INITIAL STUDY AND MITIGATED
NEGATIVE DECLARATION

MEAD VALLEY AND GOOD HOPE WATER IMPROVEMENTS PROJECT

January 2024

Prepared By

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

With Assistance From

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emwd

ALBERT A. WEBB ASSOCIATES

Initial Study and Mitigated Negative Declaration

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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 areas
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 and Good Hope Water Improvements Project (the "proposed Project" or "Project"), which consists of construction and operation of potable water main lines and replacement of remote water meters with new stationary water meters.

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 and Good Hope Water Improvements 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
- Land Use and Planning
- Mineral Resources
- Noise
- Population and Housing
- Public Services
- Recreation

- Geology and Soils
- Greenhouse Gas Emissions
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Transportation
- Tribal Cultural Resources
- 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 January 22, 2024 – February 20, 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 February 20, 2024, and addressed to:

Joseph Broadhead, Principal Water Resources Specialist – CEQA/NEPA
Eastern Municipal Water District
2270 Trumble Road
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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 and Good Hope Water Improvements Project ("Project" or "proposed Project"), partially funded by the American Rescue Plan Act (ARPA) in partnership with Riverside County (County), involves construction and operation of approximately 13,450 linear feet of 8-inch diameter polyvinyl chloride (PVC) potable water transmission pipeline with interconnections and appurtenances. The Project is located within the Mead Valley and Good Hope communities that are located west of the western boundary of the City of Perris within unincorporated areas 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 improve the operational efficiency of EMWD's potable water distribution system within the communities of Mead Valley and Good Hope by closing gaps between existing water mains and eliminating remote water meters and install new water meters. Another purpose of the Project is to improve operational redundancy in EMWD's potable water system, specifically within the 1872 Mead Valley pressure zone (PZ) and 1832 Good Hope 2 PZ.

2.3 Project Location

The proposed Project alignment is in the unincorporated territory of Riverside County, located west of the western boundary of the City of Perris (See **Figure 1** – Regional Location Map). The Project alignment will be within portions of Robinson Street, north of Cajalco Road, as depicted on **Figure 2 – Project Alignment: Mead Valley Area 1**; portions of Oakwood Street, Pinewood Street, Carroll Street, and Day Street as depicted on **Figure 3 – Project Alignment: Mead Valley Area 2**; and portions of Main Street, Club Drive, Eucalyptus Avenue, Maple Avenue, Pine Street, Cherry Avenue, and Maguglin Way as depicted on **Figure 4 – Project Alignment: Good Hope Area.** Most of the Project would be constructed entirely within road right-of-way (ROW). The Project's alignment is located within Township 4 South, Range 4 West, Section 1 and Township 5 South, Range 4 West, Sections 3 and 10, 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 Mead Valley Area 1 portion of the Project, at Robinson Street, north of Cajalco Road, as shown in **Figure 6 – Existing Conditions: Mead Valley Area 1**, contains a partially paved road with no streetlights, sidewalks, curbs, gutters, or storm drains.

There are above ground power poles along the eastern portion of the Robinson Street. road. Existing land uses include rural residential and vacant land. This area does not currently contain water lines. Approximately ten properties along Robinson Street have remote meters that are not located near their respective property.

The Mead Valley Area 2 portion of the Project, at Oakwood Street, Pinewood Street, Day Street, and Carroll Street, south of Cajalco Road, as shown in **Figure 7 – Existing Conditions: Mead Valley Area 2**, contains partially paved roads with above ground power poles. These streets consist of paved or unpaved surface roads accepted for public use and do not have streetlights, sidewalks, curbs, gutters, or storm drains. Portions of the unpaved streets of Oakwood Street and Day Street contain depressions in the roads. Existing land uses include rural residential, vacant land, and public facilities (public library). This area does not currently contain water lines. Properties along this area have remote meters that are not located near their respective property.

The Good Hope Area portion of the Project, at Main Street, Club Drive, Eucalyptus Avenue, Maple Avenue, Pine Street, Cherry Avenue, and Maguglin Way, as shown in **Figure 8 – Existing Conditions: Good Hope Area**, contains partially paved roads with above ground power poles. These streets consist of paved or unpaved surface roads accepted for public use and do not have streetlights, sidewalks, curbs, gutters, or storm drains. Portions of the unpaved streets of Eucalyptus Avenue contain depression in the roads. There is single eucalyptus tree within Eucalyptus Avenue, between Theda Street and Spring Street. Existing land uses include rural residential and vacant land. This area contains an existing 4-inch waterline along Eucalyptus Avenue.

The Good Hope Area include staging areas, as shown in **Figure 8 – Existing Conditions: Good Hope Area**. These staging areas are vacant lots along Pine Street, Cherry Avenue, and Sharp Road.

2.5 Proposed Project Description

The Project would construct approximately 13,450 linear feet of 8-inch diameter polyvinyl chloride (PVC) potable water main pipelines and remote water meters and other associated appurtenances to increase fire flow capacity, provide long-term accessibility, serviceability, and longevity to the Mead Valley and Good Hope communities. Details are provided in the following subsections.

2.5.1 Pipeline Construction

Mead Valley

Mead Valley Area 1

The Proposed 1,650 linear foot (LF) of new 8-inch diameter PVC water main, would be placed within the Robinson Street roadway using open trench construction. The maximum trench width is expected to be 3-4 feet, while the depth of was expected to be 5 feet. The proposed water lines would connect to the existing 8-inch diameter asbestos cement pipe (ACP) water line in Robinson Road and the existing 18-inch water main

connection in Cajalco Road. The existing remote meters would be moved and installed along Robinson Street at each customer's property. The pipeline alignment would be designed to avoid conflict with existing utilities.

Mead Valley Area 2

The Proposed water main along Oakwood Street, Day Street, and Pinewood Street consists of the construction of approximately 4,000 LF of new 8-inch diameter PVC. The proposed water main will connect to the existing 8-inch diameter PVC water on Oakwood Street and connect to the new 8-inch diameter water main on Day Street. The maximum trench width is expected to be 3-4 feet, while the depth is expected to be 5 feet. The existing remote meters would be moved and installed along Oakwood Street, Day Street, and Pinewood Street at each customer's property. The pipeline alignment would be designed to avoid conflicts with existing utilities. Approximately 300-feet of existing 4-inch pipe will be abandoned in place and filled with Cellcrete. Cellcrete is cellular concrete, which is also known as foamed concrete. Cellular concrete is a special engineered concrete that is produced by mixing Portland cement, sand, fly ash, water, and pre-formed foam in varied proportions to form a hardened material. Cellular concrete is used in abandoned pipes because it is self-compacting and may be pumped over major distances.

Good Hope

The Proposed 7,800 LF of new 8-inch PVC water main, would be placed within Eucalyptus Avenue (west of Spring Street), Club Drive (between Theda Street and Spring Street), Main Street, Maple Avenue, Pine Street, Cherry Lane, and Maguglin Way roadway right of way using open trench construction. The maximum trench width is expected to be 3-4 feet, while the depth is expected to be 5 feet. The proposed water main will connect into existing 4-inch to 8-inch diameter water line connections in Day Street, Carroll Street, Pinewood Street, Theda Street, Spring Street, and Club Drive. Trenchless techniques (jack and bore) will be used along Club Drive and Spring Street near Eucalyptus Avenue, to avoid RCFCWCD's future storm drainage facilities along Club Drive and Spring Street, near Eucalyptus Avenue. The existing remote meters would be moved and installed along the Good Hope area at each customer's property. The pipeline alignment would be designed to avoid conflict with existing utilities. Project construction of the Good Hope segment will require the removal of three Peruvian pepper trees and one red gum eucalyptus tree.

2.5.2 Pipeline Interconnections and Appurtenances

The Project would also include valves, air valves, blow-off valves, and fire hydrants. For safety and protection, appurtenances would be located a practicable distance from traffic lanes. The precise location and number of appurtenances would be determined in final design.

2.5.3 Construction Schedule

Project construction is anticipated to begin no sooner than April 2024 and continue until October 2024. Construction would include trenching and paving construction activities. Construction activities would commence with the Mead Valley Area 1 followed with the Mead Valley Are 2 segment. The Good Hope Area construction activities would overlap with the Mead Valley Area 1 and Mead Valley Area 2. Below is the estimated construction duration per phase:

Construction Activity	Construction Duration[1]		
	Mead Valley Area 1	Mead Valley Area 2	Good Hope Area
Trenching (Grading and Excavation)	April 1, 2024 to May 3, 2024	May 11, 2024 to August 16, 2024	April 1, 2024 to October 8, 2024
Paving (Linear Paving)	May 4, 2024 to May 10, 2024	August 17, 2024 to August 28, 2024	October 9, 2024 to October 17, 2024

[1]Estimated construction schedule, subject to change.

Construction would take place Monday through Friday during daytime hours of 7:00 a.m. to 6:00 p.m. No planned construction activities are expected to occur at night. Nighttime security lighting may be used for security purposes. Security lighting would be directed downward and not onto adjacent properties.

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

Table 2-1: Offroad Construction Equipment

Construction Activity	Construction Equipment	Unit Amount Per Phase		
		Mead Valley Area 1	Mead Valley Area 2	Good Hope Area
Trenching (Grading and Excavation)	**Crawler Tractors**	0	1	0
	Excavators	2	2	2
	Graders	0	0	1
	Rollers	2	2	2
	Rubber Tired Loaders	1	1	1
	Tractors/Loaders/Backhoes	2	2	2

Construction Activity	Construction Equipment	Unit Amount Per Phase		
		Mead Valley Area 1	Mead Valley Area 2	Good Hope Area
Paving (Linear Paving)	Pavers	1	1	1
	Paving Equipment	1	1	1
	Rollers	3	3	3
	Tractors/Loaders/Backhoes	2	2	2

2.5.4 Equipment Staging Areas

Construction staging area options are included in this environmental analysis (See **Figure 4 – Project Alignment: Good Hope Area**). These staging areas would be used for stockpiling, storage, and parking. No construction activities would occur and the sites would be returned to their original condition following construction. The Mead Valey Area 1 and Mead Valey Area 2 do not have specific staging areas delineated; however, these areas include sufficient shoulder for staging, including but not limited to Robinson Street. The Good Hope Area includes six staging areas that are currently vacant and undeveloped. These areas are along Pine Street, Cherry Avenue, and Sharp Road.

2.6 Operations

The pipeline and appurtenances would not be associated with long-term energy usage or additional EMWD operations and maintenance (O&M) activities. Project O&M activities would include inspection and repair, as necessary, of air vacuum valves, blowoff valves, and fire hydrants; valve exercising; and possible flushing and sampling of water quality. Inspection of the above ground appurtenances and exercise of the valves would be incorporated into EMWD's existing O&M activities.

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), groundwater levels along the pipeline alignment are anticipated to be deeper than 9 feet below the existing ground surface. During construction, temporary groundwater seepage may occur due to local irrigation or following heavy rain. EMWD shall retain a qualified specialty contractor to design a dewatering system. The dewatering system shall be reviewed and approved by a geotechnical engineer prior to commencing construction.

- 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.
- EMWD is required to comply with federal and State regulations that govern the renovation, demolition, construction, alteration, repair, maintenance, or renovation of structures, substrates, or portions thereof, that contain asbestos. These requirements include: SCAQMD Rules and Regulations pertaining to asbestos abatement (including rule 1403), Construction Safety Orders 1529 (pertaining to asbestos) from Title 8 of the California Code of Regulations, Part 61, Subpart M of the Code of Federal Regulations (pertaining to asbestos), and OSHA, section 1926.1101- Asbestos. Asbestos abatement must be performed and monitored by contractors with appropriate certifications from the State Department of Health Services.
- 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;

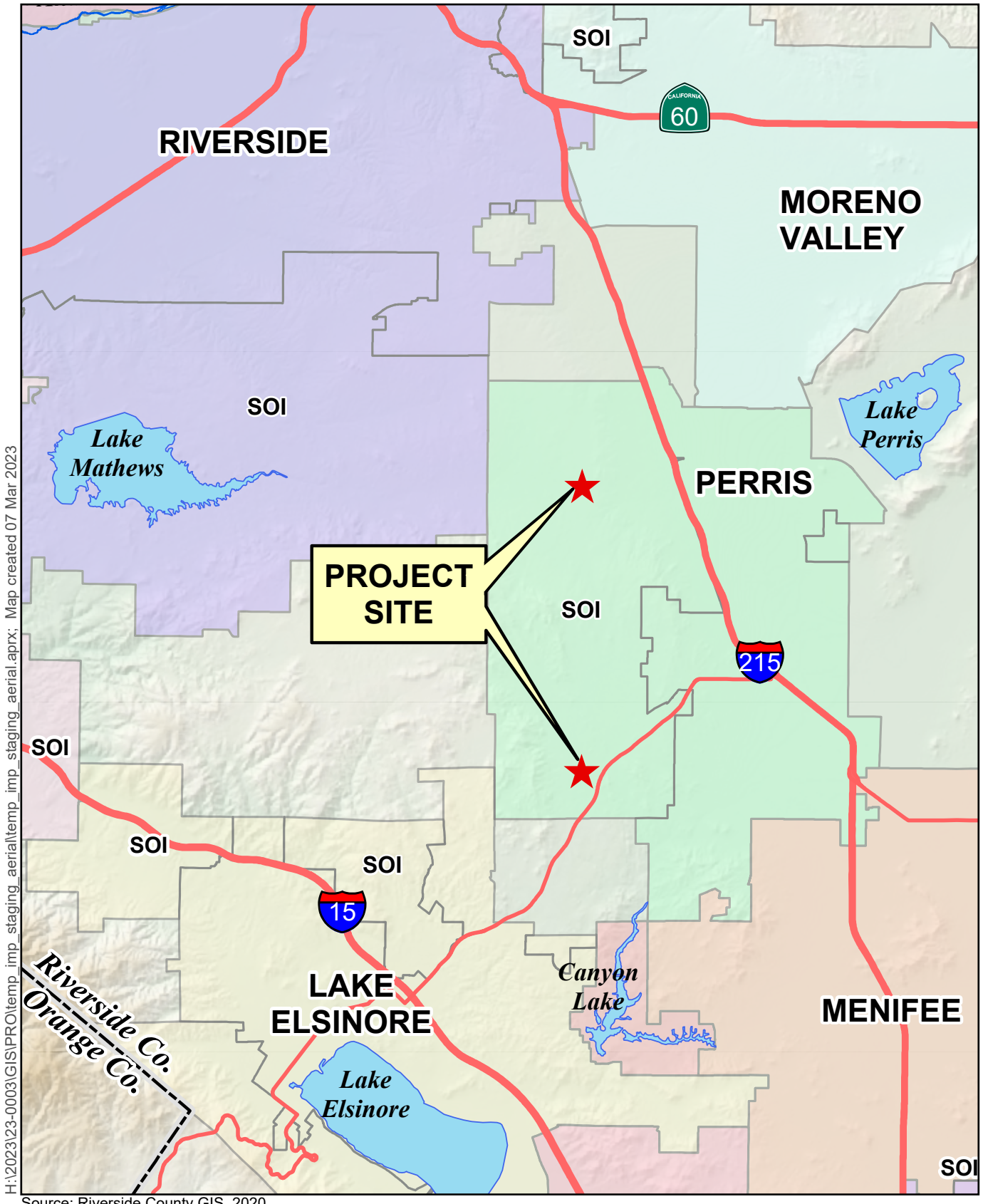
fully charged fire extinguishers of the appropriate type, supplemented with temporary fire hoses wherever an adequate water supply exists, are furnished and maintained; and flammable materials are stored in a manner that prevents spontaneous combustion or dispersion.

2.8 Required Permits and Approvals

Anticipated permits are identified in **Table 2-2: Permits and Approvals**.

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
California Occupational Safety and Health Administration	Trenching/Shoring Permit



Source: Riverside County GIS, 2020.

Figure 1 – Regional Location Map

Mead Valley, Good Hope, and Oakwood Water Improvements Project

0 2 4 6 Miles

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Source: Nearmap, 2023.

Figure 2 - Project Alignment: Mead Valley Area 1

Mead Valley and Good Hope Water Improvements Project

0 100 200 300 Feet

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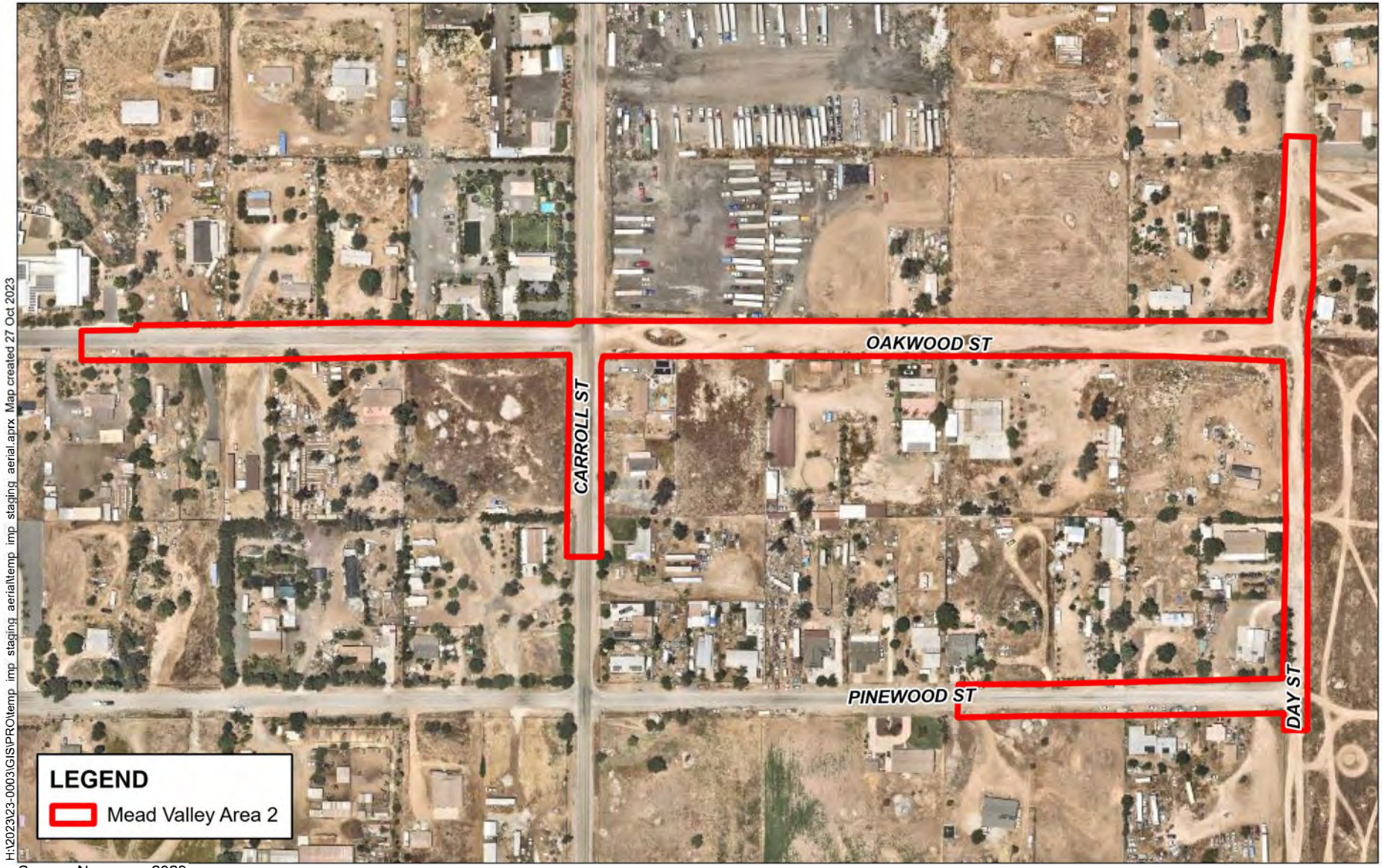

Source: Nearmap, 2023.

Figure 3 - Project Alignment: Mead Valley Area 2

Mead Valley and Good Hope Water Improvements Project

0 250 500 750 Feet

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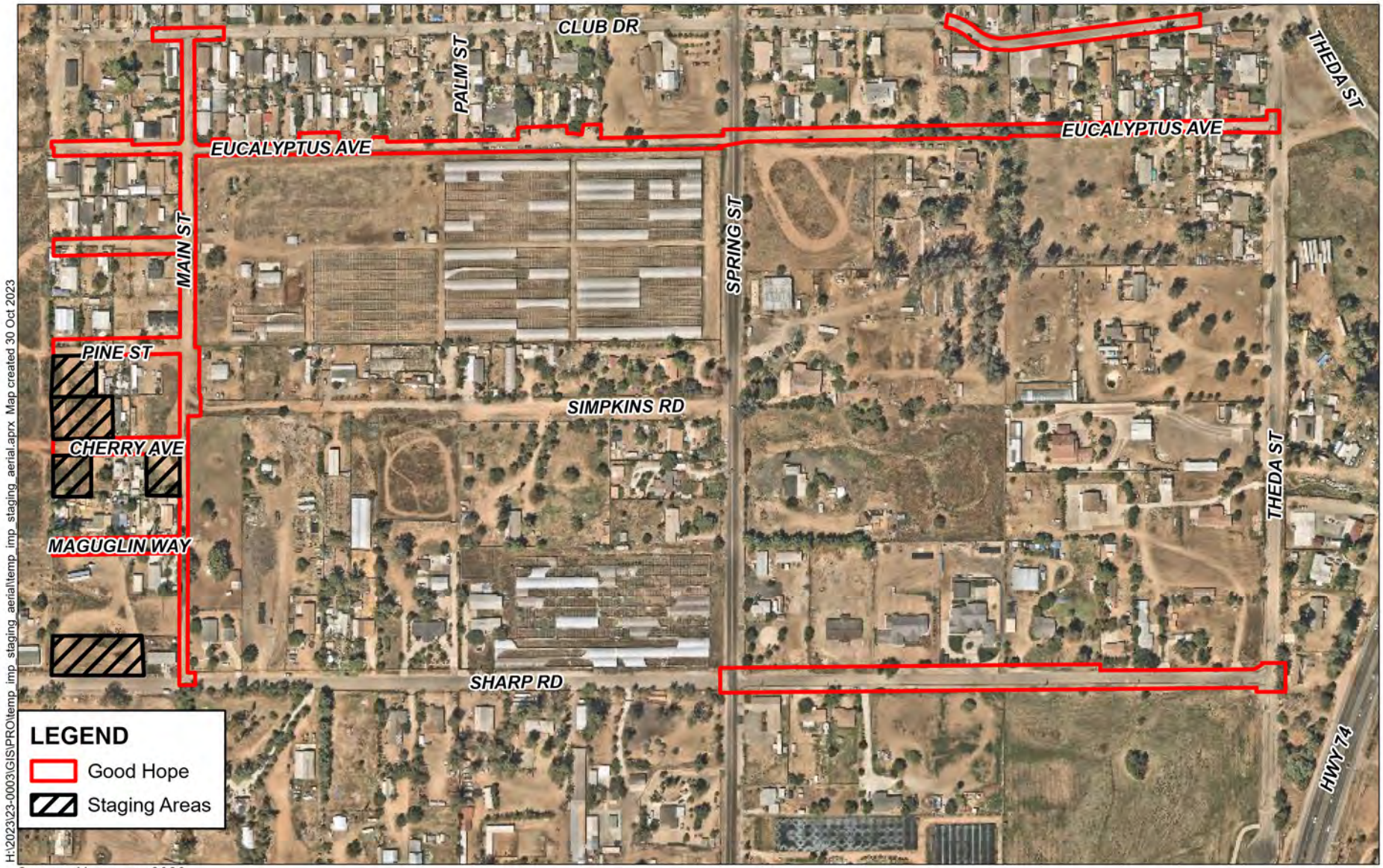

Source: Nearmap, 2023.

