CA	9/23/22	9/23/22	22

DRILLING COMPANY	DRILL METHOD	LOGGED BY	REVIEWED BY
Baja Exploration	Hollow Stem Auger	HK	DAS/MM

DRILLING EQUIPMENT	BORING DIA. (in.)	TOTAL DEPTH (ft)	GROUND ELEV. (ft)	DEPTH/ELEV. GROUND WATER (ft)
CME-75	8	41.5	1587	▽ AT TIME OF DRILLING ---
				▼ AT END OF DRILLING ---
				▼ AFTER DRILLING ---

SAMPLING METHOD	NOTES
140-lb Hammer, 30-in Drop	Hammer Efficiency = 80.0% N_{60}~1.33N_{SPT}

ELEVATION (ft)	DEPTH (ft)	BULK SAMPLE	DRIVE SAMPLE	BLOWS PER FOOT	N_{60}	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION	LAB TESTS
1560			SPT	81	108		**VAL VERDE TONALITE (Kvt)**: IGNEOUS ROCK (QUARTZ DIORITE), brown, intensely weathered to decomposed, soft to moderately hard; (SILTY SAND (SM), very dense, moist, fine to medium grained). *(continued)*	
	30		SPT	83/12"	111/12"			
1555								
	35		SPT	50/6	67/6			
1550								
	40		SPT	50/6	67/6			
1545							**BORING TERMINATED AT 41½ FEET** Groundwater and Seepage not observed	
	45							
1540								

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Figure

I-22

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LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	
Mead Valley Sewer Improvements	1962.000-1	**B-12S**

SITE	START	END	SHEET NO.
Riverside County, CA	9/23/22	9/23/22	23

DRILLING COMPANY	DRILL METHOD	LOGGED BY	REVIEWED BY
Baja Exploration	Hollow Stem Auger	HK	DAS/MM

DRILLING EQUIPMENT	BORING DIA. (in.)	TOTAL DEPTH (ft)	GROUND ELEV. (ft)
CME-75	8	41.5	1582

DEPTH/ELEV. GROUND WATER (ft)
- ▽ AT TIME OF DRILLING 39.00 ft / Elev 1543.00 ft
- ▼ AT END OF DRILLING ---
- ▼ AFTER DRILLING ---

SAMPLING METHOD: 140-lb Hammer, 30-in Drop

NOTES: Hammer Efficiency = 80.0% N_{60}~1.33N_{SPT}

ELEVATION (ft)	DEPTH (ft)	BULK SAMPLE	DRIVE SAMPLE	BLOWS PER FOOT	N_{60}	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION	LAB TESTS
1582	0						**FILL (Qf)**: SILTY SAND (SM), medium dense, brown, moist, fine to medium grained, trace gravel, asphalt fragments.	PD RV
1580								
	5		CAL	23			**YOUNG WASH DEPOSITS (Qywa)** : SILTY SAND, medium dense, moist, fine to coarse grained, slightly micaceous.	
1575								
	10		CAL	21				
1570								
	15		CAL	40			**VAL VERDE TONALITE (Kvt)**: IGNEOUS ROCK (QUARTZ DIORITE), light brown, intensely weathered to decomposed, soft to moderately hard; (POORLY GRADED SAND (SP), dense, moist, fine to medium grained).	
1565								
	20		CAL	69/12"			(Very dense).	
1560								

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Figure
I-23

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LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	
Mead Valley Sewer Improvements	1962.000-1	**B-12S**

SITE	START	END	SHEET NO.
Riverside County, CA	9/23/22	9/23/22	24

DRILLING COMPANY	DRILL METHOD	LOGGED BY	REVIEWED BY
Baja Exploration	Hollow Stem Auger	HK	DAS/MM

DRILLING EQUIPMENT	BORING DIA. (in.)	TOTAL DEPTH (ft)	GROUND ELEV. (ft)
CME-75	8	41.5	1582

DEPTH/ELEV. GROUND WATER (ft)
- ▽ **AT TIME OF DRILLING** 39.00 ft / Elev 1543.00 ft
- ▼ **AT END OF DRILLING** ---
- ▼ **AFTER DRILLING** ---

SAMPLING METHOD: 140-lb Hammer, 30-in Drop

NOTES: Hammer Efficiency = 80.0% N_{60}~1.33N_{SPT}

ELEVATION (ft)	DEPTH (ft)	BULK SAMPLE	DRIVE SAMPLE	BLOWS PER FOOT	N_{60}	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION	LAB TESTS
1555			CAL	50/6			**VAL VERDE TONALITE (Kvt)**: IGNEOUS ROCK (QUARTZ DIORITE), light brown, intensely weathered to decomposed, soft to moderately hard; (POORLY GRADED SAND (SP), very dense, moist, fine to medium grained). *(continued)*	
	30		SPT	51	68		(Increase in coarse material).	
1550								
	35		SPT	66	88		Potassium feldspar, weakly cemented, (increased coarse material).	
1545						▽	Groundwater observed at 39 feet.	
	40		SPT	76/12"	101/12"			
1540							**BORING TERMINATED AT 41½ FEET** Groundwater observed at 39 Feet	
	45							
1535								

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LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	B-13S
Mead Valley Sewer Improvements	1962.000-1	

SITE	START	END	SHEET NO.
Riverside County, CA	9/28/22	9/28/22	25

DRILLING COMPANY	DRILL METHOD	LOGGED BY	REVIEWED BY
Baja Exploration	Hollow Stem Auger	SD	DAS/MM

DRILLING EQUIPMENT	BORING DIA. (in.)	TOTAL DEPTH (ft)	GROUND ELEV. (ft)
LAR-55	8	40.5	1577

DEPTH/ELEV. GROUND WATER (ft)
- ▽ AT TIME OF DRILLING ---
- ▼ AT END OF DRILLING ---
- ▼ AFTER DRILLING ---

SAMPLING METHOD: 140-lb Hammer, 30-in Drop

NOTES: Hammer Efficiency = 80.0% N_{60}~1.33N_{SPT}

ELEVATION (ft)	DEPTH (ft)	BULK SAMPLE	DRIVE SAMPLE	BLOWS PER FOOT	N_{60}	MOISTURE (%)	DRY DENSITY (pcf)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION
1575									**FILL (Qf)** : SILTY SAND (SM), medium dense, brown, moist, fine to coarse grained.
	5		CAL	12		8.7	119.9		**YOUNG WASH DEPOSITS (Qywa)** : CLAYEY SAND (SC), medium dense, pale brown, moist, fine to medium grained.
1570									
	10		CAL	79/9"					Very dense.
1565									
	15		CAL	50/6					Decrease in fine content.
1560									
	20		CAL	50/6					**VAL VERDE TONALITE (Kvt)**: IGNEOUS ROCK (QUARTZ DIORITE), light brown, intensely weathered to decomposed, soft to moderately hard; (CLAYEY SAND (SC), very dense, moist, fine to coarse grained).
1555									Yellowish brown to dark brown.

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LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	
Mead Valley Sewer Improvements	1962.000-1	**B-13S**

SITE	START	END	SHEET NO.
Riverside County, CA	9/28/22	9/28/22	26

DRILLING COMPANY	DRILL METHOD	LOGGED BY	REVIEWED BY
Baja Exploration	Hollow Stem Auger	SD	DAS/MM

DRILLING EQUIPMENT	BORING DIA. (in.)	TOTAL DEPTH (ft)	GROUND ELEV. (ft)
LAR-55	8	40.5	1577

DEPTH/ELEV. GROUND WATER (ft)
- ▽ AT TIME OF DRILLING ---
- ▼ AT END OF DRILLING ---
- ▼ AFTER DRILLING ---

SAMPLING METHOD
140-lb Hammer, 30-in Drop

NOTES
Hammer Efficiency = 80.0% N_{60}~1.33N_{SPT}

ELEVATION (ft)	DEPTH (ft)	BULK SAMPLE	DRIVE SAMPLE	BLOWS PER FOOT	N_{60}	MOISTURE (%)	DRY DENSITY (pcf)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION
1550			SPT	50/6	67/6				**VAL VERDE TONALITE (Kvt)**: IGNEOUS ROCK (QUARTZ DIORITE), light brown, intensely weathered to decomposed, soft to moderately hard; (CLAYEY SAND (SC), very dense, moist, fine to coarse grained). *(continued)*
	30		CAL	50/6					
1545									
	35		SPT	50/2					
1540									
	40		SPT	50/2					
1535									**BORING TERMINATED AT 40½ FEET** Groundwater and Seepage not observed
	45								
1530									

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Figure

I-26

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LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	
Mead Valley Sewer Improvements	1962.000-1	**B-14S**

SITE	START	END	SHEET NO.
Riverside County, CA	9/29/22	9/29/22	27

DRILLING COMPANY	DRILL METHOD	LOGGED BY	REVIEWED BY
Baja Exploration	Hollow Stem Auger	SD	DAS/MM

DRILLING EQUIPMENT	BORING DIA. (in.)	TOTAL DEPTH (ft)	GROUND ELEV. (ft)
CME-75	8	40.5	1641

DEPTH/ELEV. GROUND WATER (ft)
- ▽ **AT TIME OF DRILLING** 29.00 ft / Elev 1612.00 ft
- ▼ **AT END OF DRILLING** ---
- ▼ **AFTER DRILLING** ---

SAMPLING METHOD: 140-lb Hammer, 30-in Drop

NOTES: Hammer Efficiency = 80.0% N_{60}~1.33N_{SPT}

ELEVATION (ft)	DEPTH (ft)	BULK SAMPLE	DRIVE SAMPLE	BLOWS PER FOOT	N_{60}	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION
1640							**FILL (Qf)** : SILTY SAND (SM), medium dense, light reddish brown, moist, fine grained.
							VERY OLD AXIAL-CHANNEL DEPOSITS (Qvoa) : CLAYEY SAND (SC), dense, reddish brown, moist, fine to medium grained.
							VAL VERDE TONALITE (Kvt): IGNEOUS ROCK (QUARTZ DIORITE), dark grayish brown, intensely weathered to decomposed, soft to moderately hard; (POORLY GRADED SAND (SP), very dense, moist, fine to coarse grained).
1635	5		CAL	50/6			
1630	10		CAL	50/6			
1625	15		CAL	50/6			
1620	20		CAL	50/6			

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Figure

I-27

ATLAS LOG REPORT - - 3/3/23 10:54 - \\SD.SCST.COM\DFS_ROOT\DATA\CLIENTS\EASTERN MUNICIPAL WATER DISTRICT\190063P4 - EMWD, AS-NEEDED ENGINEERING NON-DESIGN SERVICES\190063P4.2 - EMWD, GOOD HOPE & MEAD VALLEY WATER SI

LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	
Mead Valley Sewer Improvements	1962.000-1	**B-14S**

SITE	START	END	SHEET NO.
Riverside County, CA	9/29/22	9/29/22	28

DRILLING COMPANY	DRILL METHOD	LOGGED BY	REVIEWED BY
Baja Exploration	Hollow Stem Auger	SD	DAS/MM

DRILLING EQUIPMENT	BORING DIA. (in.)	TOTAL DEPTH (ft)	GROUND ELEV. (ft)
CME-75	8	40.5	1641

DEPTH/ELEV. GROUND WATER (ft)
- ▽ **AT TIME OF DRILLING** 29.00 ft / Elev 1612.00 ft
- ▼ **AT END OF DRILLING** ---
- ▼ **AFTER DRILLING** ---

SAMPLING METHOD: 140-lb Hammer, 30-in Drop

NOTES: Hammer Efficiency = 80.0% N_{60}~1.33N_{SPT}

ELEVATION (ft)	DEPTH (ft)	BULK SAMPLE	DRIVE SAMPLE	BLOWS PER FOOT	N_{60}	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION
1615			SPT	50/3	67/3		**VAL VERDE TONALITE (Kvt)**: IGNEOUS ROCK (QUARTZ DIORITE), dark grayish brown, intensely weathered to decomposed, soft to moderately hard; (POORLY GRADED SAND (SP), very dense, moist, fine to coarse grained). *(continued)* (Trace fines).
							▽ Groundwater observed at 29 feet.
	30		SPT	50/6			
1610							
	35		SPT	50/5			
1605							
	40		SPT	50/4			
1600							**BORING TERMINATED AT 40½ FEET** Groundwater observed at 29 Feet
	45						
1595							

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Figure

I-28

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LOG OF TEST BORING

ATLAS PROJECT NAME: Mead Valley Sewer Improvements	ATLAS PROJECT NUMBER: 1962.000-1	**B-15S**	
SITE: Riverside County, CA	START: 9/29/22	END: 9/29/22	SHEET NO.: 29
DRILLING COMPANY: Baja Exploration	DRILL METHOD: Hollow Stem Auger	LOGGED BY: SD	REVIEWED BY: DAS/MM
DRILLING EQUIPMENT: CME-75	BORING DIA. (in.): 8	TOTAL DEPTH (ft): 40.5	GROUND ELEV. (ft): 1641
SAMPLING METHOD: 140-lb Hammer, 30-in Drop	NOTES: Hammer Efficiency = 80.0% N_{60}~1.33N_{SPT}		

DEPTH/ELEV. GROUND WATER (ft)
- ▽ AT TIME OF DRILLING: 28.00 ft / Elev 1613.00 ft
- ▼ AT END OF DRILLING: ---
- ▼ AFTER DRILLING: ---

ELEVATION (ft)	DEPTH (ft)	BULK SAMPLE	DRIVE SAMPLE	BLOWS PER FOOT	N_{60}	MOISTURE (%)	DRY DENSITY (pcf)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION	LAB TESTS
1640	0								**FILL (Qf)** : CLAYEY SAND (SC), medium dense, reddish brown, moist, fine to medium grained.	AL WA
	5		CAL	50/6						
1635									**VAL VERDE TONALITE (Kvt)**: IGNEOUS ROCK (QUARTZ DIORITE), brownish gray, intensely weathered to decomposed, soft to moderately hard; (POORLY GRADED SAND (SP), very dense, moist, fine to coarse grained).	
	10		SPT	50/6	67/6	13.8	116.4			
1630										
	15		CAL	50/6						
1625										
	20		CAL	50/5						
1620										

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LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	B-15S
Mead Valley Sewer Improvements	1962.000-1	

SITE	START	END	SHEET NO.
Riverside County, CA	9/29/22	9/29/22	30

DRILLING COMPANY	DRILL METHOD	LOGGED BY	REVIEWED BY
Baja Exploration	Hollow Stem Auger	SD	DAS/MM

DRILLING EQUIPMENT	BORING DIA. (in.)	TOTAL DEPTH (ft)	GROUND ELEV. (ft)
CME-75	8	40.5	1641

DEPTH/ELEV. GROUND WATER (ft)
- ▽ AT TIME OF DRILLING 28.00 ft / Elev 1613.00 ft
- ▼ AT END OF DRILLING ---
- ▼ AFTER DRILLING ---

SAMPLING METHOD: 140-lb Hammer, 30-in Drop

NOTES: Hammer Efficiency = 80.0% N_{60}~1.33N_{SPT}

ELEVATION (ft)	DEPTH (ft)	BULK SAMPLE	DRIVE SAMPLE	BLOWS PER FOOT	N_{60}	MOISTURE (%)	DRY DENSITY (pcf)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION	LAB TESTS
1615			SPT	50/6					**VAL VERDE TONALITE (Kvt)**: IGNEOUS ROCK (QUARTZ DIORITE), brownish gray, intensely weathered to decomposed, soft to moderately hard; (POORLY GRADED SAND (SP), very dense, moist, fine to coarse grained). *(continued)*	
									▽ Groundwater observed at 28 feet.	
	30		SPT	50/4						
1610									(SILTY SAND (SM), very dense, wet, fine to medium grained).	
	35		SPT	50/6						
1605										
	40		SPT	50/4						
1600									**BORING TERMINATED AT 40½ FEET** Groundwater observed at 28 Feet	
	45									
1595										

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Figure

I-30

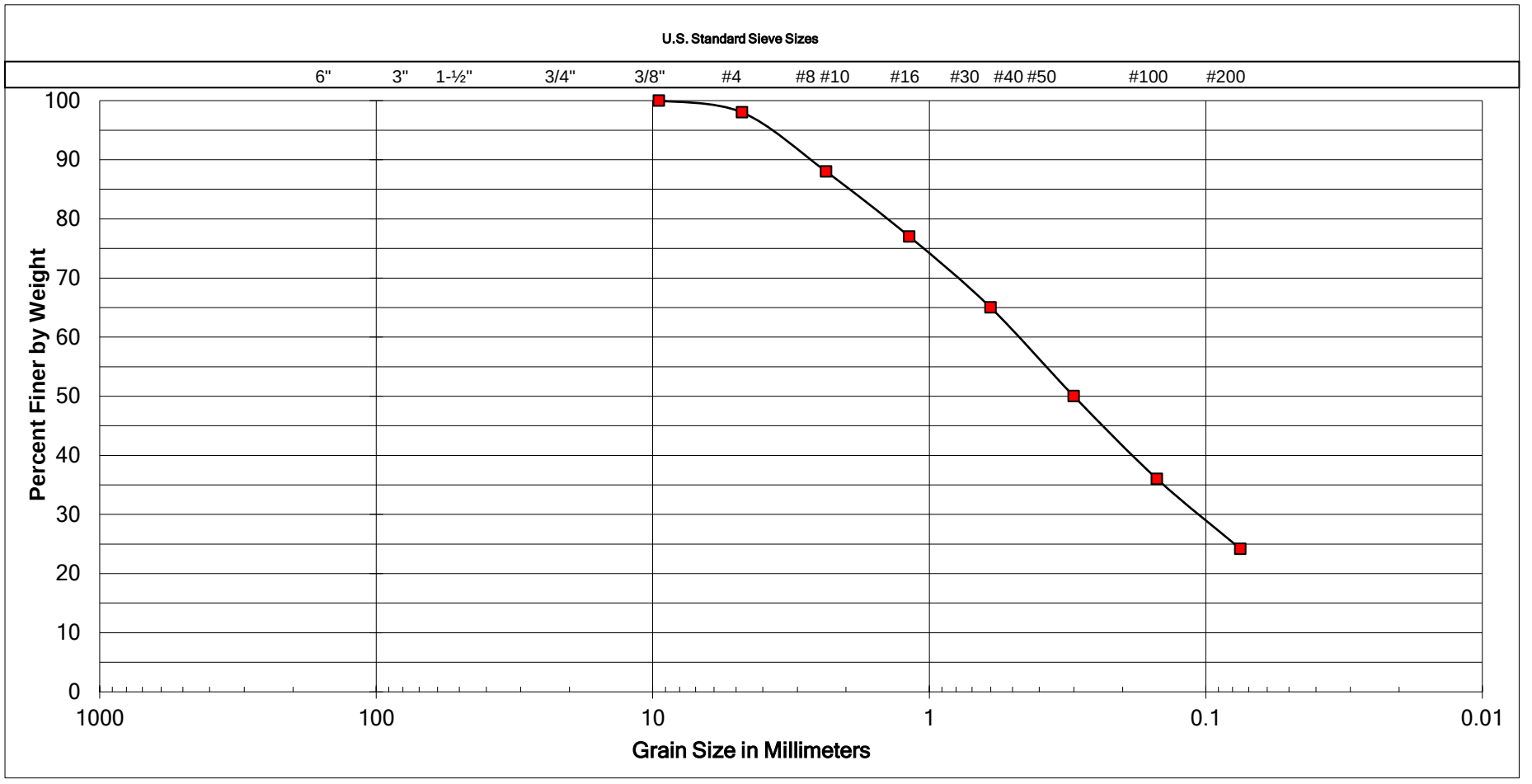
ATLAS LOG REPORT - - 3/3/23 10:54 - \\SD.SCST.COM\DFS_ROOT\DATA\CLIENTS\EASTERN MUNICIPAL WATER DISTRICT\190063P4 - EMWD, AS-NEEDED ENGINEERING NON-DESIGN SERVICES\190063P4.2 - EMWD, GOOD HOPE & MEAD VALLEY WATER SI

APPENDIX II
LABORATORY TESTING

Laboratory tests were performed to provide geotechnical parameters for engineering analyses. The following tests were conducted:

- **CLASSIFICATION:** Field classifications were verified in the laboratory by visual examination. The final soil classifications are in accordance with the Unified Soil Classification System.
- **IN SITU MOISTURE AND DENSITY:** The in-situ moisture content and dry unit weight were evaluated on samples collected from the borings. The test results are presented on the boring logs in Appendix I.
- **PARTICLE-SIZE DISTRIBUTION:** The particle-size distribution was evaluated on soil samples in accordance with ASTM D6913.
- **CORROSIVITY:** Corrosivity tests were performed on soil samples. The pH and minimum resistivity were evaluated in general accordance with California Test 643. The soluble sulfate content was evaluated in accordance with California Test 417. The total chloride ion content was evaluated in accordance with California Test 422.
- **PERCENT FINDER THAN #200:** This test was performed on soil samples in accordance with ASTM D1140.
- **DIRECT SHEAR:** This test was performed on soil samples in accordance with ASTM D3080. The shear stress was applied to inundated samples at a constant rate of strain of 0.003 inch per minute.
- **EXPANSION INDEX:** This test was performed on soil samples in accordance with ASTM D4289.
- **ATTERBERG LIMITS:** The Atterberg limits were evaluated on a selected soil sample in accordance with ASTM D4318.
- **R-VALUE:** This test was performed on soil samples in accordance with Caltrans Test Method 301.
- **UNCONFINED COMPRESSIVE STRENGTH:** This test was performed on intact rock samples in accordance with ASTM D7012.

Soil and rock samples not tested are stored in our laboratory for future reference and analysis, if needed. Unless notified to the contrary, all samples will be disposed of 30 days from the date of this report.



Cobbles	Gravel		Sand			Silt or Clay
	Coarse	Fine	Coarse	Medium	Fine	

SAMPLE LOCATION
B-4S at 5 to 5½ feet
SAMPLE NUMBER
78201

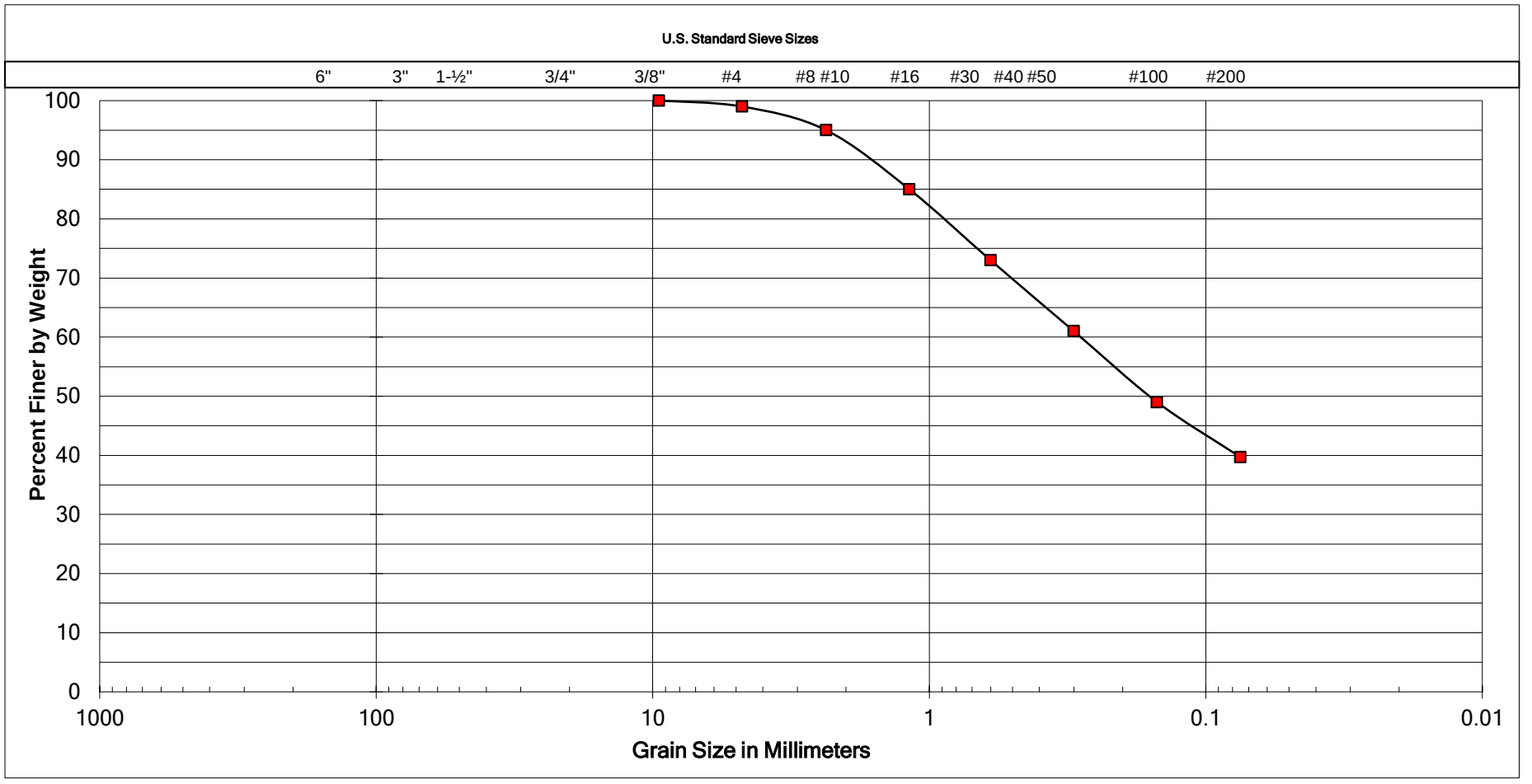
UNIFIED SOIL CLASSIFICATION:	SM
DESCRIPTION	SILTY SAND

ATTERBERG LIMITS	
LIQUID LIMIT	-
PLASTIC LIMIT	-
PLASTICITY INDEX	-

ATLAS

Mead Valley Sewer Improvements
Riverside County, California

By:	JRD	Date:	March, 2023
Job Number:	1962.000-1	Figure:	II-1



Cobbles	Gravel		Sand			Silt or Clay
	Coarse	Fine	Coarse	Medium	Fine	

SAMPLE LOCATION
B-11S at 6 to 6½ feet
SAMPLE NUMBER
78210

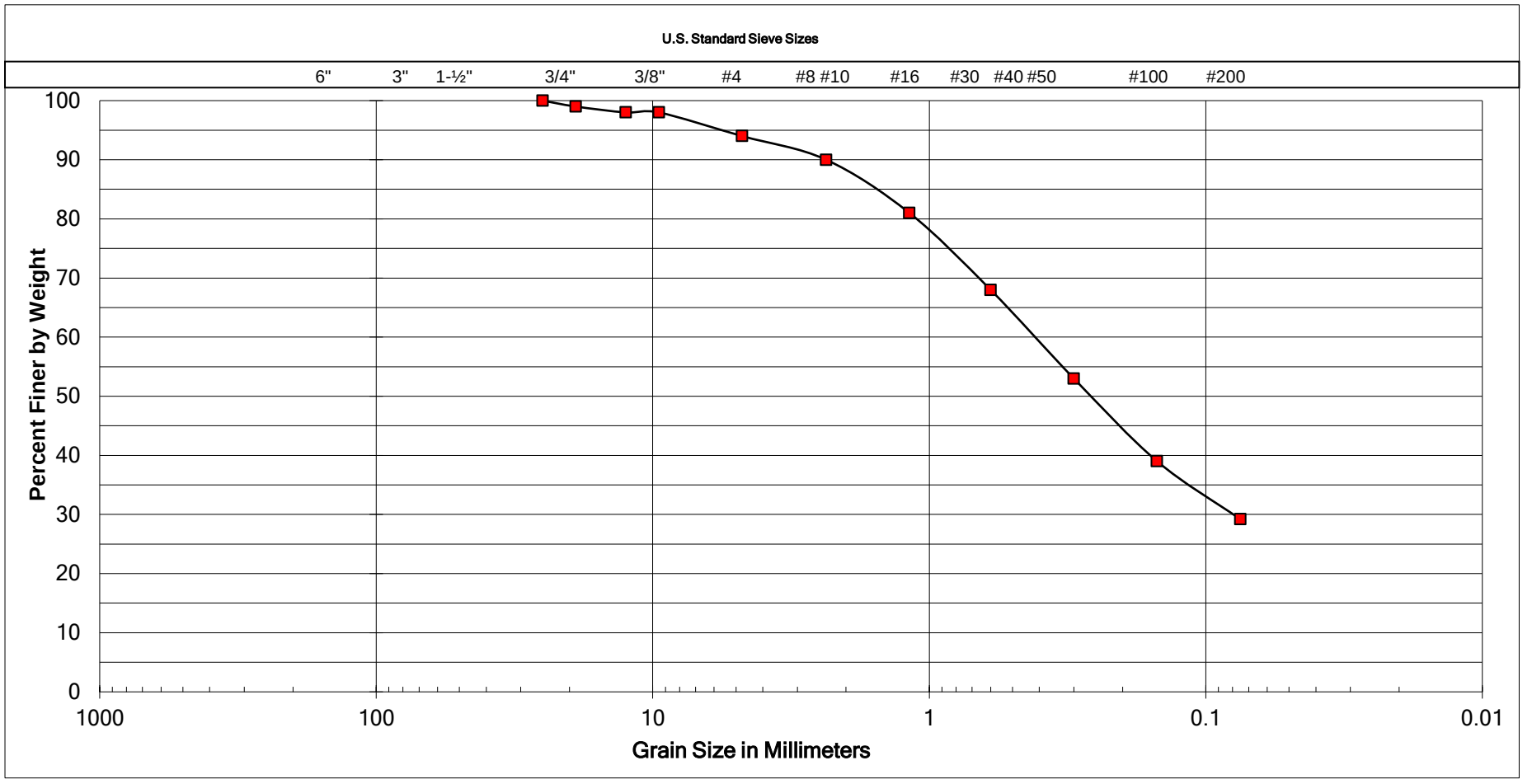
UNIFIED SOIL CLASSIFICATION:	SM
DESCRIPTION	SILTY SAND

ATTERBERG LIMITS	
LIQUID LIMIT	-
PLASTIC LIMIT	-
PLASTICITY INDEX	-

ATLAS

Mead Valley Sewer Improvements
Riverside County, California

By:	JRD	Date:	March, 2023
Job Number:	1962.000-1	Figure:	II-2



Cobbles	Gravel		Sand			Silt or Clay
	Coarse	Fine	Coarse	Medium	Fine	

SAMPLE LOCATION
B-12S at 0 to 5 feet
SAMPLE NUMBER
78211

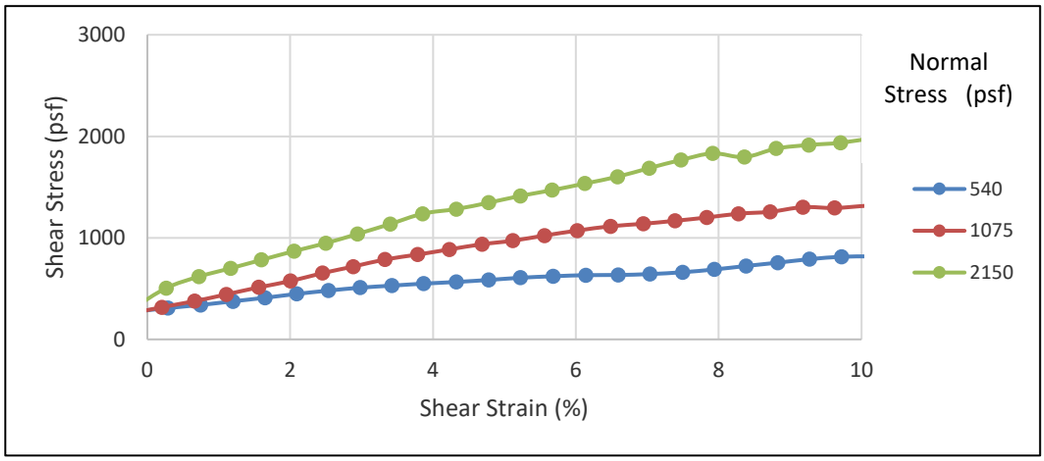
UNIFIED SOIL CLASSIFICATION:	SM
DESCRIPTION	SILTY SAND

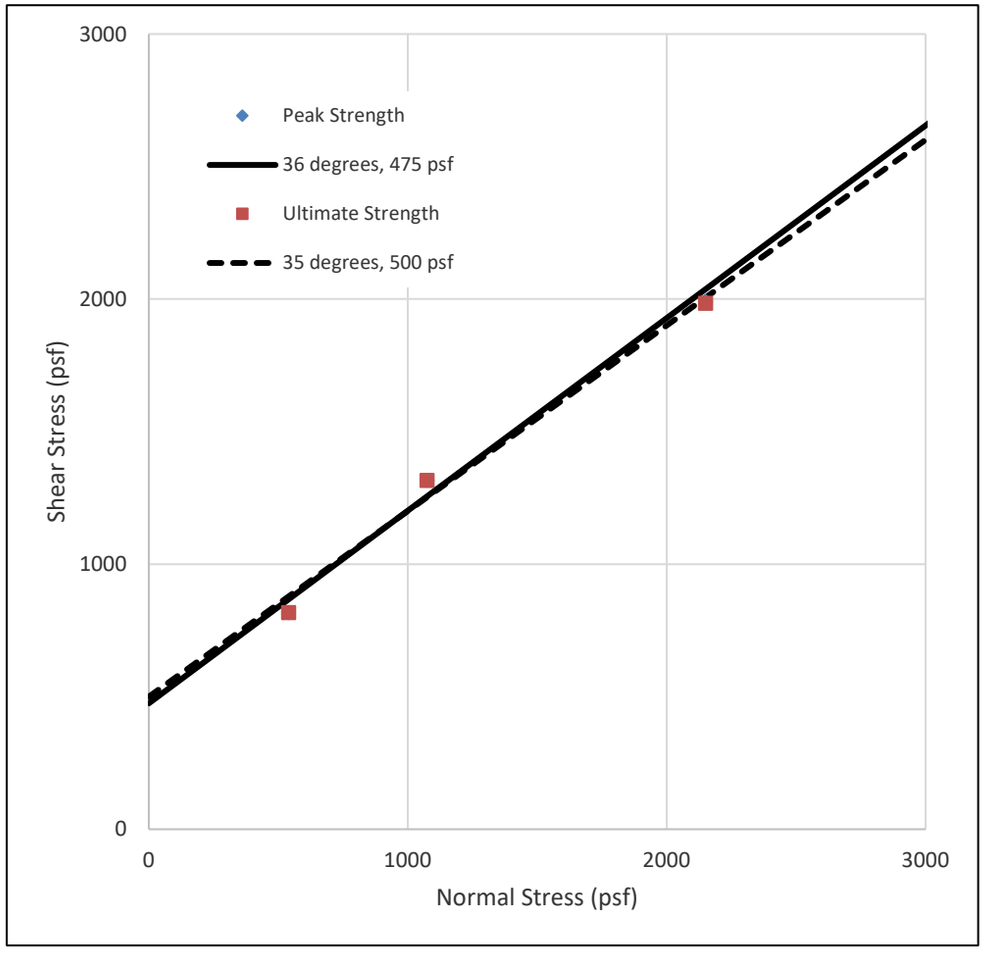
ATTERBERG LIMITS	
LIQUID LIMIT	-
PLASTIC LIMIT	-
PLASTICITY INDEX	-

ATLAS

Mead Valley Sewer Improvements
Riverside County, California

By:	JRD	Date:	March, 2023
Job Number:	1962.000-1	Figure:	II-3





SAMPLE ID: B-1S at 5½ to 6 Feet

VAL VERDE TONALITE (Kvt):
Intensely Weathered to Decomposed Igneous Rock

NOTES: In Situ
Strain Rate: 0.003 in/min
Sample was consolidated and drained

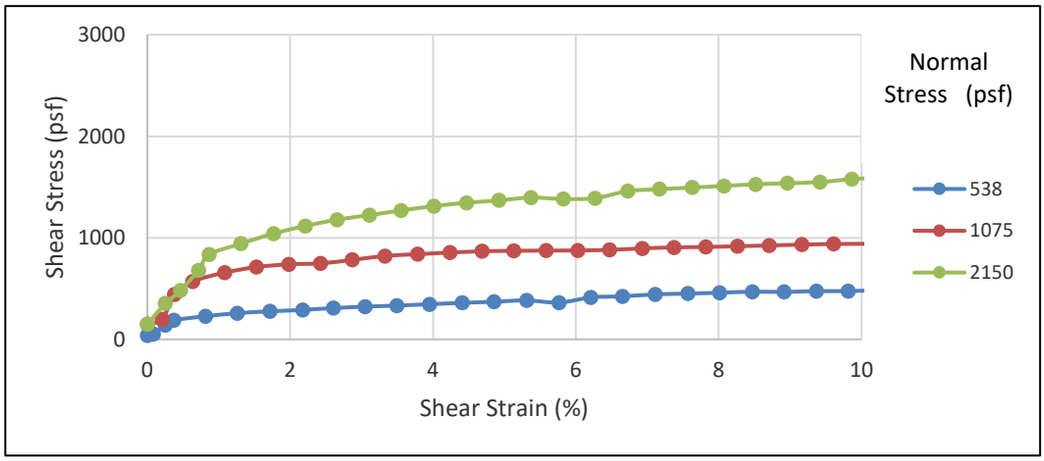
	Peak	Ultimate
Φ	36 °	35 °
c	475 psf	500 psf

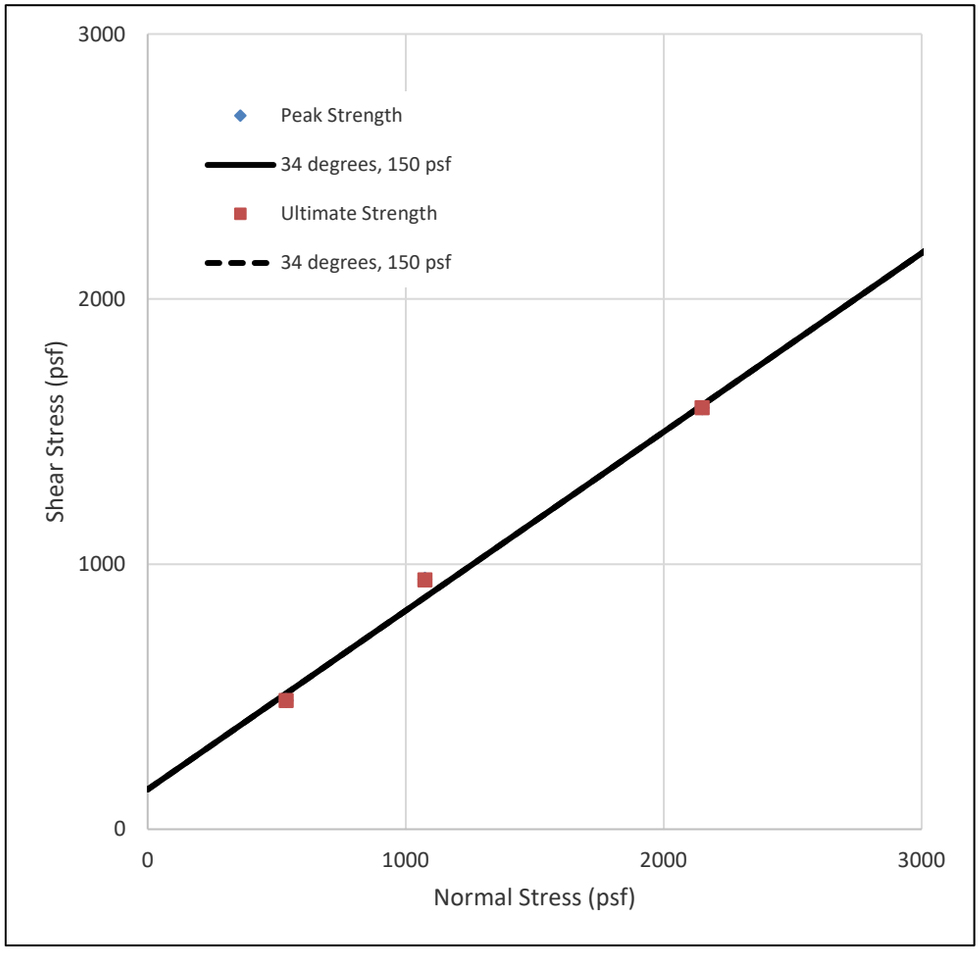
	Initial	Final
γ_d	109.5 pcf	109.5 pcf
w_c	3.6 %	17.7 %
Saturation	18 %	90 %

ATLAS

Mead Valley Sewer Improvements
Riverside County, California

By:	JRD	Date:	March, 2023
Job Number:	1962.000-1	Figure:	II-4





SAMPLE ID: B-9S at 11 to 11½ Feet

VERY OLD AXIAL-CHANNEL DEPOSITS (Qvoa):
CLAYEY SAND (SC)

NOTES: In Situ
Strain Rate: 0.003 in/min
Sample was consolidated and drained

	Peak	Ultimate
Φ	34 °	34 °
c	150 psf	150 psf

	Initial	Final
γ_d	112.4 pcf	112.4 pcf
w_c	9.0 %	17.0 %
Saturation	50 %	93 %

ATLAS

Mead Valley Sewer Improvements
Riverside County, California

By:	JRD	Date:	March, 2023
Job Number:	1962.000-1	Figure:	II-5

RESISTIVITY, pH, SOLUBLE CHLORIDE and SOLUBLE SULFATE

pH & Resistivity (Cal 643, ASTM G51) , Soluble Chlorides (Cal 422) , Soluble Sulfate (Cal 417)

SAMPLE ID	pH	RESISTIVITY (Ω-CM)	CHLORIDE (%)	SULFATE (%)
B-11S at 0 to 5 feet	7.99	1250	0.005	0.014

EXPANSION INDEX

(ASTM D4289)

SAMPLE ID	EXPANSION INDEX	EXPANSION POTENTIAL	SOIL TYPE (USCS)
B-3S at 0 to 5 feet	*18*	Very Low	CLAYEY SAND (SC)
B-9S at 6 to 6½ feet	*38*	Low	CLAYEY SAND (SC)

Expansion Index	Expansion Potential
1-20	Very Low
21-50	Low
51-90	Medium
91-130	High
Above 130	Very High

Percent Passing No. 200 and No. 4

ASTM D1140

SAMPLE ID	PASSING NO. 200 (%)	PASSING NO. 4 (%)	SOIL TYPE (USCS)
B-1S at 5½ to 6 Feet	7.1	100	Poorly Graded SAND with SILT (SP-SM)
B-3S at 0 to 5 Feet	49.5	100	CLAYEY SAND (SC)
B-5S at 5 to 5½ Feet	45.9	100	CLAYEY SAND (SC)
B-7S at 11 to 11½ Feet	31.9	100	SILTY SAND (SM)
B-8S at 0 to 5 Feet	33.8	100	CLAYEY SAND (SC)
B-8S at 11 to 11½ Feet	40.9	100	CLAYEY SAND (SC)
B-9S at 0 to 5 Feet	36.7	100	SILTY SAND (SM)
B-9S at 11 to 11½ Feet	32.2	100	CLAYEY SAND (SC)
B-15S at 0 to 5 Feet	40.3	100	CLAYEY SAND (SC)

ATTERBERG LIMITS

(ASTM D4318)

SAMPLE ID	LIQUID LIMIT	PLASTIC LIMIT	PLASTIC INDEX	SOIL TYPE (USCS)
B-3S at 0 to 5 feet	27	17	10	CLAYEY SAND (SC)
B-8S at 0 to 5 feet	42	15	27	CLAYEY SAND (SC)
B-15S at 0 to 5 Feet	33	15	18	CLAYEY SAND (SC)

R-Value

(CTM 301)

SAMPLE ID	R-VALUE	SOIL TYPE (USCS)
B-3S at 0 to 5 feet	13	CLAYEY SAND (SC)
B-9S at 0 to 5 feet	24	SILTY SAND (SM)
B-12S at 0 to 5 feet	44	SILTY SAND (SM)

UNCONFINED COMPRESSIVE STRENGTH

(ASTM D7012)

SAMPLE ID	UNCONFINED COMPRESSIVE STRENGTH (PSI)			ROCK DESCRIPTION
	SPECIMEN 1	SPECIMEN 2	AVERAGE	
B-6S at 38 to 40 feet	2106	4037	3071	VAL VERDE TONALIATE (Kvt)

APPENDIX III
SEISMIC REFRACTION STUDY

Atlas performed a seismic refraction study to develop subsurface velocity profiles to assess depth of bedrock and apparent rippability of the subsurface materials on January 3rd and 4th, 2023. The seismic refraction study is presented in this appendix.



SEISMIC REFRACTION STUDY

EASTERN MUNICIPAL WATER DISTRICT
GOOD HOPE AND MEAD VALLEY WATER PROJECT

Riverside, California

PREPARED FOR:

Mr. Nate Olivas
Eastern Municipal Water District
2270 Trumble Road
Perris, CA 92570

PREPARED BY:

Atlas Technical Consultants LLC
6280 Riverdale Street
San Diego, CA 92120

January 31, 2023

6280 Riverdale Street
San Diego, CA 92120
(877) 215-4321 | oneatlas.com

January 31, 2023

Atlas No. 1962

MR. NATE OLIVAS
EASTERN MUNICIPAL WATER DISTRICT
2270 TRUMBLE ROAD
PERRIS, CA 92570

Subject: Eastern Municipal Water District
Good Hope and Mead Valley Water Project
Riverside, California

Dear Mr. Olivas:

In accordance with your authorization, Atlas has performed a seismic refraction study pertaining to the subject project located in Riverside County, California. Specifically, our evaluation consisted of performing six 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 January 3rd and 4th, 2022. 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 related to this report, please contact the undersigned at your convenience.

Respectfully submitted,
Atlas Technical Consultants LLC

REGISTERED PROFESSIONAL GEOPHYSICIST
PATRICK F. LEHRMANN
No. 1043
Exp. 1/31/2024
STATE OF CALIFORNIA

Paul W. Gresoro
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PWG:SL:PFL:ds

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Figure 4e P-Wave Profile, SL-5
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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 Riverside County, California. Specifically, our evaluation consisted of performing six 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 January 3rd and 4th, 2023. This data report presents our methodology, equipment used, analysis, and results.

2. SCOPE OF SERVICES

Our scope of services included:

- Performance of six seismic P-wave refraction traverses 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 site was separated into two general areas, each containing three seismic traverses. SL-1 through SL-3 were located approximately 2 miles west of Interstate 215 adjacent to Cajalco Road in Mead Valley, California (Figure 1a). SL-4 through SL-6 were located within a residential area approximately 0.5 mile west of Highway 74 in Perris, California (Figure 1b). The seismic traverses were conducted in the study area locations selected by a representative from your office. The traverses were conducted in areas of minimal topographic relief. Figures 2a through 2f and Figures 3a and 3b show the seismic line locations and depict the general site conditions, respectively. Based on our discussions with you, it is our understanding that your office requested this study in advance of trenching activities for proposed pipeline alignments for the subject project. 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

Six 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 through SL-6. 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, therefore, 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. However, 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, six seismic traverses were conducted as part of our study and Figures 4a through 4f present the velocity models generated from our analysis. Based on the results, it appears that the study area is generally underlain by low velocity materials in the near subsurface and higher velocity material at depth. Distinct vertical and lateral velocity variations are evident in the models. Moreover, the degree of bedrock weathering and the depth to bedrock appears to be highly variable across the study areas. In addition, remnant boulders appear to be present in the subsurface in some areas.

Based on the refraction results, variability in the excavatability (including depth of rippability) of the subsurface materials may be expected across 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.

8. SELECTED REFERENCES

Caterpillar, Inc., 2018, Caterpillar Performance Handbook, Edition 48, Caterpillar, Inc., Peoria, Illinois.

Gebrande H. and Miller H., 1985, Refraktionsseismik (in German). In: F. Bender (Editor), Angewandte Geowissenschaften II. Ferdinand Enke, Stuttgart; pp. 226-260. ISBN 3-432-91021-5.

Intelligent Resources Inc., 2022, Seismic Refraction Interpretation and Modeling Program (Rayfract), V-3.36.

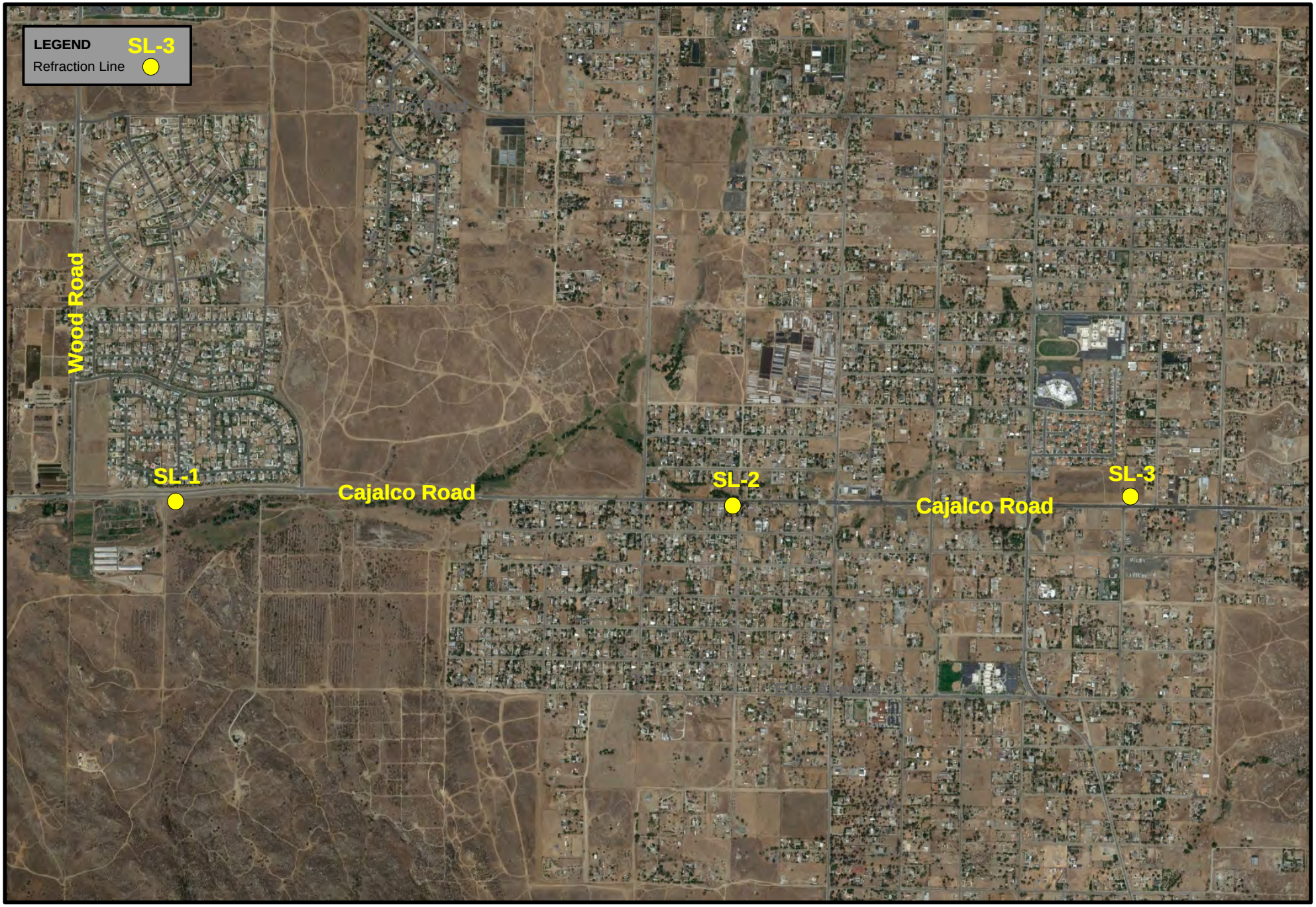
Mooney, H.M., 1976, Handbook of Engineering Geophysics, dated February.

Rimrock Geophysics, 2003, Seismic Refraction Interpretation Program (SIPwin), V-2.76

Rohdewald S., 2007, XTV Inversion. See http://rayfract.com/xtv_inversion.pdf

Schuster, G.T. and Quintus-Bosz, A., 1993, Wavepath eikonal traveltime inversion: Theory. Geophysics, 58(9), 1314-1323.

Telford, W.M., Geldart, L.P., Sheriff, R.E., and Keys, D.A., 1976, Applied Geophysics, Cambridge University Press.



SITE LOCATION MAP

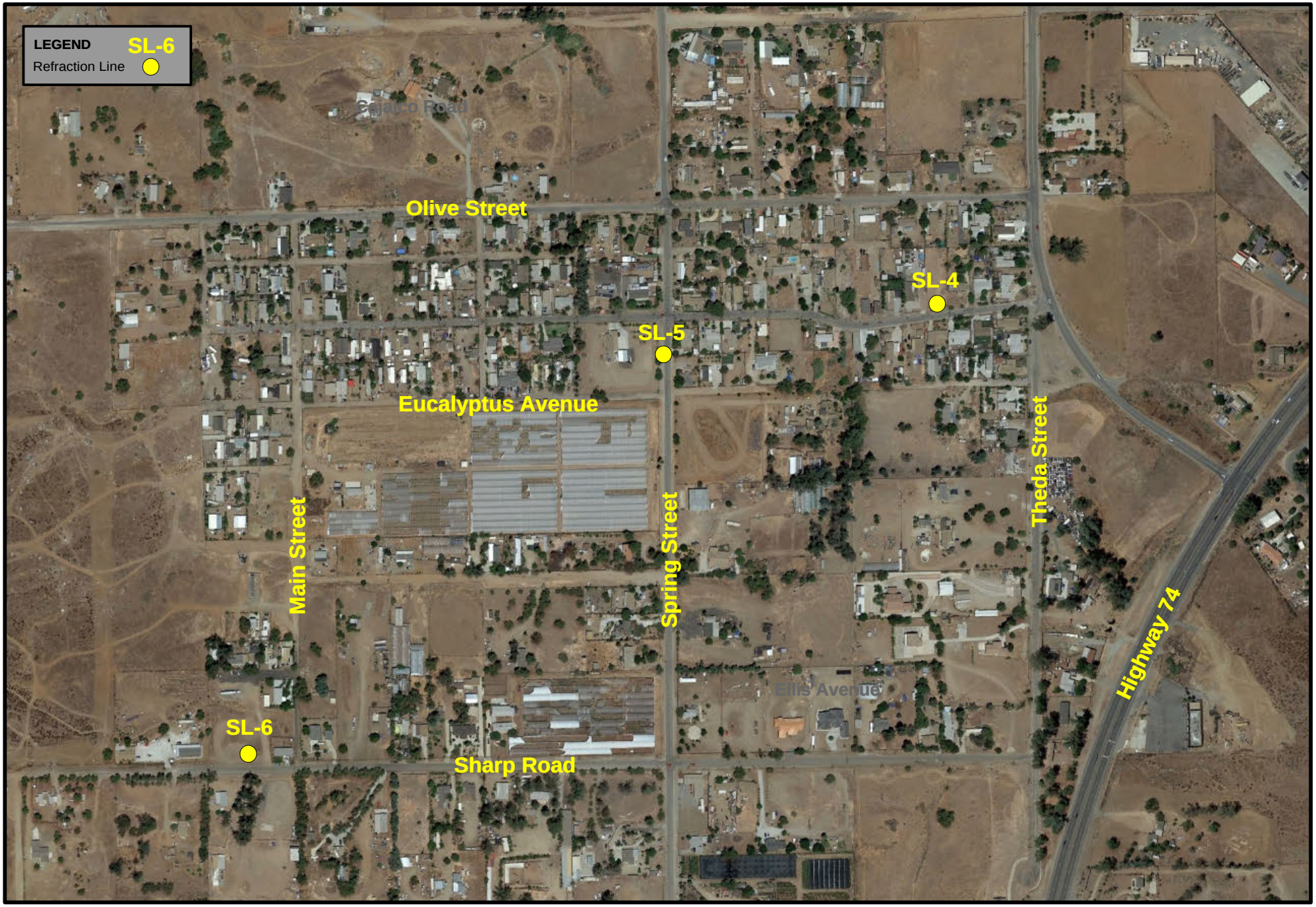
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GOOD HOPE AND MEAD VALLEY WATER PROJECT
RIVERSIDE, CALIFORNIA

Project No.: 1962 | Date: 01/23

ATLAS

Figure 1a



SITE LOCATION MAP

N

GOOD HOPE AND MEAD VALLEY WATER PROJECT
RIVERSIDE, CALIFORNIA

Project No.: 1962 | Date: 01/23

ATLAS

Figure 1b



SEISMIC LINE LOCATION MAP
SL-1

N

GOOD HOPE AND MEAD VALLEY WATER PROJECT
RIVERSIDE, CALIFORNIA

Project No.: 1962 | Date: 01/23

ATLAS

Figure 2a

0 75 150

approximate scale in feet



SEISMIC LINE LOCATION MAP
SL-2

N

GOOD HOPE AND MEAD VALLEY WATER PROJECT
RIVERSIDE, CALIFORNIA

Project No.: 1962 | Date: 01/23

ATLAS

Figure 2b

0 50 100

approximate scale in feet



SEISMIC LINE LOCATION MAP
SL-3

N

GOOD HOPE AND MEAD VALLEY WATER PROJECT
RIVERSIDE, CALIFORNIA

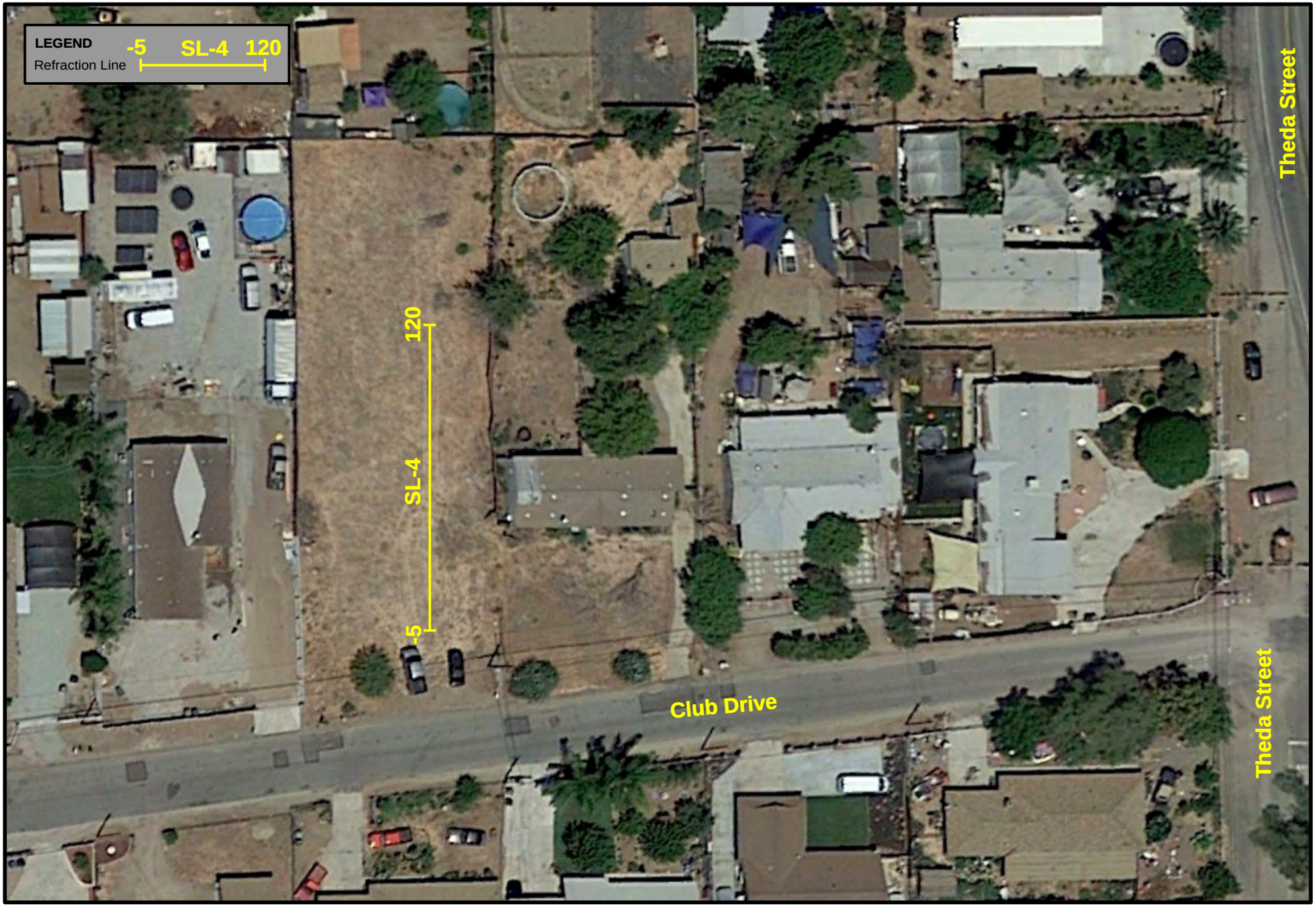
Project No.: 1962 | Date: 01/23

ATLAS

Figure 2c

0 50 100

approximate scale in feet



SEISMIC LINE LOCATION MAP
SL-4

N

GOOD HOPE AND MEAD VALLEY WATER PROJECT
RIVERSIDE, CALIFORNIA

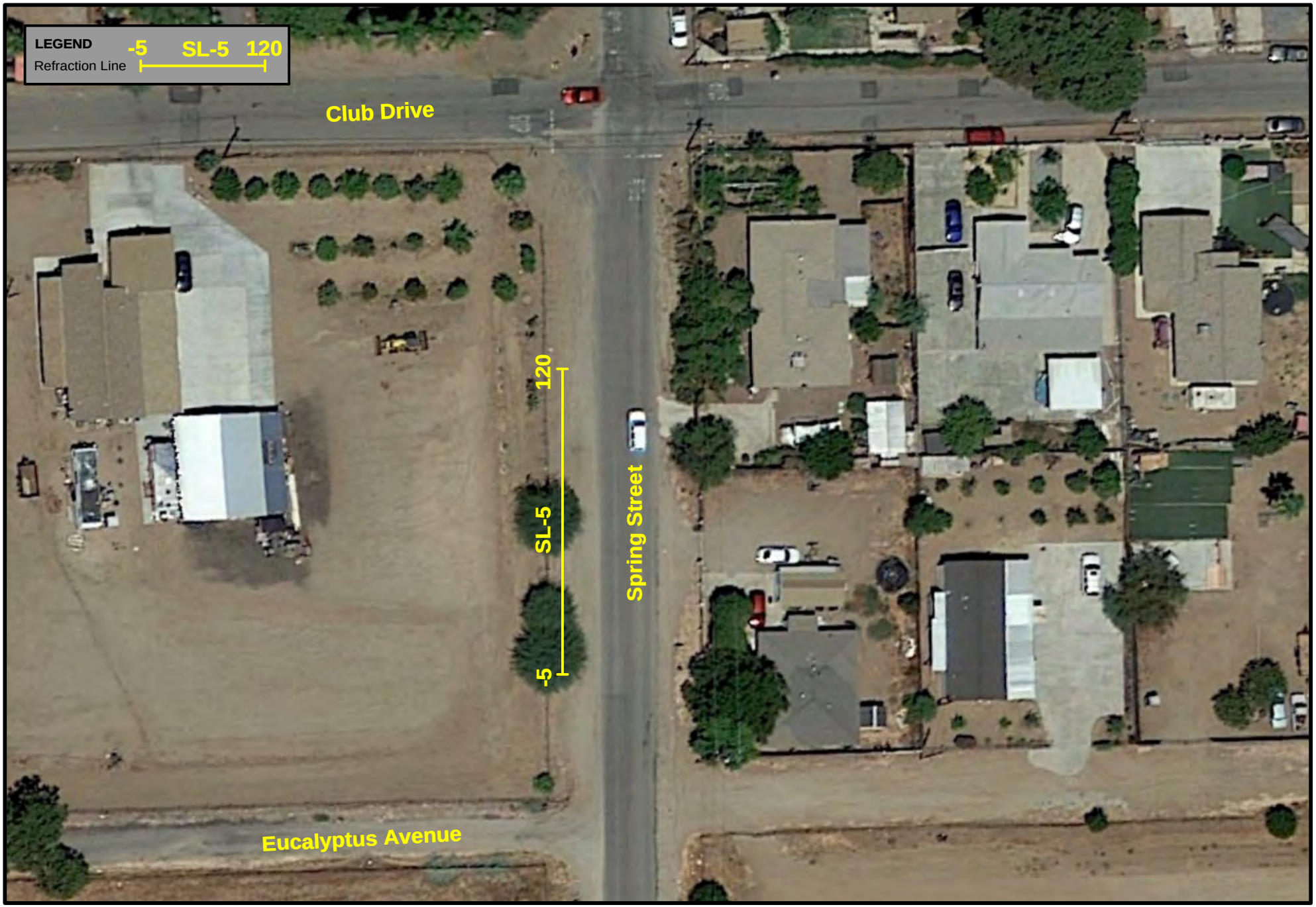
Project No.: 1962 | Date: 01/23

ATLAS

Figure 2d

0 50 100

approximate scale in feet



SEISMIC LINE LOCATION MAP
SL-5

N

GOOD HOPE AND MEAD VALLEY WATER PROJECT
RIVERSIDE, CALIFORNIA

Project No.: 1962 | Date: 01/23

ATLAS

Figure 2e

0 50 100

approximate scale in feet



SEISMIC LINE LOCATION MAP
SL-6

N

GOOD HOPE AND MEAD VALLEY WATER PROJECT
RIVERSIDE, CALIFORNIA

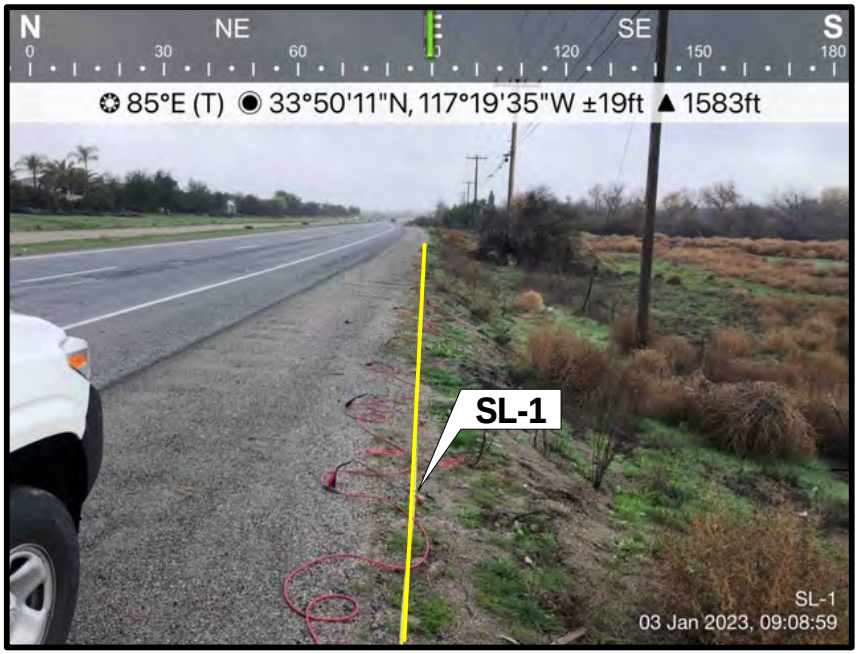
Project No.: 1962 | Date: 01/23

ATLAS

Figure 2f

0 50 100

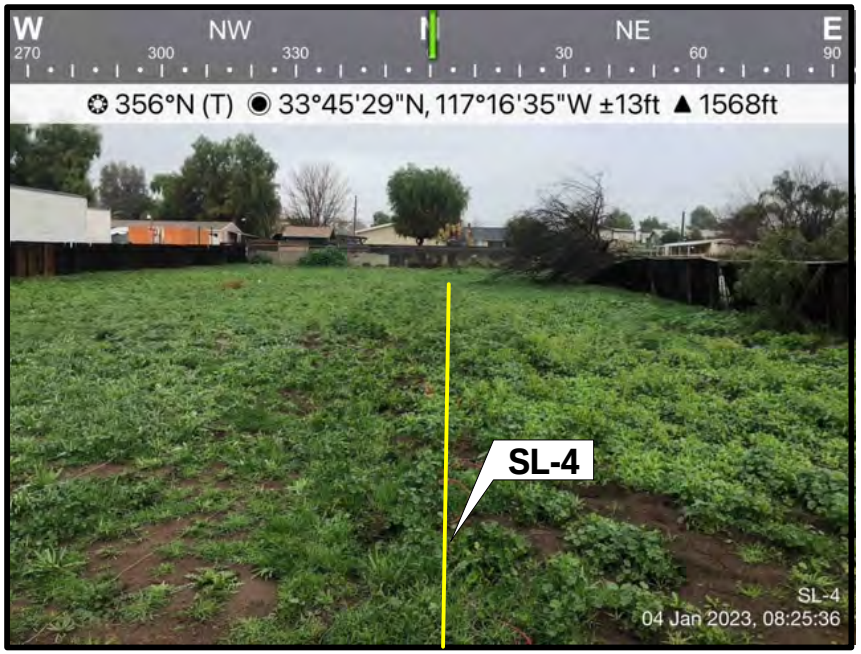
approximate scale in feet







SITE PHOTOGRAPHS SL-1, SL-2 and SL-3	**GOOD HOPE AND MEAD VALLEY WATER PROJECT RIVERSIDE, CALIFORNIA**	ATLAS
	Project No.: 1962 / Date: 01/23	Figure 3a





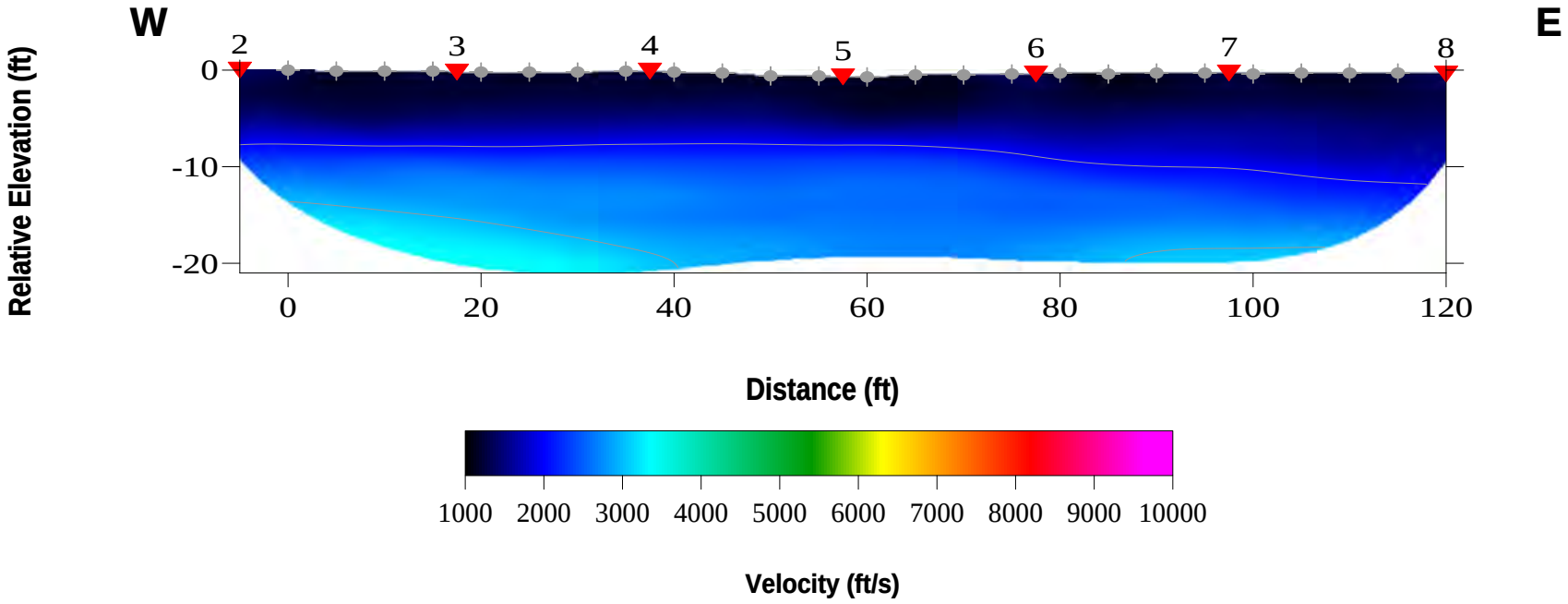


SITE PHOTOGRAPHS SL-4, SL-5 and SL-6	**GOOD HOPE AND MEAD VALLEY WATER PROJECT RIVERSIDE, CALIFORNIA**	ATLAS
	Project No.: 1962 / Date: 01/23	Figure 3b

TOMOGRAPHY MODEL

SL-1

LEGEND
Geophone Locations
Shot Points

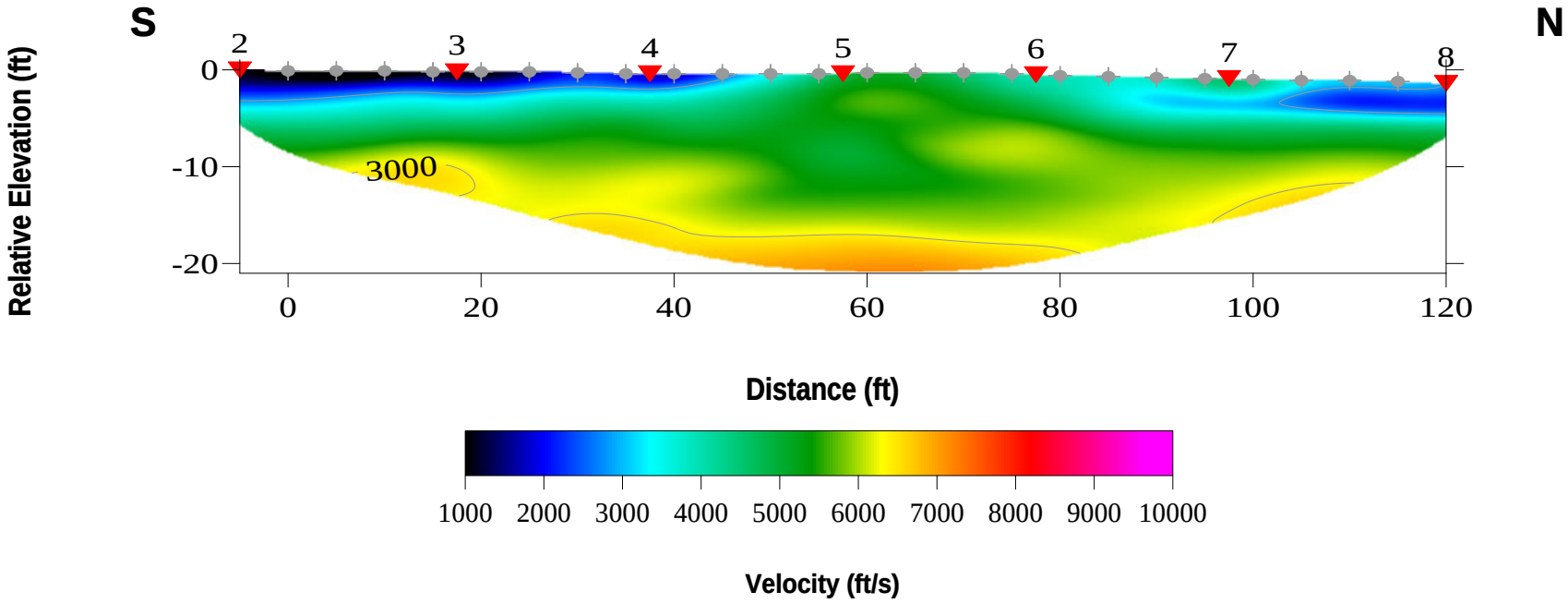


P-WAVE PROFILE SL-1	**GOOD HOPE AND MEAD VALLEY WATER PROJECT RIVERSIDE, CALIFORNIA** Project No.: 1962 Date: 01/23	ATLAS Figure 4a

Note: Contour Interval = 1,000 feet per second

TOMOGRAPHY MODEL

SL-2



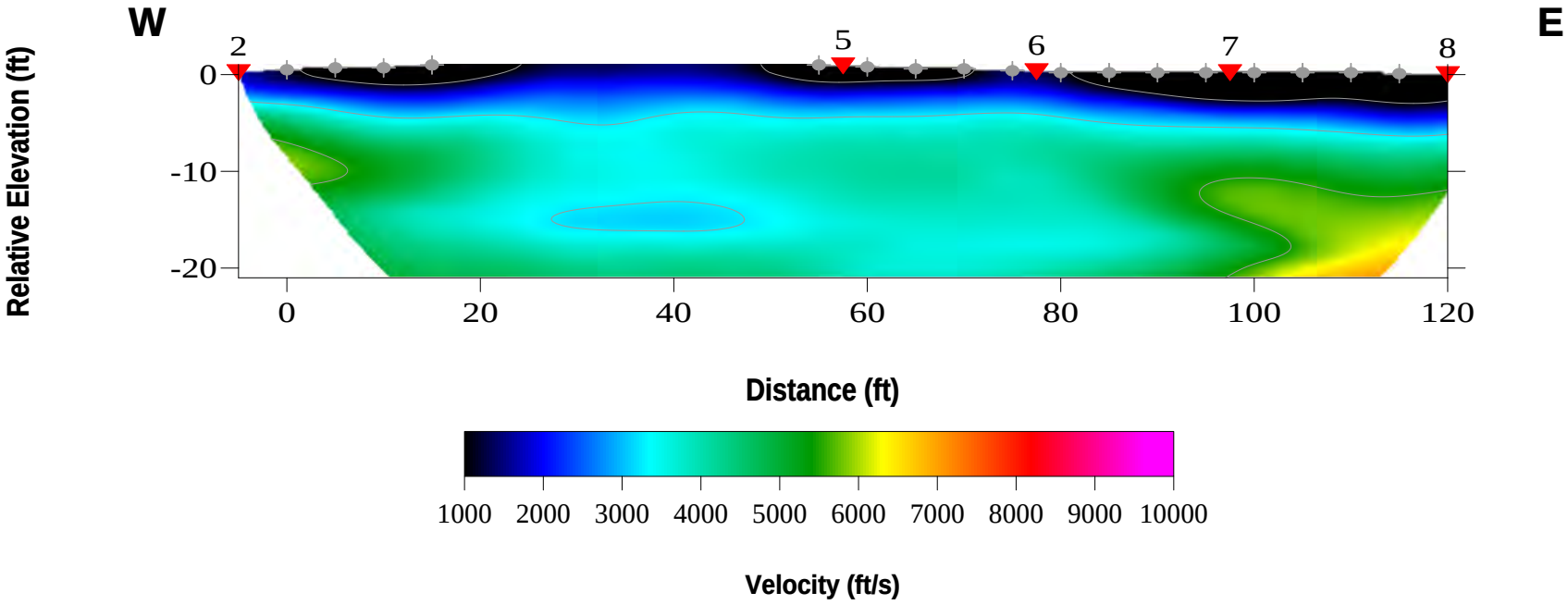
P-WAVE PROFILE SL-2	**GOOD HOPE AND MEAD VALLEY WATER PROJECT RIVERSIDE, CALIFORNIA**	ATLAS
	Project No.: 1962 / Date: 01/23	Figure 4b

Note: Contour Interval = 1,000 feet per second

TOMOGRAPHY MODEL

SL-3

LEGEND
Geophone Locations
Shot Points



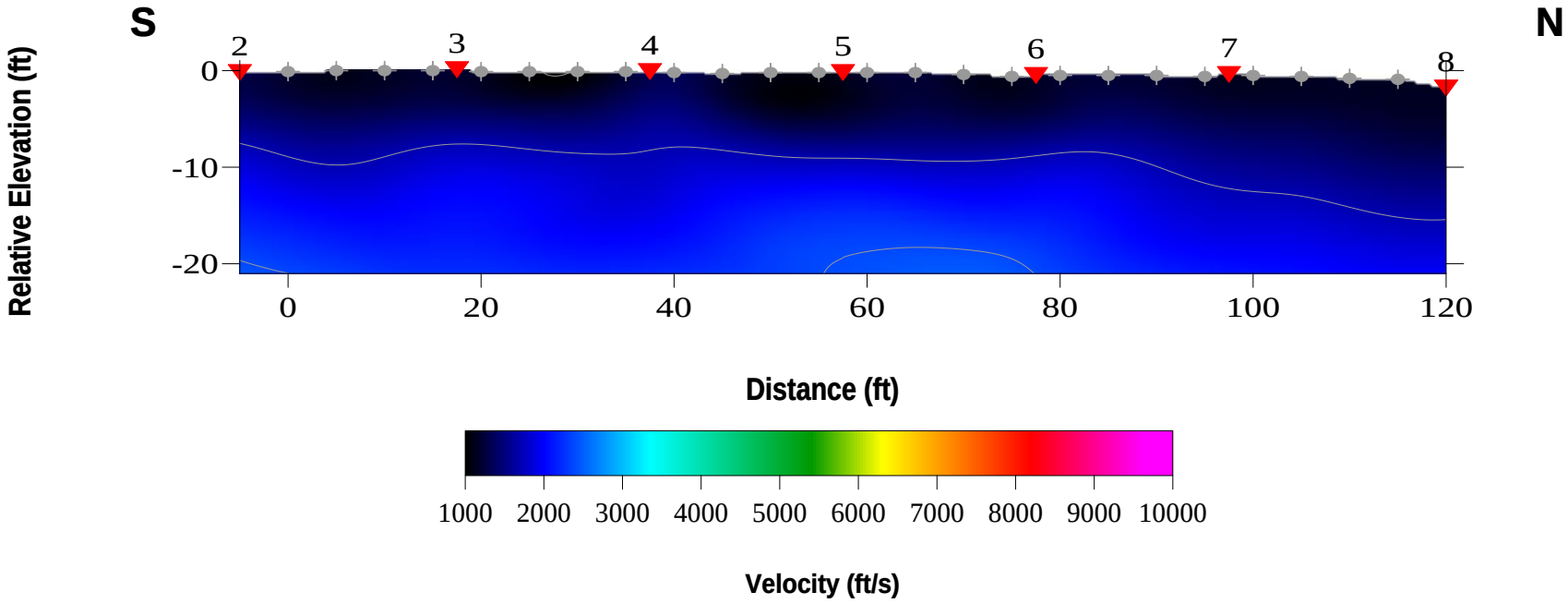
P-WAVE PROFILE SL-3	**GOOD HOPE AND MEAD VALLEY WATER PROJECT RIVERSIDE, CALIFORNIA** Project No.: 1962 Date: 01/23	ATLAS Figure 4c

Note: Contour Interval = 1,000 feet per second

TOMOGRAPHY MODEL

SL-4

LEGEND
Geophone Locations
Shot Points

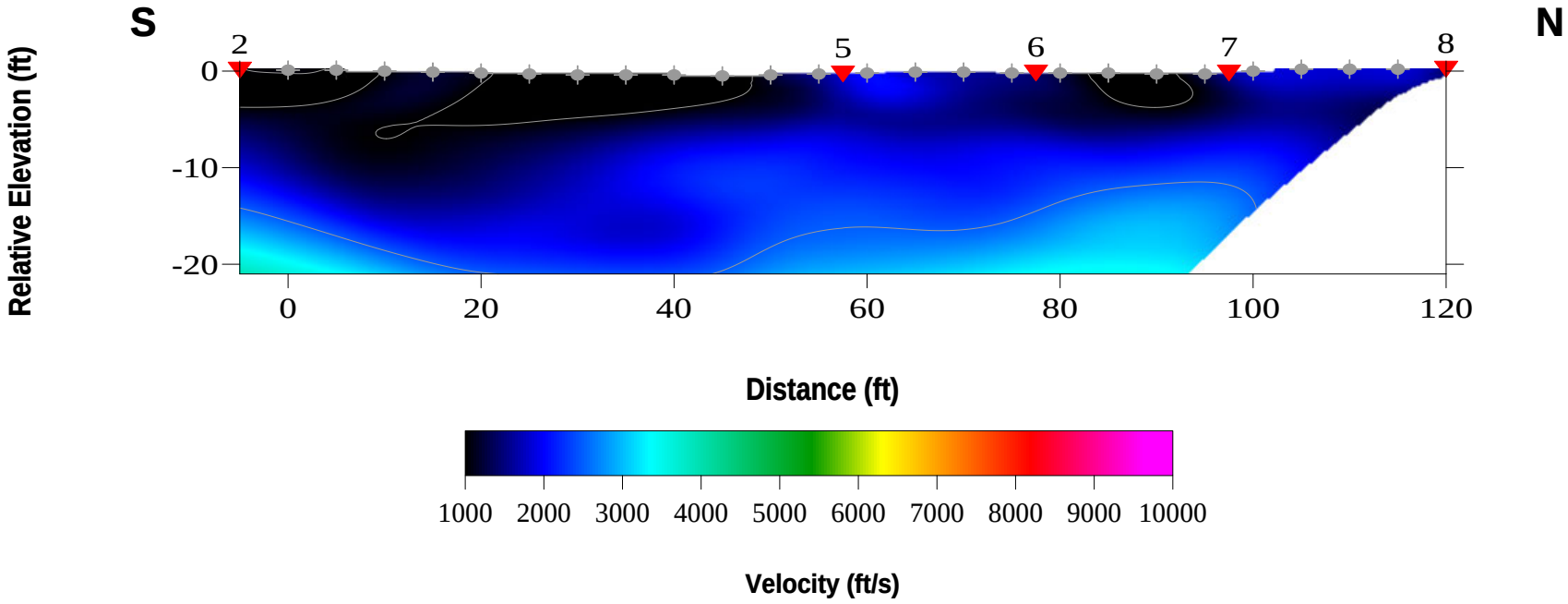


P-WAVE PROFILE SL-4	**GOOD HOPE AND MEAD VALLEY WATER PROJECT RIVERSIDE, CALIFORNIA**	ATLAS
	Project No.: 1962 / Date: 01/23	Figure 4d

Note: Contour Interval = 1,000 feet per second

TOMOGRAPHY MODEL

SL-5



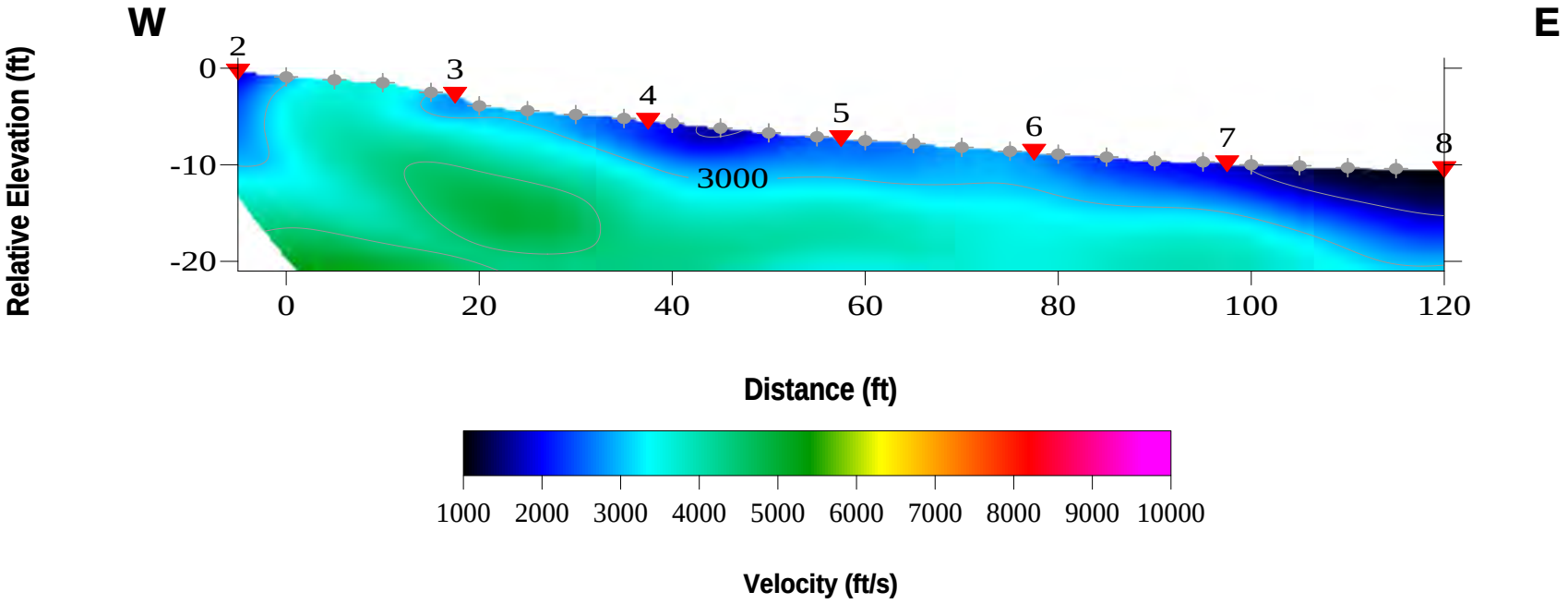
P-WAVE PROFILE SL-5	**GOOD HOPE AND MEAD VALLEY WATER PROJECT RIVERSIDE, CALIFORNIA**	ATLAS
	Project No.: 1962 / Date: 01/23	Figure 4e

Note: Contour Interval = 1,000 feet per second

TOMOGRAPHY MODEL

SL-6

LEGEND
Geophone Locations
Shot Points



P-WAVE PROFILE SL-6	**GOOD HOPE AND MEAD VALLEY WATER PROJECT RIVERSIDE, CALIFORNIA**	ATLAS Figure 4f
	Project No.: 1962 / Date: 01/23	

Note: Contour Interval = 1,000 feet per second

APPENDIX E: PRELIMINARY DESIGN REPORT







MEAD VALLEY CAJALCO SEWER PROJECT
DRAFT PRELIMINARY DESIGN REPORT

JANUARY 27, 2023



ARDURRA

DRAFT

PRELIMINARY DESIGN REPORT FOR MEAD VALLEY CAJALCO SEWER PROJECT

January 2023

Prepared by:

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Table 3.2 – EMWD Minimum Slopes
Table 3.3 – Results of Potential Upsizing Hydraulic Analysis
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APPENDICES

A. Mead Valley Cajalco Sewer Project Alternative Alignment Analysis Technical Memorandum prepared by Ardurra, dated January 19, 2023
B. Mead Valley Sewer Diversion Hydraulic Analysis Technical Memorandum prepared by Dudek, dated October 17, 2022
C. Mead Valley Cajalco Sewer Project Hydraulic Analysis
D. Mead Valley Cajalco Sewer Project 30% Design Plans
E. Hydraulic Analysis Prior to Buildout
F. Potential Upsizing Hydraulic Analysis
G. Clark Lift Station Condition Assessment Field Report, completed by V&A
H. Draft Geotechnical Investigation completed by Atlas Technical Consultants LLC, dated January 13, 2023
I. Groundwater Monitoring Report, Completed by Access Environmental Engineering, dated July 29, 2022
J. FEMA Flood Insurance Rate Map, Panel 1410G
K. Conceptual narrative for open trench at low water crossing west of Brown Street
L. Engineer's Opinion of Probable Construction Cost
M. Project Schedule

SECTION 1: INTRODUCTION

1.1 Introduction

The Mead Valley Cajalco Sewer Project will extend Eastern Municipal Water District's (EMWD or District) collection system in Mead Valley. The goals of the Mead Valley Cajalco Sewer Project (Project) are to:

- extend sewer service to and promote economic development of the disadvantaged community of Mead Valley,
- redirect existing flow to the proposed trunk sewer in order to decommission the EMWD Clark Street Lift Station, and
- provide additional flow to Western Municipal Water District's (WMWD) Western Water Recycling Facility in order to produce additional recycled water.