0 250 500 750 Feet

Figure 4 - Project Alignment: Good Hope Area

Mead Valley and Good Hope Water Improvements Project

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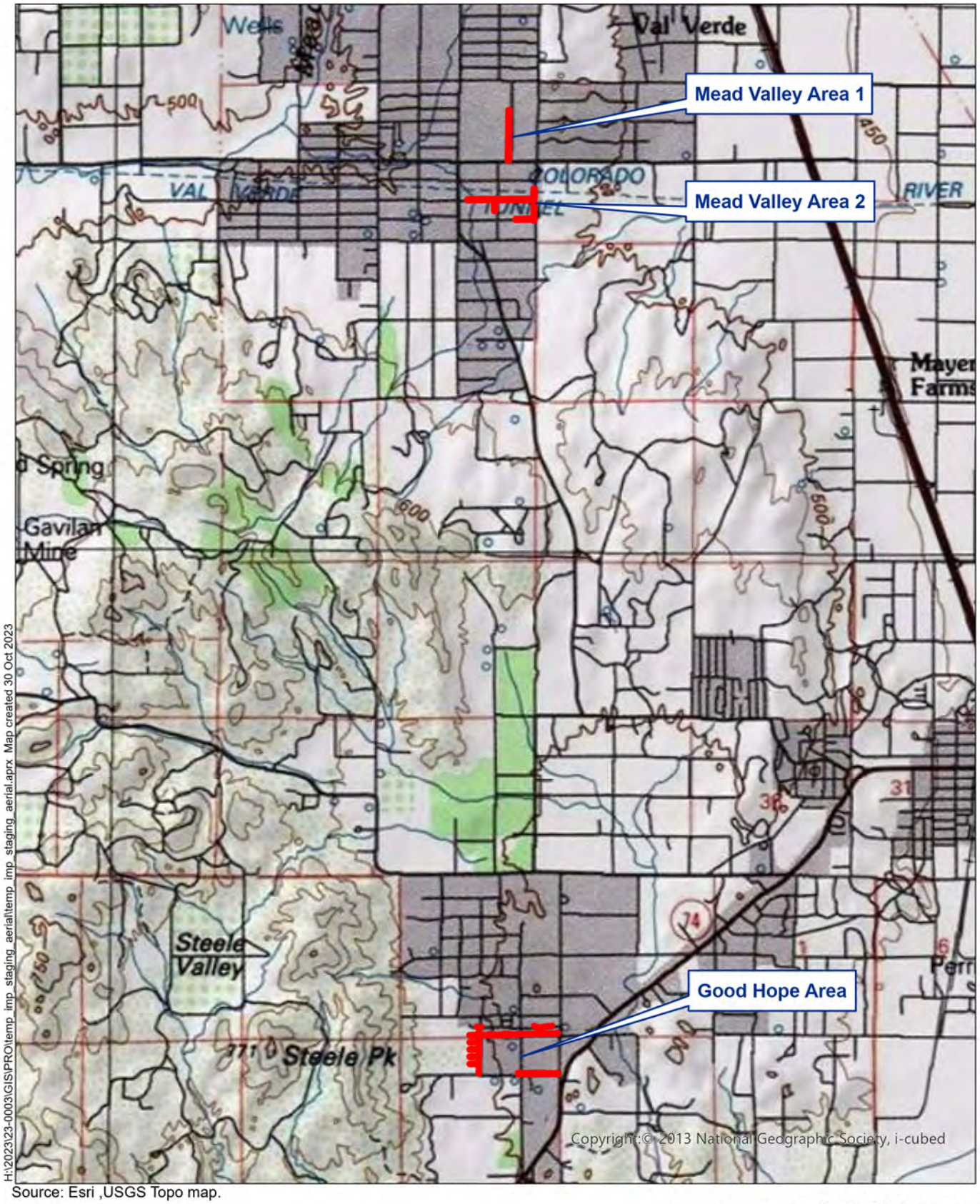

H:\2023\23-0003\GIS\PRO\temp_imp_staging_aerialtemp_imp_staging_aerial.aprx Map created 30 Oct 2023

Source: Esri ,USGS Topo map.

0 2,000 4,000 6,000 Feet

Figure 5 - USGS Map

Mead Valley and Good Hope Water Improvements Project

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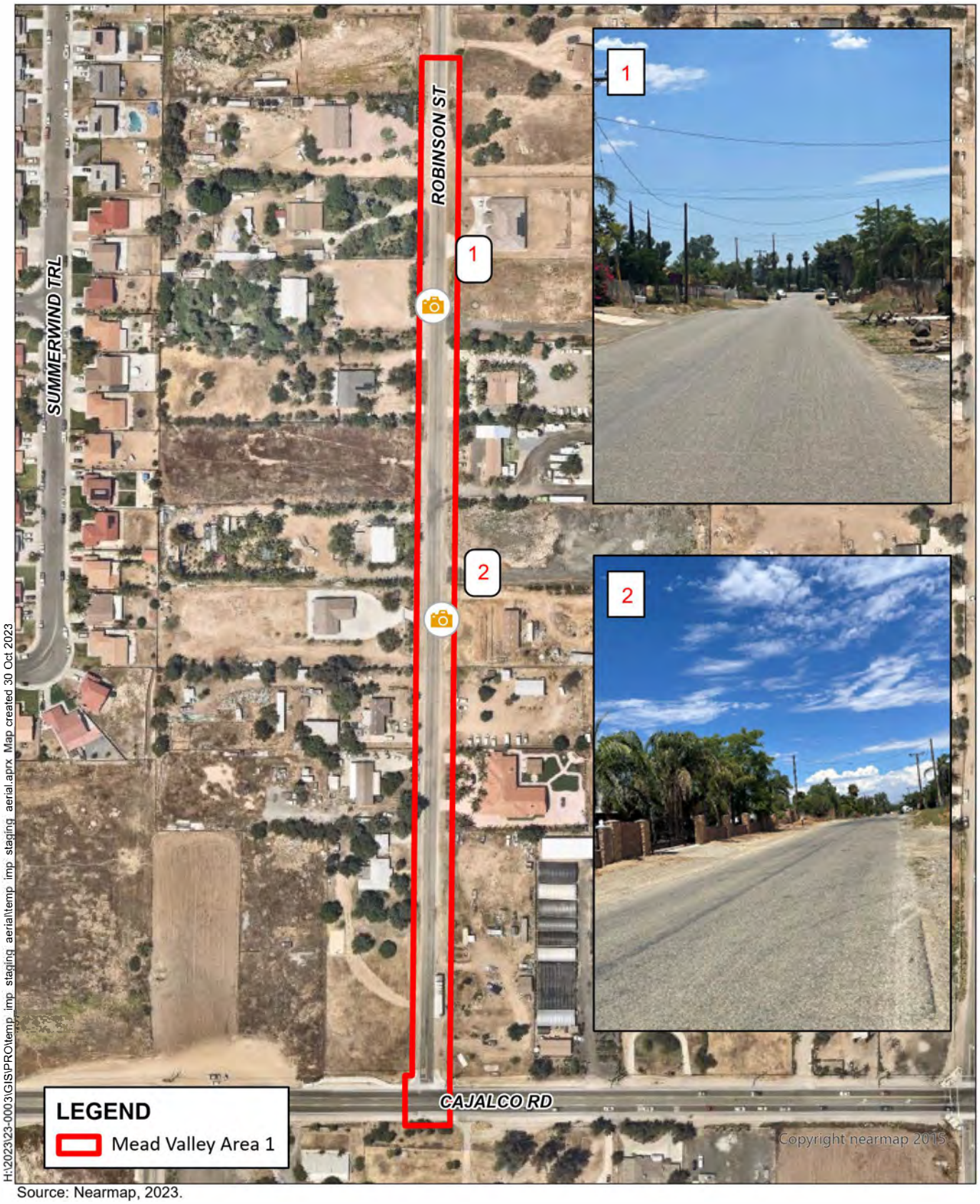

Source: Nearmap, 2023.

Figure 6 - Existing Conditions: Mead Valley Area 1

Mead Valley and Good Hope Water Improvements Project

0 100 200 300 Feet

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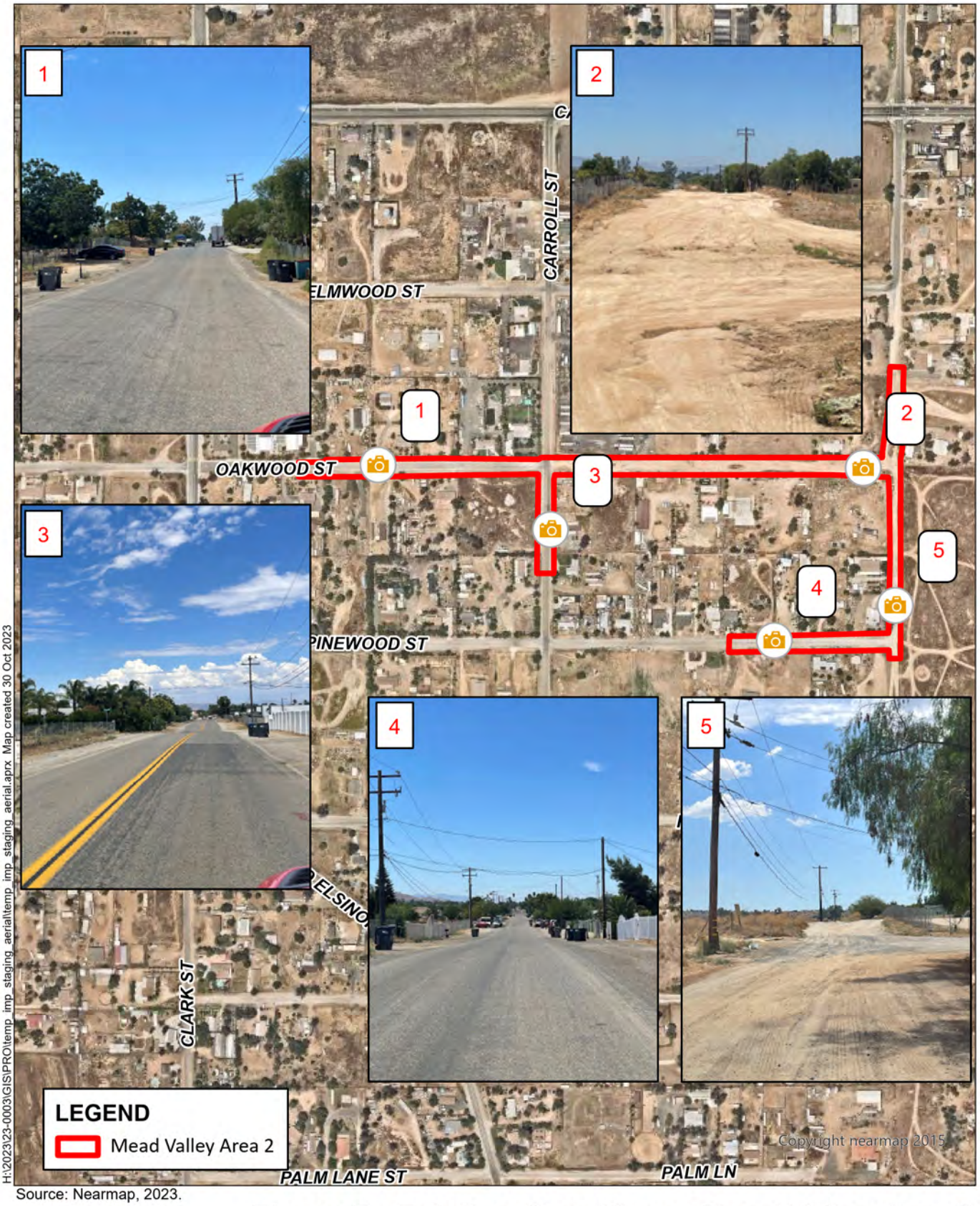

Source: Nearmap, 2023.

Figure 7 - Existing Conditions: Mead Valley Area 2

Mead Valley and Good Hope Water Improvements Project

0 200 400 600 Feet

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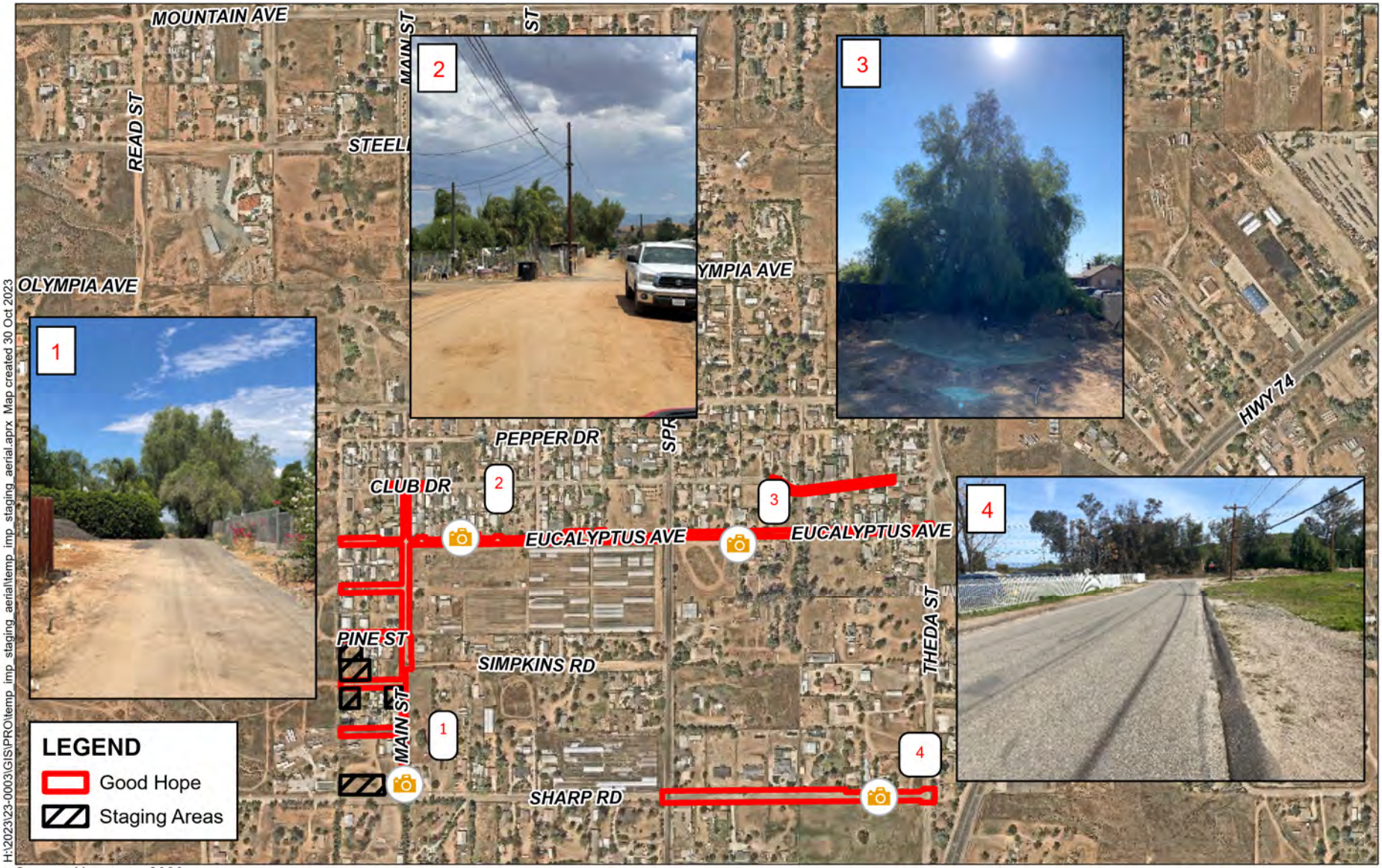

Source: Nearmap, 2023.

Figure 8 - Existing Conditions: Good Hope Area

Mead Valley and Good Hope Water Improvements Project

0 250 500 750 Feet

ALBERT A. WEBB ASSOCIATES

3. ENVIRONMENTAL CHECKLIST FORM

1. **Project title:** Mead Valley and Good Hope Water Improvements 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
(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:** Right-of-way, Rural Community

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

8. **Description of project:** The Mead Valley and Good Hope Water Improvements Project (Project) involves construction and operation of approximately 13,450 linear feet of 8-inch diameter polyvinyl chloride (PVC) potable water main pipelines with interconnections and appurtenances within the Mead Valley and Good Hope communities in unincorporated Riverside County west of the City of Perris. The Project would connect to existing 6-inch and 18-inch pipelines and would close gaps between existing potable water mains in the area and eliminate remote water meters and install new water meters in front of each customer's property. The Project would provide system reliability and redundancy by looping the water systems within the 1832 Good Hope 2 Pressure Zone (PZ) and within the 1872 Mead Valley PZ. **Figure 1 – Regional Location Map, Figure 2 – Project Alignment: Mead Valley Area 1, Figure 3 – Project Alignment: Mead Valley Area 2, Figure 4 – Project Alignment: Good Hope Area,** and **Figure 5 – USGS Map,** shows the vicinity of the Project and the proposed pipeline alignments.

9. **Surrounding land uses and setting:** The area surrounding the Project alignment is partially built out. Surrounding land uses include residential, rural residential, residential agricultural, vacant and undeveloped, and commercial uses.

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 Pechanga Band of Luiseño Indians] to discuss the Project and potential effects to 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" 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
[X]	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.

Signature	1/22/24 Date
Joe Broadhead Printed Name	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 alignment 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 alignment, 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 2-1 Existing Site Conditions*), the new potable water transmission main would be constructed along various streets that supports intermittent views of surrounding mountains and hills for motorists and pedestrians.

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 southern portion of Project alignment, the Good Hope Area, is located approximately 36 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 alignment. (CAL 2023.)

a) Less than Significant Impact

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

b) No Impact

The proposed Project alignment 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 alignment include those from roadways, sidewalks and bicycle lanes. Installation of pipelines may cause slower traffic during construction, however the public views of the Project construction from roadways would be fleeting – on the order of seconds or minutes – whereas public views of the construction from sidewalks and bicycle lanes 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, impacts on scenic vistas and visual character 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. No nighttime construction is proposed. However temporary nighttime lighting may be used for security purposes during the construction phase. Security 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 36 miles south of the Project alignment. 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 alignment 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 Riverside County. The Project alignment is not near any forest land. Per the California Department of Conservation (CDOC) Farmland Mapping and Monitoring Program, the Project alignment 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 alignment. (CDOC-B 2023; RIVZ 2023; RIVORD 348.)

a-e) No Impact

The proposed Project alignment 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 alignment and staging areas are not within Williamson Act contracted lands and no impacts would occur in this regard.

The proposed Project alignment 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. Therefore, no impacts would occur.

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 Project alignment and the EMWD service area are within unincorporated Riverside County. The Project area is located within the Basin, which is regulated by the SCAQMD. 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: Criteria Pollutant Attainment Status – Basin** 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: SCAQMD Air Quality Significance Thresholds**.

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. The Project alignment 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. 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 16.33 acres. Since the Project is linear it will progress in a linear fashion and would disturb a much smaller area 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 is shown in **Table 3-3: SCAQMD LSTs for Construction and Operation**. LSTs are provided for receptors at a distance of 25 meters (82 feet) from the Project alignment 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 13,450 linear feet of potable water pipeline and appurtenances to increase fire flow capacity, provide long-term accessibility, serviceability, and longevity

[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.

to the Mead Valley and Good Hope communities. Therefore, the proposed Project would not lead to unplanned population, housing or employment growth that exceeds the forecasts used in the development of the AQMP. The 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).

The Project construction emissions have been analyzed on the Air Quality/Greenhouse Gas Analysis for the Mead Valley and Good Hope Water Lines Project (WEBB-A) included as 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 one year. 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: Proposed Project Maximum Daily Construction Emissions Compared to Regional Thresholds (pounds/day).** 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}	$PM_{2.5}$
Mead Valley Area 1 (2024)	1.07	8.45	12.50	0.02	0.68	0.43
Mead Valley Area 2 (2024)	1.41	10.90	15.30	0.02	1.02	0.62
Good Hope Area (2024)	1.46	11.50	16.40	0.02	0.99	0.59
Total Maximum Daily Emissions	3.94	30.85	44.20	0.06	2.69	1.64
SCAQMD Regional Thresholds	*75*	*100*	*550*	*150*	*150*	*55*
Threshold exceeded?	**No**	**No**	**No**	**No**	**No**	**No**

Source: WEBB--A
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. Maximums are showing the sum of maximum daily construction emissions for Mead Valley Area 1 Segment 2024 and Good Hope Area Segment 2024 or the sum of maximum daily construction emissions for Mead Valley Area 2 Segment 2024 and Good Hope Area Segment 2024 because these activities are assumed to overlap.

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: Proposed Project Maximum Daily Construction Emissions Compared to Localized Significance Thresholds (pounds/day).** . 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.

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

Emissions Source	NO_x	CO	PM_{10}	$PM_{2.5}$
Mead Valley Area 1 - Trenching	7.74	11.00	0.35	0.33
Mead Valley Area 2 - Trenching	**10.60**	**13.50**	0.71	0.53
Good Hope Area - Trenching	**11.10**	**14.70**	**0.68**	**0.51**
Mead Valley Area 1 - Paving	8.15	10.9	0.39	0.36
Mead Valley Area 2 - Paving	8.15	10.9	0.39	0.36
Good Hope - Paving	8.15	10.9	0.39	0.36
LST (one-acre LST)	*118*	*602*	*4*	*3*
Maximum	**21.70**	**28.20**	**1.39**	**1.04**
Threshold exceeded?	**No**	**No**	**No**	**No**

Source: WEBB-A
Note: Maximums are the greater of either the sum of Mead Valley Area1 Segment trenching and Good Hope Area Segment Trenching, the sum of Mead Valley Area 2 Segment Trenching and Good Hope Area Trenching, or the sum of Good Hope Area Trenching and either Mead Valley Area 1 Segment Paving or Mead Valley Area 2 Segment Paving, because these activities 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. Manuel L. Real Elementary School, Tomas Rivera Middle School, Columbia Elementary School, and Good Hope Elementary School are located within one mile from the Project alignment.

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 defines a biological study area (BSA) that encompasses the Project alignment, staging areas, and a 100-foot buffer. Because suitable habitat to support for burrowing owl (*Athene cunicularia*) and listed large branchiopods (fairy shrimp) 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. 10.) 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 84.4-acre BSA were performed on February 2, 2023 and February 21, 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. 10.) 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 entirely within paved or otherwise disturbed road rights-of-way, and 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, sensitive species are not expected to occur within the Project footprint and staging areas due to the lack of suitable habitat as well as historical and existing disturbances. No sensitive vegetation communities are present within the BSA. (WEBB-B, p. 24.) While the literature review identified 58 special-status amphibian, crustaceans, fish, bird, insect, reptile, and mammal species within the BSA, no special-status wildlife species were found on the Project alignment during the surveys, and 56 of the 58 species had no suitable habitat present in the BSA. (WEBB-B 2023, p. 25**.**)

Suitable habitat was present in the BSA for the following two species: burrowing owl (*Athene cunicularia*) and Riverside fairy shrimp (*Streptocephalus woottoni*).

Focused burrowing owl surveys conducted for the Project alignment 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 9-A and Figure 9-B – Burrowing Owl Survey Results**, a total of 132 burrows suitable for burrowing owl were recorded within the burrowing owl survey area. (WEBB-B 2023, p. 25.) Although no burrowing owl or burrowing owl signs (i.e., pellets with regurgitated fur, bones, and insect parts; whitewash; or feathers) were detected during the protocol level surveys, burrowing owls are highly mobile, and suitable habitat is present throughout portions of the Project alignment. For this reason, burrowing owls have the potential to colonize the suitable areas of the Project alignment and adjacent areas at any time. To avoid impacts to burrowing owls, **Mitigation Measure BIO-1**, which requires preconstruction surveys shall be implemented to avoid impacts to burrowing owls that may have colonized the burrows within the BSA. (WEBB-B, p. 35.)

As shown on **Figure 10-A and Figure 10-B – Fairy Shrimp Survey Results**, 12 unvegetated road rut pools were identified as potential habitat for fairy shrimp. These pools were evaluated for the presence of fairy shrimp following the survey methods set forth in the United States Fish and Wildlife Service *Survey Guidelines for the Listed Large Branchiopods*, revised November 13, 2017. The surveys included both wet-season and dry-season protocols. Among the 12 identified pools, only four were confirmed to contain versatile fairy shrimp (*Branchinecta lindahli*), an unlisted common species. (WEBB-B 2023, p. 26.) Because Listed Large Branchiopods were not found in areas of suitable habitat, there will be no impacts to this species and no mitigation is required.

The field survey confirmed trees, shrubs, low vegetation, and/or riparian habitat that could provide suitable nesting habitat for several common avian species is present in the Biological Study Area. The common avian species are not candidate, sensitive, or special status; however, the Migratory Bird Treaty Act protects nearly all native bird species in the United States. The common species observed within the BSA included American crow (*Corvus Brachyrhynchos*), mourning doves (*Zenaida macroura*), house finch (*Haemorhous mexicanus*), and song sparrow (*Melospiza melodia*). (WEBB-B 2023, p. 25.) These common species have the potential to nest even in highly disturbed areas. Some common avian species can be ground nesters and will nest on fairly exposed ground such as that found within some of the potential staging area sites. While the literature review identified 24 special-status bird species reported within the search area, no suitable habitat to support these special-status species is present within the Project footprint. (WEBB-B 2023. pp. 23, 30.)

Construction of the proposed Project would occur entirely within the road rights-of-way and the high levels of existing disturbance within the potential staging area sites would likely deter wildlife and nesting birds' long-term use. However, while indirect impacts to plants and wildlife would be minimal, construction activities planned during the bird nesting/breeding season could have a potential impact on hatchlings or fledglings. **Mitigation Measure BIO-2** would be implemented to avoid impacts to nesting birds in areas with trees and shrubs adjacent to Project construction and the staging areas, by requiring a survey for nesting birds prior to construction and requiring active nests be

avoided and monitored until construction activities cease. With implementation of **Mitigation Measure BIO-2**, impacts would be less than significant.

b) No Impact

Four types of vegetation community (or land cover type) were identified in the BSA: urban/developed, disturbed habitat, non-native grassland, and eucalyptus woodland. None of these vegetation communities/land covers are sensitive; therefore, no impacts to sensitive vegetation will occur.

The literature review identified 59 special-status plant species with potential to occur in the BSA. However, no special-status plant species were identified during the reconnaissance surveys, and no suitable habitat is present; therefore, no impacts to special-status plants are expected to occur. (WEBB-B 2023, p. 30.)

The Project will remove three Peruvian pepper trees (*Schinus molle*) and one red gum eucalyptus tree (*Eucalyptus camaldulensis*); however, none of these are special status species and none are located in a sensitive vegetation community.(WEBB-B 2023, pp. 22, 24.) Given the Project location in the road rights-of-way and the disturbed condition of the 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. There are no riparian, riverine, or natural communities present in the BSA. (WEBB-B 2023, p. 32.)

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 which are comprised of Criteria Cells, 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. 32.) There are no riparian/riverine habitats protected by the Western Riverside MSHCP within the proposed Project area.

c) No Impact

The field survey identified 12 unvegetated ephemeral road rut pools along Oakwood Street, Day Street, Carrol Street, Robinson Street, and Pinewood Street that are located within the Project footprint. The pools did not possess indicators of vernal pools or jurisdictional wetlands or non-wetland waters including distinctive hydrology markers, soils and plant species. Further, the pools are not hydrologically connected to any upstream or downstream jurisdictional features. However, as described previously in response “3.4a”, the pools did contain suitable habitat for fairy shrimp and therefore protocol surveys were conducted. The results of the protocol surveys indicated that all pools were negative for the presence of special status listed fairy shrimp species. Only common versatile fairy shrimp (*Branchinecta lindahli*) were found in four pools in Mead

Valley Area 2. Because the road ruts were negative for special status fairy shrimp and the road ruts did not have indicators of jurisdictional waters, no potentially jurisdictional wetlands or other aquatic features were present in the Project footprint or BSA. No impacts to protected wetlands or other aquatic features would occur.

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 require the removal of three Peruvian pepper trees and one red gum eucalyptus tree in the Good Hope Project Area along Eucalyptus Avenue. Riverside County does not have policies to protect these two common species. Therefore, no impacts would occur.

f) Less than Significant with Mitigation Incorporated

The proposed Project is located within the boundaries of two Habitat Conservation Plans: Western Riverside County MSHCP and Stephen's kangaroo rat Habitat Conservation Plan (HCP). 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 2023, p. 32.)

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 BSA. (WEBB-B 2023, p. 32.) No vernal pools were identified in the Project BSA. Twelve unvegetated road rut pools were present in the Mead Valley Area 2 and Good Hope Area and were evaluated for presence of fairy shrimp. However, these road rut pools did not meet the established classification criteria for vernal pools, which include specific hydrology, soils, and vegetation characteristics typically associated with vernal pool habitats. (WEBB-B 2023, pp. 23, 32.) Moreover, no Riverside Fairy shrimp were detected during the protocol wet and dry season surveys conducted for the Project. (WEBB-B 2023, p. 26.) No habitat for least Bell's vireo, southwestern willow flycatcher, or western yellow-billed cuckoo was present in the Project BSA. (WEBB-B 2023, p. 33.) Therefore, the implementation of the Project 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. 33.) Therefore, the implementation of the Project 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. 36.) Therefore, the implementation of the Project 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 alignment 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 for burrowing owl 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 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 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. (WEBB-B 2023, p. 36.) No conflict with this HCP would occur.

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.*[2]. (Refer to **Figure 9-A and Figure 9-B – Burrowing Owl Survey Results** for location of suitable burrowing owl habitat.) Additionally, a final burrowing owl survey shall be conducted 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 Preconstruction Nesting Bird Survey.

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 conduct a nesting bird survey within 72 hours prior to commencement of any Project-related ground disturbance or construction within suitable habitat 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.

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

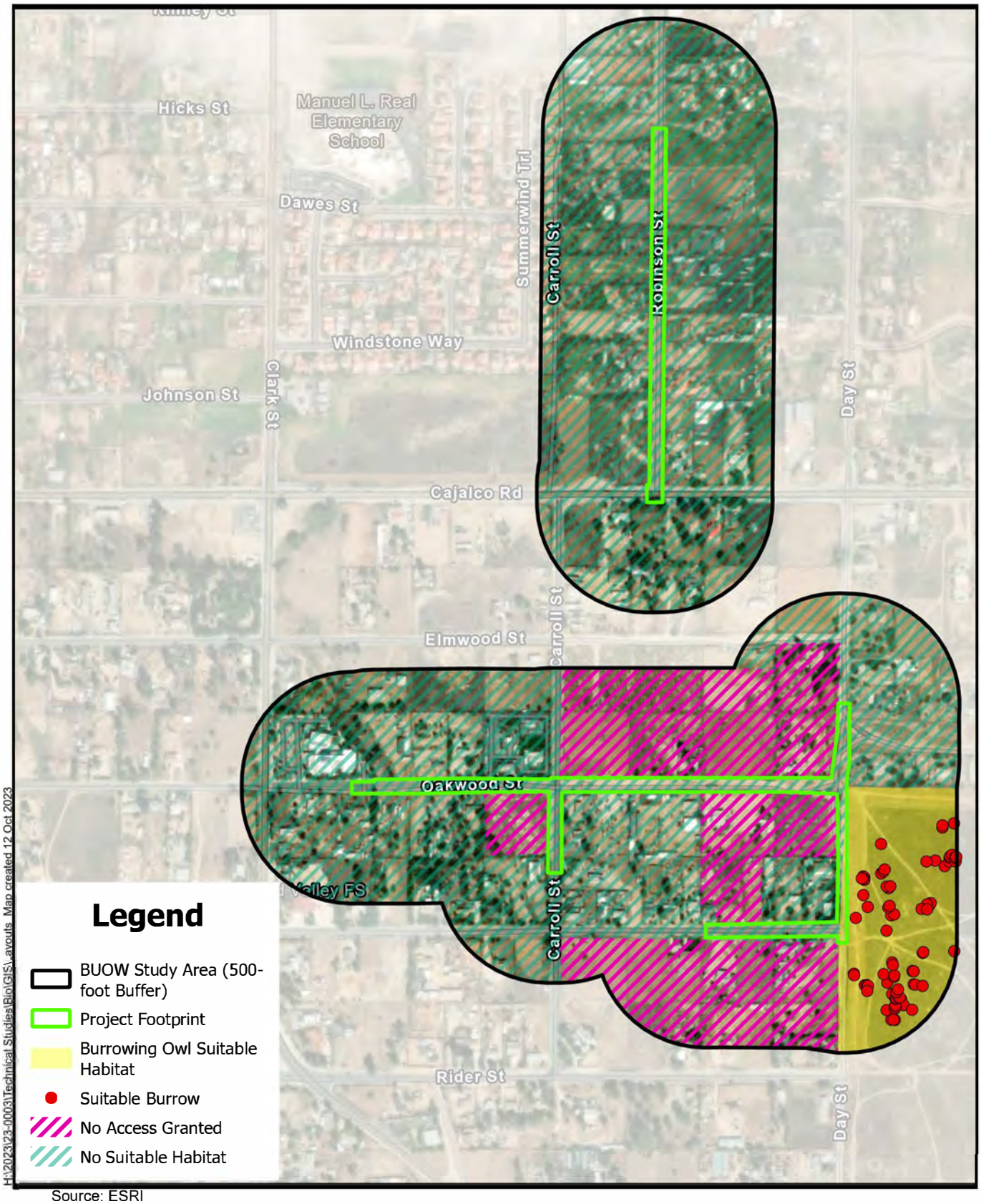

Figure 9-A - Burrowing Owl Survey Results (Mead Valley Areas 1 and 2)
Mead Valley and Good Hope Water Improvements Project

ALBERT A. WEBB ASSOCIATES

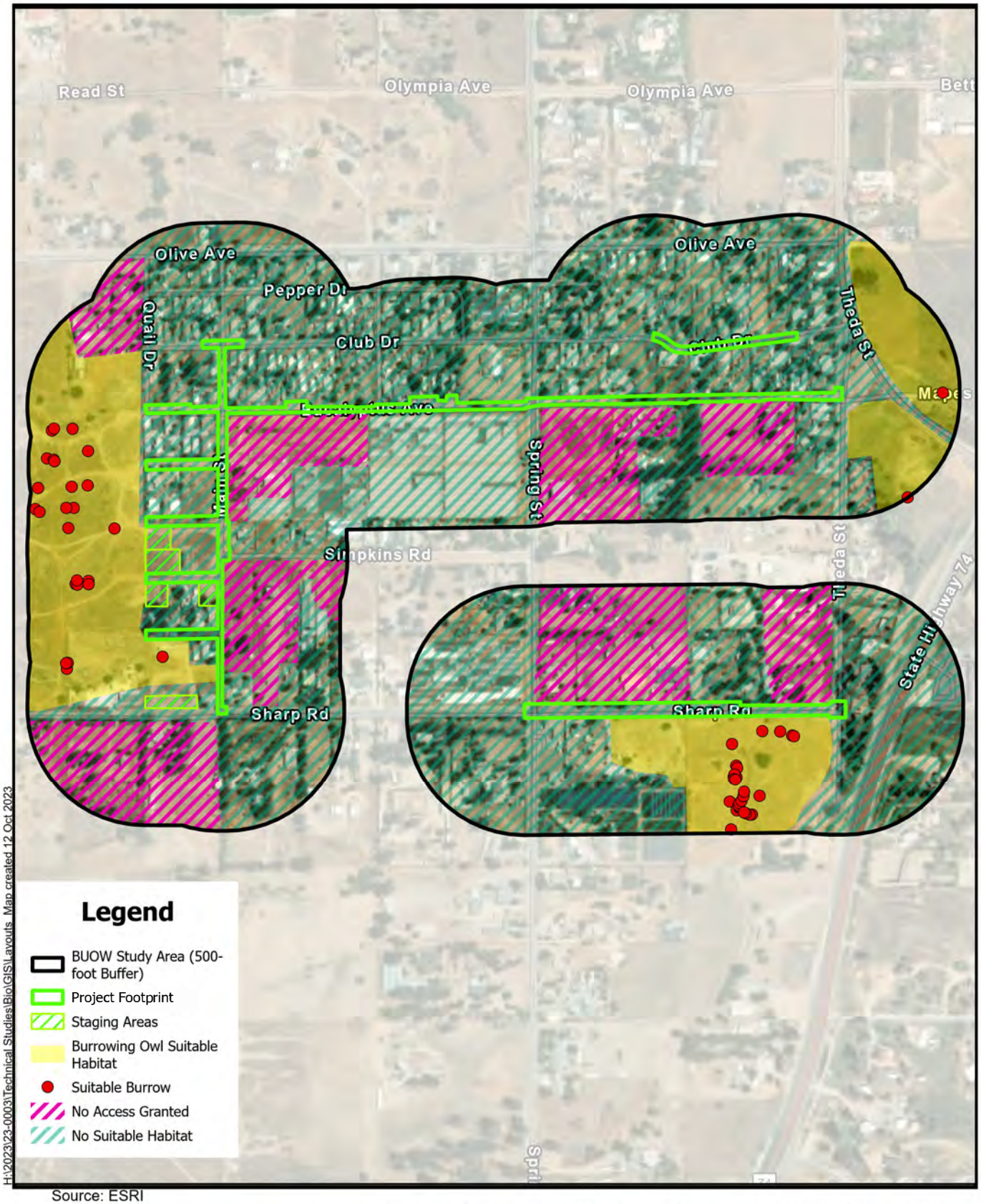

Figure 9-B - Burrowing Owl Survey Results (Good Hope)
Mead Valley and Good Hope Water Improvements Project

ALBERT A. WEBB ASSOCIATES

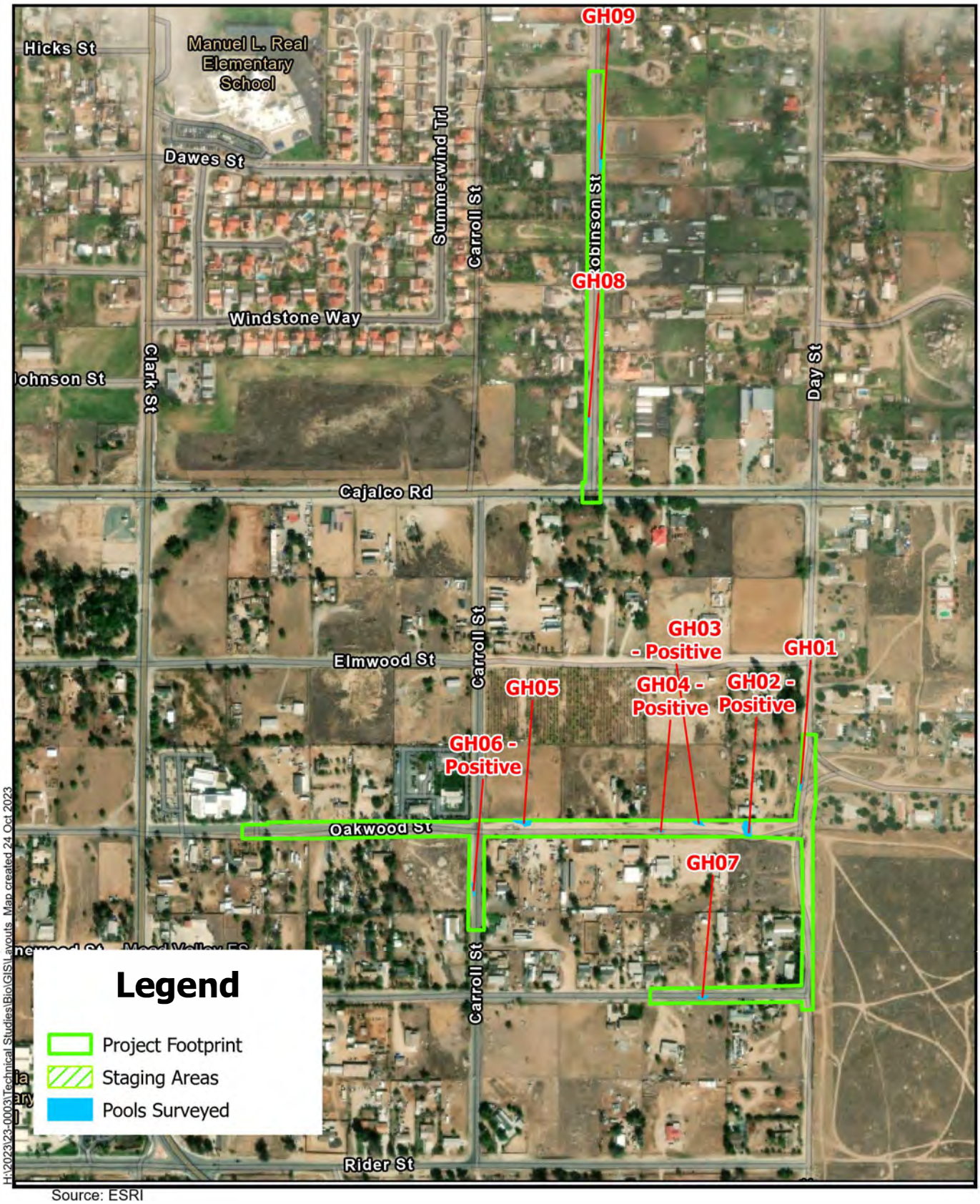

Figure 10-A - Fairy Shrimp Survey Results (Mead Valley Areas 1 and 2)
Mead Valley and Good Hope Water Improvements Project

0 170 340 680 Feet

ALBERT A. WEBB ASSOCIATES

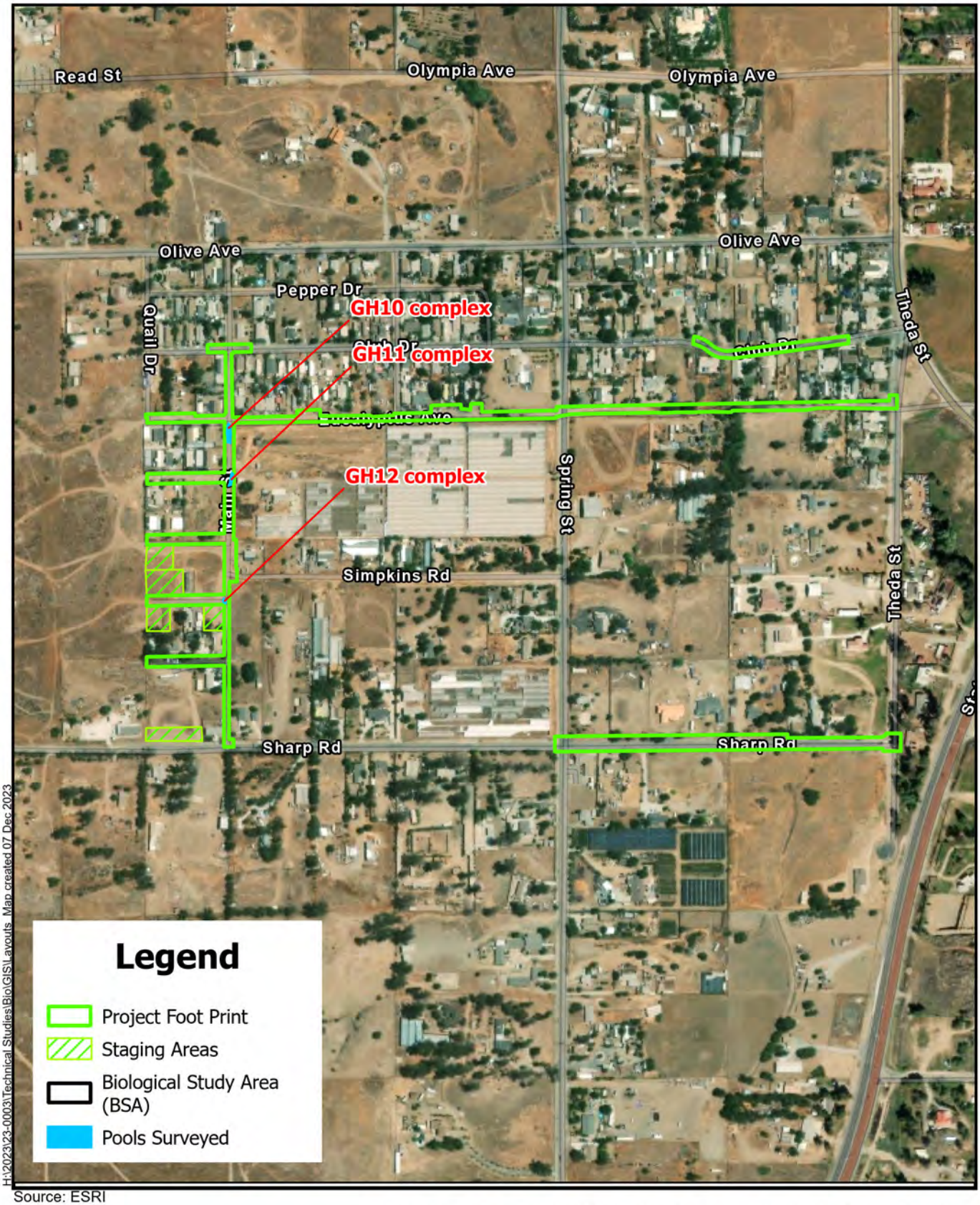

Figure 10-B - Fairy Shrimp Survey Results (Good Hope)
Mead Valley and Good Hope Water Improvements Project

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 Study for Eastern Municipal Water District's Good Hope and Mead Valley 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 and literature review, a cultural resources survey, and preparation of a cultural resources technical report. The complete report is summarized in this IS/MND. No previously recorded cultural resources were identified within the Project alignment, which includes the staging areas as a result of the records search, and no cultural resources were identified within the Project alignment during the field survey.

a) Less than Significant Impact with Mitigation Incorporated

On August 9, 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 alignment. (AE-A 2023, p. 1.) The CHRIS record search included a search of the California Inventory of Historic Resources, the Office of Historic Preservation (OHP) Archeological Resources Directory, and the OHP Built Environment Resources Directory (which includes the National Register of Historic Places, California Register of Historical Resources, California State Historical Landmarks, California State Points of Historical Interest, and historic building surveys).

The records search found 30 cultural resource studies that had been previously conducted within a 0.5-mile radius of the Project alignment between 1977 and 2012. From these studies, 54 previously recorded cultural resources were identified within a 0.5-mile radius of the proposed Project alignment. Of the 54 previously recorded cultural resources, 30 are historic/prehistoric and the remaining 24 are built environment resources. Two cultural resources are within the Project alignment, one historical resource: the Pinacate Mining District and one built environment resources, the Colorado River Aqueduct. (AE-A 2023, pp. 7-8, 10.)

The Pinacate Mining District encompasses the entirety of the Good Hope Area of the Project alignment. This resource was named a Point of Historical Interest in 1980. Originally recorded in 1982, the district contains several mines, many of which have been filled in. This district also contains cabin foundations, prospect pits, and refuse deposits. The cultural resource site does not appear to have been evaluated for listing on the California Register of Historical Resources by any of the previous recorders. (AE-A 2023, pp. 8 -10.)

The Colorado River Aqueduct is within Mead Valley Area 1 and Area 2 of the Project alignment. This resource has been recommended as eligible for listing in the National Register of Historic Places. A review of historical topographic maps and aerial photographs of the proposed Project and a 0.5-mile radius from the early 1900s to the late 1900s shows multiple structures and roads. One feature to note is the Val Verde Tunnel at Day Street, that ties into the westernmost extension of the Colorado River Aqueduct. No other historical features were observed in any of the historical maps. (AE-A 2023, p. 9.)

A pedestrian field survey was conducted for the Project alignment and staging areas on August 17, 2023. The purpose of the survey was to identify cultural resources that may be present along the Project alignment and the potential staging areas. Approximately 90 percent of the Project alignment and surrounding area was previously developed with paved roads, graded dirt roads, or plowed private lots. Ground visibility varied from 0 percent on paved surfaces to 95 percent within dirt roads, shoulders, and medians. Due to private property access restrictions, several plowed lots designated as staging areas on the west side of Main Street were not surveyed on foot. Instead, these lots were observed from the roadways. As mentioned above, the Pinacate Mining District encompasses the entirety of the Good Hope area of the Project alignment. (AE-A 2023, p. 10.) During the pedestrian survey, no resources or features associated with the mining district were observed. (AE-A 2023, p. 9.) The pedestrian survey did not identify any new cultural resources within the Project alignment and potential staging areas and confirmed that known resources associated with the Pinacate Mining District would not be impacted by the proposed Project. Additionally, impacts to the Colorado River Aqueduct would not occur since this resource is outside of the Project alignment's vertical limits. (AE-A 2023, pp 10-11.)

As concluded by the Cultural Resource Study, no significant historical resources were identified within the Project alignment. Although no known historical resources would be

affected by the proposed Project, construction has the potential to encounter previously unknown archaeological and historical resources. While encountering unknown historical resources is unlikely based on the previously disturbed condition of the proposed Project alignment and surrounding area's ground disturbance from previous development, because the Project alignment is near historical resources the Cultural Resource Study recommends archaeological monitoring. **Mitigation Measure CUL-1** and **Mitigation Measure CUL-2** will be implemented to reduce impacts to historic cultural resources. **Mitigation Measure CUL-1** requires that archaeological monitoring and the preparation of the 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 two cultural resources were recorded within the Project alignment. One of the resources was a historical resource, the Pinacate Mining District, and the other was an archeological resource: the Colorado River Aqueduct. The Colorado River Aqueduct is located within the Mead Valley Area of the Project alignment. Specifically, the Colorado Aqueduct crosses underground through the Project alignment at Day Street. (AE-A 2023, p. 10.) The Colorado River Aqueduct and its various segments were constructed in the early 1930s. The aqueduct begins at the Whitsett Intake Pumping Plant in Lake Havasu, California, and extends approximately 242 miles to its terminus at Lake Mathews. The Colorado River Aqueduct has been recommended as eligible for listing in the National Register of Historic Places (NRHP). A portion of the aqueduct was determined eligible for the NRHP with State Historic Preservation Officers (SHPO) concurrence.