The Mead Valley Cajalco Sewer Project is comprised of the following major elements as shown on Figure 1:

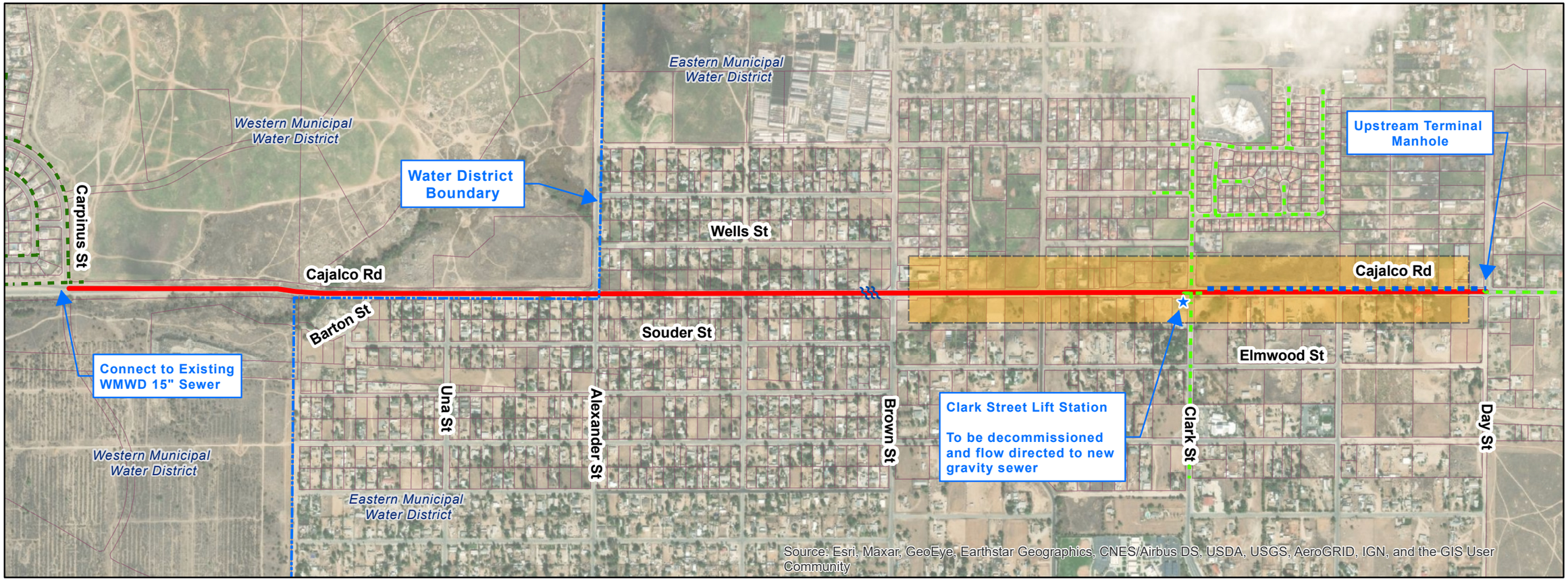
- 12,630 ft of new gravity trunk sewer, 8"–12" diameter, with manholes along Cajalco Road from Day Street to Carpinus Drive.
- An upstream dead end manhole at the upstream (eastern) end of the project and a connection to the Western Municipal Water District (WMWD) existing 15" sewer at the downstream (west) end of the project.
- Demolition of the Clark Street Sewer Lift Station with associated sewer connections to re-direct the incoming flows to the new Cajalco Sewer, and abandonment in place of the existing 6" force main that extends from Clark Street to Day Street and currently connects to EMWD's existing 18" sewer flowing east from Day Street.

1.2 Purpose

The purpose of the preliminary design presented herein is to:

- summarize the alternative alignment analysis performed as part of this Preliminary Design,
- present the hydraulic analysis of the proposed sewer to:
    - meet the required flow capacity and self-cleansing velocities, and
    - contrast self-cleansing velocities between the minimum required diameter and one pipe size larger,
- identify constructability and operation maintenance (O&M) issues and mitigating factors including,
    - proposed area of work and preliminary traffic control concepts for construction of the sewer,
    - geotechnical conditions including potential for rock and groundwater,
    - document the proposed service area and potential limitations on future septic-to-sewer conversions,

Author: Leah Russell Created 1/29/2023



N

0 500 1,000 Feet

ARDURRA

Legend

- Proposed Alignment
- Target Service Area
- Parcel Lines
- Exist Clark St. LS FM to be abandoned
- EMWD Existing Sewer
- WMWD Existing Sewer
- Arizona Crossing

Eastern Municipal Water District

PRELIMINARY DESIGN OF GRAVITY SEWER
FOR THE MEAD VALLEY CAJALCO ROAD PROJECT

Figure 1. Proposed Alignment

  - document criteria for manhole spacing and future O&M access,
  - identify proposed improvements to prevent inflow and infiltration due to location of portions of the sewer within the 100-year flood plain,
  - document proposed methods for crossing existing culverts of Cajalco Creek, and
  - document the County of Riverside's proposed Cajalco Road Improvement Project and impacts to future operation of the Project.
- identify required permits and utility coordination required to construct the sewer, and
- provide an Engineer's Opinion of Probable Construction Cost and Project Schedule

1.3 Report Content

This PDR is comprised of the following sections:

- **Section 1: Introduction** provides background information for the Project.
- **Section 2: Pipeline Alignment Analysis** summarizes the results of the previously completed study.
- **Section 3: Hydraulic Analysis** evaluates the capacity of the existing and proposed sewer systems to convey projected wastewater flows.
- **Section 4: Clark Street Lift Station Decommissioning** discusses the existing lift station, decommissioning, and site improvements.
- **Section 5: Design Criteria** discusses design of pipeline, traffic control, existing conditions, and maintenance and operations.
- **Section 6: Permit Requirements** identifies the permits that will be required to construct the Project.
- **Section 7: Opinion of Probable Construction Cost** provides the engineer's opinion of probable construction cost.
- **Section 8: Schedule** provides the anticipated design and construction schedule.

SECTION 2: PIPELINE ALIGNMENT ANALYSIS

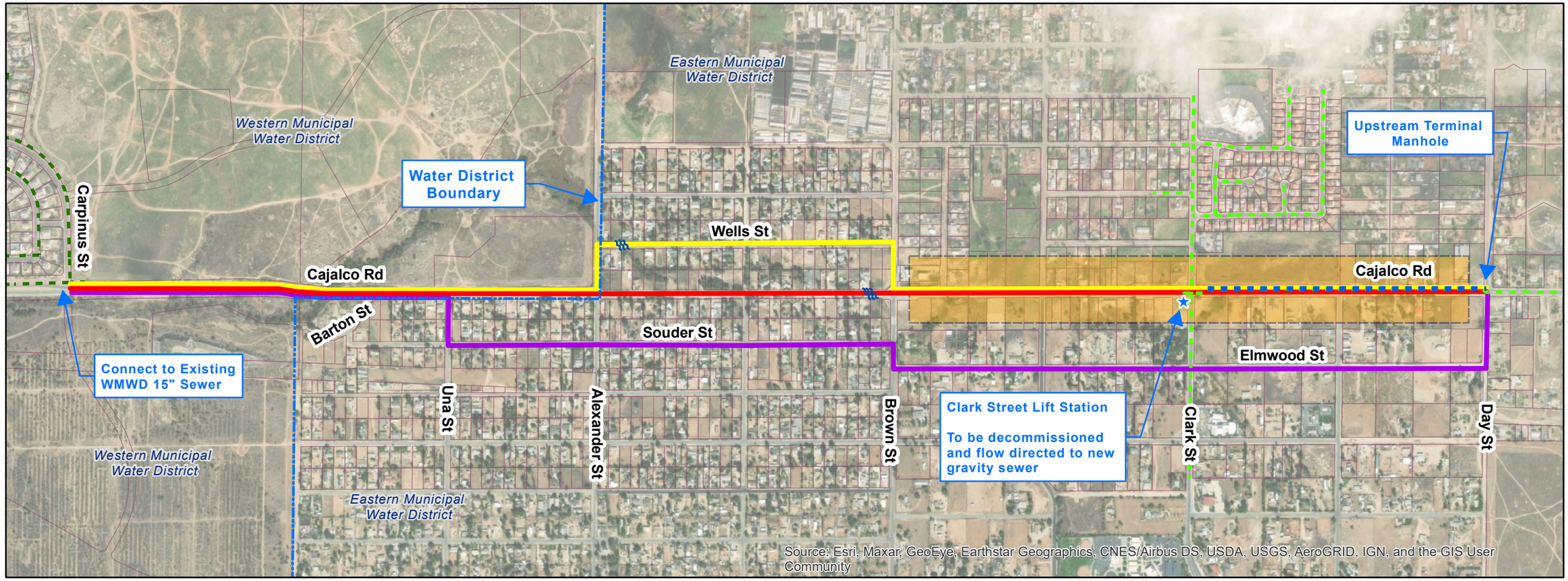
2.1 Alignment Analysis

Ardurra completed an Alternative Alignment Analysis Memorandum dated January 19, 2023, included as Appendix A. Three alternatives were identified and quantitatively and qualitatively evaluated on the basis of nine criteria:

- Hydraulics – does the project meet the District's requirements for sewer capacity as outlined in the EMWD Guidelines for Sewer System Plans?
- Utilities – are there potential existing or future utility conflicts along the alignment?
- Right-of-Way – is the alternative located in public right-of-way or existing easements?
- Traffic Impacts (Construction) – are there significant impacts to traffic during construction?
- Permitting – what permits are required?
- Constructability/Risk – will the alignment require sustained construction within areas with significant groundwater, potential for rock excavation, and/or sewer depths exceeding 20 ft in depth?
- Operations & Maintenance – will the alignment provide self-cleansing velocity at peak dry weather flow, require manholes located outside of heavily traveled roadways, or require collector sewers to service the targeted service area?
- Opinion of Probable Construction Cost – a planning level Engineer's Opinion of Probable Construction Cost was developed for each alternative for comparison purposes.

The three alternatives, and one sub-alternative that were identified are described below and shown in Figure 2.

- **Alternative 1** – This alternative extends from Day Street to Carpinus Drive, approximately 12,630 feet within Cajalco Road. This alignment is the most direct route between connection points and would maximize slope in the new alignment. This alignment would trench through the existing Arizona crossing just west of Brown Street.
- **Alternative 2** – This alternative is approximately 13,490 linear feet and is similar to Alternative 1, however, it turns north at Brown Street, east on Wells Street, and south on Alexander Street to rejoin Cajalco Road and continue west to Carpinus Drive. The main benefit of this alignment would be the avoidance of impacts on the existing Arizona crossing on Cajalco Road, just west of Brown Street. This alignment would impact an Arizona crossing on Wells Street, just east of Alexander Street.
- **Alternative 2A** – This alternative is similar to Alternative 2A (with a total length of 13,490 ft), except after turning north at Brown Street and east on Wells Street, it would turn south on Mead Street to rejoin Cajalco Road. This alignment was identified in discussions with District Staff as a potential alignment that does not require trenching through an existing Arizona crossing.



N

0 500 1,000 Feet

Legend

- Alternative 1
- Alternative 2
- Alternative 3
- Target Service Area
- Parcel Lines
- Exist Clark St. LS FM to be abandoned
- EMWD Existing Sewer
- WMWD Existing Sewer
- Arizona Crossing

ARDURRA

Eastern Municipal Water District

PRELIMINARY DESIGN OF GRAVITY SEWER
FOR THE MEAD VALLEY CAJALCO ROAD PROJECT

Figure 2. Alignment Alternatives

However, Mead Street between Wells and Cajalco Roads is an undeveloped right-of-way with a double track dirt path that does not stay within public right-of-way. The actual right-of-way contains several mature trees and is proposed to be crossed in the future with an unlined earthen channel to convey the FEMA 100-year flood flows. Due to potential environmental impacts and the future liability of a sewer installation under an unlined flood channel, this alternative was not carried forward.

- **Alternative 3** – This alternative is located within Souder Street and Elmwood Street and would bypass Cajalco Road from Day Street to Una Street. This alternative requires that collector sewers would need to be installed along Cajalco Road to provide service to the target service area from Brown Street to Day Street. This alternative would comprise approximately 12,610 feet of trunk sewer and an additional 4,570 feet of collector sewer.

2.2 Proposed Alignment

The three alternatives were evaluated against the identified criteria. Alternative 1, the alignment directly along Cajalco Road, was selected as the preferred alternative due to having the shortest route, minimizing impacts to residences by avoiding narrow residential streets, avoiding sewer depths over 20 feet and having the lowest overall cost. After review by the District of the draft Alignment Analysis Memorandum, Alternative 1 was selected as the preferred Project.

SECTION 3: HYDRAULIC ANALYSIS

3.1 Determination of Flow

Considering the potential for receiving additional flow from the Mead Valley area, WMWD previously contracted with Dudek to perform a hydraulic analysis of the impact of the additional flow on WMWD's downstream facilities. This memorandum, titled Mead Valley Sewer Diversion Hydraulic Analysis, dated October 17, 2022 (Sewer Diversion TM), is included herein as Appendix B.

The Sewer Diversion TM identified tributary areas to the proposed Mead Valley Cajalco Sewer as identified below.

Table 3.1 – Existing Flow to the Clark Lift Station per Tributary Area per the Sewer Diversion TM

Land Use Type	Average Dry Weather Flow (gpd)	Peak Dry Weather Flow (gpd)	Peak Design Flow (gpd)
School	6,753	19,329	23,195
Public Facility	4,424	12,697	15,236
Medium Density Residential	32,430	93,074	111,689
Totals	**43,607**	**125,100**	**150,120**

In addition to the above inflow associated with land use types, the Sewer Diversion TM identified future flows from the proposed EMWD target service area and designated this area as the Mixed Used Policy Area, or MUPA, shown in orange in Figure 1 of the Sewer Diversion TM. The Sewer Diversion TM analyzed the respective EMWD and WMWD methodologies for analyzing proposed flows and identified the EMWD method as being more conservative. EMWD standards were therefore utilized to calculate the flow.

Per EMWD guidelines, Average Dry Weather Flow (ADWF) in gallons per day is calculated as 235 gallons per day per equivalent dwelling unit (EDU) at 5 EDU/acre. A peaking factor of 2.87 is applied to the ADWF to obtain the Peak Dry Weather Flow (PDWF). A peaking factor of 1.2 is applied to the PDWF to obtain the Peak Wet Weather Flow (PWWF). Ardurra identified influent acreage in the proposed new service area per reach and assigned corresponding flows. The per reach influent flow is identified in Appendix C - Mead Valley Cajalco Sewer Project Hydraulic Analysis.

The total influent flow calculated per the EMWD Guidelines varies from that presented in the Sewer Diversion TM. The Cajalco Sewer Project Hydraulic Analysis identified a future influent flow of 80,311 gpd Average Dry Flow whereas the Sewer Diversion TM identified the same future influent flow as 61,100 gpd Average Dry Flow. This variance in proposed future flow could potentially be attributed to a difference in acreage of the proposed service area, or "Mixed Use Policy Area" as it is referred to in the Sewer Diversion TM. This variance needs to be coordinated with WMWD as the Project moves forward.

Additionally, the Sewer Diversion TM identified "School" and "Public Facility" acreages as currently on septic systems. Per EMWD, these existing service areas are currently serviced by EMWD sewers. This also needs to be coordinated with WMWD as the Project moves forward.

3.2 Pipeline Sizing

Using the estimated maximum influent flow described above, Ardurra applied the standards described in the EMWD Guidelines for Sewer System Plan to identify the minimum required diameter of the Project pipelines. These results are shown in Appendix C – Mead Valley Cajalco Sewer Hydraulic Analysis and on the Mead Valley Cajalco Sewer 30% Plans in Appendix D. The EMWD standards are summarized below:

- Maximum d/D (depth to diameter ratio) of 0.5 for sewers 12" and below during PWWF.
- Maximum d/D of 0.75 for sewers 15" and above during PWWF.
- Minimum velocity of 2 fps (feet per second) during PDWF.
- Minimum slopes as follows:

Table 3.2 – EMWD Minimum Slopes

Sewer Size	Minimum Slope
8"	0.004
10"	0.0032
12"	0.0024
15"	0.0016
18"	0.0014

The hydraulic analysis identified 8,560 linear feet of proposed minimum pipe size as 12" downstream (west of) of Clark Street, 1,335 linear feet of proposed minimum pipe size of 10" upstream of Clark Street to Haines Street, and 2,425 linear feet of proposed minimum pipe size of 8" upstream (east of) Haines Street. This pipe sizing satisfies the above EMWD sewer sizing requirements with the exception of the upstream dead end reach (400 ft in length) which will not meet the requirement for 2 fps self-cleansing flow. The minimal flows in this dead end reach would not allow for this requirement to be met regardless of slope.

The basis of design includes the currently undeveloped area along Cajalco Road. Ardurra performed an additional Hydraulic Analysis to check for self-cleansing velocities prior to development of this area. Prior to buildout, the sewer would be dry upstream of Clark Lift Station. Downstream of the lift station the sewer would not meet self-cleansing velocity between Haines Street (MH 21) and Una Street (MH 10) with velocities at Peak Dry Weather in these reaches between 15. Fps and 2.0 fps. The full results are shown in Appendix E - Hydraulic Analysis Prior to Buildout.

3.3 Potential for Upsizing Proposed Sizing

The District requested the potential for a larger pipe size to be evaluated to accommodate potential future septic-to-sewer conversions without compromising self-cleansing velocities for the current design flow. Note that the current design flow includes the target service area which is not yet built out and does not currently meet self cleansing velocities without the inclusion of the undeveloped target service area as discussed in Section 3.2 of this preliminary design report. Upsizing the proposed sewer to 15" while keeping the currently designed slopes constant was evaluated and is presented in Appendix E – Potential Upsizing Hydraulic Analysis. It should be noted that the proposed design already has adequate capacity to provide a larger flow than the design flow as noted in the below table under current design, maximum capacity. A summary of the results of the Potential Upsizing Hydraulic Analysis are shown in the below table.

Table 3.3 – Results of Potential Upsizing Hydraulic Analysis

Design	Sewer Sizing	Total Design Flow	Limiting Reach for Maximum Capacity	Maximum Capacity
Current Design	8,560 LF 12" from Carpinus Drive to Clark Street 1,335 LF 10" from Clark Street to Haines Street 2,425 LF 8" from Haines Street to Day Street	123,900 gpd ADWF/ 86.04 gpm ADWF/ 246.94 gpm PDWF/ 296.33 gpm PWWF/	Max d/D of 0.5 per minimum slope as designed of 0.0290 downstream of Alexander Street	180,167 gpd ADWF/ 125.11 gpm ADWF/ 359.1 gpm PDWF/ 430.9 gpm PWWF
Potential Upsizing	11,491 LF 15" from Carpinus Drive to Robinson Street 830 LF 8" from Robinson Street to Day Street	N/A	Max d/D of 0.75 per minimum slope as designed of 0.0290 downstream of Alexander Street	1833 gpm PWWF west of Una Street/ 1425 gpm PWWF east of Una Street

SECTION 4: CLARK STREET LIFT STATION DECOMMISSIONING

4.1 Existing Lift Station Configuration

The Clark Street Lift Station is a submersible lift station with two 4" 150 gpm submersible pumps. The precast wet well is approximately 20 feet deep and 8 feet in diameter. Influent flow is routed into the wet well from Clark Street via an 8" PVC sewer. A precast valve vault contains two 6" check valves, three 6" plug valves, and associated 6" ductile iron piping. A plug valve is buried on the discharge side of the valve vault. Effluent flow is routed north to Cajalco Road and is pumped east to a discharge manhole at Cajalco Road and Day Street via a 6" PVC force main. An existing pressure regulator is located in the southwest corner of the property and connected to the 18" waterline running along Cajalco Road via two 164' lengths of 8" PVC. The lift station has an onsite emergency generator that was recently installed and served by an electrical service via a power pole in the southeast corner of the property. A condition assessment report prepared by V&A is included in Appendix G.



Clark Street Lift Station

4.2 Lift Station Decommissioning

Upon completion and acceptance of the proposed Mead Valley Cajalco Sewer, the Clark Street Lift Station is proposed for decommissioning. Decommissioning is understood to include the following:

- Demolition or salvage of above grade facilities including:
  - Emergency generator (salvage)
  - Motor control center and Automatic Transfer Switch (salvage)
  - Generator Shed
  - Approximately 560 feet of chain link fence, gates and barbed wire
  - Shade structure (salvage)
- Relocation of the existing Pressure Regulator into the street right of way along Cajalco Road
- Demolition or salvage of the existing wet well including:
  - Pumps (salvage)
  - 8" ductile iron pipe
  - Float switches and bubbler system

    - 20-ft deep, 8-ft diameter precast wet well – remove the cover and top three feet of precast concrete, fill with slurry or sand and abandon in place.
- Demolition or salvage of the valve vault
    - 3 plug valves
    - 2 check valves
    - Ductile iron pipe and fittings
    - Pipe supports
    - Ladder
    - Precast concrete wet well
- Buried piping and Manhole
    - Remove isolation valve and salvage
    - Plug existing 8" diameter PVC gravity sewer at wet well wall and abandon pipe in place.
    - Remove frame and cover and top 3 ft of manhole in Clark Street. Fill with slurry up to remaining manhole wall, and with compressed backfill to grade and abandon in place. Install paving to match existing pavement.
    - Plug 8" sewer at connection to new Mead Valley Cajalco Sewer and abandon remaining 8" sewer in place.
    - On lift station site, remove 6" force main to 3 ft below grade and plug remainder with concrete and abandon in place.
    - Along Cajalco Road, plug 6" forcemain with concrete and abandon in place.
    - Plug 6" force main inlet to receiving manhole and abandon 6" force main in place.

4.3 Lift Station Site Improvements

Following completion of decommissioning, the lift station site will have had existing buried utilities removed within the top three feet and will be covered in a layer of crushed rock to stabilize surface. The resulting site can then be repurposed by the District or sold for development.

4.4 Reduction of Flow to Existing 18" Sewer

Removal of the flow from the receiving 18" sewer east of Day Street will result in a dry sewer until lateral flow enters the sewer main. Remaining flow downstream of the existing force main connection point is not likely to meet self-cleansing velocities. Ardurra recommends the District conduct additional study to determine the length of sewer that will not meet self-cleansing velocity and put those reaches on an enhanced cleaning frequency of at least twice per year.

SECTION 5: DESIGN CRITERIA

5.1 Pipeline Materials

EMWD Guidelines require PVC or VCP pipe. VCP pipe is required for sewers 15" in diameter or greater. Based on the 12" diameter size defined by the analyses presented in Section 3, the proposed Project is currently designed with PVC pipe. If the District elects to upsize portions of the 12" sewer to 15", the design will need to be modified to utilize VCP pipe for reaches 15" in diameter or larger.

Manholes are proposed to be constructed utilizing precast polymer concrete manholes. Due to the shallow groundwater in some areas, ballast slabs are proposed for the manholes to prevent flotation. Specific manholes requiring ballast slabs will be finalized during final design. Per EMWD standards, where groundwater is encountered, manholes shall be coated in the exterior by an approved material, Barricoat-R, Mel-Rol-LM, or approved equal. EMWD standards do not give explicit guidelines regarding the size of manholes other than providing standard details for four, five and, six foot manholes. Ardurra recommends the District consider four foot manholes for sewers 12" and smaller (including all manholes in the proposed project) and five foot manholes for sewers 15" and larger (if the District elects to increase the diameter of the proposed sewer).

5.2 Pipeline Alignment Refinement

Starting with the preferred conceptual sewer alignment (as described by the analysis in Section 2 above), Ardurra has refined the alignment based on several factors including the following:

- avoidance of conflict and preferred horizontal separation with existing utilities
- coordination opportunities that would align better with the County of Riverside's plan for a future widening and construction of raised medians along Cajalco Road
- construction means and methods
- meeting funding deadlines
- impacts to the community, and
- impacts to traffic flow considering that Cajalco Rd is used as a thoroughfare connecting I-15 to I-215.

When considering construction means and methods, Ardurra took into consideration the following factors:

- width of the trench
- type of excavation equipment necessary
- the operation of the contractor for offloading spoils
- the safety and efficiency of the work zone for both workers and the motoring public, and
- how to effectively and efficiently construct the improvements in the shortest duration to minimize impacts to the community and motorists.

5.3 Construction Traffic Control Strategies

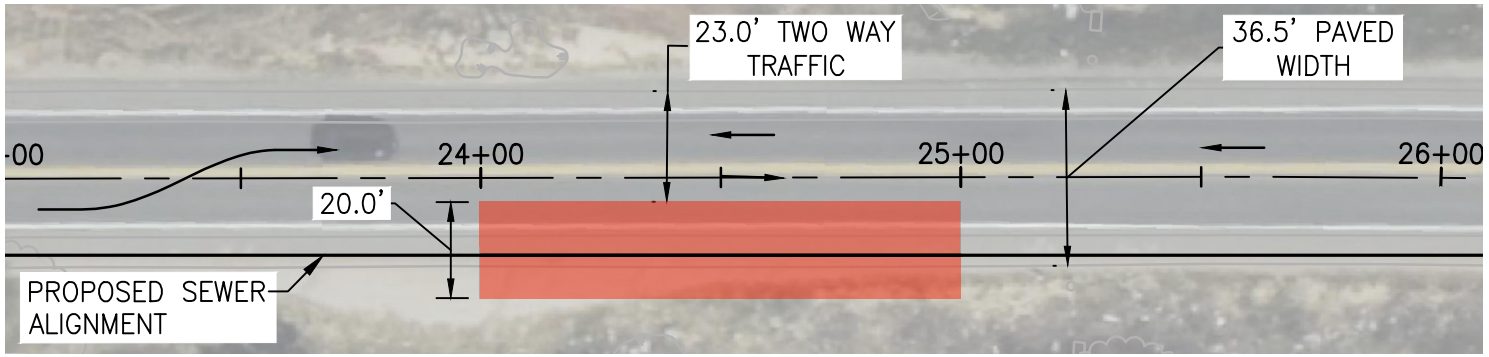
Cajalco Road is a heavily traveled arterial road that connects I-15 and I-215. The proposed alignment shown in the 30% plans (see Appendix D) provides both opportunities and challenges for traffic control strategies. While it is the Contractor's responsibility to tailor his means and methods to provide an adequate work zone and the Contractor is solely responsible for job site safety, Ardurra is presenting conceptual traffic control strategies herein in order to streamline the permitting process with the County. To provide for an adequate work zone, Ardurra proposes that the contractor be allowed a 20-ft to 25-ft wide work zone. This provides space for the excavation equipment centered over the trench, room for workers to maneuver both in and above the trench and around the equipment, and space for offloading to the side of the excavation.

Initial traffic control concepts are illustrated in Figure 3. Ardurra made an initial review of the available roadway widths and potential traffic control strategies along the different segments of the project alignment. For the segment of Cajalco Road. between Brown Street. and Day Street. (approximately 5,100 ft in length) there is adequate roadway width to provide for two lanes of traffic, one in each direction, parallel to the construction corridor.

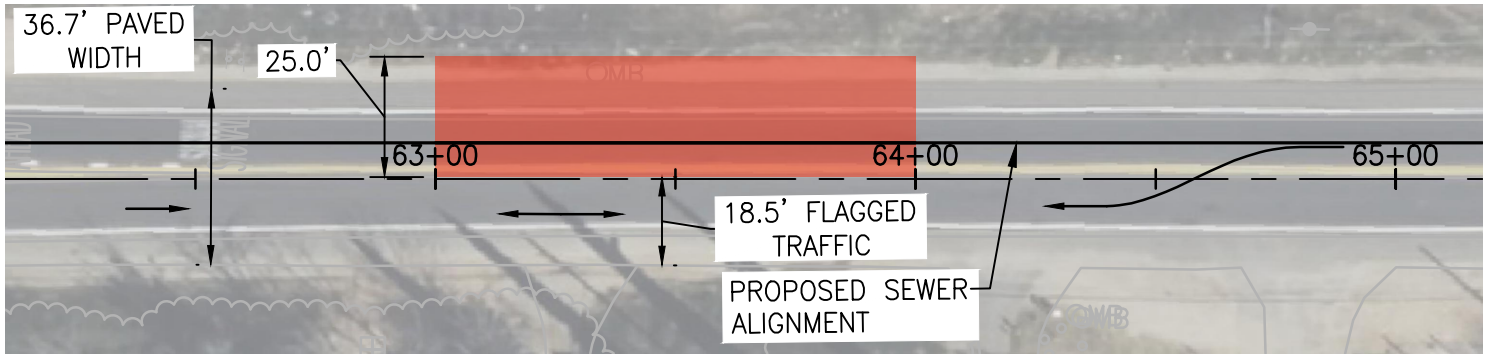
Along the segments between Carpinus Drive. and Barton Street. (approximately 2,600 ft in length) and between Barton Street and Brown Street (approximately 4,700 ft in length), the roadway is not wide enough to allow for two lanes of traffic in parallel with the construction corridor. Along these segments, the use of a single traffic lane controlled by flagging operations was initially considered. Subsequent discussions with EMWD and the County indicated a strong preference for maintaining two lanes of traffic without the need for flagging operations. There was also discussion about working hours and the possibility of performing night work for certain sections along Cajalco Road. Discussions regarding working hours included suggested reduced daytime working hours of 9AM to 3PM, and nighttime hours of 8PM to 5AM, although these were preliminary discussions. Final determination of working hours is expected to be received by the County upon submission of detailed traffic control plans.

Based on further review of the two narrow road segments, the following revised approaches are proposed at this preliminary design stage:

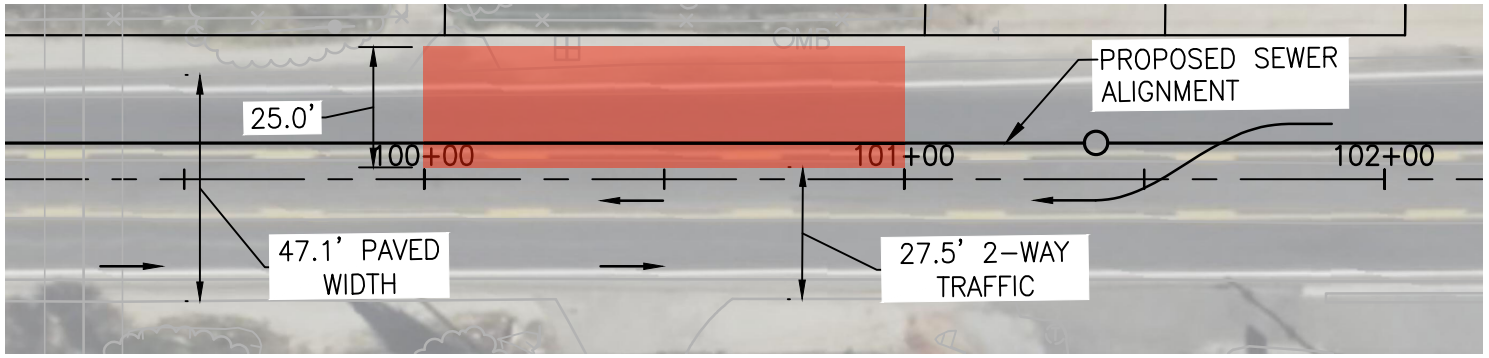
- Between Carpinus Drive and Barton Street – Two lanes of traffic can be provided by reducing the work area width to 20 feet. Although this will impact construction efficiency, the benefit of having two lanes for traffic is considered more valuable.
- Between Barton and Brown Streets – This segment is very constrained, and more survey and utility information is required to assess options for providing more space for traffic without a flagging operation. Strategies that will be evaluated further during final design will include modifying the proposed sewer alignment in this section, providing temporary paving along the unimproved shoulder area, and reducing the work zone width. Depending on the specific



TYPICAL AREA OF WORK
CAJALCO ROAD – CARPINUS DR. TO BARTON ST.



TYPICAL AREA OF WORK
CAJALCO ROAD – BARTON ST. TO BROWN ST.



TYPICAL AREA OF WORK
CAJALCO ROAD – BROWN ST. TO DAY ST.

LEGEND

AREA OF WORK
25' WIDE

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CAJALCO ROAD CONCEPTUAL TRAFFIC PLAN

FIGURE
3

constraints, potential trade-offs may include the decreased horizontal separation from existing utilities, placement of the sewer line inside the proposed alignment of a raised median (to be constructed as part of the County's future improvements along Cajalco Road., and impacts to properties along areas where temporary pavement is placed.

Recommendations for the traffic control approach for these alignment segments and associated project modifications will be performed during final design.

5.4 Geotechnical Conditions

A Draft Geotechnical Investigation has been performed by Atlas Technical Consultants LLC (Atlas); a copy of their report, stamped draft and dated January 13, 2023, is and included in Appendix H. Thirteen (13) borings to depths of up to approximately 41 feet below the existing ground service were performed in September 2022. Additionally, Atlas recently installed (January 2023) two temporary groundwater monitoring wells to a depth of about 40 feet below ground surface. These wells were added to Atlas' scope and installed following production of the Draft Geotechnical Report. Data from these monitoring wells will be included in the Final Geotechnical Report.

The geotechnical report indicated trenching operations may encounter very dense granular materials and potentially igneous rock formations. The presence of cobbles, boulders and groundwater are expected at the site. Fill was encountered in some borings to depths of five feet below grade. Fill materials were noted as moist, medium dense sandy silt, silty sand, and clayey sand and could cause the potential for trench sloughing.

5.4.1 Potential for Rock Excavation

The draft Geotechnical Report recommends that the Contractor be prepared to mobilize equipment (such as rock breakers, carbide tipped teeth, or carbide/diamond tipped coring equipment) to excavate/drill hard rock materials. A refraction survey to better assess rock hardness and excavatability was completed in January 2023 and will be included in the final Geotechnical Report. The final version of this preliminary design report will be updated accordingly to reflect these findings. Although a preliminary cost opinion is assigned to potential for rock excavation in this preliminary design report, it is anticipated that the results of the refraction survey will allow the project team to more accurately identify the potential and associated cost associated with rock excavation.

5.4.2 Potential for Groundwater

The proposed alignment crosses the historic drainage way of Cajalco Creek in two locations, west of Barton Street, and west of Brown Street. This drainageway was taken into account in siting the proposed groundwater monitoring wells. Monitoring wells associated with a remediation effort adjacent to a gas station at Brown Street and Cajalco Road are currently being monitored on a regular basis with information available on the Geotracker website. The most recent quarterly report, dated July 29, 2022 is included in Appendix I. Groundwater elevations during the period of the quarterly report varied between

9 feet and 11.5 feet below grade. The District obtained a sample of the groundwater during a site visit on October 27, 2022 and tested the sample in their lab. Results are shown below.

Table 5.1 – Water Quality Test Results, ug/L

Analysis	Results	Analysis	Results
Ag	<0.3	Mo	12.8
Al	3,440	Ni	7
As	2.6	Pb	<0.9
B	282	Sb	<0.12
Ba	344	Se	3.8
Be	<0.3	Sn	<0.6
Cd	<0.09	Sr	1410
Co	3.38	Tl	<0.9
Cr	7	V	147
Cu	7.2	Zn	20.3
Fe	10,600	pH	7.39
Mn	158		

The borings associated with the Geotechnical Report noted groundwater as shallow as 18 feet below grade. However, the report also noted available literature indicates the groundwater could be shallower than 10 feet below grade. Two groundwater monitoring wells were recently installed (January 2023) at the Cajalco Creek crossing west of Barton Street and west of Clark Street (Borings 6S and 2S, respectively) by Atlas. It is proposed that these wells be monitored by Atlas and EMWD with water loggers during preliminary and final design. The water loggers will be pulled quarterly and the water level records downloaded.

Based on these preliminary results it is expected that portions of the alignment will require dewatering. Options for dewatering disposal include:

- obtaining a discharge permit to discharge to an existing WMWD gravity sewer, or
- obtaining an NPDES discharge permit (estimated time to obtain is 9 months).

Ardurra recommends the feasibility of both options be explored during final design taking into account potential treatment requirements, timeline for permit approval, estimated flow rates, and anticipated locations where dewatering will be required.

5.5 Maintenance and Operations

5.5.1 Manholes

The EMWD Guidelines for Sewer System Plan require a minimum manhole spacing of 500 feet. Additionally, manholes should be installed where there is a change in alignment, and at intersections to

capture potential future inflow. Limited future flow is expected as discussed further below. Additional manholes at intersections are located at Barton Street, Alexander Street, Mead Street, Brown Street, Haines Street, and Clark Street (to capture existing flow).

Traffic control required for accessing the sewer manholes for maintenance operations is divided into three broad phases:

- Carpinus Drive to Barton Street – The sewer alignment is located on the south shoulder. Traffic control for manhole access will require either flagging, or signage and cones to narrow and redirect traffic lanes to the north.
- Barton Street to Brown Street – The sewer alignment is located in the westbound traffic lane. Flagging is expected to be required for manhole access to this area.
- Brown Street to Day Street – The sewer alignment is located in a center turning lane. Traffic control to isolate the center lane from surrounding traffic is expected to be required for manhole access to this area.

5.5.2 County of Riverside Proposed Improvement Project

The County has completed a 30% design and is currently in the process of preparing environmental documents for a road and drainage improvement project along Cajalco Road. The proposed project would widen Cajalco Road, install new storm drains, and channelize the historical Cajalco Creek drainageway west of Barton Street. Although the County is the lead agency for this project, the channelization of the drainageway between Alexander Street and Brown Street is in accordance with the Riverside County Flood Control and Water Conservation District master planning efforts. The preliminary roadway plans indicate that minor grading will raise the elevation of Cajalco Road. West of Barton Street the project proposes dividing the west and east bound traffic lanes with the east bound lanes traversing the existing Cajalco Creek Crossing and constructing a new bridge over Cajalco Creek for the west bound lanes.

From Barton Street to Day Street, the County's proposed project includes a new median. The location of the proposed sewer alignment was selected, in part, to facilitate future access by placing the sewer alignment outside of the future median.

5.5.3 100 Year Flood Plain

Portions of the project are within the FEMA mapped flood plain for Cajalco Creek. FEMA Flood Insurance Rate Map Panel 1410G is included in Appendix J for reference. Ardurra recommends that during the final design, the manholes located within the mapped FEMA flood plain be identified and equipped with locking, gasketed composite manhole lids to prevent infiltration.

5.5.4 Future Sewer Connections

As discussed with the District, the proposed sewer profile will be designed for the ultimate capacity and self-cleansing flows to serve the tributary area described in Section 3 of this report. It is noted that even if the sewer has the hydraulic capacity to receive additional flow, the profile of the sewer may not provide

enough slope to allow for capturing flow from adjacent low-lying areas not already included in the proposed tributary area.

5.5.5 Cajalco Creek Crossings

Cajalco Creek crosses Cajalco Road in two locations along the proposed alignment. The proposed design approach to each of these locations is described further below.

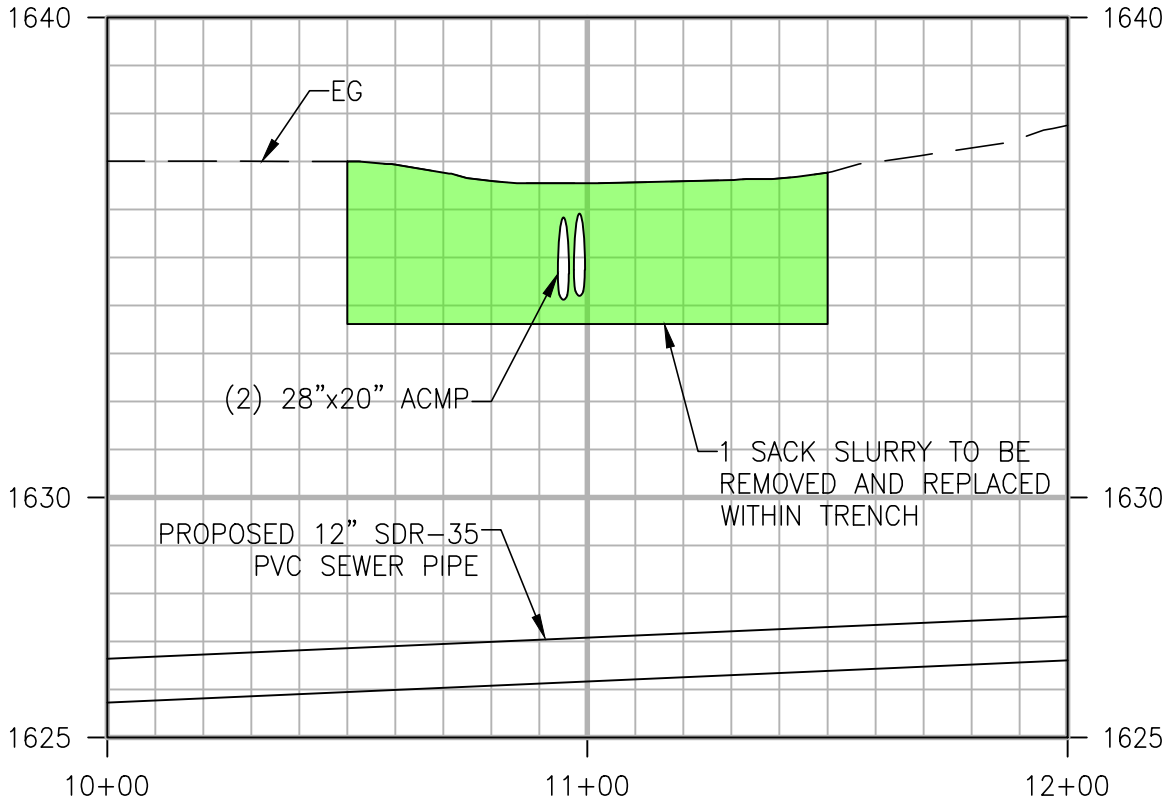
West of Barton Road, Cajalco Creek crosses the road via a culvert comprised of one 84" CMP (corrugated metal pipe) and one 60" CMP. Ardurra's survey results indicate that there is sufficient space to route the sewer alignment over these pipes. However, the County's proposed Cajalco Road Widening Project proposes replacing this culvert with a new triple box culvert. Ardurra has requested the County provide the invert and size of the proposed culvert in order to confirm that the proposed sewer will also clear the future culvert.

West of Brown Street, Cajalco Creek crosses Cajalco Road via a low water (Arizona crossing) and two parallel 28"x20" arch CMPs. The County's project proposes replacing this culvert with a new triple 8 ft W x 4 ft H box culvert at a lower invert elevation. Ardurra has designed the proposed sewer to accommodate this future drainage structure based on design information received from the County (see 30% Plans). Ardurra previously proposed that construction of the sewer across the existing low water crossing, which is comprised of a reinforced concrete pad extending 100 feet along Cajalco Road, be accomplished via open trench. This construction approach was presented to the County at a meeting on October 27, 2022. Following the meeting, Ardurra provided the narrative herein as Appendix K. Figure 4 diagrams the proposed open trench installation. The County has indicated that they are open to an open trench crossing of the low water crossing with the addition of the following preliminary input from the County's structural engineer:

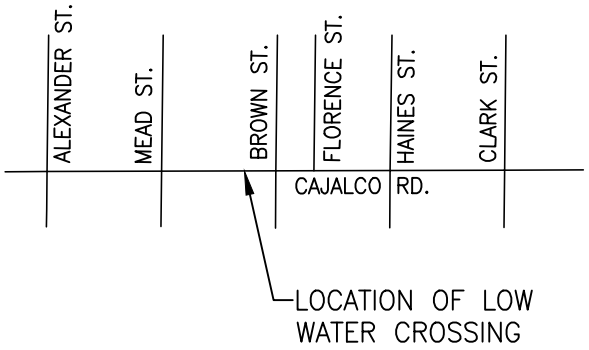
- Use proper compaction under and over the existing 20" pipes or use 1-2 sack slurry.
- When cutting the concrete slab, the contractor should avoid cutting the existing #4 rebar. Where damage to the rebar is unavoidable, use drill and dowel with an equivalent number of bars with adequate development length and embedment depth.

A full structural detail of the proposed replacement section for the Arizona crossing will be performed during final design.

Additionally, the District has contracted with Albert A. Webb & Associates (Webb) to complete the required environmental documents and permit applications associated with sewer construction across the Arizona crossing. Initial conversations with Webb indicate that an open trench approach may trigger additional agency permits. At this time, the District has directed Ardurra to proceed under the assumption that the open trench method will be utilized and included in the preliminary opinion of construction cost. This direction was given with the understanding that if during final design open trench construction triggers agency permits that impact the proposed project timeline significantly (e.g. such that it might not be completed in time for funding requirements), then additional study would be conducted to evaluate the feasibility of a trenchless construction approach.



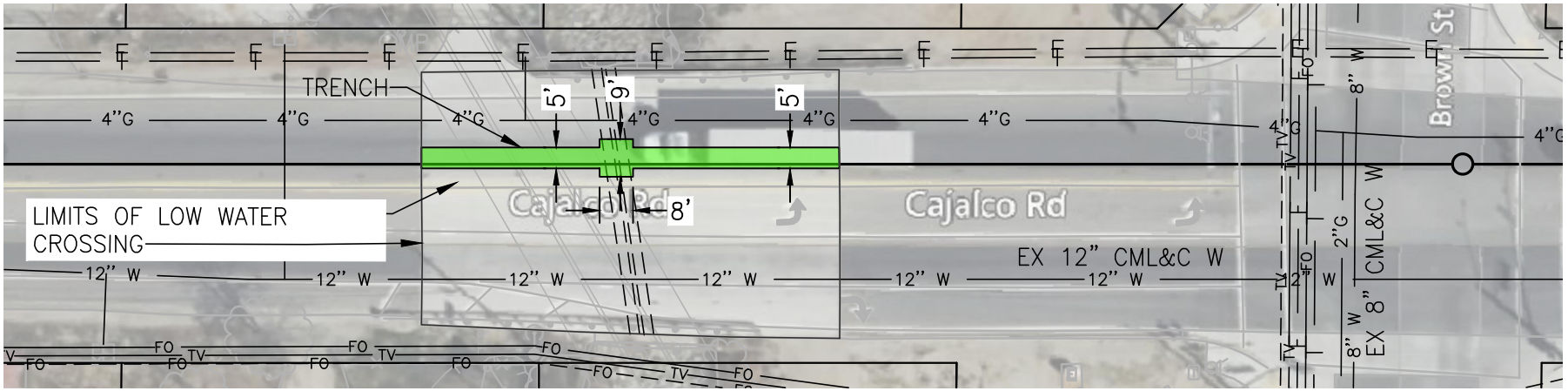
VICINITY MAP



LEGEND

TRENCH LIMITS

BROWN STREET



BROWN STREET

ARDURRA COLLABORATE. INNOVATE. CREATE. 14271 Danielson Street Poway, California 92064 (858) 413-2400 www.Ardurra.com	MEAD VALLEY CAJALCO SEWER PROJECT	FIGURE
	CAJALCO ROAD LOW WATER CROSSING	4

SECTION 6: PERMIT REQUIREMENTS

6.1 County of Riverside Encroachment Permit

Ardurra and EMWD met with the County on October 27, 2022, and January 17, 2023 to discuss the proposed Project. Although the contractor will be responsible for pulling the encroachment permit, early outreach during the design process is intended to minimize comments and streamline this process. Ardurra recommends including the following design elements in the final design and submitting the project to the County for review and comment to facilitate timely approval of the permit:

- Traffic Control - Preliminary traffic control conceptual approaches are detailed in Section 5.3. The County has requested EMWD include detailed traffic control plans in the final design submittal for review in advance of awarding the construction contract. The contractor will then be responsible for developing the means and methods to accomplish the work within the prescribed work area, or to submit for approval alternate traffic control plans (at the Contractor's own risk and signed by a California registered engineer) that confine the construction activities to within the defined work area limits.
- Arizona Crossing near Brown Street - As discussed in section 5.5.5, the proposed approach at this location is to construct the proposed sewer via open trench. This approach has been preliminarily approved by the County, however, full details and approval will be obtained during the final design and incorporated into the Contract Documents.

6.2 CEQA and Resource Agency Permits

EMWD has contracted with Webb to complete the required environmental documents and resource permit applications. Design related input from Ardurra for completion of these documents will be provided during the preliminary design and final design stages as necessary.

SECTION 7: OPINION OF PROBABLE CONSTRUCTION COST

7.1 Opinion of Probable Construction Cost

A preliminary design level opinion of probable construction cost has been prepared based on the project description and assumptions presented in this report. A breakdown of the cost is included in Appendix L. The total opinion of probable construction cost for the proposed project is $8.5/=8M and includes a 30% contingency given the preliminary nature of the project description and an additional 10% escalation factor to reflect the mid-point of construction.

SECTION 8: PROJECT SCHEDULE

8.1 Proposed Final Design and Construction Schedule

A proposed schedule is included in Appendix M including final design and construction. Major milestones are noted below.

- Final Preliminary Design Report Submittal — March 2023
- 60% Design Submittal — June 2023
- 90% Design Submittal — July 2023
- 100% Design Submittal — August 2023
- Final Contract Documents — October 2023
- County of Riverside ROW Permit — October 2023
- CEQA Compliance — November 2023
- NPDES Discharge Permit (if applicable) — December 2024
- Completion of Bid/Award — January 2024
- Construction Completion — November 2025

APPENDIX A

Mead Valley Cajalco Sewer Project Alternative Alignment Analysis Technical Memorandum

EASTERN MUNICIPAL WATER DISTRICT
TECHNICAL MEMORANDUM

Date: December 4, 2022 – Draft
January 19, 2023 - Final

Subject: **Mead Valley Cajalco Sewer Project**
Alternative Alignment Analysis

Prepared By: Jamie Fagnant, P.E.
Reviewed By: Anders Egense, P.E., Ryan Huston, P.E.



PURPOSE

The purpose of this technical memorandum is to identify potential alternative alignments for the proposed Mead Valley Cajalco Sewer, develop ranking criteria, and apply the criteria to each alternative to identify the preferred alignment. This memorandum addresses only the alternative alignment analysis in order to support the development of the formal Preliminary Design Report and associated 30% design drawings.

BACKGROUND

The Mead Valley Cajalco Sewer Project will extend Eastern Municipal Water District's (EMWD or District) collection system in Mead Valley. The goals of the Mead Valley Cajalco Sewer Project is to:

- extend sewer service to and promote economic development of the disadvantaged community of Mead Valley,
- redirect existing flow to the trunk sewer in order to decommission the Clark Street Lift Station, and
- provide additional flow to Western Municipal Water District's (WMWD) Western Water Recycling Facility in order to produce additional recycled water.

A new trunk sewer is proposed along Cajalco Road from Day Street to Carpinus Drive where it would connect to Western Municipal Water District's (WMWD) existing 15" sewer. Proposed alternative alignments, location of the Clark Lift Station and the target service area are shown in the attached Figure 1.

A portion of the project is within the mapped FEMA 100 year flood plain. Cajalco Creek, an ephemeral waterway extends along part of Cajalco Road. Two Arizona crossings convey flow. These are located on Cajalco Road west of Brown Street (within Alignment 1), and on Wells Street east of Alexander Street (within Alignment 2). Riverside County is in the planning stages of the Cajalco Road Widening Project. The Cajalco Road Widening Project will widen Cajalco Road, raise the grade of Cajalco Road to remove the traveled way from the 100 year flood plain, and channelize the overland portions of Cajalco Creek along the Cajalco Road corridor. During the development of this technical memorandum, Ardurra and the District met with Riverside County to discuss the proposed road widening project and the impact to the existing Arizona crossings. As a follow-up to the meeting, Riverside County indicated they would

allow the District to trench through and repair the Arizona crossing(s) to install the new trunk sewer, thus avoiding the risk and cost associated with trenchless construction under the existing Arizona crossing(s). Application of the alignment evaluation criterion was done with the understanding that the installation of the new trunk sewer under the existing Arizona crossing(s) would be undertaken via open trench.

ALTERNATIVE ALIGNMENTS

Ardurra has identified three potential alternative alignments as shown in Figure 1 and described below. Alternatives start at a new upstream manhole at Day Street and Cajalco Road and end at the downstream connection point, connecting to an existing WMWD 15" stub out at Carpinus Drive and Cajalco Road. The proposed sewer would intercept existing flow at Clark Street and Cajalco Road, where the existing Clark Street Lift Station is located, and convey it to the west. East of Clark Street the sewer would service future developments along Cajalco Road. For the purposes of comparing identified alternatives within this technical memorandum it is assumed that the sewer will be 12" downstream of the Clark Street and 8" upstream of Clark Street. Proposed sizing will be finalized in the full preliminary design report for the selected alignment.

- **Alternative 1** – This alternative extends from Day Street to Carpinus Drive, approximately 12,630 feet within Cajalco Road. This alignment is the most direct route between connection points and would maximize slope in the new alignment. This alignment would trench through the existing Arizona crossing just west of Brown Street.
- **Alternative 2** – This alternative is approximately 13,490 linear feet and is similar to Alternative 1, however, it turns north at Brown Street, east on Wells Street, and south on Alexander Street to rejoin Cajalco Road and continue west to Carpinus Drive. The main benefit of this alignment would be the avoidance of impacts on the existing Arizona crossing on Cajalco Road, just west of Brown Street. This alignment would impact an Arizona crossing on Wells Street, just east of Alexander Street.
- **Alternative 2A** – This alternative is similar to Alternative 2A (with a total length of 13,490 ft), except after turning north at Brown Street and east on Wells Street, it would turn south on Mead Street to rejoin Cajalco Road. This alignment was identified in discussions with District Staff as a potential alignment that not require trenching through an existing Arizona crossing. However, Mead Street between Wells and Cajalco Roads is an undeveloped right-of-way with a double track dirt path that does not stay within public right-of-way. The actual right-of-way contains several mature trees and is proposed to be crossed in the future with an unlined earthen channel to convey the FEMA 100-year flood flows. Due to potential environmental impacts and the future liability of a sewer installation under an unlined flood channel, this alternative was not carried forward.
- **Alternative 3** – This alternative is located within Souder Street and Elmwood Street and would bypass Cajalco Road from Day Street to Una Street. This alternative requires that collector sewers would need to be installed along Cajalco Road in order to provide service to the target service area from Brown Street to Day Street. This alternative would comprise approximately 12,610 feet of 12" trunk sewer and an additional 4,570 feet of 8" collector sewer.

ALIGNMENT EVALUATION CRITERIA DEVELOPMENT

A list of criteria was developed and reviewed with District staff. The criteria and methodology for applying them are detailed below.

Hydraulics – Does the project meet the District's requirements for sewer capacity as outlined in the EMWD Guidelines for Sewer System Plans? Weighted value of 10%. Design flows were provided in the Draft Technical Memorandum titled Mead Valley Sewer Diversion Hydraulic Analysis prepared by Dudek for WMWD. The District's capacity requirements are outlined below.

- Convey the Peak Wet Weather Flow (PWWF), 0.361 MGD, at a maximum d/D (depth to Diameter ratio) of 0.5 for sewers 12" and smaller and 0.75 for sewers 15" and larger
- Provide a minimum velocity of 2 fps (feet per second) at Peak Dry Weather Flow (PDWF), 0.299 MGD
- Allow for minimum slopes as shown in the below table:

Size	Minimum slope
8"	0.0040
10"	0.0032
12"	0.0024
15"	0.0016
18"	0.0014

A rating of 5 indicates the alignment meets the above criteria. A rating of 1 indicates the alignment does not meet the above criteria. A rating of 3 indicates the alignment meets the above criteria but would require depths exceeding 20 feet to do so. Additionally, a 1 rating would be applied to an alignment that would require collector sewers to provide service to the target service area as the low flow in the collector sewers and increased turbulence where these flows would connect to the main line is less hydraulically optimal.

Utilities (Existing & Future) – Are there any potential existing or future utility conflicts along the alignment? Weighted value of 10%. The Riverside County Cajalco Road Widening Project includes multiple new drainage crossings along Cajalco Road. A 5 rating indicates the alignment has very few existing utility conflicts. A 3 rating indicates existing and/or proposed utilities (including the proposed drainage crossings along Cajalco Road) in the project corridor but not in conflict with the proposed design. A 1 rating indicates a very congested utility corridor with a high potential for utility relocations and/or modifications to the proposed line and grade to avoid utility conflicts.

Right-of-Way – Is the alternative located in public right-of-way or existing easements? Weighted value of 10%. A 5 rating indicates the alignment is within public right-of-way, that the right-of-way is paved, and that no immediate improvements to the right-of-way are proposed. A 3 rating indicates that less than 50% of the alignment would require additional permanent and/or temporary easements. A 1 rating indicates that over 50% of the alignment will require easements.

Residential/Business Access Impacts – What is the extent of impacts to the residents and/or businesses? Weighted value of 10%. A 5 rating indicates the project does not cross directly in front of residences or disrupt the traffic flow into or out of businesses. If best management practices can

maintain traffic to businesses, the alignment would still receive a 5 rating. A 3 rating indicates the project is in close proximity to residences and businesses and may temporarily impact ingress to parcels containing businesses. A 1 rating indicates the alignment crosses directly in front of residences on residential streets for over 50% of the alignment thereby causing significant impacts to residents.

Traffic Impacts (Construction) – Are there significant impacts to traffic during construction? Weighted value of 10%. A 5 rating indicates the project occurs along lightly traveled roadways. A 3 rating indicates the project occurs may be located within a major arterial road, but proper traffic control and reduced working hours could be implemented to minimize traffic disruptions. A 1 rating indicates the project occurs within a major arterial road without adequate roadway width to allow for continued flow of traffic and would therefore require night work to minimize traffic impacts.

Permitting – What permits, including regulatory are required? Weighted value of 5%. A 5 rating indicates basic encroachment permits are required for construction. A 3 rating indicates additional regulatory permitting is required including Army Corps of Engineers or California Department of Fish and Wildlife. A 1 rating indicates that regulatory permitting would be extremely difficult and costly to obtain.

Constructability/Risk – Will the alignment require sustained construction within areas with significant groundwater, potential for hard rock excavation, and/or sewer depths exceeding 20 ft in depth Weighted value of 10%. Although the geotechnical investigation is not yet completed, there are numerous granitic outcroppings in the project area. Additionally, groundwater monitoring wells exist at the intersection of Brown Street and Cajalco Road. At the time of preparation of this draft memorandum it is assumed that the three alternatives under evaluation have similar potential for rock and groundwater. A 5 rating indicates the alignment is expected to have no more than 25% of the length within areas with known high, or fluctuating to high groundwater, not expected to contain hard rock excavation, and sewer depths would not exceed 20 ft in depth. A 3 rating indicates the alignment may have between 25% to 50% of the length within areas with known high, or fluctuating to high, groundwater, and may contain hard rock excavations. A 3 rating would also require the sewer depth to be less than 20 ft. A 1 rating indicates over half the alignment is subject to groundwater, hard rock, and/or construction depths would be greater than 20 ft.

Operations & Maintenance – Will the alignment provide self-cleansing velocity at PDWF, involve manholes located outside of heavily traveled roadways (except for west of Barton Street on Cajalco which is common to all alternatives), and not require collector sewers to service the targeted service area (which would require additional cleaning). Weighted value of 15%. A 5 rating indicates the alignment would meet self-cleansing velocity at PDWF, site manholes outside of heavily traveled roadways, and not require collector sewers to service the targeted service area. A 3 rating indicates the alignment would meet self-cleansing velocity at PDWF but would entail manholes within heavily traveled roadways in a manner that would generally allow for a simple lane closure to access. A 1 rating indicates the majority of the manholes would be within heavily traveled roadways, would not meet self-cleansing velocity at PDWF, and/or may require collector sewers to service the targeted service area.

Opinion of Probable Construction Cost – A planning level Engineer's Opinion of Probable Construction Cost was developed for each alternative for comparison purposes. Since the geotechnical investigations and report are still in progress, all alternatives are considered to have similar costs regarding rock excavations, dewatering and contaminated soils. This assumption will be updated upon receipt of a detailed Geotechnical Report for the Project. Paving, rock excavation, and dewatering are assumed to be

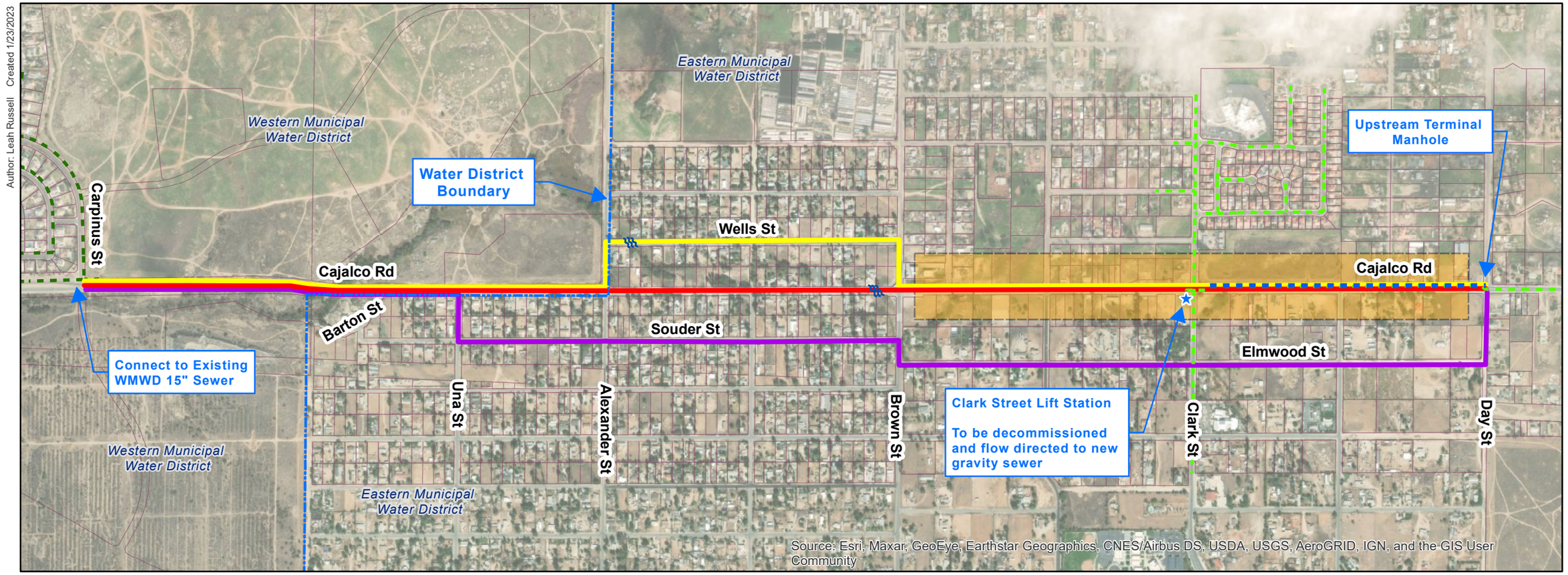
included in the pipeline unit costs. Cost is weighted at 20%. A rating of 5 indicates a cost between $7 and $8 million. A rating of 4 indicates a cost between $8 and $9 million. A rating of 5 indicates a cost between $9 and $10 million.

Alternate Alignments Evaluation Criterion Application

Results of applying the evaluation criterion to the three alignments are shown in the attached Table 1 - Application of Criteria to Alternative Alignments. Of the three alignments, Alternative 1 received the highest overall score. Alignment 1 is the shortest route, minimizes impacts to residences by avoiding narrow residential streets, avoids sewer depths over 20 feet, and has the lowest overall cost. Based on the information presented herein, it is recommended to move forward with the preliminary design utilizing Alignment 1.

ATTACHMENTS

Figure 1 – Alignment Alternatives
Table 1 – Application of Criterion to Alternative Alignments
Engineer's Opinion of Probable Construction Cost – Alignment 1, 2 & 3



N

0 500 1,000 Feet

Legend

- Alternative 1
- Alternative 2
- Alternative 3
- Target Service Area
- Parcel Lines
- Exist Clark St. LS FM to be abandoned
- EMWD Existing Sewer
- WMWD Existing Sewer
- Arizona Crossing

ARDURRA

Eastern Municipal Water District

PRELIMINARY DESIGN OF GRAVITY SEWER
FOR THE MEAD VALLEY CAJALCO ROAD PROJECT

Figure 1. Alignment Alternatives

Table 1 - Application of Criteria to Alternative Alignments

			Alternative 1 (Cajalco)			Alternative 2 (Cajalco/Wells)			Alternative 3 (Elmwood/Stouder)		
Criteria	**Weight**	**Scoring Description**	**Score**	**Weighted Score**	**Comment**	**Score**	**Weighted Score**	**Comment**	**Score**	**Weighted Score**	**Comment**
Hydraulics	10%	1-5 (Best)	5	10	most direct route	3	6	increased excavation depth required to maintain minimum slopes	1	2	collector sewers req'd
Utilities (Existing & Future)	10%	1-5 (Best)	3	6	proposed drainage crossings	3	6	proposed drainage crossings	5	10	
Right-of-Way	10%	1-5 (Best)	5	10	within existing public ROW	5	10	within existing public ROW	5	10	within existing public ROW
Residential/Business Impacts	10%	1-5 (Best)	5	10	minimizes impacts to residents	4	8	some impacts to residents	3	6	entirely adjacent to residential areas
Traffic Impacts (Construction)	10%	1-5 (Best)	3	6	within arterial	3	6	within arterial	4	8	mostly within lightly traveled roadways
Permitting	5%	1-5 (Best)	5	5	std encroachment	5	5	std encroachment	5	5	std encroachment
Constructability/Risk	10%	1-5 (Best)	3	6	fluctuating groundwater	1	2	fluctuating groundwater, deep installation	1	2	fluctuating groundwater, deep installation
O&M	15%	1-5 (Best)	3	9	within heavily traveled way	3	9	within heavily traveled way	1	3	collector sewers required
Sub-Total	**80%**		32	62		27	52		25	46	
Cost	20%	1-5 (Best)	5	20	$7.5M	4	16	$8.1M	3	12	$9.3M
Total	**100%**			82			68			58	

Eastern Municipal Water District
Mead Valley Cajalco Sewer
Engineer's Opinion of Probable Construction Cost
Alternative Analysis Planning Level Cost Opinion - Alternative 1
January 2022

Item	Quantity	Unit	Article	Unit Price	Extension
1	1	LS	Mobilization, Bonds, Permits, Cleanup, and Demobilization	$270,000	$270,000
2	1	LS	Excavation Support Systems	$250,000	$250,000
3	1	LS	Traffic Control	$100,000	$100,000
4	1	LS	Temporary Erosion Control/Storm Water Pollution Prevention Plan (SWPPP)	$50,000	$50,000
5	1	LS	Pothole Utilities	$50,000	$50,000
6	10,010	LF	Construct new 12-Inch PVC Sewer	$340	$3,403,400
7	2619	EA	Construct new 8-inch PVC Sewer	$290	$759,510
8	29	EA	Construct new 5' dia MH	$15,000	$435,000
				Subtotal	$5,317,910
				Contingency, 40%	$2,127,164
				Total	**$7,450,000**

The planning level opinions of construction cost presented herein represents Ardurra's judgment as a design-professional and is supplied for the general guidance of the District. Since Ardurra has no control over the cost of labor and material (particularly related to recent inflationary spikes and supply chain issues), or over competitive bidding or market conditions, Ardurra does not guarantee the accuracy of such opinions as compared to contractor bids or actual cost. This opinion of cost does not include estimates for other project elements including, but not limited to, design, inspection, construction management, District administration, environmental compliance, and right of way acquisition.

Eastern Municipal Water District
Mead Valley Trunk Sewer
Engineer's Opinion of Probable Construction Cost
Alternative Analysis Planning Level Cost Opinion - Alternative 2
January 2022

Item	Quantity	Unit	Article	Unit Price	Extension
1	1	LS	Mobilization, Bonds, Permits, Cleanup, and Demobilization	$289,000	$289,000
2	1	LS	Excavation Support Systems	$250,000	$250,000
3	1	LS	Traffic Control	$100,000	$100,000
4	1	LS	Temporary Erosion Control/Storm Water Pollution Prevention Plan (SWPPP)	$50,000	$50,000
5	1	LS	Pothole Utilities	$50,000	$50,000
6	10,866	LF	Construct new 12-Inch PVC Sewer	$350	$3,803,100
7	2,619	EA	Construct new 8-inch PVC Sewer	$290	$759,510
8	29	EA	Construct new 5' dia MH	$15,000	$435,000
9	2	EA	Construct new 6' dia MH (over 20')	$25,000	$50,000
				Subtotal	$5,786,610
				Contingency, 40%	$2,314,644
				Total	**$8,101,254**

The planning level opinions of construction cost presented herein represents Ardurra's judgment as a design-professional and is supplied for the general guidance of the District. Since Ardurra has no control over the cost of labor and material (particularly related to recent inflationary spikes and supply chain issues), or over competitive bidding or market conditions, Ardurra does not guarantee the accuracy of such opinions as compared to contractor bids or actual cost. This opinion of cost does not include estimates for other project elements including, but not limited to, design, inspection, construction management, District administration, environmental compliance, and right of way acquisition.

Eastern Municipal Water District
Mead Valley Trunk Sewer
Engineer's Opinion of Probable Construction Cost
Alternative Analysis Planning Level Cost Opinion - Alternative 3
January 2022

Item	Quantity	Unit	Article	Unit Price	Extension
1	1	LS	Mobilization, Bonds, Permits, Cleanup, and Demobilization	$332,000	$332,000
2	1	LS	Excavation Support Systems	$250,000	$250,000
3	1	LS	Traffic Control	$40,000	$40,000
4	1	LS	Temporary Erosion Control/Storm Water Pollution Prevention Plan (SWPPP)	$50,000	$50,000
5	1	LS	Pothole Utilities	$70,000	$70,000
6	12,612	LF	Construct new 12-Inch PVC Sewer	$320	$4,035,840
7	4,570	EA	Construct new 8-inch PVC Sewer	$270	$1,233,900
8	37	EA	Construct new 5' dia MH	$15,000	$555,000
9	2	EA	Construct new 6' dia MH (over 20')	$25,000	$50,000
				Subtotal	$6,616,740
				Contingency, 40%	$2,646,696
				Total	**$9,263,436**

The planning level opinions of construction cost presented herein represents Ardurra's judgment as a design-professional and is supplied for the general guidance of the District. Since Ardurra has no control over the cost of labor and material (particularly related to recent inflationary spikes and supply chain issues), or over competitive bidding or market conditions, Ardurra does not guarantee the accuracy of such opinions as compared to contractor bids or actual cost. This opinion of cost does not include estimates for other project elements including, but not limited to, design, inspection, construction management, District administration, environmental compliance, and right of way acquisition.

APPENDIX B

Mead Valley Sewer Diversion Hydraulic Analysis Technical Memorandum

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MAIN OFFICE
605 THIRD STREET
ENCINITAS, CALIFORNIA 92024
T 800.450.1818 F 760.632.0164

TECHNICAL MEMORANDUM

To:	Ryan Shaw, Western Municipal Water District (WMWD)
From:	Elizabeth Caliva, Dudek; Jenny Li, Dudek
Subject:	Mead Valley Sewer Diversion Hydraulic Analysis
Date:	October 17, 2022
cc:	Tony Pollak, WMWD; Laura Barraza, EMWD; Daniel Meacham, EMWD
Attachment(s):	EMWD Wastewater Design Criteria

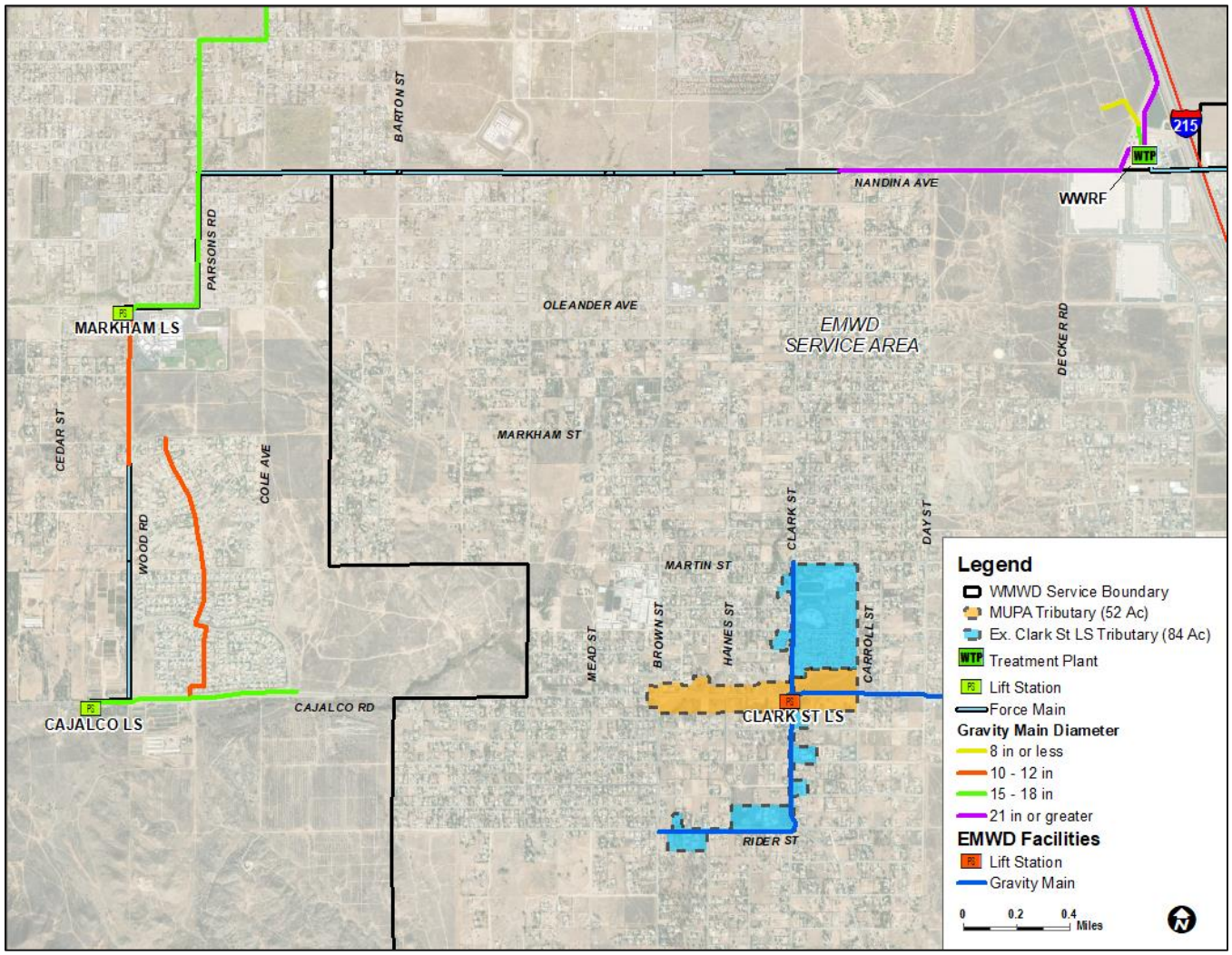
Eastern Municipal Water District (EMWD) proposes to divert all, or a fraction, of the flows currently being served by EMWD's Clark Street Lift Station (LS) to Western Municipal Water District's (WMWD) sewer collection system. This includes flows generated by planned septic to sewer conversion projects in Mead Valley. By diverting the additional sewer flows to WMWD, EMWD may avoid a costly relocation of its existing Clark St LS and associated infrastructure. The following technical memorandum evaluates the impacts of the proposed sewer diversion to WMWD's collection system, especially with regards to the CIP projects previously defined in Western's 2021 Riverside Facilities Master Plan (2021 FMP).

As shown in **Figure 1**, sewer flows from up to approximately 136 acres of various land use types within EMWD's service area may be diverted to the existing WMWD 15-inch gravity main in Cajalco Rd, just upstream of the Cajalco LS. Included in the total diversion area is a 52-acre region of predominantly vacant land known as a Mixed Use Policy Area (MUPA), currently zoned for future mixed-use commercial developments.

The memorandum is organized into the following sections:

- *Section 1 – Sewer Flows Estimation & Loading* – Describes the estimated sewer flows from the EMWD tributary area that may be diverted into WMWD's collection system.
- *Section 2 – Pipeline Capacity Analysis* – Analyzes the capacity of gravity and force mains within WMWD's collection system downstream of the added EMWD sewer flows.
- *Section 3 – Lift Station Capacity Analysis* – Analyzes the capacity of lift stations downstream of the added EMWD sewer flows.
- *Section 4 –Treatment Plant Analysis* – Analyzes the capacity of the Western Water Recycling Facility (WWRF) with the addition of EMWD sewer flows.
- *Section 5 – Conclusion & Recommendations* – Recommends any improvements to WMWD's collection system resulting from the added EMWD sewer flows, beyond what was previously defined in the 2021 FMP.

Figure 1: Location Map



1 Sewer Flows Estimation & Loading

EMWD wastewater flow factors (Attachment A) and existing indoor water use data were used to initially estimate sewer flows generated by the tributary areas shown in Figure 1. These sewer flow estimates were compared to those estimated using WMWD sewer flow factors. The EMWD estimates for peak design flow resulted in slightly higher estimates (total peak design flow of 0.361 MGD vs. 0.343 MGD); therefore, the EMWD estimates were utilized for the capacity analysis. In addition to the MUPA tributary area, the existing Clark St LS tributary area is comprised of medium density residential, school, and public facility land use types in varying stages of development. A portion of the existing Clark St LS tributary area is currently on septic, including the schools and some public facilities.

Table 1 presents the estimated total sewer flows generated by the EMWD tributary area in Mead Valley. In the following sections the total peak design flow, which is equivalent to the peak dry weather flow (PDWF) multiplied by a safety factor of 1.2, is used to evaluate the capacity of gravity mains and lift stations.

Table 1. Estimated Sewer Flows from EMWD Tributary Area (Mead Valley)

Land Use Type	Status	Area (Ac)	Unit Sewer Flow Factor	Average Dry Weather Flow (gpd)	Peak Dry Weather Flow[1] (gpd)	Peak Design Flow[2] (gpd)
School	Developed (On Septic)	41	N/A[3]	6,735[3]	19,329	23,195
Public Facility	Developed (On Septic)	11	N/A[3]	4,424[3]	12,697	15,236
Medium Density Residential (138 DUs)	Developed (111 DU), Undeveloped (27 DU)	32	235 gpd/EDU[4]	32,430	93,074	111,689
Mixed Used Policy Area (MUPA)	Undeveloped	52	235 gpd/EDU at 5 EDU/acre[4]	61,100	175,357	210,428
	Total:	**136**	–	**104,689 gpd (0.105 MGD)**	**299,015 gpd (0.299 MGD)**	**360,548 gpd (0.361 MGD)**

Notes:

1 Peak dry weather flow (PDWF) calculated as the average dry weather flow (ADWF) multiplied by a diurnal peaking factor of 2.87 where ADWF is less than or equal to 0.1 MGD. Where ADWF is greater than 0.1 MGD, the following peaking factor equation is applied: $PF = 2.13 \times Q_{ADWF}^{-0.13}$. Reference Appendix 3A of EMWD 2015 Wastewater Collection System Master Plan Update.

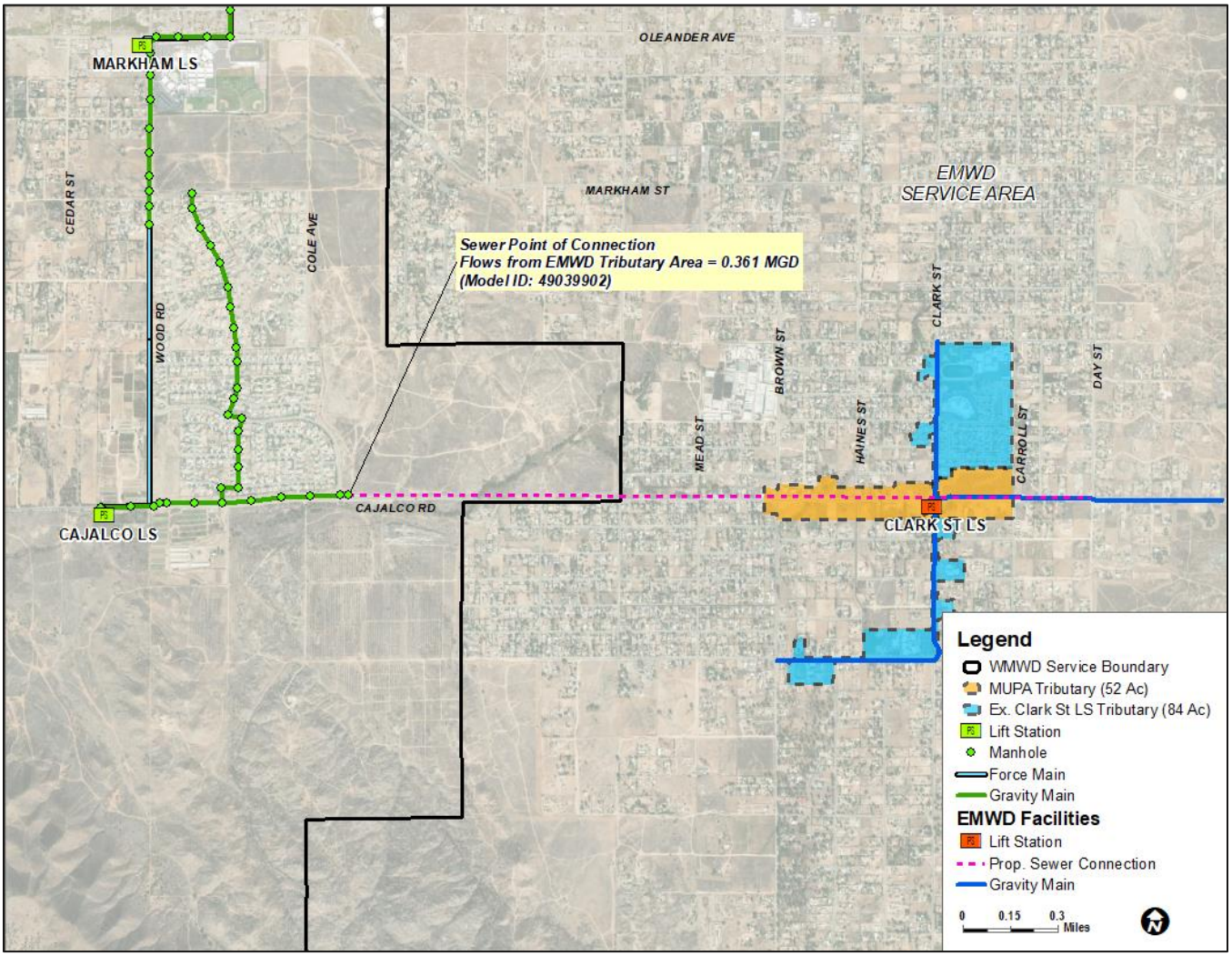
2 Peak Design Flow calculated as the PDWF multiplied by an additional safety factor of 1.2 to simulate PWWF. Reference Appendix 3A of EMWD 2015 Wastewater Collection System Master Plan Update.

3 Values based on historical indoor water usage data assuming 100% return rate.

4 Unit sewer flow factors per wastewater design criteria provided by EMWD.

As shown in **Figure 2**, EMWD will construct and maintain a sewer interconnection between the proposed tributary area and the easternmost WMWD manhole in Cajalco Rd, located at the intersection of Cajalco Rd and Carpinus Dr. After discharging to the 15-inch gravity main in Cajalco Rd, the diverted EMWD sewer flows will enter the Cajalco LS in conjunction with existing WMWD flows. From the Cajalco LS, flows travel directly downstream through the Markham LS before entering the Western Water Recycling Facility (WWRF).

Figure 2: Proposed EMWD-WMWD Sewer Interconnection & Loading Location



The pipeline capacity analysis in Section 2 assumes the total peak design flow of 0.361 MGD estimated in Table 1 is applied to the manhole at Cajalco Rd and Carpinus Dr (model ID: 49039902).

2 Pipeline Capacity Analysis

The following subsections evaluate the capacity of WMWD's gravity and force mains downstream of the proposed EMWD sewer interconnection under existing, Near-Term, and Ultimate scenarios.

The 2021 FMP evaluated WMWD's collection system under peak wet weather flow (PWWF) conditions. Therefore, each of the following model scenario analyses considers the impact of the added EMWD sewer flows on WMWD's collection system under PWWF conditions.

The latest WMWD InfoSewer model was updated with the additional peak design flow of 0.361 MGD from EMWD applied to the manhole specified in Figure 2. The existing "DAUCHY_PWWF" model pattern was applied to the PDWF load. Per Section 3.4.1.1 of the 2021 FMP, the size and land use of the Dauchy LS drainage basin most closely resembles that of the Cajalco LS and Markham LS. In the absence of viable data from the Cajalco LS and Markham LS flow meters, the Dauchy LS flow pattern was assumed for those basins.

Under PWWF conditions, WMWD design criteria state the maximum depth-to-diameter ratio (d/D) of a sewer gravity main shall not exceed 0.5 ft/ft in pipes with diameter less than 15-inch or 0.75 ft/ft in pipes with diameter equal to or greater than 15-inch. However, a d/D of 0.90 or greater is required to "trigger" a pipeline improvement project. Additionally, the maximum allowable velocity of force mains within WMWD's collection system is 7 fps under all operating conditions.

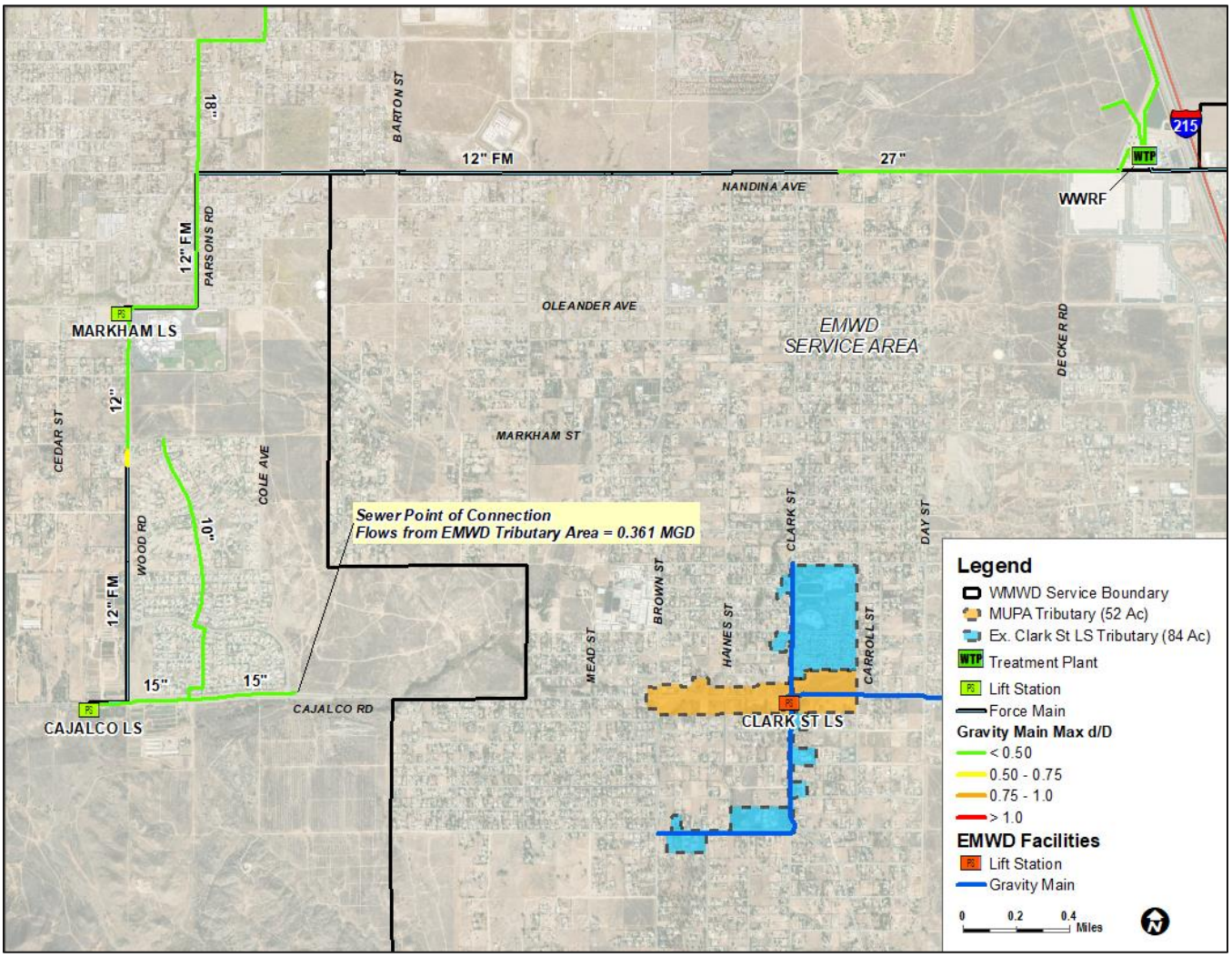
2.1 Existing PWWF Analysis

Model scenario "CAL_PWWF" was used to evaluate the impact of the total sewer flows diverted from EMWD on WMWD's existing collection system. The results shown in **Figure 3** indicate that under existing PWWF conditions, no gravity mains downstream of the proposed EMWD sewer point of connection are projected to violate WMWD design criteria for maximum d/D ratios.

A short segment of 12-inch gravity main just upstream of the Cajalco LS force main exhibits a maximum d/D of greater than 0.5 ft/ft, but less than 0.75 ft/ft. However, the 2021 FMP already identified the same gravity main as exceeding maximum d/D design criteria under existing PWWF conditions, without the additional flows from EMWD. Furthermore, the pipe segment does not meet the established "trigger" criteria of flowing at 90% full that would result in an upsizing improvement project.

Lastly, the velocities of force mains downstream of the EMWD sewer point of connection are not projected to exceed 7 fps. Therefore, under existing PWWF conditions no improvements to WMWD's sewer pipeline system are anticipated to be required as a result of the additional EMWD sewer flows.