The pedestrian field survey did not identify any new archaeological resources within the Project alignment. The Colorado River Aqueduct crosses under the Mead Valley Area of the Project alignment, however it is outside the Project's vertical limits of 5-feet excavation, and 10-feet excavation at future storm drain crossings. Although there are no surface indicators of archaeological resources within the Project alignment, much of the pipeline alignment is obscured by pavement and landscaping and it is possible that unknown buried or obscured archaeological resources may exist. The Cultural Resource Study recommends archeological monitoring. **Mitigation Measure CUL-1** and **Mitigation Measure CUL-2** are required to reduce impacts to historic cultural resources. **Mitigation Measure CUL-1** requires that archaeological monitoring and the preparation of the 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 archeological resources, if encountered during construction, to less than significant.

c) Less than Significant Impact with Mitigation Incorporated

Previous land uses along the proposed Project alignments and staging areas do not include known cemetery use and the Project alignment and staging areas are 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 Consulting Tribe(s) and their designated the 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 at the Project alignment and 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.)

Riverside County 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 Riverside County'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, Riverside County 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.)

Riverside County 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, Riverside County 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 (e.g., hydrants) 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

Riverside County'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. Riverside County'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 may be 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, twelve (12) test borings were drilled within and near the Project alignment. The borings drilled to the approximate depths of 13 to 41 feet below the existing ground surface found that Project alignment consisted of soils that include: Asphalt Concrete (AC) pavement section, fill, old alluvial-fan deposits, Val Verde tonalite, massive-textured tonalite, and Schist. (ATLAS 2023, p. 3.) Groundwater was encountered in depths as shallow as 9 feet below ground surface. The approximate depth to bedrock ranged from 5.5 feet to 10 feet. The bedrock material ranged from weathered rock, decomposed rock, and intensely weathered metamorphic rock. (ATLAS 2023, pp. 3-4.)

The Project is located 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. 3.)

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 alignment is located in the coastal plain and the subsurface materials

consists of Asphalt Concrete (AC) pavement section, fill, old alluvial-fan deposits, Val Verde tonalite, massive-textured tonalite, and Schist. (ATLAS 2023, pp. 2–3.)

The closest active fault to the Project alignment and the staging areas is the Glen Ivy North fault more than 7 miles southwest of the Project Alignment. (ATLAS 2023, p. 5.) The Project alignment and the staging areas are not located in an Alquist-Priolo Earthquake Fault Zone. (ATLAS 2023, p. 5.)

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 alignment and staging areas are not within a known fault. (DOC 2022.) The Project alignment 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 alignment and the staging areas is the Glen Ivy North fault located southwest of the Project alignment. (ATLAS 2023, p. 5; DPC-B 2023.) The shortest distance between this Glen Ivy North fault and the Project alignment is 6 miles. Due to the distance of the Glen Ivy North fault, there is no potential for surface fault rupture in the Project alignment.

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 alignment. 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 alignment.

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. 6.) Shallow hard material was mapped along the Project alignment 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 alignment and determined that slope instabilities, or landslides, to affect the Project alignment were considered low. (ATLAS 2023, p. 6.) 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 (BMPs) 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 alignment has a low potential for liquefaction and settlement because of the dense soils, depth to groundwater, and absence of liquefiable material. (ATLAS 2023, p. 6.) The Project alignment 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 alignment were evaluated and determined that they have a low to medium potential for expansion potential. (ATLAS 2023, p. 7.) 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. Therefore, no impacts would occur.

f) Less than Significant Impact with Mitigation Incorporated

A *Paleontological Technical Memorandum for the Eastern Municipal Water District Good Hope and Mead Valley Water-System Improvements Project* (Paleontological Resource Assessment Report) dated October 11, 2023, was prepared by Applied Earthworks and included as Appendix E of this IS. The paleontological study 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.

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 Natural History Museum of Los Angeles County (NHMLAC) and the Western Science Center (WSC) in Hemet for a list of known fossil localities for the Project alignment area and within a one-mile radius. Riverside County developed a countywide ranking system that establishes detailed protocols for the assessment of the paleontological sensitivity of a project area and outlines measures to follow in order to mitigate adverse impacts to known or unknown fossil resources during project development. The Paleontological Resource Assessment Report uses the County's ranking system to determine the Project's impacts to paleontological resources. The County's paleontological sensitivity map indicates that the paleontological sensitivity designation of the Project alignment is low to undetermined. (AE-B 2023, pp. 6, 12.)

To assess the paleontological sensitivity of geologic units mapped at the ground surface and those likely to occur in the subsurface of the Project alignment, a desktop study review and pedestrian field survey was conducted. Published geologic maps and paleontological literature for the region were also reviewed. Additionally, searches were conducted on the online Paleobiology Database (PBDB) and the University of California Museum of Paleontology (UCMP). The PBDB lists a large collection of museum records and publications of fossil material, whereas the UCMP is the largest repository of fossils on the West Coast of the U.S., with an older history of collection than several other regional natural history museums. (AE-B 2023, pp. 6, 12.)

The records search from NHMLAC, PBDB, and UCMP reported that no fossil localities were recorded within a one-mile radius of the Project alignment. The closest fossil localities are approximately more than 5.5 miles from the Project alignment. The LACM VP 5168, LACM (CIT) 570–(CIT) 572, and LACM VP 6059 are fossil localities from an unknown geologic formation from the Pleistocene era. These localities recovered various specimen including horse, peccary, and camel. (AE-B 2023, p.9.)

A pedestrian field survey was conducted on August 17, 2023. The purpose of the survey was to confirm the presence or absence of mapped geologic units, evaluate geologic exposures for their potential to yield subsurface fossil material, and investigate exposed fossils, if any. Most of the ground surface in the Project alignment was disturbed by previous infrastructure, residential, and commercial development. Because of the previous disturbances, many portions of the Project alignment do not provide intact geologic information, including the rights-of-ways of all paved or graded roads. In addition, the proposed staging areas within the Good Hope Area were examined from the existing right-of-way as they were not accessible during the survey. The Mead Valley Area of the Project alignment contained reddish-brown deposits consisting of consolidated silty sands that match descriptions of Pleistocene alluvial units which have proven to be highly fossiliferous throughout inland valleys of Riverside and San Bernardino Counties. (AE-B 2023, pp. 8, 10.) Outside of the Mead Valley Area 2, east of Day Street, massive-textured gray tonalite outcrops were observed. Although, no paleontological resources were observed during the pedestrian survey, the Project alignment contains three Pleistocene alluvial units that have yielded a wide variety of megafauna, such as mammoths, ground sloths, dire wolves, saber-toothed cats,

horses, camels, and bison, as well as numerous invertebrate and plant taxa in Riverside and San Bernardino counties. (AE-B 2023, pp. 8, 10, 12.)

As concluded by the *Paleontological Technical Memorandum*, no known paleontological resources were identified within the Project alignment and known paleontological resources would not be affected by the proposed Project. However, because trenching during construction would occur at depths of 5 feet and at 10 feet at future storm drain crossing, the Project has the potential to encounter previously unknown paleontological resources. Moreover, the Project alignment contains alluvial units that have the potential to yield identifiable significant fossils sediments. 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 Workers Environmental Awareness Program (WEAP) are recommended. Therefore, with the 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.).

Riverside County 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 seven 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 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: Proposed Project GHG Emissions per Year ($MTCO_2e$/year)** 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				
Mead Valley Area 1 Segment 2024	28.10	<0.005	<0.005	0.01	28.30
Mead valley Area 2 Segment 2024	85.30	<0.005	<0.005	0.03	85.90
Good Hope Area Segment 2024	172.00	0.01	<0.005	0.05	174.00
Total	**285.4**	**0.01**	**0.00**	**0.09**	**288.20**
Construction (amortized over 30 years)					9.61
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 288.20 $MTCO_2e$ in 2024. Amortized over a 30-year period, the Project would generate approximately 9.61 $MTCO_2e$ 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. The Scoping Plan also recognizes that about two percent of the total energy used in the state is related to water conveyance; it calls for, increased water conservation and efficiency, improved coordination and management of various water supplies, greater understanding of the water-energy nexus, deployment of new technologies in drinking water treatment, groundwater remediation and recharge, and potentially brackish and seawater desalination. (CDWR 2023.)

The proposed Project improves operational flexibility for EMWD, thus improving management of water resources. The proposed Project would not interfere with existing County or regional programs intended to reduce energy and improve water use efficiency and 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	[ ]	[X]	[ ]	[ ]

release of hazardous materials into the environment?				
c) Emit hazardous emissions or handle hazardous or acutely hazardous 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 adopted emergency response plan or emergency evacuation plan?	[ ]	[ ]	[X]	[ ]
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 water lines and aboveground valves, fire hydrants 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 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. The Project would include a connection to an existing 8-inch diameter ACP in Robinson Road, which may result in the release of asbestos. As described in *Section 2.7 Environmental Commitments*, EMWD would comply with federal and State regulations governing the renovation, demolition, construction, alteration, repair, maintenance, or renovation of structures, substrates, or portions thereof, that contain asbestos. 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 alignment 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 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 alignment, 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 alignment and it's 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 alignment 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 alignment 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 Project alignment 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 3.4 miles east from the Good Hope Area portion of the Project alignment. 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 the 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) identifies the County's hazards, reviews and assesses past disaster occurrences, estimates the probability of future occurrences, and sets 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 alignment can be accessed by various nearby roadways including Cajalco Road, Day Street, Clark Street, in the Mead Valley Area and Sharp Road, Olive Drive, Theada Street, and Spring Street in the Good Hope Area. 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 of a Traffic Control Plan that would coordinate lane closures, access, and construction work hours in order to minimize potential impacts associated with emergency response, 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 with Mitigation Incorporated

The proposed Project is the installation, operation, and maintenance of an underground pipeline and several above-ground valves, hydrants, and other appurtenances. Operation of these types of infrastructure is not typically associated with fire risk. (See *Section 3.20 Wildfire*). However, portions of the proposed Project alignment 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 capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or	[ ]	[ ]	[X]	[ ]

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

The Project alignment 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 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) underlies 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 Springs 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 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 alignment 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 16.33 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 is not anticipated, but should it be needed, it would be either 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 water through the proposed pipeline to EMWD's potable water system and flushing pipes. 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 potable water distribution system within the disadvantaged communities of Mead Valley and Good Hope by closing gaps between existing water mains and eliminating remote water meters and install new water meters. 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

The proposed Project pipelines would be constructed in existing roadways which would be restored to pre-construction conditions, and thus would not permanently increase total impervious surface area. The above ground valves, air valves, blow-off valves, and fire hydrants 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 would limit erosion and sedimentation. As a result, the proposed Project facilities 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, the proposed Project would have a less than significant impact.

d) No Impact

A tsunami is a large ocean wave, caused by earthquakes or major ground movement. The proposed Project alignment 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 alignment are Lake Perris, approximately 5.5 miles east and Lake Elsinore approximately 6.50 miles to the west may have the potential for seismically induced seiche. However, the Project alignment has low risk for flooding from a seiche due to the distance of the Project 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 various roadways with the Project alignment which 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 discussed previously, 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 potable water for use in EMWD's service area. 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 alignment 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 increase fire flow capacity, provide long-term accessibility, serviceability, and longevity to the Mead Valley and Good Hope communities. 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 communities of Mead Valley and Good Hope. 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 Project alignment and staging areas include residential, rural residential, residential agricultural, and vacant and undeveloped land. The pipelines would be constructed underground and the associated appurtenances would be constructed aboveground within various paved and unpaved roadways with the Project alignment as shown on **Figure 6 – Existing Conditions: Mead Valley Area 1, Figure 7 – Existing Conditions: Mead Valley Area 2**, and **Figure 8 – Existing Conditions: Good Hope Area**.

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 distributed vacant land and within the unpaved shoulder of Robinson Street. The proposed Project would not permanently interfere with the 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 or Good Hope, 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* above, no components of the Project alignment are located within existing or proposed criteria areas or reserves as defined in the Western Riverside MSHCP. The proposed Project would not impact wildlife movement corridors and habitat linkages because none are present in the Project area and 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	[ ]	[ ]	[X]	[ ]

would be of value to the region and the residents of the state?				
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	[ ]	[ ]	[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. (GPEIR,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 alignment 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 alignment 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	[ ]	[ ]	[ ]	[X]

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?

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. 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 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 manufactures.

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 Project is expected to last approximately twenty months. The pipeline trenching, and installation would involve the most noise-generating activities from use of heavy construction equipment and hauling. The offroad construction equipment that would be used for this Project is identified in *Section 2.5.3, 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 Project alignment would increase ambient noise levels. The Project alignment is adjacent to residential properties. However, construction activities and the associated noise impacts would be temporary, would move linearly along the Project alignment as the pipelines are constructed and not remain in the same location for an extended period of time, 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 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 alignment.

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 alignment. Pipeline construction would occur near sensitive receptors, including single-family and multi-family residences and one church. 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 Project alignment is not located within two miles of an airport. The Project alignment is within the MARB/IPA ALUCP, located northeast of the Project alignment and is within compatibility Zone E. This zone is designated as having low noise and low aircraft safety risks. (ALUC 2014.)

The Project alignment is approximately 2.3 miles from MARB/IPA ALUCP and would be outside the 60-CNEL noise contour for the airport. (ALUC 2014.) The Project would not expose residences or workers to excessive aircraft noise and there would be no impacts.

Mitigation Measures:

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

NOI-1 Construction Noise Reduction Measures.

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

- Prior to construction, 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 construction commencement, 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	[ ]	[ ]	[ ]	[X]

proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?				
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	[ ]	[ ]	[ ]	[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 planned EMWD's water service infrastructure to provide long-term accessibility, serviceability, and longevity to the Mead Valley and Good Hope communities. Operation of the Project would supply existing and projected water demand and is consistent with planned growth anticipated in the 2020 UWMP. 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 paved and unpaved roadways and the staging would occur within vacant lots and within the unpaved shoulder of Robinson Street. 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 stations to the Project alignment are the Riverside County Fire Station No 59 located at 21510 Pinewood Street, approximately 0.2 miles southeast from the Mead Valley 2 Area portion of the Project and the Riverside County Fire Station No 9 located at 21565 Steele Peak Drive, approximately one-half mile north of the Good Hope Area of the Project.

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 8 miles northeast from the Mead Valley Area 1 of the Project.

Schools

Children who reside in the Mead Valley Area 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, located approximately 0.2 miles east from the Mead Valley Area 1, and Columbia Elementary, located approximately 0.2 miles south from the Mead Valley Area 2. Children who reside in the Good Hope Area attend schools within the Perris Elementary School District and Perris Union High School District. These two districts operate 20 preschools, elementary schools, middle schools, high schools, and alternative schools within Riverside County. (PESD, PUHSD.) California Rancho School is a private school located approximately 0.4 miles to the northeast of the Good Hope Area.

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 adjacent to the Mead Valley Area 2.

Hospitals

There are two hospitals near the Project alignment vicinity. The Kindred Hospital located at 2224 Medical Center Drive in the City of Perris is approximately five miles northeast of the Good Hope Area and Kaiser Permanente Moreno Valley Medical Center located at 27300 Iris Avenue is approximately seven miles northeast from the Mead Valley Area 1.

a.i.) No Impact

The proposed Project would add fire hydrants within the Project alignment which would improve fire protection in the area. 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 responses to the proposed Project alignment area. 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. 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 or recreational facilities within the Project alignment. 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 the Project

alignment. 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 Mead Valley alignments are roughly two (2) miles west of Interstate-215 (I-215) while the Good Hope alignment is roughly 5 miles from I-215.

The major roadway in the Project vicinity within the Mead Valley Area 1 and Mead Area Valley Area 2 is Cajalco Road. The Mead Valley Area 2 portion of the Project alignment

is located roughly one-half mile from State Route 74. The Project alignment is on paved and unpaved roads. Local access within the Project alignment is provided by Cajalco Road, Day Street, and Clark Street, in the Mead Valley Area. In the Good Hope Area, local access is provided via Sharp Road, Olive Drive, Theada Street, and Spring Street.

Active bus routes in the Mead Valley area are operated by Riverside Transit Agency (RTA) route 41 along Cajalco Road. The RTA bus routes in the Good Hope area of the Project are on Ellis Avenue and Theda Street located roughly 1.5 miles to the north. (RTA 2023.)

The Riverside County Transportation Commission owns a commuter rail line parallel to I-215 (roughly 2 miles west of the Mead Valley Area portion of the Project alignment), 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 stops at Cajalco Road near Clark Street. (RTA 2023.) As discussed under *Section 3.16 Recreation,* Cajalco Road is classified as a Class II Bike Lane.

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 and aboveground appurtenances. Project construction is estimated to take approximately twenty months. Construction would take place during daytime hours and no construction activities are planned during nighttime . 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 and temporary closure of bicycle lanes and sidewalks at the intersection of Robinson Street and

Cajalco Road. However, with the implementation of a Traffic Control Plan, as described in *Section 2.7 Environmental Commitments*, impacts would be less than significant.

As discussed in *Section 3.3 Air Quality*, Project construction would require approximately 40 round-trip worker trips per day during 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 Vehicles 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 40 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, hydrants, 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, with 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 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 Impact 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 30, 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: the Pechanga Band of Luiseño 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	06/30/2023	Info Only	N/A
Morongo Band of Mission Indians	Laura Chatterton	06/30/2023	Accepted	Did not Respond
Pechanga Band of Luiseño Indians	Ebru Ozdil	06/30/2023	Accepted	10/05/2023
Rincon Band of Luiseño Indians	Cheryl Madrigal	06/30/2023	Undecided	N/A
San Manuel Band of Mission Indians	Ryan Nordness	06/30/2023	Declined	N/A
Soboba Band of Luiseño Indians	Joe Ontiveros	06/30/2023	Did not Respond	N/A

During the consultation meeting, the responding Tribe highlighted their concerns for the general area noting that within that it is within 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 Measure TRI-1** through **Mitigation Measure 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 alignment 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 proposed Project alignment 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 alignment. 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.)

Stormwater

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, including 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). (GPEIR, 4.8.1.) Natural gas service in the Project Area is provided by the Southern California Gas Company (SoCal Gas). (GPEIR, 4.8.1.) 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 potable water 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 potable water delivery system as described and analyzed in this IS. Construction of the Project would occur within the paved and unpaved roadways of the Project alignment 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 water transmission 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 water service infrastructure within its existing service area to increase fire flow capacity, provide long-term accessibility, serviceability, and longevity to the Mead Valley and Good Hope communities. 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 "3.19b" 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. 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 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 alignment. 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 Impact

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	[ ]	[ ]	[X]	[ ]

ongoing impacts to the environment?				
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). Fire Hazard Severity Zones fall into the following classifications: Moderate, High, and Very High. The Mead Valley Area1 and Mead Valley Are 2 are outside of the State Responsibility Areas. However, the Good Hope Area is within 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) identifies the County's hazards, reviews and assesses past disaster occurrences, estimates the probability of future occurrences, and sets goals to mitigate potential risks to reduce or eliminate long-term risk to people and property from natural and human-caused hazards. (MJLHMP 2023.)

a) Less than Significant

Portions of the Project alignment 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, 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 water lines and aboveground valves, fire hydrants 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 to 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.

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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	[ ]	[X]	[ ]	[ ]

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?				
b) Does the project have impacts, that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects?	[ ]	[ ]	[X]	[ ]
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 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*, indicate that with implementation of **Mitigation Measure BIO-1** and **Mitigation Measure BIO-2** 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*, there are no known resources associated with the Pinacate Mining District or the Colorado River Aqueduct within the Project alignment. 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** and **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 TR-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 near the Project alignment include Riverside County Flood Control and Water Conservation District (RCFCWCD) proposed storm drainage facilities along Club Drive and Spring Street, near Eucalyptus Avenue. It is estimated that RCFCWCD's project would start before the proposed Project. (PDR, p. 20.) Per RCFCWCD, the preferred method for installing facilities crossing under RCFCWCD utilities is jack and bore and trenchless excavation techniques are expected at RCFCWCD's future storm drainage facilities. (PDR, p. 11.)

EMWD is proposing sewer improvements along Cajalco Road, from Day Street to Carpinus Street. This proposed sewer improvement project may commence as early as April 2024 and is near Mead Valley Area 1 and Mead Valley Area 2.

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 alignment 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

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

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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 and Good Hope Water Lines 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 and Good Hope Waterlines Project (Project). The Project involves the construction of approximately 13,450 linear feet of 8-inch diameter polyvinyl chloride (PVC) potable water main pipelines and remote water meters and other associated appurtenances to increase fire flow capacity, provide long-term accessibility, serviceability, and longevity within 3 distinct locations within Mead Valley and Good Hope communities in Riverside County. The Project is assumed to construct waterlines within the Mead Valley Community simultaneously to the construction of the Good Hope Community waterlines.

▪ 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. The Project consists of waterline construction and improvements. 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 16.33 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 alignment contains three segments. The Mead Valley Area 1 segment consists of construction of 1,650 linear foot (LF) of new 8-inch diameter PVC water main within the Mead Valley community along portions of Robinson Street roadway, using open trench construction. The Mead Valley Area 2 segment consists of the construction of 4,000 LF of new 8-inch diameter PVC along portions of Oakwood Street, Day Street, and Pinewood Street. The Good Hope Area Segment consists of construction of 7,800 LF of new 8-inch PVC water main within the Good Hope community along portions of Eucalyptus Avenue (west of Spring Street), Club Drive (between Theda Street and Spring Street), Main Street, Maple Avenue, Pine Street, Cherry Lane, and Maguglin Way roadway right of way using open trench construction. The Project was modeled as a linear road construction project. Each segment will start with trenching as the first construction activity, which was modeled as grading and excavation. The second construction activity for each segment is paving, which was modeled as paving. The modeled construction schedule for each activity is shown below:

Mead Valley Area 1 Segment

Construction Activity	Start Date	End Date	Total Working Days
Trenching	04/01/2024	05/3/2024	25 days
Paving	05/04/2024	05/10/2024	5 days

Mead Valley Area 2 Segment

Construction Activity	Start Date	End Date	Total Working Days
Trenching	05/11/2024	08/16/2024	70 days
Paving	08/17/2024	08/28/2024	8 days

Good Hope Area Segment

Construction Activity	Start Date	End Date	Total Working Days
Trenching	04/01/2024	10/08/2024	137 days
Paving	10/09/2024	10/17/2024	7 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 Per Phase		
		Mead Valley Area 1 Segment	Mead valley Area 2 Segment	Good Hope Area Segment
Trenching	Crawler Tractors	0	1	0
	Excavator	2	2	2
	Grader	0	0	1
	Rollers	2	2	2
	Rubber Tired Loaders	1	1	1
	Tractor/Loader/Backhoes	2	2	2
Paving	Pavers	1	1	1
	Paving Equipment	1	1	1
	Rollers	3	3	3
	Tractors/Loaders/Backhoes	2	2	2

- 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 14.87 acres of asphalt pavement would be disturbed for all three segments.

- 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**
Mead Valley Area 1 Segment 2024	1.07	8.45	12.50	0.02	0.68	0.43
Mead Valley Area 2 Segment 2024	1.41	10.90	15.30	0.02	1.02	0.62
Good Hope Area Segment 2024	1.46	11.50	16.40	0.02	0.99	0.59
Maximum	**2.87**	**22.40**	**31.70**	**0.04**	**2.01**	**1.21**
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. Maximums are showing the sum of maximum daily construction emissions for Mead Valley Area 1 Segment 2024 and Good Hope Area Segment 2024 or the sum of maximum daily construction emissions for Mead Valley Area 2 Segment 2024 and Good Hope Area Segment 2024 because these activities are assumed to overlap.

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 16.33 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.

[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.)

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**
Mead Valley Area 1 Segment - Trenching	7.74	11.00	0.35	0.33
Mead Valley Area 2 Segment - Trenching	**10.60**	**13.50**	**0.71**	**0.53**
Good Hope Area Segment - Trenching	**11.10**	**14.70**	**0.68**	**0.51**
Mead Valley Area 1 Segment - Paving	8.15	10.90	0.39	0.36
Mead Valley Area 2 Segment - Paving	8.15	10.90	0.39	0.36
Good Hope Area Segment - Paving	8.15	10.90	0.39	0.36
Maximum	**21.70**	**28.20**	**1.39**	**1.04**
Exceeds Threshold?	**No**	**No**	**No**	**No**

Note: Maximums are the greater of either the sum of Mead Valley Area1 Segment trenching and Good Hope Area Segment Trenching, the sum of Mead Valley Area 2 Segment Trenching and Good Hope Area Trenching, or the sum of Good Hope Area Trenching and either Mead Valley Area 1 Segment Paving or Mead Valley Area 2 Segment Paving, because these activities 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 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.

[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

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
Mead Valley Area 1 Segment 2024	28.10	<0.005	<0.005	0.01	28.30
Mead valley Area 2 Segment 2024	85.30	<0.005	<0.005	0.03	85.90
Good Hope Area Segment 2024	172.00	0.01	<0.005	0.05	174.00
Total	**285.40**	**0.01**	**0.00**	**0.09**	**288.20**
				Amortized	**9.61**

Evaluation of the table above indicates that an estimated 288.20 $MTCO_2E$ will occur from Project construction equipment over the course of the estimated approximately twenty-month construction period, which is approximately 9.61 $MTCO_2E$ 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 water 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.

[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).

CALEEMOD OUTPUT FILES

Mead Valley and Good Hope Water Improvements Project (MV1 Segment) Detailed Report

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1.1. Basic Project Information

Data Field	Value
Project Name	Mead Valley and Good Hope Water Improvements Project (MV1 Segment)
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	33.83362783115072, -117.28245687727744
County	Riverside-South Coast
City	Unincorporated
Air District	South Coast AQMD
Air Basin	South Coast
TAZ	5578
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	0.31	Mile	2.36	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	8.45	12.5	0.02	0.40	0.28	0.68	0.36	0.07	0.43	—	2,087	2,087	0.08	0.05	1.52	2,105
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.10	0.09	0.67	1.00	< 0.005	0.03	0.02	0.05	0.03	0.01	0.03	—	170	170	0.01	< 0.005	0.05	171
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.02	0.02	0.12	0.18	< 0.005	0.01	< 0.005	0.01	0.01	< 0.005	0.01	—	28.1	28.1	< 0.005	< 0.005	0.01	28.3

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	8.45	12.5	0.02	0.40	0.28	0.68	0.36	0.07	0.43	—	2,087	2,087	0.08	0.05	1.52	2,105
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.10	0.09	0.67	1.00	< 0.005	0.03	0.02	0.05	0.03	0.01	0.03	—	170	170	0.01	< 0.005	0.05	171
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.02	0.02	0.12	0.18	< 0.005	0.01	< 0.005	0.01	0.01	< 0.005	0.01	—	28.1	28.1	< 0.005	< 0.005	0.01	28.3

3. Construction Emissions Details

3.1. Trenching (2024) - Unmitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.08	0.07	0.53	0.75	< 0.005	0.02	—	0.02	0.02	—	0.02	—	113	113	< 0.005	< 0.005	—	113

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	0.01	0.01	0.10	0.14	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	18.7	18.7	< 0.005	< 0.005	—	18.8
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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.08	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	16.1	16.1	< 0.005	< 0.005	0.03	16.3
Vendor	< 0.005	< 0.005	0.02	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	12.8	12.8	< 0.005	< 0.005	0.02	13.4
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
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	2.66	2.66	< 0.005	< 0.005	< 0.005	2.70
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	2.11	2.11	< 0.005	< 0.005	< 0.005	2.21

Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.3. Paving (2024) - Unmitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.14	0.96	8.15	10.9	0.01	0.39	—	0.39	0.36	—	0.36	—	1,620	1,620	0.07	0.01	—	1,626
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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.01	0.11	0.15	< 0.005	0.01	—	0.01	< 0.005	—	< 0.005	—	22.2	22.2	< 0.005	< 0.005	—	22.3
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.02	0.03	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	3.67	3.67	< 0.005	< 0.005	—	3.69
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.21	3.21	< 0.005	< 0.005	0.01	3.26
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	2.55	2.55	< 0.005	< 0.005	< 0.005	2.67
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.53	0.53	< 0.005	< 0.005	< 0.005	0.54
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.42	0.42	< 0.005	< 0.005	< 0.005	0.44
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	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Remove	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase	Phase Description
Trenching	Linear, Grading & Excavation	4/1/2024	5/3/2024	5.00	25.0	—
Paving	Linear, Paving	5/4/2024	5/10/2024	5.00	5.00	—

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
Trenching	Excavators	Diesel	Average	2.00	8.00	36.0	0.38
Trenching	Rollers	Diesel	Average	2.00	8.00	36.0	0.38
Trenching	Rubber Tired Loaders	Diesel	Average	1.00	8.00	150	0.36
Trenching	Tractors/Loaders/Backhoes	Diesel	Average	2.00	8.00	84.0	0.37
Paving	Pavers	Diesel	Average	1.00	8.00	81.0	0.42
Paving	Paving Equipment	Diesel	Average	1.00	8.00	89.0	0.36
Paving	Rollers	Diesel	Average	3.00	8.00	36.0	0.38
Paving	Tractors/Loaders/Backhoes	Diesel	Average	2.00	8.00	84.0	0.37

5.3. Construction Vehicles

5.3.1. Unmitigated

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

Trenching	Onsite truck	—	—	HHDT
Paving	—	—	—	—
Paving	Worker	17.5	18.5	LDA,LDT1,LDT2
Paving	Vendor	6.00	10.2	HHDT,MHDT
Paving	Hauling	0.00	20.0	HHDT
Paving	Onsite truck	—	—	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Non-applicable. No control strategies activated by user.

5.5. Architectural Coatings

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

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (cy)	Material Exported (cy)	Acres Graded (acres)	Material Demolished (sq. ft.)	Acres Paved (acres)
Trenching	—	—	2.36	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%

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt
Road Construction	2.36	100%

5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

Year	kWh per Year	CO2	CH4	N2O
2024	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	29.1	annual days of extreme heat
Extreme Precipitation	2.10	annual days with precipitation above 20 mm
Sea Level Rise	—	meters of inundation depth
Wildfire	6.94	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	4	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	4	1	1	4
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	95.3

AQ-PM	55.1
AQ-DPM	13.9
Drinking Water	10.2
Lead Risk Housing	54.6
Pesticides	52.5
Toxic Releases	43.8
Traffic	90.2
Effect Indicators	—
CleanUp Sites	60.4
Groundwater	14.3
Haz Waste Facilities/Generators	70.9
Impaired Water Bodies	0.00
Solid Waste	0.00
Sensitive Population	—
Asthma	66.5
Cardio-vascular	91.0
Low Birth Weights	49.3
Socioeconomic Factor Indicators	—
Education	93.2
Housing	80.1
Linguistic	84.3
Poverty	84.1
Unemployment	93.1

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	8.712947517
Employed	6.274862056
Median HI	6.826639292
Education	—
Bachelor's or higher	1.860644168
High school enrollment	100
Preschool enrollment	13.02450917
Transportation	—
Auto Access	65.16104196
Active commuting	54.20248941
Social	—
2-parent households	54.04850507
Voting	3.259335301
Neighborhood	—
Alcohol availability	90.15783395
Park access	8.558963172
Retail density	9.829334018
Supermarket access	10.3554472
Tree canopy	2.104452714
Housing	—
Homeownership	46.43911202
Housing habitability	15.55241884
Low-inc homeowner severe housing cost burden	28.37161555
Low-inc renter severe housing cost burden	2.322597203
Uncrowded housing	11.35634544
Health Outcomes	—

Insured adults	4.79917875
Arthritis	24.0
Asthma ER Admissions	34.2
High Blood Pressure	19.3
Cancer (excluding skin)	68.9
Asthma	7.7
Coronary Heart Disease	13.8
Chronic Obstructive Pulmonary Disease	7.1
Diagnosed Diabetes	14.5
Life Expectancy at Birth	12.9
Cognitively Disabled	46.5
Physically Disabled	37.2
Heart Attack ER Admissions	6.2
Mental Health Not Good	6.0
Chronic Kidney Disease	7.4
Obesity	3.9
Pedestrian Injuries	94.4
Physical Health Not Good	6.0
Stroke	13.0
Health Risk Behaviors	—
Binge Drinking	72.5
Current Smoker	4.8
No Leisure Time for Physical Activity	4.7
Climate Change Exposures	—
Wildfire Risk	32.2
SLR Inundation Area	0.0
Children	22.0

Elderly	91.2
English Speaking	24.7
Foreign-born	59.6
Outdoor Workers	4.2
Climate Change Adaptive Capacity	—
Impervious Surface Cover	93.6
Traffic Density	67.0
Traffic Access	23.0
Other Indices	—
Hardship	96.9
Other Decision Support	—
2016 Voting	13.0

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	81.0
Healthy Places Index Score for Project Location (b)	5.00
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	Yes
Project Located in a Low-Income Community (Assembly Bill 1550)	Yes
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

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

7.4. Health & Equity Measures

No Health & Equity Measures selected.

7.5. Evaluation Scorecard

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: Trips and VMT	Per District assumed a total of 6 vendor trucks (2 for water trucks per Rule 403 and 4 for material delivery and misc hauling) for each of the construction activities (Paving and Trenching). Changed Trenching activity vendor trips from 1 to 6; updated Paving vendor trips from 0 to 6.

Mead Valley and Good Hope Water Imporvement Projects (MV2 Segment) Detailed Report

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8. User Changes to Default Data

1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	Mead Valley and Good Hope Water Imporvement Projects (MV2 Segment)
Construction Start Date	5/11/2024
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	2.50
Precipitation (days)	9.00
Location	33.83362783115072, -117.28245687727744
County	Riverside-South Coast
City	Unincorporated
Air District	South Coast AQMD
Air Basin	South Coast
TAZ	5578
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	0.76	Mile	5.80	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.	1.67	1.41	10.9	15.3	0.02	0.57	0.45	1.02	0.53	0.09	0.62	—	2,472	2,472	0.10	0.05	1.67	2,492
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.35	0.29	2.28	3.13	< 0.005	0.12	0.09	0.21	0.11	0.02	0.13	—	515	515	0.02	0.01	0.15	519
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.06	0.05	0.42	0.57	< 0.005	0.02	0.02	0.04	0.02	< 0.005	0.02	—	85.3	85.3	< 0.005	< 0.005	0.03	85.9

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	1.67	1.41	10.9	15.3	0.02	0.57	0.45	1.02	0.53	0.09	0.62	—	2,472	2,472	0.10	0.05	1.67	2,492
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.35	0.29	2.28	3.13	< 0.005	0.12	0.09	0.21	0.11	0.02	0.13	—	515	515	0.02	0.01	0.15	519
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.06	0.05	0.42	0.57	< 0.005	0.02	0.02	0.04	0.02	< 0.005	0.02	—	85.3	85.3	< 0.005	< 0.005	0.03	85.9

3. Construction Emissions Details

3.1. Trenching (2024) - Unmitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.55	1.30	10.6	13.5	0.02	0.57	—	0.57	0.52	—	0.52	—	1,998	1,998	0.08	0.02	—	2,005
Dust From Material Movement	—	—	—	—	—	—	0.14	0.14	—	0.01	0.01	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.30	0.25	2.03	2.59	< 0.005	0.11	—	0.11	0.10	—	0.10	—	383	383	0.02	< 0.005	—	384

Dust From Material Movement	—	—	—	—	—	—	0.03	0.03	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.05	0.05	0.37	0.47	< 0.005	0.02	—	0.02	0.02	—	0.02	—	63.4	63.4	< 0.005	< 0.005	—	63.6
Dust From Material Movement	—	—	—	—	—	—	< 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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.11	0.10	0.10	1.67	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	288	288	0.01	0.01	1.14	292
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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.02	0.25	0.00	0.00	0.05	0.05	0.00	0.01	0.01	—	51.4	51.4	< 0.005	< 0.005	0.09	52.1
Vendor	< 0.005	< 0.005	0.04	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	35.7	35.7	< 0.005	0.01	0.04	37.4
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
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.05	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	8.51	8.51	< 0.005	< 0.005	0.02	8.63
Vendor	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	5.92	5.92	< 0.005	< 0.005	0.01	6.19

Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.3. Paving (2024) - Unmitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.14	0.96	8.15	10.9	0.01	0.39	—	0.39	0.36	—	0.36	—	1,620	1,620	0.07	0.01	—	1,626
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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.02	0.18	0.24	< 0.005	0.01	—	0.01	0.01	—	0.01	—	35.5	35.5	< 0.005	< 0.005	—	35.6
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.03	0.04	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	5.88	5.88	< 0.005	< 0.005	—	5.90
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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.03	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	5.14	5.14	< 0.005	< 0.005	0.01	5.21
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	4.08	4.08	< 0.005	< 0.005	< 0.005	4.27
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.85	0.85	< 0.005	< 0.005	< 0.005	0.86
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.68	0.68	< 0.005	< 0.005	< 0.005	0.71
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	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Remove	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase	Phase Description
Trenching	Linear, Grading & Excavation	5/11/2024	8/16/2024	5.00	70.0	—
Paving	Linear, Paving	8/17/2024	8/28/2024	5.00	8.00	—

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
Trenching	Excavators	Diesel	Average	2.00	8.00	36.0	0.38
Trenching	Rollers	Diesel	Average	2.00	8.00	36.0	0.38
Trenching	Rubber Tired Loaders	Diesel	Average	1.00	8.00	150	0.36
Trenching	Tractors/Loaders/Backhoes	Diesel	Average	2.00	8.00	84.0	0.37
Trenching	Crawler Tractors	Diesel	Average	1.00	8.00	87.0	0.43
Paving	Pavers	Diesel	Average	1.00	8.00	81.0	0.42
Paving	Paving Equipment	Diesel	Average	1.00	8.00	89.0	0.36
Paving	Rollers	Diesel	Average	3.00	8.00	36.0	0.38
Paving	Tractors/Loaders/Backhoes	Diesel	Average	2.00	8.00	84.0	0.37

5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Trenching	—	—	—	—
Trenching	Worker	20.0	18.5	LDA,LDT1,LDT2
Trenching	Vendor	6.00	10.2	HHDT,MHDT

Trenching	Hauling	0.00	20.0	HHDT
Trenching	Onsite truck	—	—	HHDT
Paving	—	—	—	—
Paving	Worker	17.5	18.5	LDA,LDT1,LDT2
Paving	Vendor	6.00	10.2	HHDT,MHDT
Paving	Hauling	0.00	20.0	HHDT
Paving	Onsite truck	—	—	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Non-applicable. No control strategies activated by user.

5.5. Architectural Coatings

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

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (cy)	Material Exported (cy)	Acres Graded (acres)	Material Demolished (sq. ft.)	Acres Paved (acres)
Trenching	—	—	5.80	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%

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt
Road Construction	5.80	100%

5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

Year	kWh per Year	CO2	CH4	N2O
2024	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	29.1	annual days of extreme heat
Extreme Precipitation	2.10	annual days with precipitation above 20 mm
Sea Level Rise	—	meters of inundation depth
Wildfire	6.94	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	4	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	4	1	1	4
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	95.3
AQ-PM	55.1
AQ-DPM	13.9
Drinking Water	10.2
Lead Risk Housing	54.6
Pesticides	52.5
Toxic Releases	43.8
Traffic	90.2
Effect Indicators	—
CleanUp Sites	60.4
Groundwater	14.3
Haz Waste Facilities/Generators	70.9
Impaired Water Bodies	0.00
Solid Waste	0.00
Sensitive Population	—
Asthma	66.5
Cardio-vascular	91.0
Low Birth Weights	49.3
Socioeconomic Factor Indicators	—
Education	93.2
Housing	80.1
Linguistic	84.3
Poverty	84.1
Unemployment	93.1

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	8.712947517
Employed	6.274862056
Median HI	6.826639292
Education	—
Bachelor's or higher	1.860644168
High school enrollment	100
Preschool enrollment	13.02450917
Transportation	—
Auto Access	65.16104196
Active commuting	54.20248941
Social	—
2-parent households	54.04850507
Voting	3.259335301
Neighborhood	—
Alcohol availability	90.15783395
Park access	8.558963172
Retail density	9.829334018
Supermarket access	10.3554472
Tree canopy	2.104452714
Housing	—
Homeownership	46.43911202
Housing habitability	15.55241884
Low-inc homeowner severe housing cost burden	28.37161555
Low-inc renter severe housing cost burden	2.322597203
Uncrowded housing	11.35634544

Health Outcomes	—
Insured adults	4.79917875
Arthritis	24.0
Asthma ER Admissions	34.2
High Blood Pressure	19.3
Cancer (excluding skin)	68.9
Asthma	7.7
Coronary Heart Disease	13.8
Chronic Obstructive Pulmonary Disease	7.1
Diagnosed Diabetes	14.5
Life Expectancy at Birth	12.9
Cognitively Disabled	46.5
Physically Disabled	37.2
Heart Attack ER Admissions	6.2
Mental Health Not Good	6.0
Chronic Kidney Disease	7.4
Obesity	3.9
Pedestrian Injuries	94.4
Physical Health Not Good	6.0
Stroke	13.0
Health Risk Behaviors	—
Binge Drinking	72.5
Current Smoker	4.8
No Leisure Time for Physical Activity	4.7
Climate Change Exposures	—
Wildfire Risk	32.2
SLR Inundation Area	0.0

Children	22.0
Elderly	91.2
English Speaking	24.7
Foreign-born	59.6
Outdoor Workers	4.2
Climate Change Adaptive Capacity	—
Impervious Surface Cover	93.6
Traffic Density	67.0
Traffic Access	23.0
Other Indices	—
Hardship	96.9
Other Decision Support	—
2016 Voting	13.0

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	81.0
Healthy Places Index Score for Project Location (b)	5.00
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	Yes
Project Located in a Low-Income Community (Assembly Bill 1550)	Yes
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

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

7.4. Health & Equity Measures

No Health & Equity Measures selected.

7.5. Evaluation Scorecard

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: Trips and VMT	Per District, assumed a total of 6 vender truck trips (2 water truck trips per Rule 403 and 4 material and hauling truck trips) for each construction activity. Updated Trenching vendor trips from 1 to 6 and Paving Vendor trips from 0 to 6.

Mead Valley and Good Hope Water Imporvement Projects (Good Hope Segment) Detailed Report

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8. User Changes to Default Data

1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	Mead Valley and Good Hope Water Imporvement Projects (Good Hope Segment)
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	33.83362783115072, -117.28245687727744
County	Riverside-South Coast
City	Unincorporated
Air District	South Coast AQMD
Air Basin	South Coast
TAZ	5578
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	1.48	Mile	8.17	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.	1.74	1.46	11.5	16.4	0.02	0.54	0.45	0.99	0.50	0.09	0.59	—	2,690	2,690	0.11	0.06	1.67	2,711
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1.73	1.46	11.5	16.0	0.02	0.54	0.45	0.99	0.50	0.09	0.59	—	2,667	2,667	0.11	0.06	0.04	2,687
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.67	0.57	4.47	6.26	0.01	0.21	0.17	0.39	0.19	0.04	0.23	—	1,041	1,041	0.04	0.02	0.28	1,049
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.12	0.10	0.82	1.14	< 0.005	0.04	0.03	0.07	0.04	0.01	0.04	—	172	172	0.01	< 0.005	0.05	174

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	1.74	1.46	11.5	16.4	0.02	0.54	0.45	0.99	0.50	0.09	0.59	—	2,690	2,690	0.11	0.06	1.67	2,711
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	1.73	1.46	11.5	16.0	0.02	0.54	0.45	0.99	0.50	0.09	0.59	—	2,667	2,667	0.11	0.06	0.04	2,687
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.67	0.57	4.47	6.26	0.01	0.21	0.17	0.39	0.19	0.04	0.23	—	1,041	1,041	0.04	0.02	0.28	1,049
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.12	0.10	0.82	1.14	< 0.005	0.04	0.03	0.07	0.04	0.01	0.04	—	172	172	0.01	< 0.005	0.05	174

3. Construction Emissions Details

3.1. Trenching (2024) - Unmitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.61	1.36	11.1	14.7	0.02	0.54	—	0.54	0.50	—	0.50	—	2,216	2,216	0.09	0.02	—	2,224
Dust From Material Movement	—	—	—	—	—	—	0.14	0.14	—	0.01	0.01	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	1.61	1.36	11.1	14.7	0.02	0.54	—	0.54	0.50	—	0.50	—	2,216	2,216	0.09	0.02	—	2,224
Dust From Material Movement	—	—	—	—	—	—	0.14	0.14	—	0.01	0.01	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.61	0.51	4.18	5.50	0.01	0.20	—	0.20	0.19	—	0.19	—	832	832	0.03	0.01	—	835
Dust From Material Movement	—	—	—	—	—	—	0.05	0.05	—	0.01	0.01	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.11	0.09	0.76	1.00	< 0.005	0.04	—	0.04	0.03	—	0.03	—	138	138	0.01	< 0.005	—	138
Dust From Material Movement	—	—	—	—	—	—	0.01	0.01	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.11	0.10	0.10	1.67	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	288	288	0.01	0.01	1.14	292
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	0.11	0.10	0.11	1.26	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	265	265	0.01	0.01	0.03	268
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	0.04	0.04	0.04	0.50	0.00	0.00	0.10	0.10	0.00	0.02	0.02	—	101	101	< 0.005	< 0.005	0.19	102
Vendor	< 0.005	< 0.005	0.08	0.02	< 0.005	< 0.005	0.02	0.02	< 0.005	0.01	0.01	—	69.9	69.9	< 0.005	0.01	0.08	73.2
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.09	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	16.7	16.7	< 0.005	< 0.005	0.03	16.9
Vendor	< 0.005	< 0.005	0.02	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	11.6	11.6	< 0.005	< 0.005	0.01	12.1
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.3. Paving (2024) - Unmitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.14	0.96	8.15	10.9	0.01	0.39	—	0.39	0.36	—	0.36	—	1,620	1,620	0.07	0.01	—	1,626
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	0.02	0.02	0.16	0.21	< 0.005	0.01	—	0.01	0.01	—	0.01	—	31.1	31.1	< 0.005	< 0.005	—	31.2
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.03	0.04	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	5.14	5.14	< 0.005	< 0.005	—	5.16
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	4.50	4.50	< 0.005	< 0.005	0.01	4.56
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	3.57	3.57	< 0.005	< 0.005	< 0.005	3.74
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.74	0.74	< 0.005	< 0.005	< 0.005	0.75
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.59	0.59	< 0.005	< 0.005	< 0.005	0.62
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	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

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

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase	Phase Description
Trenching	Linear, Grading & Excavation	4/1/2024	10/8/2024	5.00	137	—
Paving	Linear, Paving	10/9/2024	10/17/2024	5.00	7.00	—

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
Trenching	Excavators	Diesel	Average	2.00	8.00	36.0	0.38
Trenching	Graders	Diesel	Average	1.00	8.00	148	0.41
Trenching	Rollers	Diesel	Average	2.00	8.00	36.0	0.38
Trenching	Rubber Tired Loaders	Diesel	Average	1.00	8.00	150	0.36

Trenching	Tractors/Loaders/Backhoes	Diesel	Average	2.00	8.00	84.0	0.37
Paving	Pavers	Diesel	Average	1.00	8.00	81.0	0.42
Paving	Paving Equipment	Diesel	Average	1.00	8.00	89.0	0.36
Paving	Rollers	Diesel	Average	3.00	8.00	36.0	0.38
Paving	Tractors/Loaders/Backhoes	Diesel	Average	2.00	8.00	84.0	0.37

5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Trenching	—	—	—	—
Trenching	Worker	20.0	18.5	LDA,LDT1,LDT2
Trenching	Vendor	6.00	10.2	HHDT,MHDT
Trenching	Hauling	0.00	20.0	HHDT
Trenching	Onsite truck	—	—	HHDT
Paving	—	—	—	—
Paving	Worker	17.5	18.5	LDA,LDT1,LDT2
Paving	Vendor	6.00	10.2	HHDT,MHDT
Paving	Hauling	0.00	20.0	HHDT
Paving	Onsite truck	—	—	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Non-applicable. No control strategies activated by user.