Figure 3: Gravity Main Capacity Analysis under Existing PWWF Conditions with EMWD Sewer Flows

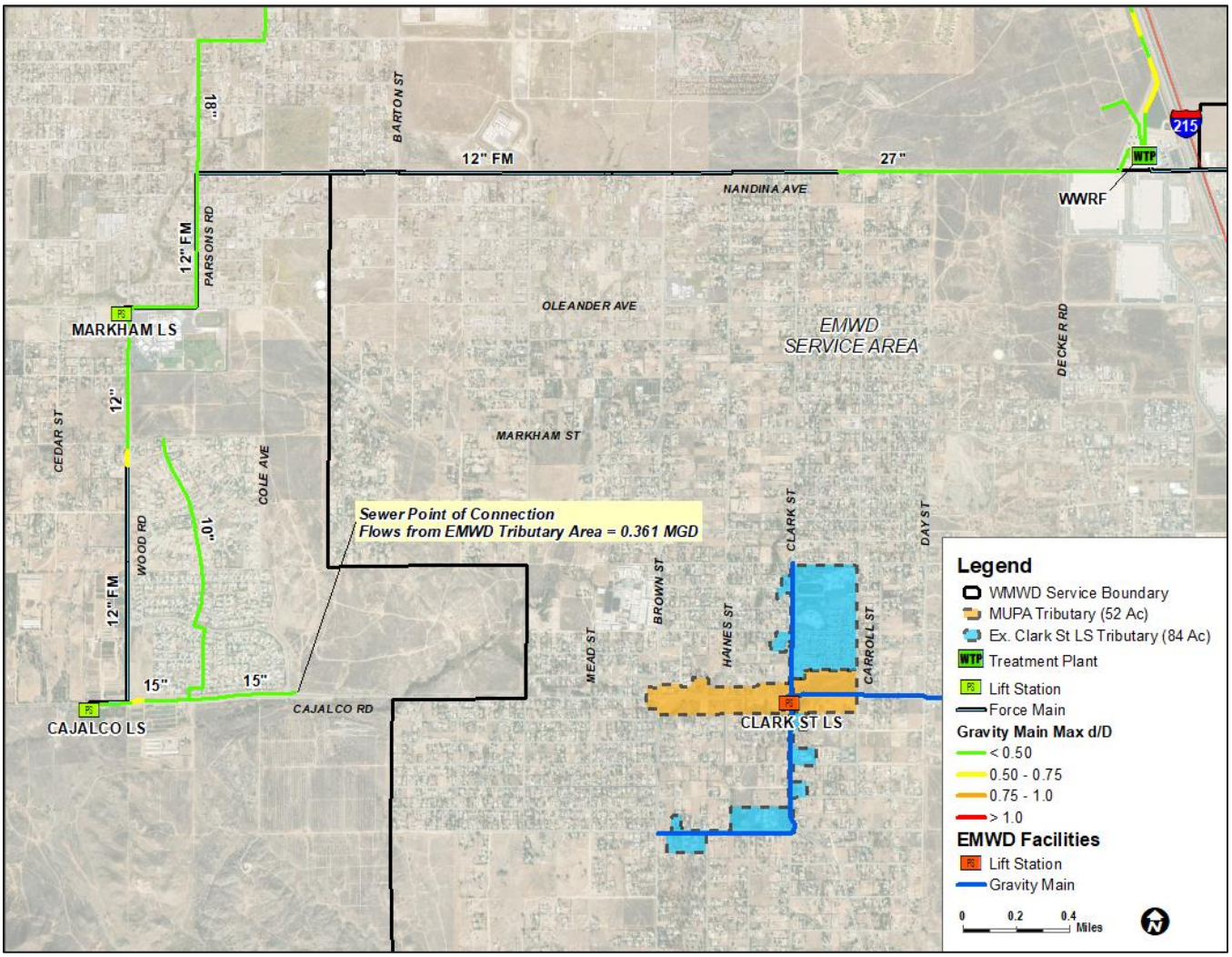


2.2 Near-Term (2030) PWWF Analysis

Model scenario "2030_PWWF" was used to evaluate the impact of the total sewer flows diverted from EMWD on WMWD's Near-Term collection system. The results shown in **Figure 4** indicate that under Near-Term PWWF conditions, no gravity mains downstream of the proposed EMWD sewer point of connection are projected to violate WMWD design criteria for maximum d/D ratios.

Furthermore, the velocities of force mains downstream of the EMWD sewer point of connection are not projected to exceed 7 fps. Therefore, under Near-Term PWWF conditions no improvements to WMWD's sewer pipeline system are anticipated to be required as a result of the additional EMWD sewer flows.

Figure 4: Gravity Main Capacity Analysis under Near-Term PWWF Conditions with EMWD Sewer Flows

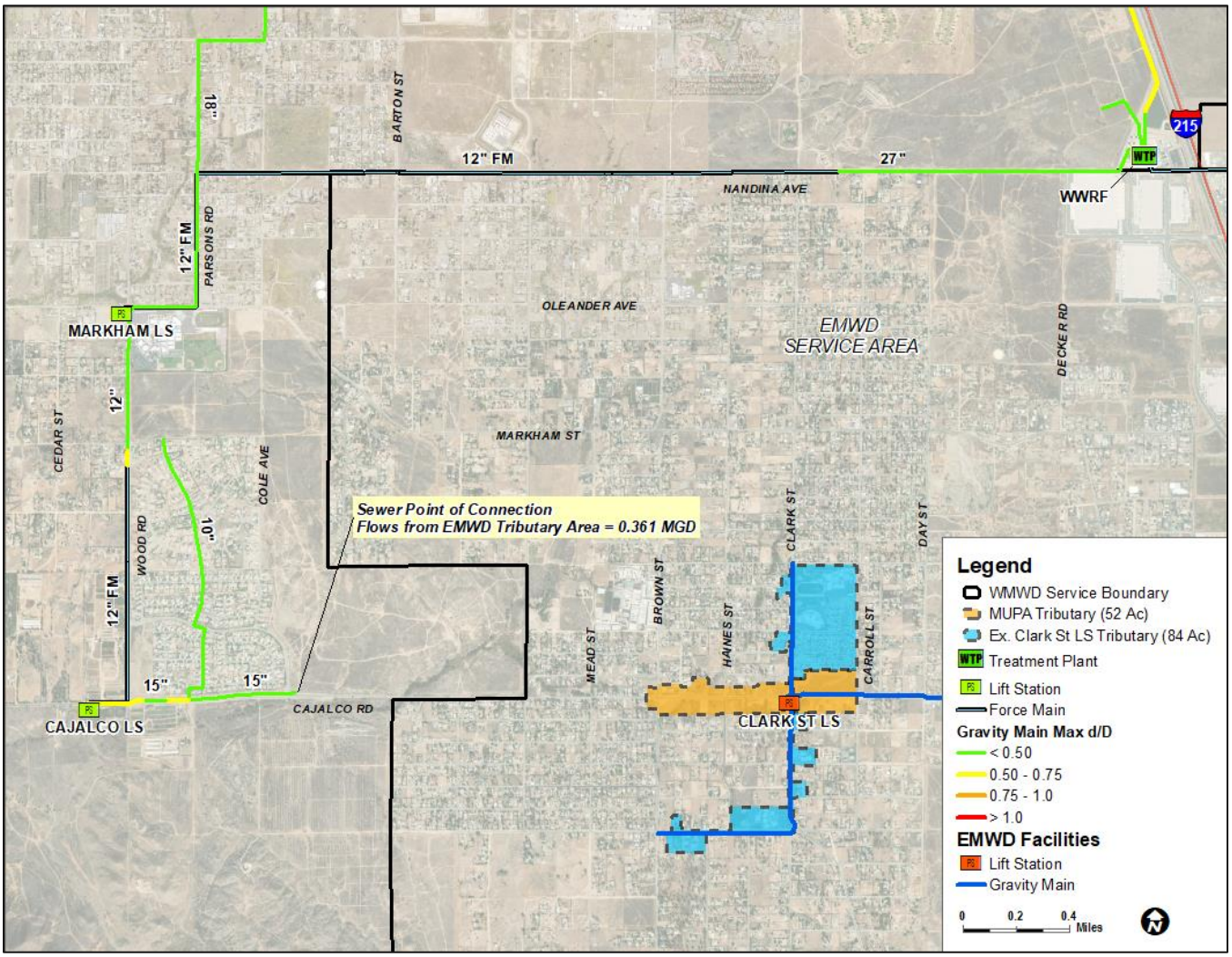


2.3 Ultimate (2040) PWWF Analysis

Model scenario "2040_PWWF" was used to evaluate the impact of the total sewer flows diverted from EMWD on WMWD's Ultimate collection system loading projections. The results shown in **Figure 5** indicate that under projected Ultimate PWWF conditions, no gravity mains downstream of the proposed EMWD sewer point of connection are anticipated to violate WMWD design criteria for maximum d/D ratios.

Furthermore, velocities of force mains downstream of the EMWD sewer point of connection are not projected to exceed 7 fps. Therefore, under Ultimate PWWF conditions no improvements to WMWD's sewer pipeline system are anticipated to be required as a result of the additional EMWD sewer flows.

Figure 5: Gravity Main Capacity Analysis under Ultimate PWWF Conditions with EMWD Sewer Flows



3 Lift Station Analysis

The following subsections evaluate the capacity within the Cajalco and Markham lift stations (LS) downstream of the proposed EMWD sewer interconnection under existing, Near-Term, and Ultimate conditions.

WMWD requires the firm capacity of any lift station within its system be greater than the influent PWWF. Firm capacity is the pumping capacity of a lift station with its largest pump taken out of service. The risk of sewage backing up into the gravity collection system or overflowing at the lift station increases when a lift station's firm capacity is less than the peak inflow.

3.1 Existing LS Capacity Analysis

The 2021 FMP compared the peak wet weather inflow measured at each existing lift station to the firm capacity of the lift station. **Table 2** presents the existing peak wet weather inflow and capacity of the Cajalco and Markham LSs as summarized in Table 8-2 of the 2021 FMP, as well as the revised inflow and capacity after addition of the total peak LS design flow diverted from EMWD (0.361 MGD).

The 2021 FMP identified the Markham LS as capacity deficient under existing peak inflow conditions. As such, the 2021 FMP recommended that WMWD increase the firm capacity of Markham LS from 1.44 MGD to 2.1 MGD by replacing both existing pumps with two new pumps, each capable of 1,500 gpm design flow. Since the Markham LS pumps operate on variable frequency drives (VFD), an expansion of the existing wet well structure was determined to not required.

Table 2. Cajalco & Markham LS Capacity Analysis – Existing PWWF

Lift Station	Capacity (gpm)		Total Capacity		Firm Capacity		Existing PWWF - Without EMWD (MGD)	Capacity Deficient Without EMWD	Existing PWWF - With EMWD[1] (MGD)	Capacity Deficient With EMWD
	Pump No. 1	Pump No. 2	(gpm)	(MGD)	(gpm)	(MGD)				
Cajalco	1,000	1,000	2,000	2.88	1,000	1.44	0.13	No	0.77	No
Markham	1,000	1,000	2,000	2.88	1,000	1.44	1.55[2]	Yes	2.05	Yes

Notes:
1 Results obtained from latest InfoSewer model after addition of total peak design flow diverted from EMWD tributary area (0.361 MGD) as calculated in Table 1.
2 Existing PWWF at Markham LS differs from Table 8-2 of 2021 FMP due to InfoSewer model updates since completion of the 2021 FMP.

As seem in Table 2, the firm capacity of the Cajalco LS is greater than its anticipated inflow both before and after addition of the EMWD tributary area flows. Therefore, the Cajalco LS is not capacity deficient under existing peak inflow conditions.

Meanwhile, the capacity deficit of the Markham LS increases upon addition of the EMWD tributary area flows. However, the overall peak inflow at Markham LS remains below the recommended improved firm capacity of 2.1 MGD as proposed in the 2021 FMP. Therefore, no modifications to the Markham LS improvement project originally recommended in the 2021 FMP are anticipated to be required under existing peak inflow conditions.

3.2 Near-Term (2030) LS Capacity Analysis

Table 3 presents the Near-Term peak wet weather inflow and capacity of the Cajalco and Markham LS as summarized in Table 8-5 of the 2021 FMP, as well as the revised inflow and capacity after addition of the total peak LS flow diverted from EMWD.

Table 3. Cajalco & Markham LS Capacity Analysis – Near-Term (2030) PWWF

Lift Station	Capacity (gpm)		Total Capacity		Firm Capacity		Near-Term PWWF - Without EMWD (MGD)	Capacity Deficient Without EMWD	Near-Term PWWF - With EMWD[1] (MGD)	Capacity Deficient With EMWD
	Pump No. 1	Pump No. 2	(gpm)	(MGD)	(gpm)	(MGD)				
Cajalco	1,000	1,000	2,000	2.88	1,000	1.44	0.59	No	1.24	No
Markham	1,000	1,000	2,000	2.88	1,000	1.44	1.87[2]	Yes	2.08	Yes

Notes:
1 Results obtained from latest InfoSewer model after addition of total peak design flow diverted from EMWD tributary area (0.361 MGD) as calculated in Table 1.
2 Near-Term PWWF at Markham LS differs from Table 8-5 of 2021 FMP due to InfoSewer model updates since completion of the 2021 FMP.

As seen in Table 3, the firm capacity of the Cajalco LS is greater than its anticipated inflow both before and after addition of the EMWD tributary area flows. Therefore, the Cajalco LS is not capacity deficient under Near-Term peak wet weather conditions.

As in the existing scenario, the peak inflow at Markham LS after addition of the EMWD tributary area flows remains below the recommended improved firm capacity of 2.1 MGD as proposed in the 2021 FMP. The peak inflow at Markham LS is not anticipated significantly increase between the existing and Near-Term scenarios due to the upstream Cajalco LS being a fixed speed pump and generating the same peak outflow in both situations, even as average flows increase.

3.3 Ultimate (2040) LS Capacity Analysis

Table 4 presents the Ultimate peak wet weather inflow and capacity of the Cajalco and Markham LS as summarized in Table 8-8 of the 2021 FMP, as well as the revised inflow and capacity after addition of the total peak LS flow diverted from EMWD.

Table 4. Cajalco & Markham LS Capacity Analysis – Ultimate (2040) PWWF

Lift Station	Capacity (gpm)		Total Capacity		Firm Capacity		Ultimate PWWF - Without EMWD (MGD)	Capacity Deficient Without EMWD	Ultimate PWWF - With EMWD[1] (MGD)	Capacity Deficient With EMWD
	Pump No. 1	Pump No. 2	(gpm)	(MGD)	(gpm)	(MGD)				
Cajalco	1,000	1,000	2,000	2.88	1,000	1.44	0.67	No	1.32	No
Markham	1,000	1,000	2,000	2.88	1,000	1.44	2.43[2]	Yes	2.62	Yes

Notes:
1 Results obtained from latest InfoSewer model after addition of total peak design flow diverted from EMWD tributary area (0.361 MGD) as calculated in Table 1.
2 Ultimate PWWF at Markham LS differs from Table 8-8 of 2021 FMP due to InfoSewer model updates since completion of the 2021 FMP.

As seen in Table 4, the firm capacity of the Cajalco LS is greater than its anticipated inflow both before and after addition of the EMWD tributary area flows. Therefore, the Cajalco LS is not capacity deficient under Ultimate peak wet weather conditions.

Given the uncertainty of projected developments beyond 2040, it is not recommended that WMWD increase the firm capacity of Markham LS by any more than what is required by the Near-Term scenario. Instead, WMWD should regularly measure inflows at the Markham LS as the Ultimate scenario year approaches and evaluate if further improvements to Markham LS are necessary.

4 Treatment Plant Analysis

The following evaluates the capacity of the Western Water Recycling Facility (WWRF) under existing, Near-Term, and Ultimate conditions. Treatment plant capacity is evaluated using average dry weather flows (ADWF). The current treatment capacity of WWRF is 3.0 MGD. Per the 2021 FMP, WMWD should begin evaluating options for expansion of WWRF when inflow under average dry weather conditions exceed 75% of the plant's current capacity.

4.1 Existing Treatment Capacity Analysis

The 2021 FMP compared the average dry weather flow at each treatment plant's inlet to the plant's established treatment capacity. The total treatment capacity of WWRF is 3.0 MGD. **Table 5** presents the existing ADWF and remaining available capacity at WWRF as summarized in Table 3-24 of the 2021 FMP, as well as the revised inflow and capacity after addition of the total ADWF diverted from EMWD. Under existing conditions, WWRF has ample capacity to treat anticipated ADWF both before and after addition of the EMWD tributary area flows.

Table 5. WWRF Treatment Capacity – Existing ADWF

Condition	ADWF (MGD)	Excess Capacity (MGD)	Capacity Utilized
Existing[1] – Without EMWD	1.15	1.85	38%
Existing – With EMWD[2]	1.25	1.75	42%

Notes:
1 Includes 0.35 MGD of flows diverted from City of Riverside. Reference Section 2.4.5 of 2021 FMP.
2 Equal to existing ADWF into WWRF (1.15 MGD) plus total ADWF from EMWD tributary area as calculated in Table 1 (0.105 MGD).

4.2 Near-Term (2030) Treatment Capacity Analysis

By 2030, a large light industrial development known as Meridian West Upper Plateau (MWUP) is likely to complete construction within WMWD's service area. MWUP will generate approximately 0.45 MGD of ADWF that will serve as additional inflow to WWRF. **Table 6** presents the projected ADWF and remaining available capacity at WWRF under various development conditions in the Near-Term scenario.

Table 6. WWRF Treatment Capacity – Near-Term (2030) ADWF

Condition	ADWF (MGD)	Excess Capacity (MGD)	Capacity Utilized
Near-Term[1] – Without EMWD & MWUP	2.32	0.68	77%
Near-Term – With EMWD[2] Only	2.42	0.58	81%
Near-Term – With MWUP[3] Only	2.77	0.23	92%
Near-Term – With EMWD & MWUP	2.87	0.13	96%

Notes:
[1] Includes 0.35 MGD of flows diverted from City of Riverside. Reference Section 2.4.5 of 2021 FMP.
[2] Equal to Near-Term ADWF into WWRF (2.32 MGD) plus total ADWF from EMWD tributary area as calculated in Table 1 (0.105 MGD).
[3] Equal to Near-Term ADWF into WWRF (2.32 MGD) plus total ADWF from proposed MWUP development (0.45 MGD).

With the addition of both EMWD tributary area and MWUP flows, WWRF approaches but does not exceed its total treatment capacity of 3.0 MGD. At the time of writing, MWUP was in midst of environmental permitting and no definite construction schedule was available, however the developer anticipates full buildout in approximately the next 10 years. Meanwhile, EMWD has already secured government funding and plans to complete construction of the sewer interconnection between its tributary area and WMWD's collection system by mid-2025.

4.3 Ultimate (2040) Treatment Capacity Analysis

Table 7 presents the projected ADWF and remaining available capacity at WWRF under various development conditions in the Ultimate scenario. Upon consideration of WWRF's minimal remaining available capacity in the Near-Term, WMWD staff directed Dudek to remove the additional 0.35 MGD of flows diverted from the City of Riverside from the following Ultimate scenario analysis.

Table 7. WWRF Treatment Capacity – Ultimate (2040) ADWF

Condition	ADWF (MGD)	Deficit Capacity (MGD)	Capacity Utilized
Ultimate[1] – Without EMWD & MWUP	3.27	0.27	> 100%
Near-Term – With EMWD[2] Only	3.37	0.37	> 100%
Near-Term – With MWUP[3] Only	3.72	0.72	> 100%
Near-Term – With EMWD & MWUP	3.82	0.82	> 100%

Notes:
[1] Does not include 0.35 MGD of flows diverted from City of Riverside. Reference Section 2.4.5 of 2021 FMP.
[2] Equal to Ultimate ADWF into WWRF (3.27 MGD) plus total ADWF from EMWD tributary area as calculated in Table 1 (0.105 MGD).
[3] Equal to Ultimate ADWF into WWRF (3.27 MGD) plus total ADWF from proposed MWUP development (0.45 MGD).

Even without either EMWD tributary area or MWUP flows, WWRF is projected to exceed its current treatment capacity of 3.0 MGD at Ultimate Buildout. However, development projects planned for 2040 and beyond are

relatively undefined and subject to change or outright cancellation depending on economic conditions and numerous other factors outside of WMWD's purview. As WWRF approaches its projected Ultimate flow, WMWD will evaluate options to expand the treatment plant or divert excess flows to the City of Riverside.

5 Conclusions & Recommendations

The following summarizes the results of the pipeline, lift station, and treatment plant capacity analysis downstream of the proposed EMWD sewer interconnection.

Pipeline Capacity:

- Through the Ultimate scenario, the gravity and force mains within WMWD's collection system are anticipated to be able to accommodate the total peak flows diverted from EMWD without violating WMWD design criteria.
- No improvements to WMWD's pipeline network as a direct result of the proposed EMWD sewer interconnection are recommended at this time.

Lift Station Capacity:

- Through the Ultimate scenario, the Cajalco LS is anticipated to be able to accommodate the total peak flows diverted from EMWD without exceeding its firm capacity.
- As determined in the 2021 FMP, the Markham LS is capacity deficient in the existing scenario. Addition of any EMWD tributary area flows will exacerbate the deficiency.
- The 2021 FMP had recommended increasing the firm capacity of Markham LS from 1.44 MGD to 2.1 MGD to accommodate projected Near-Term flows. If WMWD completes the improvement project as recommended in the 2021 FMP, the Markham LS is anticipated to be able to accommodate the total peak flows diverted from EMWD without exceeding its firm capacity through the Near-Term scenario.

WWRF (Treatment Plant) Capacity:

- Through the Near-Term scenario, WWRF has sufficient capacity to accommodate its total projected inflow including both EMWD tributary area and MWUP flows.
- By the Ultimate Buildout scenario, WWRF will exceed its total treatment capacity regardless of any additional flows diverted from EMWD or produced by MWUP. Before such conditions are met, WMWD should evaluate options for expanding WWRF's treatment capacity or diverting excess flows to neighboring systems like the City of Riverside.

ATTACHMENT A
EMWD WASTEWATER DESIGN CRITERIA

EMWD Design Criteria for Wasterwater Flow Factors and Land Use Density

Land Use Category	Units	Res Density (DU/acre)	Residential EDU/DU	EDU/Acre	Calculated and rounded Residential Flow gpd/~~EDU~~acre
Agriculture	acre	0		0	
Business Park/Light Industrial	acre	0		5	1200
Business Park/Light Industrial/Warehouse	acre	0		1.25	300
Commercial Office	acre	0		5	1200
Commercial Retail	acre	0		5	1200
Estate Density Residential	DU	0.5	1.5	0.75	350
Heavy Industrial	acre	0		7.5	1800
High Density Residential	DU	12	0.70	8.4	165
Hospital	acre	0		5	1200
Low Density Residential	DU	2	1.3	2.6	310
Medium Density Residential	DU	4.5	1.0	4.5	235
Medium High Density Residential	DU	6	0.9	5.4	210
Mobile Home Park	DU	10	0.65	6.5	150
Mixed Use Policy Area	acre	0		5	1200
Open Space Conservation	acre	0		0	
Open Space Landscape	acre	0		0	
Open Space Recreation	acre	0		0	
Open Space Rural	acre	0.1		0	
Open Space Water	acre	0		0	
OSC	acre	0		0	
Public Facilities	acre	0		5	1200
Public Facilities College	acre	0		5	1200
Public Facilities Elementary School	acre	0		5	1200
Public Facilities High School	acre	0		5	1200
Public Facilities Middle School	acre	0		5	1200
Rural Mountainous	DU	0.1		0	
Rural Residential	DU	0.2		0	
Very High Density Residential	DU	17	0.65	11.1	150
Very Low Density Residential	DU	1		0	

Note:

1. Wastewater flow generation based on 235 gpd/EDU.
2. Business Park/Light Industrial/Warehouse is specific to Moreno Valley and Perris Valley (North) service areas.
3. The following residential uses should be excluded from wastewater flow generation calculations:
Open Space Rural, Rural Mountainous, Rural Residential, and Very Low Density Residential.
4. Estate Denity and Low Density Residential designations are included/excluded from flow generation calculations on a case-by-case basis.

APPENDIX C

Mead Valley Cajalco Sewer Project Hydraulic Analysis

Eastern Municipal Water District
Mead Valley Cajalco Sewer Project
Hydraulic Analysis

ARDURRA

Average Dry Weather Flow from Dudek TM		
	(gpd)	(gpm)
School	6735	4.68
Public Facility	4424	3.07
Medium Density Residential	32430	22.52
Total Clark LS Influent Flow	43589	30.2701

Flow Influent to MH #	Reach No.	Intersection	Trib Area (ac)	Ave Dry Influent to MH (gpd)	Ave Dry in Reach (gpd)	Ave Dry in Reach (gpm)	PDWF in Reach (gpm)	V (PDWF) (fps)	PWWF (gpm)	d/D (PWWF)	Slope	Sewer Size	MH Size	MH Depth	Reach Length (ft)	Rim El	CL El	Sta
MH No. 31		Day St	0	0									48"	9.1		1686.03	1677.3	13450
	30		6.16		7238	5.03	14.43	1.7	17.31	0.12	0.0143	8"			400			
MH No. 30				7238									48"	10.3		1681.57	1671.6	13050
	29		5.61		13830	9.60	27.56	2.1	33.08	0.16	0.0145	8"			400			
MH No. 29		Robinson St		13830									48"	10.2		1675.62	1665.8	12650
	28		5.55		20351	14.13	40.56	2.3	48.67	0.19	0.0142	8"			400			
MH No. 28		Carroll St		20351									48"	9.3		1669.06	1660.1	12250
	27		9.83		31901	22.15	63.58	2.8	76.30	0.22	0.0178	8"			500			
MH No. 27				31901									48"	10.7		1661.58	1651.2	11750
	26		6.13		39104	27.16	77.94	2.4	93.52	0.29	0.0091	8"			350			
MH No. 26				39104									48"	11.4		1659.04	1648	11400
	25		4.69		44615	30.98	88.92	2.4	106.70	0.32	0.0084	8"			375.28			
MH No. 25		Clark St		88204									48"	12.6		1657.01	1644.86	11024.72
	24		4.93		93997	65.28	187.34	3.0	224.81	0.34	0.0088	10"			444.72			
MH No. 24				93997									48"	11.4		1651.7	1640.7	10580
	23		4.5		99284	68.95	197.88	3.0	237.45	0.35	0.0089	10"			440			
MH No. 23				99284									48"	9.5		1646	1636.9	10140
	22		4.47		104536	72.59	208.35	3.3	250.02	0.34	0.0105	10"			450			
MH No. 22		Haines St		104536									48"	12.5		1644	1632	9690
	21		7.39		113220	78.62	225.65	2.3	270.78	0.36	0.004	12"			430			
MH No. 21				113220									48"	12.2		1642	1630.3	9260
	20		5.33		119482	82.97	238.13	2.4	285.76	0.36	0.0041	12"			440			
MH No. 20		Florence St		119482									48"	13.0		1641.02	1628.5	8820
	19		3.76		123900	86.04	246.94	2.4	296.33	0.37	0.0041	12"			440			
MH No. 19		Brown St		123900									48"	13.1		1639.32	1626.7	8380
	18				123900	86.04	246.94	2.4	296.33	0.37	0.0041	12"			440			
MH No. 18				123900									48"	11.9		1636.34	1624.9	7940
	17				123900	86.04	246.94	2.1	296.33	0.41	0.003	12"			440			
MH No. 17				123900									48"	2.9		1635	1632.6	7500
	16				123900	86.04	246.94	2.1	296.33	0.41	0.003	12"			440			
MH No. 16		Mead St		123900									48"	13.8		1635.64	1622.3	7060
	15				123900	86.04	246.94	2.1	296.33	0.41	0.003	12"			440			
MH No. 15				123900									48"	13.5		1634	1621	6620

Eastern Municipal Water District
Mead Valley Cajalco Sewer Project
Hydraulic Analysis

ARDURRA

Flow Influent to MH #	Reach No.	Intersection	Trib Area (ac)	Ave Dry Influent to MH (gpd)	Ave Dry in Reach (gpd)	Ave Dry in Reach (gpm)	PDWF in Reach (gpm)	V (PDWF) (fps)	PWWF (gpm)	d/D (PWWF)	Slope	Sewer Size	MH Size	MH Depth	Reach Length (ft)	Rim El	CL El	Sta
	14				123900	86.04	246.94	2.1	296.33	0.41	0.003	12"			440			
MH No. 14				123900									48"	17.1		1636.31	1619.7	6180
	13				123900	86.04	246.94	2.1	296.33	0.41	0.003	12"			470			
MH No. 13		Alexander St		123900									48"	17.2		1635.02	1618.3	5710
	12				123900	86.04	246.94	2.1	296.33	0.41	0.0029	12"			480			
MH No. 12				123900									48"	16.6		1633.05	1616.9	5230
	11				123900	86.04	246.94	2.1	296.33	0.41	0.0029	12"			480			
MH No. 11				123900									48"	16.0		1631.04	1615.5	4750
	10				123900	86.04	246.94	2.2	296.33	0.4	0.0031	12"			480			
MH No. 10		Una St		123900									48"	14.0		1627.46	1614	4270
	9				123900	86.04	246.94	3.3	296.33	0.3	0.0094	12"			500			
MH No. 9				123900									48"	9.2		1618.03	1609.3	3770
	8				123900	86.04	246.94	3.1	296.33	0.31	0.0083	12"			60			
MH No. 8		Barton St		123900									48"	9.1		1617.39	1608.8	3710
	7				123900	86.04	246.94	2.8	296.33	0.34	0.0061	12"			460			
MH No. 7				123900									48"	10.5		1616	1606	3250
	6				123900	86.04	246.94	3.3	296.33	0.29	0.011	12"			300			
MH No. 6				123900									48"	12.1		1614.29	1602.7	2950
	5				123900	86.04	246.94	2.7	296.33	0.34	0.0057	12"			300			
MH No. 5				123900									48"	11.2		1611.65	1601	2650
	4				123900	86.04	246.94	4.1	296.33	0.25	0.0194	12"			360			
MH No. 4				123900									48"	11.5		1604.97	1594	2290
	3				123900	86.04	246.94	3.8	296.33	0.27	0.0155	12"			380			
MH No. 3				123900									48"	9.9		1597.48	1588.1	1910
	2				123900	86.04	246.94	3.8	296.33	0.26	0.016	12"			400			
MH No. 2				123900									48"	11.6		1595	1583.9	1510
	1				123900	86.04	246.94	3.4	296.33	0.29	0.0048	12"			380.38			
MH No. 1		Carpinus Dr		123900									48"	12.8		1592	1579.67	1129.62

Total Quantities

12" PVC	8560.38
10" PVC	1334.72
8" PVC	2425.28
Total Length	12320.38

APPENDIX D

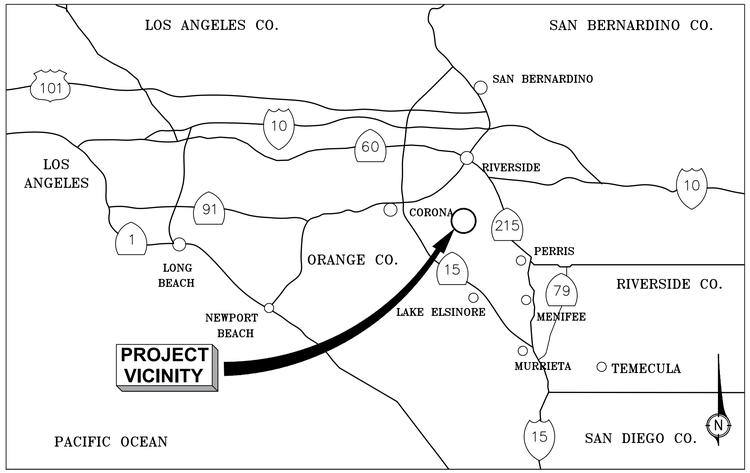
Mead Valley Cajalco Sewer Project 30% Design Plans

EASTERN MUNICIPAL WATER DISTRICT

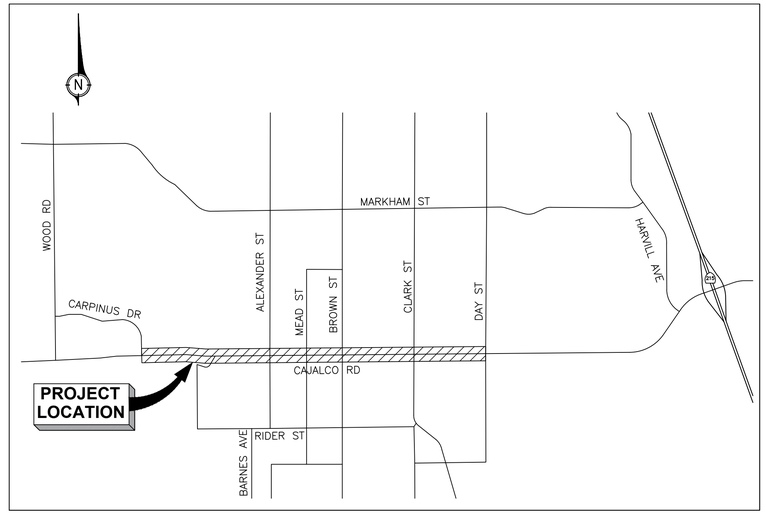
RIVERSIDE COUNTY, CALIFORNIA

MEAD VALLEY CAJALCO SEWER PRELIMINARY DESIGN PROJECT

30% DESIGN



VICINITY MAP
NTS



LOCATION MAP
NTS

SHEET INDEX

FILE No.	SHEET No.	DISCIPLINE	SHEET TITLE
D-XXXXX	1	G-1	TITLE SHEET
D-XXXXX	2	G-2	GENERAL NOTES, LEGEND AND ABBREVIATIONS
D-XXXXX	3	C-1	PLAN AND PROFILE STA 9+00 TO STA 19+00
D-XXXXX	4	C-2	PLAN AND PROFILE STA 19+00 TO STA 29+00
D-XXXXX	5	C-3	PLAN AND PROFILE STA 29+00 TO STA 39+00
D-XXXXX	6	C-4	PLAN AND PROFILE STA 39+00 TO STA 49+00
D-XXXXX	7	C-5	PLAN AND PROFILE STA 49+00 TO STA 59+00
D-XXXXX	8	C-6	PLAN AND PROFILE STA 59+00 TO STA 69+00
D-XXXXX	9	C-7	PLAN AND PROFILE STA 69+00 TO STA 79+00
D-XXXXX	10	C-8	PLAN AND PROFILE STA 79+00 TO STA 89+00
D-XXXXX	11	C-9	PLAN AND PROFILE STA 89+00 TO STA 99+00
D-XXXXX	12	C-10	PLAN AND PROFILE STA 99+00 TO STA 109+00
D-XXXXX	13	C-11	PLAN AND PROFILE STA 109+00 TO STA 119+00
D-XXXXX	14	C-12	PLAN AND PROFILE STA 119+00 TO STA 129+00
D-XXXXX	15	C-13	PLAN AND PROFILE STA 129+00 TO STA 138+00

BOARD OF DIRECTORS

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STEPHEN J. CORONA	VICE-PRESIDENT
JEFF D. ARMSTRONG	BOARD MEMBER
RANDY A. RECORD	BOARD MEMBER
DAVID J. SLAWSON	BOARD MEMBER
JOE MOUAWAD, P.E.	GENERAL MANAGER

APPROVED BY: _____ DATE

LANAYA VOELZ ALEXANDER, P.E.
ASSISTANT GENERAL MANAGER OF PLANNING, ENGINEERING AND CONSTRUCTION

DECLARATION OF RESPONSIBLE CHARGE

I HEREBY DECLARE THAT I AM THE ENGINEER OF WORK FOR THIS PROJECT, THAT I HAVE EXERCISED RESPONSIBLE CHARGE OVER DESIGN OF THIS PROJECT AS DEFINED IN SECTION 6703 OF THE BUSINESS AND PROFESSIONS CODE, AND THAT THE DESIGN IS CONSISTENT WITH CURRENT STANDARDS.

I UNDERSTAND THAT THE CHECK OF PROJECT DRAWINGS AND SPECIFICATIONS OF EASTERN MUNICIPAL WATER DISTRICT IS CONFINED TO A REVIEW ONLY AND DOES NOT RELIEVE ME, AS ENGINEER OF WORK, OF MY RESPONSIBILITIES FOR PROJECT DESIGN.

BY _____ _____
RYAN HUSTON P.E. # 60324 DATE

Underground Service Alert
DIG ALERT
Call: TOLL FREE
811
TWO WORKING DAYS BEFORE YOU DIG

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

PLANS PREPARED BY:
43410 BUSINESS PARK DRIVE
TEMECULA, CA 92590
T 951.396.4980

UNDER THE SUPERVISION OF:
RYAN M. HUSTON C60324 6/30/24
PROFESSIONAL ENGINEER R.C.E. No. DATE

ARDURRA
COLLABORATE. INNOVATE. CREATE.

REGISTERED PROFESSIONAL ENGINEER
RYAN M. HUSTON
No. C60324
CIVIL
STATE OF CALIFORNIA

REVISIONS

NO.	DATE	INITIAL	DESCRIPTION	APP'VD/DATE

APPROVED BY:
SENIOR DIRECTOR OF ENGINEERING DATE
REFERENCES

EASTERN MUNICIPAL WATER DISTRICT
PROJECT MANAGER DATE

APPROVALS

	INITIAL	DATE
PROJECT ENGR.		
INSPECTION		
OPERATIONS		
MAINTENANCE		

	DATE
DESIGNED	
DRAWN	
CHECKED	
SUBMITTED	

SCALE: AS SHOWN

EASTERN MUNICIPAL WATER DISTRICT
RIVERSIDE COUNTY, CALIFORNIA

MEAD VALLEY CAJALCO SWR PRELIM DESIGN

TITLE SHEET

I.D.	
S.A.	
W.O.	
C.O.	
COORD.	
SHT. 1 OF 15	
D-XXXXX	
G-1	

LEGEND

ROAD CL DATA
PIPE ALIGNMENT DATA
EXISTING RIGHT OF WAY
EXISTING PROPERTY LINE
EXISTING CENTERLINE
PROPOSED SEWER
PROPOSED SEWER MANHOLE
ABANDON EXISTING UTILITY
DEMOLISH EXISTING STRUCTURE
EXISTING OVERHEAD CATV
EXISTING BURIED CATV
EXISTING OVERHEAD ELECTRIC
EXISTING BURIED ELECTRIC
EXISTING OVERHEAD FIBER OPTIC
EXISTING BURIED FIBER OPTIC
EXISTING OVERHEAD TELEPHONE
EXISTING GAS VALVE
EXISTING GAS LATERAL
EXISTING 2" GAS MAIN
EXISTING 4" GAS MAIN
EXISTING 6" GAS MAIN
EXISTING SEWER MANHOLE
EXISTING 6" SEWER FORCE MAIN
EXISTING 8" SEWER MAIN
EXISTING 10" SEWER MAIN
EXISTING 12" SEWER MAIN
EXISTING 15" SEWER MAIN
EXISTING 18" SEWER MAIN
EXISTING 14" RECYCLED WATER MAIN
EXISTING 16" RECYCLED WATER MAIN
EXISTING WATER LATERAL
EXISTING FIRE HYDRANT LATERAL
EXISTING WATER VALVE
EXISTING FIRE HYDRANT
EXISTING 4" WATER MAIN
EXISTING 6" WATER MAIN
EXISTING 12" WATER MAIN
EXISTING 16" WATER MAIN
EXISTING 18" WATER MAIN
EXISTING STORM DRAIN MANHOLE
EXISTING STORM DRAIN
EXISTING FENCE
EXISTING EDGE OF PAVEMENT
EXISTING EDGE OF PAVEMENT
EXISTING POWER POLE
EXISTING ELECTRICAL BOX
EXISTING TELEPHONE BOX
EXISTING MAILBOX
EXISTING STREETLIGHT
EXIST PALM TREE
EXIST TREE/BUSH

ABBREVIATIONS

ABAN	ABANDONED
AC	ASBESTOS-CEMENT
AVAR	AIR VACUUM AND AIR RELEASE VALVE
AVE	AVENUE
BO	BLOW OFF
BOT	BOTTOM
CATV	CABLE TELEVISION
CDF	CONTROL DENSITY FILL
CG	CENTER GRADE
CL	CENTERLINE
CLR	CLEARANCE
CML&C	CEMENT MORTAR LINED & COATED
CONC	CONCRETE
CTS	CORROSION TEST STATION
DCDA	DOUBLE CHECK DETECTOR ASSEMBLY
DEFL	DEFLECTION
DWG	DRAWING
(E), EXIST	EXISTING
EL	ELEVATION
ELEC,E	ELECTRICAL
EMWD	EASTERN MUNICIPAL WATER DISTRICT
FCA	FLANGE COUPLING ADAPTER
FH	FIRE HYDRANT
FLG	FLANGE
FO	FIBER OPTIC
G	GAS
GPM	GALLON PER MINUTE
GV	GATE VALVE
H	HUB
HDC	HIGH DEFLECTION COUPLING
LAT	LATERAL
MIN	MINIMUM
(N)	NEW, PROPOSED
OH	OVER HEAD
PH	POT HOLE
PI	POINT OF INTERSECTION
PP	POWER POLE
PVC	POLYVINYL CHLORIDE PIPE
RBS	RIDGEMOOR BOOSTER STATION
RCFC&WCD	RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RD	ROAD
RSGV	RESILIENT SEATED GATE VALVE
SC	SPECIAL CONDITION
SCG	SOUTHERN CALIFORNIA GAS COMPANY
SD	STORM DRAIN
SFM	SEWER FORCE MAIN
S	SLOPE
SS	SANITARY SEWER
SHT	SHEET
SLT	STREET LIGHT
STA	STATION
STD	STANDARD
TEL	TELEPHONE
TEMP	TEMPORARY
TS	TRAFFIC SIGNAL
TYP	TYPICAL
UG	UNDERGROUND
UNK	UNKNOWN
VERT	VERTICAL
W	WATER
XING	CROSSING

GENERAL CONSTRUCTION NOTES

ENGINEER'S NOTE TO CONTRACTOR

THE EXISTENCE AND LOCATION OF ANY UNDERGROUND UTILITIES OR STRUCTURES SHOWN ON THESE PLANS WERE OBTAINED BY A SEARCH OF AVAILABLE RECORDS. THE CONTRACTOR IS REQUIRED TO TAKE DUE PRECAUTIONARY MEASURES TO PROTECT THE UTILITIES SHOWN, AND ANY OTHER LINES OR STRUCTURES NOT SHOWN ON THESE PLANS, AND IS RESPONSIBLE FOR THE PROTECTION OF, AND ANY DAMAGE TO THESE LINES OR STRUCTURES.

CONSTRUCTION CONTRACTOR AGREES THAT IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, CONSTRUCTION CONTRACTOR WILL BE REQUIRED TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS, AND CONSTRUCTION CONTRACTOR FURTHER AGREES TO DEFEND, INDEMNIFY AND HOLD DESIGN PROFESSIONAL AND EMWD HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT.

THE CONTRACTOR SHALL BE RESPONSIBLE TO REPORT DISCREPANCIES IN PLANS AND/OR CONDITIONS IMMEDIATELY TO THE DISTRICT AND THE DESIGN ENGINEER FOR RESOLUTION PRIOR TO CONSTRUCTION, AND SHALL BE RESPONSIBLE FOR DISCREPANCIES NOT SO REPORTED AND RESOLVED.

NOTE TO CONTRACTOR

1. ALL EXISTING UNDERGROUND UTILITY LOCATIONS SHOWN HEREON ARE FROM PLANS FURNISHED BY THE RESPECTIVE UTILITY COMPANIES. CONTRACTOR SHALL CONTACT "UNDERGROUND SERVICE ALERT" (USA 811) TO VERIFY EXISTING UTILITY LOCATIONS ON SITE BEFORE COMMENCING CONSTRUCTIONS.
2. CONTRACTOR SHALL MAKE ALL NECESSARY SERVICE CONNECTIONS TO THE NEW PIPELINE, REGARDLESS OF EXISTING UTILITY CONFLICTS AND SHALL INCLUDE IN THEIR BID ACCORDINGLY.
3. WHERE INVESTIGATIONS OF SUBSURFACE CONDITIONS HAVE BEEN MADE BY EMWD IN RESPECT TO FOUNDATION OR OTHER STRUCTURAL DESIGN, AND THAT INFORMATION IS SHOWN IN THE PLANS, SAID INFORMATION REPRESENTS ONLY THE STATEMENT BY EMWD AS TO THE CHARACTER OF THE MATERIAL WHICH HAS BEEN ACTUALLY ENCOUNTERED BY IT IN ITS INVESTIGATIONS, AND IS ONLY INCLUDED FOR THE CONVENIENCE OF BIDDERS. INVESTIGATIONS OF SUBSURFACE CONDITIONS ARE MADE FOR THE PURPOSE OF DESIGN, AND EMWD ASSUMES NO RESPONSIBILITY WHATSOEVER IN RESPECT TO THE SUFFICIENCY OR ACCURACY OF THE BORINGS OR OF THE LOG OF TEST BORINGS OR OTHER PRELIMINARY INVESTIGATIONS, OR OF THE INTERPRETATION THEREOF, AND THERE IS NO GUARANTY EITHER EXPRESSED OR IMPLIED, THAT THE CONDITIONS INDICATED ARE REPRESENTATIVE OF THOSE EXISTING THROUGHOUT THE WORK OR ANY PART OF IT, OR THAT UNLOCKED FOR DEVELOPMENTS MAY NOT OCCUR.
4. MAKING SUCH INFORMATION AVAILABLE TO BIDDERS IS NOT TO BE CONSTRUED IN ANY WAY AS WAIVER OF THE PROVISIONS OF THE FIRST PART OF THIS ARTICLE AND BIDDERS MUST BE SATISFY THEMSELVES THROUGH THEIR OWN INVESTIGATIONS AS TO CONDITIONS TO BE ENCOUNTERED.

WATER NOTES

DETAIL REFERENCE

SECTION (LETTER)
DETAIL (NUMERAL)
DRAWING NUMBER
DRAWN ON

Underground Service Alert
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PLANS PREPARED BY:
43410 BUSINESS PARK DRIVE
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T 951.396.4980
UNDER THE SUPERVISION OF:
RYAN M. HUSTON C60324 6/30/24
PROFESSIONAL ENGINEER R.C.E. No. DATE

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REGISTERED PROFESSIONAL ENGINEER RYAN M. HUSTON No. C60324 CIVIL STATE OF CALIFORNIA

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NO.	DATE	INITIAL	DESCRIPTION	APP'VD/DATE

APPROVED BY:
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PROJECT MANAGER DATE

APPROVALS

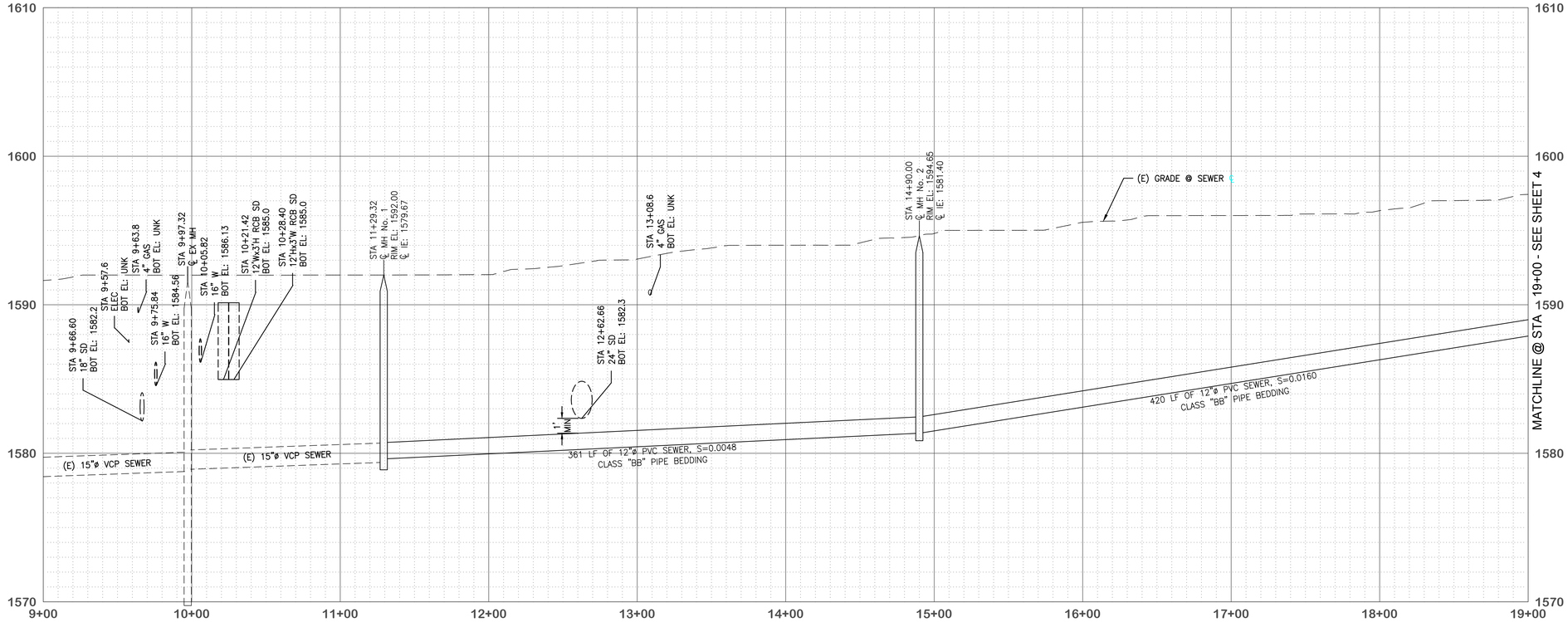
	INITIAL	DATE
PROJECT ENGR.		
INSPECTION		
OPERATIONS		
MAINTENANCE		

	DATE
DESIGNED	
DRAWN	
CHECKED	
SUBMITTED	

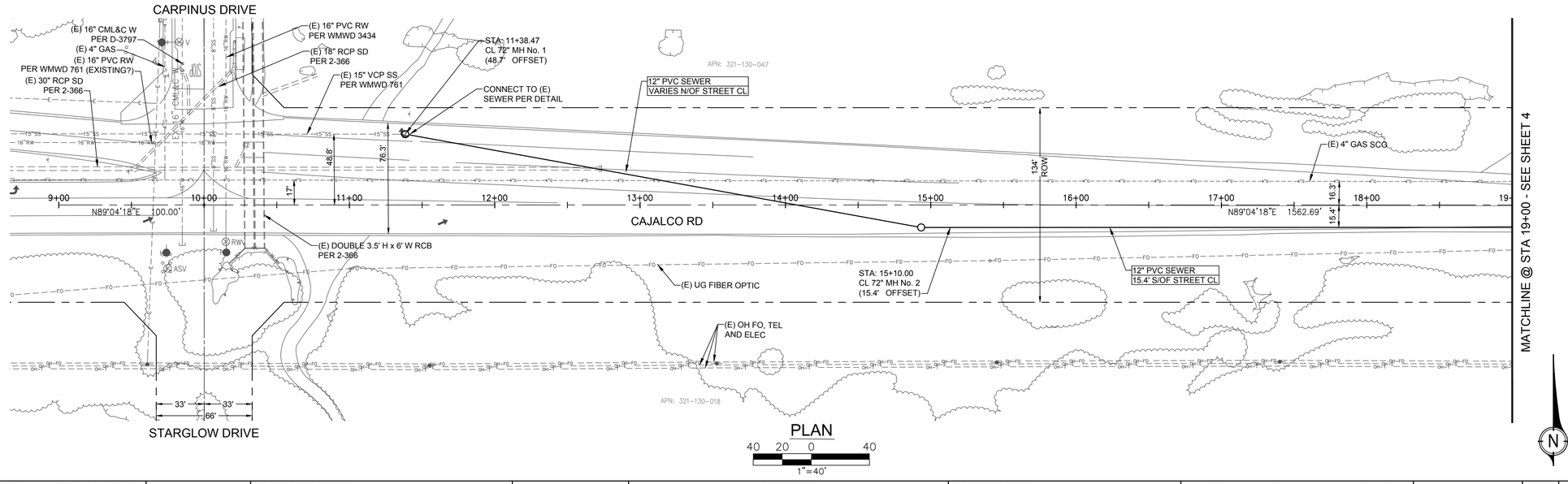
SCALE: AS SHOWN

EASTERN MUNICIPAL WATER DISTRICT
RIVERSIDE COUNTY, CALIFORNIA
MEAD VALLEY CAJALCO SWR PRELIM DESIGN
GENERAL NOTES, LEGEND
AND ABBREVIATIONS

I.D.
S.A.
W.O.
C.O.
COORD.
SHT. 2 OF 15
D-XXXXX
G-2



40 20 0 40 PROFILE 4 2 0 4
1"=40' HORIZ 1"=4' VERT



PLAN
40 20 0 40
1"=40'

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CIVIL
STATE OF CALIFORNIA

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PROJECT MANAGER DATE

APPROVALS

	INITIAL	DATE
PROJECT ENGR.		
INSPECTION		
OPERATIONS		
MAINTENANCE		

	DATE
DESIGNED	
DRAWN	
CHECKED	
SUBMITTED	

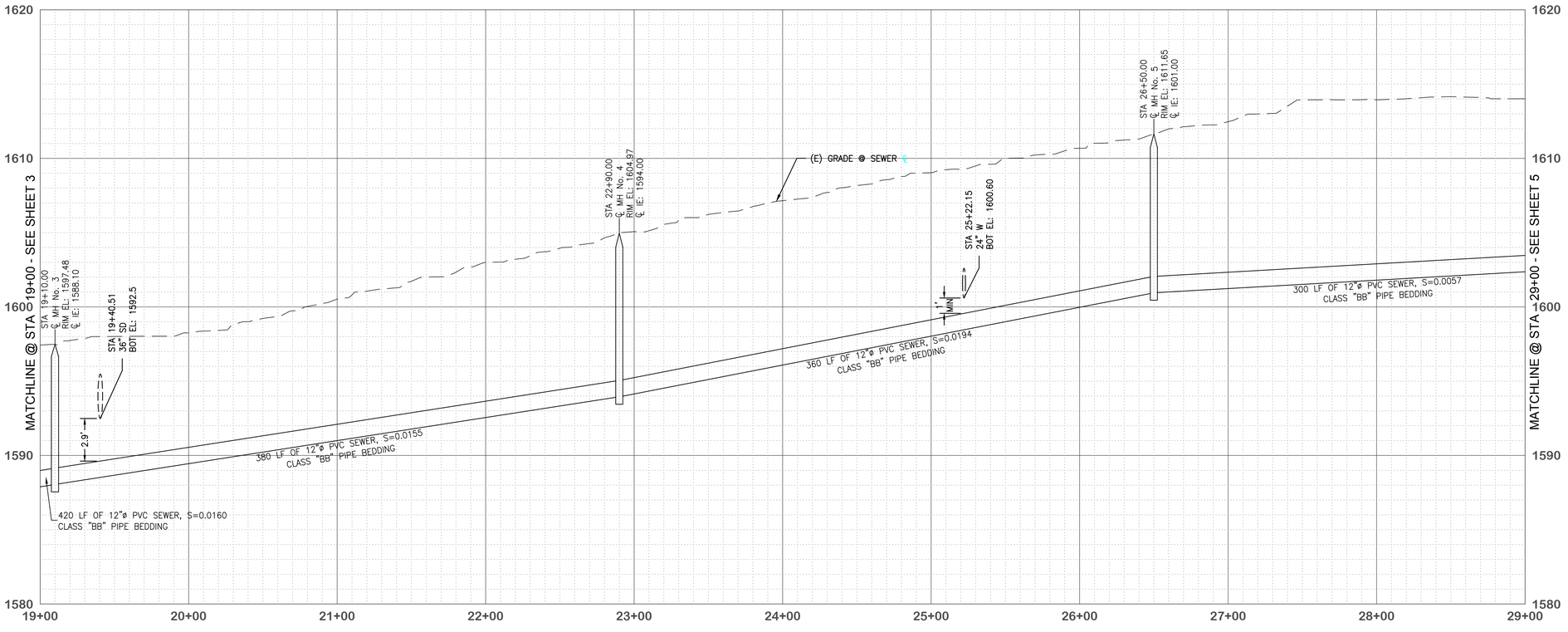
SCALE: AS SHOWN

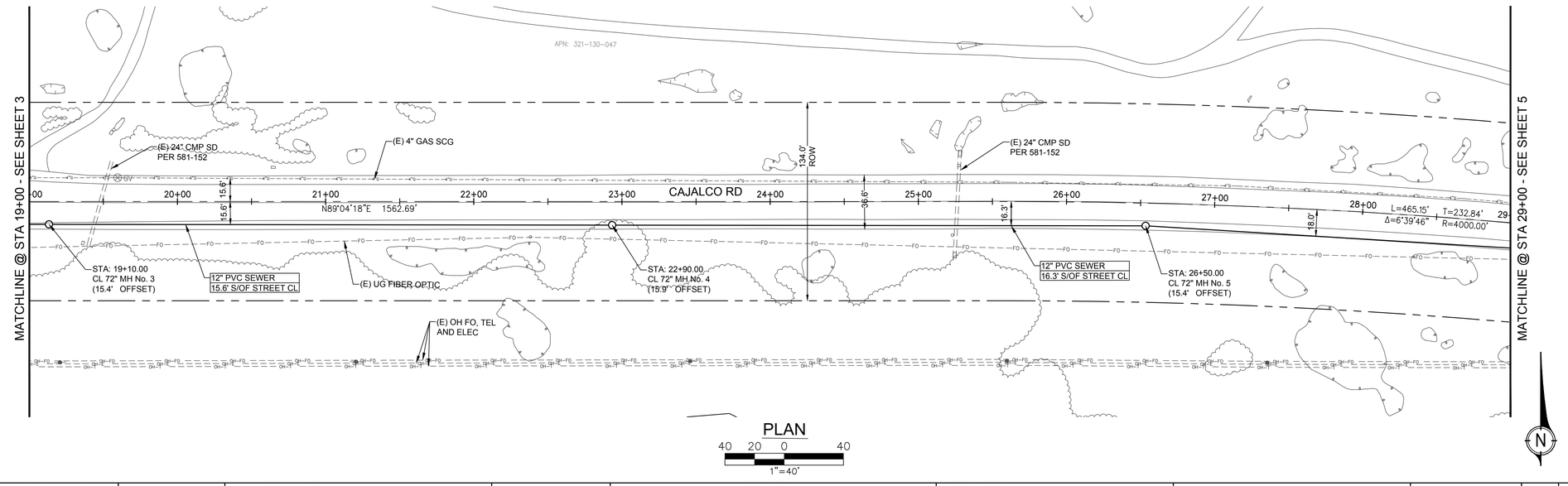
EASTERN MUNICIPAL WATER DISTRICT
RIVERSIDE COUNTY, CALIFORNIA

MEAD VALLEY CAJALCO SWR PRELIM DESIGN

PLAN AND PROFILE
STA 9+00 TO STA 19+00

I.D.	
S.A.	
W.O.	
C.O.	
COORD.	
SHT. 3 OF 15	
D-XXXXX	
C-1	





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STATE OF CALIFORNIA

REVISIONS

NO.	DATE	INITIAL	DESCRIPTION	APP'VD/DATE

APPROVED BY:

SENIOR DIRECTOR OF ENGINEERING DATE

REFERENCES

EASTERN MUNICIPAL WATER DISTRICT

PROJECT MANAGER DATE

APPROVALS

	INITIAL	DATE
PROJECT ENGR.		
INSPECTION		
OPERATIONS		
MAINTENANCE		

	DATE
DESIGNED	
DRAWN	
CHECKED	
SUBMITTED	

SCALE: AS SHOWN

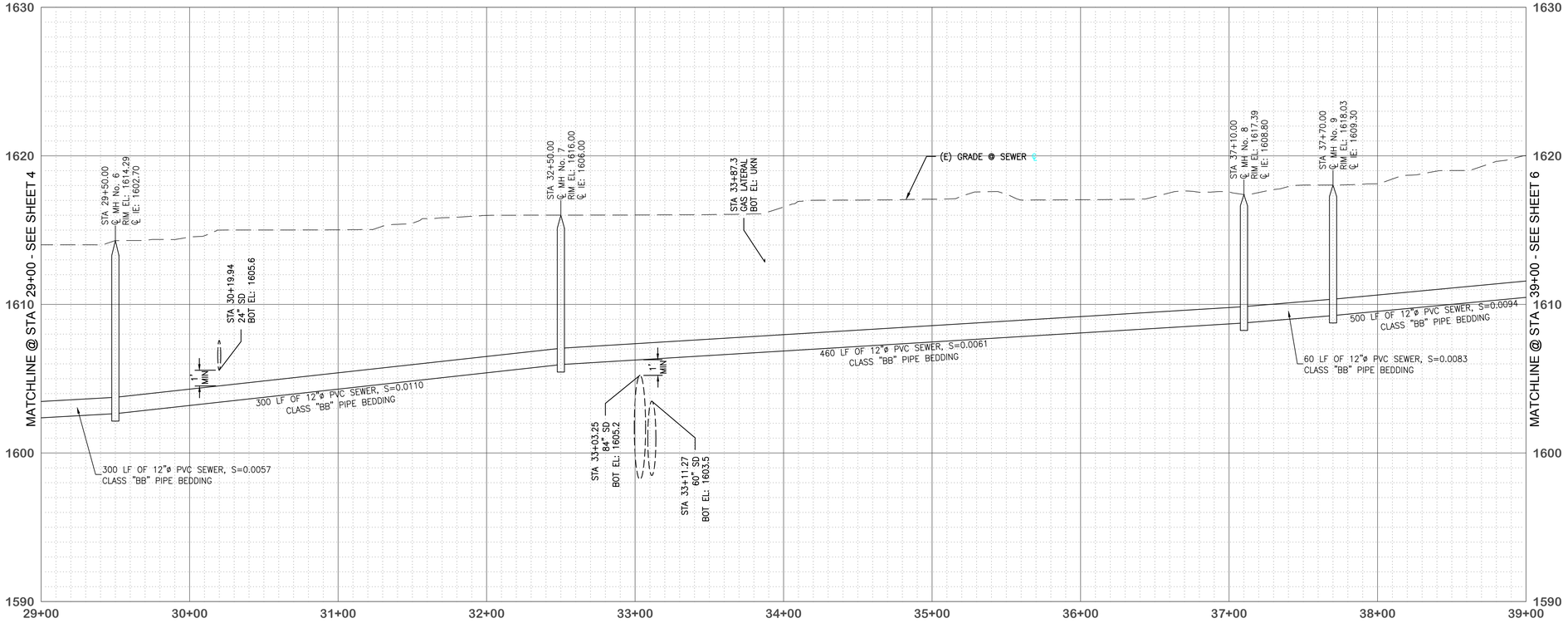
EASTERN MUNICIPAL WATER DISTRICT
RIVERSIDE COUNTY, CALIFORNIA

MEAD VALLEY CAJALCO SWR PRELIM DESIGN

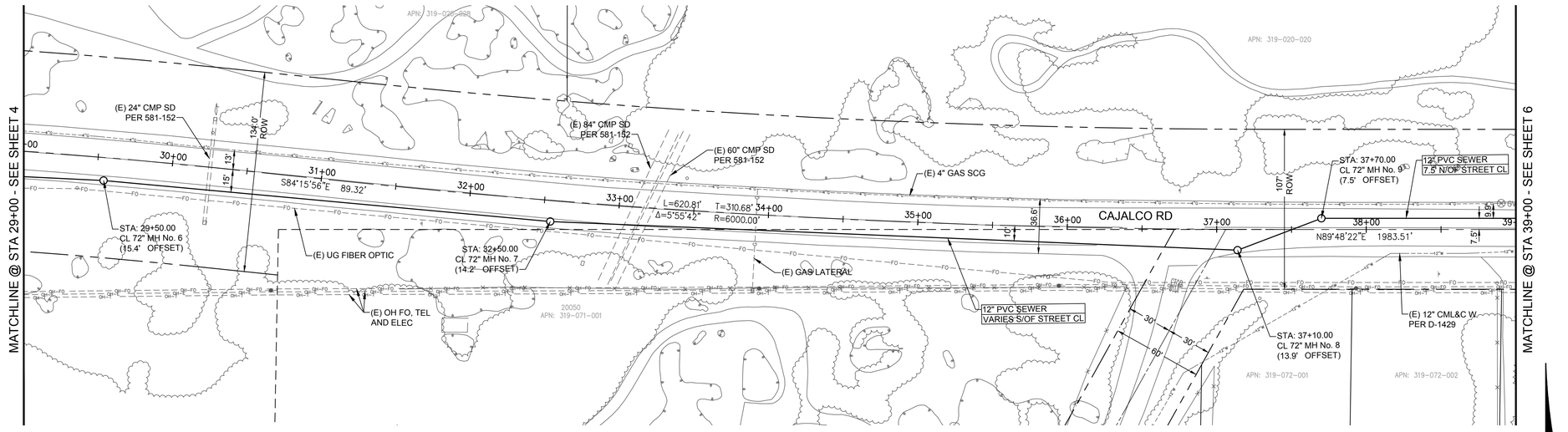
PLAN AND PROFILE

STA 19+00 TO STA 29+00

I.D.	
S.A.	
W.O.	
C.O.	
COORD.	
SHT. 4 OF 15	
D-XXXXX	
C-2	



40 20 0 40 PROFILE 4 2 0 4
1"=40' HORIZ 1"=4' VERT



PLAN
40 20 0 40
1"=40'

Underground Service Alert
DIG BEFORE YOU DIG
Call: TOLL FREE
811
TWO WORKING DAYS BEFORE YOU DIG

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

PLANS PREPARED BY:
43410 BUSINESS PARK DRIVE
TEMECULA, CA 92590
T 951.396.4980

UNDER THE SUPERVISION OF:
RYAN M. HUSTON C60324 6/30/24
PROFESSIONAL ENGINEER R.C.E. No. DATE

ARDURRA
COLLABORATE. INNOVATE. CREATE.

REGISTERED PROFESSIONAL ENGINEER
RYAN M. HUSTON
No. C60324
CIVIL
STATE OF CALIFORNIA

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MAINTENANCE		

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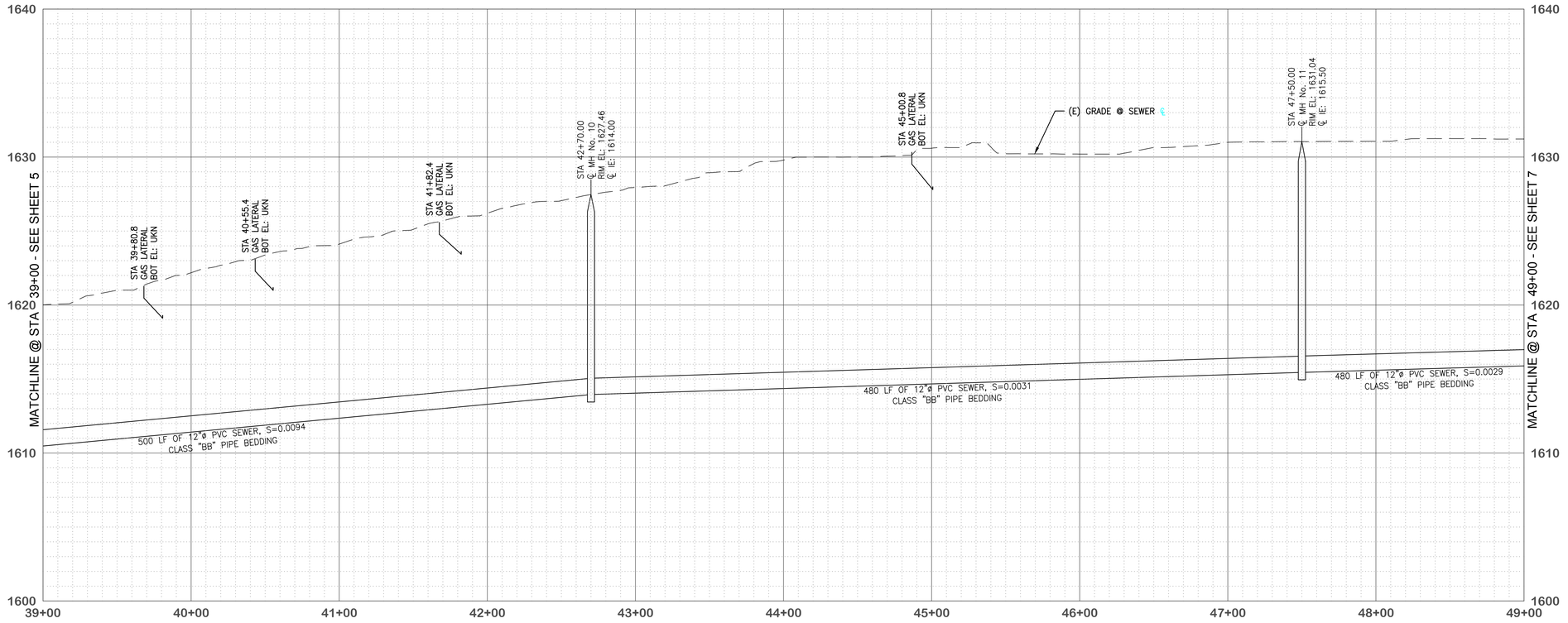
SCALE: AS SHOWN

EASTERN MUNICIPAL WATER DISTRICT
RIVERSIDE COUNTY, CALIFORNIA

MEAD VALLEY CAJALCO SWR PRELIM DESIGN

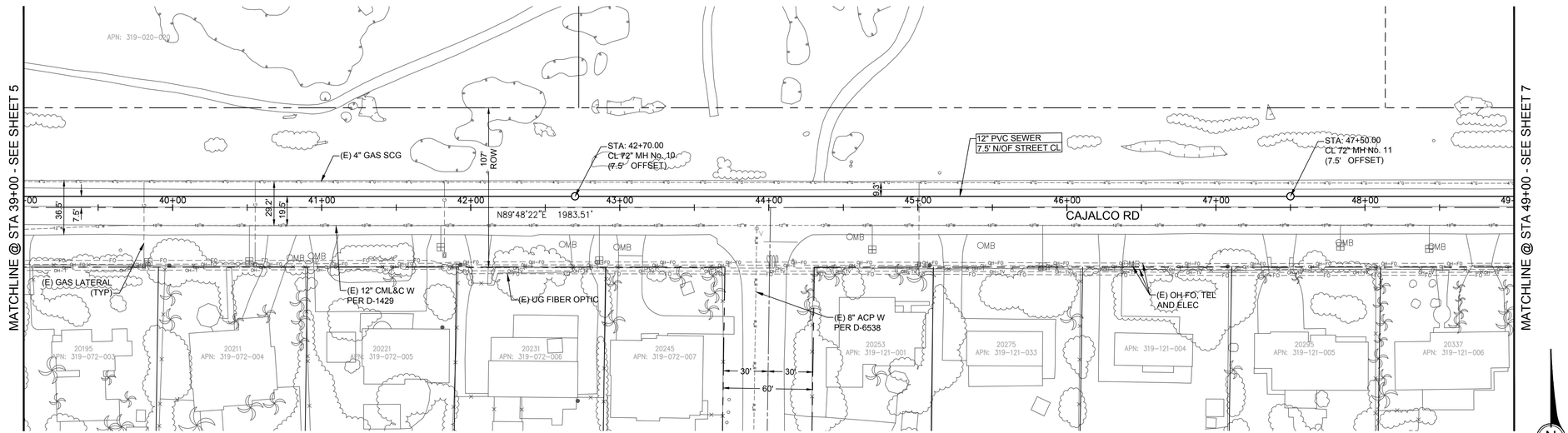
PLAN AND PROFILE
STA 29+00 TO STA 39+00

I.D.	
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W.O.	
C.O.	
COORD.	
SHT. 5 OF 15	
D-XXXXX	
C-3	



40 20 0 40 PROFILE 4 2 0 4

1"=40' HORIZ 1"=4' VERT



PLAN

40 20 0 40

1"=40'

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INSPECTION		
OPERATIONS		
MAINTENANCE		

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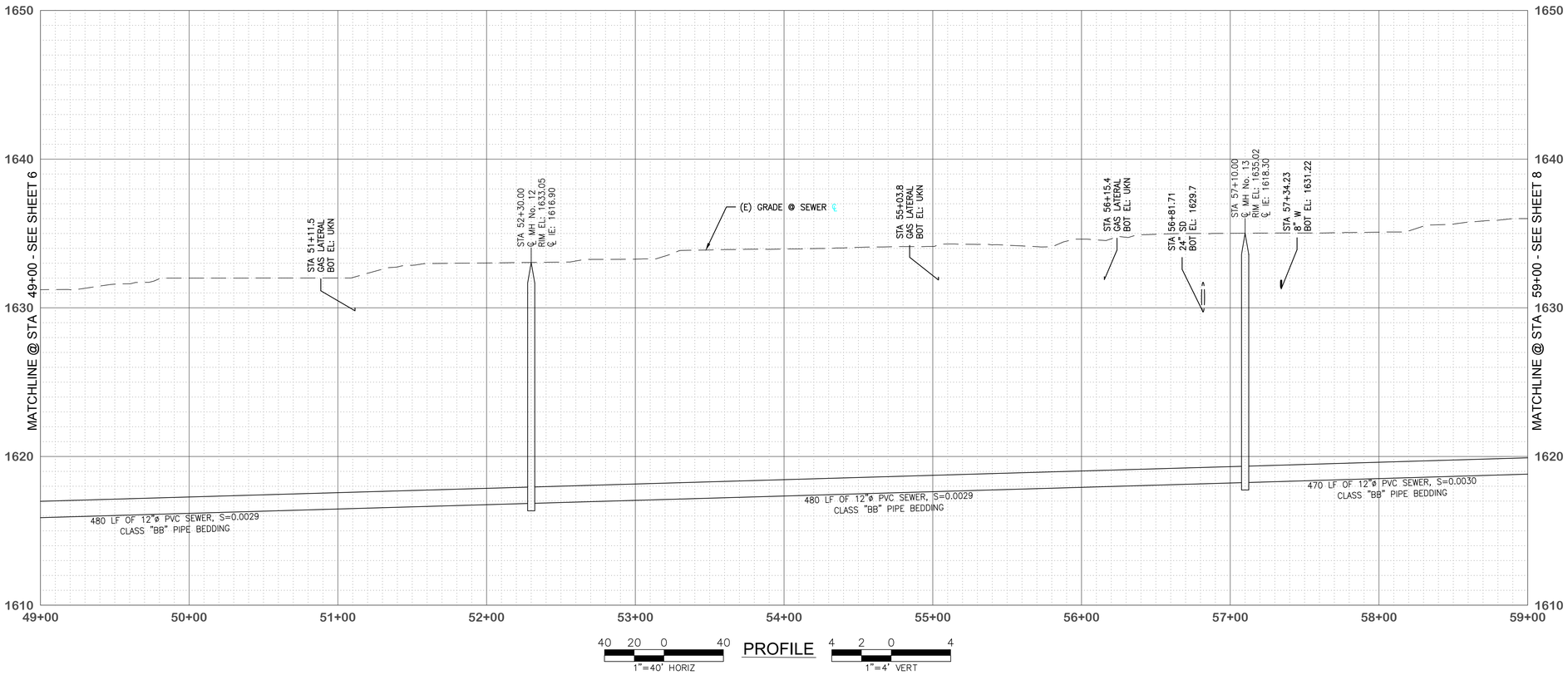
SCALE: AS SHOWN

EASTERN MUNICIPAL WATER DISTRICT
RIVERSIDE COUNTY, CALIFORNIA

MEAD VALLEY CAJALCO SWR PRELIM DESIGN

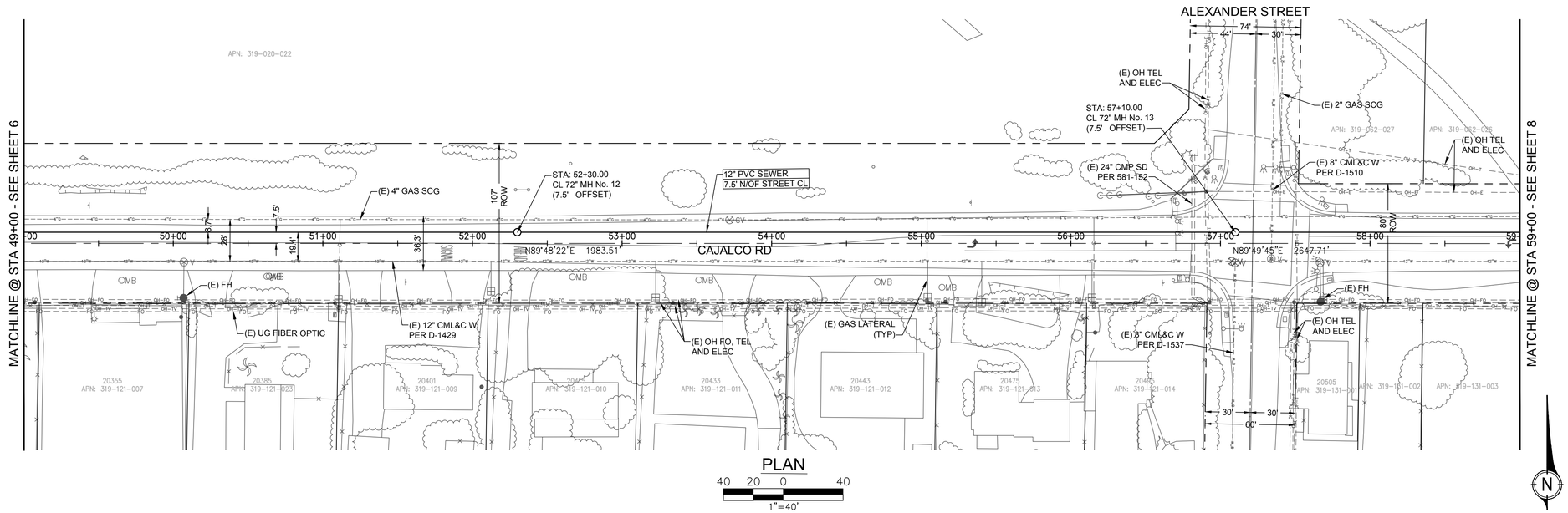
PLAN AND PROFILE
STA 39+00 TO STA 49+00

I.D.	
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COORD.	
SHT. 6 OF 15	
D-XXXXX	
C-4	



40 20 0 40 PROFILE 4 2 0 4

1"=40' HORIZ 1"=4' VERT



PLAN

40 20 0 40

1"=40'

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MAINTENANCE		

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SCALE: AS SHOWN

EASTERN MUNICIPAL WATER DISTRICT

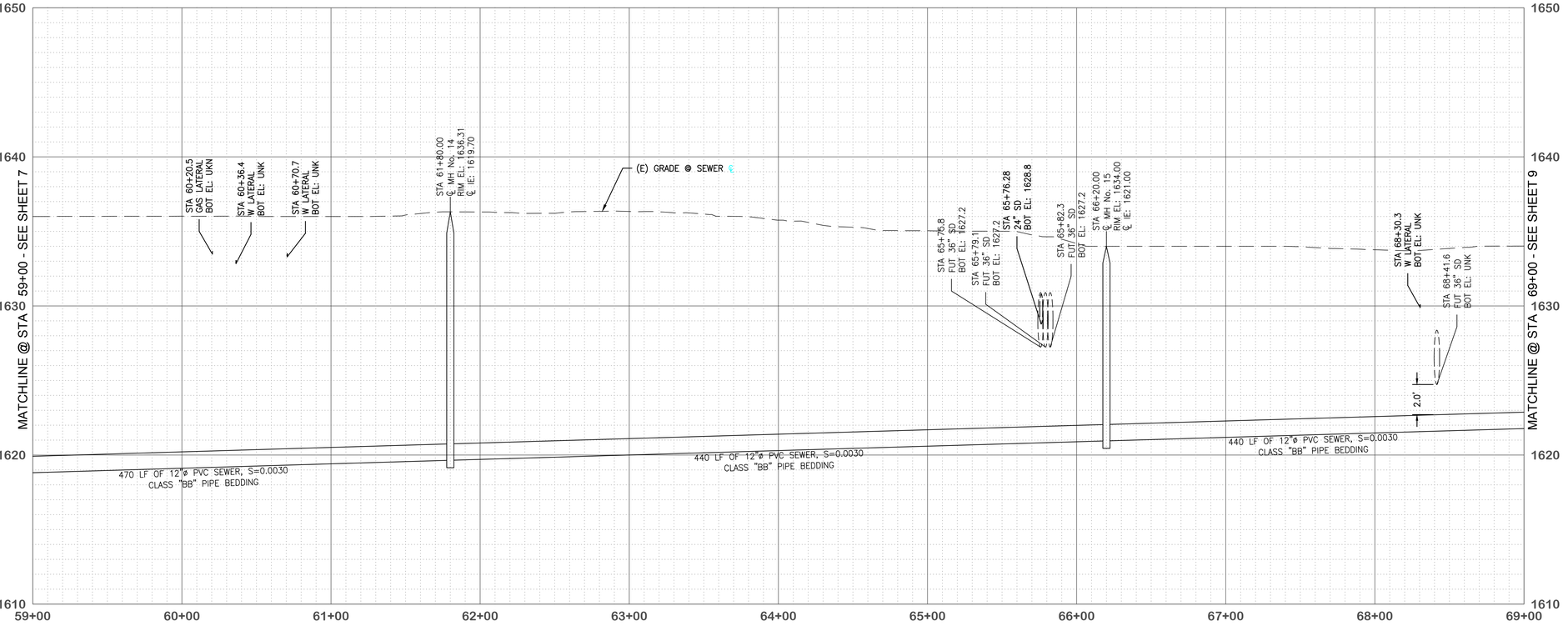
RIVERSIDE COUNTY, CALIFORNIA

MEAD VALLEY CAJALCO SWR PRELIM DESIGN

PLAN AND PROFILE

STA 49+00 TO STA 59+00

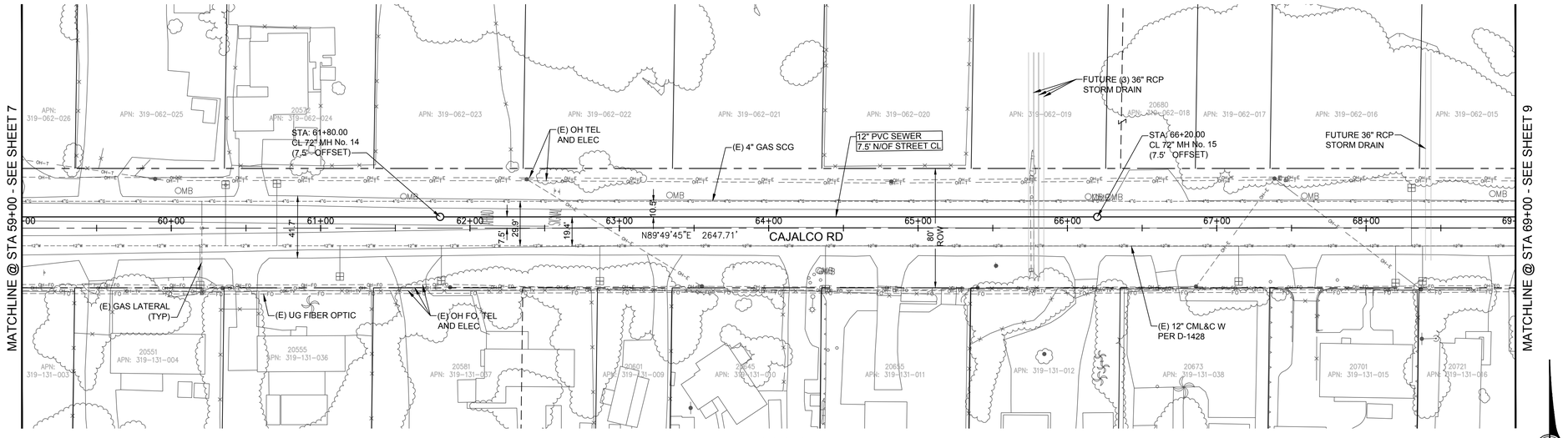
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SHT.	7 OF 15
	D-XXXXX
	C-5



40 20 0 40
1"=40' HORIZ

PROFILE

4 2 0 4
1"=4' VERT



PLAN

40 20 0 40
1"=40'

N

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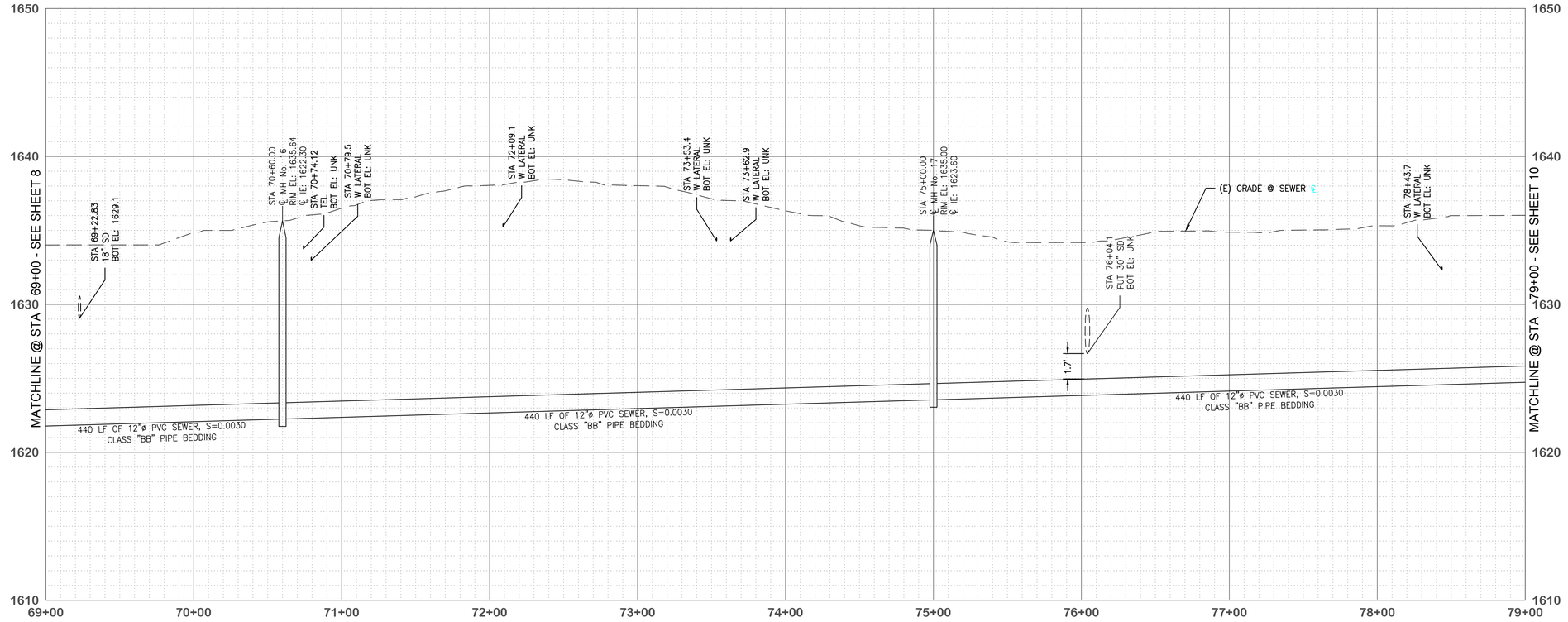
EASTERN MUNICIPAL WATER DISTRICT
RIVERSIDE COUNTY, CALIFORNIA

MEAD VALLEY CAJALCO SWR PRELIM DESIGN

PLAN AND PROFILE

STA 59+00 TO STA 69+00

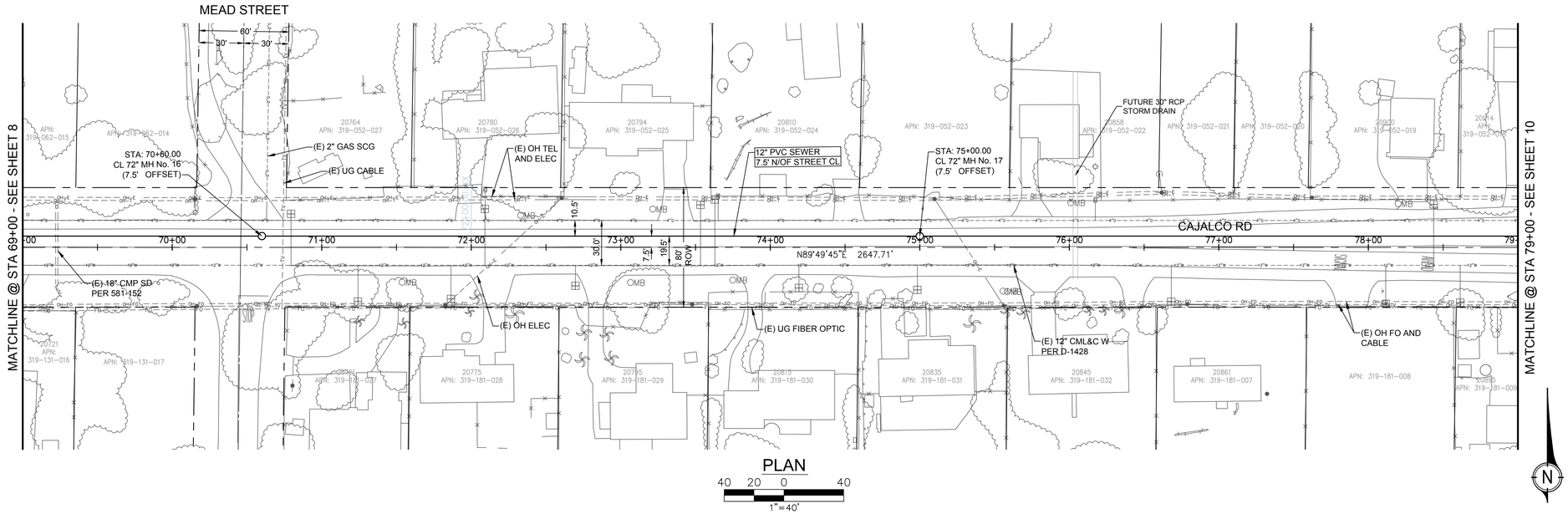
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40 20 0 40
1"=40' HORIZ

PROFILE

4 2 0 4
1"=4' VERT



PLAN

40 20 0 40
1"=40'