5.5. Architectural Coatings

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

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (cy)	Material Exported (cy)	Acres Graded (acres)	Material Demolished (sq. ft.)	Acres Paved (acres)
Trenching	—	—	8.17	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%

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt
Road Construction	8.17	82%

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

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	29.1	annual days of extreme heat
Extreme Precipitation	2.10	annual days with precipitation above 20 mm
Sea Level Rise	—	meters of inundation depth
Wildfire	6.94	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	4	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	4	1	1	4
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	95.3
AQ-PM	55.1
AQ-DPM	13.9
Drinking Water	10.2
Lead Risk Housing	54.6
Pesticides	52.5
Toxic Releases	43.8
Traffic	90.2
Effect Indicators	—
CleanUp Sites	60.4
Groundwater	14.3
Haz Waste Facilities/Generators	70.9
Impaired Water Bodies	0.00
Solid Waste	0.00

Sensitive Population	—
Asthma	66.5
Cardio-vascular	91.0
Low Birth Weights	49.3
Socioeconomic Factor Indicators	—
Education	93.2
Housing	80.1
Linguistic	84.3
Poverty	84.1
Unemployment	93.1

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	8.712947517
Employed	6.274862056
Median HI	6.826639292
Education	—
Bachelor's or higher	1.860644168
High school enrollment	100
Preschool enrollment	13.02450917
Transportation	—
Auto Access	65.16104196
Active commuting	54.20248941
Social	—
2-parent households	54.04850507

Voting	3.259335301
Neighborhood	—
Alcohol availability	90.15783395
Park access	8.558963172
Retail density	9.829334018
Supermarket access	10.3554472
Tree canopy	2.104452714
Housing	—
Homeownership	46.43911202
Housing habitability	15.55241884
Low-inc homeowner severe housing cost burden	28.37161555
Low-inc renter severe housing cost burden	2.322597203
Uncrowded housing	11.35634544
Health Outcomes	—
Insured adults	4.79917875
Arthritis	24.0
Asthma ER Admissions	34.2
High Blood Pressure	19.3
Cancer (excluding skin)	68.9
Asthma	7.7
Coronary Heart Disease	13.8
Chronic Obstructive Pulmonary Disease	7.1
Diagnosed Diabetes	14.5
Life Expectancy at Birth	12.9
Cognitively Disabled	46.5
Physically Disabled	37.2
Heart Attack ER Admissions	6.2

Mental Health Not Good	6.0
Chronic Kidney Disease	7.4
Obesity	3.9
Pedestrian Injuries	94.4
Physical Health Not Good	6.0
Stroke	13.0
Health Risk Behaviors	—
Binge Drinking	72.5
Current Smoker	4.8
No Leisure Time for Physical Activity	4.7
Climate Change Exposures	—
Wildfire Risk	32.2
SLR Inundation Area	0.0
Children	22.0
Elderly	91.2
English Speaking	24.7
Foreign-born	59.6
Outdoor Workers	4.2
Climate Change Adaptive Capacity	—
Impervious Surface Cover	93.6
Traffic Density	67.0
Traffic Access	23.0
Other Indices	—
Hardship	96.9
Other Decision Support	—
2016 Voting	13.0

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	81.0
Healthy Places Index Score for Project Location (b)	5.00
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	Yes
Project Located in a Low-Income Community (Assembly Bill 1550)	Yes
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

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

7.4. Health & Equity Measures

No Health & Equity Measures selected.

7.5. Evaluation Scorecard

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: Trips and VMT	Per District, assumed a total of 6 vender truck trips (2 water truck trips per Rule 403 and 4 material and hauling truck trips) for each construction activity. Updated Trenching vendor trips from 1 to 6 and Paving Vendor trips from 0 to 6.
Construction: Paving	Project alignment 6.709 acres; Staging areas 1.46 acres

APPENDIX B: BIOLOGICAL TECHNICAL REPORT

BIOLOGICAL TECHNICAL REPORT

For:

Mead Valley and Good Hope Water Improvements Project

Prepared By:

ALBERT A. WEBB ASSOCIATES

September 2023

W.O. 2023-0003

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2023 Wet & Dry Season Vernal Pool Branchiopod Survey Final Report, Huffman Environmental, LLC.

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EXECUTIVE SUMMARY

Albert A Webb Associates (WEBB) has completed this biological technical report for the Mead Valley and Good Hope Water Improvements Project (Project) as requested by Eastern Municipal Water District (EMWD). The Project is proposed in the County of Riverside, California. The proposed Project entails the construction of approximately 13,450 linear feet (LF) of 8-inch diameter polyvinyl chloride (PVC) potable water main pipelines in the mostly right-of-way (ROW) areas of the Mead Valley and Good Hope communities. The Project is necessary to address gaps between existing potable water mains, increase fire flow capacity, and provide long-term accessibility, serviceability, and longevity to the Mead Valley and Good Hope communities.

The main objective of this report is to provide an assessment of the existing biological conditions within the Project footprint and the surrounding 100-foot buffer, collectively referred to as the biological study area (BSA). The 100-foot buffer is standard for biological surveys and was chosen for adequate 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 survey(s), and focused listed large branchiopod survey(s). The BSA comprises four land cover types and vegetation communities: urban/developed lands, disturbed habitat, non-native grasslands, and eucalyptus woodland.

No suitable habitat for burrowing owl is present within the Project footprint; however, suitable burrowing owl habitat was documented within the burrowing owl survey area, which extends 500-feet from the edge of the Project footprint. No burrowing owls or their sign of presence was detected within the burrowing owl survey area. A total of 12 road-rut pools were analyzed for special-status fairy shrimp species by Huffman Environmental; however, only the common fairy shrimp species known as the versatile fairy shrimp was detected within four of the road-rut pools. No jurisdictional resources are present in the Project footprint and therefore no impacts to jurisdictional waters are anticipated.

Permanent impacts would consist of the removal of three Peruvian pepper trees and a single red gum eucalyptus tree in the Good Hope area of the Project. Temporary impacts are anticipated for urban/developed lands, disturbed habitat, and non-native grasslands. Potential significant indirect impacts have been identified for burrowing owls and nesting bird species, if appropriate mitigation measures are not implemented. This report proposes specific measures to fully mitigate 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 technical report conducted by Albert A. Webb Associates (WEBB) for the proposed Mead Valley and Good Hope Water Improvements Project (Project) proposed by the Eastern Municipal Water District (EMWD) located in the County of Riverside, 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.

This report provides an overview of the project site's existing biological conditions, including vegetation communities, and documents the plant and wildlife species observed or detected during surveys. It identifies sensitive resources within the Project area and highlights the potential presence of special-status species. Additionally, this report assesses the impacts of the Project and proposes recommendations to address any significant adverse effects on sensitive biological resources that are expected to occur as a result of Project implementation.

1.1 Project Site Location

The proposed Project encompasses two distinct geographic locations, a northern component, and a southern component, both situated in the County of Riverside, California (Figure 1- Regional Map; all Figures are provided in Appendix A). Both the northern and southern Project components are located within the Steele Peak 7.5-minute quadrangle map in Section 2 of Township 50 South, Range 40 West. For the purposes of this report, the northern and southern Project components, including their respective staging areas, will be collectively referred to as the "Project," unless stated otherwise. The Project encompasses approximately 16-acres in total.

The northern component of the Project is further divided into two areas: Mead Valley Area 1 to the north and Mead Valley Area 2 to the south. The construction activities of the Mead Valley Area 1 will remain within the public road rights-of-way (ROW) of Cajalco Rd. at the intersection of Robinson St. and private ROW of Robinson St.[1] The Mead Valley Area 2 area construction activities will occur within the public road ROW of the following streets: Day St., Oakwood St., Carroll St., and Pinewood St. The northern Project components (Mead Valley Areas 1 and 2) are positioned approximately two miles west of Interstate 215 and within 1-mile or less of Cajalco Rd. (Figure 2- Vicinity Map). The staging areas for the Mead Valley Areas 1 and 2 will be within the Project alignment.

The southern component of the Project consists of a single location, Good Hope, along with its corresponding staging areas. The construction activities of the Good Hope Project area will fall

[1] Because Robinson St. has not been dedicated as a Riverside County roadway and is still under private property ownership, Project activities including staging on Robinson St. takes place on the road and the following adjacent Assessor Parcel Numbers (APNs): 318-110-014, 318-110-026, 318-110-016, 318-110-030, 318-110-027, 318-110-029, 318-110-012, 318-110-015, 318-110-021, 318-110-009, 318-110-018, 318-110-031, 318-110-033, 318-110-034, 318-110-011, 318-110-010, 318-110-013, 318-110-022, 318-110-028, 318-110-017, 318-110-025, and 318-110-032.

within the road ROW of Sharp Rd., Theda St., Eucalyptus Ave., Club Dr., Main St., Maple Ave., Pine St., Cherry Ln., and Maguglin Way. The Good Hope area is located roughly one mile west of Highway 74, primarily between Eucalyptus Ave. and Sharp Rd. (Figure 2- Vicinity Map). Construction activities within the southern Project area will occur on existing County roadways and construction staging areas are proposed on the following APNs: 345-034-008, 345-034-007, 345-033-001, 345-033-002, 345-033-003, 345-033-014, 345-033-013, 345-033-016, 345-033-015, 345-034-001, 345-034-002, 345-034-003, 345-036-004, 345-036-006, 345-036-001, 345-036-003, 345-036-005, 345-036-002 (Figure 4).

1.2 Project Description

The proposed Project is within the EMWD potable water service area.

The Project entails the construction of approximately 13,450 linear feet (LF) of 8-inch diameter polyvinyl chloride (PVC) potable water main pipelines in the mostly ROW areas of the Mead Valley and Good Hope communities (Figure 2 – Vicinity Map). The Project is necessary to address gaps between existing potable water mains, increase fire flow capacity, and provide long-term accessibility, serviceability, and longevity to the community. The Project will include the following activities:

Northern Area

1. Mead Valley Area 1: Improvements include the construction of approximately 1,650 LF of new potable water main pipeline in Robinson St. that will connect to the existing water main pipeline in Cajalco Rd. (Figure 2). Improvements will impact approximately 2.4 acres (Table 1).

2. Mead Valley Area 2: Improvements include the construction of approximately 4,000 LF of potable water main pipelines in portions of Oakwood St., Pinewood St., Day St., and Carroll St. Portions of the existing potable water pipelines in Oakwood St. will be replaced (Figure 2). Improvements will impact approximately 5.8 acres (Table 1).

Southern Area

3. Good Hope: Improvements include the construction of approximately 7,800 LF of new potable water main pipelines in portions of the following streets: Sharp Rd., Eucalyptus Ave., Club Dr., Main St., Maple Ave., Pine St., Maguglin Way, Theda St., and Cherry Ave. The proposed potable water pipelines will use jack and bore method to cross storm drain lines in the Project alignment at the intersections of Spring St. and Eucalyptus St. and at Club Dr., near Haines St. Improvements will impact approximately 6.7 acres plus 1.5-acres staging area for a total of 8.2 acres (Table 1).

Additionally, the Project also includes new fire hydrants and the replacement of existing fire hydrants within the Project areas, as required. Existing remote meters will be replaced with new water meters that will be installed in front of customer properties, as required.

Construction methods in Project areas will include open excavation trenching techniques for the pipelines and the use of jack and bore trenchless techniques at storm drain crossings, wherever possible. Ground excavation will be at a minimum of 5 feet and deeper at the storm drain crossings.

Table 1. Project and Survey Areas Acreages

Project Area	Staging Area (acres)	Project Footprint Area (acres)	100-foot Survey Buffer Area (acres)	Biological Study Area (acres)	Burrowing Owl Study Area (acres)
Mead Valley Area 1	0*	2.4	8.8	11.2	60.9
Mead Valley Area 2	0*	5.8	20.2	26.0	110.9
Good Hope Area	1.5	6.7	39.0	47.2	191.9
Totals	1.5	14.9	68.0	84.4	363.1

*Separate Staging Areas were not delineated for Mead Valley Areas 1 and 2 of the Project. Staging assumed within the Project Footprints.

Table 1. Project Survey Areas Acreages shows a breakdown of the acreages of the Project Footprint and Staging Areas by Project Area as well as the Biological Study Area. It is important to note that the Biological Study Area is the sum of the Staging Area, Project Footprint Area, and 100-foot Survey Buffer Area. Likewise, the Burrowing Owl Study Area includes the Staging Area and Project Footprint Area in addition to land within a 500ft buffer of the two.

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 site or vicinity of the Project site. 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)
- 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 2nd, 2023 and February 21st, 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 BSA totals 84.4 acres (Table 2).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 2 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 2nd 2023 / 0700-1530	Air Temperature: 56-68°F; Wind:0-1 miles per hour (MPH); Cloud Cover:0%
February 21st, 2023 / 0730-1430	Air Temperature: 50-63°F; Wind: 0-1 MPH; Cloud Cover: 0%

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 appropriate survey buffer respective to the species being analyzed. Focused surveys for burrowing owl (*Athene cunicularia*) were conducted by WEBB and focused surveys for listed large branchiopods were conducted by Huffman Environmental. The survey methods and limitations of each focused survey completed are discussed below.

2.3.1 Habitat Assessment and Focused Burrowing Owl Surveys

Burrowing owl is a CDFW species of special concern 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 (Figure 5A and 5B). 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 2016).

The surveyors slowly walked meandering transects no greater than 10 meters apart through areas of potentially suitable habitat located in the burrowing owl study area, visually searching for suitable burrows or burrow surrogates (dimensions of >11 centimeters 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. After completion of the habitat assessment, potential burrowing owl habitat areas were refined so that the subsequent surveys were conducted in suitable habitat. As shown in Table 3, 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 21st, 2023 / 0630-1300	Marshall Paymard, Virginia Waters	Habitat Assessment	Air Temperature: 45-58°F; Wind: 0-1 MPH; Cloud Cover:10%
March 6th, 2023 / 0630-1006	Marshall Paymard, Virginia Waters	Focused Survey #1	Air Temperature: 48-52°F; Wind:0-1 MPH; Cloud Cover: 0%
April 19th, 2023 / 0545-1000	Marshall Paymard, Virginia Waters	Focused Survey #2	Air Temperature: 50-54°F;

Date/Time	Surveyor	Type	Climatic Conditions
			Wind:0-1 MPH; Cloud Cover: 20%
May 12th, 2023 / 0545-1003	Marshall Paymard, Virginia Waters	Focused Survey #3	Air Temperature: 50-54°F; Wind:0-1 MPH; Cloud Cover: 30%
June 28th, 2023 / 0630-1000	Marshall Paymard, Virginia Waters	Focused Survey #4	Air Temperature: 64-68°F; Wind:0-1 MPH; Cloud Cover: 0%
Source: Focused Burrowing Owl Survey Report for Mead Valley, Good Hope, and Oakwood Water Improvements Project, Albert A. Webb Associates. September 2023 (located in Appendix D).			

2.3.2 Focused Protocol Surveys for Listed Branchiopods

Riverside fairy shrimp (*Streptocephalus woottoni*) is listed as federally endangered, and the vernal pool fairy shrimp (*Branchinecta lynchi*) is listed as federally threatened. Both species are MSHCP covered species. Protocol wet and dry season surveys were conducted for Riverside fairy shrimp and vernal pool fairy shrimp within suitable habitat present in the BSA by Huffman Environmental. All surveys were conducted in accordance with the USFWS Survey Guidelines for Listed Large Branchiopods (USFWS 2017).

Before commencing the field assessment, a thorough analysis of the Project site was carried out by examining historical aerial imagery and conducting a query in the CNDDB. Following the initial desktop analysis, a comprehensive field survey was conducted by Huffman Environmental, covering the entire Project area. Once suitable habitat was identified, wet season surveys were conducted by Garrett Huffman (TE-20186A-3.2) of Huffman Environmental. These surveys took place in March and April 2023, as indicated in Table 4. Visits to the site occurred on a weekly basis, specifically during periods when at least one feature exhibited ponding during the 2023 wet season. The visits concluded after the features were observed to be dry, and it was determined the wet season had reached its end. Following the wet season surveys, dry season sampling commenced in June 2023.

Table 4. Schedule of Large Branchiopods Focused Surveys

Date	Surveyor	Survey Type
03-15-2023	Garrett Huffman (TE-20186A-3.2)	Wet Season
03-22-202	Garrett Huffman (TE-20186A-3.2)	Wet Season
03-30-2023	Garrett Huffman (TE-20186A-3.2)	Wet Season
04-05-2023	Garrett Huffman (TE-20186A-3.2)	Wet Season

Date	Surveyor	Survey Type
04-12-2023	Garrett Huffman (TE-20186A-3.2)	Wet Season
04-20-2023	Garrett Huffman (TE-20186A-3.2)	Wet Season
06-26-2023	Garrett Huffman (TE-20186A-3.2)	Dry Season
Source: *2023 Good Hope Water Line Project Wet & Dry Season Vernal Pool Branchiopod Survey Final Report,* Huffman Environmental LLC (located in Appendix D).		

2.4 Survey Limitations

All direct Project impact areas were accessed and surveyed on foot by WEBB and Huffman Environmental. However, lawful access could not be obtained at several adjacent areas within the burrowing owl study area and the general BSA due to concerns associated with accessing privately fenced properties. Those areas where lawful access could not be obtained, surveys were conducted within proximity using binoculars. It should be noted that a high degree of anthropogenic related disturbances (i.e., private agriculture and horse stables) were associated with those areas that access could not be obtained and as such Project implementation likely will not result in adverse effects to any potentially occurring species in those areas.

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, which can be either formal or informal, is required when there is a connection (referred to as a "nexus") between the use of a site by endangered species and a proposed impact associated with a federal action. The purpose of this consultation is to assess the potential impacts of the proposed action on listed species and their designated critical habitats. The consultation process ensures that the Federal agency takes into account the best available scientific and commercial information regarding the species in question before proceeding with the action.

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 MSHCP

The Western Riverside County Multiple Species Habitat Conservation Plan (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) 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 proposed Project falls within the jurisdiction of the SKR HCP. However, 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 water line within rights-of-way that would be returned to pre-project conditions, and so would not have any permanent impacts on potential habitat.

4.0 RESULTS

4.1 Land Uses

The BSA predominantly comprises both paved and unpaved roadways accompanied by single-family homes, agricultural operations, and equestrian stables in proximity. The BSA exhibits characteristics of semi-rural residential development, characterized by compacted earthen disturbed roads, as well as scattered disturbed vacant lots interspersed throughout the community.

4.2 Soils

The NRCS Web Soil Survey (USDA 2023) identifies 15 soil map units in the BSA (Figure 3A and 3B-USDA Soils). The soils present in the BSA are as follows:

- Bosanko clay, 9 to 15 percent slopes (BfD)
- Cajalco fine sandy loam, 2 to 8 percent slopes, eroded (CaC2)
- Cajalco fine sandy loam, 8 to 15 percent slopes, eroded (CaD2)
- Cajalco rocky fine sandy loam, 15 to 50 percent slopes, eroded (CbF2)
- Cieneba sandy loam, 5 to 8 percent slopes (ChC)
- Cieneba sandy loam, 8 to 15 percent slopes, eroded (ChD2)
- Fallbrook sandy loam, shallow, 5 to 8 percent slopes, eroded (FbC2)
- Fallbrook rocky sandy loam, shallow, 8 to 15 percent slopes, eroded (FcD2)
- Fallbrook fine sandy loam, 2 to 8 percent slopes, eroded (FfC2)
- Greenfield sandy loam, 2 to 8 percent slopes, eroded (GyC2)
- Hanford coarse sandy loam, 2 to 8 percent slopes (HcC)
- Honcut sandy loam, 2 to 8 percent slopes (HnC)
- Pachappa fine sandy loam, 2 to 8 percent slopes, eroded (PaC2)
- Terrace escarpments (TeG)
- Yokohl loam, 2 to 8 percent slopes (YbC)

4.3 Vegetation Communities and Land Covers

The BSA contains a total of four land cover types and vegetation communities; including, urban/developed lands, disturbed habitat, non-native grasslands, and eucalyptus woodland (Figures 4A and 4B-Vegetation Communities and Land Cover Types). The Project footprint totals 14.9 acres, and staging areas in the Good Hope area total 1.5 additional acres. The BSA which represents the Project footprint, staging areas, and a surrounding 100-foot buffer is a total area of 84.4 acres (Table 1). The land cover types and vegetation communities are discussed in detail below and summarized in Table 5. Representative photos are provided in Appendix C.

Table 5. Vegetation Communities and Land Cover Types

Vegetation Community / Land Cover Type	Acres within the BSA	Acres within Mead Valley Area 1[(b)]	Acres within Mead Valley Area 2[(b)]	Acres within Good Hope Area
Urban/Developed (URB/DEV)	45.9	1.8	2.1	4.1
Disturbed Habitat (DH)	29.2	0.4	3.5	3.7
Non-Native Grassland (NH)	8.4	0.2	0.1	0.3
Eucalyptus Woodland (EUC)	0.9	0	0	0.1
Totals	84.4	2.4	5.7*	8.2[(a)]

*Acres may not sum due to rounding
(a) Includes 1.5-acre staging area.
(b) Staging is included in footprints of construction.

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 predominantly occupied by 45.9 acres of urban/developed lands. These lands are characterized by single-family residences and their properties, accompanied by ornamental plantings, paved and unpaved roads, concrete surfaces, and semi-permanent structures such as trailers, sheds, and hoop houses. A notable tree species commonly found in this classification includes 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 29.2 acres of disturbed habitat is co-dominant with Urban/Developed Lands. In the BSA, disturbed habitat refers to areas that retain a soil or earthen ground substrate. If vegetation is present, then it is predominantly composed of species such as cheeseweed (*Malva parviflora*), foxtail barley (*Hordeum murinum*), and *Erodium* species. Disturbed habitat occurs in the BSA mainly on dirt roads and lands associated with single-family homes and equestrian use areas.

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 8.4 acres of non-native grasslands occurs in the BSA, primarily along the periphery, near open lands. 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 0.9 acres of eucalyptus woodlands occurs in the BSA as single trees or sparse stands of one to three red gum eucalyptus (*Eucalyptus camaldulensis*).

4.4 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 Wildlife

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

4.5.1 Nesting Birds

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

4.6 Jurisdictional Non-Wetland Waters and Wetlands

No jurisdictional resources were identified within the BSA. WEBB biologists observed several unvegetated ephemeral road rut pools along Oakwood St., Day St., Carrol St., Robinson St., and Pinewood St. within the BSA. It is important to note that these pools do not meet the established classification criteria for vernal pools, which include specific hydrology, soils, and vegetation characteristics typically associated with vernal pool habitats during the wet season. These road rut pools lack the distinctive soils and plant species that are typically found in vernal pool ecosystems. As a result, they do not provide the usual functions and values associated with vernal pool habitats. Furthermore, it is worth mentioning that these pools are not hydrologically connected to any upstream or downstream jurisdictional features and their

relatively small size limits their capacity to contribute significantly to groundwater recharge within the watershed.

Based on these observations and evaluations, it is concluded that the road rut pools within the BSA do not meet the criteria for jurisdictional waters or vernal pools.

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 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.

No sensitive vegetation communities occur within the BSA. Urban/developed lands, disturbed habitat, non-native grasslands, and eucalyptus woodlands do not meet the definition of a sensitive vegetation community or natural community under CEQA. Impacts to these land cover types, and vegetation communities typically do not require mitigation.

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 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 CNDDB and the CNPS as 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 burrowing owl 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 almost all the impact footprint is composed of heavily disturbed and compacted soils as typically associated with urban/developed lands with accompanying vehicle use.

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 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 SSC in California", which includes animals tracked by the CNDDB; and, animals considered locally significant in local or regional plans, policies, or ordinances.

No special-status wildlife species were observed during the general habitat assessment or focused surveys, and none are expected to occur within the BSA. The Project footprint is located within an urban landscape with a high degree of existing anthropogenic disturbances. Disturbances such as loud music, vehicle traffic, construction, and stray domesticated dogs were encountered in the BSA during the field assessments. However, as mentioned, focused surveys for burrowing owl and large branchiopod species were conducted in suitable habitat throughout the Project footprint and their respective survey buffers; results of the focused surveys were negative for the presence of these species and are therefore considered absent from the Project. Focused protocol species survey results are detailed below.

4.7.3.1 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 132 burrows suitable for burrowing owl were recorded within approximately 46.5-acres of suitable burrowing owl habitat (Figure 5A and 5B-Burrowing Owl Survey Results). Further, there are no burrowing owl CNDDB

occurrences within the BSA. The burrowing owl 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 21st, 2023 / 0630-1300	Marshall Paymard, Virginia Waters	Habitat Assessment	Suitable habitat identified.
March 6th, 2023 / 0630-1006	Marshall Paymard, Virginia Waters	Focused Survey #1	No burrowing owl or sign detected.
April 19th, 2023 / 0545-1000	Marshall Paymard, Virginia Waters	Focused Survey #2	No burrowing owl or sign detected.
May 12th, 2023 / 0545-1003	Marshall Paymard, Virginia Waters	Focused Survey #3	No burrowing owl or sign detected.
June 28th, 2023 / 0630-1000	Marshall Paymard, Virginia Waters	Focused Survey #4	No burrowing owl or sign detected.
Source: *Focused Burrowing Owl Survey Report for Mead Valley, Good Hope, and Oakwood Water Improvements Project,* Albert A. Webb Associates, September 2023 (located in Appendix D).			