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OPERATIONS		
MAINTENANCE		

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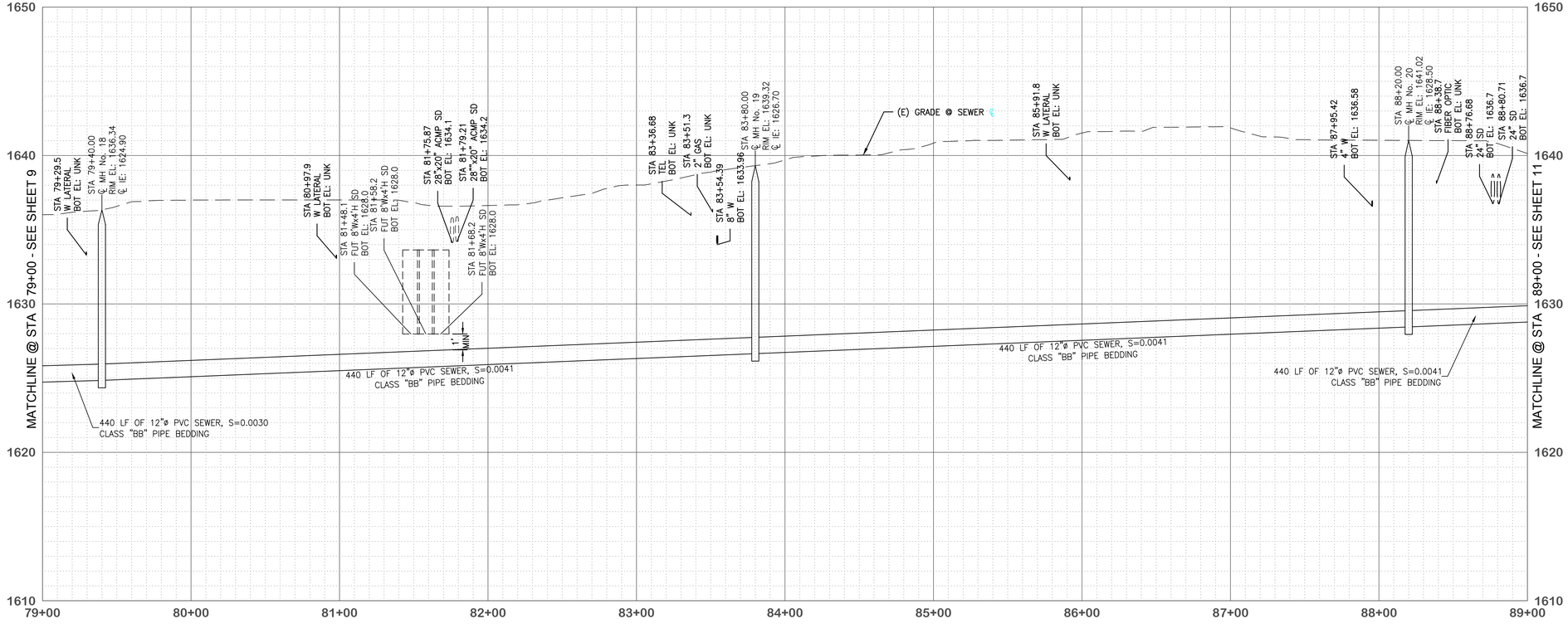
SCALE: AS SHOWN

EASTERN MUNICIPAL WATER DISTRICT
RIVERSIDE COUNTY, CALIFORNIA

MEAD VALLEY CAJALCO SWR PRELIM DESIGN

PLAN AND PROFILE
STA 69+00 TO STA 79+00

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SHT. 9 OF 15	
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MAINTENANCE		

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SCALE: AS SHOWN

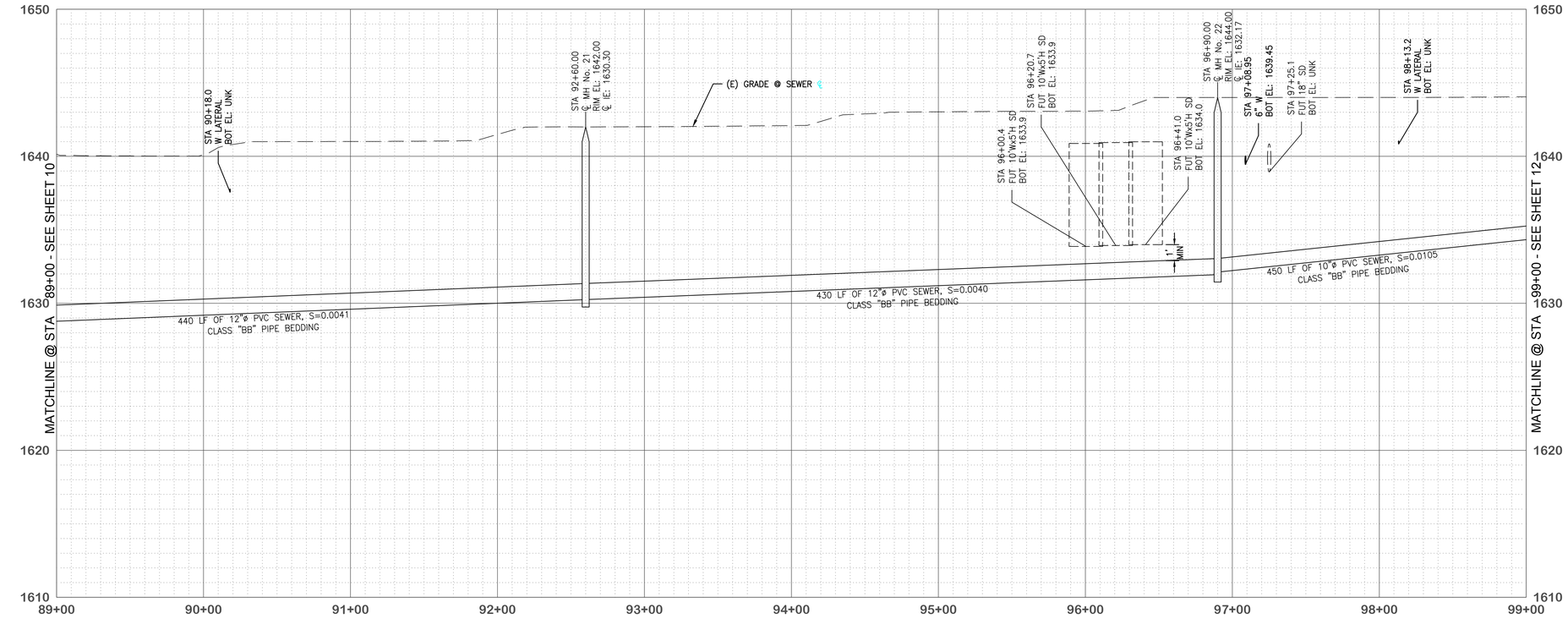
EASTERN MUNICIPAL WATER DISTRICT
RIVERSIDE COUNTY, CALIFORNIA

MEAD VALLEY CAJALCO SWR PRELIM DESIGN

PLAN AND PROFILE

STA 79+00 TO STA 89+00

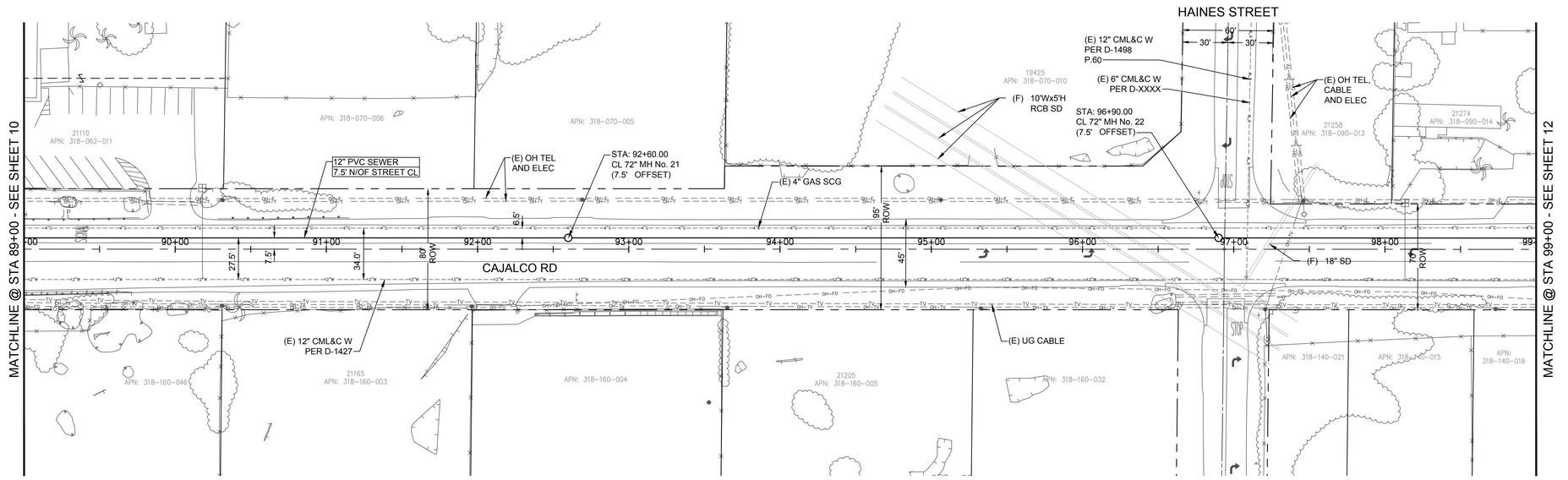
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SHT. 10 OF 15	
D-XXXXX	
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40 20 0 40
1"=40' HORIZ

PROFILE

4 2 0 4
1"=4' VERT



PLAN

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1"=40'

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Underground Service Alert
DIG BEFORE YOU DIG
Call: TOLL FREE
811
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0 1"

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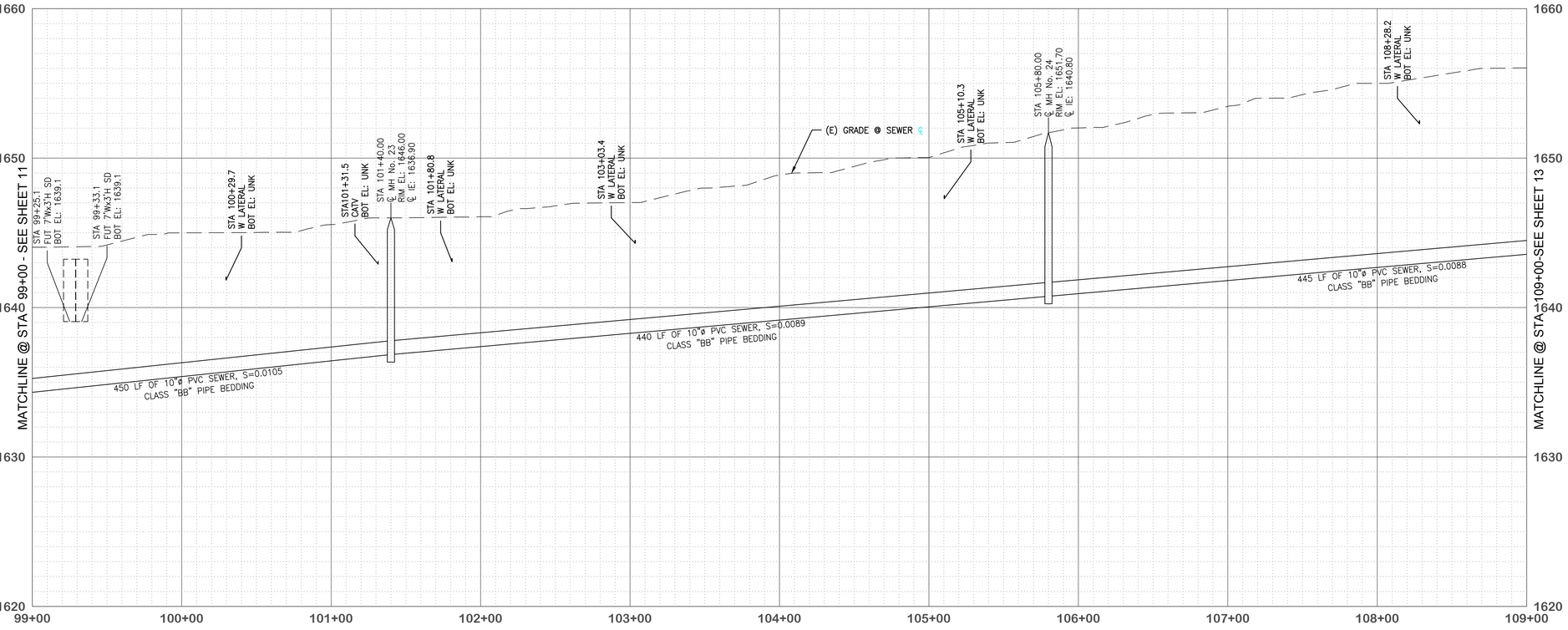
EASTERN MUNICIPAL WATER DISTRICT
RIVERSIDE COUNTY, CALIFORNIA

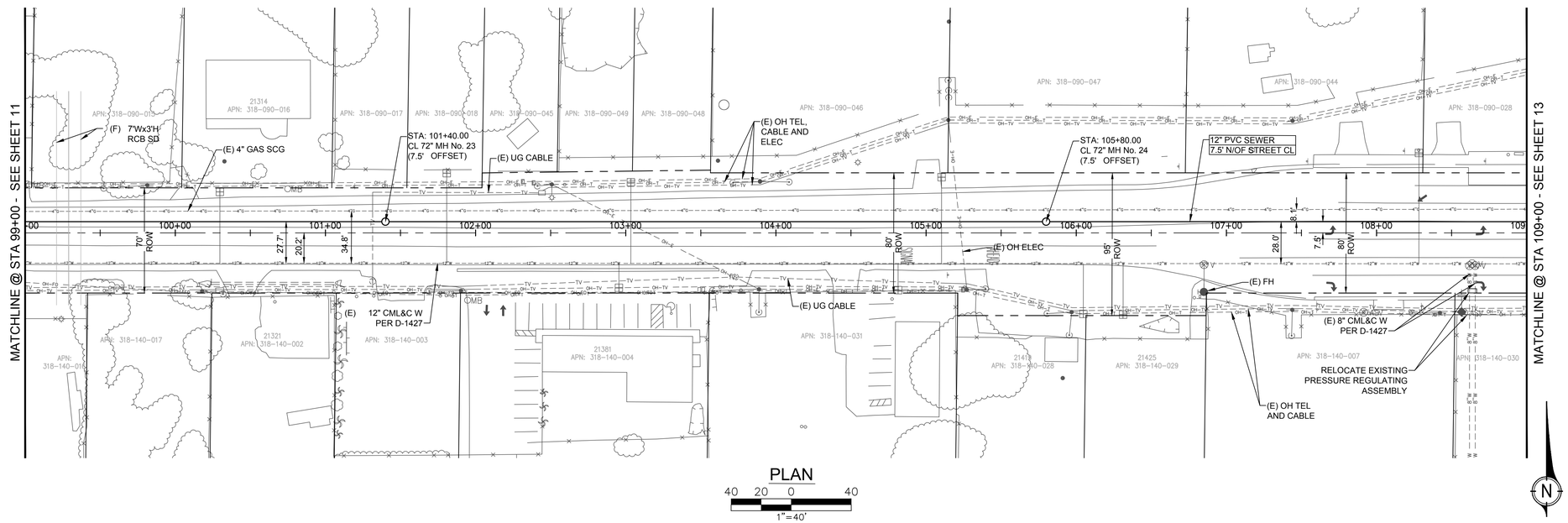
MEAD VALLEY CAJALCO SWR PRELIM DESIGN

PLAN AND PROFILE

STA 89+00 TO STA 99+00

I.D.	
S.A.	
W.O.	
C.O.	
COORD.	
SHT. 11 OF 15	
D-XXXXX	
C-9	





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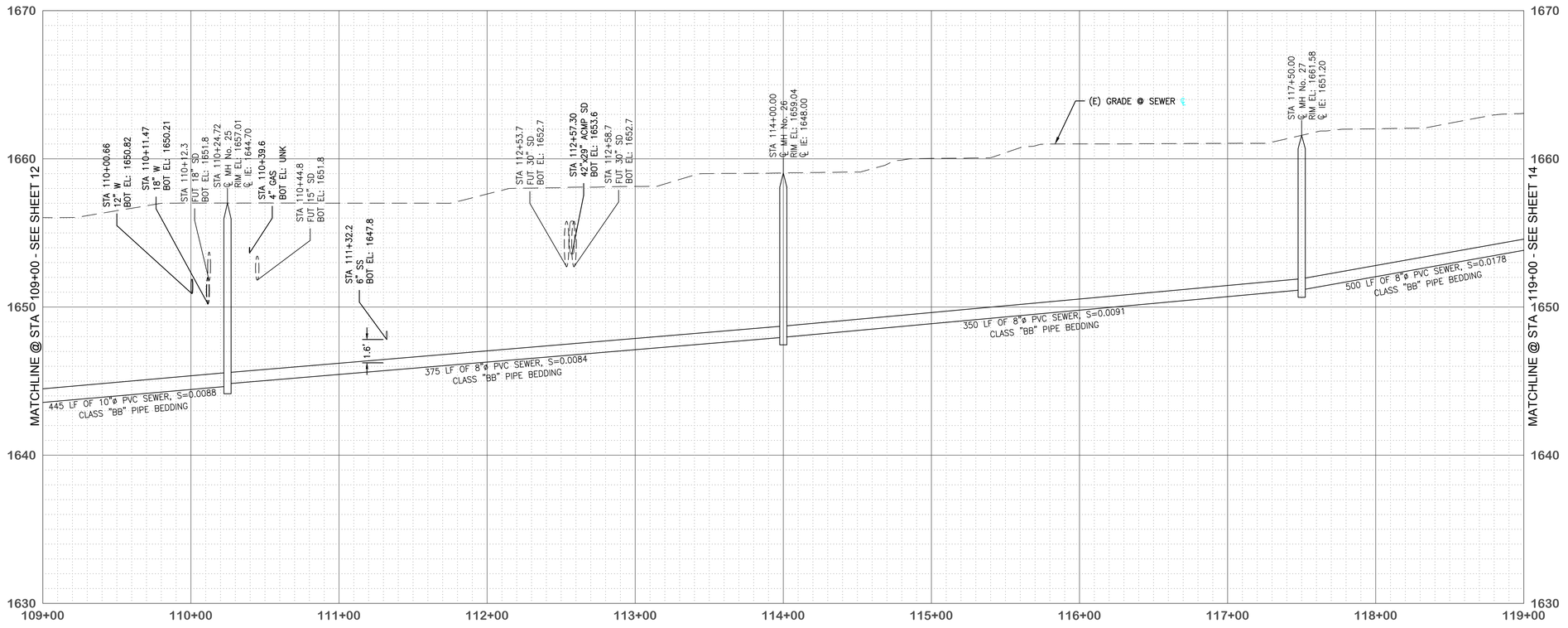
SCALE: AS SHOWN

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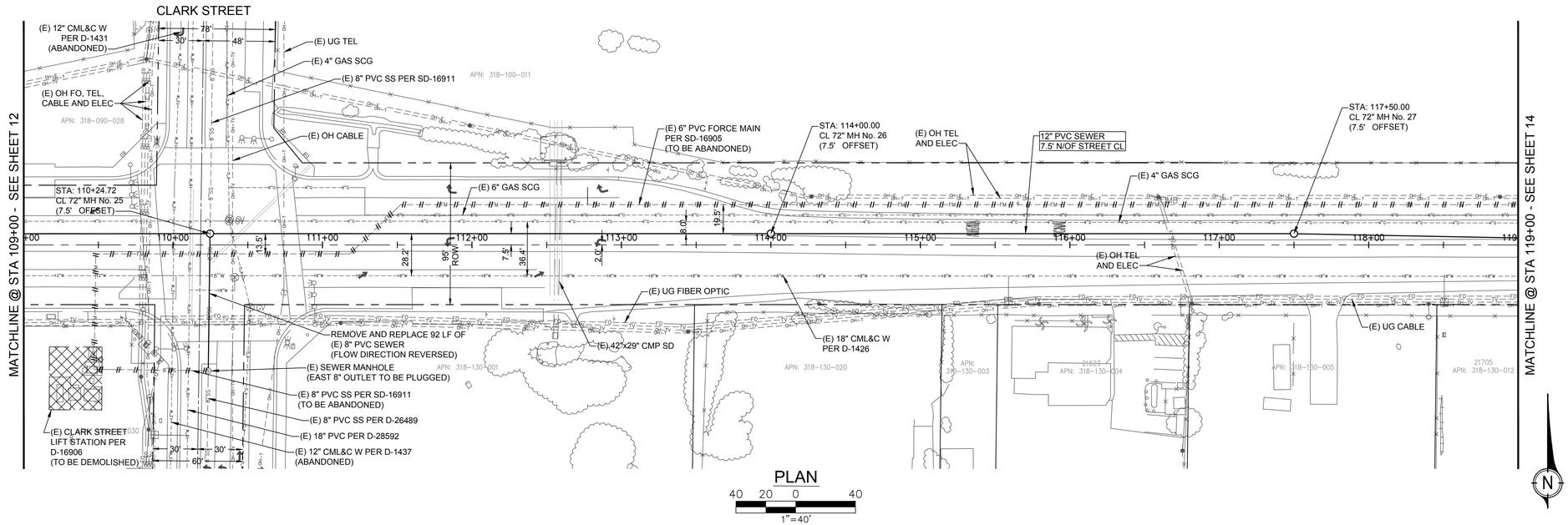
PLAN AND PROFILE
STA 99+00 TO STA 109+00

I.D.	
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W.O.	
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SHT. 12 OF 15	
D-XXXXX	
C-10	



40 20 0 40 PROFILE 4 2 0 4

1"=40' HORIZ 1"=4' VERT



PLAN

40 20 0 40

1"=40'

Underground Service Alert

DIG BEFORE YOU DIG

Call: TOLL FREE

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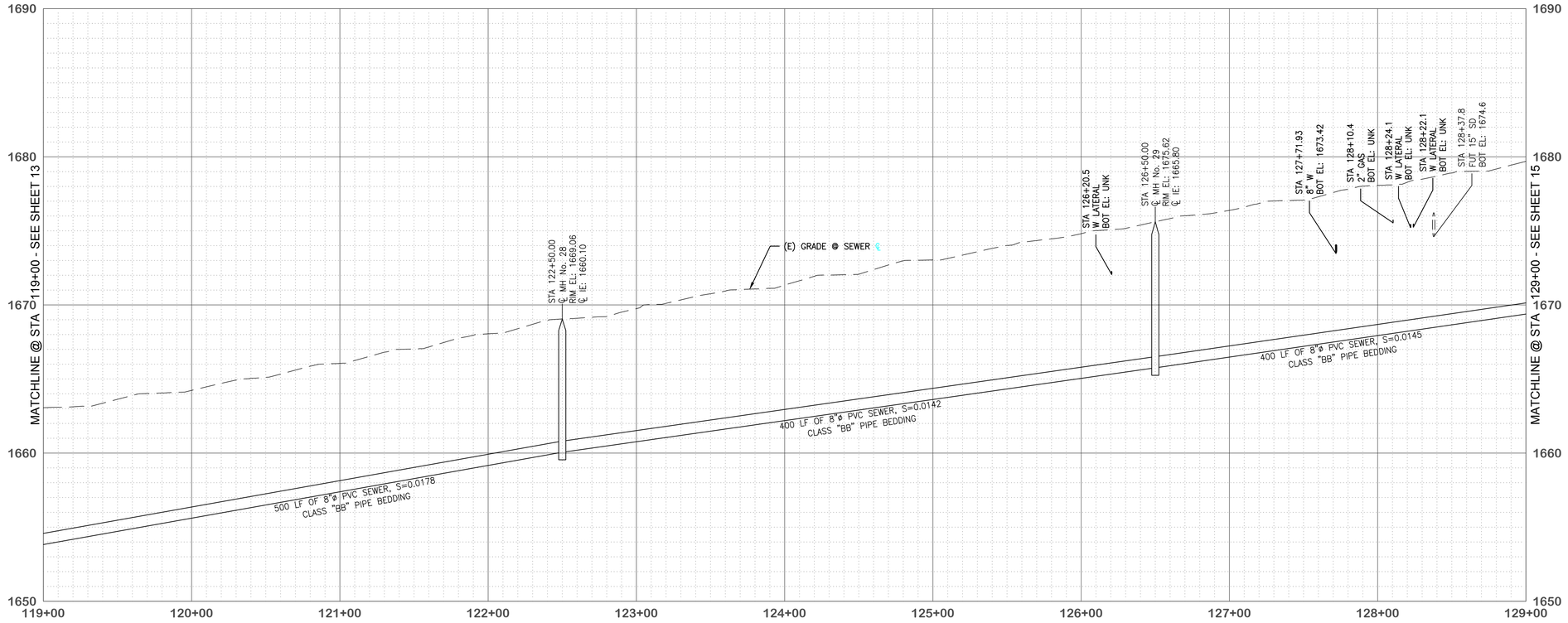
EASTERN MUNICIPAL WATER DISTRICT
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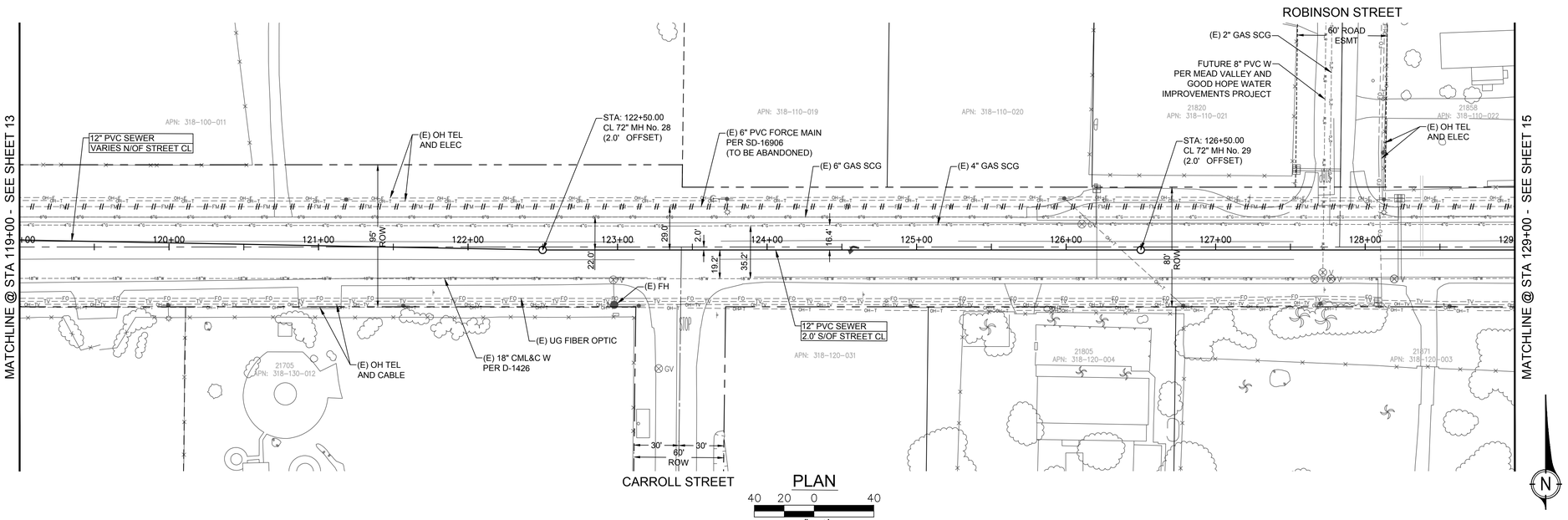
PLAN AND PROFILE

STA 109+00 TO STA 119+00

I.D.	
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C.O.	
COORD.	
SHT. 13 OF 15	
D-XXXXX	
C-11	



40 20 0 40 PROFILE 4 2 0 4
1"=40' HORIZ 1"=4' VERT



PLAN
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1"=40'

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SCALE: AS SHOWN

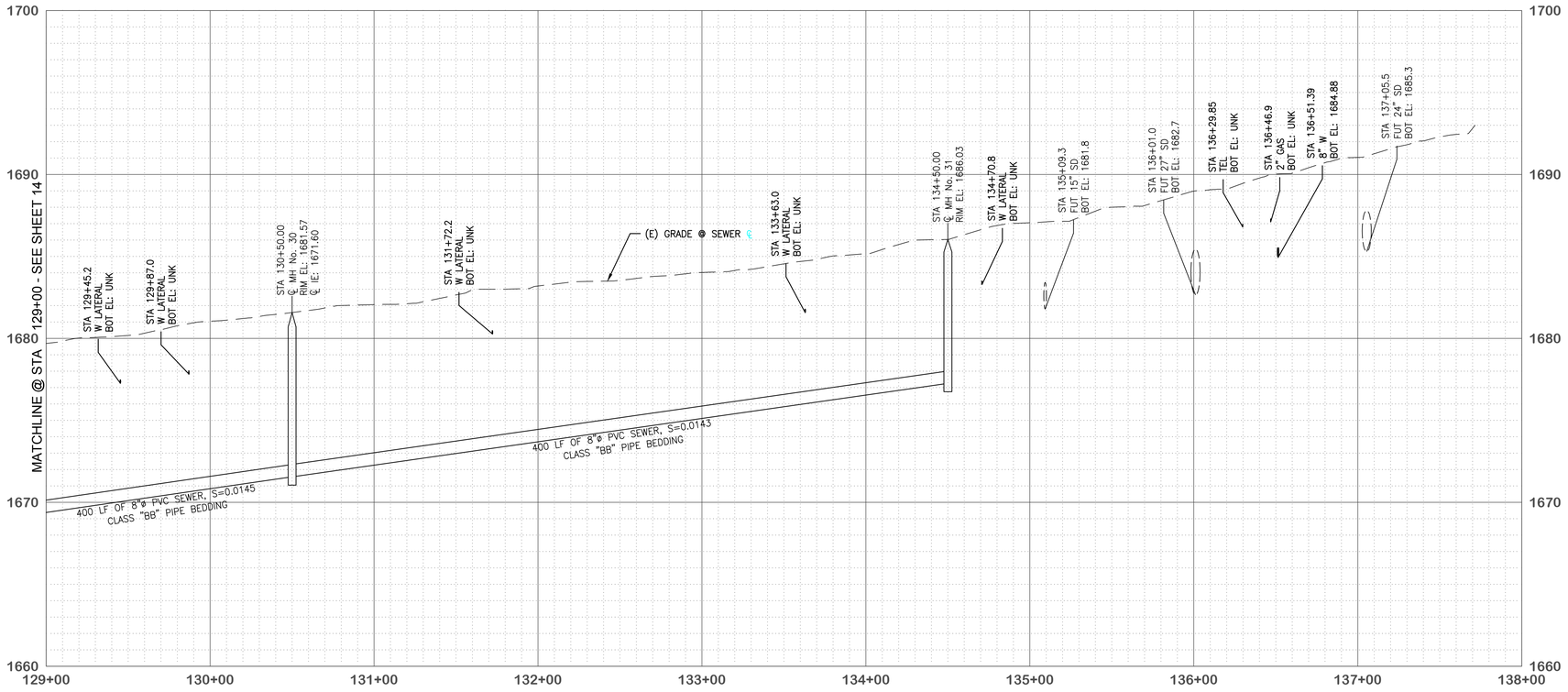
EASTERN MUNICIPAL WATER DISTRICT
RIVERSIDE COUNTY, CALIFORNIA

MEAD VALLEY CAJALCO SWR PRELIM DESIGN

PLAN AND PROFILE

STA 119+00 TO STA 129+00

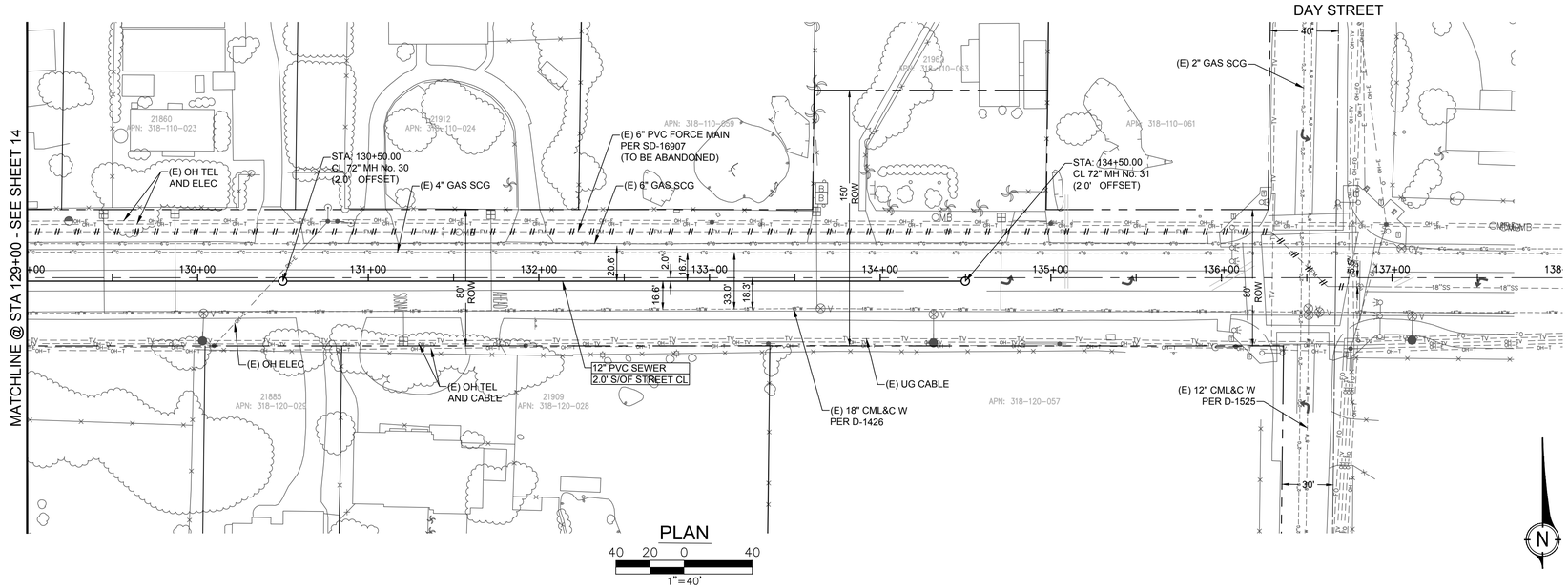
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COORD.	
SHT. 14 OF 15	
D-XXXXX	
C-12	



40 20 0 40
1"=40' HORIZ

PROFILE

4 2 0 4
1"=4' VERT



PLAN
40 20 0 40
1"=40'

Underground Service Alert
DIG BEFORE YOU DIG
Call: TOLL FREE
811
TWO WORKING DAYS BEFORE YOU DIG

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

PLANS PREPARED BY:
43410 BUSINESS PARK DRIVE
TEMECULA, CA 92590
T 951.396.4980

UNDER THE SUPERVISION OF:

RYAN M. HUSTON C60324 6/30/24
PROFESSIONAL ENGINEER R.C.E. No. DATE

ARDURRA
COLLABORATE. INNOVATE. CREATE.

REGISTERED PROFESSIONAL ENGINEER
RYAN M. HUSTON
No. C60324
CIVIL
STATE OF CALIFORNIA

REVISIONS

NO.	DATE	INITIAL	DESCRIPTION	APP'VD/DATE

APPROVED BY:

SENIOR DIRECTOR OF ENGINEERING DATE

REFERENCES

EASTERN MUNICIPAL WATER DISTRICT

PROJECT MANAGER DATE

APPROVALS

	INITIAL	DATE
PROJECT ENGR.		
INSPECTION		
OPERATIONS		
MAINTENANCE		

	DATE
DESIGNED	
DRAWN	
CHECKED	
SUBMITTED	

SCALE: AS SHOWN

EASTERN MUNICIPAL WATER DISTRICT
RIVERSIDE COUNTY, CALIFORNIA

MEAD VALLEY CAJALCO SWR PRELIM DESIGN

PLAN AND PROFILE

STA 129+00 TO STA 138+00

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C-13

APPENDIX E

Hydraulic Analysis Prior to Buildout

Eastern Municipal Water District
Mead Valley Cajalco Sewer Project
Hydraulic Analysis

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Average Dry Weather Flow from Dudek TM		
	(gpd)	(gpm)
School	6735	4.68
Public Facility	4424	3.07
Medium Density Residential	32430	22.52
Total Clark LS Influent Flow	43589	30.2701

Flow Influent to MH #	Reach No.	Intersection	Trib Area (ac)	Ave Dry Influent to MH (gpd)	Ave Dry in Reach (gpd)	Ave Dry in Reach (gpm)	PDWF in Reach (gpm)	V (PDWF) (fps)	PWWF (gpm)	d/D (PWWF)	Slope	Sewer Size	MH Size	MH Depth	Reach Length (ft)	Rim El	CL El	Sta
MH No. 31		Day St		0									48"	9.1		1686.03	1677.3	13450
	30				0	0.00	0.00	0.0	0.00	0	0.0143	8"			400			
MH No. 30				0									48"	10.3		1681.57	1671.6	13050
	29				0	0.00	0.00	0.0	0.00	0	0.0145	8"			400			
MH No. 29		Robinson St		0									48"	10.2		1675.62	1665.8	12650
	28				0	0.00	0.00	0.0	0.00	0	0.0142	8"			400			
MH No. 28		Carroll St		0									48"	9.3		1669.06	1660.1	12250
	27				0	0.00	0.00	0.0	0.00	0	0.0178	8"			500			
MH No. 27				0									48"	10.7		1661.58	1651.2	11750
	26				0	0.00	0.00	0.0	0.00	0	0.0091	8"			350			
MH No. 26				0									48"	11.4		1659.04	1648	11400
	25				0	0.00	0.00	0.0	0.00	0	0.0084	8"			375.28			
MH No. 25		Clark St		43589									48"	12.6		1657.01	1644.86	11024.72
	24				43589	30.27	86.88	2.4	104.25	0.23	0.0088	10"			444.72			
MH No. 24				43589									48"	11.4		1651.7	1640.7	10580
	23				43589	30.27	86.88	2.4	104.25	0.23	0.0089	10"			440			
MH No. 23				43589									48"	9.5		1646	1636.9	10140
	22				43589	30.27	86.88	2.5	104.25	0.22	0.0105	10"			450			
MH No. 22		Haines St		43589									48"	12.5		1644	1632	9690
	21				43589	30.27	86.88	1.7	104.25	0.22	0.004	12"			430			
MH No. 21				43589									48"	12.2		1642	1630.3	9260
	20				43589	30.27	86.88	1.8	104.25	0.22	0.0041	12"			440			
MH No. 20		Florence St		43589									48"	13.0		1641.02	1628.5	8820
	19				43589	30.27	86.88	1.8	104.25	0.22	0.0041	12"			440			
MH No. 19		Brown St		43589									48"	13.1		1639.32	1626.7	8380
	18				43589	30.27	86.88	1.8	104.25	0.22	0.0041	12"			440			
MH No. 18				43589									48"	11.9		1636.34	1624.9	7940
	17				43589	30.27	86.88	1.6	104.25	0.24	0.003	12"			440			
MH No. 17				43589									48"	2.9		1635	1632.6	7500
	16				43589	30.27	86.88	1.6	104.25	0.24	0.003	12"			440			
MH No. 16		Mead St		43589									48"	13.8		1635.64	1622.3	7060
	15				43589	30.27	86.88	1.6	104.25	0.24	0.003	12"			440			
MH No. 15				43589									48"	13.5		1634	1621	6620

Eastern Municipal Water District
Mead Valley Cajalco Sewer Project
Hydraulic Analysis

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Flow Influent to MH #	Reach No.	Intersection	Trib Area (ac)	Ave Dry Influent to MH (gpd)	Ave Dry in Reach (gpd)	Ave Dry in Reach (gpm)	PDWF in Reach (gpm)	V (PDWF) (fps)	PWWF (gpm)	d/D (PWWF)	Slope	Sewer Size	MH Size	MH Depth	Reach Length (ft)	Rim El	CL El	Sta
	14				43589	30.27	86.88	1.6	104.25	0.24	0.003	12"			440			
MH No. 14				43589									48"	17.1		1636.31	1619.7	6180
	13				43589	30.27	86.88	1.6	104.25	0.24	0.003	12"			470			
MH No. 13		Alexander St		43589									48"	17.2		1635.02	1618.3	5710
	12				43589	30.27	86.88	1.5	104.25	0.24	0.0029	12"			480			
MH No. 12				43589									48"	16.6		1633.05	1616.9	5230
	11				43589	30.27	86.88	1.5	104.25	0.24	0.0029	12"			480			
MH No. 11				43589									48"	16.0		1631.04	1615.5	4750
	10				43589	30.27	86.88	1.6	104.25	0.24	0.0031	12"			480			
MH No. 10		Una St		43589									48"	14.0		1627.46	1614	4270
	9				43589	30.27	86.88	2.4	104.25	0.18	0.0094	12"			500			
MH No. 9				43589									48"	9.2		1618.03	1609.3	3770
	8				43589	30.27	86.88	2.2	104.25	0.18	0.0083	12"			60			
MH No. 8		Barton St		43589									48"	9.1		1617.39	1608.8	3710
	7				43589	30.27	86.88	2.0	104.25	0.2	0.0061	12"			460			
MH No. 7				43589									48"	10.5		1616	1606	3250
	6				43589	30.27	86.88	2.5	104.25	0.17	0.011	12"			300			
MH No. 6				43589									48"	12.1		1614.29	1602.7	2950
	5				43589	30.27	86.88	2.1	104.25	0.2	0.0057	12"			300			
MH No. 5				43589									48"	11.2		1611.65	1601	2650
	4				43589	30.27	86.88	3.0	104.25	0.15	0.0194	12"			360			
MH No. 4				43589									48"	11.5		1604.97	1594	2290
	3				43589	30.27	86.88	2.8	104.25	0.16	0.0155	12"			380			
MH No. 3				43589									48"	9.9		1597.48	1588.1	1910
	2				43589	30.27	86.88	2.8	104.25	0.16	0.016	12"			400			
MH No. 2				43589									48"	11.6		1595	1583.9	1510
	1				43589	30.27	86.88	2.5	104.25	0.17	0.0048	12"			380.38			
MH No. 1		Carpinus Dr		43589									48"	12.8		1592	1579.67	1129.62

Total Quantities

12" PVC	8560.38
10" PVC	1334.72
8" PVC	2425.28
Total Length	12320.38

APPENDIX F

Potential Upsizing Hydraulic Analysis

Eastern Municipal Water District
Mead Valley Cajalco Sewer Project
Hydraulic Analysis

Average Dry Weather Flow from Dudek TM		
	(gpd)	(gpm)
School	6735	4.68
Public Facility	4424	3.07
Medium Density Residential	32430	22.52
Total Clark LS Influent Flow	43589	30.2701

Flow Influent to MH #	Reach No.	Intersection	Trib Area (ac)	Ave Dry Influent to MH (gpd)	Ave Dry in Reach (gpd)	Ave Dry in Reach (gpm)	Design PDWF in Reach (gpm)	Design V (PDWF) (fps)	Max PWWF (gpm)	Max d/D (PWWF)	Slope	Sewer Size	MH Size	MH Depth	Reach Length (ft)	Rim El	CL El	Sta
MH No. 31		Day St	0	0									48"	9.1		1686.03	1677.3	13450
	30	limited by V	6.16		7238	5.03	14.43	1.7	324.52	0.12	0.0143	8"			400			
MH No. 30				7238									48"	10.3		1681.57	1671.6	13050
	29	limited by V	5.61		13830	9.60	27.56	2.1	326.78	0.5	0.0145	8"			400			
MH No. 29		Robinson St		13830									48"	10.2		1675.62	1665.8	12650
	28		5.55		20351	14.13	40.56	2.0	1424.98	0.45	0.0142	15"			400			
MH No. 28		Carroll St		20351									48"	9.3		1669.06	1660.1	12250
	27		9.83		31901	22.15	63.58	2.6	1424.98	0.42	0.0178	15"			500			
MH No. 27				31901									48"	10.7		1661.58	1651.2	11750
	26		6.13		39104	27.16	77.94	2.1	1424.98	0.51	0.0091	15"			350			
MH No. 26				39104									48"	11.4		1659.04	1648	11400
	25		4.69		44615	30.98	88.92	2.2	1424.98	0.53	0.0084	15"			375.28			
MH No. 25		Clark St		88204									48"	12.6		1657.01	1644.86	11024.72
	24		4.93		93997	65.28	187.34	2.7	1424.98	0.52	0.0088	15"			444.72			
MH No. 24				93997									48"	11.4		1651.7	1640.7	10580
	23		4.5		99284	68.95	197.88	2.9	1424.98	0.52	0.0089	15"			440			
MH No. 23				99284									48"	9.5		1646	1636.9	10140
	22		4.47		104536	72.59	208.35	3.0	1424.98	0.49	0.0105	15"			450			
MH No. 22		Haines St		104536									48"	12.5		1644	1632	9690
	21		7.39		113220	78.62	225.65	2.2	1424.98	0.67	0.004	15"			430			
MH No. 21				113220									48"	12.2		1642	1630.3	9260
	20		5.33		119482	82.97	238.13	2.3	1424.98	0.66	0.0041	15"			440			
MH No. 20		Florence St		119482									48"	13.0		1641.02	1628.5	8820
	19		3.76		123900	86.04	246.94	2.3	1424.98	0.66	0.0041	15"			440			
MH No. 19		Brown St		123900									48"	13.1		1639.32	1626.7	8380
	18				123900	86.04	246.94	2.3	1424.98	0.66	0.0041	15"			440			
MH No. 18				123900									48"	11.9		1636.34	1624.9	7940
	17				123900	86.04	246.94	2.1	1424.98	0.74	0.003	15"			440			
MH No. 17				123900									48"	2.9		1635	1632.6	7500
	16				123900	86.04	246.94	2.1	1424.98	0.74	0.003	15"			440			
MH No. 16		Mead St		123900									48"	13.8		1635.64	1622.3	7060
	15				123900	86.04	246.94	2.1	1424.98	0.74	0.003	15"			440			
MH No. 15				123900									48"	13.5		1634	1621	6620

Eastern Municipal Water District
Mead Valley Cajalco Sewer Project
Hydraulic Analysis

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Flow Influent to MH #	Reach No.	Intersection	Trib Area (ac)	Ave Dry Influent to MH (gpd)	Ave Dry in Reach (gpd)	Ave Dry in Reach (gpm)	Design PDWF in Reach (gpm)	Design V (PDWF) (fps)	Max PWWF (gpm)	Max d/D (PWWF)	Slope	Sewer Size	MH Size	MH Depth	Reach Length (ft)	Rim El	CL El	Sta
	14				123900	86.04	246.94	2.1	1424.98	0.74	0.003	15"			440			
MH No. 14				123900									48"	17.1		1636.31	1619.7	6180
	13				123900	86.04	246.94	2.1	1424.98	0.74	0.003	15"			470			
MH No. 13		Alexander St		123900									48"	17.2		1635.02	1618.3	5710
	12	limiting reach, max d/D			123900	86.04	246.94	2.1	1424.98	0.75	0.0029	15"			480			
MH No. 12				123900									48"	16.6		1633.05	1616.9	5230
	11	limiting reach, max d/D			123900	86.04	246.94	2.1	1424.98	0.75	0.0029	15"			480			
MH No. 11				123900									48"	16.0		1631.04	1615.5	4750
	10	third limiting reach, max d/D			123900	86.04	246.94	2.1	1473.30	0.75	0.0031	15"			480			
MH No. 10		Una St		123900									48"	14.0		1627.46	1614	4270
	9				123900	86.04	246.94	3.1	1833.29	0.6	0.0094	15"			500			
MH No. 9				123900									48"	9.2		1618.03	1609.3	3770
	8				123900	86.04	246.94	3.0	1833.29	0.62	0.0083	15"			60			
MH No. 8		Barton St		123900									48"	9.1		1617.39	1608.8	3710
	7				123900	86.04	246.94	2.7	1833.29	0.69	0.0061	15"			460			
MH No. 7				123900									48"	10.5		1616	1606	3250
	6				123900	86.04	246.94	3.3	1833.29	0.58	0.011	15"			300			
MH No. 6				123900									48"	12.1		1614.29	1602.7	2950
	5				123900	86.04	246.94	2.6	1833.29	0.72	0.0057	15"			300			
MH No. 5				123900									48"	11.2		1611.65	1601	2650
	4				123900	86.04	246.94	4.0	1833.29	0.49	0.0194	15"			360			
MH No. 4				123900									48"	11.5		1604.97	1594	2290
	3				123900	86.04	246.94	3.7	1833.29	0.51	0.0155	15"			380			
MH No. 3				123900									48"	9.9		1597.48	1588.1	1910
	2				123900	86.04	246.94	3.7	1833.29	0.49	0.016	15"			400			
MH No. 2				123900									48"	11.6		1595	1583.9	1510
	1	second limiting reach, max d/D			123900	86.04	246.94	2.6	1833.29	0.75	0.0048	15"			380.38			
MH No. 1		Carpinus Dr		123900									48"	12.8		1592	1579.67	1129.62

Total Quantities

12" PVC	8560.38
10" PVC	1334.72
8" PVC	2425.28
Total Length	12320.38

APPENDIX G

Clark Lift Station Condition Assessment Field Report

4.34 L3526 Clark St LS

Site Information



Figure 4.34-1 – Clark St LS Location Map [33.8369822, -117.2878794]

Clark St LS is located near 19519 Clark St in Perris, CA. Upgraded in 1993, it has the capacity for 150 gpm with two pumps in service. The following components were assessed by V&A during the condition assessment:

1. Pump Assemblies
2. Wet Wells

Non-destructive testing (UT and DFT) locations for Green Acres LS are illustrated in Figure 4.34-2 below.

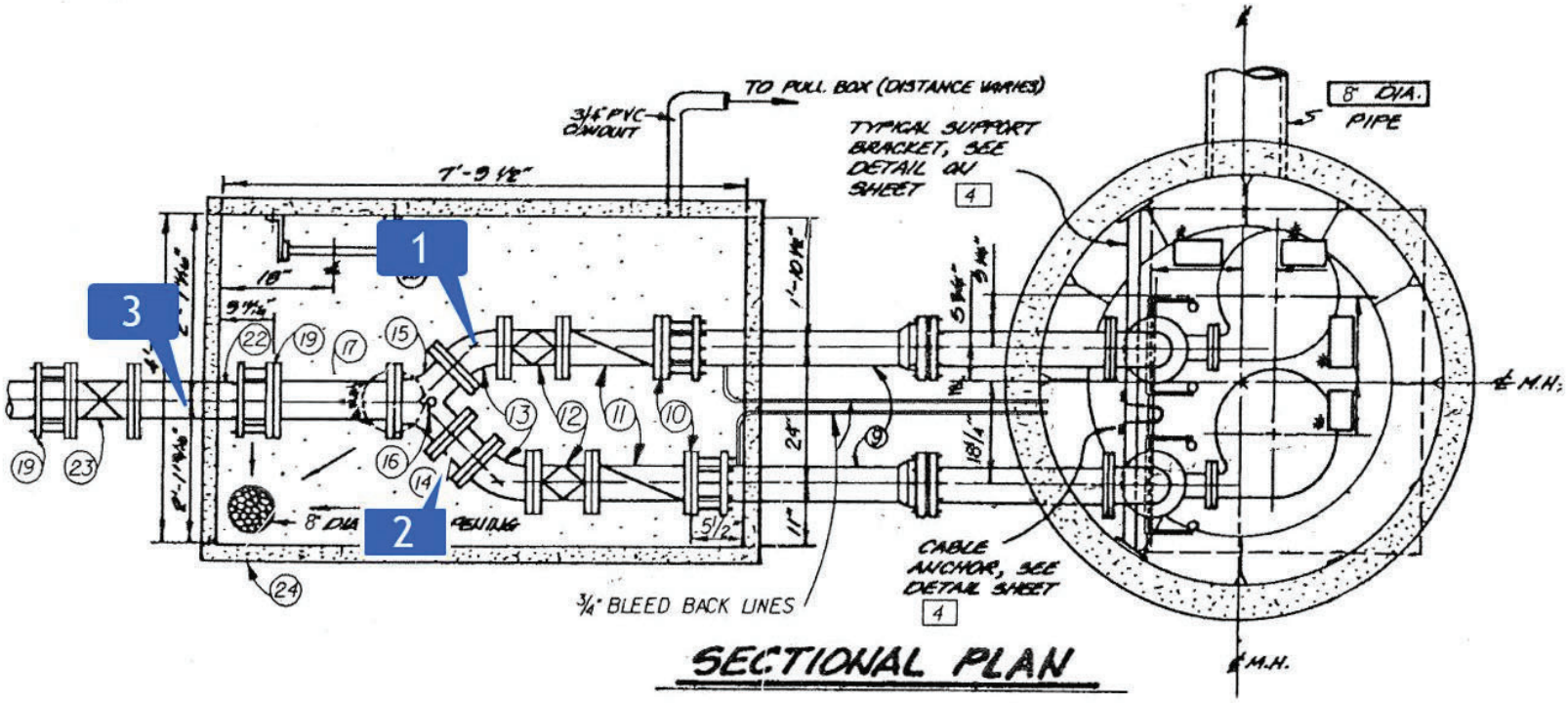


Figure 4.34-2 - Non-Destructive Testing Locations

Findings

Pump Assemblies

UT and DFT measurements 1-3 were taken at the locations shown in Figure 4.34-2. Band 4 was taken on the 8-in potable water regulated zone piping, with the UT/DFT reading location shown in the photos. The piping consisted primarily of 6-in ductile iron pipe. The results of the UT and DFT testing are shown in the tables below.

Table 4.34-1 - UT Measurements

Band	Piping	Minimum (inches)	Maximum (inches)	Average (inches)	Max. Wall Loss (in.)	Maximum Metal Loss (%)
1	Pump Assembly 1	0.121	0.127	0.124	0.129	52%(1)
2	Pump Assembly 2	0.128	0.185	0.144	0.122	49%(1)
3	Common Discharge	0.420	0.426	0.418	0.010	2%
4	Potable Water Zone Piping	0.303	0.319	0.309	0.027	8%

(1) Assumed nominal thickness of 0.25-in, UT readings questionable

Table 4.34-2 - DFT Measurements

Band	Piping	Minimum (mils)	Maximum (mils)	Average (mils)	Recommended thickness (mils)(1)
1	Pump Assembly 1	8.2	14.8	11.6	6 to 9
2	Pump Assembly 2	7.5	19.1	12.6	6 to 9
3	Common Discharge	5.6	9.8	7.8	6 to 9
4	Potable Water Zone Piping	1.0	1.9	1.4	6 to 9

(1) Piping exposed to sunlight is recommended to have 4 to 6 mils of epoxy coating with an additional 2 to 3 mils of aliphatic polyurethane

Photo 4.34-1 through Photo 4.34-6 illustrate the general condition of the pump assemblies at Clark St LS.



Photo 4.34-1 – Pump Assemblies 1-2



Photo 4.34-2 – Pump Assemblies 1-2



Photo 4.34-3 – Common header



Photo 4.34-4 – Rust staining at flanges/bolts where coating has thinned (typical)



Photo 4.34-5 – Mead Valley Regulated Zone Piping Assembly



Photo 4.34-6 – Regulated Zone Piping Assembly UT-4 location

Comments: Piping and coating in good overall condition, surface corrosion evident where coating has thinned or flaked off

Condition Rating: 2

Wet Wells

Photo 4.34-7 through Photo 4.34-12 illustrate the general condition of the Wet Well at Clark St LS.



Photo 4.34-7 – Wet well exterior



Photo 4.34-8 – Wet well, topside



Photo 4.34-9 – Submersible pump discharge piping heavily corroded throughout



Photo 4.34-10 – Coating failure and corrosion on discharge piping (closeup)



Photo 4.34-11 – Wet well interior (closeup)



Photo 4.34-12 – Wet well interior (closeup)

Comments:
-Wet well liner in good condition
-Wet well submersible pump discharge piping coating is failing with heavy corrosion throughout
Condition Rating: 3

Additional findings:



Photo 4.34-13 – Corrosion throughout electrical panels



Photo 4.34-14 – Corrosion throughout electrical panels (typical)

Recommendations

Based on the findings of the Clark St LS condition assessment, V&A recommends the following for Hazen & Sawyer and the District to consider:

1. Touch-up coating as needed at flanges/bolts throughout aboveground piping, including the uncoated spool on the potable water piping.

2. Replace submersible pump discharge piping with fusion bonded epoxy-coated and lined steel piping.

APPENDIX H

Draft Geotechnical Investigation Report



GEOTECHNICAL INVESTIGATION

EASTERN MUNICIPAL WATER DISTRICT
MEAD VALLEY SEWER IMPROVEMENTS

Riverside County, California

PREPARED FOR:

Mr. Nate Olivas
Eastern Municipal Water District
2270 Trumble Road
Perris, California 92570

PREPARED BY:

Atlas Technical Consultants LLC
6280 Riverdale Street
San Diego, California 92120

DRAFT

January 13, 2023

DRAFT

6280 Riverdale Street
San Diego, CA 92120
(877) 215-4321 | oneatlas.com

January 13, 2023

Atlas No. 190063P4.2
Report No. 1962-1

MR. NATE OLIVAS
EASTERN MUNICIPAL WATER DISTRICT
2270 TRUMBLE ROAD
PERRIS, CALIFORNIA 92570

Subject: **Geotechnical Investigation**
Mead Valley Sewer Improvements
Eastern Municipal Water District
Riverside County, California

Dear Mr. Olivas,

In accordance with your request and our proposal No. 22-04013R2, Atlas performed a geotechnical investigation to assess the geologic conditions for the project, including potential geologic hazards, and to provide recommendations based on our findings. Our investigation consisted of a review of readily available geologic literature, site reconnaissance, exploratory borings, limited hydrogeologic testing and analysis, geotechnical laboratory testing, and the preparation of this report.

We appreciate the opportunity to be of service on this project. Should you have any questions related to this report, please contact the undersigned at your convenience.

Respectfully submitted,
Atlas Technical Consultants LLC

DRAFT ONLY – DO NOT RELY ON THIS REPORT

Jason Dale, EIT
Project Manager

DRAFT ONLY – DO NOT RELY ON THIS REPORT

Doug Skinner, PG 2472
Senior Engineering Geologist

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APPENDICES

Appendix I Subsurface Exploration
Appendix II Laboratory Testing

1. INTRODUCTION

This report presents the results of the geotechnical investigation Atlas performed for the subject project. It is our understanding the project will consist of the design and construction of approximately 3½ miles of new sewer pipeline along Cajalco Road in Riverside County, California. Figure 1 presents the site vicinity.

2. SCOPE OF WORK

2.1 Investigations and Monitoring Wells

Atlas performed a geologic investigation to address potential geologic hazards and geotechnical conditions that could impact the proposed construction. Pertinent documents reviewed included published reports and mapping, aerial photographs, in-house geotechnical reports, and available reports by others. Atlas explored subsurface conditions by drilling thirteen (13) borings to depths of up to approximately 41½ feet below the existing ground surface using limited access and truck-mounted drill rigs equipped with a hollow stem auger in September 2022. Additionally, Atlas will install two temporary groundwater monitoring wells to a depth of about 40 feet below ground surface in January 2023. Figure 2 presents the approximate locations and depths of the borings and proposed monitoring wells.

An Atlas engineer and geologist logged the borings and collected samples of the material encountered for geotechnical laboratory testing. Soils and rocks recovered during the field investigation were observed in the field for soil and/or groundwater contamination with visual and olfactory methods. Soils were classified according to the Unified Soil Classification System illustrated in the Subsurface Exploration Legend (Appendix I). The rocks encountered were classified in general accordance with the California Department of Transportation (Caltrans) rock classification system. The boring logs are presented in Appendix I.

2.2 Geophysical Survey

The scope of our work also included performing a geophysical survey at select locations on the project alignment. The geophysical study is currently underway and will be included in the final report.

2.3 Laboratory Testing

Selected samples from the exploratory borings were tested to evaluate pertinent soil classification and engineering properties. The laboratory testing consisted of in-situ moisture and density, particle-size distribution, percent finer than #200 sieve, corrosivity, direct shear, expansion index, Atterberg limits, and R-value. The laboratory testing standards and results are presented in Appendix II.

2.4 Analysis and Report Preparation

The results of the field and laboratory tests were evaluated to develop conclusions and recommendations, including the following:

- A plot plan showing the boring locations
- Exploration logs with soil characterization detailing the subsurface conditions noted at the boring locations
- A description of the above ground geologic conditions
- Groundwater levels and the necessity for dewatering
- Excavation characteristics of the subsurface materials encountered
- Backfill recommendations and the suitability of excavated materials for use as backfill and bedding
- Allowable temporary excavation side slope and shoring recommendations
- Lateral earth pressures and resistance to lateral loads
- Support for the pipeline
- Potential pipeline settlements
- Appropriate types of bedding and backfill materials as well as placement and compaction procedures
- Soil modulus E' for pipeline design
- Subgrade compaction beneath pavements
- New flexible pavement structural sections
- Corrosivity of earth materials

3. SITE AND PROJECT DESCRIPTION

The project alignment is along Cajalco Road between Wood Road and Robinson Street in Riverside County, California. The site topography descends towards the east, with site elevations along the alignment ranging from approximately 1577 to 1671 above mean sea level.

4. GEOLOGY AND SUBSURFACE CONDITIONS

The site is located within the Peninsular Ranges Geomorphic Province of California, which stretches from the Los Angeles basin south into Baja California. This province is characterized as a series of northwest-trending mountain ranges separated by subparallel fault zones and a coastal plain of subdued landforms. The mountain ranges are underlain primarily by Mesozoic metamorphic rocks that were intruded by plutonic rocks of the southern California batholith, while the coastal plain is underlain by subsequently deposited marine and non-marine sedimentary formations. The site is located in the coastal plain. The materials observed in our borings consisted of fill, very old axial-channel deposits, young wash deposits, and Val Verde tonalite

(granitic rock). Figure 3 presents the regional geology, and descriptions of the materials encountered are provided below.

Fill (Qf): Fill was encountered in some of our borings below the existing ground surface and extends to depths of up to approximately 5 feet below ground surface. The fill materials encountered generally consisted of moist, medium dense sandy silt, silty sand, and clayey sand. Debris and boulders may be encountered.

Very old axial-channel deposits (Qvoa): Very old axial-channel deposits were encountered in a number of our borings at both existing ground surface and below the fill and extends up to about 24 feet below ground surface. The materials encountered generally consisted of moist, loose to medium dense poorly graded sand with silt, and loose to dense silty and clayey sand.

Young wash deposits (Qywa): Young wash deposits were encountered below fill in Borings B-12S and B-13S and extends to a depth of up to approximately 18 feet below ground surface. The materials encountered generally consisted of moist, medium dense to very dense silty and clayey sand.

Val Verde tonalite (Kvt): Val Verde tonalite was encountered in each of the borings below the surficial soils and extends to the total depths explored. The materials encountered generally consisted of intensely weathered to decomposed, very soft igneous rock. The excavated material could be characterized as moist to wet, poorly graded sand with silt or clay, silty and clayey sand, sandy silt, and hard, lean clay with sand. Gravels and cobble may be expected. Boulders are possible.

Groundwater: Groundwater was observed as shallow as 18 feet below existing ground surface. Available literature indicates the groundwater could be shallower than approximately 10 feet below ground surface near Boring B-15S (SWRCB, 2022). It should be recognized that groundwater conditions may vary at a site over time. Fluctuations in the groundwater level may occur due to variations in ground surface topography, subsurface geologic conditions and structure, rainfall, irrigation, broken pipes, changes in site drainage, and other factors. These types of conditions can be most effectively assessed at the time of construction. Table 1 presents the observed groundwater levels relative to the ground surface.

To assist in assessing groundwater levels during construction, temporary groundwater monitoring wells will be installed at boring locations B-2S and B-6S to observe the groundwater activity. The monitoring wells should be periodically monitored, and groundwater elevations be recorded by a qualified individual. A diagram presenting the well construction is in Appendix I.

Table 1: Observed Groundwater Level

Boring Location	Depth to Encountered Groundwater (ft)	Boring Location	Depth to Encountered Groundwater (ft)
B-1S	22	B-9S	25
B-2S	*Pending*	B-10S	27
B-3S	26	B-11S	Not encountered
B-4S	18	B-12S	39
B-5S	33	B-13S	Not encountered
B-6S	*Pending*	B-14S	29
B-7S	37	B-15S	28
B-8S	Not encountered	*Empty*	

4.1 Geologic Hazards

4.1.1 Fault-Rupture Hazard

Faulting in the Riverside County area is dominantly characterized by a series of Quaternary-age and older fault zones that typically consist of several individual echelon faults, generally striking in a northerly to northwesterly direction. Active fault zones are those that have shown conclusive evidence of faulting during the Holocene Epoch (the most recent 11,000 years) while potentially active fault zones have demonstrated movement during the Pleistocene Epoch (11,000 to 2.6 million years before the present) but no evidence of movement during Holocene time. Faults that can be shown to have experienced no movement within the Holocene or Pleistocene Epochs are generally considered to be inactive. The closest active fault, the Glen Ivy North fault, is about 10 miles west of the site (Jennings, 2010). Figure 4 presents the California fault activity. The project alignment is not located in an Alquist-Priolo Earthquake Fault Zone. No signs of faulting and no active faults are known to underlie or project toward the site. The probability of fault rupture is considered negligible.

4.1.2 CBC Seismic Design Parameters

A geologic hazard likely to affect the project is ground shaking because of movement along an active fault zone in the vicinity of the subject site (USGS, 2020). Based on the subsurface conditions encountered during our investigation and available online resources (Wills et al. 2015), the alignment could generally be classified as Site Class C. The mapped site coefficients and adjusted earthquake spectral response parameters in accordance with the 2019 CBC are presented below in Table 2. Please note that the seismic parameters are provided for the approximate coordinates tabulated for the site.

Table 2: 2019 California Building Code / ASCE 7-16 Site Specific Seismic Parameters

Site Coordinates	
Latitude	Longitude
33.8391°	-117.2819°
Site Coefficients and Spectral Response Acceleration Parameters	**Values**
Site Class	C – Very Dense Soil
Site Coefficients, F_a	1.2
Site Coefficients, F_v	1.446
Spectral Response Acceleration at Short Period, S_s	1.5g
Spectral Response Acceleration at 1-Second Period, S_1	0.554g
Design Spectral Acceleration at Short Period, S_{DS}	1.2g
Design Spectral Acceleration at 1-Second Period, S_{D1}	0.534g
Site Modified Peak Ground Acceleration, PGA_M	0.6g

4.1.3 Liquefaction and Dynamic Settlement

Liquefaction occurs when loose, saturated, generally fine sands and silts are subjected to strong ground shaking. The soils lose shear strength and become liquid, potentially resulting in large total and differential ground surface settlement as well as possible lateral spread during an earthquake. Liquefiable material is not mapped along the project alignment. Because of the relatively dense soils and depth to groundwater, it is our opinion that the potential liquefaction and dynamic settlement significantly affecting the proposed project is low.

4.1.4 Flooding, Tsunamis, and Seiches

Flood Insurance Rate Maps via the Federal Emergency Management Agency (FEMA) Flood Hazard Map online database were reviewed to evaluate if the subject site is located within an area susceptible to flooding (FEMA, 2022). The project site is designated as Flood Hazard Zone A, which designates the areas with a 1% annual chance of flooding and a 26% chance of flooding over the life of a 30-year mortgage. Published depth or base flood elevations are not provided for Zone A. The potential for flooding should be considered.

The site is not located within a mapped area on the State of California Tsunami Inundation Maps (CDC, 2022b). Seiches are periodic oscillations in large bodies of water such as lakes, harbors, bays, or open reservoirs. The site is not located adjacent to any bodies of water subject to seiches.

4.1.5 Landslides and Slope Stability

There are no mapped or known landslides underlying or adjacent to the project site (CDC, 2021a). Additionally, evidence of slope instabilities or landslides was not observed at the time of our site reconnaissance. The potential for slope instabilities or landslides to affect the site is considered low.

4.1.6 Subsidence

The project is not located in an area of known subsidence associated with fluid withdrawal (groundwater or petroleum) (USGS, 2022). Due to this, as well as the presence of very dense deposits, the potential for subsidence is low.

4.1.7 Hydro-Consolidation

Hydro-consolidation can occur in recently deposited sediments (less than 10,000 years old) that were deposited in a semi-arid environment. Examples of such sediments are eolian sands, alluvial fan deposits, and mudflow sediments deposited during flash floods. The pore spaces between the particle grains can re-adjust when inundated by groundwater, causing the material to consolidate. Due to the relatively dense and moist nature of the material encountered beneath the site, the potential for hydro-consolidation occurrence in the subsurface layers is considered low.

5. CONCLUSIONS

Based on the results of our investigation, we consider the project feasible from a geotechnical standpoint provided that the recommendations of this report are followed. In our opinion, the site conditions are suitable to install the pipelines using traditional open excavation trenching techniques; however, the contractor should be prepared for excavating in very dense granular materials, as well as igneous rock formations. The presence of cobbles and boulders are also expected at the site. There are no known geologic hazards of sufficient magnitude that preclude the intended improvements. The main geotechnical considerations affecting the project is the potential for difficult trench excavations and potentially groundwater. The materials anticipated below the pipeline depths are generally expected to provide good pipeline support. However, dewatering is anticipated depending on the elevation of groundwater at the time of construction.

6. RECOMMENDATIONS

The remainder of this report presents recommendations regarding earthwork construction as well as preliminary geotechnical recommendations for the design of the proposed improvements. These recommendations are based on empirical and analytical methods typical of the standard-of-practice in southern California. If these recommendations appear not to address a specific feature of the project, please contact our office for additions or revisions to the recommendations.

6.1 Earthwork

Grading and earthwork should be conducted in accordance with the local standards and the recommendations of this report. The following recommendations are provided regarding specific aspects of the proposed earthwork construction. These recommendations should be considered subject to revision based on field conditions observed by our office during construction.

6.1.1 Site Preparation

Site preparation should begin with the removal of existing improvements, vegetation, and debris. Subsurface improvements that are to be abandoned should be removed, and the resulting excavations should be backfilled and compacted in accordance with the recommendations of this report. Pipeline abandonment can consist of capping or rerouting at the project perimeter and removal within the project perimeter. If appropriate, abandoned pipelines can be filled with grout or slurry as recommended by and observed by the geotechnical consultant.

6.1.2 Excavation Characteristics

It is anticipated that excavation can be achieved with heavy-duty earthwork equipment in good working order. Excavations in fill may be locally unstable and may contain construction debris, cobbles, or boulders. Difficult drilling and excavation should be anticipated in areas with dense to very dense granular materials and/or igneous rock. The contractor should mobilize equipment capable of excavating granitic materials with variable fracturing, weathering, rock abrasiveness, and strength/hardness rock conditions. Rock breakers, carbide tipped teeth, or carbide/diamond tipped coring equipment may be required to excavate/drill hard rock materials.

6.1.3 Oversized Material

Excavations may generate oversized material. Oversized material is defined as rocks or cemented clasts greater than 6 inches in largest dimension. Oversized material should be broken down to no greater than 6 inches in largest dimension for use toward non-structural fill purposes, such as landscape fill, or disposed of outside the site perimeter.

6.1.4 Temporary Excavations

Temporary excavations 4 feet deep or less can be made vertically. Temporary excavations deeper than 4 feet should not be steeper than 1½:1 (horizontal: vertical), per Cal/OSHA Type C soil classification. Excavations in competent bedrock can be made vertically. Unweathered (i.e., fresh), unfractured rock is considered competent. The faces of temporary slopes should be inspected daily by the contractor's competent person before personnel are allowed to enter the excavation. Zones of potential instability, sloughing, or raveling should be brought to the attention of the engineer and corrective action implemented before personnel begin working in the trench.

Slopes steeper than those described above will require shoring. Soldier piles and lagging, corrugated metal pipe, internally braced shoring such as trench boxes or speed shoring could be used. If trench boxes or metal pipe are used, the soil immediately adjacent to the shoring is not directly supported. Ground surface deformations adjacent to the excavation could be greater when these methods are used compared to other methods of shoring leading to distress to overlying improvements.

If open trenches are to be maintained during the rainy season, berms are recommended along the tops of the trenches to prevent runoff water from entering the excavation.

6.1.5 Temporary Shoring

For design of cantilevered shoring, an active soil pressure equal to a fluid weighing 40 pounds per cubic foot (pcf) can be used for level retained ground or 65 pcf for 2:1 (horizontal:vertical) sloping ground. A passive soil pressure equal to a fluid weighing 330 pcf can be used for the design of cantilevered shoring. These values assume that shoring will take place above the groundwater level. The passive pressure should be reduced by one half below the groundwater table. The surcharge loads on shoring from traffic and construction equipment adjacent to the excavation can be modeled by assuming an additional 2 feet of soil behind the shoring.

6.1.6 Temporary Dewatering

Groundwater was observed as shallow as 18 feet below existing ground surface. Available literature indicates the groundwater could be shallower than approximately 10 feet. Groundwater seepage may occur locally due to local irrigation or following heavy rain. An experienced and qualified specialty contractor should design the dewatering system. The contractor's geotechnical engineer should review the design.

6.1.7 Remedial Grading – Manhole Foundations

Proposed manhole foundations can be supported by firm and unyielding formational material, 2 feet of compacted fill, or geogrid. If placed on compacted fill, the on-site soils should be excavated to a depth of at least 2 feet below planned subgrade elevation. If competent, formational materials are exposed, excavation need not be performed. An Atlas representative should observe conditions exposed in the bottom of excavations to evaluate whether additional excavation is recommended.

6.1.8 Expansive Soil

The on-site materials tested have expansion indices ranging from 18 to 38, classified as very low to low expansion potential. The grading and foundation recommendations presented in this report assume materials with a low expansion potential.

6.1.9 Compacted Fill

On-site materials, except for soil containing roots, debris, and rock greater than 6 inches, can be used as compacted fill or trench backfill. Fill and backfill should be placed in horizontal lifts at a thickness appropriate for the equipment spreading, mixing, and compacting the material, but generally should not exceed 8 inches in loose thickness. Fill and backfill should be moisture conditioned within 2% of optimum moisture content and compacted to at least 90% relative compaction. The top 12 inches of subgrade beneath pavement should be compacted to at least 95%. The maximum dry density and optimum moisture content for evaluating relative compaction should be obtained using ASTM D1557.

6.1.10 Imported Soil

Imported soil should consist of predominately granular soil, free of organic matter, and rocks less than 6 inches. Imported soil should be observed and, if appropriate, tested by Atlas prior to transport to the site.

6.1.11 Bottom Stabilization

Although not anticipated, in areas encountering wet, soft or yielding excavations bottoms, a geogrid reinforced soil mat could be installed to provide support for proposed manhole foundation construction. To stabilize soft or yielding bottoms, Atlas recommends placing one layer of Tensar® Triax TX-160 reinforcing geogrid or equivalent on the removal surface (e.g. excavation bottom) followed by at least 6 inches of aggregate base compacted using lightweight equipment to a relative compaction of 90%. A second layer of geogrid followed by at least 6 inches of compacted based should be placed. If yielding is still observed upon proof rolling, an additional layer of geogrid should be placed on the compacted base followed by at least 6 inches of aggregate base.

6.1.12 Grading Plan Review

Atlas should review the grading plans and earthwork specifications to ascertain whether the intent of the recommendations contained in this report have been implemented, and that no revised recommendations are needed due to changes in the development scheme.

6.2 Pipelines

6.2.1 Pipeline Support

It is anticipated that most of the materials along the pipeline alignment will provide adequate support for the pipe, although loose, soft, and otherwise unsuitable materials could be encountered. Unsuitable materials encountered near trench bottom levels should be excavated to competent material as determined by the geotechnical consultant. The excavated materials can be replaced with compacted fill or with pipe bedding material, as described below. Unsuitable materials should be removed from the full width of the trench. The bottoms of the excavations should be observed by the geotechnical consultant prior to placement of pipe bedding.

6.2.2 Backfill

Utility trench sections should conform to the minimum requirements of the EMWD and local jurisdictions. Backfill should be placed in 6-inch to 8-inch thick loose lifts, moisture conditioned to near optimum moisture content, and compacted to at least 90% relative compaction.

On-site materials, except for soil containing roots, debris, and rock greater than 6 inches, can be used as compacted fill or trench backfill, provided that they have an expansion index of 50 or less. The maximum dry density and optimum moisture content for the evaluation of relative compaction should be determined in accordance with ASTM D1557.

6.2.3 Pipe Bedding

Pipe bedding as specified in the “Greenbook” can be used. Bedding material should consist of clean sand having a sand equivalent not less than 30 and should extend to at least 12 inches above the top of pipe. Alternative materials meeting the intent of the bedding specifications are also acceptable. Samples of materials proposed for use as bedding should be provided to the engineer for inspection and testing before the material is imported for use on the project. The on-site materials are not expected to meet “Greenbook” bedding specifications. The pipe bedding material should be placed over the full width of the trench. After placement of the pipe, the bedding should be brought up uniformly on both sides of the pipe to reduce the potential for unbalanced loads. No voids or uncompacted areas should be left beneath the pipe haunches. Ponding or jetting the pipe bedding should not be allowed.

6.2.4 Thrust Blocks

For level ground conditions, a passive earth pressure of 330 pounds per square foot (psf) per foot of depth below the lowest adjacent final grade can be used to compute allowable thrust block resistance. A value of 140 psf per foot should be used below groundwater level, if encountered.

6.2.5 Modulus of Soil Reaction

A modulus of soil reaction (E’) of 1,000 pounds per square inch can be used to evaluate the deflection of buried flexible pipelines. This value assumes that granular bedding material is placed adjacent to the pipe and is compacted to at least 90% relative compaction.

6.3 Manholes

6.3.1 Foundations

The planned manholes can be supported on mat foundations with bottom levels on compacted fill, reinforced geogrid mats, or competent formational material.

Thickness and reinforcement of the mat foundation should be in accordance with the recommendations of the project structural engineer. Mat foundations typically experience some deflection due to loads placed on the mat and the reaction of the soils underlying the mat. A design modulus of subgrade reaction, K, of 150 pounds per cubic inch (pci) may be used in evaluating such deflections on dense to very dense granular soils or formational materials, and 75 pci on other loose soils. These values are based on an area of one square foot and should be adjusted for large mats. Adjusted values of the modulus of subgrade reaction, K_{BxB}, can be obtained from the following equation for square mats of various widths:

$$K_{B\times B} = K\left[\frac{\mathrm{B}+1}{2\mathrm{B}}\right]^2 (pci)$$

Where, B is the width of the mat in feet.

Where the mat slab is rectangular, adjusted values of the modulus of subgrade reaction, K', can be obtained from the following equation:

$$K' = \frac{K_{B\times B}(1 + 0.5\left(\frac{B}{L}\right))}{1.5}(pci)$$

Where, B is the width and L is the length of the mat in feet.

6.3.2 Allowable Soil Bearing Pressure

The planned manholes can be supported on mat foundations with bottom levels on compacted fill, reinforced geogrid mats, or competent formational material. An allowable bearing capacity of 3,000 psf can be used. The bearing value can be increased by ⅓ when considering short term loads.

Lateral loads will be resisted by friction between the bottoms of footings and passive pressure on the faces of footings and other structural elements below grade. An allowable coefficient of friction of 0.30 can be used. Passive pressure can be computed using a lateral pressure value of 300 psf per foot of depth below the ground surface for level ground conditions. Reductions for sloping ground should be made. The passive pressure can be increased by ⅓ when considering the total of loads, including wind or seismic forces. The upper 1 foot of soil should not be relied on for passive support unless the ground is covered with pavements or slabs.

6.3.3 Manhole Backfill

Manhole backfill should consist of granular, free-draining material having a sand equivalent of 20 or more. The backfill zone is defined by a 1:1 plane projected upward from the bottom of the manhole. Expansive or clayey soil should not be used. Backfill should be compacted to at least 90% relative compaction. Backfill should not be placed until the manhole walls have achieved adequate structural strength. Compaction of manhole backfill will be necessary to minimize settlement of the backfill and overlying settlement-sensitive improvements. However, some settlement should still be anticipated. Alternatively, a controlled low-strength material such as sand cement slurry may be considered for backfill. The controlled low-strength material should be thoroughly consolidated, have a maximum slump of 4 inches, and the slurry combined graded should meet the requirements of the local authority with jurisdiction.

6.4 Preliminary Pavement Section Recommendations

Atlas utilized the Caltrans Highway Design Manual (Caltrans, 2020) to prepare preliminary recommendations for flexible pavements. An R-value of 13 and assumed Traffic Indexes of 7, 9, and 11 were used for the design of preliminary pavement sections. The actual subgrade support characteristics should be evaluated after grading and final pavement sections are provided. Table 3 presents recommended flexible structural sections for the assumed Traffic Indexes and subgrade R-value:

Table 3: Preliminary Pavement Structural Sections

Traffic Type	Traffic Index	AC[1] over AB[2] (inches)	Full Depth AC (inches)
Roadways	7.0	6 over 10	11
	9.0	6 over 18	16
	11.0	10 over 18	22

[1] AC: Asphalt Concrete
[2] AB: Aggregate Base

The top 12 inches of subgrade should be scarified, moisture conditioned to near optimum moisture content, and compacted to at least 95% relative compaction (ASTM D1557). Soft or yielding areas should be removed and replaced with compacted fill or aggregate base. Aggregate base and asphalt concrete should conform to the Caltrans Standard Specifications and should be compacted to at least 95% relative compaction. Aggregate base should have an R-value of not less than 78. All materials and methods of construction should conform to good engineering practices and Caltrans standard specifications.

6.5 Soil Corrosivity

Representative samples of the on-site soils from the project alignment were tested to evaluate corrosion potential. The test results are presented in Appendix II. The project design engineer can use the sulfate results in conjunction with ACI 318 to specify the water/cement ratio, compressive strength and cementitious material types for concrete exposed to soil. A corrosion engineer should be contacted to provide specific corrosion control recommendations.

6.6 Geotechnical Engineering During Construction

The geotechnical engineer should review project plans and specifications prior to bidding and construction to check that the intent of the recommendations in this report has been incorporated. Observations and tests should be performed during construction. Atlas recommends a geotechnical engineer or engineering geologist be on site to observe tunneling operations. If the conditions encountered during construction differ from those anticipated based on the subsurface exploration program, the presence of the geotechnical engineer during construction will enable an evaluation of the exposed conditions and modifications of the recommendations in this report or development of additional recommendations in a timely manner.

7. CLOSURE

Atlas should be advised of changes in the project scope so that the recommendations contained in this report can be evaluated with respect to the revised plans. Changes in recommendations will be verified in writing. The findings in this report are valid as of the date of this report. Changes in the condition of the site can occur with the passage of time, whether they are due to natural processes or work on this or adjacent areas. In addition, changes in the standards of practice and government regulations can occur. Thus, the findings in this report may be invalidated wholly or

in part by changes beyond our control. This report should not be relied upon after a period of two years without a review by us verifying the suitability of the conclusions and recommendations to site conditions at that time.

In the performance of our professional services, we comply with that level of care and skill ordinarily exercised by members of our profession currently practicing under similar conditions and in the same locality. The client recognizes that subsurface conditions may vary from those encountered at the boring locations and that our data, interpretations, and recommendations are based solely on the information obtained by us. We will be responsible for those data, interpretations, and recommendations, but shall not be responsible for interpretations by others of the information developed. Our services consist of professional consultation and observation only, and no warranty of any kind whatsoever, express or implied, is made or intended in connection with the work performed or to be performed by us, or by our proposal for consulting or other services, or by our furnishing of oral or written reports or findings.

8. REFERENCES

California Department of Conservation (CDC), 2022a, Landslide Inventory Interactive Map, accessed in December: https://maps.conservation.ca.gov/cgs/lsi/app/

California Department of Conservations (CDC), 2022b, California Tsunami Maps and Data, accessed in December: https://www.conservation.ca.gov/cgs/tsunami/maps

California Department of Transportation (Caltrans), 2018, Standard Specifications.

California Department of Transportation (Caltrans), 2020, Highway Design Manual, accessed in December: https://dot.ca.gov/programs/design/manual-highway-design-manual-hdm

California Emergency Management Agency, California Geological Survey, University of Southern California (Cal EMA), 2009, Tsunami Inundation Map for Emergency Planning, June 1.

Federal Emergency Management Agency (FEMA), 2022, FEMA Flood Map Service Center, accessed in December: https://msc.fema.gov/portal/home

Historic Aerials, 2022, https://historicaerials.com/viewer, accessed in December.

International Code Council (2018), 2019 California Building Code, California Code of Regulations, Title 24, Part 2, Volume 2 of 2, Based on the 2018 International Existing Building Code, Effective January 1, 2020.

Jennings, C.W. and Bryant, W.A., 2010, Fault Activity Map of California, California Geologic Survey, Geologic Data Map No. 6.

Morton, D.M and Miller, F.K., 2006, Geologic map of the San Bernadino and Santa Ana 30’ x 60’ Quadrangles, California, U.S. Geological Survey, Scale 1:100,000.

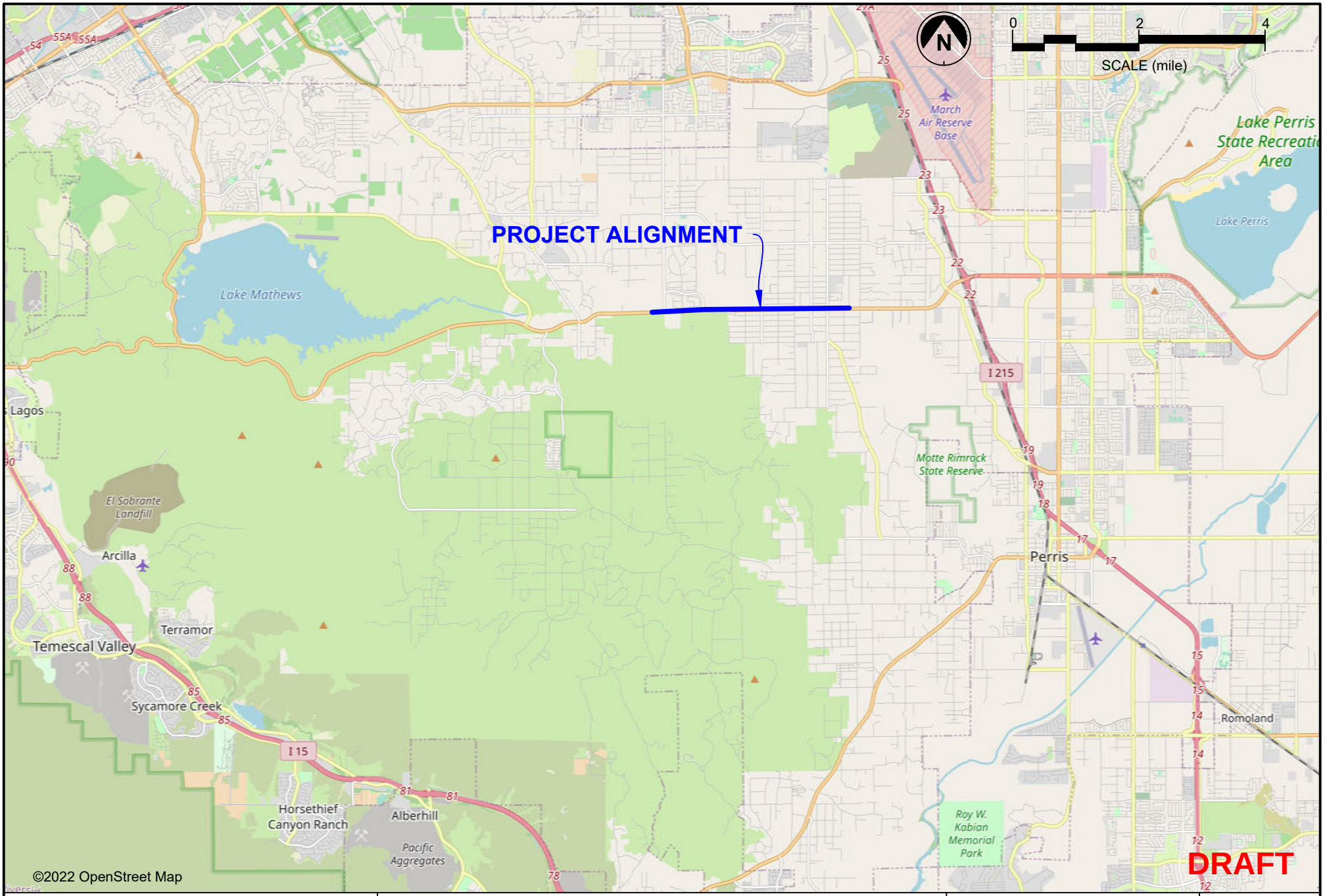
State Water Resources Control Board (SWRCB), 2022, Geotracker, accessed in December: https://geotracker.waterboards.ca.gov/

Structural Engineers Association of California (SEAOC), 2020, OSHPD Seismic Design Maps, accessed in May 2022: https://seismicmaps.org

U.S. Geological Survey (USGS), 2020a, USGS Earthquake Scenario Map, accessed in May 2022: https://earthquake.usgs.gov/scenarios/catalog/bssc2014/

U.S. Geological Survey (USGS), 2020b, USGS Geologic Hazards Science Center, U.S. Quaternary Faults, accessed in May 2022: https://usgs.maps.arcgis.com/apps/webappviewer/

U.S. Geological Survey (USGS), 2022, Areas of Land Subsidence in California, accessed in December: https://ca.water.usgs.gov/land_subsidence/california-subsidence-areas.html



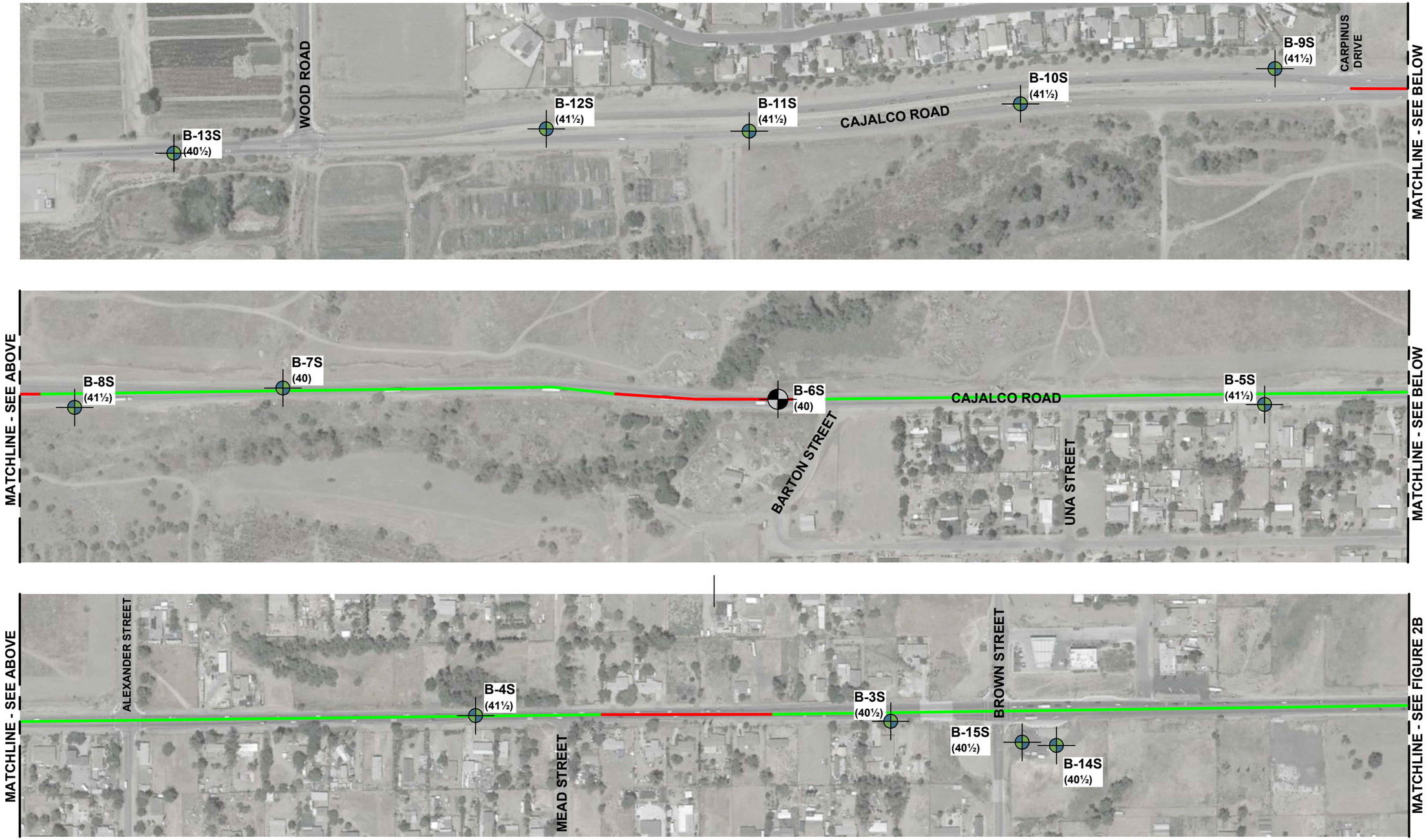
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SITE VICINITY MAP

Mead Valley Sewer Improvements
Riverside County, California

Date:	January, 2023
By:	CGI
Job No.:	190063P4.2 (1962)

Figure:
1



LEGEND:

B-15S (40½) — Location of Boring (Depth in Feet)

B-6S (40) — Location of Monitoring Well (Proposed Depth in Feet)

7-10 (Depth in Feet to Invert)

10-15 (Depth in Feet to Invert)

DRAFT

N

0 300 600

SCALE (feet)

NOTE: All Locations are approximate.

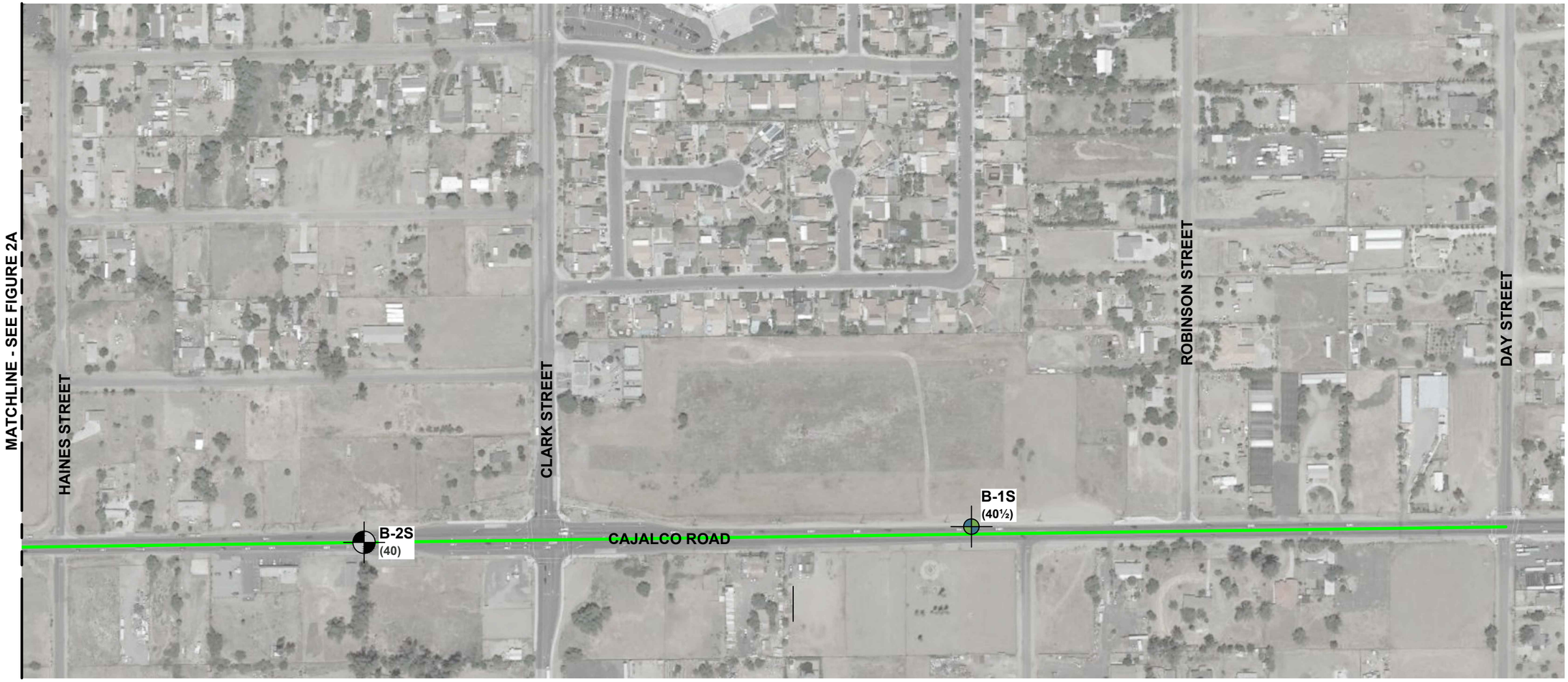
SUBSURFACE EXPLORATION MAP

Mead Valley Sewer Improvements
Riverside County, California

Date: January, 2023
By: CGI
Job No.: 190063P4.2 (1962)

ATLAS

Figure:
2A



LEGEND:

- **B-1S (40½)** — Location of Boring (Depth in Feet)
- **B-2S (40)** — Location of Monitoring Well (Proposed Depth in Feet)
- 7-10 (Depth in Feet to Invert)
- 10-15 (Depth in Feet to Invert)

DRAFT

N

0 300 600

SCALE (feet)

NOTE: All Locations are approximate.

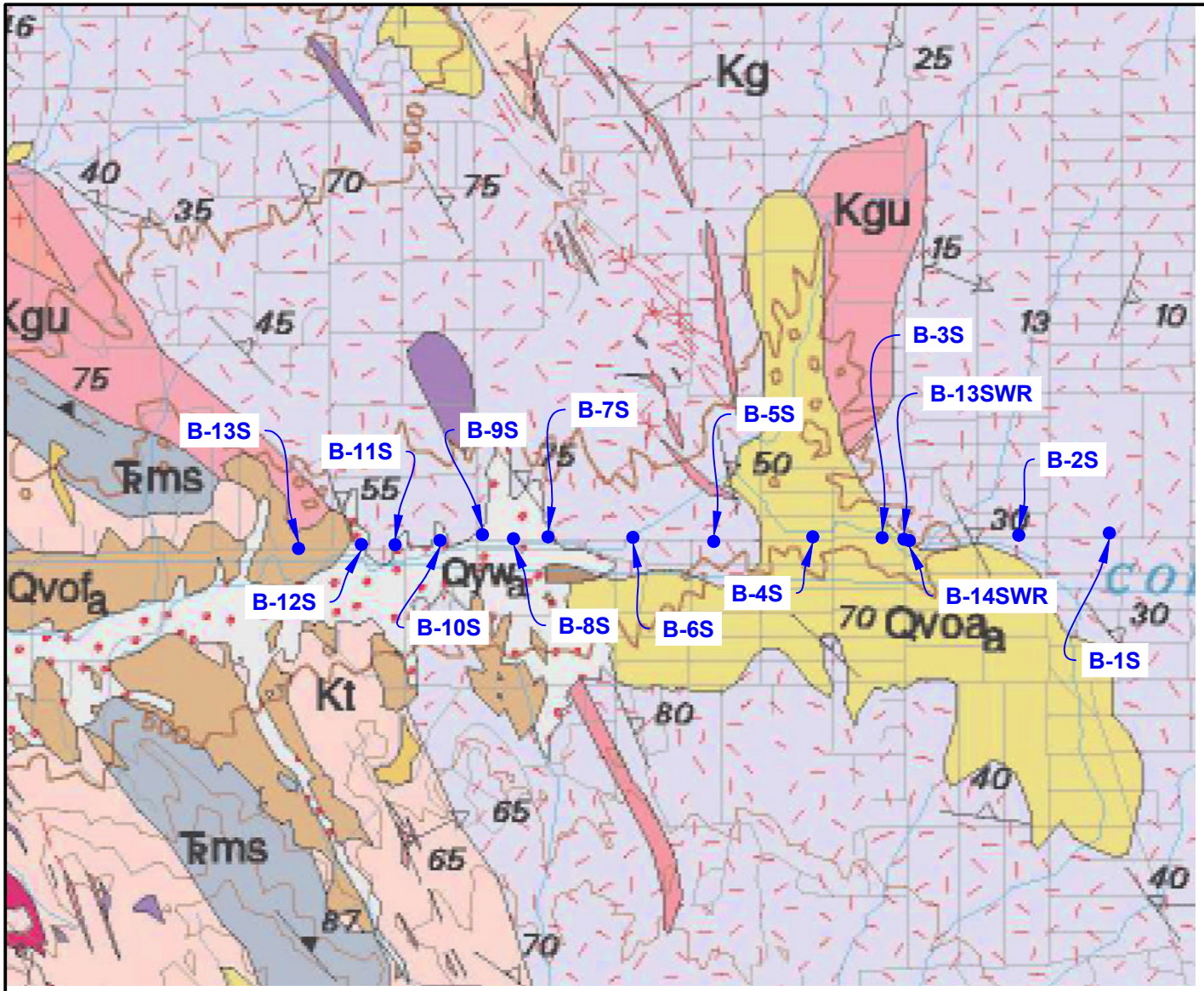
SUBSURFACE EXPLORATION MAP

Mead Valley Sewer Improvements
Riverside County, California

Date: January, 2023
By: CGI
Job No.: 190063P4.2 (1962)

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Figure:
2B



EXPLANATION:

Qyw_a	Young wash deposits (Holocene and late Pleistocene)
$Qvoa_a$	Very old axial-channel deposits (middle to early Pleistocene)
$Qvof_a$	Very old alluvial-fan deposits (middle to early Pleistocene)
Kg	Granitic dikes (Cretaceous)
Kvt	Val Verde tonalite
Kvti	Inclusion-rich tonalite
kgb	Gabbro, undifferentiated (Cretaceous)
kpd	Granitic pegmatite dikes
kgu	Granite, undifferentiated (Cretaceous)
kt	Tonalite, undifferentiated (Cretaceous)
T_Rms	Schist

N

0 3,000 6,000

SCALE (feet)

NOTE: All locations are approximate.

Reference:
Morton, D.M. and Miller, F.K., 2006, Geologic map of the San Bernardino and Santa Ana 30' x 60' quadrangles, California, U.S. Geological Survey, 1:100,000.

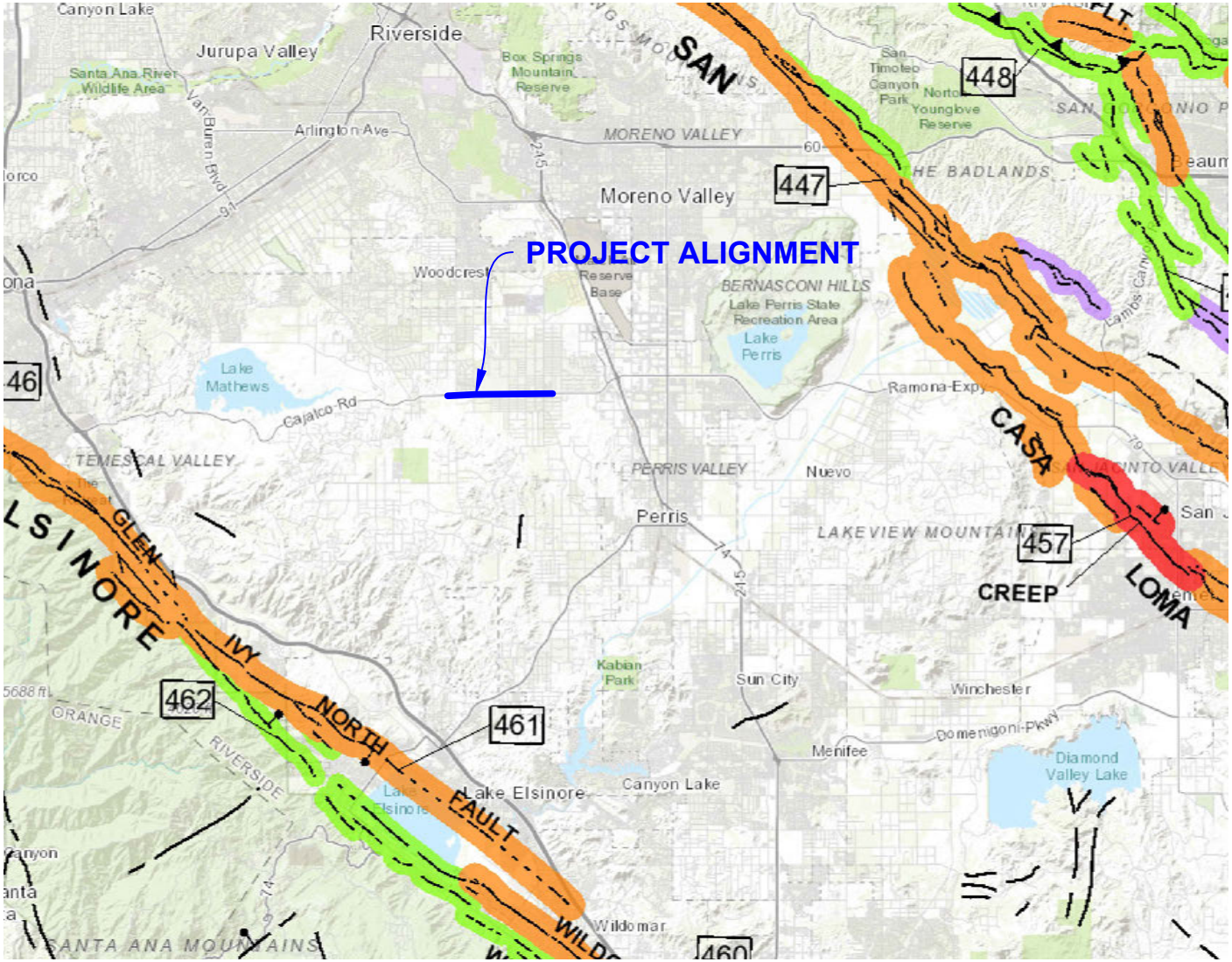
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REGIONAL GEOLOGY MAP
Mead Valley Sewer Improvements
Riverside County, California

Date: January, 2023
By: CGI
Job No.: 190063P4.2 (1962)

Figure: 3



EXPLANATION:

Fault along which historic (last 200 years) displacement has occurred

Holocene fault displacement (during past 11,700 years) without historic record.

Late Quaternary fault displacement (during past 700,000 years).

Quaternary fault (age undifferentiated).

Pre-Quaternary fault (older than 1.6 million years) or fault without recognized Quaternary displacement.

Low angle fault (barbs on upper plate).

447	Claremont fault - San Jacinto fault zone (concealed)
448	Cherry Valley fault - San Gorgonio Pass fault zone (concealed)
457	Casa Loma fault - San Jacinto fault zone (concealed)
461	Glen Ivy North fault - Elsinore fault zone (concealed)
462	Glen Ivy South fault - Elsinore fault zone (concealed)

N

0 5 10

SCALE (miles)

Reference:
Jennings, C.W., Bryant W.A., Fault Activity Map of California (2010), maps.conservation.ca.gov/cgs/fam; Accessed November, 2022

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CALIFORNIA FAULT ACTIVITY MAP

Mead Valley Sewer Improvements
Riverside County, California

Date: January, 2023
By: CGI
Job No.: 190063P4.2 (1962)

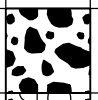
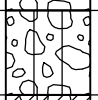
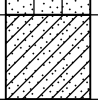
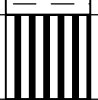
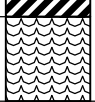
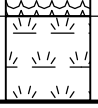
Figure: 4

APPENDIX I
SUBSURFACE EXPLORATION

Relatively undisturbed samples were obtained using a modified California (CAL) sampler, which is a ring-lined split tube sampler with a 3-inch outer diameter and 2½-inch inner diameter. Standard Penetration Tests (SPT) were performed using a 2-inch outer diameter and 1⅜-inch inner diameter split tube sampler. The CAL and SPT samplers were driven with a 140-pound weight dropping 30 inches. The number of blows needed to drive the samplers the final 12 inches of an 18-inch drive is noted on the boring logs as “Driving Resistance (blows/ft. of drive).” SPT and CAL sampler refusal was encountered when 50 blows were applied during any one of the three 6-inch intervals, a total of 100 blows was applied, or there was no discernible sampler advancement during the application of 10 successive blows. The SPT penetration resistance was normalized to a safety hammer (cathead and rope) with a 60% energy transfer ratio in accordance with ASTM D6066. The normalized SPT penetration resistance is noted on the boring logs as “N60.” When auger refusal was encountered the drill rig used a diamond HQ core bit for rock coring to advance through the rock and recover rock core for identification and testing. Disturbed bulk samples were obtained from the SPT sampler and the drill cuttings. The soils are classified in accordance with the Unified Soil Classification System. The rock encountered were classified in accordance with the Caltrans rock classification system.

Temporary groundwater monitoring wells will be installed at boring locations B-2S and B-6S to observe groundwater levels over time. The monitoring wells should be periodically monitored, and groundwater elevations recorded by a qualified individual. A diagram presenting the well construction will be presented in Appendix I.

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MAJOR DIVISIONS					TYPICAL NAMES
COARSE-GRAINED SOILS MORE THAN HALF IS COARSER THAN NO. 200 SIEVE	GRAVELS MORE THAN HALF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE	CLEAN GRAVELS WITH LESS THAN 15% FINES	GW		WELL-GRADED GRAVELS WITH OR WITHOUT SAND
			GP		POORLY GRADED GRAVELS WITH OR WITHOUT SAND
		GRAVELS WITH 15% OR MORE FINES	GM		SILTY GRAVELS WITH OR WITHOUT SAND
			GC		CLAYEY GRAVELS WITH OR WITHOUT SAND
	SANDS MORE THAN HALF COARSE FRACTION IS FINER THAN NO. 4 SIEVE SIZE	CLEAN SANDS WITH LESS THAN 15% FINES	SW		WELL-GRADED SANDS WITH OR WITHOUT GRAVEL
			SP		POORLY GRADED SANDS WITH OR WITHOUT GRAVEL
		SANDS WITH 15% OR MORE FINES	SM		SILTY SANDS WITH OR WITHOUT GRAVEL
			SC		CLAYEY SANDS WITH OR WITHOUT GRAVEL
FINE-GRAINED SOILS MORE THAN HALF IS FINER THAN NO. 200 SIEVE	SILTS AND CLAYS LIQUID LIMIT 50% OR LESS		ML		INORGANIC SILTS OF LOW TO MEDIUM PLASTICITY WITH OR WITHOUT SAND OR GRAVEL
			CL		INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY WITH OR WITHOUT SAND OR GRAVEL
			OL		ORGANIC SILTS OR CLAYS OF LOW TO MEDIUM PLASTICITY WITH OR WITHOUT SAND OR GRAVEL
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50%		MH		INORGANIC SILTS OF HIGH PLASTICITY WITH OR WITHOUT SAND OR GRAVEL
			CH		INORGANIC CLAYS OF HIGH PLASTICITY WITH OR WITHOUT SAND OR GRAVEL
			OH		ORGANIC SILTS OR CLAYS OF HIGH PLASTICITY WITH OR WITHOUT SAND OR GRAVEL
HIGHLY ORGANIC SOILS			PT		PEAT AND OTHER HIGHLY ORGANIC SOILS

SAMPLE SYMBOLS

SAMPLE TYPES

- Bulk Sample
- CAL — Modified California Sampler
- SPT — Standard Penetration Test

LABORATORY SYMBOLS

- AL - ATTERBERG LIMITS
- CON - CONSOLIDATION
- COR - CORROSIVITY TESTING
- DS - DIRECT SHEAR
- EI - EXPANSION INDEX
- GW - ENVIRONMENTAL, GROUNDWATER
- RV - R-VALUE
- PD - PARTICLE-SIZE DISTRIBUTION
- UC - UNCONFINED COMPRESSIVE
- WA - STRENGTH No. 200 WASH (% PASSING No. 200 SIEVE)

GROUNDWATER SYMBOLS

WATER LEVEL AT TIME OF EXCAVATION OR AS INDICATED

RELATIVE DENSITY OF COHESIONLESS SOILS		CONSISTENCY OF COHESIVE SOILS		
RELATIVE DENSITY	SPT N60 BLOWS/FOOT	CONSISTENCY	SPT N60 BLOWS/FOOT	POCKET PENETROMETER MEASUREMENT (TSF)
VERY LOOSE	0 - 4	VERY SOFT	0 - 2	0 - 0.25
LOOSE	4 - 10	SOFT	2 - 4	0.25 - 0.50
MEDIUM DENSE	10 - 30	MEDIUM STIFF	4 - 8	0.50 - 1.0
DENSE	30 - 50	STIFF	8 - 15	1.0 - 2.0
VERY DENSE	OVER 50	VERY STIFF	15 - 30	2.0 - 4.0
		HARD	OVER 30	OVER 4.0

NUMBER OF BLOWS OF 140 LB HAMMER FALLING 30 INCHES TO DRIVE A 2 INCH O.D. (1-3/8 INCH I.D.) SPLIT-BARREL SAMPLER THE LAST 12 INCHES OF AN 18-INCH DRIVE (ASTM-1586 STANDARD PENETRATION TEST).
IF THE SEATING INTERVAL (1st 6 INCH INTERVAL) IS NOT ACHEIVED, N IS REPORTED AS REF.

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Atlas Technical Consultants
6280 Riverdale Street
San Diego, California 92120
Telephone: (619) 280-4321

SUBSURFACE EXPLORATION LEGEND

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LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	
Mead Valley Sewer Improvements	190063P4.2 (1962-1)	B-1S

SITE	START	END	SHEET NO.
Riverside County, CA	9/21/22	9/21/22	1

DRILLING COMPANY	DRILL METHOD	LOGGED BY	REVIEWED BY
Baja Exploration	Hollow Stem Auger	HK	

DRILLING EQUIPMENT	BORING DIA. (in.)	TOTAL DEPTH (ft)	GROUND ELEV. (ft)
CME-75	8	40.5	1670

DEPTH/ELEV. GROUND WATER (ft)
- ▽ AT TIME OF DRILLING 22.00 ft / Elev 1648.00 ft
- ▼ AT END OF DRILLING ---
- ▼ AFTER DRILLING ---

SAMPLING METHOD: 140-lb Hammer, 30-in Drop

NOTES: Hammer Efficiency = 80.0% N_{60}~1.33N_{SPT}

ELEVATION (ft)	DEPTH (ft)	BULK SAMPLE	DRIVE SAMPLE	BLOWS PER FOOT	N_{60}	MOISTURE (%)	DRY DENSITY (pcf)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION	LAB TESTS
									VERY OLD AXIAL-CHANNEL DEPOSITS (Qvoa): POORLY GRADED SAND with SILT (SP-SM), loose to medium dense, brown, moist, fine to coarse grained.	
1665	5		CAL	50/5		3.6	109.5		**VAL VERDE TONALITE (Kvt)**: IGNEOUS ROCK (QUARTZ DIORITE), grayish brown, intensely weathered to decomposed, very soft; (Poorly Graded SAND with SILT (SP-SM), very dense, moist, fine to medium grained).	DS WA
1660	10		CAL	50/6						
1655	15		CAL	50/6						
1650	20		CAL	50/6					Wet, fine to coarse grained. Dark brown; (POORLY GRADED SAND with CLAY (SP-SC), very dense, moist, fine to medium grained). ▽ Groundwater observed at 22 feet.	

ATLAS

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED.

Figure

I-1

ATLAS LOG REPORT - - 1/3/23 10:29 - \\SD.SCST.COM\DFS_ROOT\DATA\CLIENTS\EASTERN MUNICIPAL WATER DISTRICT\190063P4 - EMWD, AS-NEEDED ENGINEERING NON-DESIGN SERVICES\190063P4.2 - EMWD, GOOD HOPE & MEAD VALLEY WATER SEWER C

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LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	
Mead Valley Sewer Improvements	190063P4.2 (1962-1)	B-1S

SITE	START	END	SHEET NO.
Riverside County, CA	9/21/22	9/21/22	2

DRILLING COMPANY	DRILL METHOD	LOGGED BY	REVIEWED BY
Baja Exploration	Hollow Stem Auger	HK	

DRILLING EQUIPMENT	BORING DIA. (in.)	TOTAL DEPTH (ft)	GROUND ELEV. (ft)
CME-75	8	40.5	1670

DEPTH/ELEV. GROUND WATER (ft)
- AT TIME OF DRILLING 22.00 ft / Elev 1648.00 ft
- AT END OF DRILLING ---
- AFTER DRILLING ---

SAMPLING METHOD: 140-lb Hammer, 30-in Drop

NOTES: Hammer Efficiency = 80.0% N_{60}~1.33N_{SPT}

ELEVATION (ft)	DEPTH (ft)	BULK SAMPLE	DRIVE SAMPLE	BLOWS PER FOOT	N_{60}	MOISTURE (%)	DRY DENSITY (pcf)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION	LAB TESTS
			SPT	50/6					Dark brown; (POORLY GRADED SAND with CLAY (SP-SC), very dense, moist, fine to medium grained). *(continued)* (Micaceous).	
									Hard drilling.	
1640	30		SPT	50/2					Grayish brown; (fine to coarse grained).	
1635	35		SPT	50/2					(Increase in fine content).	
1630	40		SPT	50/2						
1625	45								**BORING TERMINATED AT 40½ FEET** Groundwater observed at 22 Feet	

ATLAS

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED.

Figure

I-2

ATLAS LOG REPORT - - 1/3/23 10:29 - \\SD.SCST.COM\DFS_ROOT\DATA\CLIENTS\EASTERN MUNICIPAL WATER DISTRICT\190063P4 - EMWD, AS-NEEDED ENGINEERING NON-DESIGN SERVICES\190063P4.2 - EMWD, GOOD HOPE & MEAD VALLEY WATER SEWER C

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LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	
Mead Valley Sewer Improvements	190063P4.2 (1962-1)	B-3S

SITE	START	END	SHEET NO.
Riverside County, CA	9/29/22	9/29/22	3

DRILLING COMPANY	DRILL METHOD	LOGGED BY	REVIEWED BY
Baja Exploration	Hollow Stem Auger	SD	

DRILLING EQUIPMENT	BORING DIA. (in.)	TOTAL DEPTH (ft)	GROUND ELEV. (ft)
CME-75	8	40.5	1638

DEPTH/ELEV. GROUND WATER (ft)
- ▽ AT TIME OF DRILLING 26.00 ft / Elev 1612.00 ft
- ▼ AT END OF DRILLING ---
- ▼ AFTER DRILLING ---

SAMPLING METHOD: 140-lb Hammer, 30-in Drop

NOTES: Hammer Efficiency = 80.0% N_{60}~1.33N_{SPT}

ELEVATION (ft)	DEPTH (ft)	BULK SAMPLE	DRIVE SAMPLE	BLOWS PER FOOT	N_{60}	MOISTURE (%)	DRY DENSITY (pcf)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION	LAB TESTS
1635	0								**VERY OLD AXIAL-CHANNEL DEPOSITS (Qvoa)** : CLAYEY SAND (SC), medium dense, reddish brown, moist, fine grained sand.	EI RV WA
	5		CAL	24						
1630										
	10		CAL	50/6		5.7	115.2		**VAL VERDE TONALITE (Kvt)**: IGNEOUS ROCK (QUARTZ DIORITE), brownish gray, intensely weathered to decomposed, very soft; (SILTY SAND (SM), very dense, moist, fine to coarse grained).	
1625										
	15		CAL	50/6					(Decrease in fine content).	
1620										
	20		CAL	50/6					Greenish gray, (fine to medium grained).	
1615										

ATLAS

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED.

Figure

I-3

ATLAS LOG REPORT - - 1/3/23 10:29 - \\SD.SCST.COM\DFS_ROOT\DATA\CLIENTS\EASTERN MUNICIPAL WATER DISTRICT\190063P4 - EMWD, AS-NEEDED ENGINEERING NON-DESIGN SERVICES\190063P4.2 - EMWD, GOOD HOPE & MEAD VALLEY WATER SEWER

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LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	
Mead Valley Sewer Improvements	190063P4.2 (1962-1)	B-3S

SITE	START	END	SHEET NO.
Riverside County, CA	9/29/22	9/29/22	4

DRILLING COMPANY	DRILL METHOD	LOGGED BY	REVIEWED BY
Baja Exploration	Hollow Stem Auger	SD	

DRILLING EQUIPMENT	BORING DIA. (in.)	TOTAL DEPTH (ft)	GROUND ELEV. (ft)
CME-75	8	40.5	1638

DEPTH/ELEV. GROUND WATER (ft)
- ▽ AT TIME OF DRILLING 26.00 ft / Elev 1612.00 ft
- ▼ AT END OF DRILLING ---
- ▼ AFTER DRILLING ---

SAMPLING METHOD: 140-lb Hammer, 30-in Drop

NOTES: Hammer Efficiency = 80.0% N_{60}~1.33N_{SPT}

ELEVATION (ft)	DEPTH (ft)	BULK SAMPLE	DRIVE SAMPLE	BLOWS PER FOOT	N_{60}	MOISTURE (%)	DRY DENSITY (pcf)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION	LAB TESTS
			SPT	50/6					**VAL VERDE TONALITE (Kvt)**: IGNEOUS ROCK (QUARTZ DIORITE), brownish gray, intensely weathered to decomposed, very soft; (SILTY SAND (SM), very dense, moist, fine to coarse grained). *(continued)* (Increase in fine content). Groundwater observed at 26 feet.	
1610										
	30		SPT	50/5						
1605										
	35		SPT	50/6					lincrease in fine content).	
1600										
	40		SPT	50/4						
									BORING TERMINATED AT 40½ FEET Groundwater observed at 26 Feet	
1595										
	45									
1590										

ATLAS

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED.

Figure

I-4

ATLAS LOG REPORT - - 1/3/23 10:29 - \\SD.SCST.COM\DFS_ROOT\DATA\CLIENTS\EASTERN MUNICIPAL WATER DISTRICT\190063P4 - EMWD, AS-NEEDED ENGINEERING NON-DESIGN SERVICES\190063P4.2 - EMWD, GOOD HOPE & MEAD VALLEY WATER SEWER G

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LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	
Mead Valley Sewer Improvements	190063P4.2 (1962-1)	**B-4S**

SITE	START	END	SHEET NO.
Riverside County, CA	9/27/22	9/27/22	5

DRILLING COMPANY	DRILL METHOD	LOGGED BY	REVIEWED BY
Baja Exploration	Hollow Stem Auger	SD	

DRILLING EQUIPMENT	BORING DIA. (in.)	TOTAL DEPTH (ft)	GROUND ELEV. (ft)
CME-75	8	41.5	1639

DEPTH/ELEV. GROUND WATER (ft)
- ▽ AT TIME OF DRILLING 18.00 ft / Elev 1621.00 ft
- ▼ AT END OF DRILLING ---
- ▼ AFTER DRILLING ---

SAMPLING METHOD: 140-lb Hammer, 30-in Drop

NOTES: Hammer Efficiency = 80.0% N_{60}~1.33N_{SPT}

ELEVATION (ft)	DEPTH (ft)	BULK SAMPLE	DRIVE SAMPLE	BLOWS PER FOOT	N_{60}	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION	LAB TESTS
							FILL (Qf): SANDY SILT (ML), medium dense, brown, moist, fine grained.	
							VAL VERDE TONALITE (Kvt): IGNEOUS ROCK (QUARTZ DIORITE), light brown, intensely weathered to decomposed, very soft; (SILTY SAND (SM), dense, moist, fine to medium grained).	
1635	5		CAL	42				PD
1630	10		CAL	47			(Increase in medium to coarse grained sand).	
1625	15		CAL	53			Light brown.	
						▽	Groundwater observed at 18 feet.	
1620	20		CAL	49			(Weakly cemented, increase in palgioclase feldspar).	
							Grayish to yellowish brown; (POORLY GRADED SAND (SP), dense, wet, fine to coarse grained).	
1615								

ATLAS

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED.

Figure

I-5

ATLAS LOG REPORT - - 1/3/23 10:29 - \\SD.SCST.COM\DFS_ROOT\DATA\CLIENTS\EASTERN MUNICIPAL WATER DISTRICT\190063P4 - EMWD, AS-NEEDED ENGINEERING NON-DESIGN SERVICES\190063P4.2 - EMWD, GOOD HOPE & MEAD VALLEY WATER SEWER C

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LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	
Mead Valley Sewer Improvements	190063P4.2 (1962-1)	B-4S

SITE	START	END	SHEET NO.
Riverside County, CA	9/27/22	9/27/22	6

DRILLING COMPANY	DRILL METHOD	LOGGED BY	REVIEWED BY
Baja Exploration	Hollow Stem Auger	SD	

DRILLING EQUIPMENT	BORING DIA. (in.)	TOTAL DEPTH (ft)	GROUND ELEV. (ft)
CME-75	8	41.5	1639

DEPTH/ELEV. GROUND WATER (ft)
- ▽ AT TIME OF DRILLING 18.00 ft / Elev 1621.00 ft
- ▼ AT END OF DRILLING ---
- ▼ AFTER DRILLING ---

SAMPLING METHOD: 140-lb Hammer, 30-in Drop

NOTES: Hammer Efficiency = 80.0% N_{60}~1.33N_{SPT}

ELEVATION (ft)	DEPTH (ft)	BULK SAMPLE	DRIVE SAMPLE	BLOWS PER FOOT	N_{60}	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION	LAB TESTS
			SPT	36	48		Grayish to yellowish brown; (POORLY GRADED SAND (SP), dense, wet, fine to coarse grained). *(continued)*	
1610	30		CAL	42			Yellowish brown; (POORLY GRADED SAND with SILT (SP-SM), dense, wet, fine to coarse grained).	
1605	35		SPT	51	68		(SILTY SAND (SM), very dense, wet, fine to coarse grained).	
1600	40		SPT	65	87		(Increase in fine content).	
1595	45						**BORING TERMINATED AT 41½ FEET** Groundwater observed at 18 Feet	
1590								

ATLAS

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED.

Figure

I-6

ATLAS LOG REPORT - - 1/3/23 10:29 - \\SD.SCST.COM\DFS_ROOT\DATA\CLIENTS\EASTERN MUNICIPAL WATER DISTRICT\190063P4 - EMWD, AS-NEEDED ENGINEERING NON-DESIGN SERVICES\190063P4.2 - EMWD, GOOD HOPE & MEAD VALLEY WATER SEWER C

DRAFT

LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	
Mead Valley Sewer Improvements	190063P4.2 (1962-1)	B-5S

SITE	START	END	SHEET NO.
Riverside County, CA	9/27/22	9/27/22	7

DRILLING COMPANY	DRILL METHOD	LOGGED BY	REVIEWED BY
Baja Exploration	Hollow Stem Auger	SD	

DRILLING EQUIPMENT	BORING DIA. (in.)	TOTAL DEPTH (ft)	GROUND ELEV. (ft)
CME-75	8	41.5	1634

DEPTH/ELEV. GROUND WATER (ft)
- ▽ AT TIME OF DRILLING 33.00 ft / Elev 1601.00 ft
- ▼ AT END OF DRILLING ---
- ▼ AFTER DRILLING ---

SAMPLING METHOD: 140-lb Hammer, 30-in Drop

NOTES: Hammer Efficiency = 80.0% N_{60}~1.33N_{SPT}

ELEVATION (ft)	DEPTH (ft)	BULK SAMPLE	DRIVE SAMPLE	BLOWS PER FOOT	N_{60}	MOISTURE (%)	DRY DENSITY (pcf)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION	LAB TESTS
									FILL (Qf): SILTY SAND (SM), medium dense, brown, moist, fine to medium grained, low plasticity.	
1630	5		CAL	43		10.6	129.3		**VERY OLD AXIAL-CHANNEL DEPOSITS (Qvoa)**: CLAYEY SAND (SC), dense, light brown, moist, fine to medium grained, low plasticity, white mottling, micaceous. (Fine grained, weakly cemented, more micaceous).	WA
1625	10		CAL	80/12"					**VAL VERDE TONALITE (Kvt)**: IGNEOUS ROCK (QUARTZ DIORITE), light reddish brown, intensely weathered to decomposed, very soft; (CLAYEY SAND (SC), very dense, moist, fine to coarse grained, moderately cemented).	
1620	15		CAL	50/6					(Decrease in fines).	
1615	20		CAL	82/9"					(Increase in moisture).	
1610									Reddish brown; (SANDY SILT (ML), very dense, moist, fine to medium grained).	

ATLAS

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED.

Figure

I-7

ATLAS LOG REPORT - - 1/3/23 10:29 - \\SD.SCST.COM\DFS_ROOT\DATA\CLIENTS\EASTERN MUNICIPAL WATER DISTRICT\190063P4 - EMWD, AS-NEEDED ENGINEERING NON-DESIGN SERVICES\190063P4.2 - EMWD, GOOD HOPE & MEAD VALLEY WATER SEWER C

DRAFT

LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	
Mead Valley Sewer Improvements	190063P4.2 (1962-1)	B-5S

SITE	START	END	SHEET NO.
Riverside County, CA	9/27/22	9/27/22	8

DRILLING COMPANY	DRILL METHOD	LOGGED BY	REVIEWED BY
Baja Exploration	Hollow Stem Auger	SD	

DRILLING EQUIPMENT	BORING DIA. (in.)	TOTAL DEPTH (ft)	GROUND ELEV. (ft)	DEPTH/ELEV. GROUND WATER (ft)
CME-75	8	41.5	1634	▽ AT TIME OF DRILLING 33.00 ft / Elev 1601.00 ft
				▼ AT END OF DRILLING ---
				▼ AFTER DRILLING ---

SAMPLING METHOD	NOTES
140-lb Hammer, 30-in Drop	Hammer Efficiency = 80.0% N_{60}~1.33N_{SPT}

ELEVATION (ft)	DEPTH (ft)	BULK SAMPLE	DRIVE SAMPLE	BLOWS PER FOOT	N_{60}	MOISTURE (%)	DRY DENSITY (pcf)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION	LAB TESTS
			SPT	50	67				Reddish brown; (SANDY SILT (ML), very dense, moist, fine to medium grained). *(continued)*	
									(Increase in sand content).	
1605	30									
			SPT	45	60				Yellowish brown, (SILTY SAND (SM), very dense, moist, fine to medium grained).	
								▽	Groundwater observed at 33 feet.	
1600	35									
			CAL	34					(Poorly Graded SAND (SP), medium dense, wet, fine to coarse grained).	
1595	40									
			SPT	33	44				Reddish brown; (LEAN CLAY with SAND (CL), hard, wet, fine to medium grained).	
									BORING TERMINATED AT 41½ FEET Groundwater observed at 33 Feet	
1590	45									
1585										

ATLAS

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED.

Figure

I-8

ATLAS LOG REPORT - - 1/3/23 10:29 - \\SD.SCST.COM\DFS_ROOT\DATA\CLIENTS\EASTERN MUNICIPAL WATER DISTRICT\190063P4 - EMWD, AS-NEEDED ENGINEERING NON-DESIGN SERVICES\190063P4.2 - EMWD, GOOD HOPE & MEAD VALLEY WATER SEWER C

DRAFT

LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	
Mead Valley Sewer Improvements	190063P4.2 (1962-1)	B-7S

SITE	START	END	SHEET NO.
Riverside County, CA	9/22/22	9/22/22	9

DRILLING COMPANY	DRILL METHOD	LOGGED BY	REVIEWED BY
Baja Exploration	Hollow Stem Auger	HK	

DRILLING EQUIPMENT	BORING DIA. (in.)	TOTAL DEPTH (ft)	GROUND ELEV. (ft)
CME-75	8	40	1597

DEPTH/ELEV. GROUND WATER (ft)
- ▽ AT TIME OF DRILLING 37.00 ft / Elev 1560.00 ft
- ▼ AT END OF DRILLING ---
- ▼ AFTER DRILLING ---

SAMPLING METHOD: 140-lb Hammer, 30-in Drop

NOTES: Hammer Efficiency = 80.0% N_{60}~1.33N_{SPT}

ELEVATION (ft)	DEPTH (ft)	BULK SAMPLE	DRIVE SAMPLE	BLOWS PER FOOT	N_{60}	MOISTURE (%)	DRY DENSITY (pcf)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION	LAB TESTS
1595	0								**VERY OLD AXIAL-CHANNEL DEPOSITS (Qvoa)**: SILTY SAND (SM), loose to medium dense, brown, moist, fine to coarse grained.	
	5		CAL	29					Medium dense, slightly micaceous.	
1590										
	10		CAL	15		9.6	112.9		Trace gravel.	WA
1585										
	15		CAL	19					Increase in moisture.	
1580										
	20		CAL	50/6					**VAL VERDE TONALITE (Kvt)**: IGNEOUS ROCK (QUARTZ DIORITE), grayish brown, intensely weathered to decomposed, very soft; (Poorly Graded SAND (SP), very dense, moist, fine to medium grained).	
1575										

ATLAS

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED.

Figure

I-9

ATLAS LOG REPORT - - 1/3/23 10:29 - \\SD.SCST.COM\DFS_ROOT\DATA\CLIENTS\EASTERN MUNICIPAL WATER DISTRICT\190063P4 - EMWD, AS-NEEDED ENGINEERING NON-DESIGN SERVICES\190063P4.2 - EMWD, GOOD HOPE & MEAD VALLEY WATER SEWER C

DRAFT

LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	
Mead Valley Sewer Improvements	190063P4.2 (1962-1)	B-7S

SITE	START	END	SHEET NO.
Riverside County, CA	9/22/22	9/22/22	10

DRILLING COMPANY	DRILL METHOD	LOGGED BY	REVIEWED BY
Baja Exploration	Hollow Stem Auger	HK	

DRILLING EQUIPMENT	BORING DIA. (in.)	TOTAL DEPTH (ft)	GROUND ELEV. (ft)
CME-75	8	40	1597

DEPTH/ELEV. GROUND WATER (ft)
- ▽ AT TIME OF DRILLING 37.00 ft / Elev 1560.00 ft
- ▼ AT END OF DRILLING ---
- ▼ AFTER DRILLING ---

SAMPLING METHOD: 140-lb Hammer, 30-in Drop

NOTES: Hammer Efficiency = 80.0% N_{60}~1.33N_{SPT}

ELEVATION (ft)	DEPTH (ft)	BULK SAMPLE	DRIVE SAMPLE	BLOWS PER FOOT	N_{60}	MOISTURE (%)	DRY DENSITY (pcf)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION	LAB TESTS
1570			SPT	50/6					**VAL VERDE TONALITE (Kvt)**: IGNEOUS ROCK (QUARTZ DIORITE), grayish brown, intensely weathered to decomposed, very soft; (Poorly Graded SAND (SP), very dense, moist, fine to medium grained). *(continued)*	
	30		SPT	50/6					Hard drilling.	
1565										
	35		SPT	50/4					▽ Groundwater observed at 37 feet.	
1560									(Increase in coarse material).	
	40								**BORING TERMINATED AT 40 FEET** Groundwater observed at 37 Feet	
1555										
	45									
1550										

ATLAS

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED.

Figure

I-10

ATLAS LOG REPORT - - 1/3/23 10:29 - \\SD.SCST.COM\DFS_ROOT\DATA\CLIENTS\EASTERN MUNICIPAL WATER DISTRICT\190063P4 - EMWD, AS-NEEDED ENGINEERING NON-DESIGN SERVICES\190063P4.2 - EMWD, GOOD HOPE & MEAD VALLEY WATER SEWER G

DRAFT

LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	
Mead Valley Sewer Improvements	190063P4.2 (1962-1)	B-8S

SITE	START	END	SHEET NO.
Riverside County, CA	9/22/22	9/22/22	11

DRILLING COMPANY	DRILL METHOD	LOGGED BY	REVIEWED BY
Baja Exploration	Hollow Stem Auger	HK	

DRILLING EQUIPMENT	BORING DIA. (in.)	TOTAL DEPTH (ft)	GROUND ELEV. (ft)
CME-75	8	41.5	1593

DEPTH/ELEV. GROUND WATER (ft)
- ▽ AT TIME OF DRILLING ---
- ▼ AT END OF DRILLING ---
- ▼ AFTER DRILLING ---

SAMPLING METHOD: 140-lb Hammer, 30-in Drop

NOTES: Hammer Efficiency = 80.0% N_{60}~1.33N_{SPT}

ELEVATION (ft)	DEPTH (ft)	BULK SAMPLE	DRIVE SAMPLE	BLOWS PER FOOT	N_{60}	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION	LAB TESTS
1590	0						**VERY OLD AXIAL-CHANNEL DEPOSITS (Qvoa)**: CLAYEY SAND (SC), loose to medium dense, brown, moist, fine to coarse grained.	AL WA
	5		CAL	23			**VAL VERDE TONALITE (Kvt)**: Grayish brown, intensely weathered to decomposed, very soft; (CLAYEY SAND (SC), medium dense, moist, fine to coarse grained).	
1585								
	10		CAL	36				WA
1580								
	15		CAL	66			Brown, (SILTY SAND (SM), very dense, moist, fine to coarse grained).	
1575								
	20		CAL	50/6				
1570								

ATLAS

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED.

Figure

I-11

ATLAS LOG REPORT - - 1/3/23 10:29 - \\SD.SCST.COM\DFS_ROOT\DATA\CLIENTS\EASTERN MUNICIPAL WATER DISTRICT\190063P4 - EMWD, AS-NEEDED ENGINEERING NON-DESIGN SERVICES\190063P4.2 - EMWD, GOOD HOPE & MEAD VALLEY WATER SEWER

DRAFT

LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	
Mead Valley Sewer Improvements	190063P4.2 (1962-1)	B-8S

SITE	START	END	SHEET NO.
Riverside County, CA	9/22/22	9/22/22	12

DRILLING COMPANY	DRILL METHOD	LOGGED BY	REVIEWED BY
Baja Exploration	Hollow Stem Auger	HK	

DRILLING EQUIPMENT	BORING DIA. (in.)	TOTAL DEPTH (ft)	GROUND ELEV. (ft)	DEPTH/ELEV. GROUND WATER (ft)
CME-75	8	41.5	1593	▽ AT TIME OF DRILLING ---
				▼ AT END OF DRILLING ---
				▼ AFTER DRILLING ---

SAMPLING METHOD	NOTES
140-lb Hammer, 30-in Drop	Hammer Efficiency = 80.0% N_{60}~1.33N_{SPT}

ELEVATION (ft)	DEPTH (ft)	BULK SAMPLE	DRIVE SAMPLE	BLOWS PER FOOT	N_{60}	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION	LAB TESTS
			SPT	48	64		Brown, (SILTY SAND (SM), very dense, moist, fine to coarse grained). *(continued)*	
1565								
	30							
			SPT	42	56			
1560								
	35							
			SPT	72/11"	96/11"		Hard drilling.	
1555							(Increase in moisture and coarse material).	
	40							
			SPT	19	25		(Medium dense).	
							BORING TERMINATED AT 41½ FEET Groundwater and Seepage not observed	
1550								
	45							
1545								

ATLAS

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED.

Figure

I-12

ATLAS LOG REPORT - - 1/3/23 10:29 - \\SD.SCST.COM\DFS_ROOT\DATA\CLIENTS\EASTERN MUNICIPAL WATER DISTRICT\190063P4 - EMWD, AS-NEEDED ENGINEERING NON-DESIGN SERVICES\190063P4.2 - EMWD, GOOD HOPE & MEAD VALLEY WATER SEWER

DRAFT

LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	
Mead Valley Sewer Improvements	190063P4.2 (1962-1)	B-9S

SITE	START	END	SHEET NO.
Riverside County, CA	9/22/22	9/22/22	13

DRILLING COMPANY	DRILL METHOD	LOGGED BY	REVIEWED BY
Baja Exploration	Hollow Stem Auger	HK	

DRILLING EQUIPMENT	BORING DIA. (in.)	TOTAL DEPTH (ft)	GROUND ELEV. (ft)
CME-75	8	41.5	1593

DEPTH/ELEV. GROUND WATER (ft)
- AT TIME OF DRILLING 25.00 ft / Elev 1568.00 ft
- AT END OF DRILLING ---
- AFTER DRILLING ---

SAMPLING METHOD: 140-lb Hammer, 30-in Drop

NOTES: Hammer Efficiency = 80.0% N_{60}~1.33N_{SPT}

ELEVATION (ft)	DEPTH (ft)	BULK SAMPLE	DRIVE SAMPLE	BLOWS PER FOOT	N_{60}	MOISTURE (%)	DRY DENSITY (pcf)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION	LAB TESTS
1590	0								**VERY OLD AXIAL-CHANNEL DEPOSITS (Qvoa)**: SILTY SAND (SM), loose to medium dense, brown, moist, fine to coarse grained, roots, angular gravels.	RV WA
	5		CAL	40					CLAYEY SAND (SC), brown, dense, moist, fine to coarse grained, micaceous.	EI
1585										
	10		CAL	22		9.0	112.4		Medium dense.	DS WA
1580										
	15		CAL	17					Trace gravel.	
1575										
	20		CAL	11					Loose, increase in moisture.	
1570										

ATLAS

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED.

Figure

I-13

ATLAS LOG REPORT - - 1/3/23 10:29 - \\SD.SCST.COM\DFS_ROOT\DATA\CLIENTS\EASTERN MUNICIPAL WATER DISTRICT\190063P4 - EMWD, AS-NEEDED ENGINEERING NON-DESIGN SERVICES\190063P4.2 - EMWD, GOOD HOPE & MEAD VALLEY WATER SEWER C

DRAFT

LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	
Mead Valley Sewer Improvements	190063P4.2 (1962-1)	B-9S

SITE	START	END	SHEET NO.
Riverside County, CA	9/22/22	9/22/22	14

DRILLING COMPANY	DRILL METHOD	LOGGED BY	REVIEWED BY
Baja Exploration	Hollow Stem Auger	HK	

DRILLING EQUIPMENT	BORING DIA. (in.)	TOTAL DEPTH (ft)	GROUND ELEV. (ft)
CME-75	8	41.5	1593

DEPTH/ELEV. GROUND WATER (ft)
- AT TIME OF DRILLING 25.00 ft / Elev 1568.00 ft
- AT END OF DRILLING ---
- AFTER DRILLING ---

SAMPLING METHOD: 140-lb Hammer, 30-in Drop

NOTES: Hammer Efficiency = 80.0% N_{60}~1.33N_{SPT}

ELEVATION (ft)	DEPTH (ft)	BULK SAMPLE	DRIVE SAMPLE	BLOWS PER FOOT	N_{60}	MOISTURE (%)	DRY DENSITY (pcf)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION	LAB TESTS
1565	30		CAL	36					**VAL VERDE TONALITE (qdi)**: IGNEOUS ROCK (QUARTZ DIORITE), olive gray, intensely weathered to decomposed, very soft; (POORLY GRADED SAND (SP), dense, wet, fine to medium grained). *(continued)* Groundwater observed at 25 feet.	
			SPT	34	45					
1560	35								(Very dense).	
			SPT	56	75					
1555	40									
			SPT	85/12"	113/12"					
1550	45								**BORING TERMINATED AT 41½ FEET** Groundwater observed at 25 Feet	
1545										

ATLAS

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED.

Figure

I-14

ATLAS LOG REPORT - - 1/3/23 10:29 - \\SD.SCST.COM\DFS_ROOT\DATA\CLIENTS\EASTERN MUNICIPAL WATER DISTRICT\190063P4 - EMWD, AS-NEEDED ENGINEERING NON-DESIGN SERVICES\190063P4.2 - EMWD, GOOD HOPE & MEAD VALLEY WATER SEWER

DRAFT

LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	
Mead Valley Sewer Improvements	190063P4.2 (1962-1)	**B-10S**

SITE	START	END	SHEET NO.
Riverside County, CA	9/23/22	9/23/22	15

DRILLING COMPANY	DRILL METHOD	LOGGED BY	REVIEWED BY
Baja Exploration	Hollow Stem Auger	HK	

DRILLING EQUIPMENT	BORING DIA. (in.)	TOTAL DEPTH (ft)	GROUND ELEV. (ft)
CME-75	8	41.5	1587

SAMPLING METHOD	NOTES
140-lb Hammer, 30-in Drop	Hammer Efficiency = 80.0% N_{60}~1.33N_{SPT}

DEPTH/ELEV. GROUND WATER (ft)
- ▽ AT TIME OF DRILLING 27.00 ft / Elev 1560.00 ft
- ▼ AT END OF DRILLING ---
- ▼ AFTER DRILLING ---

ELEVATION (ft)	DEPTH (ft)	BULK SAMPLE	DRIVE SAMPLE	BLOWS PER FOOT	N_{60}	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION
1585							**FILL (Qf)**: SILTY SAND (SM), medium dense, brown, moist, fine to medium grained, low plasticity, trace gravel.
	5		CAL	27			**VAL VERDE TONALITE (Kvt)**: IGNEOUS ROCK (QUARTZ DIORITE), olive gray, intensely weathered to decomposed, very soft; (POORLY GRADED SAND (SP), medium dense, moist, fine to medium grained).
1580							
	10		CAL	50/6			(Very dense, weakly cemented).
1575							
	15		CAL	50/5			Light brown; (increase in moisture).
1570							
	20		CAL	50/6			
1565							

ATLAS

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED.

Figure

I-15

ATLAS LOG REPORT - - 1/3/23 10:29 - \\SD.SCST.COM\DFS_ROOT\DATA\CLIENTS\EASTERN MUNICIPAL WATER DISTRICT\190063P4 - EMWD, AS-NEEDED ENGINEERING NON-DESIGN SERVICES\190063P4.2 - EMWD, GOOD HOPE & MEAD VALLEY WATER SEWER C

DRAFT

LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	
Mead Valley Sewer Improvements	190063P4.2 (1962-1)	B-10S

SITE	START	END	SHEET NO.
Riverside County, CA	9/23/22	9/23/22	16

DRILLING COMPANY	DRILL METHOD	LOGGED BY	REVIEWED BY
Baja Exploration	Hollow Stem Auger	HK	

DRILLING EQUIPMENT	BORING DIA. (in.)	TOTAL DEPTH (ft)	GROUND ELEV. (ft)
CME-75	8	41.5	1587

DEPTH/ELEV. GROUND WATER (ft)
- ▽ AT TIME OF DRILLING 27.00 ft / Elev 1560.00 ft
- ▼ AT END OF DRILLING ---
- ▼ AFTER DRILLING ---

SAMPLING METHOD: 140-lb Hammer, 30-in Drop

NOTES: Hammer Efficiency = 80.0% N_{60}~1.33N_{SPT}

ELEVATION (ft)	DEPTH (ft)	BULK SAMPLE	DRIVE SAMPLE	BLOWS PER FOOT	N_{60}	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION
1560			SPT	52	69		**VAL VERDE TONALITE (Kvt)**: IGNEOUS ROCK (QUARTZ DIORITE), olive gray, intensely weathered to decomposed, very soft; (POORLY GRADED SAND (SP), medium dense, moist, fine to medium grained). *(continued)* (Increase in coarse material). Groundwater observed at 27 feet.
	30						
1555			SPT	50	67		
	35						
			SPT	51	68		
1550							
	40						(Strongly cemented).
			SPT	80/12"	107/12"		
1545							**BORING TERMINATED AT 41½ FEET** Groundwater observed at 27 Feet
	45						
1540							

ATLAS

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED.

Figure

I-16

ATLAS LOG REPORT - - 1/3/23 10:29 - \\SD.SCST.COM\DFS_ROOT\DATA\CLIENTS\EASTERN MUNICIPAL WATER DISTRICT\190063P4 - EMWD, AS-NEEDED ENGINEERING NON-DESIGN SERVICES\190063P4.2 - EMWD, GOOD HOPE & MEAD VALLEY WATER SEWER

DRAFT

LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	
Mead Valley Sewer Improvements	190063P4.2 (1962-1)	**B-11S**

SITE	START	END	SHEET NO.
Riverside County, CA	9/23/22	9/23/22	17

DRILLING COMPANY	DRILL METHOD	LOGGED BY	REVIEWED BY
Baja Exploration	Hollow Stem Auger	HK	

DRILLING EQUIPMENT	BORING DIA. (in.)	TOTAL DEPTH (ft)	GROUND ELEV. (ft)	DEPTH/ELEV. GROUND WATER (ft)
CME-75	8	41.5	1587	▽ AT TIME OF DRILLING ---
				▼ AT END OF DRILLING ---
				▼ AFTER DRILLING ---

SAMPLING METHOD	NOTES
140-lb Hammer, 30-in Drop	Hammer Efficiency = 80.0% N_{60}~1.33N_{SPT}

ELEVATION (ft)	DEPTH (ft)	BULK SAMPLE	DRIVE SAMPLE	BLOWS PER FOOT	N_{60}	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION	LAB TESTS
1585							**FILL (Qf)**: SILTY SAND (SM), medium dense, brown, moist, fine to medium grained, trace gravel, asphalt fragments.	COR
	5		CAL	37			**VAL VERDE TONALITE (Kvt)**: IGNEOUS ROCK (QUARTZ DIORITE), brown, intensely weathered to decomposed, very soft; (SILTY SAND (SM), dense, moist, fine to medium grained).	PD
1580								
	10		CAL	30			(Weakly cemented).	
1575								
	15		CAL	74			(Very dense, increase in moisture).	
1570								
	20		CAL	50/4			(Increase in coarse material).	
1565								

ATLAS

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED.

Figure

I-17

ATLAS LOG REPORT - - 1/3/23 10:29 - \\SD.SCST.COM\DFS_ROOT\DATA\CLIENTS\EASTERN MUNICIPAL WATER DISTRICT\190063P4 - EMWD, AS-NEEDED ENGINEERING NON-DESIGN SERVICES\190063P4.2 - EMWD, GOOD HOPE & MEAD VALLEY WATER SEWER C

DRAFT

LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	
Mead Valley Sewer Improvements	190063P4.2 (1962-1)	B-11S

SITE	START	END	SHEET NO.
Riverside County, CA	9/23/22	9/23/22	18

DRILLING COMPANY	DRILL METHOD	LOGGED BY	REVIEWED BY
Baja Exploration	Hollow Stem Auger	HK	

DRILLING EQUIPMENT	BORING DIA. (in.)	TOTAL DEPTH (ft)	GROUND ELEV. (ft)
CME-75	8	41.5	1587

DEPTH/ELEV. GROUND WATER (ft)
- AT TIME OF DRILLING ---
- AT END OF DRILLING ---
- AFTER DRILLING ---

SAMPLING METHOD: 140-lb Hammer, 30-in Drop

NOTES: Hammer Efficiency = 80.0% N_{60}~1.33N_{SPT}

ELEVATION (ft)	DEPTH (ft)	BULK SAMPLE	DRIVE SAMPLE	BLOWS PER FOOT	N_{60}	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION	LAB TESTS
1560			SPT	81	108		**VAL VERDE TONALITE (Kvt)**: IGNEOUS ROCK (QUARTZ DIORITE), brown, intensely weathered to decomposed, very soft; (SILTY SAND (SM), dense, moist, fine to medium grained). *(continued)*	
	30		SPT	83/12"	111/12"			
1555								
	35		SPT	50/6	67/6			
1550								
	40		SPT	50/6	67/6			
1545							**BORING TERMINATED AT 41½ FEET** Groundwater and Seepage not observed	
	45							
1540								

ATLAS

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Figure

I-18

ATLAS LOG REPORT - - 1/3/23 10:29 - \\SD.SCST.COM\DFS_ROOT\DATA\CLIENTS\EASTERN MUNICIPAL WATER DISTRICT\190063P4 - EMWD, AS-NEEDED ENGINEERING NON-DESIGN SERVICES\190063P4.2 - EMWD, GOOD HOPE & MEAD VALLEY WATER SEWER

DRAFT

LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	
Mead Valley Sewer Improvements	190063P4.2 (1962-1)	B-12S

SITE	START	END	SHEET NO.
Riverside County, CA	9/23/22	9/23/22	19

DRILLING COMPANY	DRILL METHOD	LOGGED BY	REVIEWED BY
Baja Exploration	Hollow Stem Auger	HK	

DRILLING EQUIPMENT	BORING DIA. (in.)	TOTAL DEPTH (ft)	GROUND ELEV. (ft)
CME-75	8	41.5	1582

DEPTH/ELEV. GROUND WATER (ft)
- AT TIME OF DRILLING 39.00 ft / Elev 1543.00 ft
- AT END OF DRILLING ---
- AFTER DRILLING ---

SAMPLING METHOD: 140-lb Hammer, 30-in Drop

NOTES: Hammer Efficiency = 80.0% N_{60}~1.33N_{SPT}

ELEVATION (ft)	DEPTH (ft)	BULK SAMPLE	DRIVE SAMPLE	BLOWS PER FOOT	N_{60}	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION	LAB TESTS
1580	0						**FILL (Qf)**: SILTY SAND (SM), medium dense, brown, moist, fine to medium grained, trace gravel, asphalt fragments.	PD RV
	5		CAL	23			**YOUNG WASH DEPOSITS (Qywa)** : SILTY SAND, medium dense, moist, fine to coarse grained, slightly micaceous.	
1575								
	10		CAL	21				
1570								
	15		CAL	40			**VAL VERDE TONALITE (Kvt)**: IGNEOUS ROCK (QUARTZ DIORITE), light brown, intensely weathered to decomposed, very soft; (POORLY GRADED SAND (SP), dense, moist, fine to medium grained).	
1565								
	20		CAL	69/12"				
1560								

ATLAS

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Figure

I-19

ATLAS LOG REPORT - - 1/3/23 10:29 - \\SD.SCST.COM\DFS_ROOT\DATA\CLIENTS\EASTERN MUNICIPAL WATER DISTRICT\190063P4 - EMWD, AS-NEEDED ENGINEERING NON-DESIGN SERVICES\190063P4.2 - EMWD, GOOD HOPE & MEAD VALLEY WATER SEWER C

DRAFT

LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	
Mead Valley Sewer Improvements	190063P4.2 (1962-1)	B-12S

SITE	START	END	SHEET NO.
Riverside County, CA	9/23/22	9/23/22	20

DRILLING COMPANY	DRILL METHOD	LOGGED BY	REVIEWED BY
Baja Exploration	Hollow Stem Auger	HK	

DRILLING EQUIPMENT	BORING DIA. (in.)	TOTAL DEPTH (ft)	GROUND ELEV. (ft)
CME-75	8	41.5	1582

DEPTH/ELEV. GROUND WATER (ft)
- ▽ AT TIME OF DRILLING 39.00 ft / Elev 1543.00 ft
- ▼ AT END OF DRILLING ---
- ▼ AFTER DRILLING ---

SAMPLING METHOD: 140-lb Hammer, 30-in Drop

NOTES: Hammer Efficiency = 80.0% N_{60}~1.33N_{SPT}

ELEVATION (ft)	DEPTH (ft)	BULK SAMPLE	DRIVE SAMPLE	BLOWS PER FOOT	N_{60}	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION	LAB TESTS
			CAL	50/6			**VAL VERDE TONALITE (Kvt)**: IGNEOUS ROCK (QUARTZ DIORITE), light brown, intensely weathered to decomposed, very soft; (POORLY GRADED SAND (SP), dense, moist, fine to medium grained). *(continued)*	
1555								
	30						(Increase in coarse material).	
			SPT	51	68			
1550								
	35						Potassium feldspar, weakly cemented, (increased coarse material).	
			SPT	66	88			
1545							▽ Groundwater observed at 39 feet.	
	40							
			SPT	76/12"	101/12"			
1540							**BORING TERMINATED AT 41½ FEET** Groundwater observed at 39 Feet	
	45							
1535								

ATLAS

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Figure

I-20

ATLAS LOG REPORT - - 1/3/23 10:29 - \\SD.SCST.COM\DFS_ROOT\DATA\CLIENTS\EASTERN MUNICIPAL WATER DISTRICT\190063P4 - EMWD, AS-NEEDED ENGINEERING NON-DESIGN SERVICES\190063P4.2 - EMWD, GOOD HOPE & MEAD VALLEY WATER SEWER C

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LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	
Mead Valley Sewer Improvements	190063P4.2 (1962-1)	B-13S

SITE	START	END	SHEET NO.
Riverside County, CA	9/28/22	9/28/22	21

DRILLING COMPANY	DRILL METHOD	LOGGED BY	REVIEWED BY
Baja Exploration	Hollow Stem Auger	SD	

DRILLING EQUIPMENT	BORING DIA. (in.)	TOTAL DEPTH (ft)	GROUND ELEV. (ft)
LAR-55	8	40.5	1577

DEPTH/ELEV. GROUND WATER (ft)
- AT TIME OF DRILLING ---
- AT END OF DRILLING ---
- AFTER DRILLING ---

SAMPLING METHOD: 140-lb Hammer, 30-in Drop

NOTES: Hammer Efficiency = 80.0% N_{60}~1.33N_{SPT}

ELEVATION (ft)	DEPTH (ft)	BULK SAMPLE	DRIVE SAMPLE	BLOWS PER FOOT	N_{60}	MOISTURE (%)	DRY DENSITY (pcf)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION
1575	0								**FILL (Qf)** : SILTY SAND (SM), medium dense, brown, moist, fine to coarse grained.
	5		CAL	12		8.7	119.9		**YOUNG WASH DEPOSITS (Qywa)** : CLAYEY SAND (SC), medium dense, pale brown, moist, fine to medium grained.
1570									
	10		CAL	79/9"					(Very dense).
1565									
	15		CAL	50/6					(Decrease in fine content).
1560									
	20		CAL	50/6					**VAL VERDE TONALITE (Kvt)**: IGNEOUS ROCK (QUARTZ DIORITE), light brown, intensely weathered to decomposed, very soft; (CLAYEY SAND (SC), very dense, moist, fine to coarse grained).
1555									Yellowish brown to dark brown.

ATLAS

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Figure

I-21

ATLAS LOG REPORT - - 1/3/23 10:29 - \\SD.SCST.COM\DFS_ROOT\DATA\CLIENTS\EASTERN MUNICIPAL WATER DISTRICT\190063P4 - EMWD, AS-NEEDED ENGINEERING NON-DESIGN SERVICES\190063P4.2 - EMWD, GOOD HOPE & MEAD VALLEY WATER SEWER

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LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	
Mead Valley Sewer Improvements	190063P4.2 (1962-1)	B-13S

SITE	START	END	SHEET NO.
Riverside County, CA	9/28/22	9/28/22	22

DRILLING COMPANY	DRILL METHOD	LOGGED BY	REVIEWED BY
Baja Exploration	Hollow Stem Auger	SD	

DRILLING EQUIPMENT	BORING DIA. (in.)	TOTAL DEPTH (ft)	GROUND ELEV. (ft)	DEPTH/ELEV. GROUND WATER (ft)
LAR-55	8	40.5	1577	▽ AT TIME OF DRILLING ---
				▼ AT END OF DRILLING ---
				▼ AFTER DRILLING ---

SAMPLING METHOD	NOTES
140-lb Hammer, 30-in Drop	Hammer Efficiency = 80.0% N_{60}~1.33N_{SPT}

ELEVATION (ft)	DEPTH (ft)	BULK SAMPLE	DRIVE SAMPLE	BLOWS PER FOOT	N_{60}	MOISTURE (%)	DRY DENSITY (pcf)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION
1550			SPT	50/6	67/6				**VAL VERDE TONALITE (Kvt)**: IGNEOUS ROCK (QUARTZ DIORITE), light brown, intensely weathered to decomposed, very soft; (CLAYEY SAND (SC), very dense, moist, fine to coarse grained). *(continued)*
	30		CAL	50/6					
1545									
	35		SPT	50/2					
1540									
	40		SPT	50/2					
1535									**BORING TERMINATED AT 40½ FEET** Groundwater and Seepage not observed
	45								
1530									

ATLAS

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Figure

I-22

ATLAS LOG REPORT - - 1/3/23 10:29 - \\SD.SCST.COM\DFS_ROOT\DATA\CLIENTS\EASTERN MUNICIPAL WATER DISTRICT\190063P4 - EMWD, AS-NEEDED ENGINEERING NON-DESIGN SERVICES\190063P4.2 - EMWD, GOOD HOPE & MEAD VALLEY WATER SEWER

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LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	
Mead Valley Sewer Improvements	190063P4.2 (1962-1)	B-14S

SITE	START	END	SHEET NO.
Riverside County, CA	9/29/22	9/29/22	23

DRILLING COMPANY	DRILL METHOD	LOGGED BY	REVIEWED BY
Baja Exploration	Hollow Stem Auger	SD	

DRILLING EQUIPMENT	BORING DIA. (in.)	TOTAL DEPTH (ft)	GROUND ELEV. (ft)
CME-75	8	40.5	1641

DEPTH/ELEV. GROUND WATER (ft)
- AT TIME OF DRILLING 29.00 ft / Elev 1612.00 ft
- AT END OF DRILLING ---
- AFTER DRILLING ---

SAMPLING METHOD: 140-lb Hammer, 30-in Drop

NOTES: Hammer Efficiency = 80.0% N_{60}~1.33N_{SPT}

ELEVATION (ft)	DEPTH (ft)	BULK SAMPLE	DRIVE SAMPLE	BLOWS PER FOOT	N_{60}	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION
1640							**FILL (Qf)** : SILTY SAND (SM), medium dense, light reddish brown, moist, fine grained.
							VERY OLD AXIAL-CHANNEL DEPOSITS (Qvoa) : CLAYEY SAND (SC), dense, reddish brown, moist, fine to medium grained.
							VAL VERDE TONALITE (Kvt): IGNEOUS ROCK (QUARTZ DIORITE), dark grayish brown, intensely weathered to decomposed, very soft; (POORLY GRADED SAND (SP), very dense, moist, fine to coarse grained).
1635	5		CAL	50/6			
1630	10		CAL	50/6			
1625	15		CAL	50/6			
1620	20		CAL	50/6			

ATLAS

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Figure

I-23

ATLAS LOG REPORT - - 1/3/23 10:29 - \\SD.SCST.COM\DFS_ROOT\DATA\CLIENTS\EASTERN MUNICIPAL WATER DISTRICT\190063P4 - EMWD, AS-NEEDED ENGINEERING NON-DESIGN SERVICES\190063P4.2 - EMWD, GOOD HOPE & MEAD VALLEY WATER SEWER C

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LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	
Mead Valley Sewer Improvements	190063P4.2 (1962-1)	B-14S

SITE	START	END	SHEET NO.
Riverside County, CA	9/29/22	9/29/22	24

DRILLING COMPANY	DRILL METHOD	LOGGED BY	REVIEWED BY
Baja Exploration	Hollow Stem Auger	SD	

DRILLING EQUIPMENT	BORING DIA. (in.)	TOTAL DEPTH (ft)	GROUND ELEV. (ft)
CME-75	8	40.5	1641

DEPTH/ELEV. GROUND WATER (ft)
- ▽ AT TIME OF DRILLING 29.00 ft / Elev 1612.00 ft
- ▼ AT END OF DRILLING ---
- ▼ AFTER DRILLING ---

SAMPLING METHOD: 140-lb Hammer, 30-in Drop

NOTES: Hammer Efficiency = 80.0% N_{60}~1.33N_{SPT}

ELEVATION (ft)	DEPTH (ft)	BULK SAMPLE	DRIVE SAMPLE	BLOWS PER FOOT	N_{60}	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION
1615			SPT	50/3	67/3		**VAL VERDE TONALITE (Kvt)**: IGNEOUS ROCK (QUARTZ DIORITE), dark grayish brown, intensely weathered to decomposed, very soft; (POORLY GRADED SAND (SP), very dense, moist, fine to coarse grained). *(continued)* (Trace fines).
							▽ Groundwater observed at 29 feet.
	30		SPT	50/6			
1610							
	35		SPT	50/5			
1605							
	40		SPT	50/4			
1600							**BORING TERMINATED AT 40½ FEET** Groundwater observed at 29 Feet
	45						
1595							

ATLAS

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED.

Figure

I-24

ATLAS LOG REPORT - - 1/3/23 10:29 - \\SD.SCST.COM\DFS_ROOT\DATA\CLIENTS\EASTERN MUNICIPAL WATER DISTRICT\190063P4 - EMWD, AS-NEEDED ENGINEERING NON-DESIGN SERVICES\190063P4.2 - EMWD, GOOD HOPE & MEAD VALLEY WATER SEWER

DRAFT

LOG OF TEST BORING

ATLAS PROJECT NAME: Mead Valley Sewer Improvements	ATLAS PROJECT NUMBER: 190063P4.2 (1962-1)		B-15S
SITE: Riverside County, CA	START: 9/29/22	END: 9/29/22	SHEET NO.: 25
DRILLING COMPANY: Baja Exploration	DRILL METHOD: Hollow Stem Auger	LOGGED BY: SD	REVIEWED BY:
DRILLING EQUIPMENT: CME-75	BORING DIA. (in.): 8	TOTAL DEPTH (ft): 40.5	GROUND ELEV. (ft): 1641
SAMPLING METHOD: 140-lb Hammer, 30-in Drop	NOTES: Hammer Efficiency = 80.0% N_{60}~1.33N_{SPT}		

DEPTH/ELEV. GROUND WATER (ft)
- AT TIME OF DRILLING: 28.00 ft / Elev 1613.00 ft
- AT END OF DRILLING: ---
- AFTER DRILLING: ---

ELEVATION (ft)	DEPTH (ft)	BULK SAMPLE	DRIVE SAMPLE	BLOWS PER FOOT	N_{60}	MOISTURE (%)	DRY DENSITY (pcf)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION	LAB TESTS
1640	0								**FILL (Qf)** : CLAYEY SAND (SC), medium dense, reddish brown, moist, fine to medium grained.	AL WA
	5		CAL	50/6						
1635									**VAL VERDE TONALITE (Kvt)**: IGNEOUS ROCK (QUARTZ DIORITE), brownish gray, intensely weathered to decomposed, very soft; (POORLY GRADED SAND (SP), very dense, moist, fine to coarse grained).	
	10		SPT	50/6	67/6	13.8	116.4			
1630										
	15		CAL	50/6						
1625										
	20		CAL	50/5						
1620										

ATLAS

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Figure

I-25

ATLAS LOG REPORT - - 1/3/23 10:29 - \\SD.SCST.COM\DFS_ROOT\DATA\CLIENTS\EASTERN MUNICIPAL WATER DISTRICT\190063P4 - EMWD, AS-NEEDED ENGINEERING NON-DESIGN SERVICES\190063P4.2 - EMWD, GOOD HOPE & MEAD VALLEY WATER SEWER C

DRAFT

LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	
Mead Valley Sewer Improvements	190063P4.2 (1962-1)	B-15S

SITE	START	END	SHEET NO.
Riverside County, CA	9/29/22	9/29/22	26

DRILLING COMPANY	DRILL METHOD	LOGGED BY	REVIEWED BY
Baja Exploration	Hollow Stem Auger	SD	

DRILLING EQUIPMENT	BORING DIA. (in.)	TOTAL DEPTH (ft)	GROUND ELEV. (ft)
CME-75	8	40.5	1641

DEPTH/ELEV. GROUND WATER (ft)
- ▽ AT TIME OF DRILLING 28.00 ft / Elev 1613.00 ft
- ▼ AT END OF DRILLING ---
- ▼ AFTER DRILLING ---

SAMPLING METHOD: 140-lb Hammer, 30-in Drop

NOTES: Hammer Efficiency = 80.0% N_{60}~1.33N_{SPT}

ELEVATION (ft)	DEPTH (ft)	BULK SAMPLE	DRIVE SAMPLE	BLOWS PER FOOT	N_{60}	MOISTURE (%)	DRY DENSITY (pcf)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION	LAB TESTS
1615			SPT	50/6					**VAL VERDE TONALITE (Kvt)**: IGNEOUS ROCK (QUARTZ DIORITE), brownish gray, intensely weathered to decomposed, very soft; (POORLY GRADED SAND (SP), very dense, moist, fine to coarse grained). *(continued)*	
									▽ Groundwater observed at 28 feet.	
	30		SPT	50/4						
1610									(SILTY SAND (SM), very dense, wet, fine to medium grained).	
	35		SPT	50/6						
1605										
	40		SPT	50/4						
1600									**BORING TERMINATED AT 40½ FEET** Groundwater observed at 28 Feet	
	45									
1595										

ATLAS

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED.

Figure

I-26

ATLAS LOG REPORT - - 1/3/23 10:29 - \\SD.SCST.COM\DFS_ROOT\DATA\CLIENTS\EASTERN MUNICIPAL WATER DISTRICT\190063P4 - EMWD, AS-NEEDED ENGINEERING NON-DESIGN SERVICES\190063P4.2 - EMWD, GOOD HOPE & MEAD VALLEY WATER SEWER

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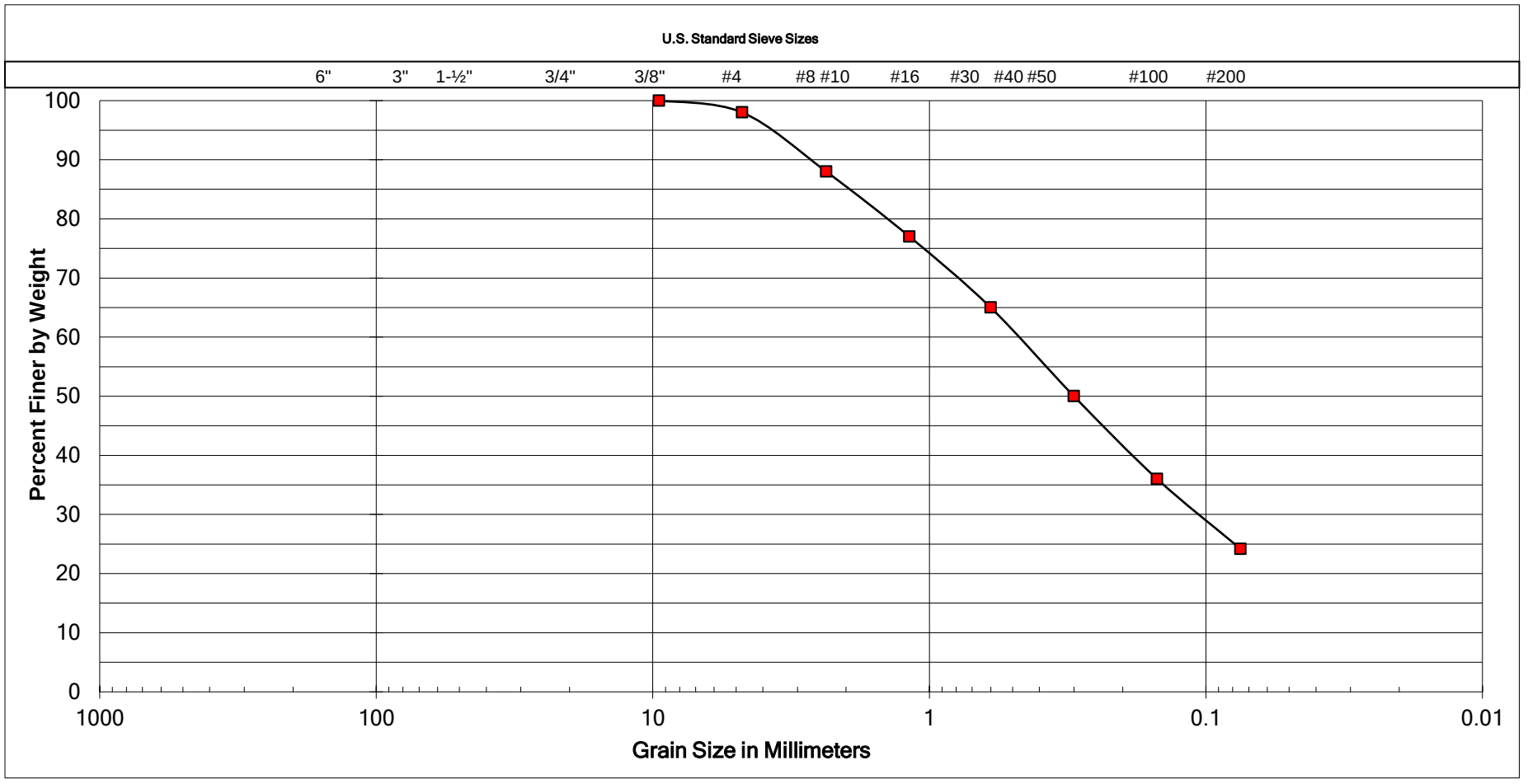
APPENDIX II
LABORATORY TESTING

Laboratory tests were performed to provide geotechnical parameters for engineering analyses. The following tests were conducted:

- **CLASSIFICATION:** Field classifications were verified in the laboratory by visual examination. The final soil classifications are in accordance with the Unified Soil Classification System.
- **IN SITU MOISTURE AND DENSITY:** The in-situ moisture content and dry unit weight were evaluated on samples collected from the borings. The test results are presented on the boring logs in Appendix I.
- **PARTICLE-SIZE DISTRIBUTION:** The particle-size distribution was evaluated on soil samples in accordance with ASTM D6913.
- **CORROSIVITY:** Corrosivity tests were performed on soil samples. The pH and minimum resistivity were evaluated in general accordance with California Test 643. The soluble sulfate content was evaluated in accordance with California Test 417. The total chloride ion content was evaluated in accordance with California Test 422.
- **PERCENT FINDER THAN #200:** This test was performed on soil samples in accordance with ASTM D1140.
- **DIRECT SHEAR:** This test was performed on soil samples in accordance with ASTM D3080. The shear stress was applied to inundated samples at a constant rate of strain of 0.003 inch per minute.
- **EXPANSION INDEX:** This test was performed on soil samples in accordance with ASTM D4289.
- **ATTERBERG LIMITS:** The Atterberg limits were evaluated on a selected soil sample in accordance with ASTM D4318.
- **R-VALUE:** This test was performed on soil samples in accordance with Caltrans Test Method 301.

Soil and rock samples not tested are stored in our laboratory for future reference and analysis, if needed. Unless notified to the contrary, all samples will be disposed of 30 days from the date of this report.