4.7.3.2 Listed Branchiopod Surveys

Vernal pool fairy shrimp is widely distributed within California's Central Valley with disjunct populations in western Riverside County. Vernal pool fairy shrimp has been documented in vernal pools in three key locations in the MSHCP Plan Area including, the Santa Rosa Plateau Ecological Reserve, Skunk Hollow, and Salt Creek in west Hemet (MSHCP 2004). Typically, this species is found in sandstone puddles surrounded by foothill grassland. Other habitats include small swale, earth slump, or basalt-flow depression basin with a grassy or sometimes muddy bottom within unplowed grassland (Eng et al. 1990).

Riverside fairy shrimp has a very restricted and scattered distribution. It is known from five localities in Riverside County on soils such as, Murrieta stony clay loams, Las Posas series, Wyman clay loam, and Willows soils (MSHCP 2004). Five known key populations occur within the MSHCP Plan Area located on the Santa Rosa Plateau, Skunk Hollow, Murrieta and Lake Elsinore back basin (MSHCP 2004). This species typically is found in longer-lived pools that often support spikerush (*Eleocharis sp*.). These pools tend to occur in seasonal grasslands sometimes interspersed with chaparral or coastal sage scrub vegetation. It typically occupies long-lasting pools in which the water persists into April or May, and which reach an average minimum depth of 11.8 inches (in) (30 centimeters [cm]) at filling (Eng et al. 1990).

Surveys for listed large branchiopods were conducted due to detection of depressional features within the BSA. Vernal pool and Riverside Fairy shrimp were not detected during the protocol wet and dry season surveys conducted in 2023 by Huffman Environmental and are presumed to be absent from the BSA (Appendix D). A total of 12 unvegetated road rut pools

were documented in the BSA during Huffman Environmental's habitat assessment and of those, three pools (GH-02, GH-04, and GH-06 located along Oakwood St. in the North Project Area) were positive for versatile fairy shrimp (*Branchinecta lindahli*) during the wet season survey effort and three pools were positive for versatile fairy shrimp (GH-02,GH-03, and GH-04 located along Oakwood St. in the North Project Area) for the dry season survey effort (Figure-6A and 6B Fairy Shrimp Survey Results).

None of the sampled features are considered vernal pool features. The reason for this is that the soils found in these pools, including Cieneba sandy loam, Greenfield sandy loam, Fallbrook fine sandy loam, Fallbrook sandy loam, Terrace escarpments, Yokohl loam, and Cajalco fine sandy loam, do not possess the characteristics commonly associated with the formation of vernal pools. Consequently, they do not create an environment conducive to the growth and propagation of vernal pool plant species. Moreover, the extensive use of vehicles within these pools impedes their ability to fulfill the ecological functions and values typically associated with vernal pool ecosystems.

For more information on the protocol listed large branchiopod surveys conducted for the Project, see the wet and dry season survey report located in 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 site 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 in semi-urban residential development and roadways, providing limited connectivity to undeveloped areas with naturalized habitat. The Project site has the potential to support birds, reptiles, amphibians, and/or smaller mammals that could tolerate ornamental type vegetation and existing anthropogenic effects. No riparian corridors or dominant wildlife trails were observed during the biological assessments.

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. Direct impacts can be permanent impacts.

Indirect impacts, also referred to as secondary effects, are effects that could occur within the BSA but outside the direct project impact area and 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. Indirect impacts can be either permanent or temporary.

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 BSA and the Project impact footprint support a total of four vegetation communities and land cover types, including: urban/developed lands, disturbed habitat, non-native grasslands, and eucalyptus woodland. No sensitive vegetation communities are present in the BSA or Project impact footprint and therefore no direct impacts are proposed to sensitive vegetation communities from the Project.

The Project will directly and permanently impact (i.e., remove) three Peruvian pepper trees, which cover an area of 0.10 acre within the urban/developed lands, as well as one red gum

eucalyptus tree (*Eucalyptus camaldulensis*), covering an area of 0.04 acre within the eucalyptus woodland community, totaling 0.14 acre of permanent impacts (Figure 7B-Project Impacts). These are the only proposed permanent impacts and all other impacts, totaling 16.13 acres, will be temporary indirect impacts (Figure 7A and 7B-Project Impacts).

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

Vegetation Community/ Land Cover Type	Direct Impact[a] (acres)	Indirect Impact[b] (acres)	Total (acres)
Mead Valley Area 1			
Urban/Developed (URB/DEV)	0.0	1.8	1.8
Disturbed Habitat (DH)	0.0	0.4	0.4
Non-Native Grassland (NH)	0.0	0.2	0.2
Eucalyptus Woodland (EUC)	0.0	0.0	0.0
Subtotal	0.0	2.4	2.4
Mead Valley Area 2			
Urban/Developed (URB/DEV)	0.0	2.1	2.1
Disturbed Habitat (DH)	0.0	3.5	3.5
Non-Native Grassland (NH)	0.0	0.1	0.1
Eucalyptus Woodland (EUC)	0.0	0.0	0.0
Subtotal	0.0	5.7	5.7
Good Hope Area[c]			
Urban/Developed (URB/DEV)	0.10	3.95	4.05
Disturbed Habitat (DH)	0.00	3.71	3.71
Non-Native Grassland (NH)	0.00	0.31	0.31
Eucalyptus Woodland (EUC)	0.04	0.06	0.10
Subtotal	0.14	8.0	8.2
Total	0.14	16.1	16.3

(a) Consists of Project footprint where permanent loss of vegetation occur.
(b) Consists of Project footprint plus staging areas where land will be returned to pre-construction condition.
(c) Includes 1.5-acre staging area.

5.1.2 Indirect Impacts

As shown in Table 7, no sensitive vegetation communities occur in the Project footprint, or within the Project BSA. Indirect impacts will occur within the Project footprint and staging areas as a result of construction activities, however they are considered temporary in nature because construction activities are temporary and the land surface will be returned to pre-construction grade upon Project completion.

5.2 Impacts to Special-Status Plant Species

5.2.1 Direct Impacts

As previously mentioned, the Project impact footprint primarily occupies urban/developed lands characterized by roadways with compacted and disturbed soils. These soil conditions are not conducive to supporting special-status plants. No special-status plants were identified during the biological assessments or focused surveys conducted within the BSA. Based on these findings, there will be no direct impacts on special-status plant species resulting from the implementation of the Project.

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

The only special-status wildlife species having the potential to exist in the Project are the burrowing owl and fairy shrimp. Therefore, focused surveys were conducted for burrowing owls from February 2023 thru June 2023 and both wet season and dry season surveys for listed large branchiopod species were conducted in spring and summer of 2023. All focused surveys yielded negative results, indicating the absence of these special-status species in the Project impact footprint and their respective survey buffers. Furthermore, no other habitats known to support special-status wildlife species were identified within the Project impact footprint, or the BSA, and therefore it is expected that no direct impacts will occur to special-status wildlife species as a result of Project implementation. All focused survey reports are included in Appendix D to this report.

5.3.2 Indirect Impacts

Due to the limited presence of suitable habitat for special-status wildlife species within the Project impact footprint and the BSA and the absence of the special status species mentioned above, it is not expected that any indirect impacts will occur to special-status wildlife as a result of Project implementation. However, burrowing owls may colonize suitable habitat areas between the time when the focused surveys were conducted and the start of construction activities. To address this potential, the implementation of recommendation **BIO-1** (refer to Section 7 of this report) will effectively minimize any potential indirect impacts to burrowing owls.

5.4 Impacts to Jurisdictional Non-Wetland Waters and Wetlands

5.4.1 Direct Impacts

No jurisdictional non-wetland waters or wetlands occur in the Project impact footprint, or within the BSA. As such, no direct impacts are anticipated to occur to jurisdictional non-wetland waters or wetlands.

5.4.2 Indirect Impacts

No jurisdictional waters or wetlands occur in the Project impact footprint, or within the BSA. As such, no indirect impacts are anticipated to occur to jurisdictional waters or wetlands.

5.5 Impacts to Wildlife Corridors and Habitat Linkages

5.5.1 Direct Impacts

No wildlife corridors or linkages occur within Project impact footprint, or within the 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 Project impact footprint, or 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 proposed Project have the potential to disrupt nesting and breeding birds inhabiting trees and shrubs within and surrounding the Project impact footprint. Potential impacts on migratory birds resulting from the construction and operation 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).

However, with implementation of recommendation **BIO-2** (see Section 7 of this report), potential impacts to nesting birds in suitable habitat 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 area or the surrounding region. This conclusion is based on two factors. Firstly, the Project is situated predominantly within existing roadways where non-native vegetation communities dominate the surrounding area. Secondly, with the exception of a single red gum eucalyptus tree and three Peruvian pepper trees, Project impacts will be temporary in nature and will occur in pre-existing roadways 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. 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 the Criteria Area and therefore a Reserve Assembly Analysis is not required. The Project will not conflict with Section 3.0 of the MSHCP.

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

The MSHCP defines riparian/riverine areas as 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).

Riparian/riverine resources were assessed during the biological assessment, as described in Section 2.2 of this report. No riparian/riverine areas occur in the Project BSA and therefore none are proposed to be impacted. The Project would not conflict with Section 6.1.2 of the MSHCP, addressing riparian and riverine resources.

6.3.2 Vernal Pools

Vernal pools are seasonal wetlands that occur in depression areas that have wetlands 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 have been identified in the BSA. However, there are a total of 12 unvegetated road rut pools present in the Mead Valley Area 2 and Good Hope components of the Project footprint (Figure-6A and 6B Fairy Shrimp Survey Results). It is important to note that these road rut pools do not exhibit the necessary characteristics during the wet season, such as the presence of hydric soils and vernal pool plant species, to be classified as vernal pools. Furthermore, they do not fulfill the biological functions typically associated with vernal pools due to their limited size and location. The Project would not conflict with Section 6.1.2 of the MSHCP, addressing vernal pools.

6.3.3 Fairy Shrimp

During the biological assessment, 12 unvegetated road rut pools were identified as potential habitat for fairy shrimp. These pools were evaluated for the presence of fairy shrimp following the survey guidelines specified by the Listed Large Branchiopods USFWS Survey Guidelines for the (USFWS 2017). The surveys encompassed both wet-season and dry-season protocols.

Among the identified pools, only four were confirmed to contain versatile fairy shrimp (*Branchinecta lindahli*), a non-listed species (Figure-6A and 6B Fairy Shrimp Survey Results). The Project would not conflict with Section 6.1.2 of the MSHCP, addressing fairy shrimp.

6.3.4 Riparian Birds

No habitat for least Bell's vireo, southwestern willow flycatcher, or western yellow-billed cuckoo is present in the Project BSA. The Project would not conflict with Section 6.1.2 of the MSHCP, addressing riparian birds.

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, addressing narrow endemic plant species.

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, addressing criteria area plant species.

6.5.2 Amphibians

The proposed Project is not located in a survey area for amphibians. No further action is required. The Project would not conflict with Section 6.3.2 of the MSHCP, addressing amphibians.

6.5.3 Burrowing Owl

The proposed Project is located within the mapped survey area for burrowing owl. Burrowing owl is a CDFW species of special concern, 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 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 (Figure 5A and 5B-Burrowing Owl Survey Results). Post completion of the habitat assessment, suitable burrowing owl habitat areas were refined so that the subsequent surveys were conducted in approximately 46.5-acres of suitable habitat.

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 21st, 2023 / 0630-1300	Marshall Paymard, Virginia Waters	Habitat Assessment	Air Temperature: 45-58°F; Wind: 0-1 MPH; Cloud Cover:10%
March 6th, 2023 / 0630-1006	Marshall Paymard, Virginia Waters	Focused Survey #1	Air Temperature: 48-52°F; Wind:0-1 MPH; Cloud Cover: 0%
April 19th, 2023 / 0545-1000	Marshall Paymard, Virginia Waters	Focused Survey #2	Air Temperature: 50-54°F; Wind: 0-1 MPH; Cloud Cover: 20%
May 12th, 2023 / 0545-1003	Marshall Paymard, Virginia Waters	Focused Survey #3	Air Temperature: 50-54°F; Wind: 0-1 MPH; Cloud Cover: 30%
June 28th, 2023 / 0630-1000	Marshall Paymard, Virginia Waters	Focused Survey #4	Air Temperature: 64-68°F; Wind: 0-1 MPH; Cloud Cover: 0%

Source: *Focused Burrowing Owl Survey Report for Mead Valley, Good Hope, and Oakwood Water Improvements Project,* Albert A. Webb Associates. September 2023 (located in Appendix D).

Burrowing owl was not detected during the 2023 focused surveys and is presumed to be absent from the burrowing owl study area (Project footprint and 150-meter survey buffer). A total of 132 potential burrows were recorded within the burrowing owl study area, however no burrowing owl signs (i.e., pellets, white wash, prey remains, feathers, tracks, nest burrow

decoration materials, or animal manure) was observed at any of the burrows (Figure 5A and 5B-Burrowing Owl Survey Result s).

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 Recommendation

Due to the presence of suitable habitat within the burrowing study area 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). 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 site, in suitable foraging habitat within the 150-meters of the Project site. 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, addressing mammals.

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, addressing the Delhi sands flower-loving fly. No further action is required.

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, addressing the coastal California gnatcatcher. No further action is required.

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) 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, 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 water line within rights-of-way that would be returned to pre-project conditions.

7.0 RECOMMENDATIONS

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

BIO-1 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. Additionally, a final burrowing owl survey shall be conducted 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-2 Nesting Bird and Raptor Avoidance

If Project development 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 suitable habitat 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

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APPENDIX A

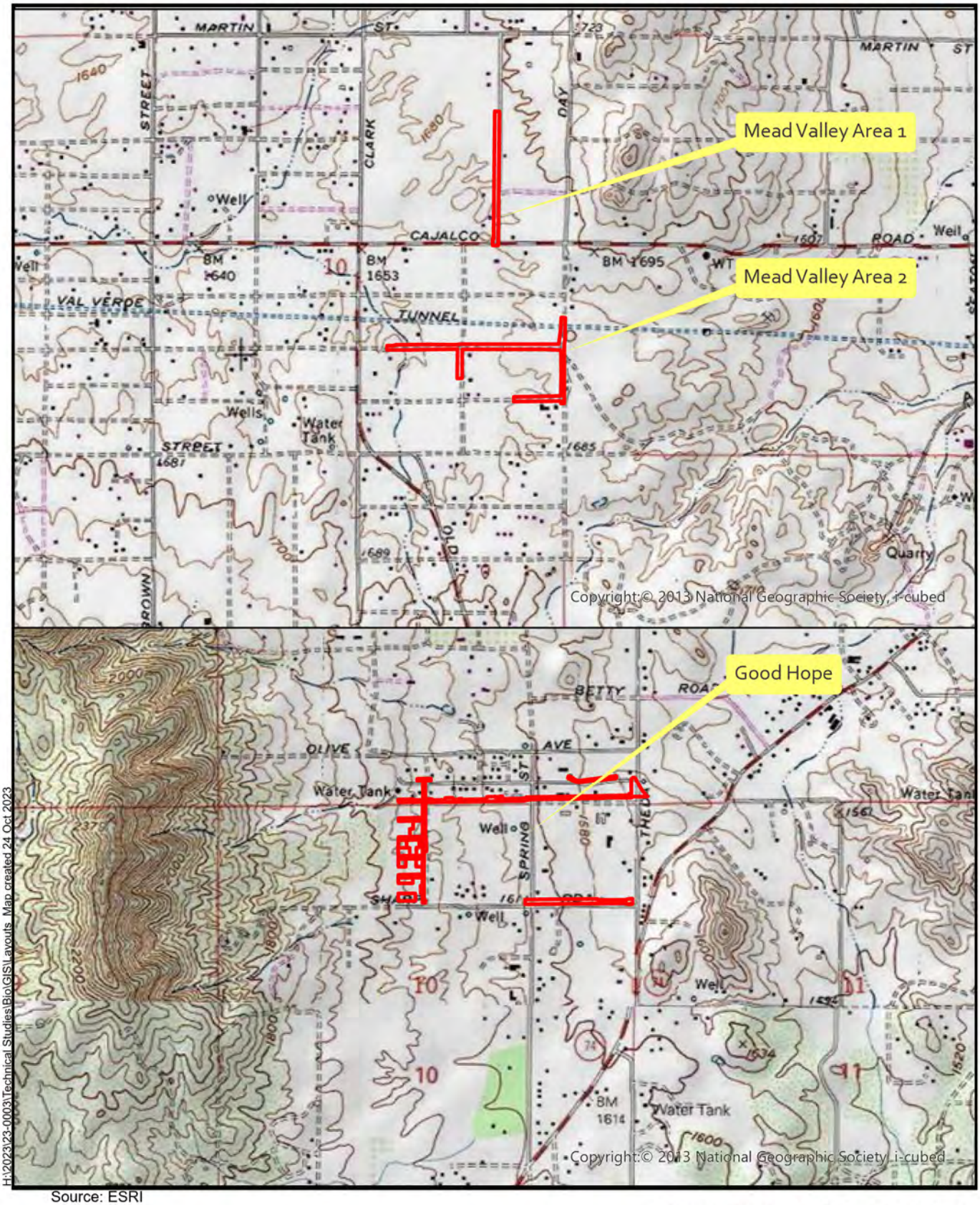
Source: ESRI

0 100 200 300 Feet

Figure 1 - Regional Map

Mead Valley and Good Hope Water Improvements Project

ALBERT A. WEBB ASSOCIATES



H:\2023\23-0003\Technical Studies\Bio\GIS\Lavouts Map created 24 Oct 2023

Source: ESRI

not to scale

Figure 2 - Vicinity Map

Mead Valley and Good Hope Water Improvements Project

ALBERT A. WEBB ASSOCIATES

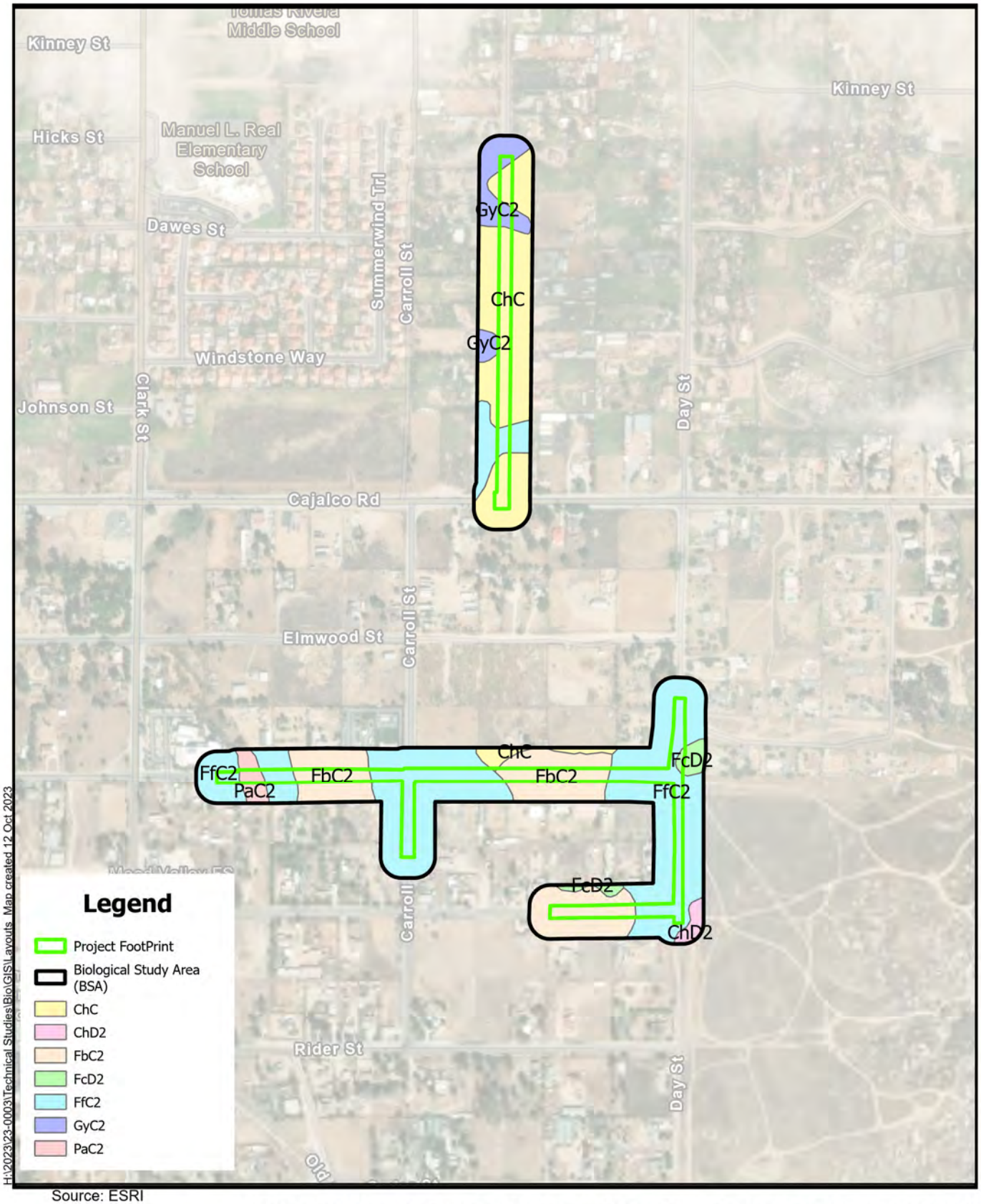
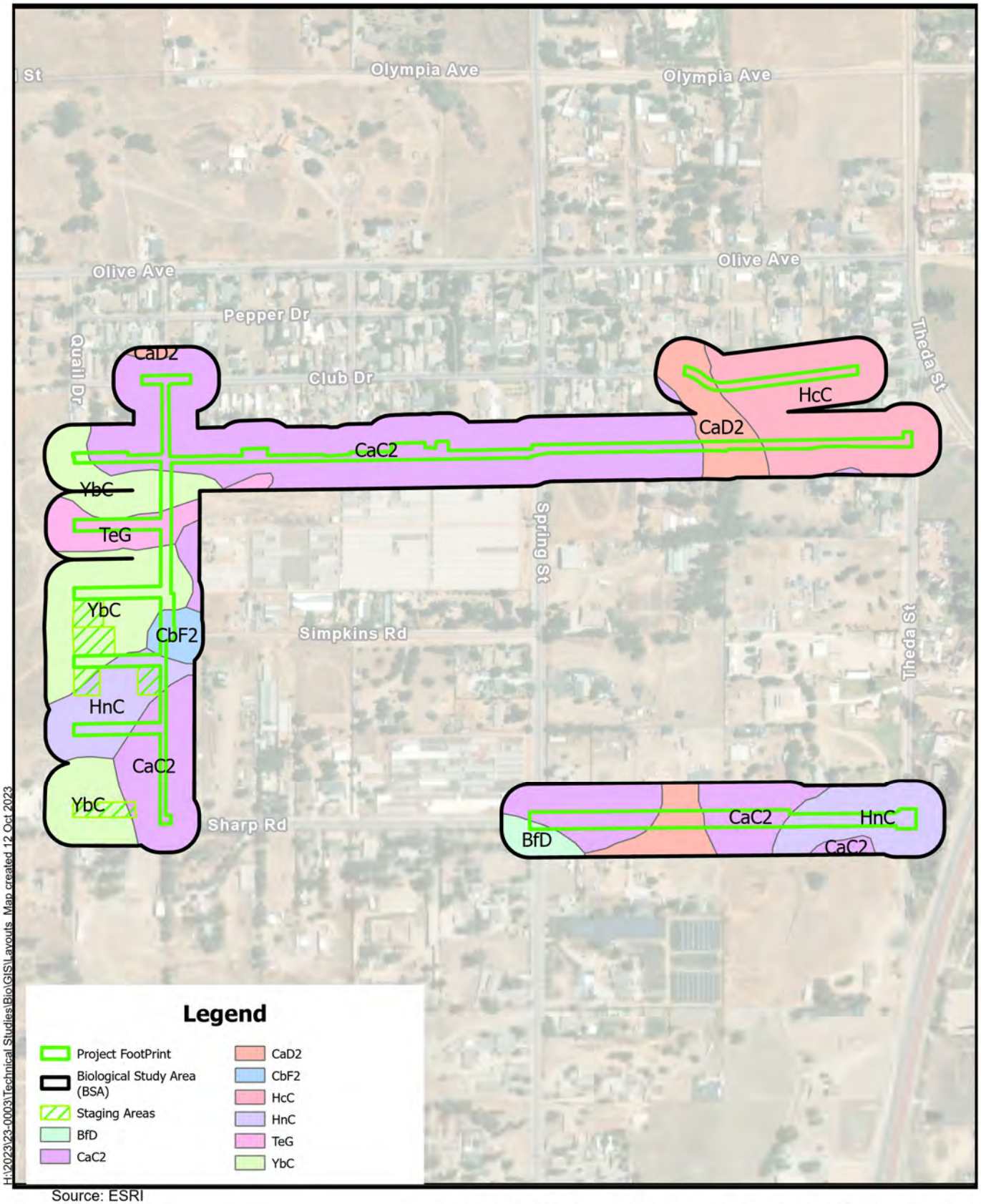