DRAFT



Cobbles	Gravel		Sand			Silt or Clay
	Coarse	Fine	Coarse	Medium	Fine	

SAMPLE LOCATION
B-4S at 5 to 5½ feet
SAMPLE NUMBER
78201

UNIFIED SOIL CLASSIFICATION:	SM
DESCRIPTION	SILTY SAND

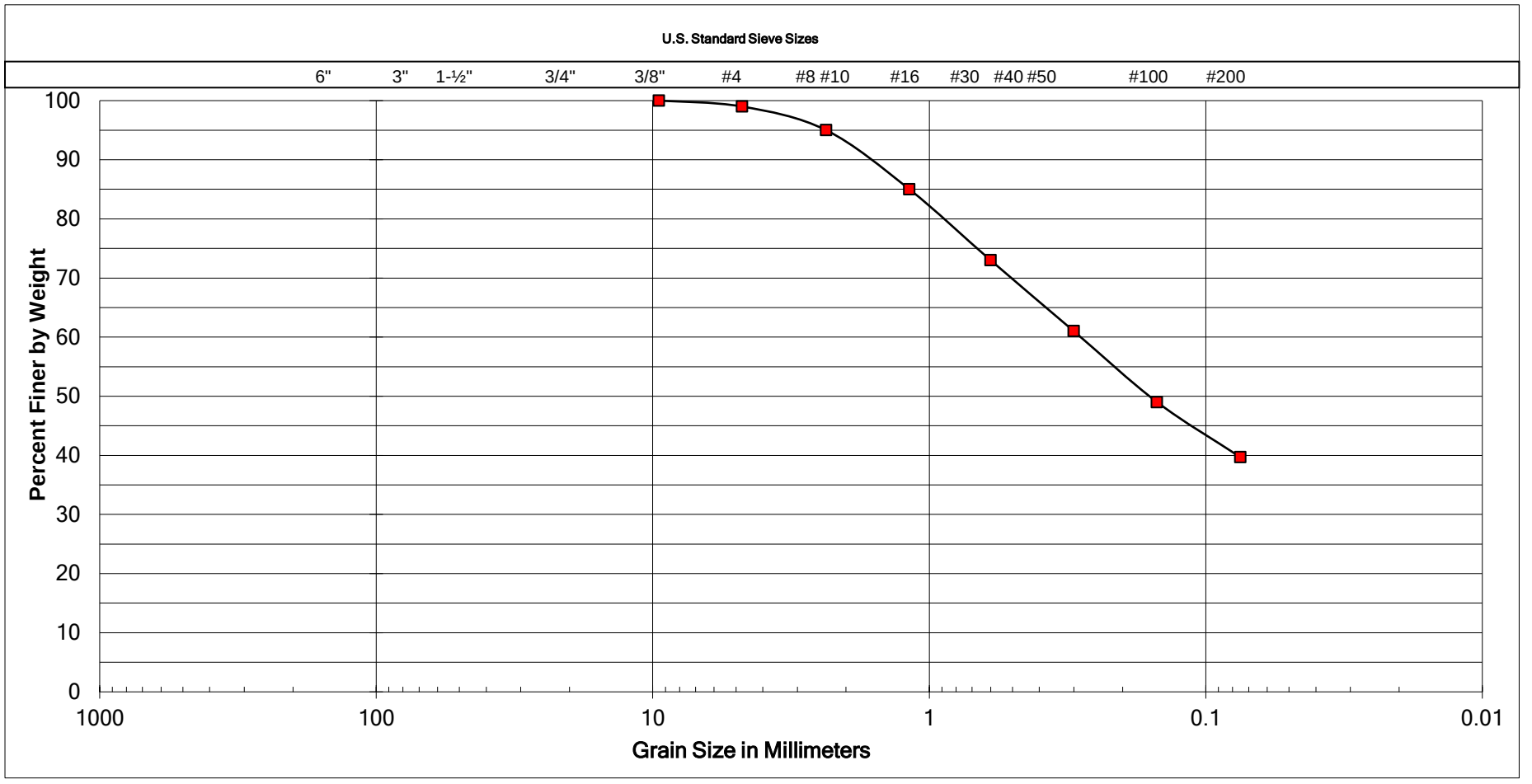
ATTERBERG LIMITS	
LIQUID LIMIT	-
PLASTIC LIMIT	-
PLASTICITY INDEX	-

ATLAS

Mead Valley Sewer Improvements
Riverside County, California

By:	JRD	Date:	January, 2023
Job Number:	190063P4.2 (1962-1)	Figure:	II-1

DRAFT



Cobbles	Gravel		Sand			Silt or Clay
	Coarse	Fine	Coarse	Medium	Fine	

SAMPLE LOCATION
B-11S at 6 to 6½ feet
SAMPLE NUMBER
78210

UNIFIED SOIL CLASSIFICATION:	SM
DESCRIPTION	SILTY SAND

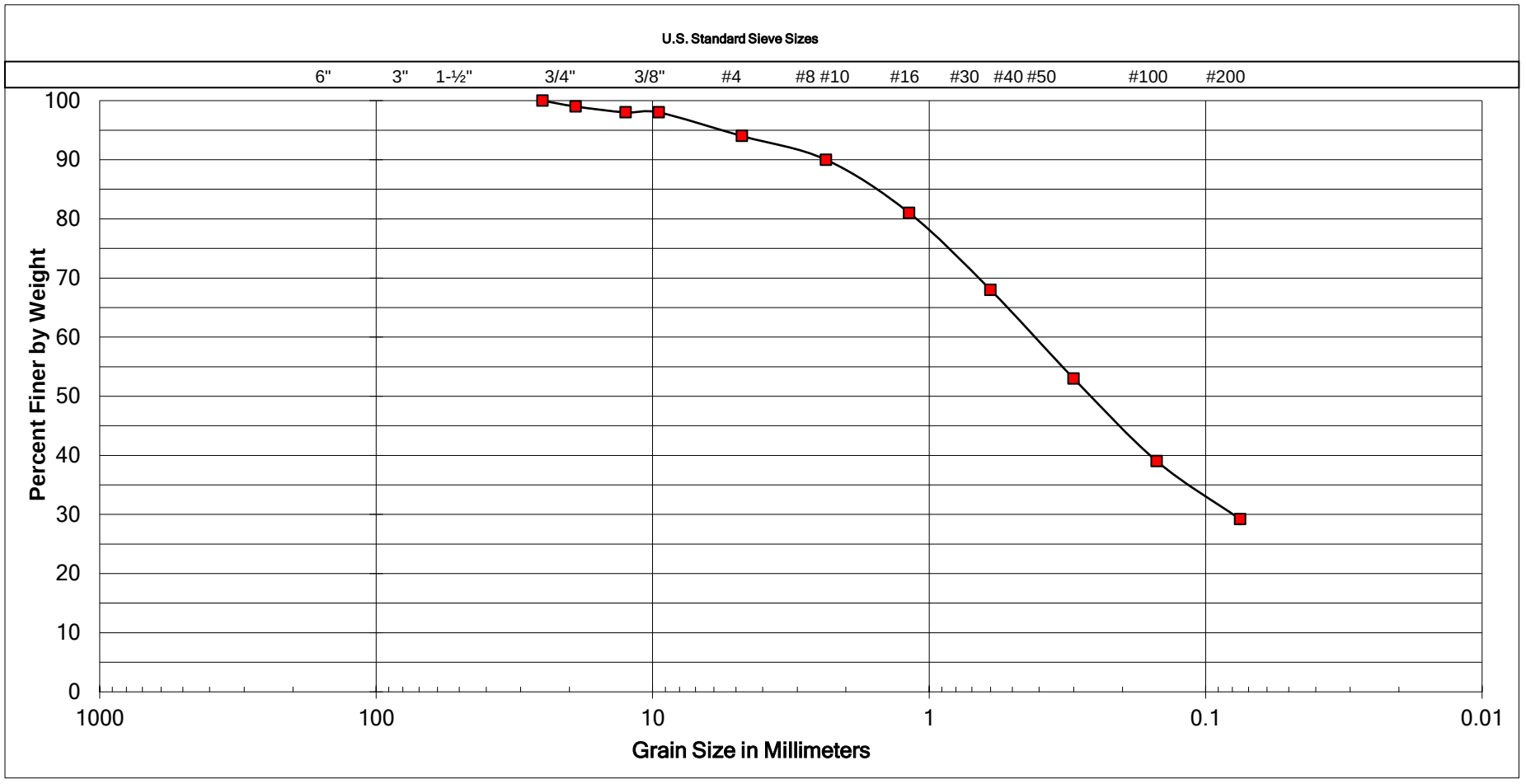
ATTERBERG LIMITS	
LIQUID LIMIT	-
PLASTIC LIMIT	-
PLASTICITY INDEX	-

ATLAS

Mead Valley Sewer Improvements
Riverside County, California

By:	JRD	Date:	January, 2023
Job Number:	190063P4.2 (1962-1)	Figure:	II-2

DRAFT



Cobbles	Gravel		Sand			Silt or Clay
	Coarse	Fine	Coarse	Medium	Fine	

SAMPLE LOCATION
B-12S at 0 to 5 feet
SAMPLE NUMBER
78211

UNIFIED SOIL CLASSIFICATION:	SM
DESCRIPTION	SILTY SAND

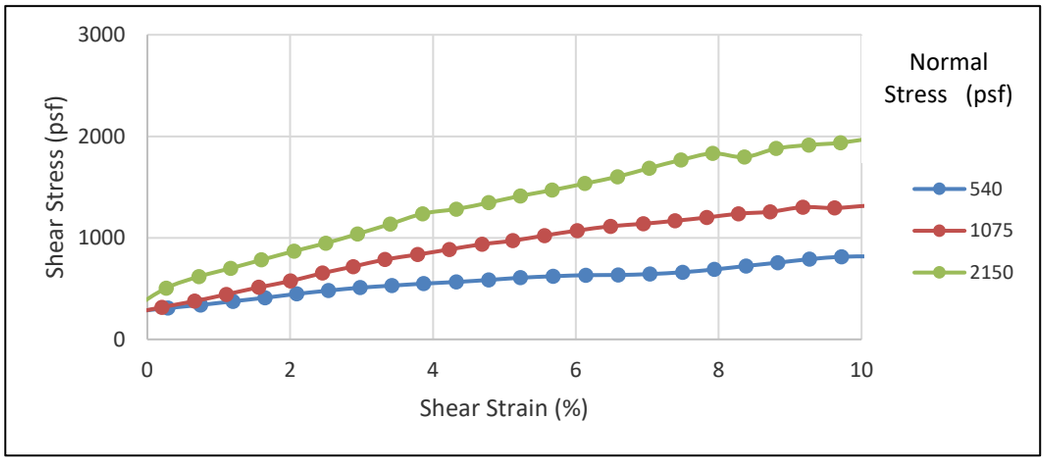
ATTERBERG LIMITS	
LIQUID LIMIT	-
PLASTIC LIMIT	-
PLASTICITY INDEX	-

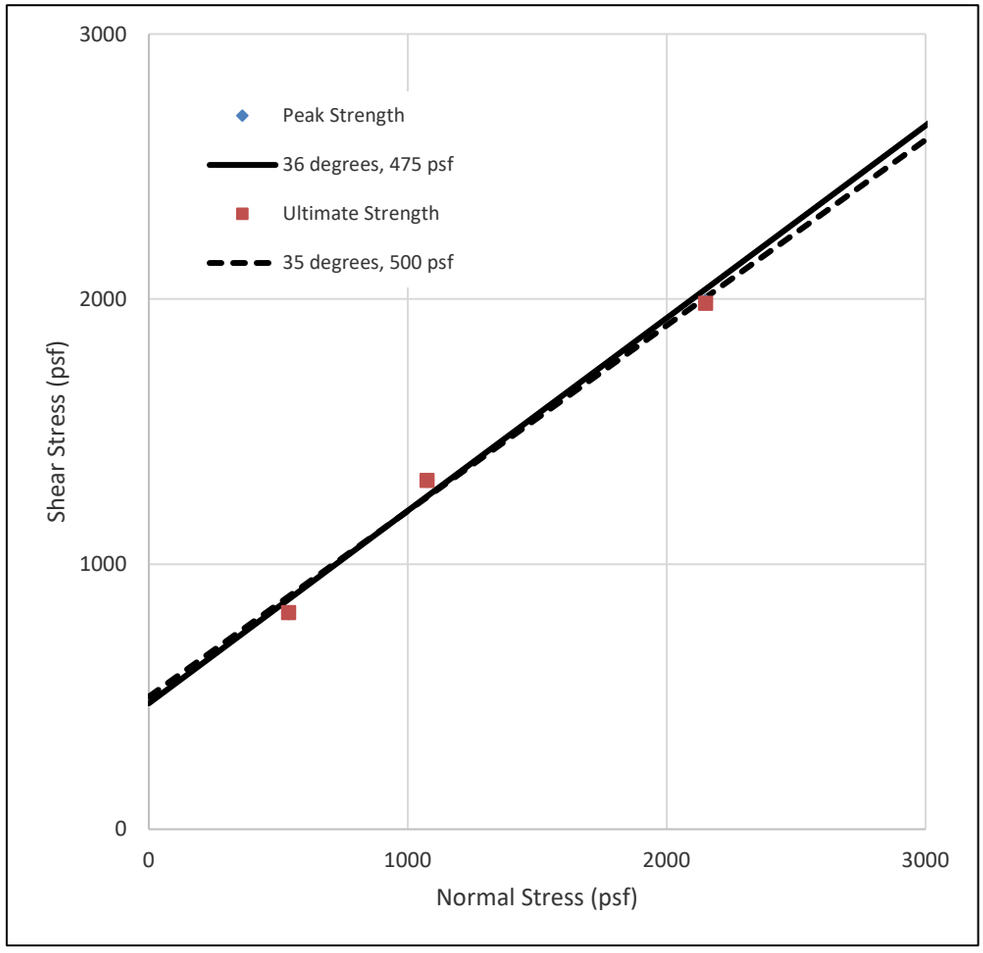
ATLAS

Mead Valley Sewer Improvements
Riverside County, California

By:	JRD	Date:	January, 2023
Job Number:	190063P4.2 (1962-1)	Figure:	II-3

DRAFT





SAMPLE ID: B-1S at 5½ to 6 Feet

VAL VERDE TONALITE (Kvt):
Intensely Weathered to Decomposed Igneous Rock

NOTES: In Situ
Strain Rate: 0.003 in/min
Sample was consolidated and drained

	Peak	Ultimate
Φ	36 °	35 °
c	475 psf	500 psf

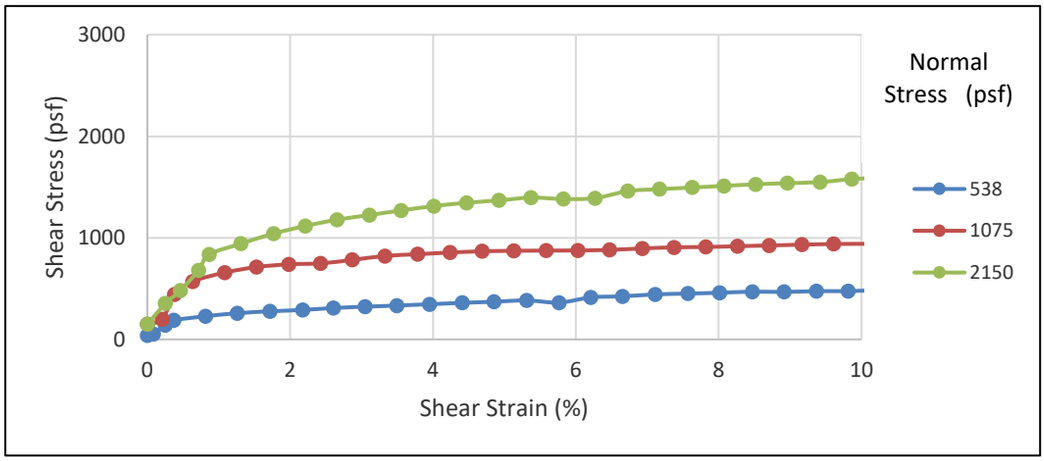
	Initial	Final
γ_d	109.5 pcf	109.5 pcf
w_c	3.6 %	17.7 %
Saturation	18 %	90 %

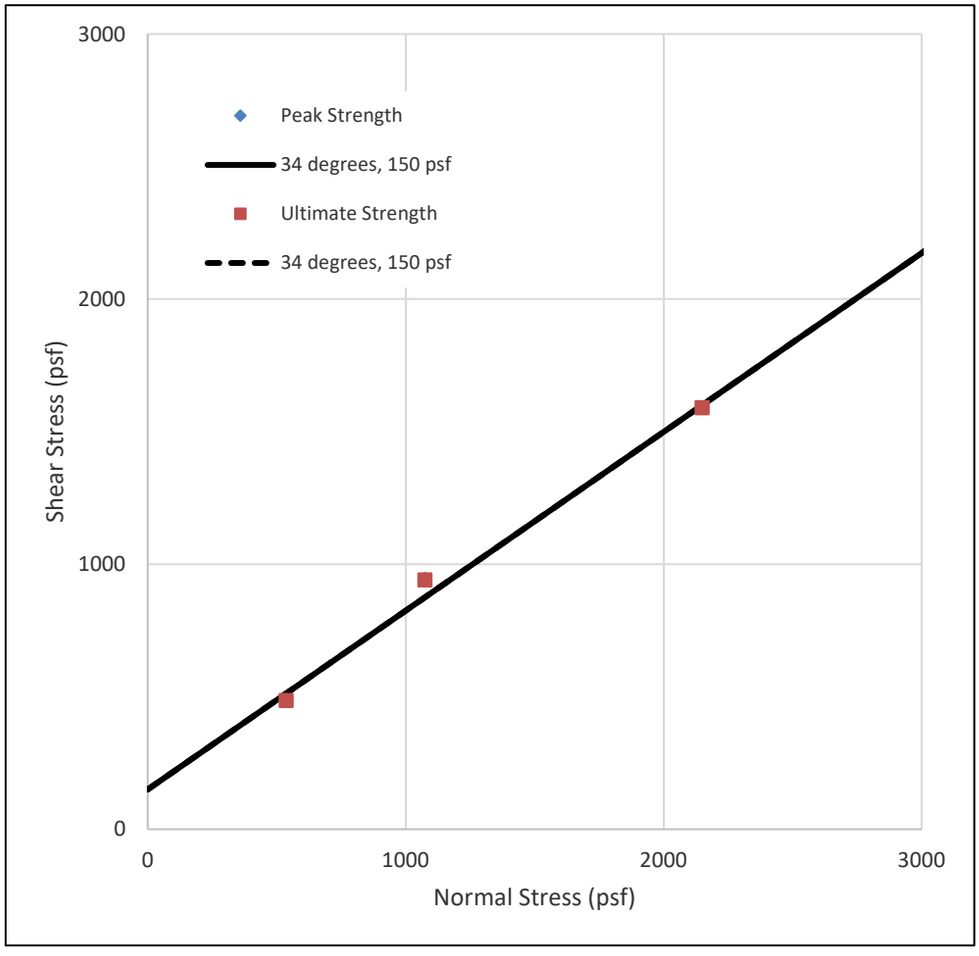
ATLAS

Mead Valley Sewer Improvements
Riverside County, California

By:	JRD	Date:	January, 2023
Job Number:	190063P4.2 (1962-1)	Figure:	II-4

DRAFT





SAMPLE ID: B-9S at 11 to 11½ Feet

VERY OLD AXIAL-CHANNEL DEPOSITS (Qvoa):
CLAYEY SAND (SC)

NOTES: In Situ
Strain Rate: 0.003 in/min
Sample was consolidated and drained

	Peak	Ultimate
Φ	34 °	34 °
c	150 psf	150 psf

	Initial	Final
γ_d	112.4 pcf	112.4 pcf
w_c	9.0 %	17.0 %
Saturation	50 %	93 %

ATLAS

Mead Valley Sewer Improvements
Riverside County, California

By:	JRD	Date:	January, 2023
Job Number:	190063P4.2 (1962-1)	Figure:	II-5

DRAFT

RESISTIVITY, pH, SOLUBLE CHLORIDE and SOLUBLE SULFATE

pH & Resistivity (Cal 643, ASTM G51) , Soluble Chlorides (Cal 422) , Soluble Sulfate (Cal 417)

SAMPLE ID	pH	RESISTIVITY (Ω-CM)	CHLORIDE (%)	SULFATE (%)
B-11S at 0 to 5 feet	7.99	1250	0.005	0.014

EXPANSION INDEX

(ASTM D4289)

SAMPLE ID	EXPANSION INDEX	EXPANSION POTENTIAL	SOIL TYPE (USCS)
B-3S at 0 to 5 feet	*18*	Very Low	CLAYEY SAND (SC)
B-9S at 6 to 6½ feet	*38*	Low	CLAYEY SAND (SC)

Expansion Index	Expansion Potential
1-20	Very Low
21-50	Low
51-90	Medium
91-130	High
Above 130	Very High

Percent Passing No. 200 and No. 4

ASTM D1140

SAMPLE ID	PASSING NO. 200 (%)	PASSING NO. 4 (%)	SOIL TYPE (USCS)
B-1S at 5½ to 6 Feet	7.1	100	Poorly Graded SAND with SILT (SP-SM)
B-3S at 0 to 5 Feet	49.5	100	CLAYEY SAND (SC)
B-5S at 5 to 5½ Feet	45.9	100	CLAYEY SAND (SC)
B-7S at 11 to 11½ Feet	31.9	100	SILTY SAND (SM)
B-8S at 0 to 5 Feet	33.8	100	CLAYEY SAND (SC)
B-8S at 11 to 11½ Feet	40.9	100	CLAYEY SAND (SC)
B-9S at 0 to 5 Feet	36.7	100	SILTY SAND (SM)
B-9S at 11 to 11½ Feet	32.2	100	CLAYEY SAND (SC)
B-15S at 0 to 5 Feet	40.3	100	CLAYEY SAND (SC)

ATTERBERG LIMITS

(ASTM D4318)

SAMPLE ID	LIQUID LIMIT	PLASTIC LIMIT	PLASTIC INDEX	SOIL TYPE (USCS)
B-3S at 0 to 5 feet	27	17	10	CLAYEY SAND (SC)
B-8S at 0 to 5 feet	42	15	27	CLAYEY SAND (SC)
B-15S at 0 to 5 Feet	33	15	18	CLAYEY SAND (SC)

R-Value

(CTM 301)

SAMPLE ID	R-VALUE	SOIL TYPE (USCS)
B-3S at 0 to 5 feet	13	CLAYEY SAND (SC)
B-9S at 0 to 5 feet	24	SILTY SAND (SM)
B-12S at 0 to 5 feet	44	SILTY SAND (SM)

APPENDIX I

Groundwater Monitoring Report

ACCES
ENVIRONMENTAL ENGINEERING

GROUNDWATER MONITORING REPORT

FIRST SEMI-ANNUAL 2022
(SECOND QUARTER 2022)

MOBIL BALDWIN
21020 Cajalco Road
Perris, California 92370

JULY 29, 2022

Prepared for:

Mr. Fayez Sedrak
2337 Norco Drive
Norco, California 92860

Prepared by:

Ronaldo Arboleda
Geologist

Hamid R. Assadi, R.C.E.
Registered Civil Engineer

REGISTERED PROFESSIONAL ENGINEER
HAMID REZA ASSADI
06-2023
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CIVIL
STATE OF CALIFORNIA

Associated Consulting Civil & Environmental Services Inc.
2336 S. Sepulveda Blvd., Los Angeles, CA 90064 Phone: 310-822-3800 Fax: 310-822-3804 www.accesengineering.com

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APPENDICES

Appendix A: Laboratory Reports and Chain-of-Custody Documentation
Appendix B: Tabulated Groundwater Sample Analytical Results
Appendix C: Contaminant Concentration vs. Time
Appendix D: Groundwater Elevation vs. Time
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Appendix F: Water Well Purge and Sample Data Sheet
Appendix G: Waste Manifest

SUMMARY TABLES

Groundwater Monitoring Data	
Monitoring and sampling period covered	**1st SEMI-ANNUAL 2022**
Frequency of groundwater sampling	Semi-annual
Groundwater sampling event date	June 30, 2022
Number of groundwater (gw) monitoring wells existing at the site	11
Number of gw monitoring wells sampled this sampling event	9
Number of gw monitoring wells not sampled this sampling event	2 (MW-5 and MW-7)
Range of depth to groundwater (feet bgs)	9.12 – 11.63
Range of groundwater elevation (feet amsl)	1,629.92 - 1,631.46
Groundwater flow direction	West-southwest
No. of wells with reportable dissolved-phase hydrocarbon concentration	3 of 9 wells sampled
Reportable TPH_G concentrations range (µg/L)	1,390 µg/L – 77,800 µg/L
Reportable TPH_D concentrations range (µg/L)	NA
Reportable Benzene concentrations range (µg/L)	125 µg/L – 30,300 µg/L
Reportable Toluene concentrations range (µg/L)	1.1 µg/L – 33,300 µg/L
Reportable Ethylbenzene concentrations range (µg/L)	612 µg/L – 3,640 µg/L
Reportable Xylenes concentrations range (µg/L)	3.3 µg/L – 20,760 µg/L
Reportable MTBE concentrations range (µg/L)	ND
Reportable ETBE concentrations range (µg/L)	ND
Reportable DIPE concentrations range (µg/L)	ND
Reportable TAME concentrations range (µg/L)	ND
Reportable TBA concentrations range (µg/L)	ND
Wells with free product or sheen	None
Frequency of free product recovery this monitoring period	NA
Range of free product thickness this sampling event	NA
Free product/contaminated groundwater recovered to date	NA

Remedial Action Data	
Remedial action performed during this monitoring period	None
Dates of remedial action	NA
TPH_G removed to date	13,582.6 lbs
Benzene removed to date	362.2 lbs
MTBE removed to date	NA
Free product removed to date	NA
Bulk soil removed to date	740 yd^3

NA = Not Applicable

1.0 INTRODUCTION

Associated Consulting Civil and Environmental Services, Inc. (A.C.C.E.S., Inc.) was retained by Mr. Fayez Sedrak to prepare this report for submittal to the Santa Ana Regional Water Quality Control Board (SARWQCB). The report summarizes groundwater monitoring activities performed at Mobil Baldwin located at 21020 Cajalco Road in Perris, California (Figure 1). The sampling event for First Semi-annual 2022 was conducted on June 30, 2022.

1.1 Report Overview

This report describes the field procedures and observations, laboratory analytical results of groundwater samples, and conclusions resulting from the June 30, 2022 sampling event.

This report is submitted in compliance with the reporting requirements of the County of Riverside Community Health Agency Department of Environmental Health contained in "Site Assessment and Cleanup Corrective Action Guidelines"

1.2 Site Description

The subject site is located at the northeast corner of Cajalco Road and Brown Avenue in Perris, California, an unincorporated area of the County of Riverside. Near the subject site, Brown Street runs north-south and Cajalco Road runs east-west. According to the United States Geological Survey (USGS) Topographic Map for Steele Peak, California Quadrangle, the site is located in Township 4 South, Range 4 West, Section 10, and the elevation is approximately 1,640 feet above mean sea level (AMSL). The site is rectangular in shape and measures approximately 190 feet long by 174 feet wide. The site has been vacant for a number of years. In 2014, a new gasoline station (76 Gas Station) was constructed just to the north of the former Mobil Baldwin. Structures currently present at the site include a canopy that covers dispenser islands and a building that houses a shop and food mart. The surrounding properties are residential/commercial. Figure 2 illustrates the plan view of the site with the location of the existing monitoring wells, former and existing USTs and dispenser islands.

1.3 Background

In the past, the site included fuel retail dispensing facilities with five (5) USTs: two (2) 10,000-gallon and three (3) 4,000-gallon petroleum tanks.

Due to changing UST regulations, the USTs at the site were removed on June 1, 2000 at the request of the County of Riverside Department of Environmental Health (CRDEH). Use of these USTs had been suspended in 1990 and the required temporary closure permits were obtained from the CRDEH until the USTs were removed. Based on the analytical results of the soil samples collected during the UST removal, an unauthorized release report dated July 19, 2000 was filed for the site and the CRDEH required further site assessment to define the horizontal and vertical extent of the released hydrocarbons.

EAR was retained in August of 2000 to provide assistance in connection with the application process with the California State Water Resources Control Board (CSWRCB), Underground Storage Tank Cleanup Fund (USTCF) and the required site assessment activities. EAR submitted a Site Assessment Plan dated November 5, 2001 to the CRDEH to address the site assessment requirements.

The CRDEH approved the work plan in a letter dated January 2, 2002. Cost pre-approval by the USTCF was granted in their February 26, 2002 letter, however, only Geoprobe soil gas and soil sampling activities were approved based on the cost estimate provided.

The Geoprobe survey, which consisted of advancing a total of 16 soil gas and 9 soil-sampling points, was conducted on March 28, 2002 to assess the extent of petroleum hydrocarbon impact at the soil site. The analytical results of these samples indicated significant concentrations of total petroleum hydrocarbons in the gasoline range (TPH_G), benzene, toluene, ethylbenzene and xylenes (BTEX) and methyl tertiary butyl ether (MTBE) in the samples collected in the southwest quadrant of the site.

In a Site Assessment Plan dated August 12, 2002, EAR proposed that seven additional borings (one up gradient, two down gradient, three cross gradient, and one in the former small USTs pit) and sampling be conducted using a conventional drill rig with hollow stem augers to a depth of approximately 40 feet below ground surface (bgs). On December 30, 2002 EAR completed four 32-foot deep borings as groundwater monitoring wells MW-1, MW-3, MW-4, and MW-5 and two 35-foot deep borings as groundwater monitoring wells MW-2 and MW-7. On December 31, 2002, one 32-foot deep boring was completed as groundwater monitoring well MW-6.

Quarterly monitoring of the wells during the first and second quarters of 2003 indicated elevated concentrations of TPH_G and BTEX in monitoring wells MW-1, MW-4 and MW-5. MTBE was also detected in those wells during the first and second quarter sampling events and in the down gradient well (MW-7) during the first quarter sampling event. Based on the concentrations observed in the first and second quarter of 2003 groundwater monitoring events and in pursuant to the directives of the CRDEH in a letter dated June 26, 2003, EAR prepared a Further Site Assessment (FSA) and Interim Remedial Action Plan (IRAP) dated August 5, 2003. In the FSA and IRAP, EAR recommended installing one additional well to the south of the release and to conduct source removal excavation. In a letter dated September 29, 2003, the CRDEH approved the proposed work. On February 25, 2004, EAR installed groundwater monitoring well MW-8 to the south of the property. Laboratory analysis of soil and water samples collected at MW-8 indicated concentrations below laboratory detection limits. Based on the soil sampling completed on and off-site, it is evident that the impact to the subsurface soil is completely defined in all directions.

In order to meet USTCF requirements, as per discussion with Mr. James Young of the USTFC, it was decided to conduct a soil vapor extraction (SVE) feasibility study. The *Soil Vapor Extraction Feasibility Test (SVEFT) Work Plan* dated March 9, 2005 was prepared and submitted to the CRDEH for review and approval. In response, Ms. Linda Shurlow of the CRDEH issued a letter dated March 28, 2005 accepting the work plan. The three proposed vapor wells were installed on May 2, 2005, and the SVEFT was attempted on May 19, 2005.

The CRDEH issued a letter dated September 15, 2005 stating that oversight responsibilities were transferred from the CRDEH to the CRWQCB. The details of this well installation and SVERFT were submitted to the CRWQCB in a report dated November 2, 2005. The report concluded that due to shallow/semi or fully confining groundwater conditions, SVEFT could not be completed at the site. Therefore, in order to better address the site remediation, it was recommended to conduct soil excavation and the installation of an infiltration gallery as described in *Further Site Assessment and Interim Remedial Action Plan* dated August 5, 2003 and its addendum dated September 29, 2003.
In a meeting between EAR and CRWQCB on January 24, 2006, it was concluded that soil

excavation is the most suitable remedial alternative, keeping in view the limited extent of the benzene contamination plume. CRWQCB issued a letter dated January 26, 2006 which summarized the corrective action recommendations as follows:

- Conduct aquifier pump test to develop strategy for addressing groundwater to be encountered during excavation.
- Remedial excavation of soil near the tank and dispenser areas.
- Evaluate installing a reactive barrier consisting of an oxygen-release compound.
- Reinstallation of the wells destroyed during excavation
- Based on the aquifier pump test results, evaluate installation of extraction gallery through the backfill.
- Removal of product piping, dispenser and vapor recovery lines which was not removed during tank removal. Collect soil samples for laboratory analysis if petroleum hydrocarbon impact is suspected.

An aquifier pump test was conducted on April 12 and 13, 2006 by EAR. Single well tests were conducted at two-inch diameter wells VE-2 to VE-4 on April 12, 2006 and a six-hour step drawdown test was conducted at four-inch diameter well MW-1 on April 13, 2006. Based on hydraulic conductivity measured from single well tests, saturated soil to a depth of approximately 15 feet bgs has a very low permeability characteristic of a clayey silt or silty clay. Very little groundwater inflow to an excavation would be expected from this interval.

A.C.C.E.S. Inc. conducted remedial action at the site using excavation and disposal method on January 23, 28, 29, 30, February 7, March 26, 27 and 28, 2008. Before remedial actions began, MW-1 was properly destroyed on January 15, 2008. MW-1 was re-installed to its original location on September 16, 2008. During the excavation process, an underground storage tank was discovered in the excavation. The UST was discovered on January 28, 2008 and was removed on February 7, 2008. Remedial activities were temporarily suspended after the February 7, 2008 activities to complete additional permit conditions by the County of Riverside Community Health Agency. A.C.C.E.S. Inc. resumed work on March 26, 2008 with the continuation of the excavation and the removal of product piping, dispenser and vapor recovery lines that were not removed during the June 1, 2000 tank removal activities. During that remedial action, a total of twenty-nine (29) soil samples were obtained at various depths within and along the peripheries of the pre-determined excavation site (Figure 2). The results of laboratory analysis revealed that TPH_G and BTEX were reported in samples collected within and along the peripheries of the excavation area from 4 feet bgs down to the maximum depth of 14 feet bgs. At the completion of the remedial action on March 27, 2008, approximately 740 yd^3 of contaminated soil was excavated and transported to a disposal facility. Dewatering was conducted during the entire excavation process. Approximately 4,200 gallons of water were collected. The collected groundwater was temporarily stored on-site and was transported to a recycling facility for treatment and disposal. Based on laboratory analytical results, PID readings and field observations, impacted soils extend beyond the lateral and vertical extents of the excavation.

MW-2 was inadvertently destroyed by one of the transporter trucks during the soil remediation process. On September 16, 2008 MW-1 was re-installed to its original location and MW-2 was re-installed to within one foot from its original location. MW-1 and MW-2 were re-installed to the maximum depth of 30 feet and screened from 5 to 30 feet below ground surface (bgs). A.C.C.E.S. Inc. started quarterly groundwater monitoring at the site in the fourth quarter of 2006. Quarterly groundwater monitoring of the wells during the fourth quarter of 2007 indicated elevated concentrations of TPH_G, BTEX and MTBE in monitoring well MW-1. TPH_G and BTEX

concentrations were also reported at MW-4 and MW-5. Following the 2008 remedial action, results of chemical analyses of groundwater samples collected during quarterly investigations indicated fluctuations in contaminant concentrations.

A.C.C.E.S. Inc. performed additional subsurface soil and groundwater investigation at the site on February 15-16, 2012. During this phase of the investigation, two (2) soil borings, AB-5 and AB-6, were drilled to the maximum depth of 25 feet below ground surface (bgs) and converted to groundwater monitoring wells as MW-9 and MW-10; four (4) soil borings, AB-1 through AB-4, were drilled to the maximum depth of 15 feet bgs; and one (1) boring was drilled to the maximum depth of 20 feet bgs and converted to a sparge well (SW-1). Additionally, a 20-foot long slotted pipe was installed horizontally during this investigation to address extraction of soil vapor during remedial action. Based on state certified laboratory analytical results during this investigation, soils to the north, northeast and east of MW-1 were impacted by petroleum hydrocarbon contaminants.

MW-9 and MW-10 were developed on February 22, 2012. Based upon state certified laboratory analytical results during this investigation, the groundwater contamination plume appears to have extended to the north and east of MW-1.

A.C.C.E.S., Inc. performed remedial action feasibility study at the site consisting of vapor extraction combined with air sparge pilot tests on December 10-14, 2012. The results of the study indicated that that method of remediation can be implemented successfully at the site.

On December 10, 2012, vapor extraction well VE-1 was tested under applied vacuum of 55 inches of water column (*in. WC*) and flow rate of 155 cubic feet per minute (cfm). The zone of vacuum influence was determined to extend to 12 feet.

Air sparge well SW-1 was initially tested under a pressure of 30 psi with a flow rate of less than 10 cfm on December 11, 2012. The pressure and flow rate became steady at 22 psi and 15 cfm, respectively, after 4 hours of operation. The 9-hour air sparging test was performed in combination with vapor extraction. Results of the test indicated maximum hydraulic mounding at 4.5 feet at MW-1 (located 10 feet from SW-1). Marginal hydraulic mounding can be observed at MW-4, MW-5, MW-9 and MW-10 which are located 21-44 feet from SW-1. Four hours after the start of injection of air, groundwater dropped sharply at observation wells located within 44 feet of SW-1. Likewise at that point in time, positive pressure was recorded at MW-1 at 0.2 in. WC. Dissolved oxygen (DO) was observed to have increased at all existing groundwater monitoring wells at the subject site.

To further evaluate the feasibility of air sparging combined with vapor extraction and in order to determine the mass removal efficiency of the air sparging process, air sparging combined with vapor extraction operations were extended for 18 hours (9 hours each day on December 12 and 14, 2012). Overall, after 37 hours of operation, 595.108 lbs of TPH_G and 13.932 lbs of VOCs were removed during the remedial action feasibility study.

Groundwater samples were collected from all existing groundwater monitoring wells before and after air sparging. Although there were changes observed in the contaminant concentrations, the test was too short to gauge the effect of biodegradation.

In addition to the existing remediation system, four (4) air sparge wells (SW-2 through SW-5) and four (4) horizontal vapor extraction lines (VE-2 through VE-5) were installed on March 18, 2014. Remedial action consisting of air sparging combined with vapor extraction at the five air

sparge wells and five horizontal vapor extraction lines was conducted by A.C.C.E.S., Inc. on March 24 to May 6, 2014. Approximately 12,983.51 lbs of TPH_G and 1,362.14 lbs of VOCs (Benzene, Toluene, Ethylbenzene and Xylenes) were removed during the 500 hours of air sparging combined with vapor extraction operations at SW-1 and VE-1 through SW-5 and VE-5 in this phase of the remedial action.

2.0 SCOPE OF WORK

The tasks completed during the sampling were authorized by Mr. Fayez Sedrak. The scope of work for this groundwater monitoring program consisted of the following major tasks:

- Depth to groundwater measurements at nine (9) of eleven (11) monitoring wells,
- Purging of nine monitoring wells,
- Collection of groundwater samples at nine wells,
- Analytical laboratory testing of groundwater samples,
- Data analysis, &
- Report preparation

3.0 FIELD ACTIVITIES

All groundwater monitoring and sampling activities were performed in general accordance with A.C.C.E.S., Inc. protocols and the A.C.C.E.S. Inc. Site Safety Plan (SSP). Nine (9) of eleven (11) existing groundwater monitoring wells were sampled during this monitoring period. MW-5 was covered with compacted dirt overlay and cannot be located, thus, was not gauged, purged or sampled. MW-7 was covered with concrete due to the road expansion project by Riverside County and was not located and re-commissioned during this monitoring event.

3.1 Depth to Groundwater Measurements

Depth to groundwater measurements were performed prior to purging and sampling of each groundwater monitoring well. The measurements were taken using a Solinst™ water level indicator. A surveyed mark on top of the PVC casing of each well was used as the reference point.

3.2 Monitoring Well Purging and Sampling

Prior to the collection of each groundwater sample, a minimum of three (3) saturated casing volumes of water was purged from each well to ensure that stagnant well water was replaced by formation water. The saturated casing volume (CV) was calculated as follows:

$CV = \pi r^2 d\ (7.481\ gal/ft^3)$, where:
r= the radius measured from the center of the casing to the inside surface of the casing (feet); and
d= the thickness of the column of water standing in the well (feet)

Each well was purged using a 2-inch diameter, submersible pump which draws current from a 110-V AC supply outlet. Each well was pumped at a rate of approximately 0.75 to 1.5 gallons per minute. Measurements of pH, conductivity, turbidity and temperature were recorded during

purging and allowed to stabilize to within the following limits:

Parameter	Variance
pH	0.1 pH units
Conductivity	± 5%
Temperature	± 5%
Turbidity	± 10%

If a well was purged dry prior to removal of three casing volumes of water, the water level in the well was allowed to recover to eighty percent (80%) of its static level. As soon as this level was reached in the well, measurements for pH, conductivity and temperature were repeated to determine water quality, and a groundwater sample was collected. If the time for recovery to 80% of the static level exceeded two hours, a groundwater sample was collected as soon as a sufficient volume of water was available.

Groundwater samples were collected in the order of the analytical parameters' volatility starting at the well with the lowest concentration of aromatic volatile organics. Each respective sample was collected using a new, inert, disposable bailer dedicated to each well.

Groundwater generated during well purging activities and water generated during equipment decontamination activities was contained on-site in 55-gallon drums for proper handling and disposal following receipt of chemical analyses. Each 55-gallon drum was appropriately labeled with its contents, estimated volume, date and source.

3.3 Field Logs

A field log was used to record all monitoring and sampling activities. The field log was used to record the following:

- Name of the project,
- Appearance of the samples,
- Description of sampling point and sampling methodology,
- Date and time of collection,
- Type of sample,
- Sample identification numbers,
- References such as maps or photographs of the sampling site,
- Field observations,
- Location of the sampling point, &
- Field measurements made (e.g. organic vapor, water level, etc.).

4.0 QUALITY ASSURANCE PLAN

To ensure the accuracy and reliability of the data collected, standard quality assurance/quality control (QA/QC) procedures were followed. A trained field technician monitored all field activities and was responsible for the proper collection and preservation of groundwater samples.

4.1 Sample Handling

Groundwater samples were collected from the monitoring wells using new, inert, disposable bailers dedicated to each well. Each sample was transferred from the bailer, with as little agitation as possible, into pre cleaned, properly preserved laboratory- provided Volatile Organic Analyses (VOA) containers. Three VOA bottles for each location were prepared. Sample bottles for VOA were filled completely, allowing no headspace. Filled sample containers were immediately labeled, and placed into an ice cooler with blue ice. Samples were delivered to the laboratory with a completed chain-of-custody form.

4.2 Equipment Decontamination

To minimize the potential of cross-contamination of the wells, all down-hole purging and sounding equipment were thoroughly decontaminated prior to first use and between each purging event. The well purging equipment was decontaminated by using a soapy water wash, followed by a tap water rinse, and a final de-ionized water rinse. Decontamination water was stored on site in a 55-gallon drum. Each 55-gallon drum was appropriately labeled.

4.3 Laboratory Analysis

Chemical analyses were performed by Jones Environmental, Inc. (JEI). JEI is a California Department of Health Services (CA DHS) certified analytical laboratory with approved internal quality assurance/quality control (QA/QC) procedures.

5.0 REPORT FINDINGS

5.1 Groundwater Elevations/Flow Direction

Depth to groundwater measurements were performed at nine (9) of eleven (11) existing groundwater monitoring wells on June 30, 2022. MW-5 was covered with compacted dirt overlay and MW-7 was covered with concrete overlay, thus, those wells were not measured for depth to water. Top-of-casing (TOC) elevations were re-surveyed last August 8, 2019 and the results are presented below. Based on the new TOC elevations and nine wells, the groundwater flow direction appears to be to the west-southwest, as shown in Figure 3. The current groundwater elevation data is presented in Table 5.1. Historic groundwater elevations versus time are included in Appendix D.

Table 5.1: Groundwater elevations at the monitoring wells measured on June 30, 2022

WELL NO.	TOTAL WELL DEPTH (ft)	SCREENED INTERVAL (ft. bgs)	ELEVATION OF TOP OF CASING (ft. amsl)	DEPTH FROM TOP OF WELL TO GROUNDWATER (ft)	THICKNESS OF FREE PRODUCT (ft)	GROUNDWATER ELEVATION (ft. amsl)
MW-1	30	5-30	1640.63	9.95	Not Observed	1630.68
MW-2	30	5-30	1642.41	11.24	Not Observed	1631.17
MW-3	32	7-32	1643.09	11.63	Not Observed	1631.46
MW-4	32	7-32	1640.99	10.32	Not Observed	1630.67
MW-5	32	7-32	1639.63	NM	Not Observed	------
MW-6	32	7-32	1639.09	9.17	Not Observed	1629.92

WELL NO.	TOTAL WELL DEPTH (ft)	SCREENED INTERVAL (ft. bgs)	ELEVATION OF TOP OF CASING (ft. amsl)	DEPTH FROM TOP OF WELL TO GROUNDWATER (ft)	THICKNESS OF FREE PRODUCT (ft)	GROUNDWATER ELEVATION (ft. amsl)
MW-7	35	10-35	1637.31	NM	Not Observed	------
MW-8	26	6-26	1639.89	9.12	Not Observed	1630.77
MW-9	25	5-25	1640.79	9.98	Sheen	1630.81
MW-10	25	5-25	1642.27	11.30	Not Observed	1630.97
MW-11	20	5-20	1641.17	10.42	Not Observed	1630.75

NM = Not Measured

5.2 Analytical Results of Groundwater Sampling

For ease of discussion, the analytical results are presented according to the contaminant type. Analytical results from the Second Semi-annual 2021 (Fourth Quarter 2021) sampling event at Mobil Baldwin are presented in Table 5.2. See Appendix A for complete laboratory analytical reports. For a history of groundwater analytical data, refer to Appendix B. Contaminant Concentrations versus Time are included in Appendix C.

Table 5.2: Tabulated results of analytical tests for groundwater samples collected on June 30, 2022

Sample ID	8015M	Method 8260B										
	TPH_G µg/L	Benzene µg/L	Toluene µg/L	Ethyl-benzene µg/L	Xylenes µg/L	MTBE µg/L	ETBE µg/L	DIPE µg/L	TAME µg/L	TBA µg/L	Ethanol mg/L	Naph-thalene µg/L
MW-1	13,400	815	325	2,790	4,757	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	ND<25	484
MW-2	ND<100	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	ND<25	ND<2.5
MW-3	ND<100	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	ND<25	ND<2.5
MW-4	1,390	125	1.1	612	3.3	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	ND<25	20.7
MW-5	ND<100	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	ND<25	ND<2.5
MW-6	ND<100	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	ND<25	ND<2.5
MW-7	ND<100	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	ND<25	ND<2.5
MW-8	ND<100	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	ND<25	ND<2.5
MW-9	77,800	30,300	30,300	3,640	20,760	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	ND<25	708
MW-10	ND<100	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	ND<25	ND<2.5
MW-11	ND<100	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	ND<25	ND<2.5
RL	*100*	*0.5*	*0.5*	*0.5*	*0.5*	*2.5*	*2.5*	*2.5*	*2.5*	*25*	*25*	*0.5*

RL= Reporting Limit ND=Not Detected (below RL) NS=Not Sampled

5.2.1 Total Petroleum Hydrocarbons as Gasoline (TPH_G)

Groundwater samples were analyzed for Total Petroleum Hydrocarbons (TPH) as gasoline (TPH_G) by LUFT GC/MS Method. TPH_G concentrations were reported in milligram per liter (mg/L). TPH_G concentrations were converted to microgram per liter (µg/L) unit in this report for presentation and uniformity purposes.

Elevated TPH_G concentrations were detected at monitoring wells MW-1, MW-4 and MW-9 at 13,400; 1,390 and 77,800 µg/L, respectively. Isopleths of TPH_G are shown in Figure 4.

5.2.2 Aromatic Volatile Organic Compounds

Groundwater samples from each monitoring well were analyzed for BTEX (Benzene, Toluene, Ethylbenzene, Xylenes) by EPA Method 8260B. All concentrations were reported in microgram per liter (µg/L) units.

Elevated Benzene concentrations were detected at MW-1, MW-4 and MW-9 at 815; 125 and 30,300 µg/L, respectively. Isopleths of Benzene are shown in Figure 5. Of the wells sampled, Toluene, Ethybenzen and Xylenes were detected at MW-1, MW-4 and MW-9, with the highest detected at MW-9 at 30,300; 3,640 and 20,760 µg/L, respectively.

Of the wells sampled, reportable Naphthalene concentrations ranged from 20.7 – 708 µg/L

5.2.3 Fuel Additive Oxygenates

Groundwater samples from each monitoring well were also analyzed for fuel additive oxygenates (MTBE, ETBE, DIPE, TAME, and TBA) by EPA Method 8260B. Concentrations were reported in microgram per liter (µg/L) units. MTBE, ETBE, DIPE, TAME, TBA and Ethanol concentrations were not reported in this sampling event.

5.3 Laboratory QA/QC

Laboratory blanks (i.e., method blanks) were part of QA protocols utilized by the analytical laboratory to ensure that contamination was not introduced during the sample extraction or chemical analysis procedures. The laboratory did not report any detectable concentrations of contaminants in the laboratory blanks.

The laboratory also includes, as part of each complete laboratory report, a QA/QC summary sheet. The QA/QC summary sheet presents the matrix spike (MS) and matrix spike duplicate (MSD) percent recoveries, the relative percent difference, and their acceptable ranges. All MS/MSD data presented were within acceptable QC limits for the samples collected during this quarterly groundwater monitoring event.

6.0 CONCLUSIONS

Based on the results presented in this report, A.C.C.E.S., Inc. has the following conclusions:

- Based on depth to groundwater measurements at nine wells, the direction of groundwater at the site was to the west-southwest during this investigation.
- Elevated TPH_G and Benzene concentrations were detected at MW-1 (13,400 and 815 µg/L), MW-4 (1,390 and 125 µg/L) and MW-9 (77,800 and 30,300 µg/L).
- Sheen was not observed at MW-9 during this monitoring event

7.0 RECOMMENDATIONS

The following recommendations are made:

1. Continue to observe all existing groundwater monitoring wells, particularly MW-9, for floating

product or sheen. If floating product reappears at MW-9 in the next few groundwater investigations, an appropriate and cost effective floating product recovery program will be recommended.

2. Additional remedial action is recommended to address the elevated petroleum hydrocarbons contamination at the site.

3. Groundwater monitoring is recommended to be continued to determine whether the contamination plume is steady or changing in size.

4. Locate and expose MW-5 and resume monitoring of that groundwater monitoring well. MW-7 appears to be under the newly-constructed concrete curb and may be difficult and costly to recommission and it is recommended that MW-7 be relocated. A workplan will be prepared and submitted to address the issues with MW-5 and MW-7.

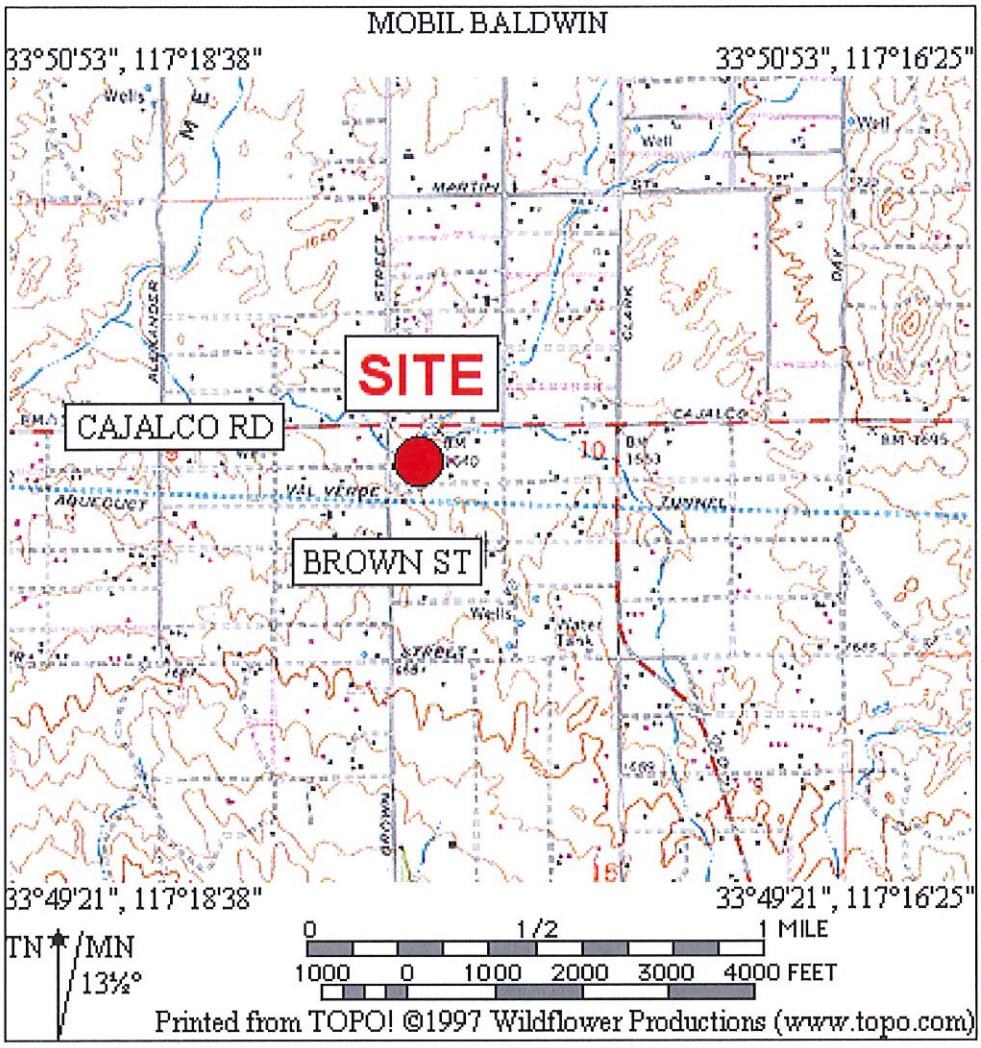
8.0 LIMITATIONS

It is possible that variations in the subsurface conditions could exist beyond points explored during the course of the assessment. Therefore, it should be recognized that evaluation of geologic conditions is difficult, and an inexact process. Judgments leading to conclusions are often made with an incomplete knowledge of the existing subsurface conditions. Changes in existing conditions could occur at some time in the future due to variations in rainfall, temperature, and other factors not apparent at the time of the field investigation. This assessment was performed in accordance with the general standard of practice exercised by other consultants working under similar conditions in Southern California at the time of the investigation. No warranty, express or implied, is made.

Thank you for this opportunity to be of service. If you have any further questions or comments, please do not hesitate to call us.

FIGURES

A.C.C.E.S. INC. – 2336 S. Sepulveda Blvd, Los Angeles, CA 90064
310-822-3800



SITE VICINITY MAP

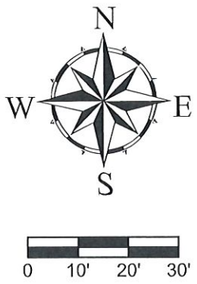
MOBIL BALDWIN

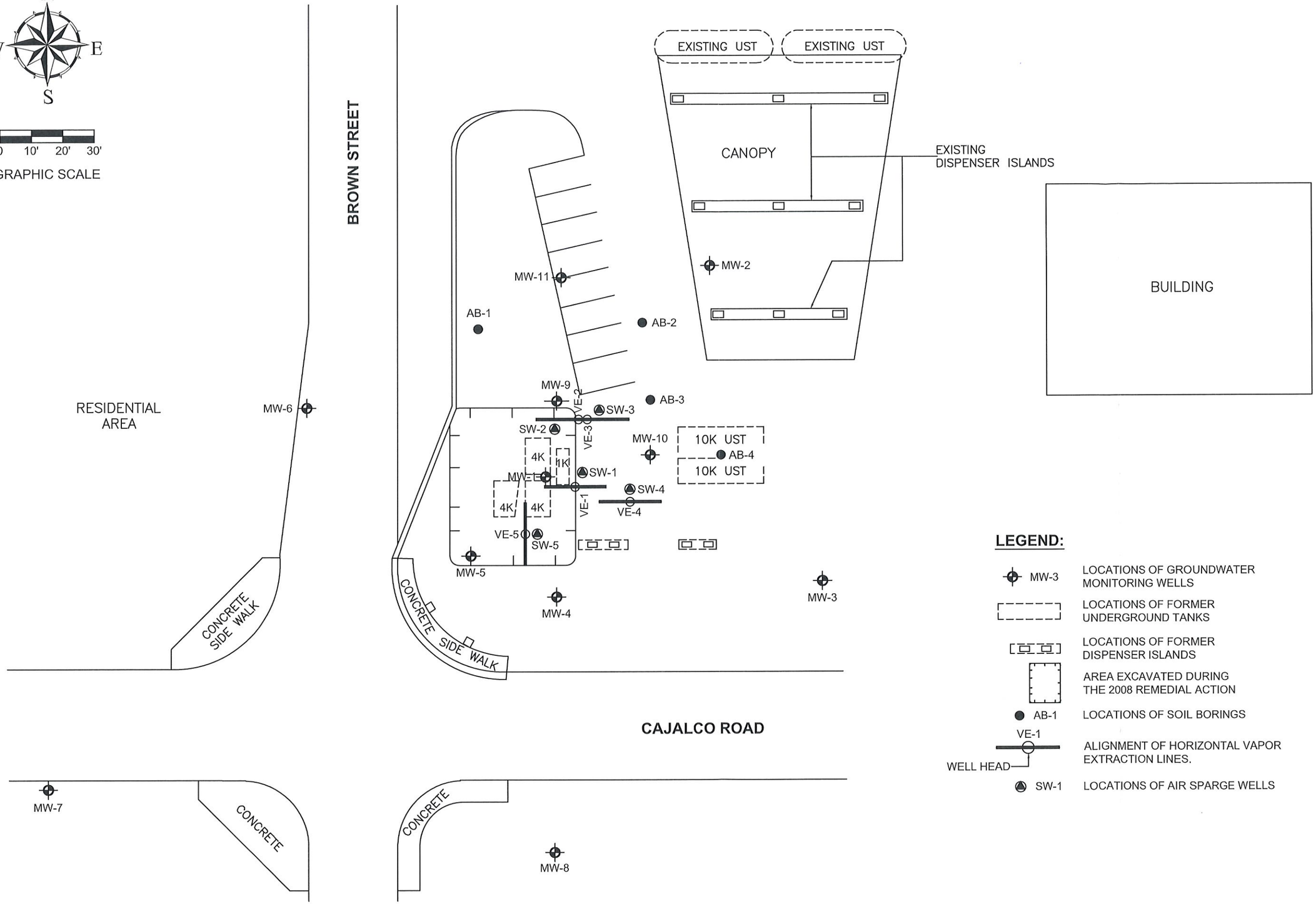
21020 CAJALCO ROAD. PERRIS, CA 92570

NOTE:

SOURCE OF MAP: TOPO INTERACTIVE MAPS

A.C.C.E.S. INC. ENVIRONMENTAL ASSOCIATED CONSULTING CIVIL & ENVIRONMENTAL SERVICES INC. P.O. Box 641607, Los Angeles, California 90064 Tel: 310 / 822 - 3800 Fax: 310 / 822 - 3804 www.accesengineering.com	TITLE: SITE VICINITY MAP	DWN BY: GS	SCALE: NOT TO SCALE
	PROJECT: GROUNDWATER MONITORING 1ST SEMI ANNUAL 2022	CHK BY: HA	DATE: 07/26/2022
	SITE: MOBIL BALDWIN 21020 CAJALCO ROAD, PERRIS, CA 92570	PROJECT No. 20145	DWG NO: FIGURE 1





LEGEND:

- MW-3 — LOCATIONS OF GROUNDWATER MONITORING WELLS
- LOCATIONS OF FORMER UNDERGROUND TANKS
- LOCATIONS OF FORMER DISPENSER ISLANDS
- AREA EXCAVATED DURING THE 2008 REMEDIAL ACTION
- AB-1 — LOCATIONS OF SOIL BORINGS
- VE-1 / WELL HEAD — ALIGNMENT OF HORIZONTAL VAPOR EXTRACTION LINES.
- SW-1 — LOCATIONS OF AIR SPARGE WELLS

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REVISION:	DATE
A	
B	
C	

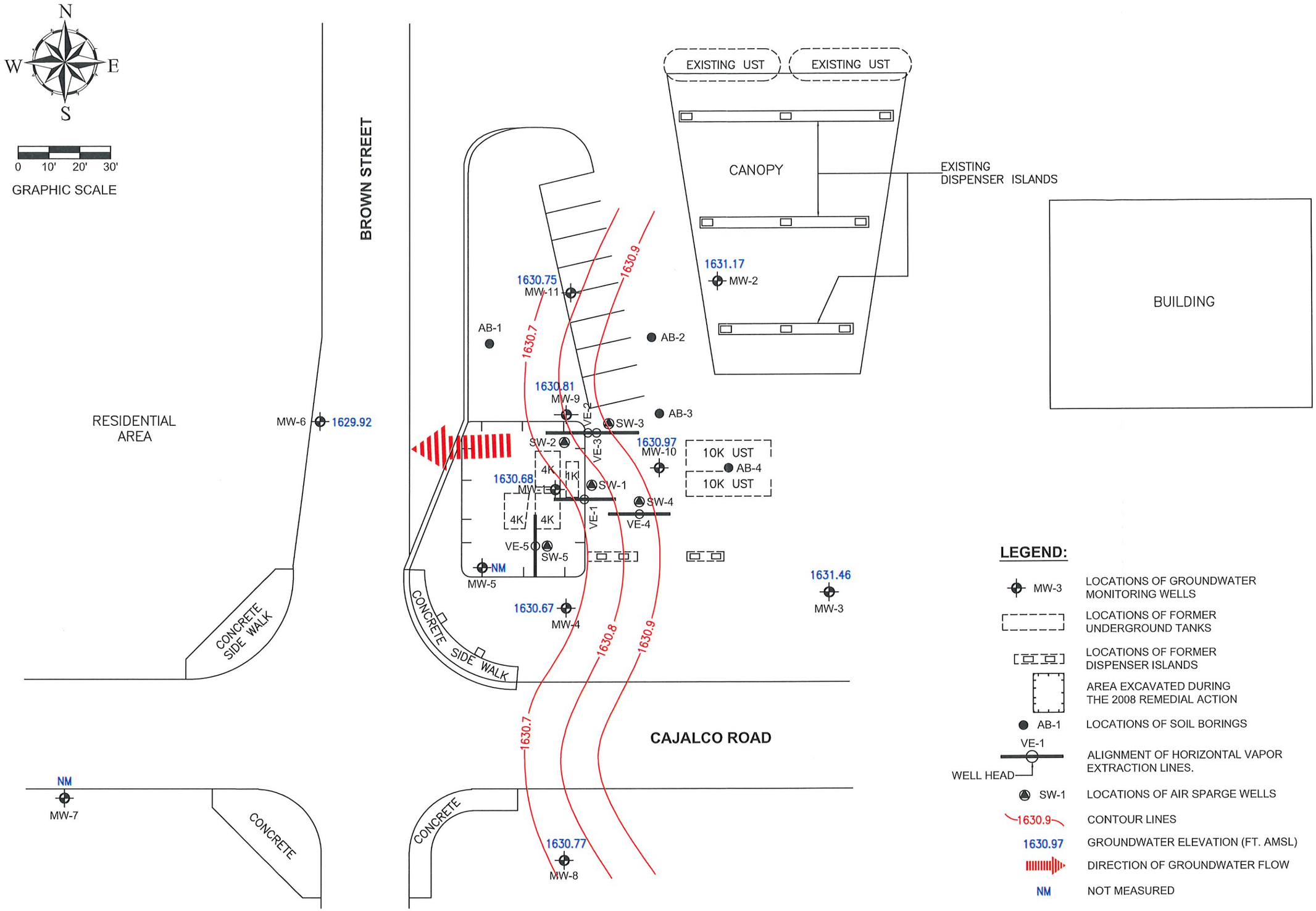
TITLE: PLAN VIEW OF SITE LOCATION OF MONITORING WELLS

PROJECT: GROUNDWATER MONITORING 1ST SEMI - ANNUAL 2022

ADDRESS: MOBIL BALDWIN

ADDRESS: 21020 CAJALCO ROAD, PERRIS, CA 92370

DRAWN BY:	GS
CHECK BY:	HA
DATE:	07/26/2022
JOB No:	20145
SCALE:	1" = 30'
DWG No:	FIGURE 2



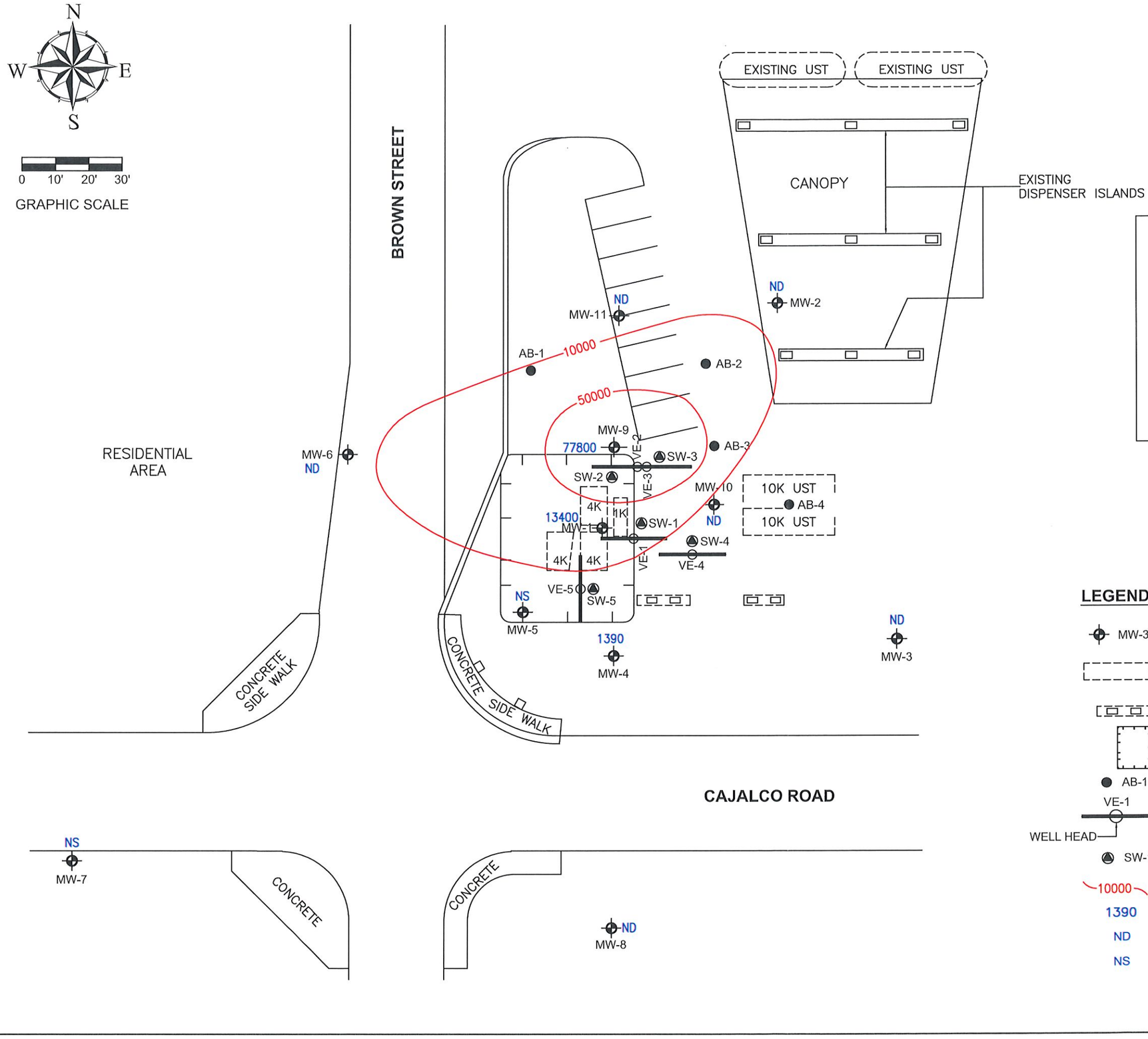
LEGEND:

MW-3	LOCATIONS OF GROUNDWATER MONITORING WELLS
	LOCATIONS OF FORMER UNDERGROUND TANKS
	LOCATIONS OF FORMER DISPENSER ISLANDS
	AREA EXCAVATED DURING THE 2008 REMEDIAL ACTION
AB-1	LOCATIONS OF SOIL BORINGS
VE-1 (WELL HEAD)	ALIGNMENT OF HORIZONTAL VAPOR EXTRACTION LINES.
SW-1	LOCATIONS OF AIR SPARGE WELLS
1630.9	CONTOUR LINES
1630.97	GROUNDWATER ELEVATION (FT. AMSL)
	DIRECTION OF GROUNDWATER FLOW
NM	NOT MEASURED

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DATE			

TITLE:	PLAN VIEW OF SITE GROUNDWATER ELEVATION CONTOUR MAP
PROJECT:	GROUNDWATER MONITORING 1ST SEMI - ANNUAL 2022
ADDRESS:	MOBIL BALDWIN
ADDRESS:	21020 CAJALCO ROAD, PERRIS, CA 92370
DRAWN BY:	GS
CHECK BY:	HA
DATE:	07/26/2022
JOB No:	20145
SCALE:	1" = 30'
DWG No:	FIGURE 3



LEGEND:

MW-3	LOCATIONS OF GROUNDWATER MONITORING WELLS
	LOCATIONS OF FORMER UNDERGROUND TANKS
	LOCATIONS OF FORMER DISPENSER ISLANDS
	AREA EXCAVATED DURING THE 2008 REMEDIAL ACTION
AB-1	LOCATIONS OF SOIL BORINGS
VE-1 / WELL HEAD	ALIGNMENT OF HORIZONTAL VAPOR EXTRACTION LINES.
SW-1	LOCATIONS OF AIR SPARGE WELLS
10000	ISOPLETH LINES
1390	CONTAMINANT CONCENTRATION (µg/L)
ND	NOT DETECTED
NS	NOT SAMPLED

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DATE			

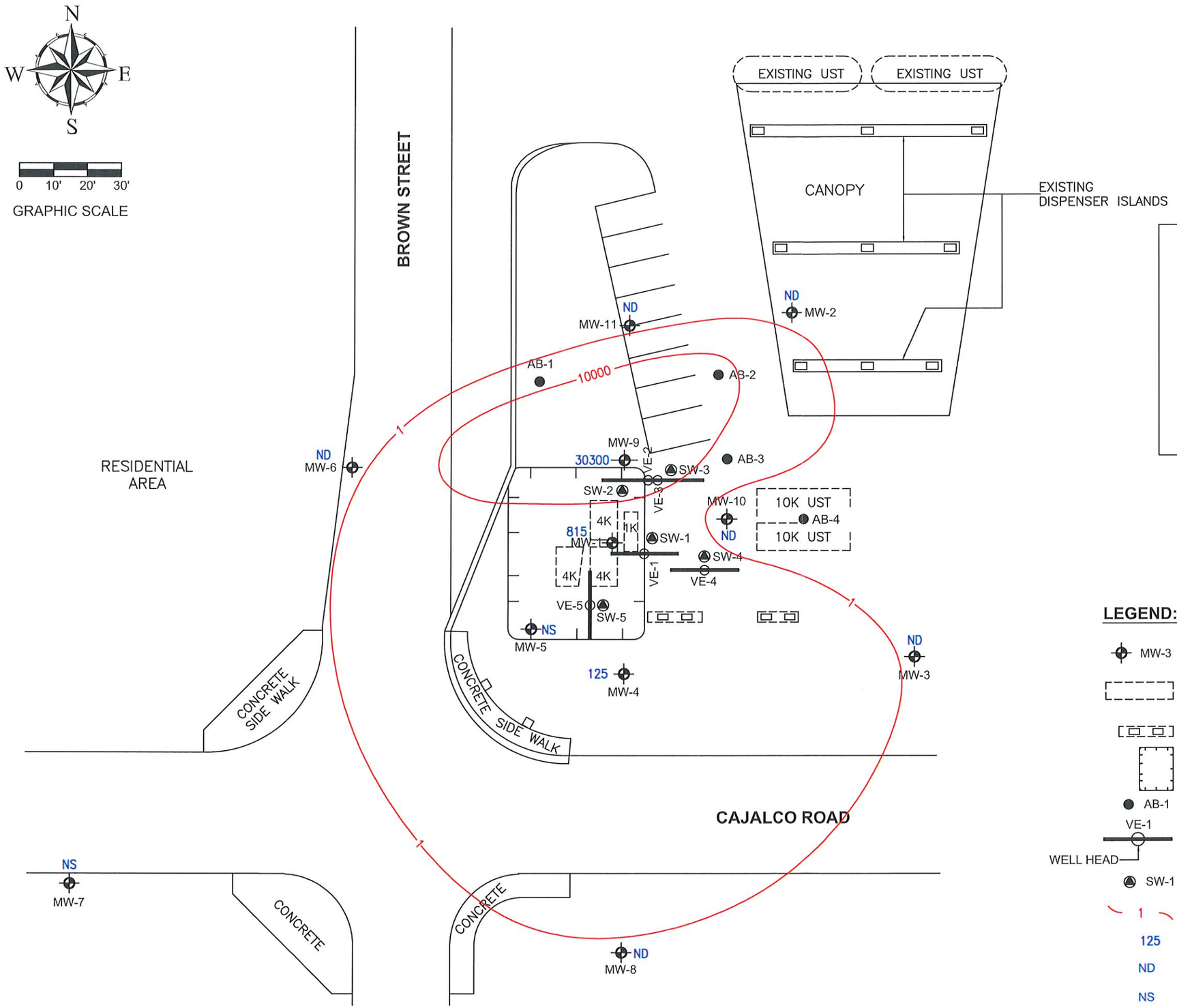
TITLE: PLAN VIEW OF SITE ISOPLETHS OF TPH-g (µg/L) IN GROUNDWATER

PROJECT: GROUNDWATER MONITORING 1ST SEMI - ANNUAL 2022

ADDRESS: MOBIL BALDWIN

ADDRESS: 21020 CAJALCO ROAD, PERRIS, CA 92370

DRAWN BY:	GS
CHECK BY:	HA
DATE:	07/26/2022
JOB No:	20145
SCALE:	1" = 30'
DWG No:	FIGURE 4



LEGEND:

MW-3	LOCATIONS OF GROUNDWATER MONITORING WELLS
	LOCATIONS OF FORMER UNDERGROUND TANKS
	LOCATIONS OF FORMER DISPENSER ISLANDS
	AREA EXCAVATED DURING THE 2008 REMEDIAL ACTION
AB-1	LOCATIONS OF SOIL BORINGS
VE-1 / WELL HEAD	ALIGNMENT OF HORIZONTAL VAPOR EXTRACTION LINES.
SW-1	LOCATIONS OF AIR SPARGE WELLS
1	ISOPLETH LINES
125	CONTAMINANT CONCENTRATION (µg/L)
ND	NOT DETECTED
NS	NOT SAMPLED

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C	

TITLE:	PLAN VIEW OF SITE ISOPLETH OF BENZENE (µg/L) IN GROUNDWATER
PROJECT:	GROUNDWATER MONITORING 1ST SEMI - ANNUAL 2022
ADDRESS:	MOBIL BALDWIN
ADDRESS:	21020 CAJALCO ROAD, PERRIS, CA 92370
DRAWN BY:	GS
CHECK BY:	HA
DATE:	07/26/2022
JOB No:	20145
SCALE:	1" = 30'
DWG No:	FIGURE 5

APPENDIX A

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LABORATORY RESULTS

Client:	Acces Inc.	**Report date:**	7/15/2022
Client Address:	PO Box 641607 Los Angeles, CA	**Jones Ref. No.:**	ST-20140
Attn:	Ronaldo	**Date Sampled:**	6/30/2022
		Date Received:	6/30/2022
Project:	Mobil Baldwin	**Date Analyzed:**	7/7-8/2022
Project Address:	21020 Cajalco Rd. Perris, CA 92570	**Physical State:**	Water

ANALYSES REQUESTED

1. EPA 8260B by 5030B – Volatile Organics by GC/MS + Oxygenates/Gasoline Range Organics

Approval: Juan Camacho

Juan Camacho, M.S.
Stationary Lab Technical Manager

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Client Address:	PO Box 641607 Los Angeles, CA	**Jones Ref. No.:**	ST-20140
Attn:	Ronaldo	**Date Sampled:**	6/30/2022
		Date Received:	6/30/2022
Project:	Mobil Baldwin	**Date Analyzed:**	7/7-8/2022
Project Address:	21020 Cajalco Rd. Perris, CA 92570	**Physical State:**	Water

EPA 8260B by 5030 – Volatile Organics by GC/MS + Oxygenates/Gasoline Range Organics

Sample ID:	MW-1	MW-2	MW-3	MW-4	MW-6		
Jones ID:	ST-20140-01	ST-20140-02	ST-20140-03	ST-20140-04	ST-20140-05	Reporting Limit	Units
Analytes:							
Benzene	**815**	ND	ND	**125**	ND	0.5	µg/L
Bromobenzene	ND	ND	ND	ND	ND	0.5	µg/L
Bromodichloromethane	ND	ND	ND	ND	ND	0.5	µg/L
Bromoform	ND	ND	ND	ND	ND	0.5	µg/L
n-Butylbenzene	ND	ND	ND	ND	ND	0.5	µg/L
sec-Butylbenzene	ND	ND	ND	**7.0**	ND	0.5	µg/L
tert-Butylbenzene	ND	ND	ND	ND	ND	0.5	µg/L
Carbon tetrachloride	ND	ND	ND	ND	ND	0.5	µg/L
Chlorobenzene	ND	ND	ND	ND	ND	0.5	µg/L
Chloroform	ND	ND	ND	ND	ND	0.5	µg/L
2-Chlorotoluene	ND	ND	ND	ND	ND	0.5	µg/L
4-Chlorotoluene	ND	ND	ND	ND	ND	0.5	µg/L
Dibromochloromethane	ND	ND	ND	ND	ND	0.5	µg/L
1,2-Dibromo-3-chloropropane	ND	ND	ND	ND	ND	0.5	µg/L
1,2-Dibromoethane (EDB)	ND	ND	ND	ND	ND	0.5	µg/L
Dibromomethane	ND	ND	ND	ND	ND	0.5	µg/L
1,2- Dichlorobenzene	ND	ND	ND	ND	ND	0.5	µg/L
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	0.5	µg/L
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	0.5	µg/L
1,1-Dichloroethane	ND	ND	ND	ND	ND	0.5	µg/L
1,2-Dichloroethane	ND	ND	ND	ND	ND	0.5	µg/L
1,1-Dichloroethene	ND	ND	ND	ND	ND	0.5	µg/L
cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	0.5	µg/L
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	0.5	µg/L
1,2-Dichloropropane	ND	ND	ND	ND	ND	0.5	µg/L
1,3-Dichloropropane	ND	ND	ND	ND	ND	0.5	µg/L
2,2-Dichloropropane	ND	ND	ND	ND	ND	0.5	µg/L
1,1-Dichloropropene	ND	ND	ND	ND	ND	0.5	µg/L
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	0.5	µg/L

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EPA 8260B by 5030 – Volatile Organics by GC/MS + Oxygenates/Gasoline Range Organics

Sample ID:	MW-1	MW-2	MW-3	MW-4	MW-6		
Jones ID:	ST-20140-01	ST-20140-02	ST-20140-03	ST-20140-04	ST-20140-05	Reporting Limit	Units
Analytes:							
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	0.5	µg/L
Ethylbenzene	**2790**	ND	ND	**612**	ND	0.5	µg/L
Freon 11	ND	ND	ND	ND	ND	2.5	µg/L
Freon 12	ND	ND	ND	ND	ND	2.5	µg/L
Freon 113	ND	ND	ND	ND	ND	2.5	µg/L
Hexachlorobutadiene	ND	ND	ND	ND	ND	0.5	µg/L
Isopropylbenzene	ND	ND	ND	**25.4**	ND	0.5	µg/L
4-Isopropyltoluene	ND	ND	ND	ND	ND	0.5	µg/L
Methylene chloride	ND	ND	ND	ND	ND	0.5	µg/L
Naphthalene	**484**	ND	ND	**20.7**	ND	2.5	µg/L
n-Propylbenzene	**230**	ND	ND	**82.6**	ND	0.5	µg/L
Styrene	ND	ND	ND	ND	ND	0.5	µg/L
1,1,1,2-Tetrachloroethane	ND	ND	ND	ND	ND	0.5	µg/L
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	0.5	µg/L
Tetrachloroethene	ND	ND	ND	ND	ND	0.5	µg/L
Toluene	**325**	ND	ND	**1.1**	ND	0.5	µg/L
1,2,3-Trichlorobenzene	ND	ND	ND	ND	ND	0.5	µg/L
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	0.5	µg/L
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	0.5	µg/L
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	0.5	µg/L
Trichloroethene	ND	ND	ND	ND	ND	0.5	µg/L
1,2,3-Trichloropropane	ND	ND	ND	ND	ND	0.5	µg/L
1,2,4-Trimethylbenzene	**1120**	ND	ND	**3.0**	ND	0.5	µg/L
1,3,5-Trimethylbenzene	**252**	ND	ND	**0.5**	ND	0.5	µg/L
Vinyl chloride	ND	ND	ND	ND	ND	0.5	µg/L
m,p-Xylene	**4370**	ND	ND	**3.3**	ND	1.0	µg/L
o-Xylene	**387**	ND	ND	ND	ND	0.5	µg/L
Methyl-tert-butylether	ND	ND	ND	ND	ND	2.5	µg/L
Ethyl-tert-butylether	ND	ND	ND	ND	ND	2.5	µg/L
Di-isopropylether	ND	ND	ND	ND	ND	2.5	µg/L
tert-amylmethylether	ND	ND	ND	ND	ND	2.5	µg/L
tert-Butylalcohol	ND	ND	ND	ND	ND	25.0	µg/L
Gasoline Range Organics (C4-C12)	**13.4**	ND	ND	**1.39**	ND	0.10	mg/L
Dilution Factor	100	1	1	1	1		
Surrogate Recoveries:						**QC Limits**	
Dibromofluoromethane	105%	103%	103%	105%	105%	60 - 140	
Toluene-d_8	98%	98%	96%	95%	95%	60 - 140	
4-Bromofluorobenzene	104%	93%	90%	109%	90%	60 - 140	
Batch:	VOC7-070822-01	VOC7-070722-01	VOC7-070722-01	VOC7-070822-01	VOC7-070722-01		

ND = Value less than reporting limit

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Client Address:	Acces Inc. PO Box 641607 Los Angeles, CA	**Report date:** **Jones Ref. No.:**	7/15/2022 ST-20140
Attn:	Ronaldo	**Date Sampled:** **Date Received:**	6/30/2022 6/30/2022
Project: **Project Address:**	Mobil Baldwin 21020 Cajalco Rd. Perris, CA 92570	**Date Analyzed:** **Physical State:**	7/7-8/2022 Water

EPA 8260B by 5030 – Volatile Organics by GC/MS + Oxygenates/Gasoline Range Organics

Sample ID:	MW-8	MW-9	MW-10	MW-11		
Jones ID:	ST-20140-06	ST-20140-07	ST-20140-08	ST-20140-09	Reporting Limit	Units
Analytes:						
Benzene	ND	**30300**	ND	ND	0.5	µg/L
Bromobenzene	ND	ND	ND	ND	0.5	µg/L
Bromodichloromethane	ND	ND	ND	ND	0.5	µg/L
Bromoform	ND	ND	ND	ND	0.5	µg/L
n-Butylbenzene	ND	ND	ND	ND	0.5	µg/L
sec-Butylbenzene	ND	ND	ND	ND	0.5	µg/L
tert-Butylbenzene	ND	ND	ND	ND	0.5	µg/L
Carbon tetrachloride	ND	ND	ND	ND	0.5	µg/L
Chlorobenzene	ND	ND	ND	ND	0.5	µg/L
Chloroform	ND	ND	ND	ND	0.5	µg/L
2-Chlorotoluene	ND	ND	ND	ND	0.5	µg/L
4-Chlorotoluene	ND	ND	ND	ND	0.5	µg/L
Dibromochloromethane	ND	ND	ND	ND	0.5	µg/L
1,2-Dibromo-3-chloropropane	ND	ND	ND	ND	0.5	µg/L
1,2-Dibromoethane (EDB)	ND	ND	ND	ND	0.5	µg/L
Dibromomethane	ND	ND	ND	ND	0.5	µg/L
1,2- Dichlorobenzene	ND	ND	ND	ND	0.5	µg/L
1,3-Dichlorobenzene	ND	ND	ND	ND	0.5	µg/L
1,4-Dichlorobenzene	ND	ND	ND	ND	0.5	µg/L
1,1-Dichloroethane	ND	ND	ND	ND	0.5	µg/L
1,2-Dichloroethane	ND	ND	ND	ND	0.5	µg/L
1,1-Dichloroethene	ND	ND	ND	ND	0.5	µg/L
cis-1,2-Dichloroethene	ND	ND	ND	ND	0.5	µg/L
trans-1,2-Dichloroethene	ND	ND	ND	ND	0.5	µg/L
1,2-Dichloropropane	ND	ND	ND	ND	0.5	µg/L
1,3-Dichloropropane	ND	ND	ND	ND	0.5	µg/L
2,2-Dichloropropane	ND	ND	ND	ND	0.5	µg/L
1,1-Dichloropropene	ND	ND	ND	ND	0.5	µg/L
cis-1,3-Dichloropropene	ND	ND	ND	ND	0.5	µg/L

JONES ENVIRONMENTAL LABORATORY RESULTS

EPA 8260B by 5030 – Volatile Organics by GC/MS + Oxygenates/Gasoline Range Organics

Sample ID:	MW-8	MW-9	MW-10	MW-11		
Jones ID:	**ST-20140-06**	**ST-20140-07**	**ST-20140-08**	**ST-20140-09**	**Reporting Limit**	**Units**
Analytes:						
trans-1,3-Dichloropropene	ND	ND	ND	ND	0.5	µg/L
Ethylbenzene	ND	**3640**	ND	ND	0.5	µg/L
Freon 11	ND	ND	ND	ND	2.5	µg/L
Freon 12	ND	ND	ND	ND	2.5	µg/L
Freon 113	ND	ND	ND	ND	2.5	µg/L
Hexachlorobutadiene	ND	ND	ND	ND	0.5	µg/L
Isopropylbenzene	ND	ND	ND	ND	0.5	µg/L
4-Isopropyltoluene	ND	ND	ND	ND	0.5	µg/L
Methylene chloride	ND	ND	ND	ND	0.5	µg/L
Naphthalene	ND	**708**	ND	ND	2.5	µg/L
n-Propylbenzene	ND	**202**	ND	ND	0.5	µg/L
Styrene	ND	ND	ND	ND	0.5	µg/L
1,1,1,2-Tetrachloroethane	ND	ND	ND	ND	0.5	µg/L
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	0.5	µg/L
Tetrachloroethene	ND	ND	ND	ND	0.5	µg/L
Toluene	ND	**30300**	ND	ND	0.5	µg/L
1,2,3-Trichlorobenzene	ND	ND	ND	ND	0.5	µg/L
1,2,4-Trichlorobenzene	ND	ND	ND	ND	0.5	µg/L
1,1,1-Trichloroethane	ND	ND	ND	ND	0.5	µg/L
1,1,2-Trichloroethane	ND	ND	ND	ND	0.5	µg/L
Trichloroethene	ND	ND	ND	ND	0.5	µg/L
1,2,3-Trichloropropane	ND	ND	ND	ND	0.5	µg/L
1,2,4-Trimethylbenzene	ND	**2750**	ND	ND	0.5	µg/L
1,3,5-Trimethylbenzene	ND	**640**	ND	ND	0.5	µg/L
Vinyl chloride	ND	ND	ND	ND	0.5	µg/L
m,p-Xylene	ND	**15700**	ND	ND	1.0	µg/L
o-Xylene	ND	**5060**	ND	ND	0.5	µg/L
Methyl-tert-butylether	ND	ND	ND	ND	2.5	µg/L
Ethyl-tert-butylether	ND	ND	ND	ND	2.5	µg/L
Di-isopropylether	ND	ND	ND	ND	2.5	µg/L
tert-amylmethylether	ND	ND	ND	ND	2.5	µg/L
tert-Butylalcohol	ND	ND	ND	ND	25.0	µg/L
Gasoline Range Organics (C4-C12)	ND	**77.8**	ND	ND	0.10	mg/L
Dilution Factor	1	200	1	1		
Surrogate Recoveries:					**QC Limits**	
Dibromofluoromethane	105%	97%	105%	104%	60 - 140	
Toluene-d_8	97%	101%	96%	95%	60 - 140	
4-Bromofluorobenzene	91%	95%	91%	96%	60 - 140	
Batch:	VOC7-070722-01	VOC7-070822-01	VOC7-070722-01	VOC7-070722-01		

ND = Value less than reporting limit

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JONES ENVIRONMENTAL LABORATORY RESULTS

Client:	Acces Inc.	**Report date:**	7/15/2022
Client Address:	PO Box 641607	**Jones Ref. No.:**	ST-20140
	Los Angeles, CA	**Client Ref. No.:**	
Attn:	Ronaldo	**Date Sampled:**	6/30/2022
		Date Received:	6/30/2022
Project:	Mobil Baldwin	**Date Analyzed:**	7/7-8/2022
Project Address:	21020 Cajalco Rd.	**Physical State:**	Water
	Perris, CA 92570		

EPA 8260B by 5030 – Volatile Organics by GC/MS + Oxygenates/Gasoline Range Organics

Sample ID:	METHOD BLANK #1	METHOD BLANK #2		
Jones ID:	070722-V7MB1	070822-V7MB1	Reporting Limit	Units
Analytes:				
Benzene	ND	ND	0.5	µg/L
Bromobenzene	ND	ND	0.5	µg/L
Bromodichloromethane	ND	ND	0.5	µg/L
Bromoform	ND	ND	0.5	µg/L
n-Butylbenzene	ND	ND	0.5	µg/L
sec-Butylbenzene	ND	ND	0.5	µg/L
tert-Butylbenzene	ND	ND	0.5	µg/L
Carbon tetrachloride	ND	ND	0.5	µg/L
Chlorobenzene	ND	ND	0.5	µg/L
Chloroform	ND	ND	0.5	µg/L
2-Chlorotoluene	ND	ND	0.5	µg/L
4-Chlorotoluene	ND	ND	0.5	µg/L
Dibromochloromethane	ND	ND	0.5	µg/L
1,2-Dibromo-3-chloropropane	ND	ND	0.5	µg/L
1,2-Dibromoethane (EDB)	ND	ND	0.5	µg/L
Dibromomethane	ND	ND	0.5	µg/L
1,2- Dichlorobenzene	ND	ND	0.5	µg/L
1,3-Dichlorobenzene	ND	ND	0.5	µg/L
1,4-Dichlorobenzene	ND	ND	0.5	µg/L
1,1-Dichloroethane	ND	ND	0.5	µg/L
1,2-Dichloroethane	ND	ND	0.5	µg/L
1,1-Dichloroethene	ND	ND	0.5	µg/L
cis-1,2-Dichloroethene	ND	ND	0.5	µg/L
trans-1,2-Dichloroethene	ND	ND	0.5	µg/L
1,2-Dichloropropane	ND	ND	0.5	µg/L
1,3-Dichloropropane	ND	ND	0.5	µg/L
2,2-Dichloropropane	ND	ND	0.5	µg/L
1,1-Dichloropropene	ND	ND	0.5	µg/L
cis-1,3-Dichloropropene	ND	ND	0.5	µg/L

JONES ENVIRONMENTAL LABORATORY RESULTS

EPA 8260B by 5030 – Volatile Organics by GC/MS + Oxygenates/Gasoline Range Organics

Sample ID:	METHOD BLANK #1	METHOD BLANK #2		
Jones ID:	070722-V7MB1	070822-V7MB1	**Reporting Limit**	**Units**
Analytes:				
trans-1,3-Dichloropropene	ND	ND	0.5	µg/L
Ethylbenzene	ND	ND	0.5	µg/L
Freon 11	ND	ND	2.5	µg/L
Freon 12	ND	ND	2.5	µg/L
Freon 113	ND	ND	2.5	µg/L
Hexachlorobutadiene	ND	ND	0.5	µg/L
Isopropylbenzene	ND	ND	0.5	µg/L
4-Isopropyltoluene	ND	ND	0.5	µg/L
Methylene chloride	ND	ND	0.5	µg/L
Naphthalene	ND	ND	2.5	µg/L
n-Propylbenzene	ND	ND	0.5	µg/L
Styrene	ND	ND	0.5	µg/L
1,1,1,2-Tetrachloroethane	ND	ND	0.5	µg/L
1,1,2,2-Tetrachloroethane	ND	ND	0.5	µg/L
Tetrachloroethene	ND	ND	0.5	µg/L
Toluene	ND	ND	0.5	µg/L
1,2,3-Trichlorobenzene	ND	ND	0.5	µg/L
1,2,4-Trichlorobenzene	ND	ND	0.5	µg/L
1,1,1-Trichloroethane	ND	ND	0.5	µg/L
1,1,2-Trichloroethane	ND	ND	0.5	µg/L
Trichloroethene	ND	ND	0.5	µg/L
1,2,3-Trichloropropane	ND	ND	0.5	µg/L
1,2,4-Trimethylbenzene	ND	ND	0.5	µg/L
1,3,5-Trimethylbenzene	ND	ND	0.5	µg/L
Vinyl chloride	ND	ND	0.5	µg/L
m,p-Xylene	ND	ND	1.0	µg/L
o-Xylene	ND	ND	0.5	µg/L
Methyl-tert-butylether	ND	ND	2.5	µg/L
Ethyl-tert-butylether	ND	ND	2.5	µg/L
Di-isopropylether	ND	ND	2.5	µg/L
tert-amylmethylether	ND	ND	2.5	µg/L
tert-Butylalcohol	ND	ND	25.0	µg/L
Gasoline Range Organics (C4-C12)	ND	ND	0.10	mg/L
Dilution Factor	1	1		
Surrogate Recoveries:			**QC Limits**	
Dibromofluoromethane	100%	104%	60 - 140	
Toluene-d_8	96%	98%	60 - 140	
4-Bromofluorobenzene	94%	97%	60 - 140	
Batch:	VOC7-070722-01	VOC7-070822-01		

ND = Value less than reporting limit

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JONES ENVIRONMENTAL QUALITY CONTROL INFORMATION

Client:	Acces Inc.	**Report date:**	7/15/2022
Client Address:	PO Box 641607 Los Angeles, CA	**Jones Ref. No.:** **Client Ref. No.:**	ST-20140
Attn:	Ronaldo	**Date Sampled:** **Date Received:**	6/30/2022 6/30/2022
Project:	Mobil Baldwin	**Date Analyzed:**	7/7-8/2022
Project Address:	21020 Cajalco Rd. Perris, CA 92570	**Physical State:**	Water

EPA 8260B by 5030 – Volatile Organics by GC/MS + Oxygenates/Gasoline Range Organics

GC#:	**VOC7-070722-01**					
Jones ID:	070722-V7LCS1	070722-V7LCSD1			070722-V7CCV1	
Parameter	LCS Recovery (%)	LCSD Recovery (%)	RPD	Acceptability Range (%)	CCV	Acceptability Range (%)
Vinyl chloride	101%	103%	1.6%	60 - 140	95%	80 - 120
1,1-Dichloroethene	105%	111%	5.8%	60 - 140	117%	80 - 120
Cis-1,2-Dichloroethene	105%	108%	2.9%	70 - 130	119%	80 - 120
1,1,1-Trichloroethane	96%	103%	6.8%	70 - 130	116%	80 - 120
Benzene	105%	110%	5.1%	70 - 130	115%	80 - 120
Trichloroethene	101%	108%	6.0%	70 - 130	114%	80 - 120
Toluene	102%	109%	6.3%	70 - 130	110%	80 - 120
Tetrachloroethene	93%	99%	5.7%	70 - 130	105%	80 - 120
Chlorobenzene	106%	113%	6.2%	70 - 130	115%	80 - 120
Ethylbenzene	99%	104%	5.1%	70 - 130	113%	80 - 120
1,2,4 Trimethylbenzene	95%	103%	7.8%	70 - 130	111%	80 - 120
Gasoline Range Organics (C4-C12)	100%	106%	6.0%	70 - 130		
Surrogate Recovery:						
Dibromofluoromethane	102%	102%		60 - 140	116%	60 - 140
Toluene-d_8	97%	97%		60 - 140	108%	60 - 140
4-Bromofluorobenzene	95%	95%		60 - 140	130%	60 - 140

LCS = Laboratory Control Sample
LCSD = Laboratory Control Sample Duplicate
CCV = Continuing Calibration Verification
RPD = Relative Percent Difference; Acceptability range for RPD is ≤ 20%

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JONES ENVIRONMENTAL QUALITY CONTROL INFORMATION

Client:	Acces Inc.	**Report date:**	7/15/2022
Client Address:	PO Box 641607 Los Angeles, CA	**Jones Ref. No.:**	ST-20140
Attn:	Ronaldo	**Date Sampled:**	6/30/2022
		Date Received:	6/30/2022
Project:	Mobil Baldwin	**Date Analyzed:**	7/7-8/2022
Project Address:	21020 Cajalco Rd. Perris, CA 92570	**Physical State:**	Water

EPA 8260B by 5030 – Volatile Organics by GC/MS + Oxygenates/Gasoline Range Organics

GC#:	**VOC7-070822-01**					
Jones ID:	070822-V7LCS1	070822-V7LCSD1			070822-V7CCV1	
Parameter	LCS Recovery (%)	LCSD Recovery (%)	RPD	Acceptability Range (%)	CCV	Acceptability Range (%)
Vinyl chloride	94%	95%	1.6%	60 - 140	89%	80 - 120
1,1-Dichloroethene	90%	99%	9.5%	60 - 140	101%	80 - 120
Cis-1,2-Dichloroethene	91%	104%	12.8%	70 - 130	107%	80 - 120
1,1,1-Trichloroethane	83%	90%	7.9%	70 - 130	93%	80 - 120
Benzene	93%	104%	10.9%	70 - 130	104%	80 - 120
Trichloroethene	95%	107%	12.1%	70 - 130	104%	80 - 120
Toluene	91%	104%	13.2%	70 - 130	99%	80 - 120
Tetrachloroethene	82%	91%	10.3%	70 - 130	87%	80 - 120
Chlorobenzene	99%	112%	12.8%	70 - 130	107%	80 - 120
Ethylbenzene	92%	101%	9.4%	70 - 130	100%	80 - 120
1,2,4 Trimethylbenzene	105%	107%	2.1%	70 - 130	105%	80 - 120
Gasoline Range Organics (C4-C12)	95%	104%	8.8%	70 - 130		
Surrogate Recovery:						
Dibromofluoromethane	99%	100%		60 - 140	102%	60 - 140
Toluene-d_8	97%	97%		60 - 140	94%	60 - 140
4-Bromofluorobenzene	95%	97%		60 - 140	103%	60 - 140

LCS = Laboratory Control Sample
LCSD = Laboratory Control Sample Duplicate
CCV = Continuing Calibration Verification
RPD = Relative Percent Difference; Acceptability range for RPD is ≤ 20%

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Santa Fe Springs, CA 90670
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Chain-of-Custody Record

Client	ACCES INC
Date	
Project Name	MOBIL BALDWIN
Client Project #	
Project Address	21020 CAJALCO RD.
	PERRIS, CA 92570
Email	rarboleda@accesengineering.com
Phone	310-822-3800
Report To	Ronaldo
Sampler	

Turn Around Requested:
- ☐ Immediate Attention
- ☐ Rush 24 Hours
- ☐ Rush 48 Hours
- ☐ Rush 72 Hours
- ☑ Normal

Report Options
EDD _____
EDF - 10% Surcharge ✓
*Global ID T0606599148

LAB USE ONLY
Jones Project # ST-20140
Page 1 of 1

Sample Condition as Received:
Chilled ☐ yes ☐ no
Sealed ☐ yes ☐ no

Sample Container | Preservative Abbreviations
- V - VOAS
- AS - Acetate Sleeve
- SS - Stainless Steel Sleeve
- BS - Brass Sleeve
- G - Glass Jar
- AB - Amber Bottle
- P - Plastic
- SOBI - Sodium Bisulfate
- MeOH - Methanol
- HCl - Hydrochloric Acid
- HNO3 - Nitric Acid
- O - Other (See Notes)

Analysis Requested

Sample ID	Date	Sample Collection Time	Jones ID Lab Use Only	Preservative	Sample Container	Sample Matrix: Soil (S), Sludge (SL), Aqueous (A), Free Product (FP)	8260B: TPHg, BTEX	OXYGENATES, FULL SCAN VOCs	Hold	Number of Containers	Notes & Special Instructions
MW-1	6/30/22	11:55	ST-20140-01	HCl	40 ml vials	A	X	X			
MW-2		10:05	ST-20140-02								
MW-3		10:40	ST-20140-03								
MW-4		11:15	ST-20140-04								
MW-6		9:30	ST-20140-05								
MW-8		8:55	ST-20140-06								
MW-9		9:25	ST-20140-07								
MW-10		12:35	ST-20140-08								
MW-11		1:00	ST-20140-09								

10

Relinquished By (Signature)	Printed Name	Received By (Signature)	Printed Name
	ERIC.R		
Company	Date / Time	Company	Date / Time
ACCES INC	6/30/22		
Relinquished By (Signature)	Printed Name	Received By Laboratory (Signature)	Printed Name
			Kiam
Company	Date / Time	Company	Date / Time
		Jones	6/30/22 1430

Total Number of Containers

Client signature on this Chain of Custody form constitutes acknowledgment that the above analyses have been requested, and the information provided herein is correct and accurate

A.C.C.E.S. INC. – 2336 S. Sepulveda Blvd, Los Angeles, CA 90064
310-822-3800

APPENDIX B

TABULATED GROUNDWATER SAMPLE ANALYTICAL RESULTS
MOBIL BALDWIN

SAMPLE SOURCE	DATE SAMPLED	TPH AS GASOLINE (µg/L)	TPH AS DIESEL (µg/L)	BENZENE (µg/L)	TOLUENE (µg/L)	ETHYL-BENZENE (µg/L)	XYLENES (µg/L)	MTBE (µg/L)	ETBE (µg/L)	DIPE (µg/L)	TAME (µg/L)	TBA (µg/L)	DEPTH TO G.W. (FT)	G.W. ELEVATION (FT - AMSL)
MW-1	01/08/03	24,620.0	NA	4,841.0	6,768.0	691.0	3,518.0	82.0	NA	NA	NA	NA	11.090	1,607.420
	04/16/03	9,570.0	NA	1,734.0	1,562.0	55.0	1,102.0	214.0	NA	NA	NA	NA	6.280	1,612.230
	07/14/03	48,094.0	NA	12,343.0	9,325.0	888.0	3,653.0	389.0	NA	NA	NA	NA	8.430	1,610.080
	10/14/03	26,809.0	NA	9,525.0	5,150.0	637.0	1,895.0	283.0	NA	NA	NA	NA	11.280	1,607.230
	03/05/04	4,325.0	NA	1,187.0	403.0	ND	321.0	51.0	NA	NA	NA	NA	7.620	1,610.890
	05/13/04	34,815.0	NA	6,482.0	4,223.0	839.0	2,217.0	1,270.0	NA	NA	NA	NA	8.000	1,610.510
	07/28/04	52,082.0	NA	12,736.0	9,552.0	1,781.0	3,823.0	381.0	NA	NA	NA	NA	9.600	1,608.910
	10/26/04	28,801.0	NA	14,979.0	8,910.0	427.0	767.0	70.0	NA	NA	NA	NA	9.940	1,608.570
	01/25/05	1,062.0	NA	423.0	74.0	5.0	111.0	59.0	NA	NA	NA	NA	3.940	1,614.570
	05/13/05	42,026.0	NA	17,977.0	11,270.0	1,027.0	2,210.0	353.0	NA	NA	NA	NA	5.160	1,613.350
	07/21/05	66,131.0	NA	20,366.0	10,783.0	1,162.0	3,453.0	164.0	NA	NA	NA	NA	7.060	1,611.450
	10/04/05	61,313.0	NA	31,399.0	13,672.3	1,129.6	3,853.3	280.9	NA	NA	NA	NA	8.520	1,609.990
	01/04/06	8,414.0	NA	1,393.8	306.8	84.0	217.9	102.0	NA	NA	NA	NA	7.440	1,611.070
**	12/08/06	108,000.0	NA	26,100.0	23,900.0	1,640.0	8,950.0	167.0	ND	ND	ND	ND	9.100	1,609.410
	03/15/07	217,000.0	NA	39,900.0	52,800.0	3,100.0	19,000.0	ND	ND	ND	ND	ND	6.210	1,612.300
	06/08/07	56,900.0	ND	17,000.0	12,600.0	1,280.0	5,010.0	408.0	ND	ND	ND	ND	7.340	1,611.170
	09/07/07	67,200.0	NA	24,200.0	19,300.0	1,520.0	6,320.0	318.0	ND	ND	ND	ND	7.530	1,610.980
	12/14/07	12,500.0	NA	4,430.0	736.0	157.0	673.0	76.5	ND	ND	ND	ND	7.520	1,610.990
	03/28/08	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA***	
	05/23/08	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA***	
	08/26/08	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA***	
	01/06/09	5,650.0	NA	850.0	194.0	NA	505.0	10.0	ND	ND	ND	ND	8.100	1,610.243
	03/13/09	ND	NA	ND	ND	NA	ND	2.4	ND	ND	ND	ND	6.380	1,611.963
	06/11/09	39,900.0	NA	9,200.0	4,970.0	NA	2,430.0	103.0	ND	ND	ND	ND	7.510	1,610.833
	09/03/09	66,100.0	NA	16,800.0	12,900.0	NA	5,150.0	150.0	ND	ND	ND	ND	9.500	1,608.843
	12/08/09	69,500.0	NA	19,700.0	13,800.0	NA	7,300.0	196.0	ND	ND	ND	ND	10.110	1,608.233
	02/18/10	3,200.1	NA	59.1	133.0	NA	239.0	4.4	ND	ND	ND	ND	4.780	1,613.563
	05/19/10	23,800.0	NA	4,420.0	3,120.0	718.0	2,940.0	42.9	ND	ND	ND	ND	6.390	1,611.953
	09/29/10	91,400.0	NA	20,100.0	21,600.0	2,110.0	10,500.0	32.4	ND	ND	ND	ND	10.760	1,607.583
	12/16/10	40,600.0	NA	10,100.0	5,960.0	1,040.0	4,850.0	98.5	ND	ND	ND	ND	10.560	1,607.783
	03/17/11	1,200.0	NA	208.0	127.0	16.1	93.0	8.4	ND	ND	ND	ND	4.430	1,613.913
	06/17/11	55,000.0	NA	12,800.0	16,400.0	1,470.0	5,470.0	160.0	ND	4.4	ND	283.0	6.550	1,611.793
	09/13/11	117,000.0	NA	23,800.0	18,200.0	2,260.0	10,500.0	334.0	ND	ND	ND	ND	9.000	1,609.343
	11/11/11	71,900.0	NA	19,100.0	15,800.0	1,760.0	10,480.0	ND	ND	ND	ND	ND	10.100	1,608.243
	02/10/12	4,480.0	NA	1,690.0	187.0	152.0	151.0	ND	ND	ND	ND	ND	7.760	1,610.583
	05/15/12	1,030.0	NA	382.0	3.9	ND	28.3	31.7	ND	ND	ND	ND	8.140	1,610.203
	08/24/12	23,500.0	NA	8,170.0	1,720.0	980.0	3,120.0	66.4	NA	NA	NA	NA	10.500	1,607.843
	12/10/12	15,200.0	NA	9,920.0	118.0	129.0	1,040.0	ND	ND	ND	ND	ND	10.680	1,607.663
	02/28/13	2,780.0	NA	1,370.0	11.7	ND	71.4	26.6	ND	ND	ND	ND	7.620	1,610.723

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TABULATED GROUNDWATER SAMPLE ANALYTICAL RESULTS
MOBIL BALDWIN

SAMPLE SOURCE	DATE SAMPLED	TPH AS GASOLINE (µg/L)	TPH AS DIESEL (µg/L)	BENZENE (µg/L)	TOLUENE (µg/L)	ETHYL-BENZENE (µg/L)	XYLENES (µg/L)	MTBE (µg/L)	ETBE (µg/L)	DIPE (µg/L)	TAME (µg/L)	TBA (µg/L)	DEPTH TO G.W. (FT)	G.W. ELEVATION (FT - AMSL)
	05/09/13	10,500.0	NA	4,740.0	409.0	387.0	307.0	43.7	ND	ND	ND	ND	7.690	1,610.653
	09/24/13	44,400.0	NA	21,800.0	1,930.0	1,220.0	8,240.0	328.0	ND	ND	ND	ND	10.320	1,608.023
	12/11/13	1,620.0	NA	160.0	260.0	29.7	240.0	22.6	ND	ND	ND	ND	8.220	1,610.123
	03/07/14	1,170.0	NA	7.8	83.8	24.1	221.0	1.4	ND	ND	ND	ND	8.500	1,609.843
	05/09/14	106,000.0	NA	26,800.0	38,300.0	1,930.0	15,900.0	ND	ND	ND	ND	ND	8.600	1,609.743
	11/17/14	115,000.0	NA	15,200.0	31,300.0	2,520.0	18,600.0	ND	ND	ND	ND	ND	11.980	1,606.363
	07/02/15	48,400.0	NA	4,370.0	10,300.0	1,050.0	7,180.0	ND	ND	ND	ND	ND	10.920	1,607.423
	10/21/15	54,900.0	NA	6,380.0	11,300.0	2,040.0	12,300.0	ND	ND	ND	ND	ND	11.740	1,606.603
	06/27/16	51,500.0	NA	3,810.0	8,000.0	1,810.0	3,240.0	ND	ND	ND	ND	ND	10.710	1,607.633
	01/23/17	210.0	NA	ND	ND	2.6	35.6	ND	ND	ND	ND	ND	12.220	1,606.123
	06/13/17	22,700.0	NA	2,020.0	3,090.0	1,480.0	7,040.0	ND	ND	ND	ND	ND	8.120	1,610.223
	10/25/17	9,050.0	NA	8,350.0	613.0	3,890.0	13,650.0	ND	ND	ND	ND	9.6	10.660	1,607.683
	05/09/18	21,500.0	NA	1,000.0	1,950.0	1,740.0	7,070.0	ND	ND	ND	ND	ND	9.580	1,608.763
	11/30/18	52,200.0	NA	17,300.0	12,700.0	ND<0.5	5,305.0	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	12.090	1,606.253
	06/05/19	12,600.0	NA	313.0	1,420.0	336.0	787.0	ND<5	ND<5	ND<5	ND<5	ND<50	6.500	1,611.843
	11/06/19	26,500.0	NA	2,200.0	1,530.0	2,720.0	4,857.0	59.7	ND<2.5	ND<2.5	ND<2.5	ND<25	10.550	1,630.080
	06/22/20	2,670.0	NA	74.3	390.0	ND<0.5	581.0	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	6.280	1,634.350
	12/14/20	10,400.0	NA	2,160.0	ND<0.5	1,290.0	620.0	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	10.080	1,630.550
	05/20/21	16,300.0	NA	394.0	509.0	1,420.0	3,631.0	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	8.070	1,632.560
	11/04/21	19,100.0	NA	2,300.0	425.0	2,750.0	4,166.0	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	10.920	1,629.710
	06/30/22	13,400.0	NA	815.0	325.0	2,790.0	4,757.0	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	9.950	1,630.680
MW-2	01/08/03	ND	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	9.800	1,607.810
	04/16/03	ND	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	4.410	1,613.200
	07/14/03	ND	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	7.100	1,610.510
	10/14/03	ND	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	10.000	1,607.610
	03/05/04	ND	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	6.300	1,611.310
	05/13/04	ND	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	6.720	1,610.890
	07/28/04	ND	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	8.300	1,609.310
	10/26/04	ND	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	8.780	1,608.830
	01/25/05	ND	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	1.880	1,615.730
	05/13/05	ND	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	3.750	1,613.860
	07/21/05	ND	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	6.200	1,611.410
	10/04/05	ND	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	7.250	1,610.360
	01/04/06	ND	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	6.100	1,611.510
**	12/08/06	ND	NA	2.3	2.2	ND	ND	ND	ND	ND	ND	ND	7.960	1,609.650
	03/15/07	206,000.0	NA	43,600.0	37,600.0	2,810.0	17,900.0	328.0	ND	29.9	ND	728.0	7.260	1,610.350
	06/08/07	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.150	1,611.460
	09/07/07	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.240	1,611.370
	12/14/07	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.220	1,611.390
	03/28/08		NA		NA	NA	NA		NA	NA	NA	NA	NA***	

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TABULATED GROUNDWATER SAMPLE ANALYTICAL RESULTS
MOBIL BALDWIN

SAMPLE SOURCE	DATE SAMPLED	TPH AS GASOLINE (µg/L)	TPH AS DIESEL (µg/L)	BENZENE (µg/L)	TOLUENE (µg/L)	ETHYL-BENZENE (µg/L)	XYLENES (µg/L)	MTBE (µg/L)	ETBE (µg/L)	DIPE (µg/L)	TAME (µg/L)	TBA (µg/L)	DEPTH TO G.W. (FT)	G.W. ELEVATION (FT - AMSL)
	05/23/08		NA		NA	NA	NA		NA	NA	NA	NA	NA***	
	08/26/08		NA		NA	NA	NA		NA	NA	NA	NA	NA***	
	01/06/09	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	7.410	1,610.642
	03/13/09	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.810	1,612.242
	06/11/09		NA		NA	NA	NA		NA	NA	NA	NA	NA****	
	09/03/09	169.0	NA	3.9	17.3	6.5	30.1	ND	ND	ND	ND	ND	8.900	1,608.152
	12/08/09	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	9.430	1,607.622
	02/18/10	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.950	1,613.102
	05/19/10	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.720	1,610.332
	09/29/10	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	10.100	1,606.952
	12/16/10	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	9.880	1,607.172
	03/17/11	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.740	1,613.312
	06/17/11	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.870	1,611.182
	09/13/11	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	7.800	1,609.252
	11/11/11	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	9.520	1,607.532
	02/10/12	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	7.060	1,609.992
	05/15/12	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	9.780	1,607.272
	08/24/12	ND	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	9.820	1,607.232
	12/10/12	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	10.400	1,606.652
	02/28/13	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	7.000	1,610.052
	05/09/13	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.920	1,610.132
	09/24/13	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	9.630	1,607.422
	12/11/13	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	10.730	1,606.322
	03/07/14	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	9.450	1,607.602
	05/09/14	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	8.680	1,608.372
	11/17/14	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	13.550	1,603.502
	07/02/15	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	12.360	1,604.692
	10/21/15	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	13.360	1,603.692
	06/27/16	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	New TOC	
	01/23/17	ND	NA	ND	3.4	ND	2.5	ND	ND	ND	ND	ND	New TOC	
	06/13/17	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	New TOC	
	10/25/17	300.0	NA	5.2	1.5	3.9	14.2	ND	ND	ND	ND	ND	New TOC	
	05/09/18	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	New TOC	
	11/30/18	ND<100	NA	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	New TOC	
	06/05/19	ND<200	NA	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<5	ND<5	ND<5	ND<5	ND<50	New TOC	
	11/06/19	ND<100	NA	1.3	1.4	2.8	6.1	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	11.810	1,630.060
	06/22/20	ND<100	NA	ND<0.5	1.3	0.8	3.0	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	7.520	1,634.890
	12/14/20	6,000.0	NA	1.5	806.0	453.0	673.0	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	11.350	1,631.060
	05/20/21	ND<100	NA	2.2	ND<0.5	2.1	0.8	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	9.320	1,633.090
	11/04/21	ND<100	NA	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	12.320	1,630.090
	06/30/22	ND<100	NA	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	11.240	1,631.170

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TABULATED GROUNDWATER SAMPLE ANALYTICAL RESULTS
MOBIL BALDWIN

SAMPLE SOURCE	DATE SAMPLED	TPH AS GASOLINE (µg/L)	TPH AS DIESEL (µg/L)	BENZENE (µg/L)	TOLUENE (µg/L)	ETHYL-BENZENE (µg/L)	XYLENES (µg/L)	MTBE (µg/L)	ETBE (µg/L)	DIPE (µg/L)	TAME (µg/L)	TBA (µg/L)	DEPTH TO G.W. (FT)	G.W. ELEVATION (FT - AMSL)
MW-3	01/08/03	ND	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	12.440	1,608.260
	04/16/03	ND	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	7.300	1,613.400
	07/14/03	ND	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	9.750	1,610.950
	10/14/03	ND	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	12.560	1,608.140
	03/05/04	ND	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	9.090	1,611.610
	05/13/04	ND	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	9.540	1,611.160
	07/28/04	ND	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	11.150	1,609.550
	10/26/04	ND	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	11.190	1,609.510
	01/25/05	ND	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	5.650	1,615.050
	05/13/05	ND	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	6.320	1,614.380
	07/21/05	ND	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	8.670	1,612.030
	10/04/05	ND	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	9.940	1,610.760
	01/04/06	ND	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	8.800	1,611.900
**	12/08/06	139.0	NA	13.2	20.9	4.6	19.8	ND	ND	ND	ND	ND	10.420	1,610.280
	03/15/07	469.0	NA	41.1	2.4	8.0	8.9	ND	ND	ND	ND	ND	7.180	1,613.520
	06/08/07	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	8.690	1,612.010
	09/07/07	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	8.750	1,611.950
	12/14/07	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	8.740	1,611.960
	03/28/08	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	7.320	1,613.380
	05/23/08	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	8.650	1,612.050
	08/26/08	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	11.790	1,608.910
	01/06/09	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	9.700	1,611.000
	03/13/09	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	8.400	1,612.300
	06/11/09	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	9.160	1,611.540
	09/03/09	63.0	NA	1.6	4.6	2.9	11.6	ND	ND	ND	ND	ND	11.130	1,609.570
	12/08/09	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	11.800	1,608.900
	02/18/10	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.440	1,614.260
	05/19/10	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	9.140	1,611.560
	09/29/10	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	12.480	1,608.220
	12/16/10	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	12.240	1,608.460
	03/17/11	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.270	1,614.430
	06/17/11	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	8.230	1,612.470
	09/13/11	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	11.300	1,609.400
	11/11/11	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	11.840	1,608.860
	02/10/12	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	9.500	1,611.200
	05/15/12	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	9.780	1,610.920
	08/24/12	ND	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	12.180	1,608.520
	12/10/12	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	12.420	1,608.280
	02/28/13	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	9.480	1,611.220
	05/09/13	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	9.400	1,611.300

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TABULATED GROUNDWATER SAMPLE ANALYTICAL RESULTS
MOBIL BALDWIN

SAMPLE SOURCE	DATE SAMPLED	TPH AS GASOLINE (µg/L)	TPH AS DIESEL (µg/L)	BENZENE (µg/L)	TOLUENE (µg/L)	ETHYL-BENZENE (µg/L)	XYLENES (µg/L)	MTBE (µg/L)	ETBE (µg/L)	DIPE (µg/L)	TAME (µg/L)	TBA (µg/L)	DEPTH TO G.W. (FT)	G.W. ELEVATION (FT - AMSL)
	09/24/13	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	12.150	1,608.550
	12/11/13	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	11.080	1,609.620
	03/07/14	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	10.520	1,610.180
	05/09/14	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	11.170	1,609.530
	11/17/14	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	13.850	1,606.850
	07/02/15	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	12.830	1,607.870
	10/21/15	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	13.750	1,606.950
	06/27/16	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	12.700	1,608.000
	01/23/17	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	14.320	1,606.380
	06/13/17	ND	NA	ND	1.0	2.0	2.5	ND	ND	ND	ND	ND	9.950	1,610.750
	10/25/17	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	12.360	1,608.340
	05/09/18	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	10.150	1,610.550
	11/30/18	ND<100	NA	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	13.300	1,607.400
	06/05/19	ND<200	NA	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<5	ND<5	ND<5	ND<5	ND<50	8.470	1,612.230
	11/06/19	ND<100	NA	0.6	0.7	1.4	2.8	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	12.140	1,630.950
	06/22/20	ND<100	NA	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	8.180	1,634.910
	12/14/20	ND<100	NA	ND<0.5	2.6	3.6	4.0	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	11.670	1,631.420
	05/20/21	ND<100	NA	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	9.790	1,633.300
	11/04/21	ND<100	NA	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	12.530	1,630.560
	06/30/22	ND<100	NA	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	11.630	1,631.460
MW-4	01/08/03	947.0	NA	27.0	3.0	ND	338.0	ND	NA	NA	NA	NA	11.120	1,607.470
	04/16/03	3,161.0	NA	61.0	340.0	45.0	408.0	6.0	NA	NA	NA	NA	5.950	1,612.640
	07/14/03	11,051.0	NA	1,214.0	1,403.0	228.0	1,099.0	ND	NA	NA	NA	NA	8.420	1,610.170
	10/14/03	22,790.0	NA	1,828.0	1,768.0	2.0	1,833.0	ND	NA	NA	NA	NA	11.210	1,607.380
	03/05/04	2,067.0	NA	455.0	240.0	8.0	153.0	ND	NA	NA	NA	NA	7.720	1,610.870
	05/13/04	8,684.0	NA	714.0	1,038.0	264.0	626.0	ND	NA	NA	NA	NA	8.150	1,610.440
	07/28/04	23,912.0	NA	3,037.0	3,807.0	953.0	1,926.0	ND	NA	NA	NA	NA	9.700	1,608.890
	10/26/04	18,047.0	NA	3,939.0	7,465.0	376.0	1,444.0	ND	NA	NA	NA	NA	9.930	1,608.660
	01/25/05	467.0	NA	12.0	33.0	ND	20.0	ND	NA	NA	NA	NA	3.880	1,614.710
	05/13/05	4,565.0	NA	711.0	859.0	246.0	270.0	ND	NA	NA	NA	NA	5.050	1,613.540
	07/21/05	13,966.0	NA	1,424.0	2,630.0	433.0	1,166.0	ND	NA	NA	NA	NA	7.220	1,611.370
	10/04/05	25,931.0	NA	3,474.4	6,555.5	610.1	2,229.0	ND	NA	NA	NA	NA	8.380	1,610.210
	01/04/06	2,219.0	NA	107.3	99.1	23.3	117.9	ND	NA	NA	NA	NA	7.340	1,611.250
**	12/08/06	9,300.0	NA	1,930.0	156.0	308.0	1,330.0	ND	ND	ND	ND	ND	9.200	1,609.390
	03/15/07	101,000.0	NA	18,000.0	20,300.0	1,830.0	11,700.0	ND	ND	ND	ND	1,650.0	6.290	1,612.300
	06/08/07	2,030.0	ND	435.0	73.7	60.8	354.0	ND	ND	ND	ND	ND	7.280	1,611.310
	09/07/07	16,500.0	NA	3,430.0	574.0	952.0	3,670.0	ND	ND	ND	ND	ND	7.330	1,611.260
	12/14/07	564.0	NA	267.0	1.8J	3.5J	2.8J	ND	ND	ND	ND	ND	7.310	1,611.280
	03/28/08	1,120.0	NA	9.5	106.0	40.7	207.0	ND	ND	ND	ND	ND	6.030	1,612.560
	05/23/08	2,640.0	NA	200.0	212.0	100.0	275.0	ND	ND	ND	ND	ND	7.180	1,611.410

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TABULATED GROUNDWATER SAMPLE ANALYTICAL RESULTS
MOBIL BALDWIN

SAMPLE SOURCE	DATE SAMPLED	TPH AS GASOLINE (µg/L)	TPH AS DIESEL (µg/L)	BENZENE (µg/L)	TOLUENE (µg/L)	ETHYL-BENZENE (µg/L)	XYLENES (µg/L)	MTBE (µg/L)	ETBE (µg/L)	DIPE (µg/L)	TAME (µg/L)	TBA (µg/L)	DEPTH TO G.W. (FT)	G.W. ELEVATION (FT - AMSL)
	08/26/08	13,700.0	NA	2,600.0	143.0	929.0	2,790.0	ND	ND	ND	ND	ND	10.220	1,608.370
	01/06/09	65.0	NA	7.4	ND	0.6J	3.4	ND	ND	ND	ND	ND	8.300	1,610.290
	03/13/09	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.700	1,611.890
	06/11/09	4,270.0	NA	601.0	10.9	190.0	451.0	ND	ND	ND	ND	ND	7.730	1,610.860
	09/03/09	9,470.0	NA	1,850.0	125.0	562.0	1,180.0	ND	ND	ND	ND	ND	9.660	1,608.930
	12/08/09	1,350.0	NA	341.0	ND	72.8	12.9	ND	ND	ND	ND	ND	10.300	1,608.290
	02/18/10	ND	NA	4.8	ND	ND	5.9	ND	ND	ND	ND	ND	5.080	1,613.510
	05/19/10	1,780.0	NA	200.0	54.0	117.0	223.0	ND	ND	ND	ND	ND	7.700	1,610.890
	09/29/10	18,700.0	NA	3,040.0	106.0	937.0	2,260.0	ND	ND	ND	ND	ND	10.960	1,607.630
	12/16/10	3,840.0	NA	521.0	28.0	197.0	365.0	ND	ND	ND	ND	ND	10.740	1,607.850
	03/17/11	90.0	NA	5.1	0.6	1.1	1.9	ND	ND	ND	ND	ND	4.790	1,613.800
	06/17/11	3,400.0	NA	607.0	21.1	86.9	132.0	ND	ND	ND	ND	ND	6.760	1,611.830
	09/13/11	16,100.0	NA	1,970.0	108.0	880.0	1,870.0	ND	ND	ND	ND	ND	9.200	1,609.390
	11/11/11	8,520.0	NA	1,540.0	48.8	423.0	1,420.0	ND	ND	ND	ND	ND	10.350	1,608.240
	02/10/12	1,500.0	NA	81.0	2.6	85.9	65.6	ND	ND	ND	ND	ND	8.040	1,610.550
	05/15/12	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	8.380	1,610.210
	08/24/12	3,490.0	NA	928.0	33.5	302.0	160.0	ND	NA	NA	NA	NA	10.700	1,607.890
	12/10/12	163.0	NA	23.9	ND	ND	23.4	ND	ND	ND	ND	ND	10.740	1,607.850
	02/28/13	ND	NA	0.7	ND	ND	ND	ND	ND	ND	ND	ND	8.080	1,610.510
	05/09/13	ND	NA	21.8	ND	ND	ND	ND	ND	ND	ND	ND	8.000	1,610.590
	09/24/13	4,220.0	NA	1,410.0	91.9	577.0	344.0	ND	ND	ND	ND	ND	10.610	1,607.980
	12/11/13	24,100.0	NA	2,400.0	4,490.0	1,330.0	4,180.0	ND	ND	ND	ND	ND	10.330	1,608.260
	03/07/14	10,100.0	NA	2,400.0	4,495.0	445.0	976.0	ND	ND	ND	ND	ND	9.600	1,608.990
	05/09/14	23,100.0	NA	4,010.0	76.5	597.0	9,780.0	ND	ND	ND	ND	ND	9.700	1,608.890
	11/17/14	114,000.0	NA	8,070.0	31,800.0	3,420.0	30,500.0	ND	ND	ND	ND	ND	12.330	1,606.260
	07/02/15	49,300.0	NA	5,900.0	4,310.0	2,370.0	9,770.0	ND	ND	ND	ND	ND	11.310	1,607.280
	10/21/15	28,300.0	NA	4,260.0	1,980.0	2,240.0	7,550.0	ND	ND	ND	ND	ND	12.270	1,606.320
	06/27/16	32,700.0	NA	3,960.0	676.0	2,043.0	8,370.0	ND	ND	ND	ND	ND	11.240	1,607.350
	01/23/17	3,310.0	NA	509.0	414.0	33.4	1,057.0	ND	ND	ND	ND	ND	12.850	1,605.740
	06/13/17	3,150.0	NA	106.0	414.0	293.0	1,017.0	2.6	ND	ND	ND	ND	8.630	1,609.960
	10/25/17	15,500.0	NA	3,620.0	24.0	1,920.0	5,947.3	ND	ND	ND	ND	ND	11.100	1,607.490
	05/09/18	14,100.0	NA	2,160.0	397.0	1,040.0	2,516.0	ND	ND	ND	ND	ND	11.170	1,608.420
	11/30/18	18,900.0	NA	3,050.0	113.0	ND<0.5	3,117.0	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	12.620	1,605.970
	06/05/19	20,500.0	NA	2,830.0	325.0	400.0	729.0	ND<5	ND<5	ND<5	ND<5	ND<50	7.220	1,611.370
	11/06/19	12,300.0	NA	2,420.0	29.7	2,010.0	660.5	13.3	ND<2.5	ND<2.5	ND<2.5	ND<25	10.880	1,630.110
	06/22/20	57,200.0	NA	20,200.0	277.0	ND<0.5	3,890.0	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	6.800	1,634.190
	12/14/20	2,400.0	NA	1,120.0	4.8	512.0	9.2	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	10.400	1,630.590
	05/20/21	10,200.0	NA	1,510.0	81.8	1,370.0	839.0	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	8.490	1,632.500
	11/04/21	7,660.0	NA	1,420.0	ND<0.5	1,400.0	104.0	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	11.240	1,629.750
	06/30/22	1,390.0	NA	125.0	1,1	612.0	3.3	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	10.320	1,630.670

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TABULATED GROUNDWATER SAMPLE ANALYTICAL RESULTS
MOBIL BALDWIN

SAMPLE SOURCE	DATE SAMPLED	TPH AS GASOLINE (µg/L)	TPH AS DIESEL (µg/L)	BENZENE (µg/L)	TOLUENE (µg/L)	ETHYL-BENZENE (µg/L)	XYLENES (µg/L)	MTBE (µg/L)	ETBE (µg/L)	DIPE (µg/L)	TAME (µg/L)	TBA (µg/L)	DEPTH TO G.W. (FT)	G.W. ELEVATION (FT - AMSL)
MW-5	01/08/03	12,158.0	NA	2,581.0	2,935.0	26.0	2,203.0	291.0	NA	NA	NA	NA	9.950	1,607.300
	04/16/03	2,757.0	NA	235.0	163.0	ND	287.0	122.0	NA	NA	NA	NA	4.700	1,612.550
	07/14/03	9,252.0	NA	1,740.0	1,033.0	146.0	990.0	171.0	NA	NA	NA	NA	7.300	1,609.950
	10/14/03	25,327.0	NA	3,707.0	860.0	55.0	996.0	158.0	NA	NA	NA	NA	10.050	1,607.200
	03/05/04	1,185.0	NA	399.0	19.0	ND	34.0	66.0	NA	NA	NA	NA	6.410	1,610.840
	05/13/04	7,233.0	NA	1,407.0	805.0	138.0	432.0	627.0	NA	NA	NA	NA	6.820	1,610.430
	07/28/04	26,511.0	NA	160.0	5,546.0	4,363.0	1,870.0	ND	NA	NA	NA	NA	8.400	1,608.850
	10/26/04	1,666.0	NA	330.0	227.0	8.0	89.0	66.0	NA	NA	NA	NA	8.800	1,608.450
	01/25/05	ND	NA	13.0	ND	ND	ND	20.0	NA	NA	NA	NA	2.500	1,614.750
	05/13/05	7,233.0	NA	1,407.0	805.0	138.0	432.0	627.0	NA	NA	NA	NA	3.960	1,613.290
	07/21/05	3,185.0	NA	536.0	193.0	52.0	117.0	89.0	NA	NA	NA	NA	6.120	1,611.130
	10/04/05	8,789.0	NA	2,041.5	485.0	172.3	333.7	162.2	NA	NA	NA	NA	7.220	1,610.030
	01/04/06	535.0	NA	30.0	8.6	1.5	17.2	54.2	NA	NA	NA	NA	6.460	1,610.790
**	12/08/06	4,020.0	NA	1,230.0	387.0	80.8	468.0	37.5	ND	ND	ND	ND	7.860	1,609.390
	03/15/07	ND	NA	3.1	0.5J	ND	ND	15.1	ND	ND	ND	ND	6.010	1,611.240
	06/08/07	2,340.0	ND	744.0	438.0	101.0	309.0	36.5	ND	ND	ND	ND	6.090	1,611.160
	09/07/07	14,500.0	NA	4,300.0	2,780.0	424.0	1,270.0	59.8	ND	ND	ND	ND	6.210	1,611.040
	12/14/07	72.6	NA	4.0	0.7J	ND	1.1J	43.6	ND	ND	ND	ND	6.200	1,611.050
	03/28/08	973.0	NA	28.3	34.9	3.2	78.3	33.0	ND	ND	ND	ND	4.790	1,612.460
	05/23/08	595.0	NA	103.0	34.5	9.8	33.4	14.2	ND	ND	ND	ND	5.950	1,611.300
	08/26/08	18,700.0	NA	2,500.0	1,330.0	493.0	2,280.0	40.2	ND	ND	ND	ND	9.800	1,607.450
	01/06/09	2,440.0	NA	422.0	272.0	86.4	535.0	4.1	ND	ND	ND	ND	7.080	1,610.170
	03/13/09	497.0	NA	164.0	5.3	1.1	123.0	ND	ND	ND	ND	ND	5.400	1,611.850
	06/11/09	5,570.0	NA	1,280.0	107.0	286.0	1,440.0	7.2	ND	ND	ND	ND	6.540	1,610.710
	09/03/09	11,800.0	NA	2,360.0	796.0	339.0	1,480.0	13.9	ND	ND	ND	ND	8.510	1,608.740
	12/08/09	8,950.0	NA	2,530.0	110.0	154.0	1,010.0	ND	ND	ND	ND	ND	9.100	1,608.150
	02/18/10	134.0	NA	17.1	ND	2.4	17.5	2.3	ND	ND	ND	ND	5.780	1,611.470
	05/19/10	3,040.0	NA	421.0	68.9	132.0	547.0	4.5	ND	ND	ND	ND	6.500	1,610.750
	09/29/10	4,010.0	NA	2,030.0	269.0	149.0	548.0	19.1	ND	ND	ND	ND	9.760	1,607.490
	12/16/10	1,100.0	NA	180.0	26.3	22.0	46.2	3.6	ND	ND	ND	ND	9.550	1,607.700
	03/17/11	ND	NA	3.7	ND	ND	ND	11.3	ND	ND	ND	ND	3.500	1,613.750
	06/17/11	6,890.0	NA	1,020.0	74.4	161.0	744.0	7.4	ND	ND	ND	ND	5.550	1,611.700
	09/13/11	17,200.0	NA	4,160.0	506.0	502.0	1,560.0	16.1	ND	ND	ND	ND	8.500	1,608.750
	11/11/11	3,970.0	NA	1,060.0	73.2	194.0	614.0	ND	ND	ND	ND	ND	9.140	1,608.110
	02/10/12	967.0	NA	551.0	1.4	61.3	27.1	ND	ND	ND	ND	ND	6.800	1,610.450
	05/15/12	ND	NA	1.3	ND	ND	ND	ND	ND	ND	ND	ND	7.160	1,610.090
	08/24/12	23,900.0	NA	11,300.0	218.0	1,450.0	3,630.0	ND	NA	NA	NA	NA	9.580	1,607.670
	12/10/12	735.0	NA	255.0	4.1	ND	13.2	ND	ND	ND	ND	ND	9.750	1,607.500
	02/28/13	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.800	1,611.450
	05/09/13	ND	NA	0.9	ND	ND	ND	ND	ND	ND	ND	ND	6.750	1,610.500
	09/24/13	3,970.0	NA	2,700.0	34.7	23.4	317.0	ND	ND	ND	ND	ND	9.400	1,607.850

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TABULATED GROUNDWATER SAMPLE ANALYTICAL RESULTS
MOBIL BALDWIN

SAMPLE SOURCE	DATE SAMPLED	TPH AS GASOLINE (µg/L)	TPH AS DIESEL (µg/L)	BENZENE (µg/L)	TOLUENE (µg/L)	ETHYL-BENZENE (µg/L)	XYLENES (µg/L)	MTBE (µg/L)	ETBE (µg/L)	DIPE (µg/L)	TAME (µg/L)	TBA (µg/L)	DEPTH TO G.W. (FT)	G.W. ELEVATION (FT - AMSL)
	12/11/13	3,520.0	NA	1,550.0	80.6	89.0	142.0	ND	ND	ND	ND	ND	9.580	1,607.670
	03/07/14	9,990.0	NA	3,700.0	56.2	186.0	92.1	ND	ND	ND	ND	ND	8.400	1,608.850
	05/09/14	2,960.0	NA	2,830.0	ND	100.0	150.0	ND	ND	ND	ND	ND	8.450	1,608.800
	11/17/14	35,600.0	NA	8,270.0	489.0	624.0	6,450.0	ND	ND	ND	ND	ND	11.170	1,608.080
	07/02/15	4,280.0	NA	886.0	20.8	126.0	504.0	ND	ND	ND	ND	ND	10.020	1,607.230
	10/21/15	4,060.0	NA	1,360.0	52.7	211.0	386.0	ND	ND	ND	ND	ND	10.990	1,606.260
	06/27/16	1,340.0	NA	250.0	24.6	45.2	163.0	ND	ND	ND	ND	ND	9.910	1,607.340
	01/23/17	1,000.0	NA	29.7	28.0	19.4	131.7	ND	ND	ND	ND	ND	11.480	1,605.770
	06/13/17	950.0	NA	290.0	6.3	83.6	124.0	ND	ND	ND	ND	ND	7.310	1,609.940
	10/25/17	910.0	NA	289.0	6.2	60.3	8.2	ND	ND	ND	ND	ND	9.820	1,607.430
	05/09/18	1,800.0	NA	473.0	17.3	63.3	60.9	8.1	ND	ND	ND	ND	9.920	1,607.330
	11/30/18	14,400.0	NA	3,690.0	433.0	ND<0.5	2,497.0	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	11.390	1,605.860
	06/05/19	6,100.0	NA	1,430.0	26.7	289.0	1,618.6	ND<5	ND<5	ND<5	ND<5	ND<50	5.850	1,611.400
	11/06/19	3,650.0	NA	1,270.0	27.9	222.0	157.8	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	9.690	1,629.940
	06/22/20	2,630.0	NA	934.0	24.0	ND<0.5	465.9	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	5.490	1,634.140
	12/14/20	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NM	
	05/20/21	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NM	
	11/04/21	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NM	
	06/30/22	ND<100	NA	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	NM	
MW-6	01/08/03	ND	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	9.570	1,607.170
	04/16/03	ND	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	4.410	1,612.330
	07/14/03	ND	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	7.200	1,609.540
	10/14/03	ND	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	9.900	1,606.840
	03/05/04	ND	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	6.240	1,610.500
	05/13/04	ND	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	6.710	1,610.030
	07/28/04	ND	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	8.300	1,608.440
	10/26/04	ND	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	8.380	1,608.360
	01/25/05	ND	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	2.580	1,614.160
	05/13/05	ND	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	3.740	1,613.000
	07/21/05	ND	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	6.000	1,610.740
	10/04/05	ND	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	7.000	1,609.740
	01/04/06	ND	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	5.750	1,610.990
**	12/08/06	ND	NA	3.0	1.1	ND	3.1	ND	ND	ND	ND	ND	7.300	1,610.940
	03/15/07	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.800	1,610.940
	06/08/07	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.915	1,610.825
	09/07/07	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.050	1,610.690
	12/14/07	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.040	1,610.700
	03/28/08	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.580	1,612.160
	05/23/08	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.780	1,610.960
	08/26/08	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	8.900	1,607.840

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* Not Analyzed for this Contaminant
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**** Not analyzed as car was parked over the monitoring well.

TABULATED GROUNDWATER SAMPLE ANALYTICAL RESULTS
MOBIL BALDWIN

SAMPLE SOURCE	DATE SAMPLED	TPH AS GASOLINE (µg/L)	TPH AS DIESEL (µg/L)	BENZENE (µg/L)	TOLUENE (µg/L)	ETHYL-BENZENE (µg/L)	XYLENES (µg/L)	MTBE (µg/L)	ETBE (µg/L)	DIPE (µg/L)	TAME (µg/L)	TBA (µg/L)	DEPTH TO G.W. (FT)	G.W. ELEVATION (FT - AMSL)
	01/06/09	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.820	1,609.920
	03/13/09	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.200	1,611.540
	06/11/09	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.440	1,610.300
	09/03/09	308.0	NA	10.2	29.9	13.4	50.8	ND	ND	ND	ND	ND	8.400	1,608.340
	12/08/09	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	8.900	1,607.840
	02/18/10	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.670	1,613.070
	05/19/10	ND	NA	6.2	ND	ND	ND	ND	ND	ND	ND	ND	6.360	1,610.380
	09/29/10	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	9.720	1,607.020
	12/16/10	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	9.420	1,607.320
	03/17/11	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.480	1,613.260
	06/17/11	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.440	1,611.300
	09/13/11	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.300	1,611.440
	11/11/11	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	8.920	1,607.820
	02/10/12	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.650	1,610.090
	05/15/12	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	7.800	1,608.940
	08/24/12	ND	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	9.470	1,607.270
	12/10/12	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	9.680	1,607.060
	02/28/13	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.610	1,610.130
	05/09/13	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.680	1,610.060
	09/24/13	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	9.330	1,607.410
	12/11/13	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	9.940	1,606.800
	03/07/14	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	8.380	1,608.360
	05/09/14	254.0	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	8.390	1,608.350
	11/17/14	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	11.040	1,605.700
	07/02/15	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	10.050	1,606.690
	10/21/15	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	11.020	1,605.720
	06/27/16	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	9.950	1,606.790
	01/23/17	ND	NA	ND	4.5	ND	5.3	ND	ND	ND	ND	ND	11.500	1,605.240
	06/13/17	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	7.460	1,609.280
	10/25/17	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	9.950	1,606.790
	05/09/18	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	9.130	1,607.610
	11/30/18	ND<100	NA	4.9	10.5	1.4	10.4	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	11.400	1,605.340
	06/05/19	ND<200	NA	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<5	ND<5	ND<5	ND<5	ND<50	6.000	1,610.740
	11/06/19	ND<100	NA	1.2	ND<0.5	1.0	1.0	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	9.740	1,629.350
	06/22/20	ND<100	NA	2.3	ND<0.5	1.1	2.6	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	5.550	1,633.540
	12/14/20	ND<100	NA	2.1	ND<0.5	1.4	ND<0.5	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	9.190	1,629.900
	05/20/21	ND<100	NA	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	7.330	1,631.740
	11/04/21	ND<100	NA	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	10.060	1,629.030
	06/30/22	ND<100	NA	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	9.170	1,629.920
MW-7	01/08/03	ND	NA	ND	ND	ND	ND	3.0	NA	NA	NA	NA	8.480	1,606.460

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TABULATED GROUNDWATER SAMPLE ANALYTICAL RESULTS
MOBIL BALDWIN

SAMPLE SOURCE	DATE SAMPLED	TPH AS GASOLINE (µg/L)	TPH AS DIESEL (µg/L)	BENZENE (µg/L)	TOLUENE (µg/L)	ETHYL-BENZENE (µg/L)	XYLENES (µg/L)	MTBE (µg/L)	ETBE (µg/L)	DIPE (µg/L)	TAME (µg/L)	TBA (µg/L)	DEPTH TO G.W. (FT)	G.W. ELEVATION (FT - AMSL)
	04/16/03	ND	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	2.720	1,612.220
	07/14/03	ND	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	6.650	1,608.290
	10/14/03	ND	NA	ND	ND	ND	ND	5.0	NA	NA	NA	NA	9.100	1,605.840
	03/05/04	ND	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	5.210	1,609.730
	05/13/04	ND	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	6.220	1,608.720
	07/28/04	ND	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	7.740	1,607.200
	10/26/04	ND	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	6.430	1,608.510
	01/25/05	ND	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	1.920	1,613.020
	05/13/05	ND	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	2.300	1,612.640
	07/21/05	ND	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	4.030	1,610.910
	10/04/05	ND	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	5.730	1,609.210
	01/04/06	ND	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	4.220	1,610.720
**	12/08/06	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	7.720	1,607.220
	03/15/07	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.310	1,610.930
	06/08/07	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.755	1,610.185
	09/07/07	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.950	1,609.990
	12/14/07	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.950	1,609.990
	03/28/08	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.480	1,611.460
	05/23/08	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.490	1,610.450
	08/26/08	ND	NA	ND	ND	ND	ND	4.8	ND	ND	ND	ND	7.900	1,607.040
	01/06/09	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.320	1,608.620
	03/13/09	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.260	1,610.680
	06/11/09	ND	NA	ND	ND	ND	ND	6.0	ND	ND	ND	ND	5.590	1,609.350
	09/03/09	364.0	NA	8.5	28.3	13.1	54.0	8.8	ND	ND	ND	ND	7.690	1,607.250
	12/08/09	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	7.310	1,607.630
	02/18/10	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.630	1,611.310
	05/19/10	ND	NA	ND	ND	ND	ND	6.4	ND	ND	ND	ND	5.600	1,609.340
	09/29/10	ND	NA	ND	ND	ND	ND	12.4	ND	ND	ND	ND	9.040	1,605.900
	12/16/10	ND	NA	ND	ND	ND	ND	9.4	ND	ND	ND	ND	8.250	1,606.690
	03/17/11	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.460	1,612.480
	06/17/11	ND	NA	ND	ND	ND	ND	6.9	ND	ND	ND	ND	4.590	1,610.350
	09/13/11	ND	NA	ND	ND	ND	ND	5.7	ND	ND	ND	ND	6.900	1,608.040
	11/11/11	ND	NA	ND	ND	ND	ND	3.4	ND	ND	ND	ND	7.760	1,607.180
	02/10/12	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.410	1,609.530
	05/15/12	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.160	1,608.780
	08/24/12	ND	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	8.920	1,606.020
	12/10/12	ND	NA	ND	ND	ND	ND	2.2	ND	ND	ND	ND	8.640	1,606.300
	02/28/13	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.610	1,609.330
	05/09/13	ND	NA	ND	ND	ND	ND	2.1	ND	ND	ND	ND	6.020	1,608.920
	09/24/13	ND	NA	ND	ND	ND	ND	11.6	ND	ND	ND	ND	9.810	1,605.130
	12/11/13	ND	NA	ND	ND	ND	ND	12.6	ND	ND	ND	ND	8.660	1,606.280

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TABULATED GROUNDWATER SAMPLE ANALYTICAL RESULTS
MOBIL BALDWIN

SAMPLE SOURCE	DATE SAMPLED	TPH AS GASOLINE (µg/L)	TPH AS DIESEL (µg/L)	BENZENE (µg/L)	TOLUENE (µg/L)	ETHYL-BENZENE (µg/L)	XYLENES (µg/L)	MTBE (µg/L)	ETBE (µg/L)	DIPE (µg/L)	TAME (µg/L)	TBA (µg/L)	DEPTH TO G.W. (FT)	G.W. ELEVATION (FT - AMSL)
	03/07/14	ND	NA	ND	ND	ND	ND	2.2	ND	ND	ND	ND	7.350	1,607.590
	05/09/14	ND	NA	ND	ND	ND	ND	9.2	ND	ND	ND	ND	7.850	1,607.090
	11/17/14	ND	NA	ND	ND	ND	ND	19.0	ND	ND	ND	ND	9.300	1,605.640
	07/02/15	ND	NA	ND	ND	ND	ND	25.0	ND	ND	ND	ND	9.710	1,605.230
	10/21/15	ND	NA	ND	ND	ND	ND	19.0	ND	ND	ND	ND	10.650	1,604.290
	06/27/16	ND	NA	ND	ND	ND	ND	19.0	ND	ND	ND	ND	9.810	1,605.130
	01/23/17	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	11.100	1,603.840
	06/13/17	ND	NA	1.8	ND	ND	ND	13.1	ND	ND	ND	ND	7.550	1,607.390
	10/25/17	ND	NA	ND	ND	0.6	2.2	36.2	ND	ND	ND	ND	9.930	1,605.010
	05/09/18	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	9.300	1,605.640
	11/30/18	ND<100	NA	1.1	ND<0.5	ND<0.5	2.0	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	11.050	1,603.890
	06/05/19	ND<200	NA	ND<1.0	ND<1.0	ND<1.0	ND<1.0	18.9	ND<5	ND<5	ND<5	ND<50	6.280	1,608.660
	11/06/19	ND<100	NA	ND<0.5	ND<0.5	0.7	ND<0.5	20.8	ND<2.5	ND<2.5	ND<2.5	ND<25	9.650	1,627.660
	06/22/20	ND<100	NA	0.7	ND<0.5	0.6	1.5	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	5.460	1,631.850
	12/14/20	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NM	
	05/20/21	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NM	
	11/04/21	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NM	
	06/30/22	ND<100	NA	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	NM	
MW-8	03/05/04	ND	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	6.900	1,610.630
	05/13/04	ND	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	6.900	1,610.630
	07/28/04	ND	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	8.500	1,609.030
	10/26/04	ND	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	8.120	1,609.410
	01/25/05	ND	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	3.550	1,613.980
	05/13/05	ND	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	4.880	1,612.650
	07/21/05	ND	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	5.800	1,611.730
	10/04/05	ND	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	6.980	1,610.550
	01/04/06	ND	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	5.900	1,611.630
**	12/08/06	92.8	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.280	1,611.250
	03/15/07	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.810	1,611.720
	06/08/07	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.820	1,611.710
	09/07/07	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.920	1,611.610
	12/14/07	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.910	1,611.620
	03/28/08	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.700	1,612.830
	05/23/08	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.840	1,611.690
	08/26/08	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	8.920	1,608.610
	01/06/09	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.800	1,610.730
	03/13/09	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.440	1,612.090
	06/11/09	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.390	1,611.140
	09/03/09	646.0	NA	32.9	56.1	23.4	97.7	ND	ND	ND	ND	ND	8.280	1,609.250
	12/08/09	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	8.760	1,608.770

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TABULATED GROUNDWATER SAMPLE ANALYTICAL RESULTS
MOBIL BALDWIN

SAMPLE SOURCE	DATE SAMPLED	TPH AS GASOLINE (µg/L)	TPH AS DIESEL (µg/L)	BENZENE (µg/L)	TOLUENE (µg/L)	ETHYL-BENZENE (µg/L)	XYLENES (µg/L)	MTBE (µg/L)	ETBE (µg/L)	DIPE (µg/L)	TAME (µg/L)	TBA (µg/L)	DEPTH TO G.W. (FT)	G.W. ELEVATION (FT - AMSL)
	02/18/10	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.950	1,613.580
	05/19/10	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.520	1,611.010
	09/29/10	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	9.710	1,607.820
	12/16/10	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	9.400	1,608.130
	03/17/11	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.760	1,613.770
	06/17/11	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.580	1,611.950
	09/13/11	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	9.400	1,608.130
	11/11/11	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	8.920	1,608.610
	02/10/12	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.670	1,610.860
	05/15/12	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	7.800	1,609.730
	08/24/12	ND	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	9.380	1,608.150
	12/10/12	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	9.620	1,607.910
	02/28/13	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	7.660	1,609.870
	05/09/13	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.720	1,610.810
	09/24/13	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	9.400	1,608.130
	12/11/13	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	9.390	1,608.140
	03/07/14	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	8.100	1,609.430
	05/09/14	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	8.460	1,609.070
	11/17/14	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	11.000	1,606.530
	07/02/15	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	10.120	1,607.410
	10/21/15	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	11.030	1,606.500
	06/27/16	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	10.100	1,607.430
	01/23/17	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	11.700	1,605.830
	06/13/17	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	7.570	1,609.960
	10/25/17	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	9.850	1,607.680
	05/09/18	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	8.900	1,608.630
	11/30/18	ND<100	NA	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	11.380	1,606.150
	06/05/19	ND<200	NA	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<5	ND<5	ND<5	ND<5	ND<50	6.250	1,611.280
	11/06/19	ND<100	NA	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	9.590	1,630.300
	06/22/20	ND<100	NA	ND<0.5	ND<0.5	ND<0.5	1.1	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	5.870	1,634.020
	12/14/20	ND<100	NA	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	9.100	1,630.790
	05/20/21	ND<100	NA	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	7.330	1,632.560
	11/04/21	ND<100	NA	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	9.920	1,629.970
	06/30/22	ND<100	NA	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	9.120	1,630.770
MW-9	02/22/12	96,500.0	NA	18,000.0	27,800.0	2,530.0	14,300.0	ND	ND	ND	ND	ND	7.500	1,612.512
	05/15/12	302.0	NA	1.2	ND	ND	18.7	ND	ND	ND	ND	ND	9.380	1,610.632
	08/24/12	111,000.0	NA	34,900.0	37,100.0	2,550.0	16,400.0	ND	NA	NA	NA	NA	10.420	1,609.592
	12/10/12	78,500.0	NA	21,000.0	16,200.0	1,420.0	7,530.0	ND	ND	ND	ND	ND	10.540	1,609.472
	02/28/13	866.0	NA	366.0	2.4	ND	23.4	ND	ND	ND	ND	ND	7.650	1,612.362
	05/09/13	48,400.0	NA	14,700.0	13,200.0	1,060.0	4,010.0	ND	ND	ND	ND	ND	7.580	1,612.432

** first sampling event conducted by AI, data prior to this date was generated by EAR
* Not Analyzed for this Contaminant
*** not analyzed as well was destroyed in soil excavation 03/2008.
**** Not analyzed as car was parked over the monitoring well.

TABULATED GROUNDWATER SAMPLE ANALYTICAL RESULTS
MOBIL BALDWIN

SAMPLE SOURCE	DATE SAMPLED	TPH AS GASOLINE (µg/L)	TPH AS DIESEL (µg/L)	BENZENE (µg/L)	TOLUENE (µg/L)	ETHYL-BENZENE (µg/L)	XYLENES (µg/L)	MTBE (µg/L)	ETBE (µg/L)	DIPE (µg/L)	TAME (µg/L)	TBA (µg/L)	DEPTH TO G.W. (FT)	G.W. ELEVATION (FT - AMSL)
	09/24/13	137,000.0	NA	34,600.0	35,200.0	2,100.0	11,800.0	ND	ND	ND	ND	ND	10.220	1,609.792
	12/11/13	179,000.0	NA	37,900.0	46,700.0	3,100.0	6,280.0	ND	ND	ND	ND	ND	10.370	1,609.642
	03/07/14	173,000.0	NA	34,700.0	41,200.0	2,100.0	14,500.0	ND	ND	ND	ND	ND	9.670	1,610.342
	05/09/14	132,000.0	NA	28,600.0	52,200.0	1,660.0	21,600.0	ND	ND	ND	ND	ND	9.770	1,610.242
	11/17/14	194,000.0	NA	34,200.0	69,300.0	3,420.0	26,300.0	ND	ND	ND	ND	ND	12.160	1,607.852
	07/02/15	277,000.0	NA	49,100.0	82,300.0	6,800.0	99,600.0	ND	ND	ND	ND	ND	11.050	1,608.962
	10/21/15	145,000.0	NA	35,400.0	54,700.0	3,420.0	23,700.0	ND	ND	ND	ND	ND	12.020	1,607.992
	06/27/16	169,000.0	NA	29,100.0	47,400.0	3,050.0	23,500.0	ND	ND	ND	ND	ND	New TOC	
	01/23/17	69,900.0	NA	12,400.0	22,300.0	2,040.0	14,740.0	ND	ND	ND	ND	ND	New TOC	
	06/13/17	84,900.0	NA	17,200.0	21,600.0	9,650.0	15,550.0	ND	ND	ND	ND	ND	New TOC	
	10/25/17	182,000.0	NA	31,900.0	38,800.0	5,030.0	24,500.0	ND	ND	ND	ND	ND	New TOC	
	05/09/18	161,000.0	NA	32,400.0	47,100.0	3,730.0	33,100.0	ND	ND	ND	ND	ND	New TOC	
	11/30/18	89,100.0	NA	49,600.0	45,400.0	ND<0.5	46,300.0	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	New TOC	
	06/05/19	148,000.0	NA	22,300.0	28,700.0	2,590.0	19,840.0	ND<5	ND<5	ND<5	ND<5	ND<50	New TOC	
	11/06/19	177,000.0	NA	1,100.0	20,200.0	2,130.0	18,500.0	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	10.610	1,630.180
	06/22/20	49,700.0	NA	70,500.0	52,800.0	9,470.0	40,000.0	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	6.370	1,634.420
	12/14/20	13,700.0	NA	4,190.0	2,660.0	650.0	2,205.0	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	10.140	1,630.650
	05/20/21	68,100.0	NA	15,900.0	18,500.0	1,840.0	13,230.0	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	8.130	1,632.660
	11/04/21	73,700.0	NA	27,000.0	12,500.0	2,770.0	13,020.0	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	10.960	1,629.830
	06/30/22	77,800.0	NA	30,300.0	30,300.0	3,640.0	20,760.0	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	9.980	1,630.810
MW-10	02/22/12	2,650.0	NA	6.3	40.6	78.7	403.0	ND	ND	ND	ND	ND	8.860	1,610.898
	05/15/12	61,300.0	NA	17,400.0	22,300.0	863.0	6,950.0	ND	ND	ND	ND	ND	8.600	1,611.158
	08/24/12	10,400.0	NA	5,630.0	11,100.0	389.0	1,310.0	ND	NA	NA	NA	NA	11.740	1,608.018
	12/10/12	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	11.980	1,607.778
	02/28/13	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	9.030	1,610.728
	05/09/13	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	8.970	1,610.788
	09/24/13	ND	NA	5.4	ND	ND	1.1J	ND	ND	ND	ND	ND	11.590	1,608.168
	12/11/13	577.0	NA	1.2	4.5	5.2	206.0	ND	ND	ND	ND	ND	9.870	1,609.888
	03/07/14	ND	NA	3.5	5.1	ND	1.8J	ND	ND	ND	ND	ND	10.250	1,609.508
	05/09/14	10,700.0	NA	955.0	1,440.0	323.0	2,460.0	ND	ND	ND	ND	ND	10.720	1,609.038
	11/17/14	6,650.0	NA	38.3	16.7	818.0	ND	ND	ND	ND	ND	ND	13.420	1,606.338
	07/02/15	105.0	NA	1.0	0.7J	8.9	3.7	ND	ND	ND	ND	ND	12.350	1,607.408
	10/21/15	138.0	NA	1.5	ND	7.2	1.4J	ND	ND	ND	ND	ND		
	06/27/16	155.0	NA	3.9	2.3	11.8	46.3	ND	ND	ND	ND	ND	12.180	1,607.578
	01/23/17	ND	NA	ND	2.6	ND	2.2	ND	ND	ND	ND	ND	13.770	1,605.988
	06/13/17	ND	NA	13.0	31.5	113.0	156.3	ND	ND	ND	ND	ND	9.520	1,610.238
	10/25/17	ND	NA	6.8	ND	9.3	21.1	ND	ND	ND	ND	ND	1205.000	1,607.708
	05/09/18	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	10.870	1,608.888
	11/30/18	ND<100	NA	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	10.600	1,609.158
	06/05/19	ND<200	NA	0.6	ND<1.0	0.7	2.7	ND<5	ND<5	ND<5	ND<5	ND<50	8.010	1,611.748

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**** Not analyzed as car was parked over the monitoring well.

TABULATED GROUNDWATER SAMPLE ANALYTICAL RESULTS
MOBIL BALDWIN

SAMPLE SOURCE	DATE SAMPLED	TPH AS GASOLINE (µg/L)	TPH AS DIESEL (µg/L)	BENZENE (µg/L)	TOLUENE (µg/L)	ETHYL-BENZENE (µg/L)	XYLENES (µg/L)	MTBE (µg/L)	ETBE (µg/L)	DIPE (µg/L)	TAME (µg/L)	TBA (µg/L)	DEPTH TO G.W. (FT)	G.W. ELEVATION (FT - AMSL)
	11/06/19	280.0	NA	23.2	31.6	7.4	39.8	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	11.830	1,630.440
	06/22/20	220.0	NA	37.7	41.3	11.3	41.9	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	7.730	1,634.540
	12/14/20	270.0	NA	11.8	1.0	46.9	25.7	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	11.380	1,630.890
	05/20/21	ND<100	NA	ND<0.5	ND<0.5	2.2	3.8	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	9.420	1,632.850
	11/04/21	ND<100	NA	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	12.230	1,630.040
	06/30/22	ND<100	NA	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	11.300	1,630.970
MW-11	08/08/19	10,400.0	NA	3.0	3,230.0	556.0	2,149.0	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	9.060	1,632.110
	11/06/19	2,900.0	NA	5.3	241.0	97.5	391.0	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	10.980	1,630.190
	06/22/20	ND<100	NA	1.5	ND<0.5	ND<0.5	ND<0.5	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	6.760	1,634.410
	12/14/20	5,430.0	NA	ND<0.5	656.0	35.2	1,201.0	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	10.500	1,630.670
	05/20/21	1,190.0	NA	ND<0.5	48.3	31.0	60.6	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	8.500	1,632.670
	11/04/21	1,170.0	NA	ND<0.5	183.0	45.0	171.5	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	11.380	1,629.790
	06/30/22	ND<100	NA	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25	10.420	1,630.750

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* Not Analyzed for this Contaminant
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**** Not analyzed as car was parked over the monitoring well.

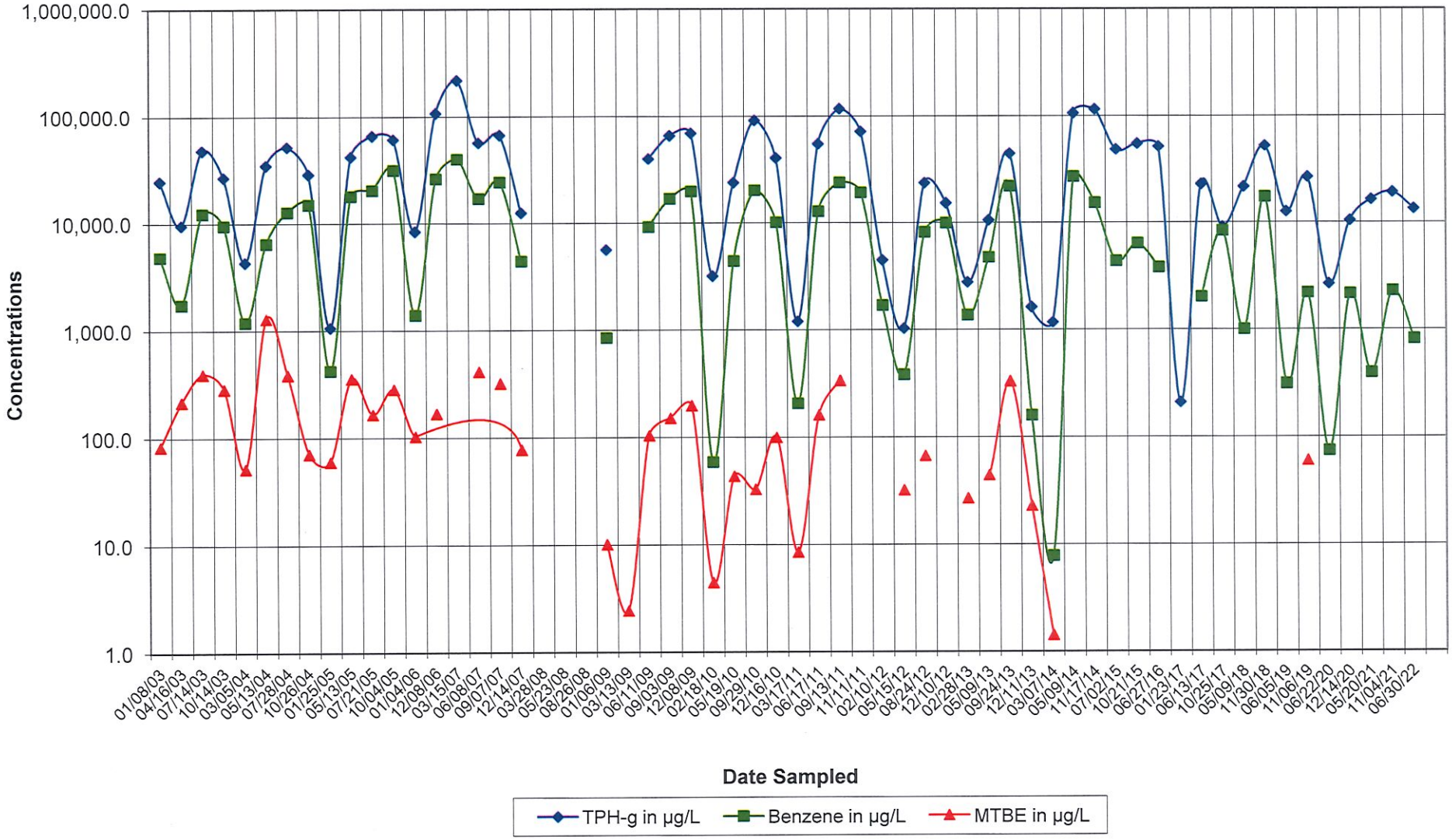
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310-822-3800

APPENDIX C

A.C.C.E.S. INC.
ENVIRONMENTAL ENGINEERING

MOBIL BALDWIN

Contaminant Concentrations v. Time for MW-1

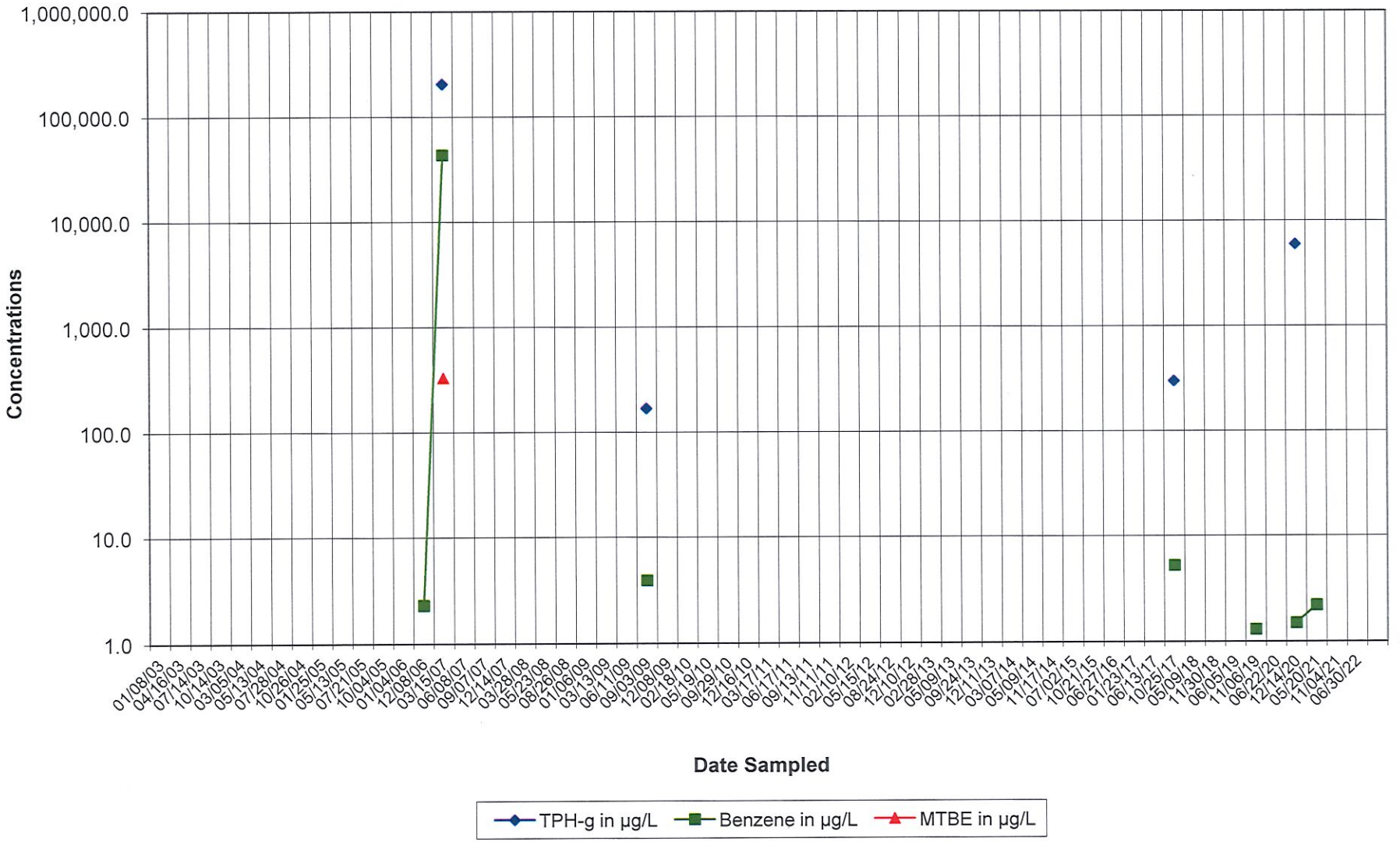


*** not analyzed as well was destroyed during 3/28/08 soil excavation.

A.C.C.E.S. INC.
ENVIRONMENTAL ENGINEERING

MOBIL BALDWIN

Contaminant Concentrations v. Time for MW-2

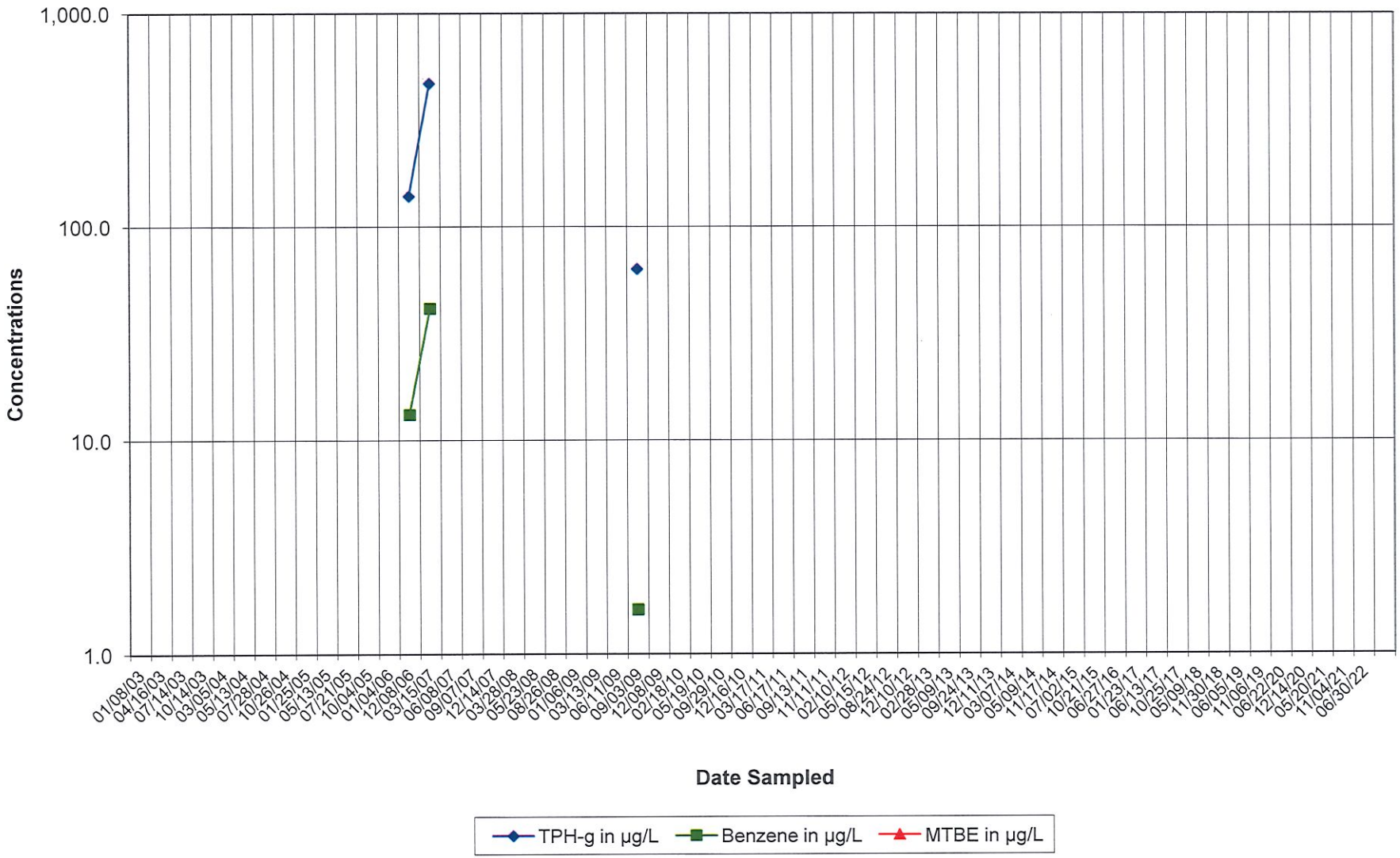


*** not analyzed as well was destroyed during 3/28/08 soil excavation.
**** Not analyzed as car was parked over the monitoring well.

A.C.C.E.S. INC.
ENVIRONMENTAL ENGINEERING

MOBIL BALDWIN

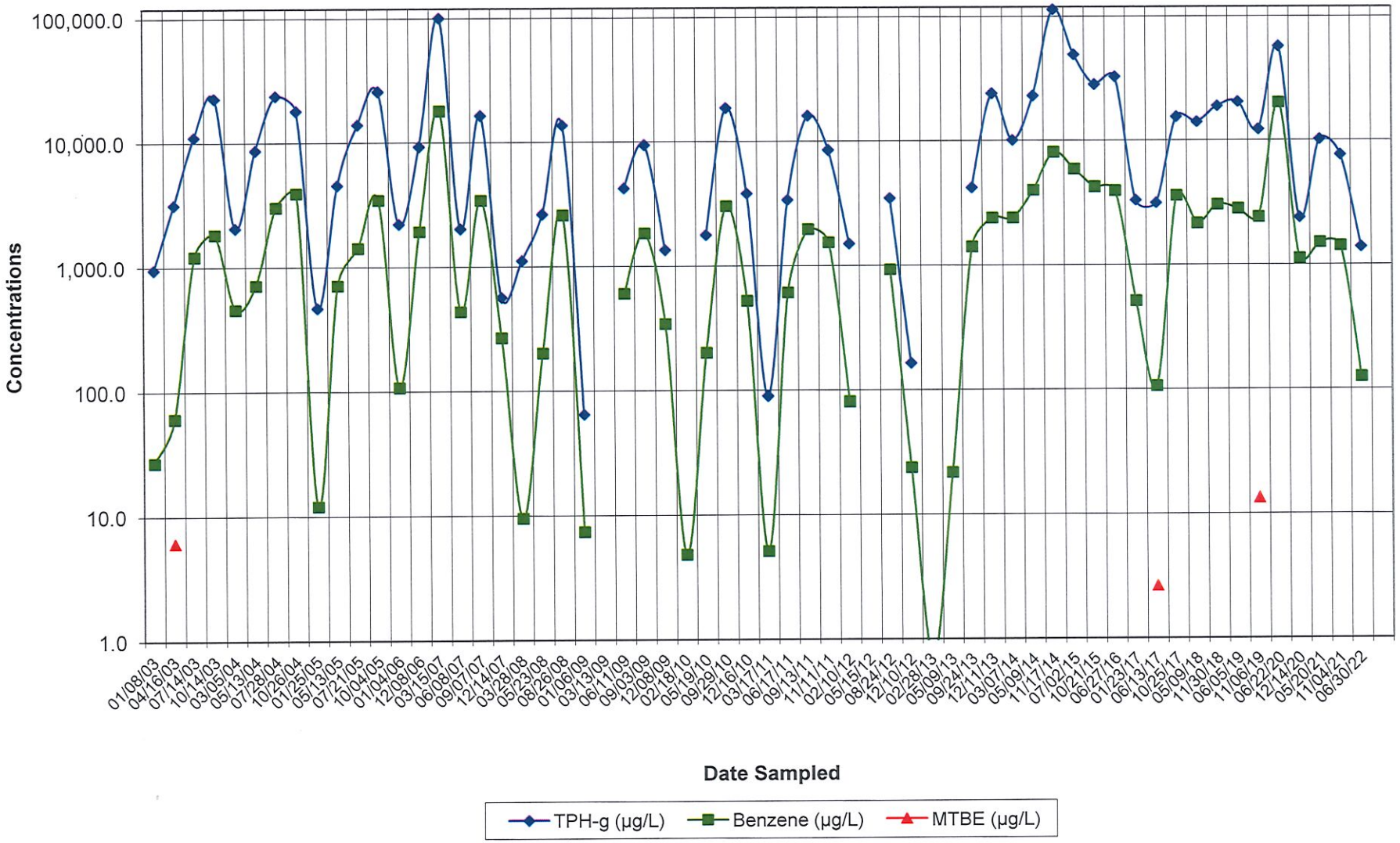
Contaminant Concentrations v. Time for MW-3



A.C.C.E.S. INC.
ENVIRONMENTAL ENGINEERING

MOBIL BALDWIN

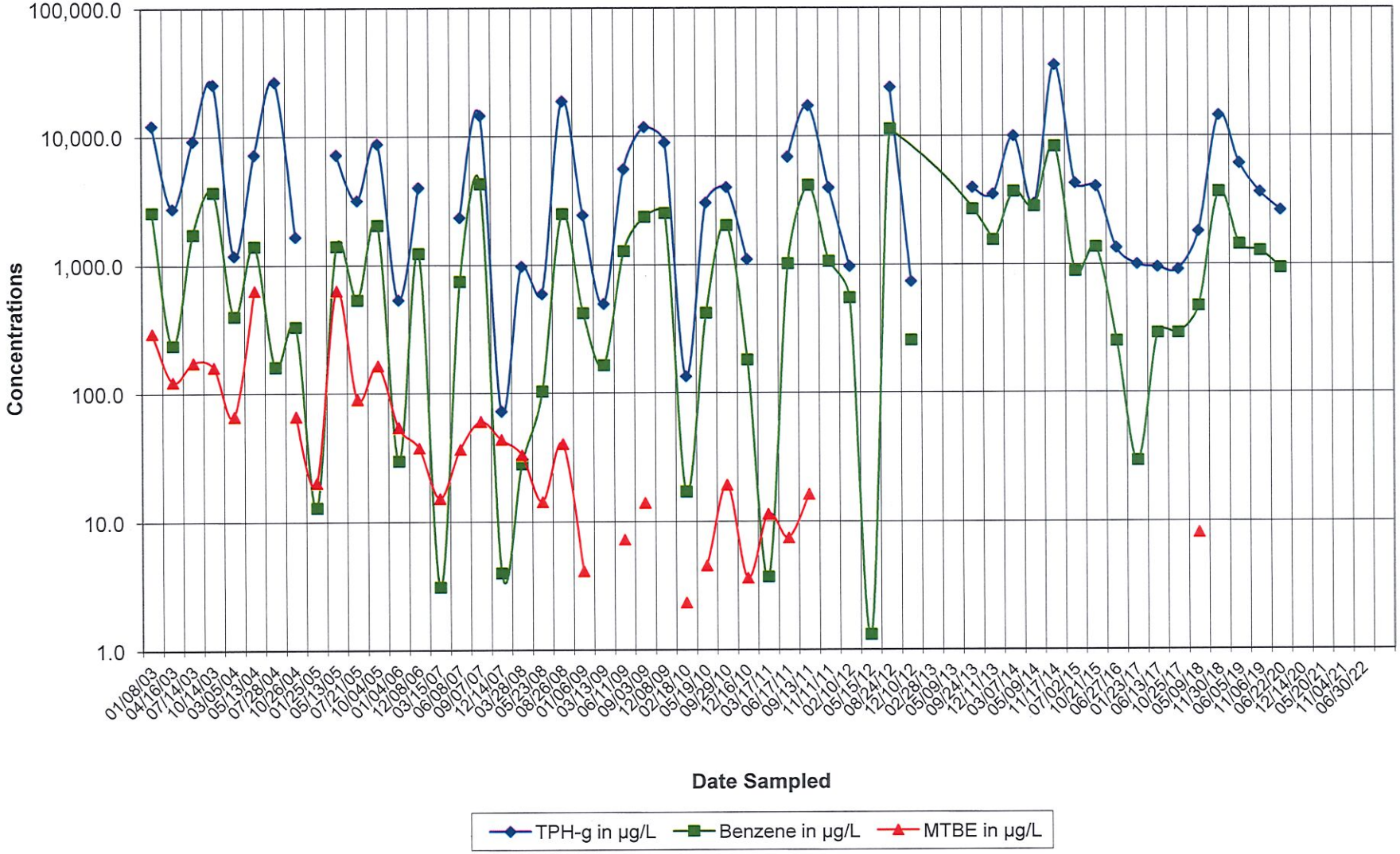
Contaminant Concentrations v. Time for MW-4



A.C.C.E.S. INC.
ENVIRONMENTAL ENGINEERING

MOBIL BALDWIN

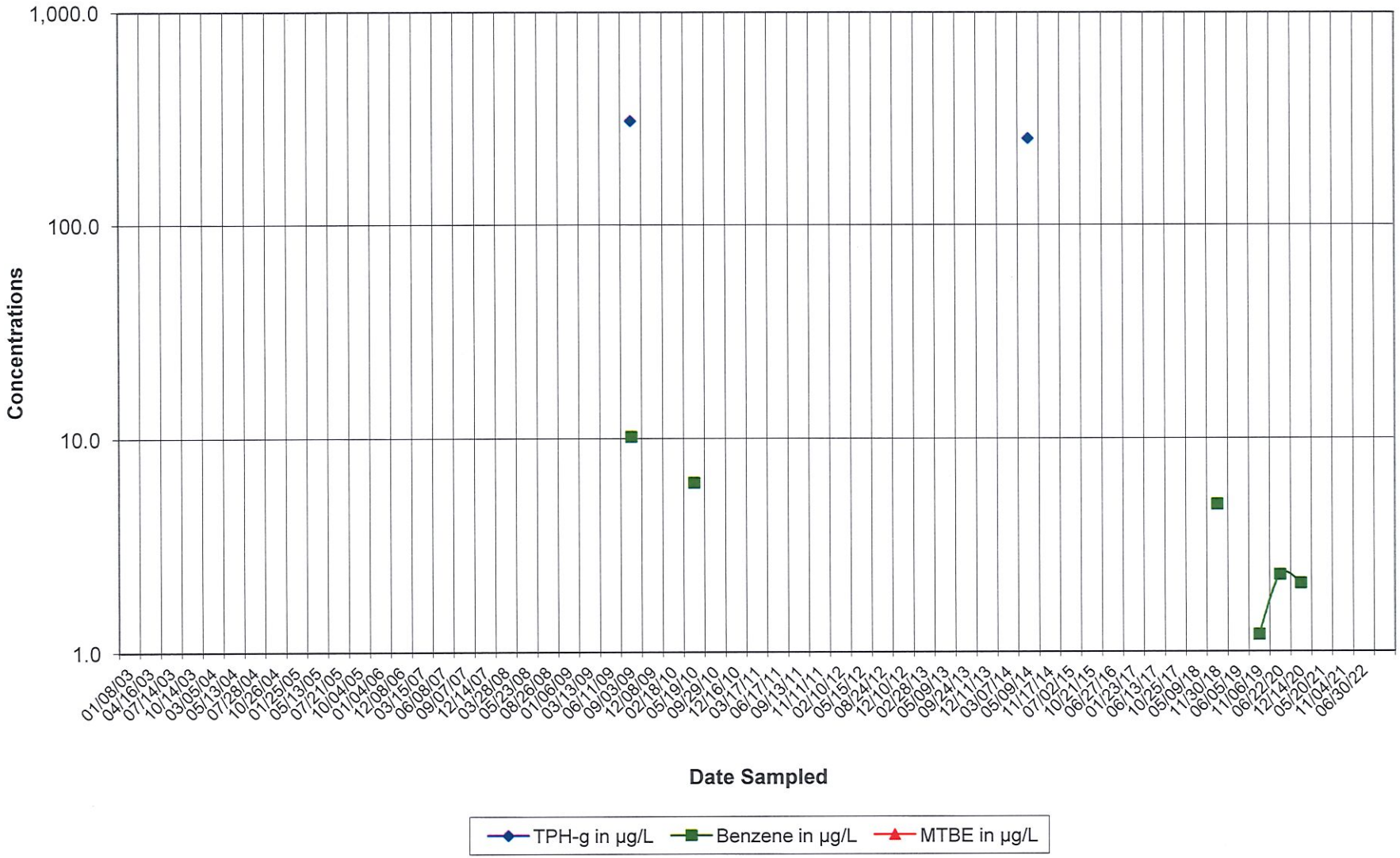
Contaminant Concentrations v. Time for MW-5



A.C.C.E.S. INC.
ENVIRONMENTAL ENGINEERING

MOBIL BALDWIN

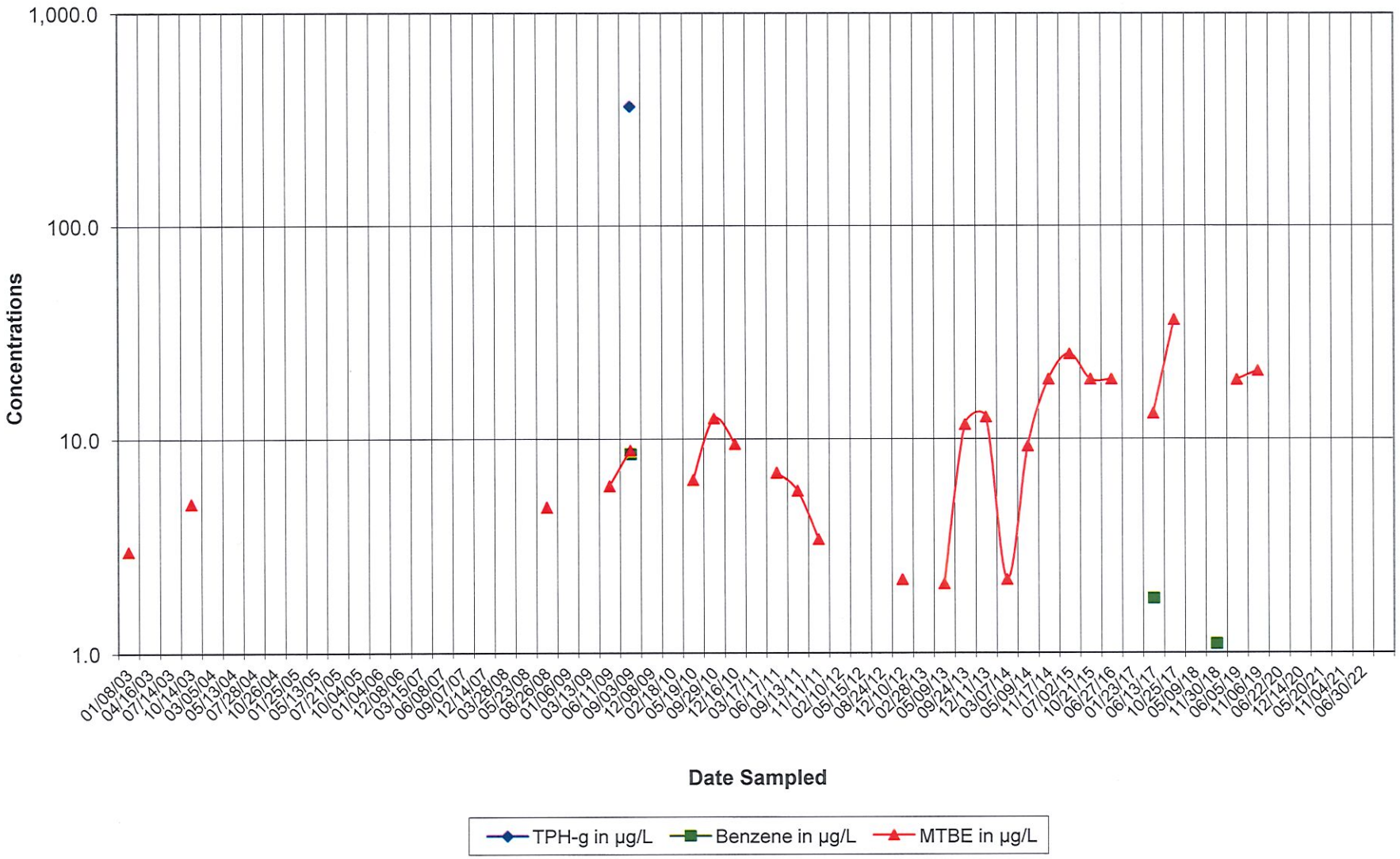
Contaminant Concentrations v. Time for MW-6



A.C.C.E.S. INC.
ENVIRONMENTAL ENGINEERING

MOBIL BALDWIN

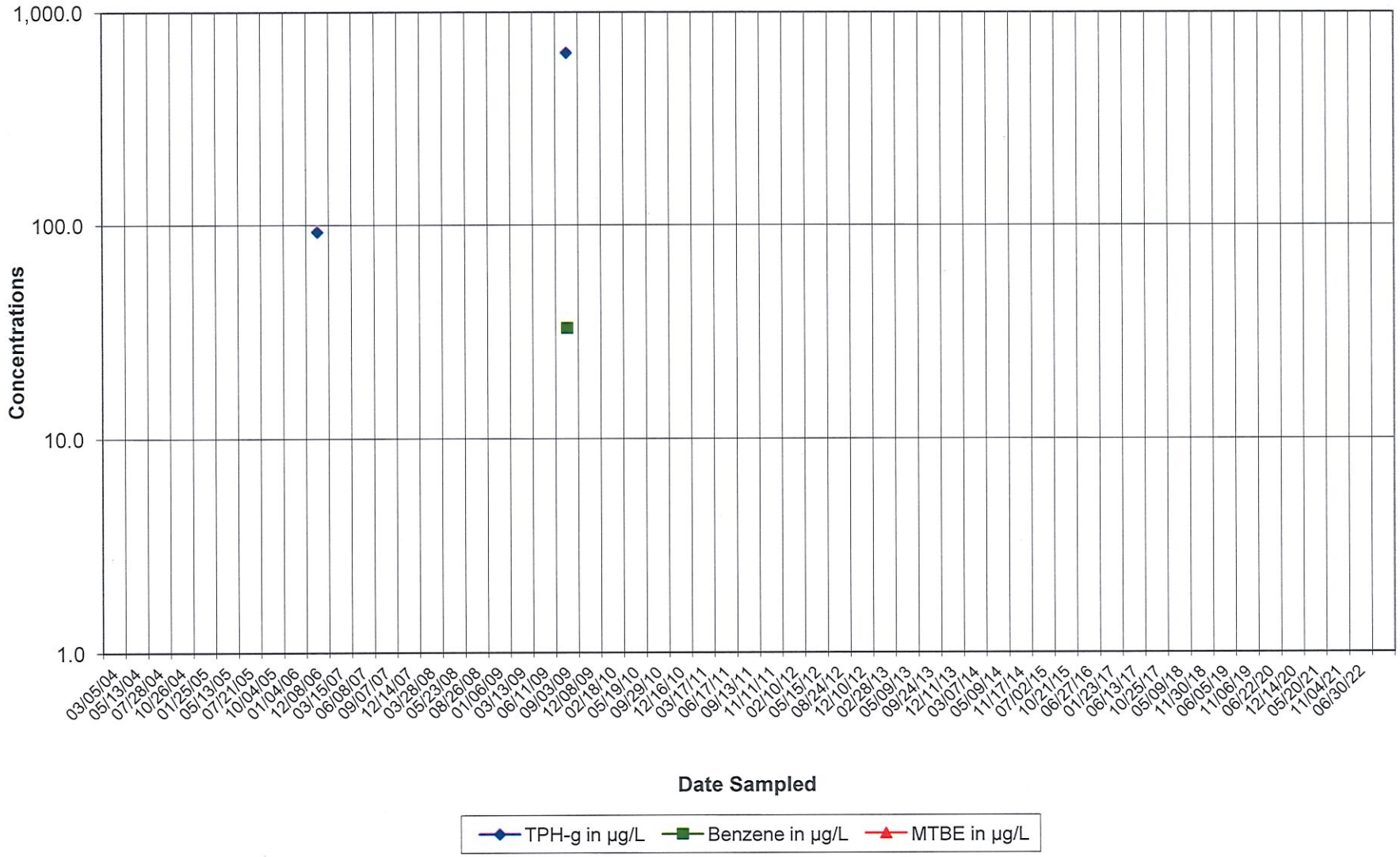
Contaminant Concentrations v. Time for MW-7



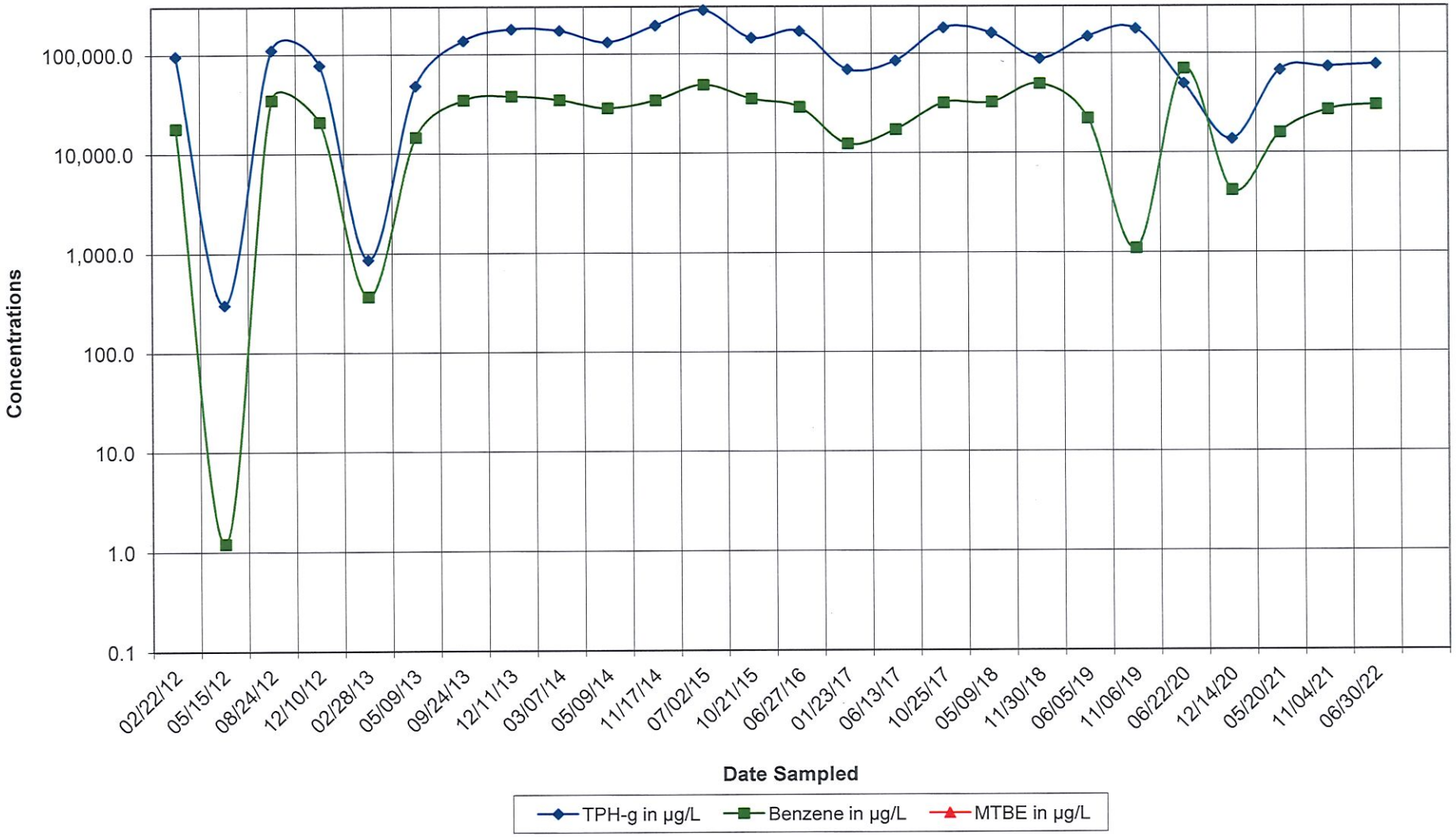
A.C.C.E.S. INC.
ENVIRONMENTAL ENGINEERING

MOBIL BALDWIN

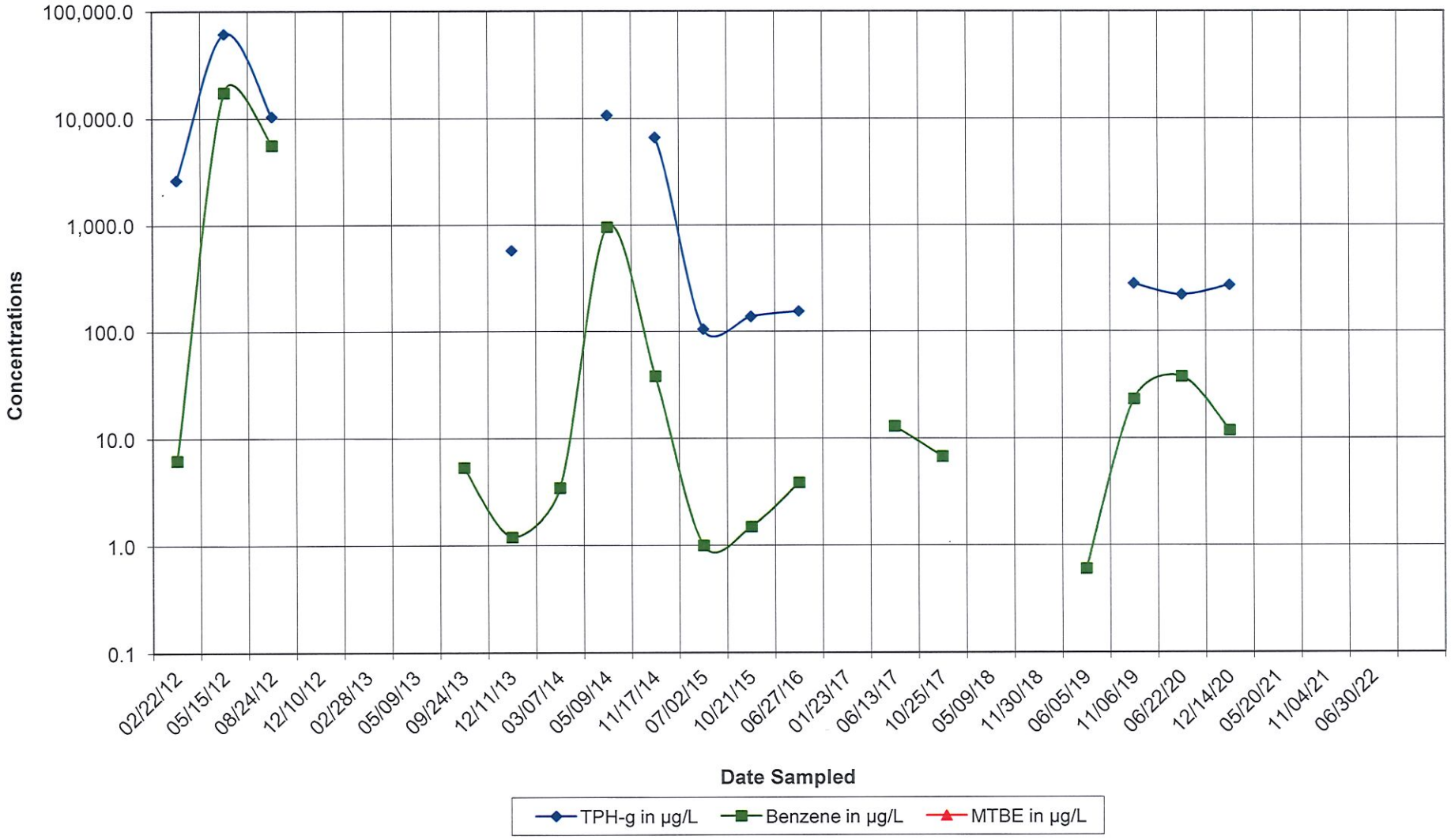
Contaminant Concentrations v. Time for MW-8



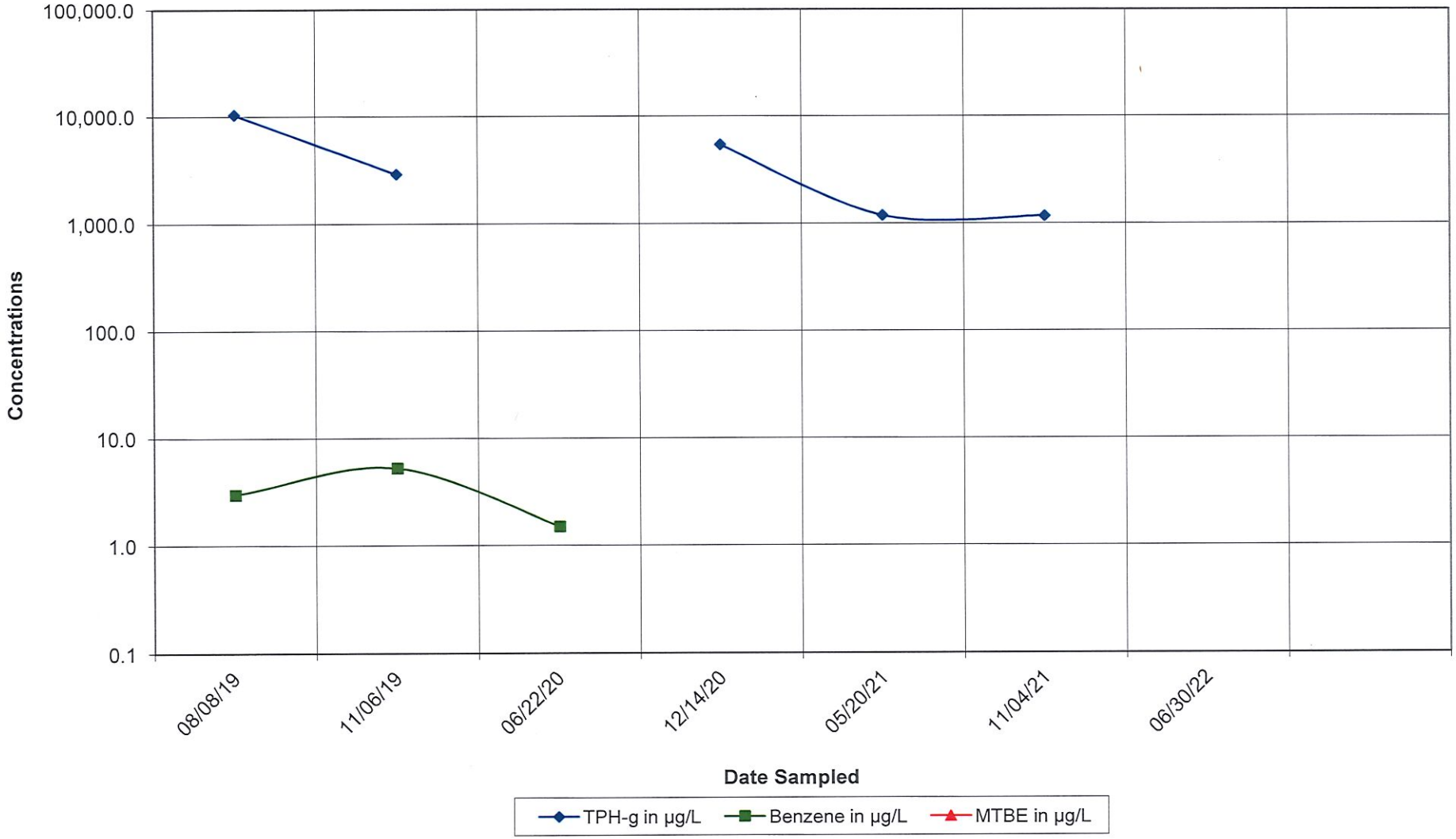
Contaminant Concentrations v. Time for MW-9



Contaminant Concentrations v. Time for MW-10



Contaminant Concentrations v. Time for MW-11



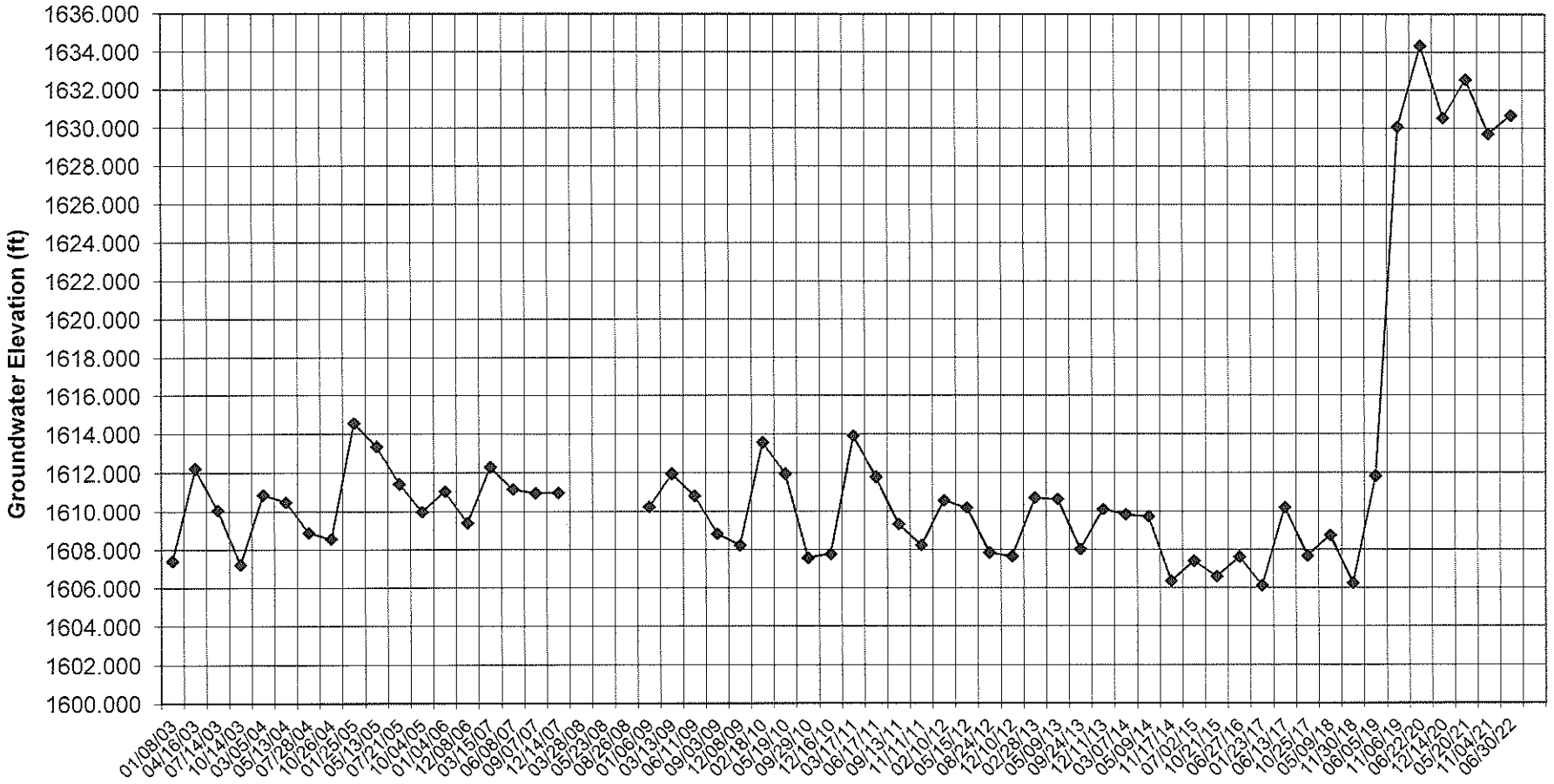
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APPENDIX D

A.C.C.E.S. INC.
ENVIRONMENTAL ENGINEERING

MOBIL BALDWIN

Groundwater Elevation vs. Time for MW-1

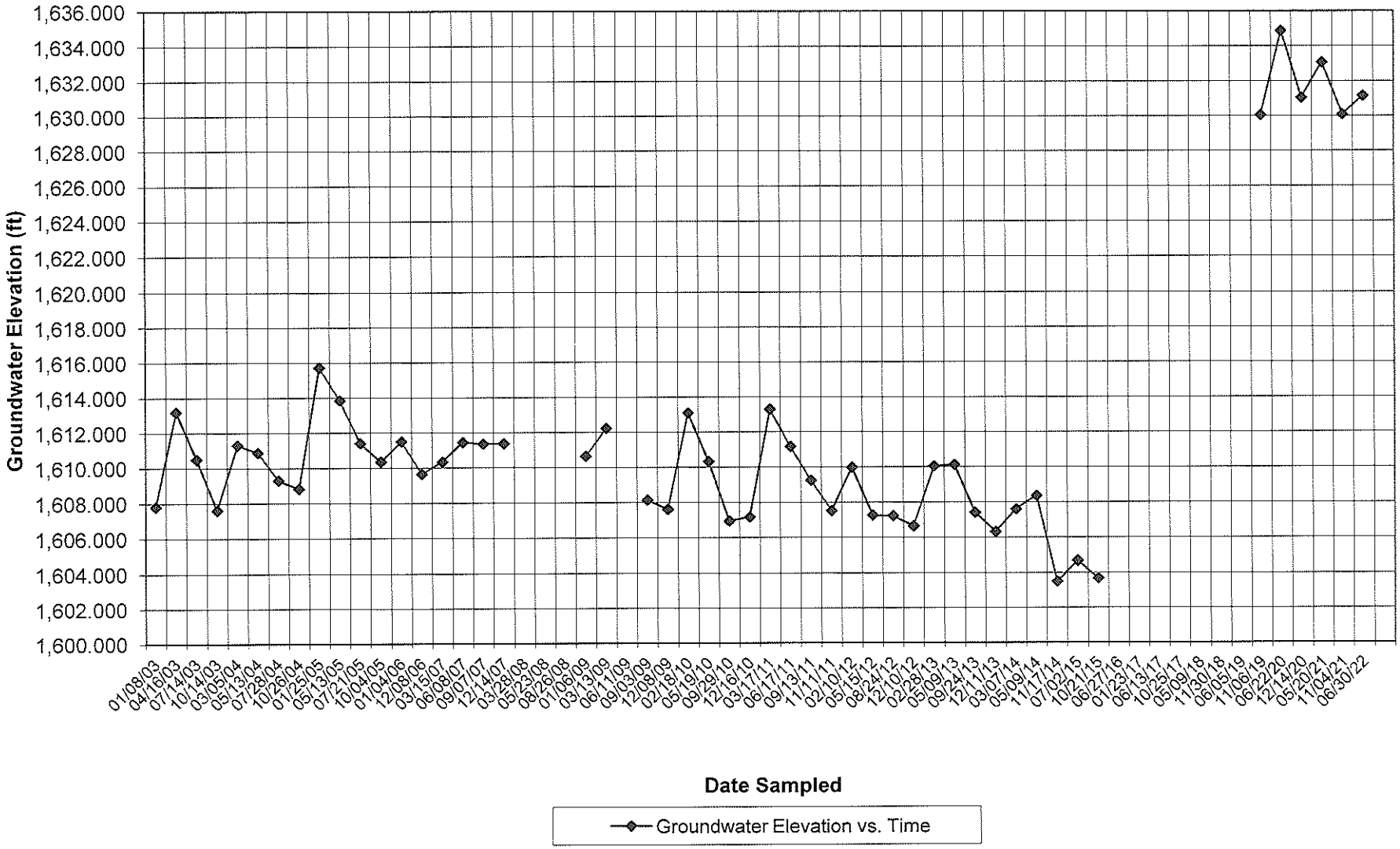


***Not measured as well was destructed during Spring 2008 Soil Excavation.

A.C.C.E.S. INC.
ENVIRONMENTAL ENGINEERING

MOBIL BALDWIN

Groundwater Elevation vs. Time for MW-2

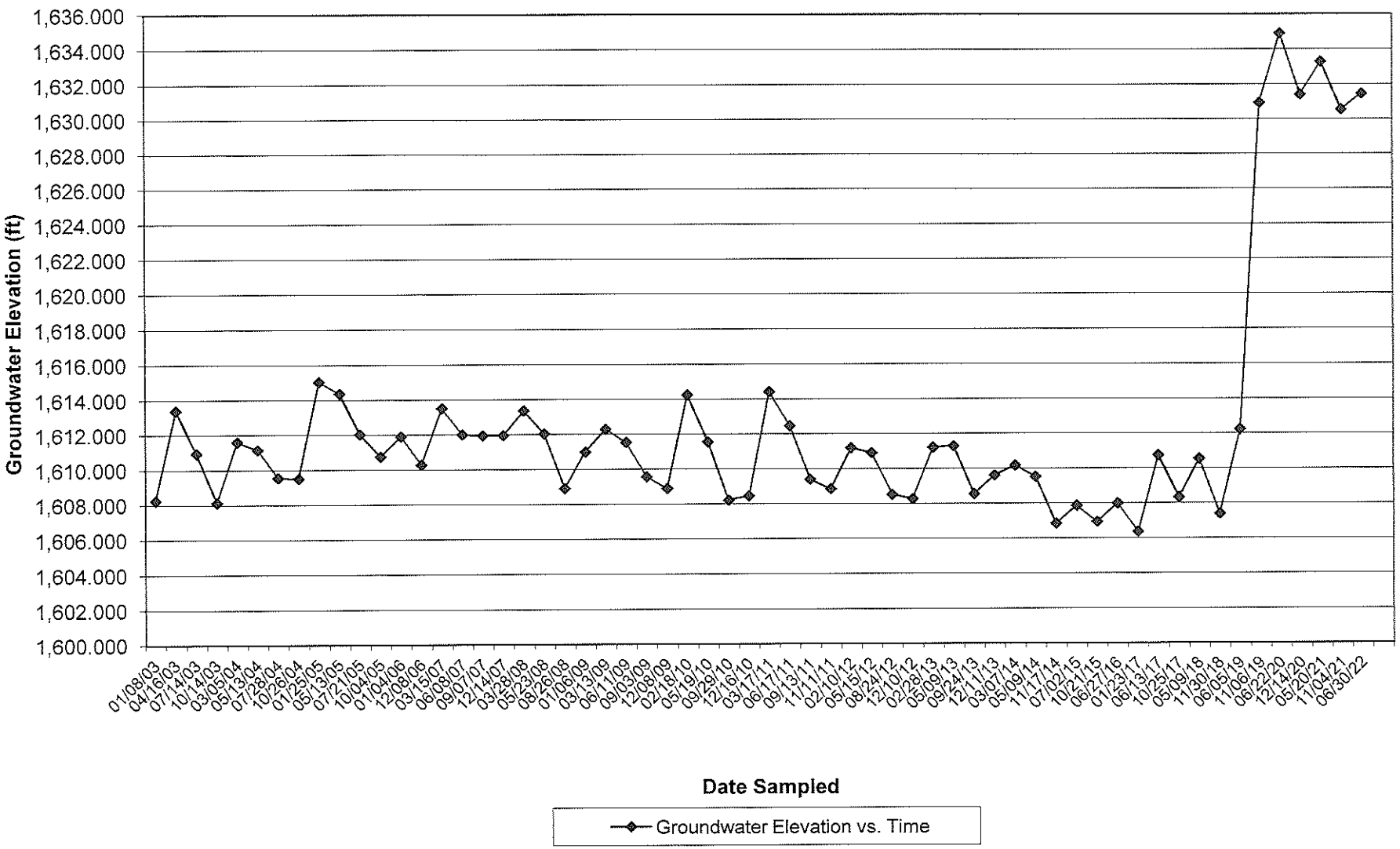


*** Not measured as well was destructed during Spring 2008 Soil Excavation.
**** Not measured as car was parked over monitoring well.

A.C.C.E.S. INC.
ENVIRONMENTAL ENGINEERING

MOBIL BALDWIN

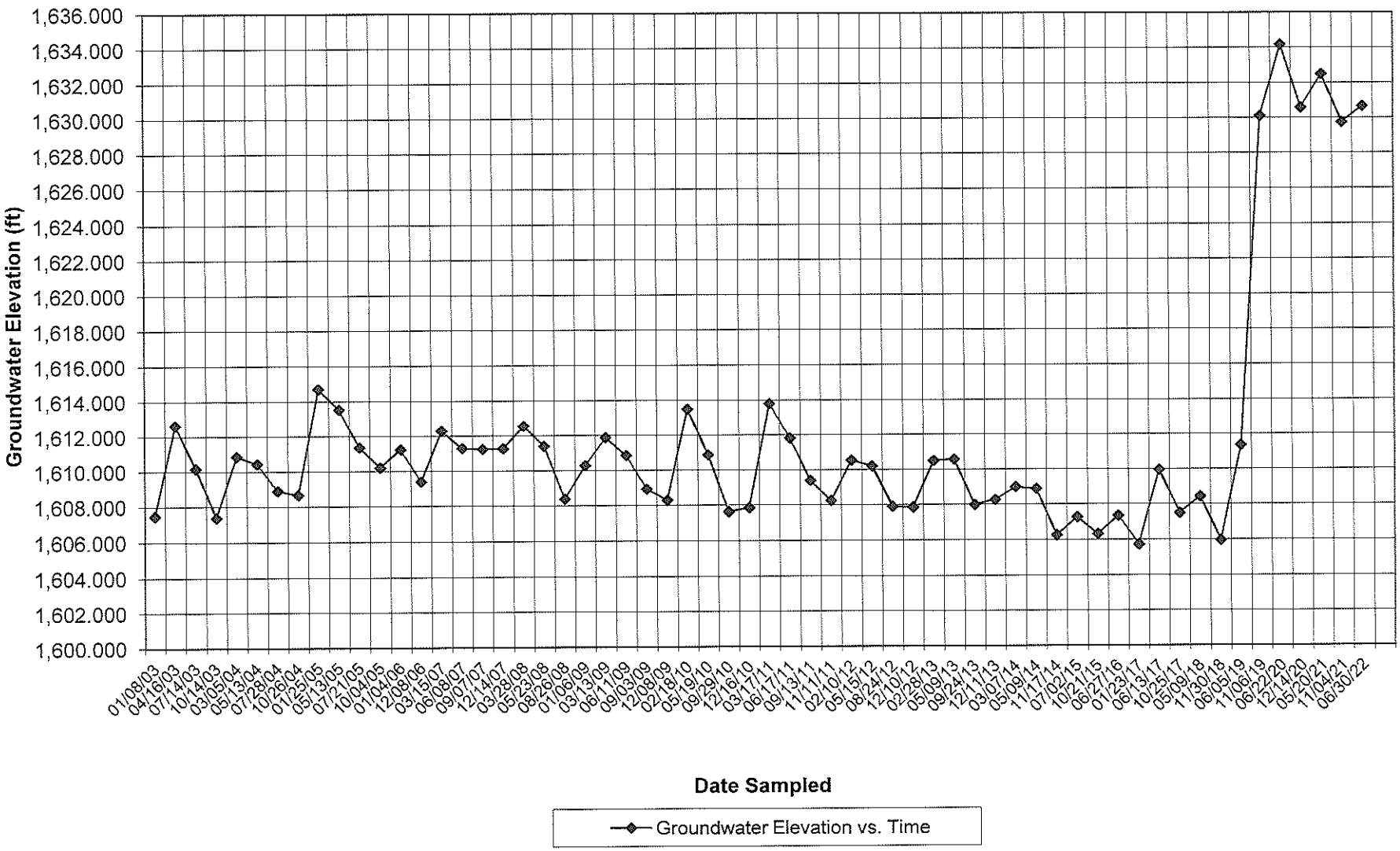
Groundwater Elevation vs. Time for MW-3



A.C.C.E.S. INC.
ENVIRONMENTAL ENGINEERING

MOBIL BALDWIN

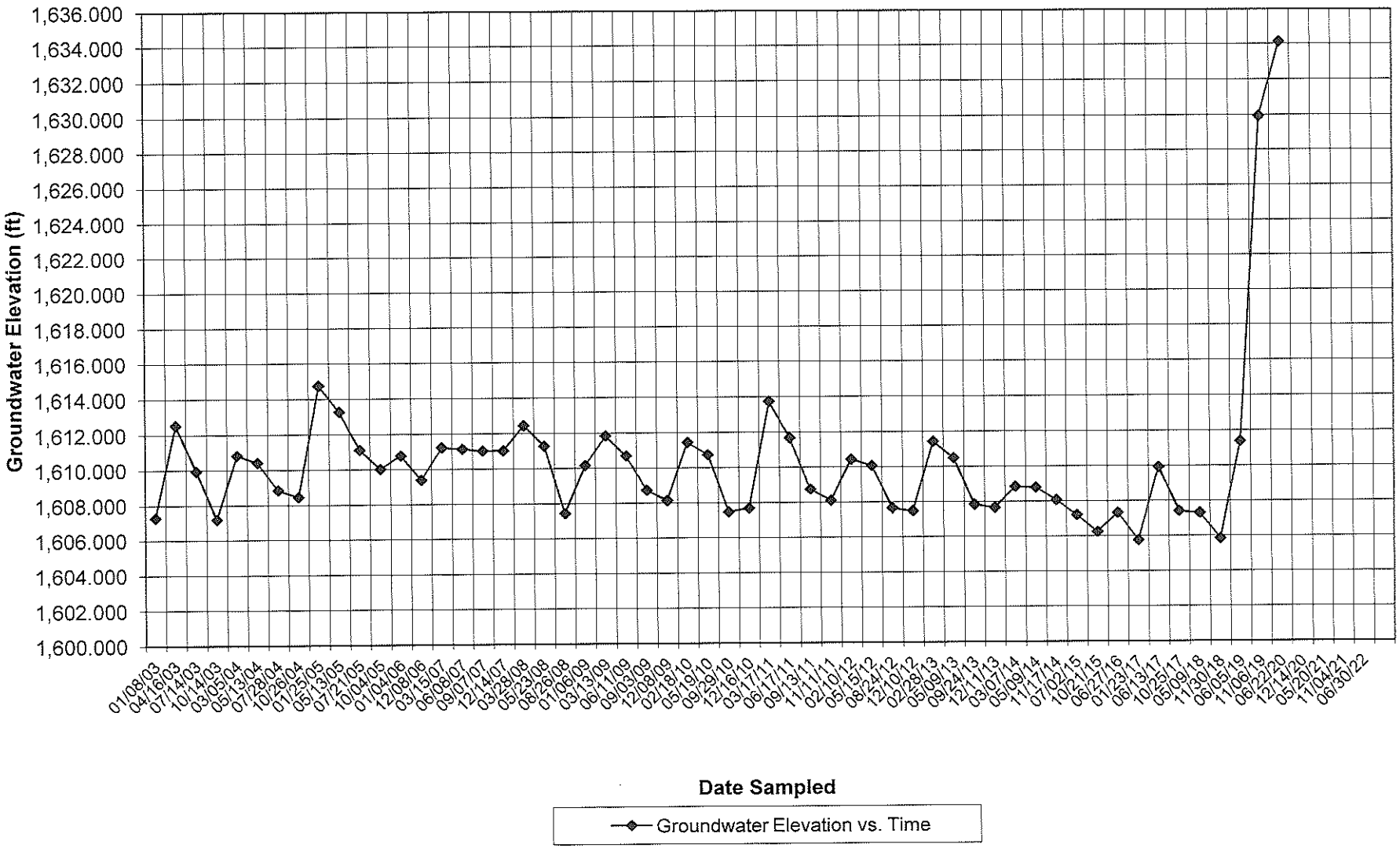
Groundwater Elevation vs. Time for MW-4



A.C.C.E.S. INC.
ENVIRONMENTAL ENGINEERING

MOBIL BALDWIN

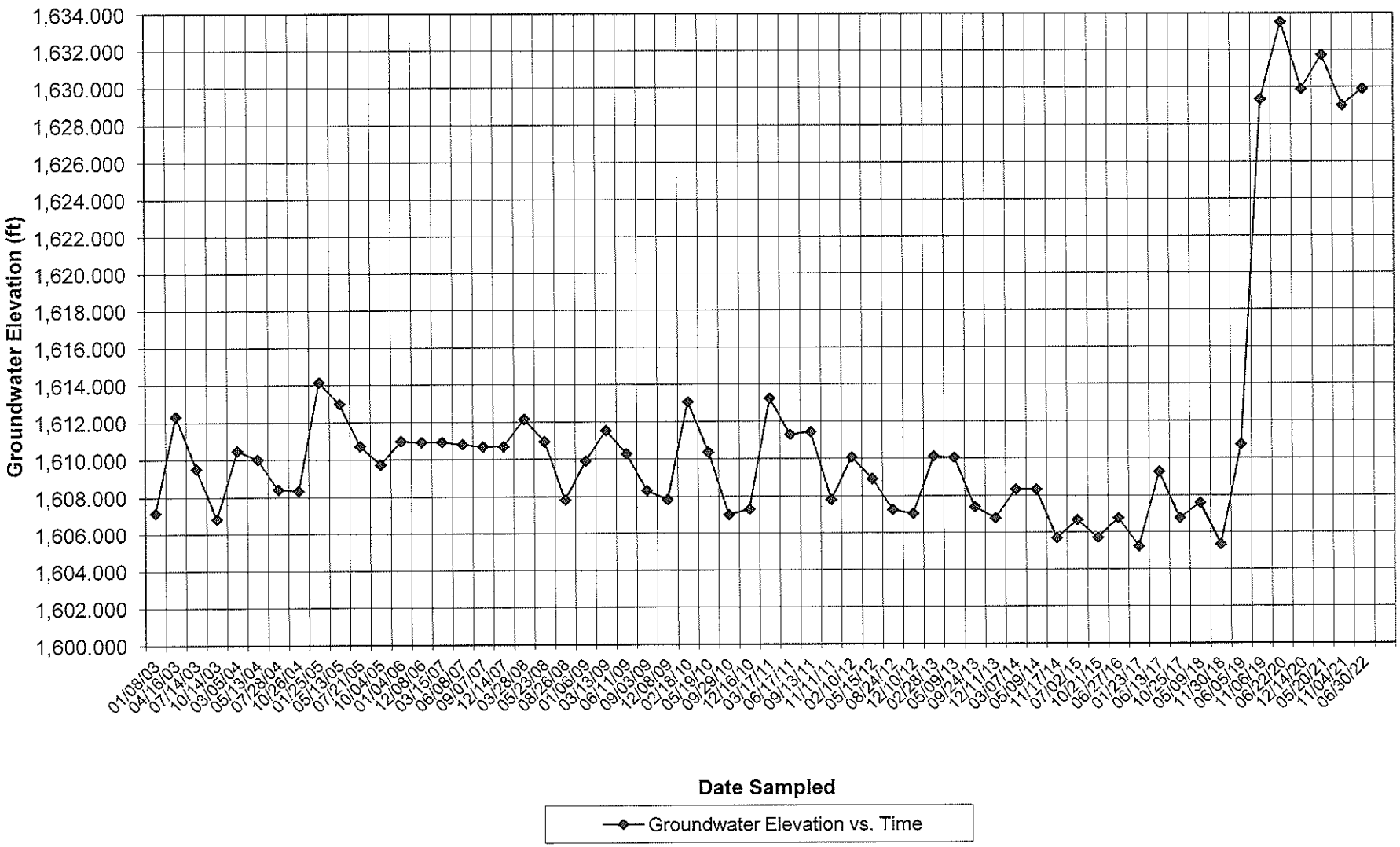
Groundwater Elevation vs. Time for MW-5



A.C.C.E.S. INC.
ENVIRONMENTAL ENGINEERING

MOBIL BALDWIN

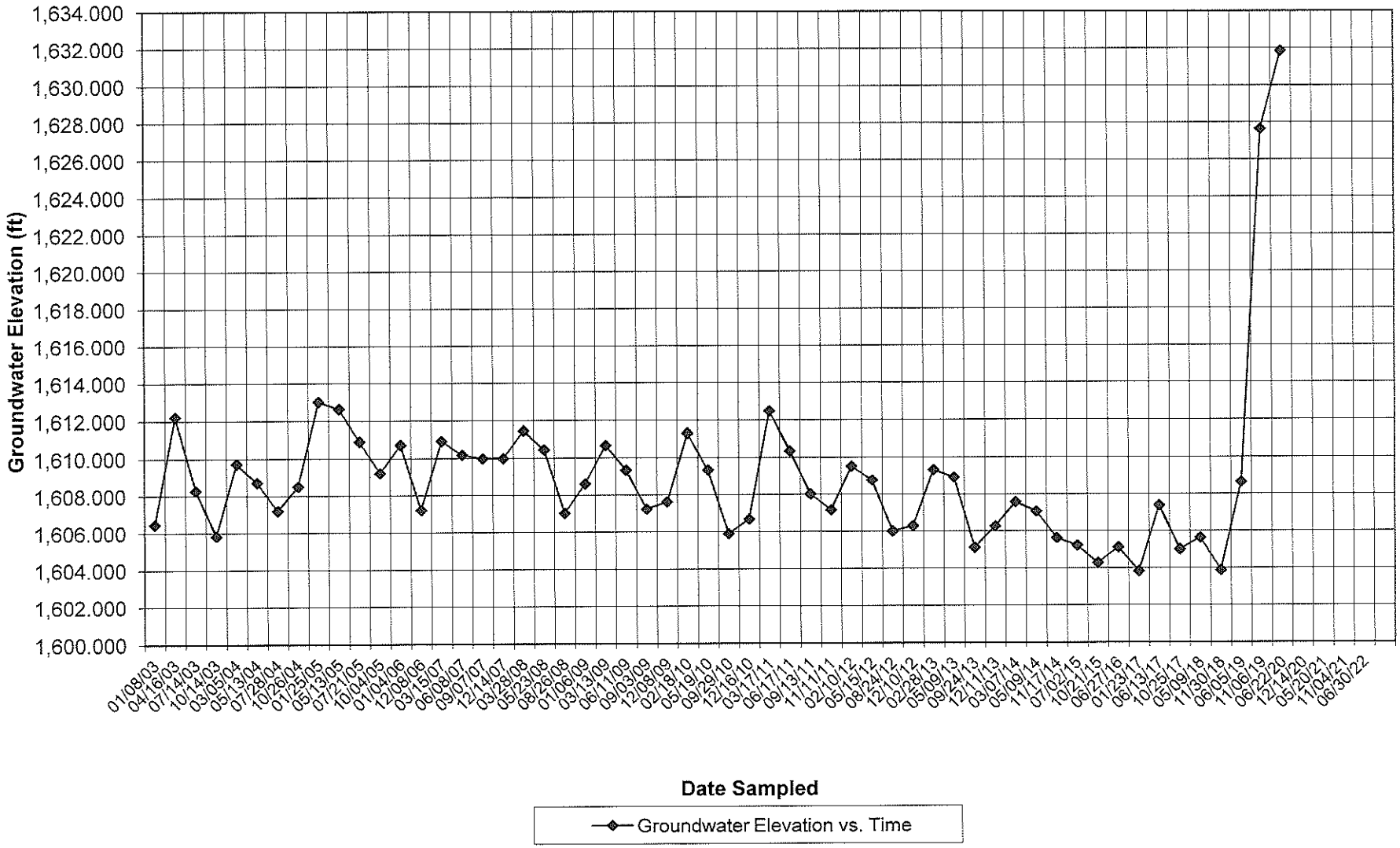
Groundwater Elevation vs. Time for MW-6



A.C.C.E.S. INC.
ENVIRONMENTAL ENGINEERING

MOBIL BALDWIN

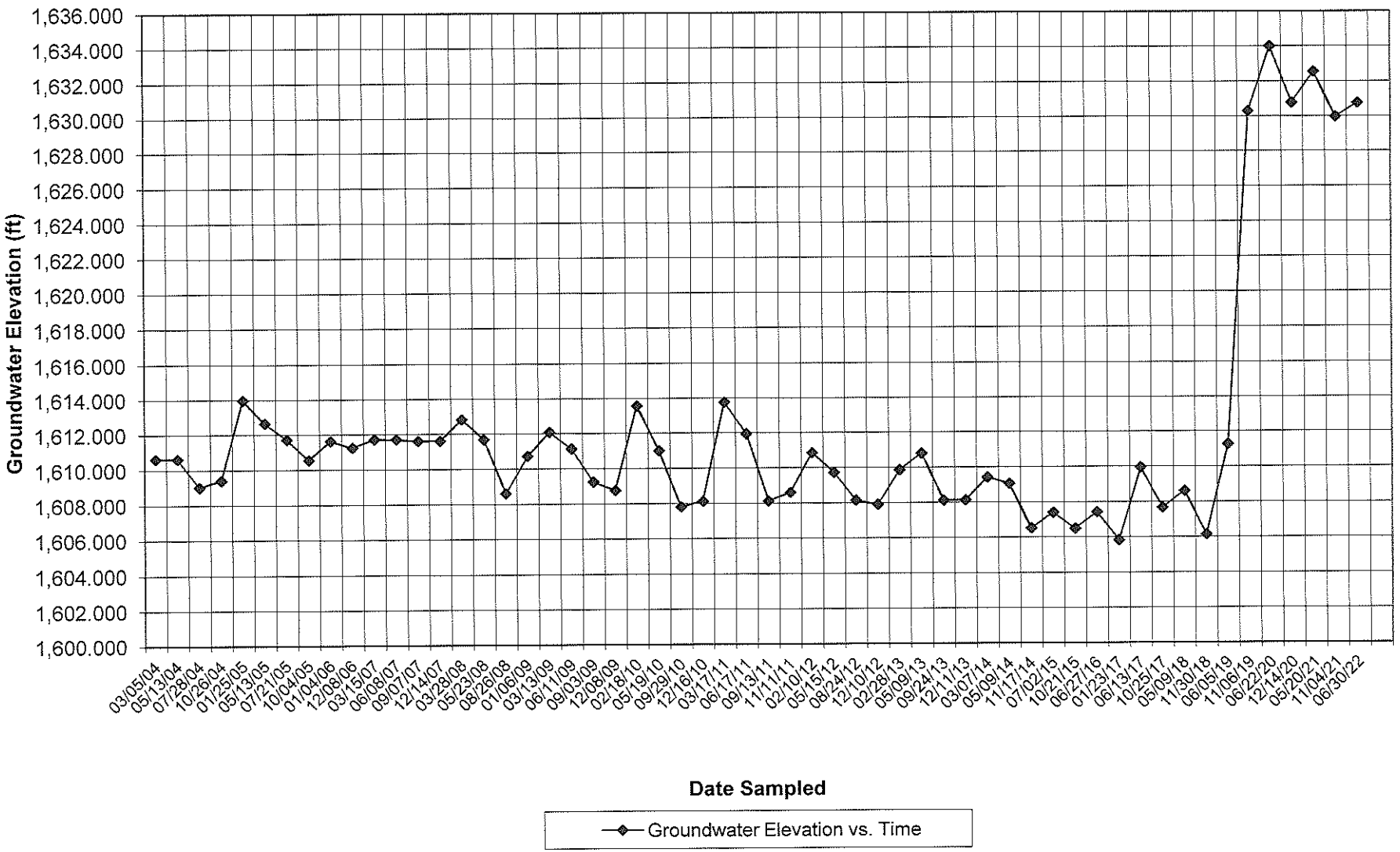
Groundwater Elevation vs. Time for MW-7



A.C.C.E.S. INC.
ENVIRONMENTAL ENGINEERING

MOBIL BALDWIN

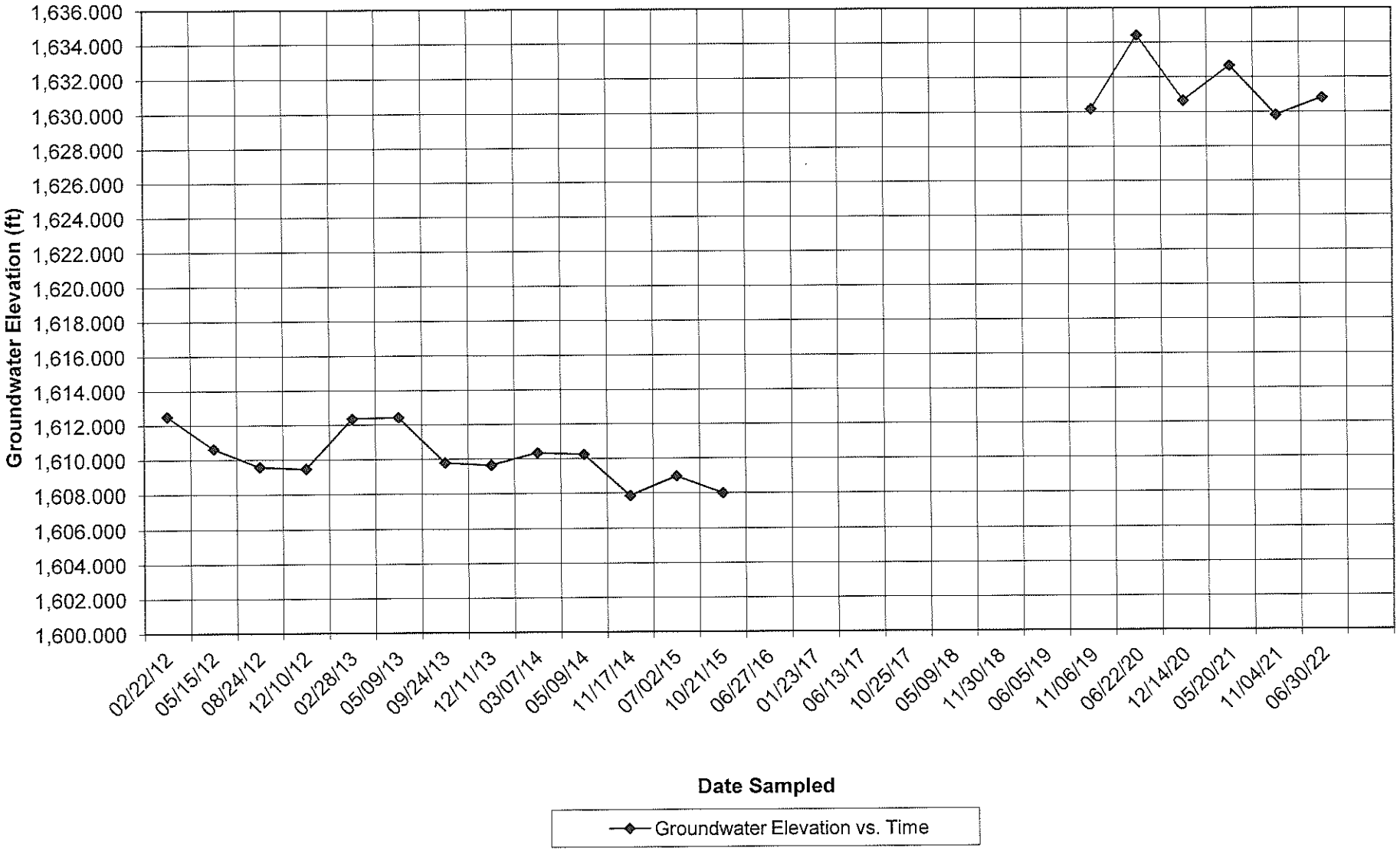
Groundwater Elevation vs. Time for MW-8



A.C.C.E.S. INC.
ENVIRONMENTAL ENGINEERING

MOBIL BALDWIN

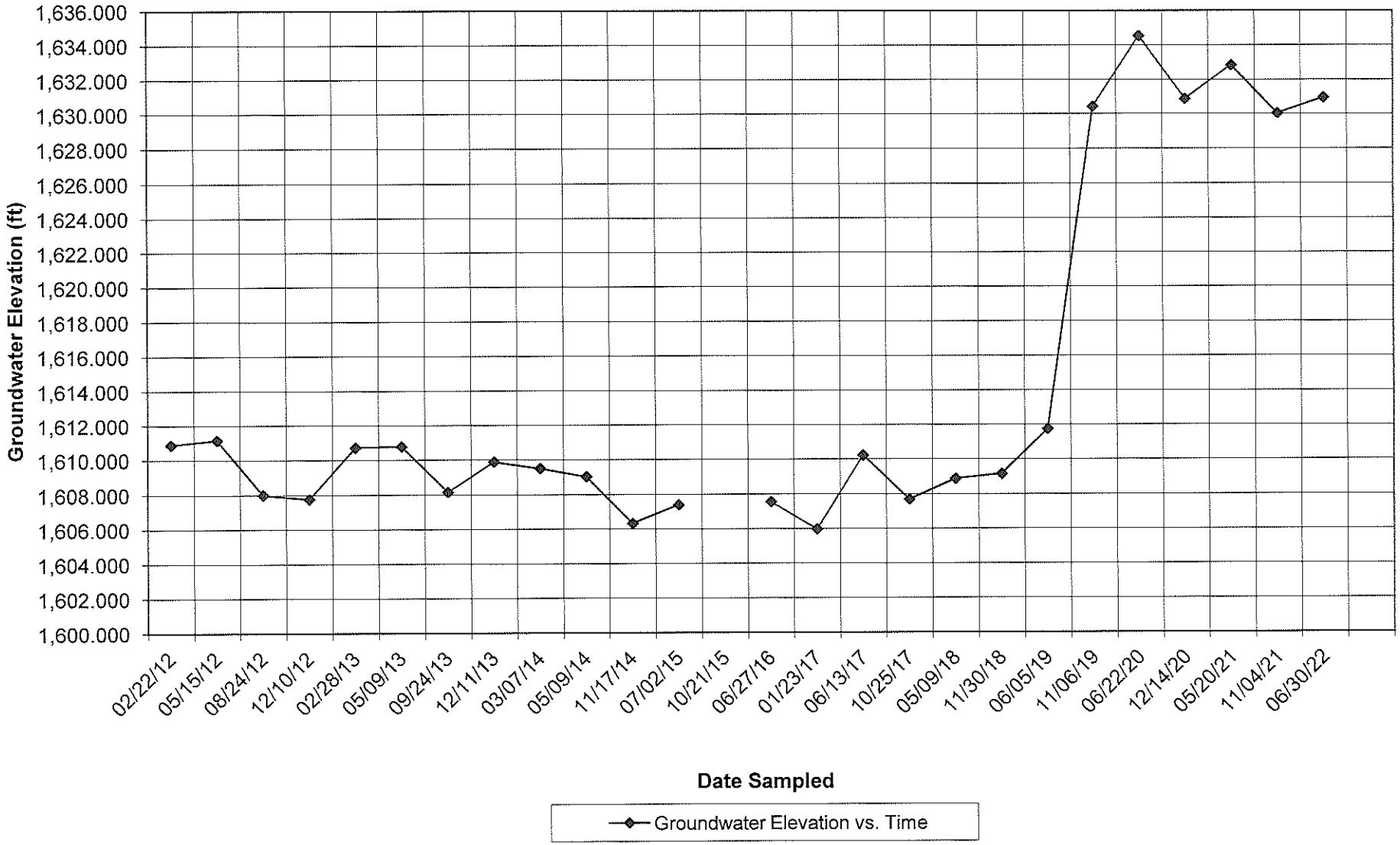
Groundwater Elevation vs. Time for MW-9



A.C.C.E.S. INC.
ENVIRONMENTAL ENGINEERING

MOBIL BALDWIN

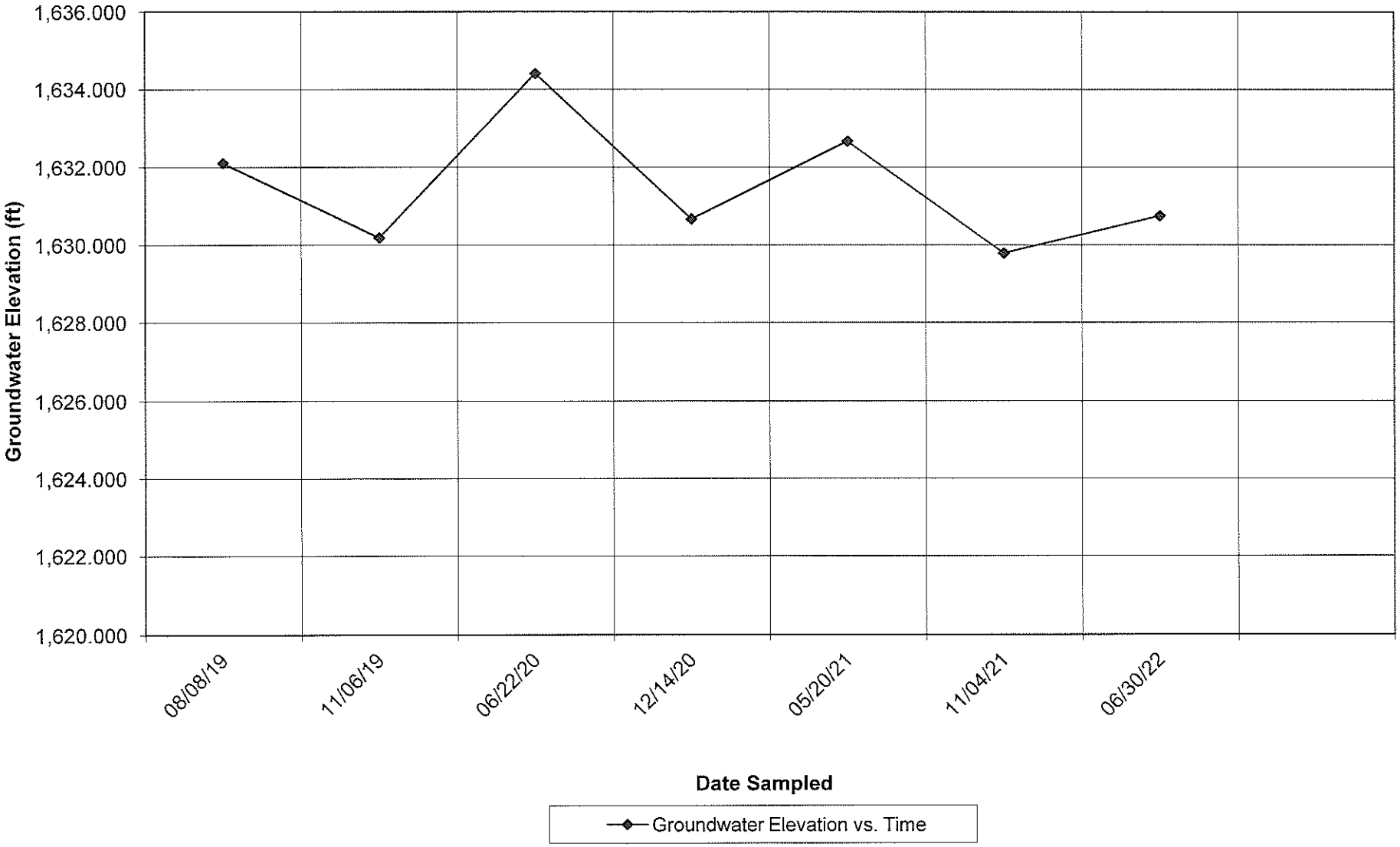
Groundwater Elevation vs. Time for MW-10



A.C.C.E.S. INC.
ENVIRONMENTAL ENGINEERING

MOBIL BALDWIN

Groundwater Elevation vs. Time for MW-11

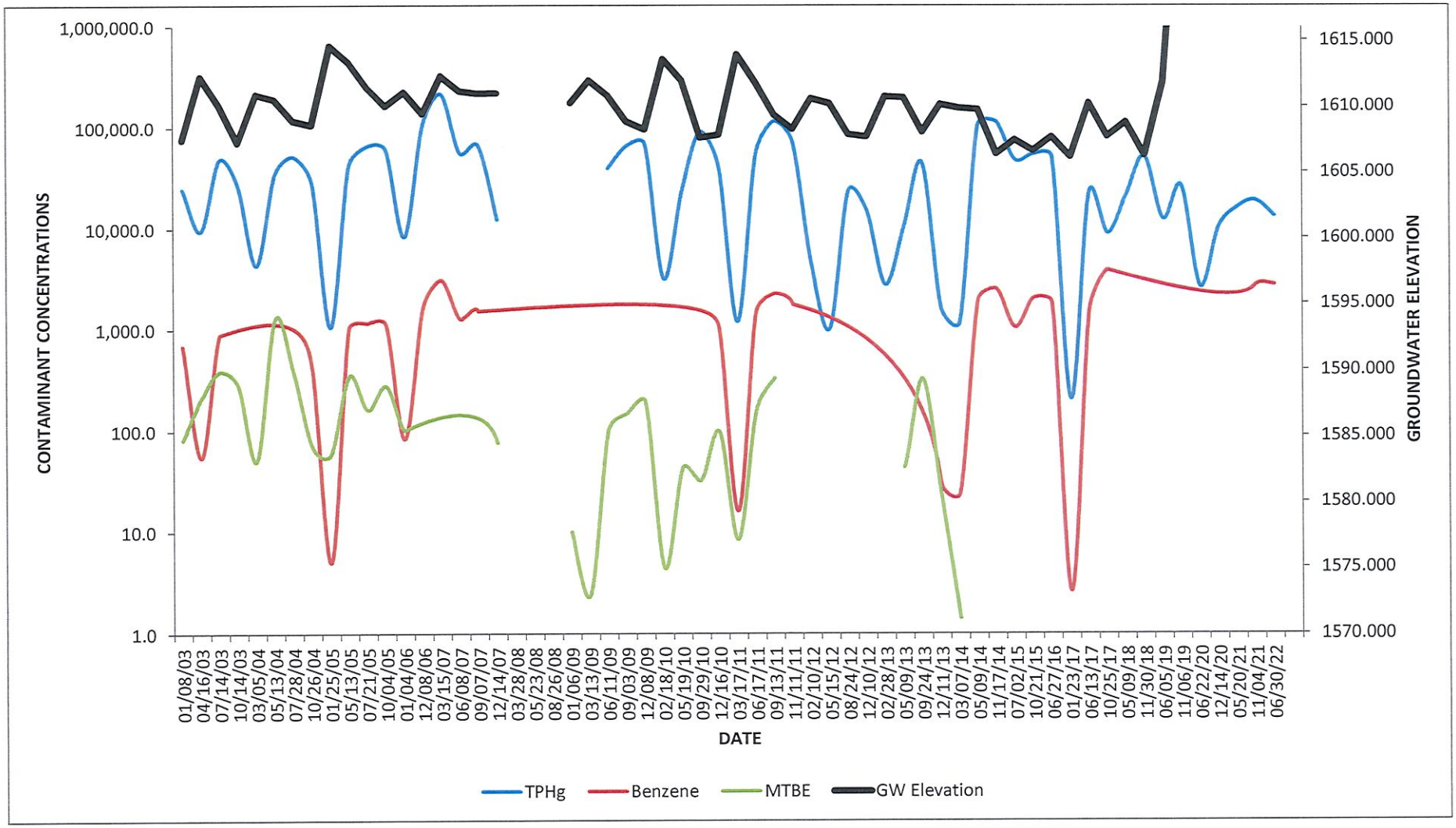


A.C.C.E.S. INC. – 2336 S. Sepulveda Blvd, Los Angeles, CA 90064
310-822-3800

APPENDIX E

A.C.C.E.S. INC.
ENVIRONMENTAL ENGINEERING

HYDROGRAPH OVER CONCENTRATIONS
MOBIL BALDWIN MW-1



APPENDIX F

A.C.C.E.S. INC. – 2336 S. Sepulveda Blvd, Los Angeles, CA 90064
310-822-3800

A.C.C.E.S. Inc. 2336 S Sepulveda Blvd, Los Angeles, CA 90064

WATER WELL PURGE AND SAMPLE DATA SHEET

JOB NAME MOBIL BALDWIN DATE 6/30/22

Well ID: MW-1

TOC Elevation (feet): 1640.63

Well Depth (feet): 30

Field Supervisor(s):

Technician(s): ERIC Jorge

BEFORE PURGE:

Depth to Groundwater (feet): 9.95

Elevation of Groundwater (ft. amsl): 1630.68

VOLUME OF WATER IN WELL (4" casing)	=	Depth of Water in Well (ft)	X	Conversion Factor	=	Volume (gal)
	=		X	0.653	=	

FREE PRODUCT:

☐ Floating Product: Thickness _____ Color _____
☐ Sheen

Time	Temperature °C	pH	Conductivity	Turbidity	Remark(s)
11:40	24.77	7.61	0.893	735	
11:45	24.57	7.38	0.753	556	
11:50	24.59	7.38	0.751	560	

Instrument Used: Horiba Water Checker U10

Notes:

A.C.C.E.S. Inc. 2336 S Sepulveda Blvd, Los Angeles, CA 90064

WATER WELL PURGE AND SAMPLE DATA SHEET

JOB NAME MOBIL BALDWIN DATE 6/30/22

Well ID: MW-2

TOC Elevation (feet): 1642.41

Well Depth (feet): 30

Field Supervisor(s):

Technician(s): ERIC JORGE

BEFORE PURGE:

Depth to Groundwater (feet): 11.24

Elevation of Groundwater (ft. amsl): 1631.17

VOLUME OF WATER IN WELL (4" casing)	=	Depth of Water in Well (ft)	X	Conversion Factor	=	Volume (gal)
	=		X	0.653	=	

FREE PRODUCT:

☐ Floating Product: Thickness Color
☐ Sheen

Time	Temperature ^{0}C	pH	Conductivity	Turbidity	Remark(s)
9:50	24.75	7.94	1.96	0.0	
9:55	24.47	7.75	1.94	0.0	
10:00	23.87	7.74	1.98	0.0	

Instrument Used: Horiba Water Checker U10

Notes:

A.C.C.E.S. Inc. 2336 S Sepulveda Blvd, Los Angeles, CA 90064

WATER WELL PURGE AND SAMPLE DATA SHEET

JOB NAME MOBIL BALDWIN DATE 6/30/22

Well ID: MW-3

TOC Elevation (feet): 1643.09

Well Depth (feet): 32 (28.22)

Field Supervisor(s):

Technician(s): Eric Jorge

BEFORE PURGE:

Depth to Groundwater (feet): 11.63

Elevation of Groundwater (ft. amsl): 1631.46

VOLUME OF WATER IN WELL (4" casing)	=	Depth of Water in Well (ft)	X	Conversion Factor	=	Volume (gal)
	=		X	0.653	=	

FREE PRODUCT:

☐ Floating Product: Thickness _____ Color _____
☐ Sheen

Time	Temperature °C	pH	Conductivity	Turbidity	Remark(s)
10:25	25.58	8.02	0.689	341	
10:30	24.49	7.94	0.682	460	
10:35	24.14	7.89	0.720	572	

Instrument Used: Horiba Water Checker U10

Notes:
Number in parenthesis in WELL DEPTH is bottom of well measured in 2007

A.C.C.E.S. Inc. 2336 S Sepulveda Blvd, Los Angeles, CA 90064

WATER WELL PURGE AND SAMPLE DATA SHEET

JOB NAME MOBIL BALDWIN DATE 6/30/22

Well ID: MW-4

TOC Elevation (feet): 1640.99

Well Depth (feet): 32 (30.05)

Field Supervisor(s):

Technician(s): ERK JORGE

BEFORE PURGE:

Depth to Groundwater (feet): 10.32

Elevation of Groundwater (ft. amsl): 1630.67

VOLUME OF WATER IN WELL (4" casing)	=	Depth of Water in Well (ft)	X	Conversion Factor	=	Volume (gal)
	=		X	0.653	=	

FREE PRODUCT:

☐ Floating Product: Thickness Color
☐ Sheen

Time	Temperature °C	pH	Conductivity	Turbidity	Remark(s)
11:00	25.90	7.51	2.45	300	
11:05	25.00	7.55	2.45	328	
11:10	24.26	7.56	2.48	310	

Instrument Used: Horiba Water Checker U10

Notes:
Number in parenthesis in WELL DEPTH is bottom of well measured in 2007

A.C.C.E.S. Inc. 2336 S Sepulveda Blvd, Los Angeles, CA 90064

WATER WELL PURGE AND SAMPLE DATA SHEET

JOB NAME MOBIL BALDWIN DATE 6/30/22

Well ID: MW-5

TOC Elevation (feet): 1639.63

Well Depth (feet): 32 (29.84)

Field Supervisor(s):

Technician(s): ERIC JORGE

BEFORE PURGE:

Depth to Groundwater (feet): —— Well buried under compacted dirt

Elevation of Groundwater (ft. amsl):

VOLUME OF WATER IN WELL (4" casing)	=	Depth of Water in Well (ft)	X	Conversion Factor	=	Volume (gal)
	=		X	0.653	=	

FREE PRODUCT:

☐ Floating Product: Thickness Color
☐ Sheen

Time	Temperature ^{0}C	pH	Conductivity	Turbidity	Remark(s)

Instrument Used: Horiba Water Checker U10

Notes:
Number in parenthesis in WELL DEPTH is bottom of well measured in 2007

A.C.C.E.S. Inc. 2336 S Sepulveda Blvd, Los Angeles, CA 90064

WATER WELL PURGE AND SAMPLE DATA SHEET

JOB NAME MOBIL BALDWIN DATE 6/30/22

Well ID: MW-6

TOC Elevation (feet): 1639.09

Well Depth (feet): 32 (29.00)

Field Supervisor(s):

Technician(s): ERIC JORGE

BEFORE PURGE:

Depth to Groundwater (feet): 9.17

Elevation of Groundwater (ft. amsl): 1629.92

VOLUME OF WATER IN WELL (4" casing)	=	Depth of Water in Well (ft)	X	Conversion Factor	=	Volume (gal)
	=		X	0.653	=	

FREE PRODUCT:

☐ Floating Product: Thickness _____ Color _____
☐ Sheen

Time	Temperature °C	pH	Conductivity	Turbidity	Remark(s)
9:15	25.53	7.24	1.55	270	
9:29	25.10	7.22	1.63	534	
9:25	24.81	7.27	1.66	502	

Instrument Used: Horiba Water Checker U10

Notes:
Number in parenthesis in WELL DEPTH is bottom of well measured in 2007

A.C.C.E.S. Inc. 2336 S Sepulveda Blvd, Los Angeles, CA 90064

WATER WELL PURGE AND SAMPLE DATA SHEET

JOB NAME MOBIL BALDWIN DATE 6/30/22

Well ID: MW-7

TOC Elevation (feet): 1637.31

Well Depth (feet): 35 (27.94)

Field Supervisor(s):

Technician(s): GRIC JORGE

BEFORE PURGE:

Depth to Groundwater (feet): — destroyed by road expension

Elevation of Groundwater (ft. amsl):

VOLUME OF WATER IN WELL (4" casing)	=	Depth of Water in Well (ft)	X	Conversion Factor	=	Volume (gal)
	=		X	0.653	=	

FREE PRODUCT:

☐ Floating Product: Thickness Color
☐ Sheen

Time	Temperature ^{0}C	pH	Conductivity	Turbidity	Remark(s)

Instrument Used: Horiba Water Checker U10

Notes:
Number in parenthesis in WELL DEPTH is bottom of well measured in 2007

A.C.C.E.S. Inc. 2336 S Sepulveda Blvd, Los Angeles, CA 90064

WATER WELL PURGE AND SAMPLE DATA SHEET

JOB NAME MOBIL BALDWIN DATE 6/30/22

Well ID: MW-8

TOC Elevation (feet): 1639.89

Well Depth (feet): 26 (24.92)

Field Supervisor(s):

Technician(s): GRC JORGE

BEFORE PURGE:

Depth to Groundwater (feet): 9.12

Elevation of Groundwater (ft. amsl): 1630.77

VOLUME OF WATER IN WELL (4" casing)	=	Depth of Water in Well (ft)	X	Conversion Factor	=	Volume (gal)
	=		X	0.653	=	

FREE PRODUCT:

☐ Floating Product: Thickness Color
☐ Sheen

Time	Temperature °C	pH	Conductivity	Turbidity	Remark(s)
8:45	25.22	6.76	2.58	255	
8:50	24.58	6.85	2.58	271	
8:55	24.25	6.91	2.59	269	

Instrument Used: Horiba Water Checker U10

Notes:
Number in parenthesis in WELL DEPTH is bottom of well measured in 2007

A.C.C.E.S. Inc. 2336 S Sepulveda Blvd, Los Angeles, CA 90064

WATER WELL PURGE AND SAMPLE DATA SHEET

JOB NAME MOBIL BALDWIN DATE 6/30/22

Well ID: MW-9

TOC Elevation (feet): 1640.79

Well Depth (feet): 25

Field Supervisor(s):

Technician(s): Eric Jorge

BEFORE PURGE:

Depth to Groundwater (feet): 9.98

Elevation of Groundwater (ft. amsl): 1630.81

VOLUME OF WATER IN WELL (4" casing)	=	Depth of Water in Well (ft)	X	Conversion Factor	=	Volume (gal)
	=		X	0.653	=	

FREE PRODUCT:

☐ Floating Product: Thickness Color

☐ Sheen

Time	Temperature ^{0}C	pH	Conductivity	Turbidity	Remark(s)
1:10	26.06	7.42	1.50	459	
1:15	25.18	7.28	1.49	1000	
1:20	25.23	7.27	1.47	1000	

Instrument Used: Horiba Water Checker U10

Notes:

A.C.C.E.S. Inc. 2336 S Sepulveda Blvd, Los Angeles, CA 90064

WATER WELL PURGE AND SAMPLE DATA SHEET

JOB NAME MOBIL BALDWIN DATE 6/30/22

Well ID: MW-10

TOC Elevation (feet): 1642.27

Well Depth (feet): 25

Field Supervisor(s):

Technician(s): Eric Jorge

BEFORE PURGE:

Depth to Groundwater (feet): 11.30

Elevation of Groundwater (ft. amsl): 1630.97

VOLUME OF WATER IN WELL (4" casing)	=	Depth of Water in Well (ft)	X	Conversion Factor	=	Volume (gal)
	=		X	0.653	=	

FREE PRODUCT:

☐ Floating Product: Thickness Color
☐ Sheen

Time	Temperature °C	pH	Conductivity	Turbidity	Remark(s)
	24.97	7.48	0.872	428	
	24.54	7.53	0.912	0.0	
	24.21	7.49	1.08	0.0	

Instrument Used: Horiba Water Checker U10

Notes:

A.C.C.E.S. Inc. 2336 S Sepulveda Blvd, Los Angeles, CA 90064

WATER WELL PURGE AND SAMPLE DATA SHEET

JOB NAME MOBIL BALDWIN DATE 6/30/22

Well ID: MW-11

TOC Elevation (feet): 1641.17

Well Depth (feet): 20

Field Supervisor(s):

Technician(s): ERIC JORGE

BEFORE PURGE:

Depth to Groundwater (feet): 10.42

Elevation of Groundwater (ft. amsl): 1630.75

VOLUME OF WATER IN WELL (4" casing)	=	Depth of Water in Well (ft)	X	Conversion Factor	=	Volume (gal)
	=		X	0.653	=	

FREE PRODUCT:

☐ Floating Product: Thickness Color
☐ Sheen

Time	Temperature °C	pH	Conductivity	Turbidity	Remark(s)
12:45	25.90	7.64	2.22	540	
12:50	25.64	7.73	2.22	0.0	
12:55	25.66	7.67	2.23	0.0	

Instrument Used: Horiba Water Checker U10

Notes:

A.C.C.E.S. INC. – 2336 S. Sepulveda Blvd, Los Angeles, CA 90064
310-822-3800

APPENDIX G

NO. 63069 -1

NON-HAZARDOUS WASTE DATA FORM

TO BE COMPLETED BY GENERATOR

	GENERATING SITE
NAME: Mobil Baldwin	Mobil Baldwin
ADDRESS: 21020 Cajalco Road	21020 Cajalco Road
CITY, STATE, ZIP: Perris, CA 92370	Perris, CA 92370

PHONE NO. ( ) SITE CONTACT PROFILE NO.

CONTAINERS: No. 12 GALLONS 110 WEIGHT

TYPE: [X] TANK TRUCK [ ] DUMP TRUCK [ ] DRUMS [ ] CARTONS [ ] OTHER

WASTE DESCRIPTION: Non-Hazardous Water GENERATING PROCESS

COMPONENTS OF WASTE	PPM	%	COMPONENTS OF WASTE	PPM	%
1. Water		99-100%	4.		
2. TPH		<1%	5. Nieto & Sons PO# April 2022		
3.			6.		

PROPERTIES pH 7 [ ] SOLID [X] LIQUID [ ] SLUDGE [ ] SLURRY [ ] OTHER

HANDLING INSTRUCTIONS: Wear Appropriate Protective Clothing

THE GENERATOR CERTIFIES THAT THE WASTE AS DESCRIBED IS 100% NON-HAZARDOUS.

Dave Nieto Dave Nieto Rep Generator 04/18/22
TYPED OR PRINTED FULL NAME & SIGNATURE DATE

TRANSPORTER

NAME: NIETO AND SONS TRUCKING, INC. EPA I.D. NO.

ADDRESS: 1281 BREA CANYON ROAD SERVICE ORDER NO.

CITY, STATE, ZIP: BREA, CALIFORNIA 92821 PICK UP DATE 04/18/22

PHONE NO. (714) 990-6855

Jesus Garcia 04/18/22
TYPED OR PRINTED FULL NAME & SIGNATURE DATE

TRUCK, UNIT, I.D. NO. 256

TSD FACILITY

NAME: World Oil Recycling EPA I.D. NO. CAT080013352

ADDRESS: 2000 N. Alameda Street DISPOSAL METHOD

[ ] LANDFILL [X] RECYCLER

CITY, STATE, ZIP: Compton, CA 90222

PHONE NO. (310) 537-7100

Daniel Pool 04/10/22
TYPED OR PRINTED FULL NAME & SIGNATURE DATE

GEN	OLD/NEW	L A	TONS	For 2nd Semi-Annual 2021 (4th Qtr 2021)
TRANS		S B		
C/Q		RT/CD	HWDF NONE	DISCREPANCY

APPENDIX J

FEMA Flood Insurance Rate Map

NOTES TO USERS

p is for use in administering the National Flood Insurance Program. It t necessarily identify all areas subject to flooding, particularly from local sources of small size. The **community map repository** should be d for possible updated or additional flood hazard information.

n more detailed information in areas where **Base Flood Elevations** nd/or **floodways** have been determined, users are encouraged to consult d Profiles and Floodway Data and/or Summary of Stillwater Elevations ontained within the Flood Insurance Study (FIS) report that accompanies M. Users should be aware that BFEs shown on the FIRM represent whole-foot elevations. These BFEs are intended for flood insurance urposes only and should not be used as the sole source of flood n information. Accordingly, flood elevation data presented in the FIS should be utilized in conjunction with the FIRM for purposes of tion and/or floodplain management.

l Base Flood Elevations shown on this map apply only landward of h American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should re that coastal flood elevations are also provided in the Summary of r Elevations tables in the Flood Insurance Study report for this jurisdiction. ns shown in the Summary of Stillwater Elevations tables should be used for tion and/or floodplain management purposes when they are higher than ations shown on this FIRM.

ies of the **floodways** were computed at cross sections and interpolated cross sections. The floodways were based on hydraulic considerations ard to requirements of the National Flood Insurance Program. Floodway nd other pertinent floodway data are provided in the Flood Insurance port for this jurisdiction.

areas not in Special Flood Hazard Areas may be protected by **flood structures**. Refer to Section 2.4 "Flood Protection Measures" of the surance Study report for information on flood control structures for this on.

jection used in the preparation of this map was Universal Transverse r (UTM) zone 11. The **horizontal datum** was NAD 83, GRS80 spheroid. ces in datum, spheroid, projection or UTM zones used in the production of or adjacent jurisdictions may result in slight positional differences in map across jurisdiction boundaries. These differences do not affect the y of this FIRM.

evations on this map are referred to the North American Vertical Datum . These flood elevations must be compared to structure and ground ns referenced to the same **vertical datum**. For information regarding ion between the National Geodetic Vertical Datum of 1929 and the merican Vertical Datum of 1988, visit the National Geodetic Survey at http://www.ngs.noaa.gov or contact the National Geodetic Survey at wing address:

ormation Services
NINGS12
Geodetic Survey
#9202
st-West Highway
ring, Maryland 20910-3282
3-3242

in current elevation, description, and/or location information for **bench** shown on this map, please contact the Information Services Branch National Geodetic Survey at **(301) 713-3242**, or visit its website at w.ngs.noaa.gov.

ap information shown on this FIRM was derived from U.S. Geological Digital Orthophoto Quadrangles produced at a scale of 1:12,000 from phy dated 1994 or later.

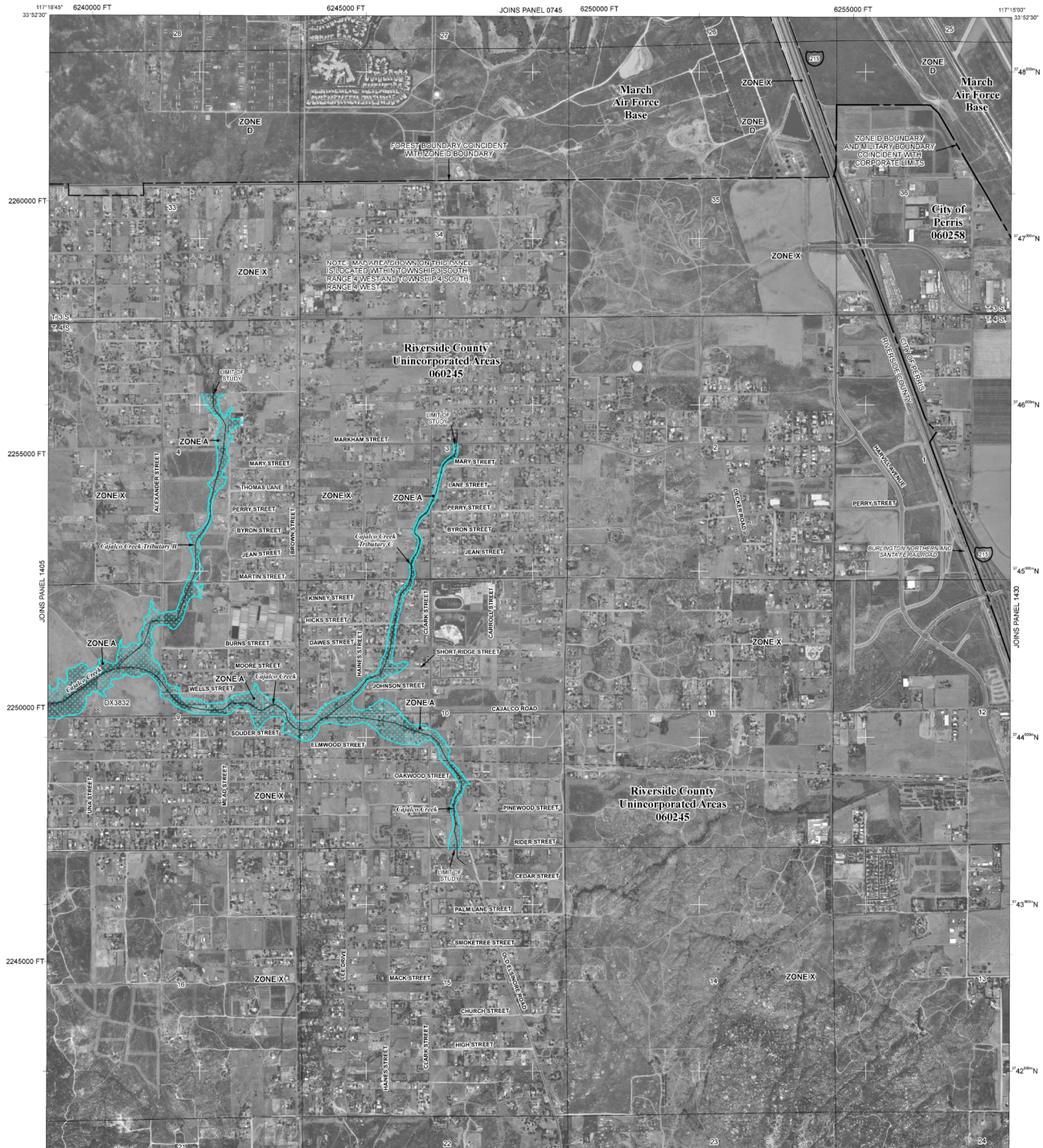
ap may reflect more detailed and up-to-date **stream channel rations** than those shown on the previous FIRM for this jurisdiction. The ns and floodways that were transferred from the previous FIRM may have justed to conform to these new stream channel configurations. As a result, d Profiles and Floodway Data in the Flood Insurance Study Report (which authoritative hydraulic data) may reflect stream channel distances that m what is shown on this map.

te limits shown on this map are based on the best data available at the ublication. Because changes due to annexations or de-annexations may curred after this map was published, map users should contact appropriate ity officials to verify current corporate limit locations.

efer to the separately printed **Map Index** for an overview map of the showing the layout of map panels; community map repository addresses; sting of Communities table containing National Flood Insurance Program r each community as well as a listing of the panels on which each ity is located.

the **FEMA Map Service Center** at 1-800-358-9616 for information on e products associated with this FIRM. Available products may include ly issued Letters of Map Change, a Flood Insurance Study report, and/or rsions of this map. The FEMA Map Service Center may also be reached t 1-800-358-9620 and its website at http://msc.fema.gov.

ve **questions about this map** or questions concerning the National Flood e Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or FEMA website at http://www.fema.gov.



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

	1% annual chance floodplain boundary
	0.2% annual chance floodplain boundary
	Floodway boundary
	Zone D boundary
	CBRS and OPA boundary
	Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
513	Base Flood Elevation line and value; elevation in feet*
(EL 987)	Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988

A A	Cross section line
23 23	Transect line
87°07'45", 32°22'30"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
4276000mN	1000-meter Universal Transverse Mercator grid values, zone 11N
600000 FT	5000-foot grid ticks: California State Plane coordinate system, zone VI (FIPSZONE 0406), Lambert Conformal Conic projection
DX5510	Bench mark (see explanation in Notes to Users section of FIRM panel)
M1.5	River Mile

MAP REPOSITORY
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
August 28, 2008

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 1000'
500 0 1000 2000 FEET
300 0 300 600 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 1410G

FIRM
FLOOD INSURANCE RATE

RIVERSIDE COUNTY, CALIFORNIA
AND INCORPORATED AREAS

PANEL 1410 OF 3805
(SEE MAP INDEX FOR FIRM PANEL LA

CONTAINS:

COMMUNITY	NUMBER	PANEL
PERRIS, CITY OF	060258	1410
RIVERSIDE COUNTY	060245	1410

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NU
06065C

EFFECTIVE
AUGUST 28

Federal Emergency Management A

APPENDIX K

Low Water Crossing Repair Narrative

Project: Cajalco Sewer Improvement Project

RE: SEWER LINE ALIGNMENT ALTERNATIVE COSTS

Alignment Option 1: Cajalco Road Arizona Crossing Proposed Repair Section:

The proposed repair to accommodate sewer main installation would consist of cutting a 9' section through the reinforced concrete pavement. The purpose of the 9' trench is to allow for an extra two (2) feet of concrete pavement to be removed which would include leaving a minimum of 1' of exposed and cleaned #4 rebar to splice to. This 9' section would be perpendicular to the road and a 8' section parallel to the road. Similarly, the 9' x 8' section would also extend to 6" below the existing dual 28" arch CMPs to allow for removal and replacement of these pipes after the sewer line is installed. The existing section below the reinforced concrete pavement contains 1-sack slurry above the pipe that would have to be removed and replaced after the sewer line is installed. The remaining portion of the trench would only need to be 5' to accommodate the sewer pipe. This accounts for removal and replacement of existing slurry within this remaining 92' segment of the Arizona crossing.

APPENDIX L

Engineer's Opinion of Probable Construction Cost

Eastern Municipal Water District
Mead Valley Trunk Sewer
Engineer's Opinion of Probable Construction Cost
Preliminary Design
January 2022

Item	Quantity	Unit	Article	Unit Price	Extension
1	1	LS	Mobilization, Bonds, Permits, Cleanup, and Demobilization	$289,000	$289,000
2	1	LS	Excavation Support Systems	$250,000	$250,000
3	1	LS	Traffic Control	$200,000	$200,000
4	1	LS	Temporary Erosion Control/Storm Water Pollution Prevention Plan (SWPPP)	$50,000	$50,000
5	1	LS	Pothole Utilities	$50,000	$50,000
6	1	LS	Dewatering	$200,000	$200,000
7	1	LS	Cajalco Lift Station decommissioning	$100,000	$100,000
8	1	LS	Brown Street low water crossing repair	$50,000	$50,000
9	1	LS	Rock Excavation Allowance	$200,000	$200,000
10	8,561	LF	Construct new 12-Inch PVC Sewer	$350	$2,996,350
11	1,335	LF	Construct new 10-Inch PVC Sewer	$320	$427,200
12	2,426	LF	Construct new 8-inch PVC Sewer	$290	$703,540
13	31	EA	Construct new 4' dia MH	$15,000	$465,000
				Subtotal	$5,981,090
				Contingency, 30%	$1,794,327
				Total	**$7,775,417**
				10% Escalation	**$8,552,959**

The planning level opinions of construction cost presented herein represents Ardurra's judgment as a design-professional and is supplied for the general guidance of the District. Since Ardurra has no control over the cost of labor and material (particularly related to recent inflationary spikes and supply chain issues), or over competitive bidding or market conditions, Ardurra does not guarantee the accuracy of such opinions as compared to contractor bids or actual cost. This opinion of cost does not include estimates for other project elements including, but not limited to, design, inspection, construction management, District administration, environmental compliance, and right of way acquisition.

APPENDIX M

Project Schedule

Eastern Municipal Water District
Mead Valley Cajalco Sewer Project
Project Schedule

ID	Task Name	Duration	Start	Finish	Predecessors
1	**Preliminary Design**	**171 days**	**Tue 8/16/22**	**Tue 4/11/23**	
2	Draft Preliminary Design Submitt	0 days	Fri 1/27/23	Fri 1/27/23	
3	Preliminary Design Roll Out Workshop	1 day	Tue 2/7/23	Tue 2/7/23	2
4	Draft Pothole Plan	1 wk	Wed 2/8/23	Tue 2/14/23	2
5	**EMWD Review of Pothole Map**	**2 wks**	**Wed 2/22/23**	**Tue 3/7/23**	**4**
6	Final Pothole Plan	1 wk	Wed 3/8/23	Tue 3/14/23	5
7	Pothole ROW Permit	1 mon	Wed 3/15/23	Tue 4/11/23	6
8	Potholing	1 mon	Wed 4/12/23	Tue 5/9/23	7
9	Final Draft Preliminary Design Report	7 wks	Wed 2/8/23	Tue 3/28/23	3
10	**CEQA Compliance**	**200 days**	**Fri 1/27/23**	**Thu 11/2/23**	
11	IS/MND	10 mons	Fri 1/27/23	Thu 11/2/23	2
12	**Final Design**	**160 days**	**Wed 3/29/23**	**Tue 11/7/23**	
13	60% Submittal	6 wks	Wed 3/29/23	Tue 5/9/23	9
14	**EMWD Review**	**15 days**	**Wed 5/10/23**	**Tue 5/30/23**	13
15	90% Submittal	6 wks	Wed 5/31/23	Tue 7/11/23	14,8
16	**EMWD Review**	**15 days**	**Wed 7/12/23**	**Tue 8/1/23**	15
17	100% Submittal	4 wks	Wed 8/2/23	Tue 8/29/23	16
18	**EMWD Review**	**15 days**	**Wed 8/30/23**	**Tue 9/19/23**	17
19	Final Submittal	4 wks	Wed 9/20/23	Tue 10/17/23	18
20	NPDES Discharge Permit	9 mons	Wed 3/29/23	Tue 12/5/23	9
21	County of Riverside ROW Permit	3 mons	Wed 7/12/23	Tue 10/3/23	15
22	**EMWD Spec Review**	**15 days**	**Wed 10/18/23**	**Tue 11/7/23**	**19**
23	**Bid Phase**	**50 days**	**Wed 11/8/23**	**Wed 1/17/24**	
24	Advertisement/Bidding	5 wks	Wed 11/8/23	Tue 12/12/23	22
25	E&O Committee Meeting	0 days	Wed 1/3/24	Wed 1/3/24	
26	EMWD Board Approval	0 days	Wed 1/17/24	Wed 1/17/24	
27	Contractor Insurance/Contract	1 mon	Wed 12/13/23	Tue 1/9/24	26
28	**Construction**	**445 days**	**Wed 1/3/24**	**Tue 9/16/25**	
29	Submittals	1 mon	Wed 1/3/24	Tue 1/30/24	25,11
30	Procurement	1 mon	Wed 1/31/24	Tue 2/27/24	29
31	ROW Permit	1 mon	Wed 1/3/24	Tue 1/30/24	25
32	Mobilization	1 mon	Wed 2/28/24	Tue 3/26/24	30
33	Sewer Installation, Carpinus Drive to Barton Street	15 wks	Wed 3/27/24	Tue 7/9/24	32
34	Sewer Installation Barton Street to Brown Street	26 wks	Wed 7/10/24	Tue 1/7/25	33
35	Sewer Installation, Brown Street to Day Street	28 wks	Wed 1/8/25	Tue 7/22/25	34
36	Clark Street Lift Station Decommissioning	1 mon	Wed 7/23/25	Tue 8/19/25	35
37	Punchlist/Demobilization	4 wks	Wed 8/20/25	Tue 9/16/25	36
38	Construction Complete/Acceptar	0 days	Tue 9/16/25	Tue 9/16/25	37