Figure 3A - USDA Soils (Mead Valley Areas 1 and 2)

Mead Valley and Good Hope Water Improvements Project

ALBERT A. WEBB ASSOCIATES



Source: ESRI

0 150 300 600 Feet

Figure 3B- USDA Soils (Good Hope)

Mead Valley and Good Hope Water Improvements Project

ALBERT A. WEBB ASSOCIATES

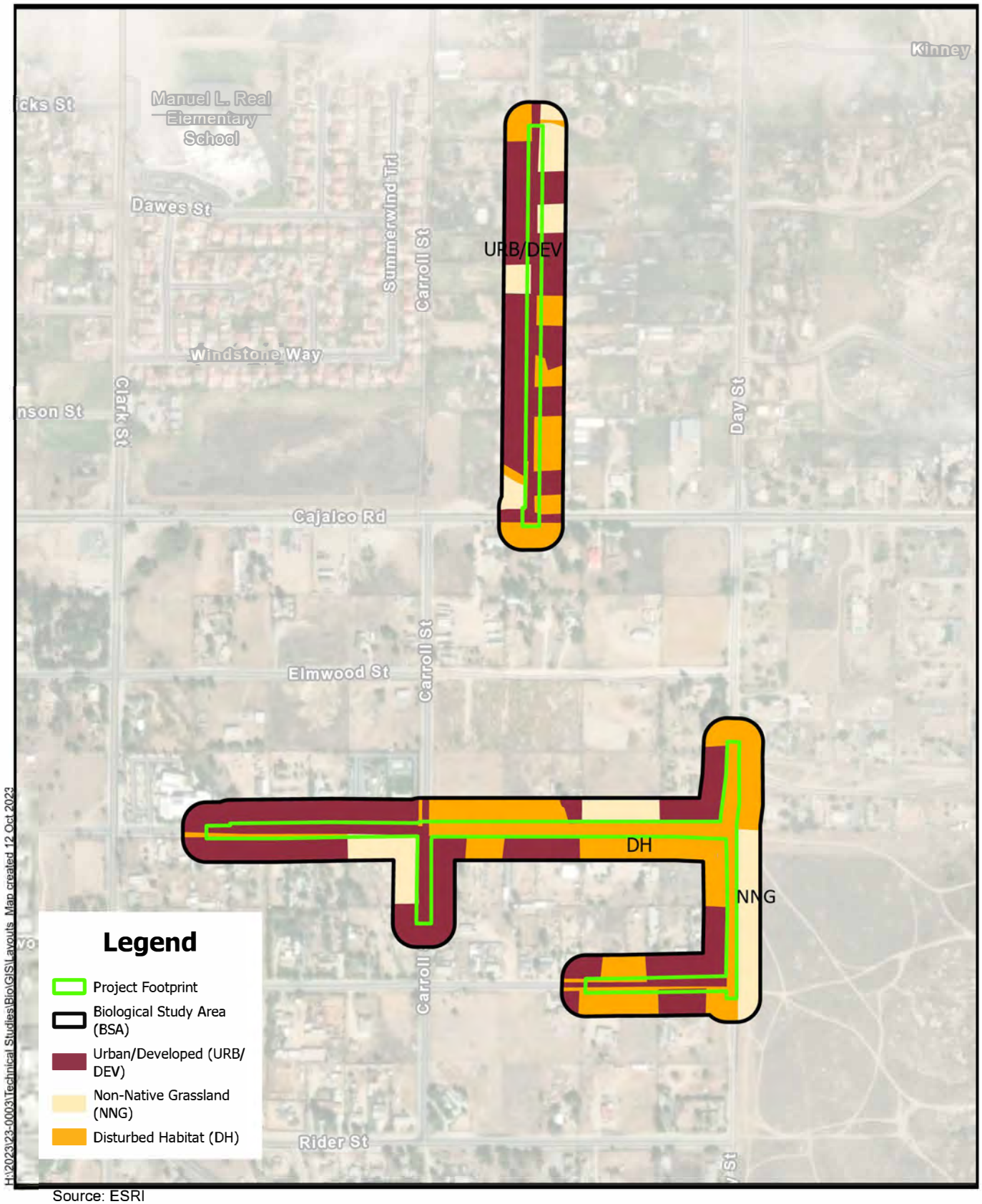
H:\2023\23-0003\GIS\PRO\temp_imp_staging_aerial\temp_imp_staging_aerial.aprx; Map created 24 Oct 2023

Source: Nearmap, 2023.

Figure 4 - Mead Valley Areas 1 and 2 Project Site

Mead Valley and Good Hope Water Improvements Project

ALBERT A. WEBB ASSOCIATES



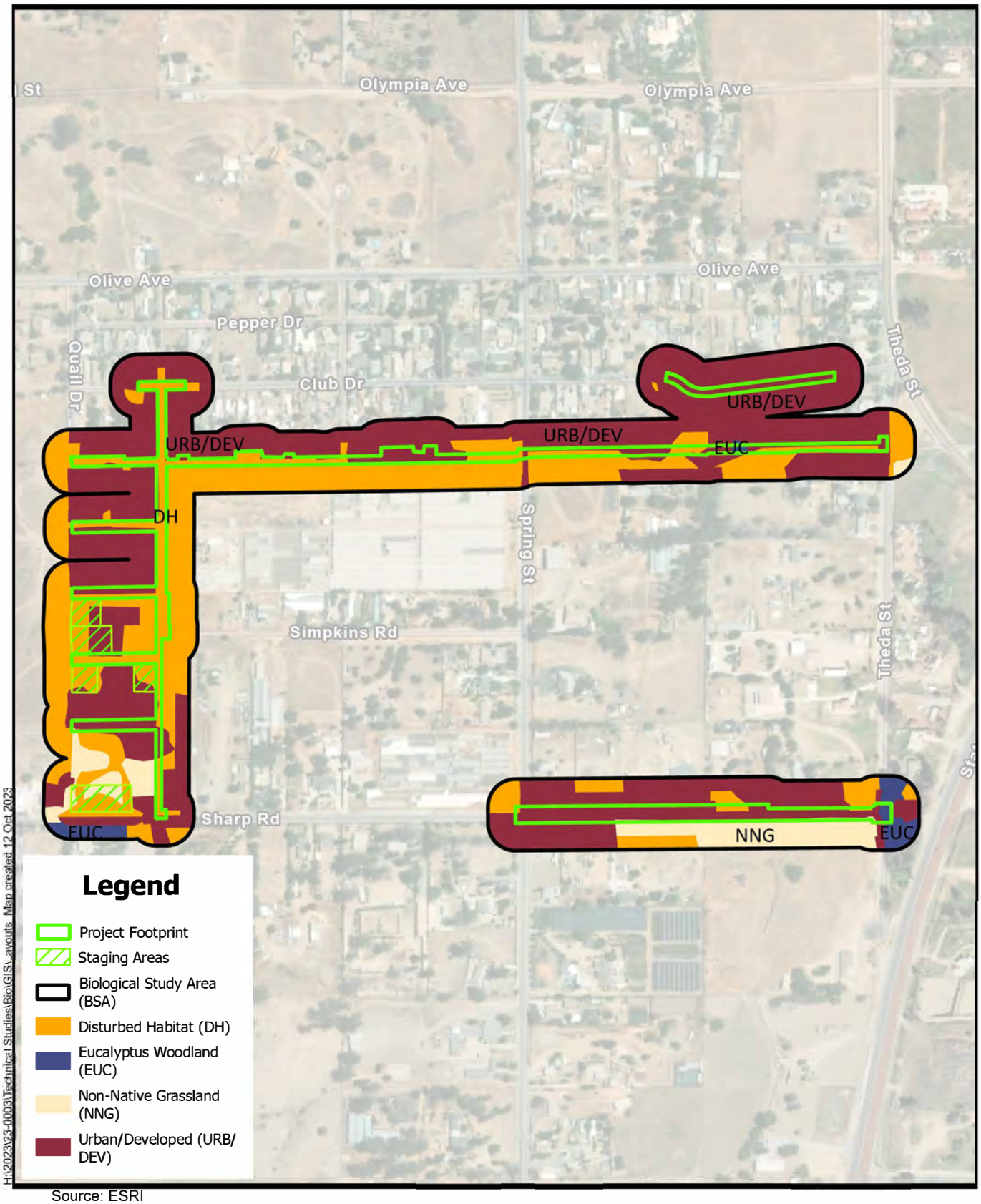
Source: ESRI

Figure 4A- Vegetation Communities and Land Cover Types (Mead Valley Areas 1 and 2)

Mead Valley and Good Hope Water Improvements Project

0 180 360 720 Feet

ALBERT A. WEBB ASSOCIATES

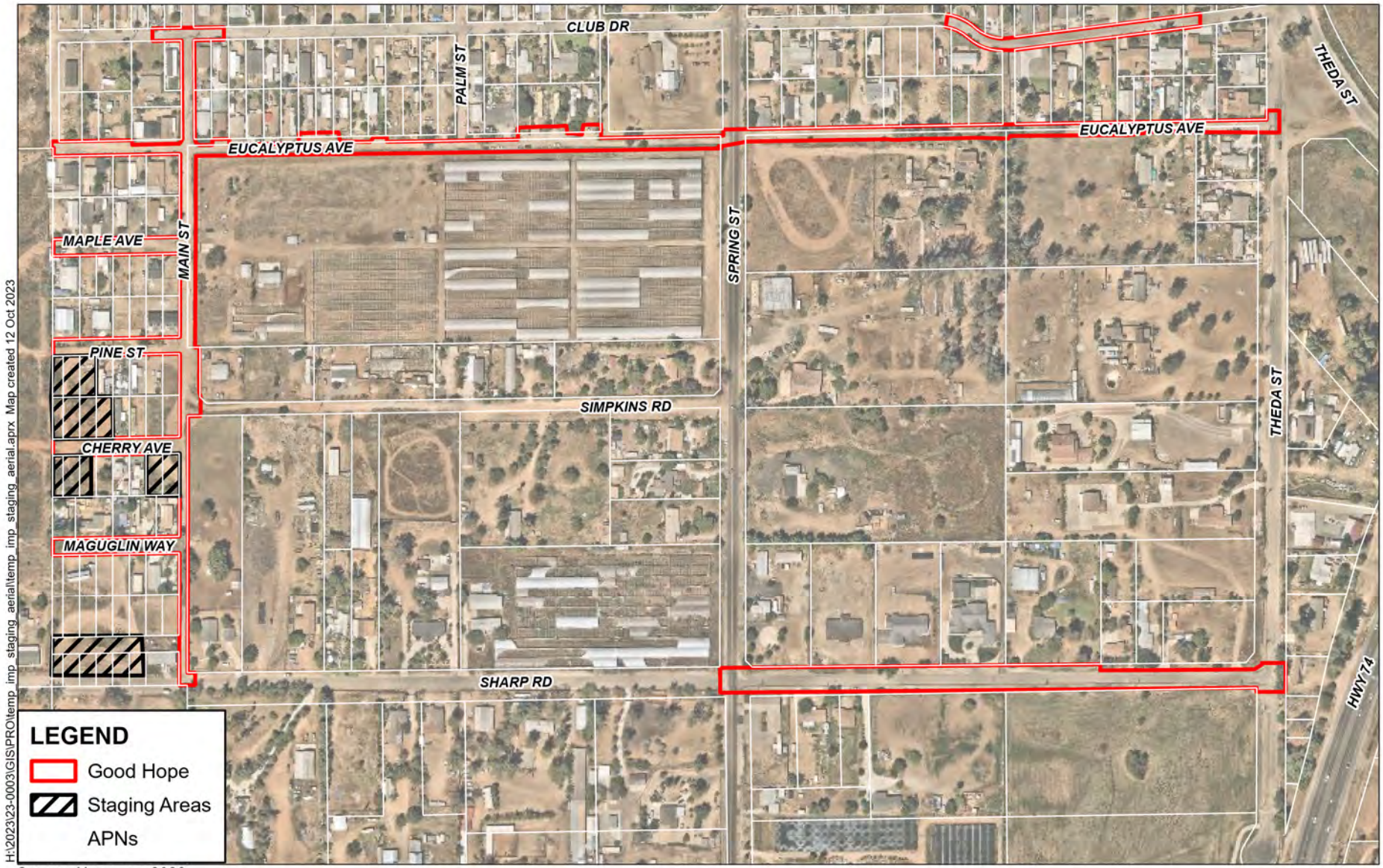


Source: ESRI

Figure 4B - Vegetation Communities and Land Cover Types (Good Hope)
Mead Valley and Good Hope Water Improvements Project

0 155 310 620 Feet

ALBERT A. WEBB ASSOCIATES



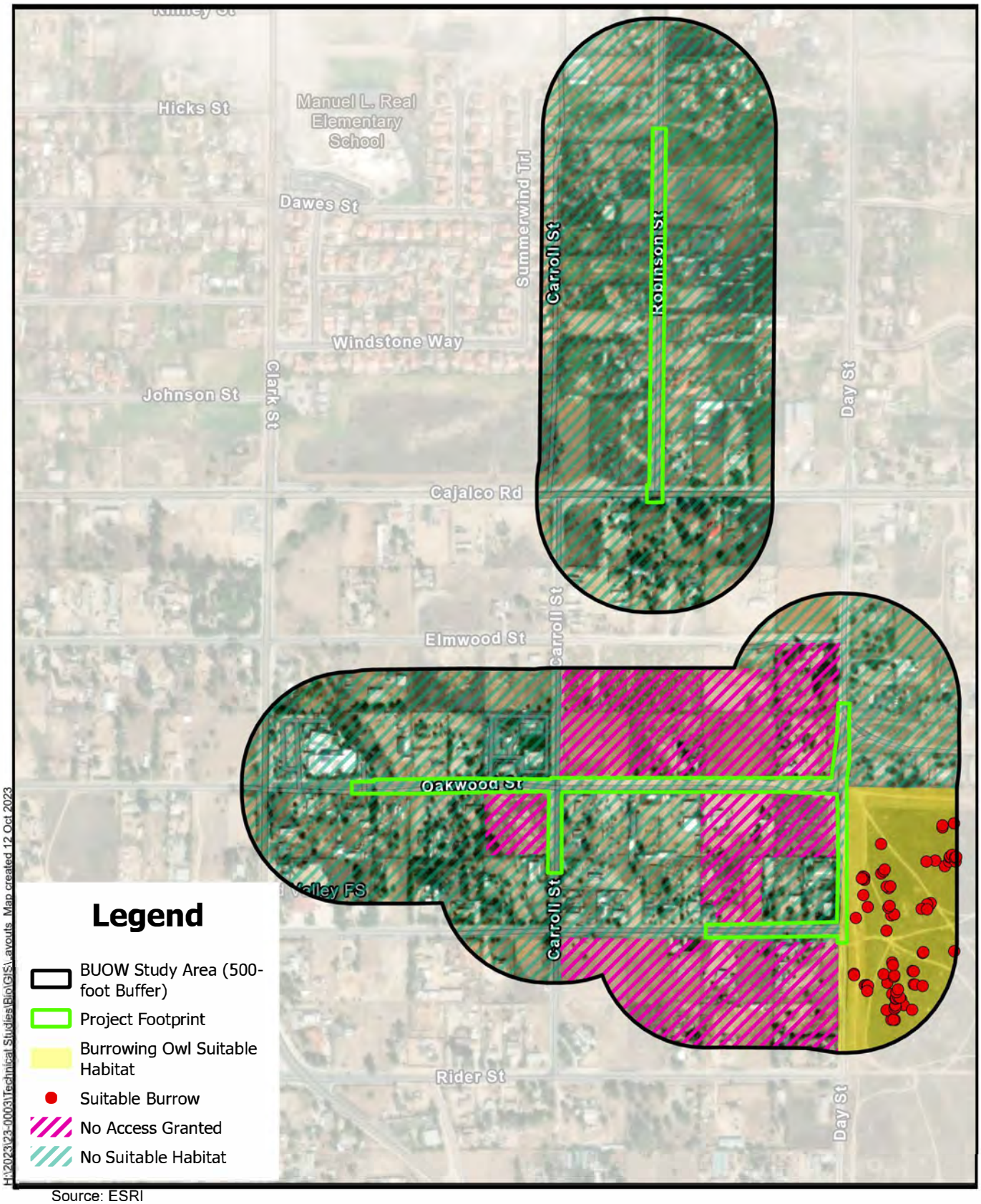
Source: Nearmap, 2023.

0 250 500 750 Feet

Figure 4C - Good Hope Project Site

Mead Valley and Good Hope Water Improvements Project

ALBERT A. WEBB ASSOCIATES



Source: ESRI

Figure 5A- Burrowing Owl Survey Results (Mead Valley Areas 1 and 2)
Mead Valley and Good Hope Water Improvements Project

0 195 390 780 Feet

ALBERT A. WEBB ASSOCIATES

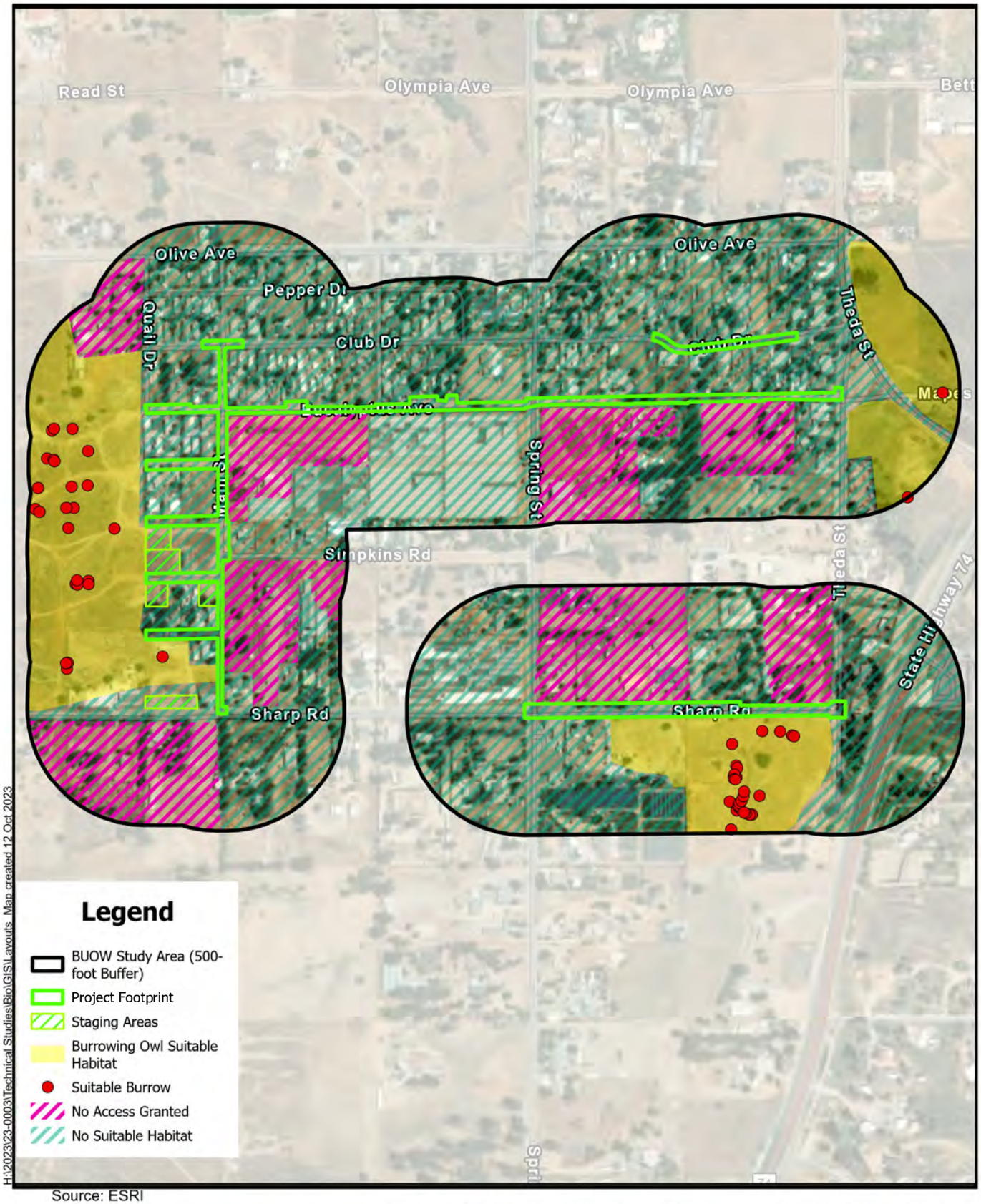


Figure 5B- Burrowing Owl Survey Results (Good Hope)
Mead Valley and Good Hope Water Improvements Project

ALBERT A. WEBB ASSOCIATES

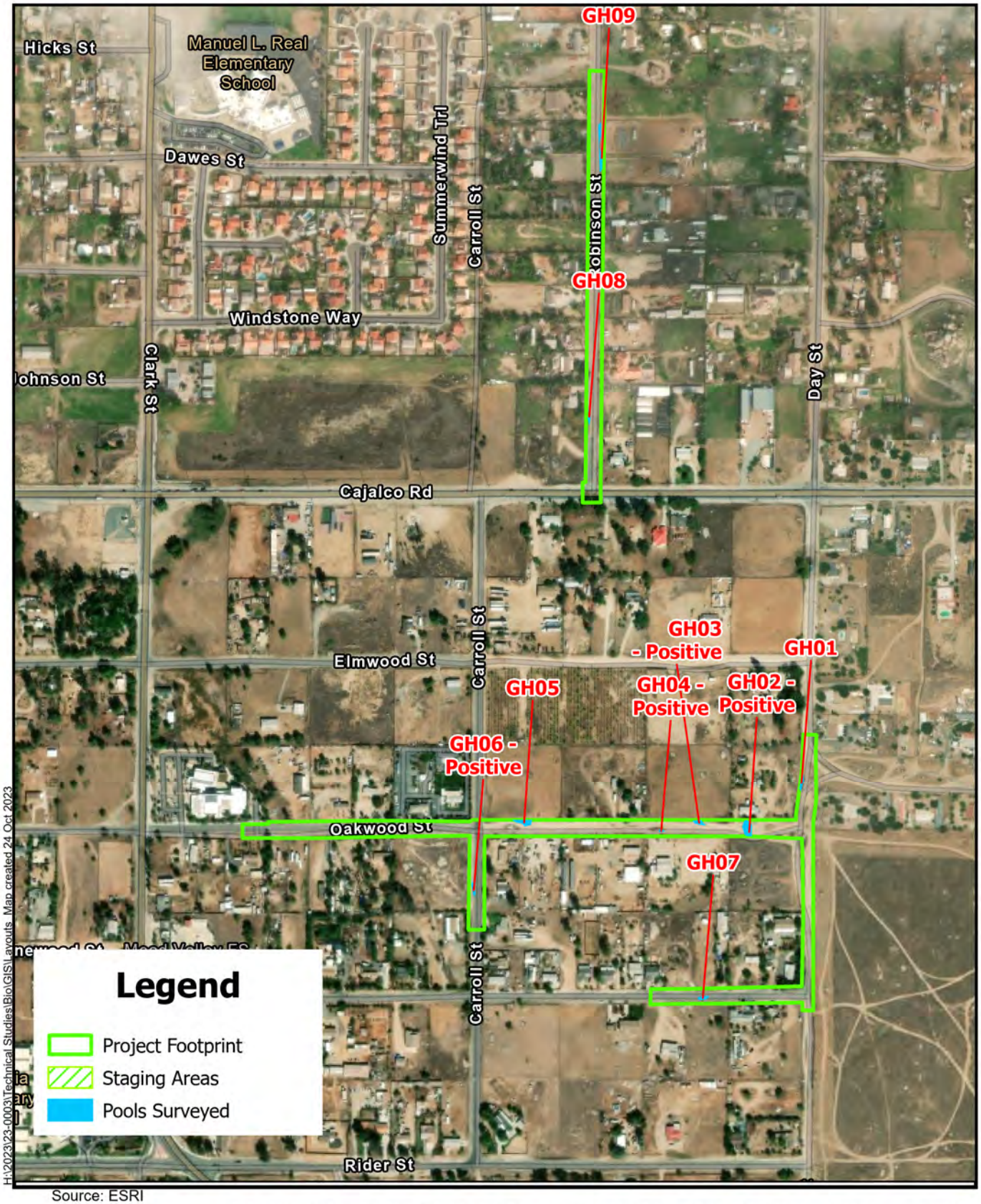
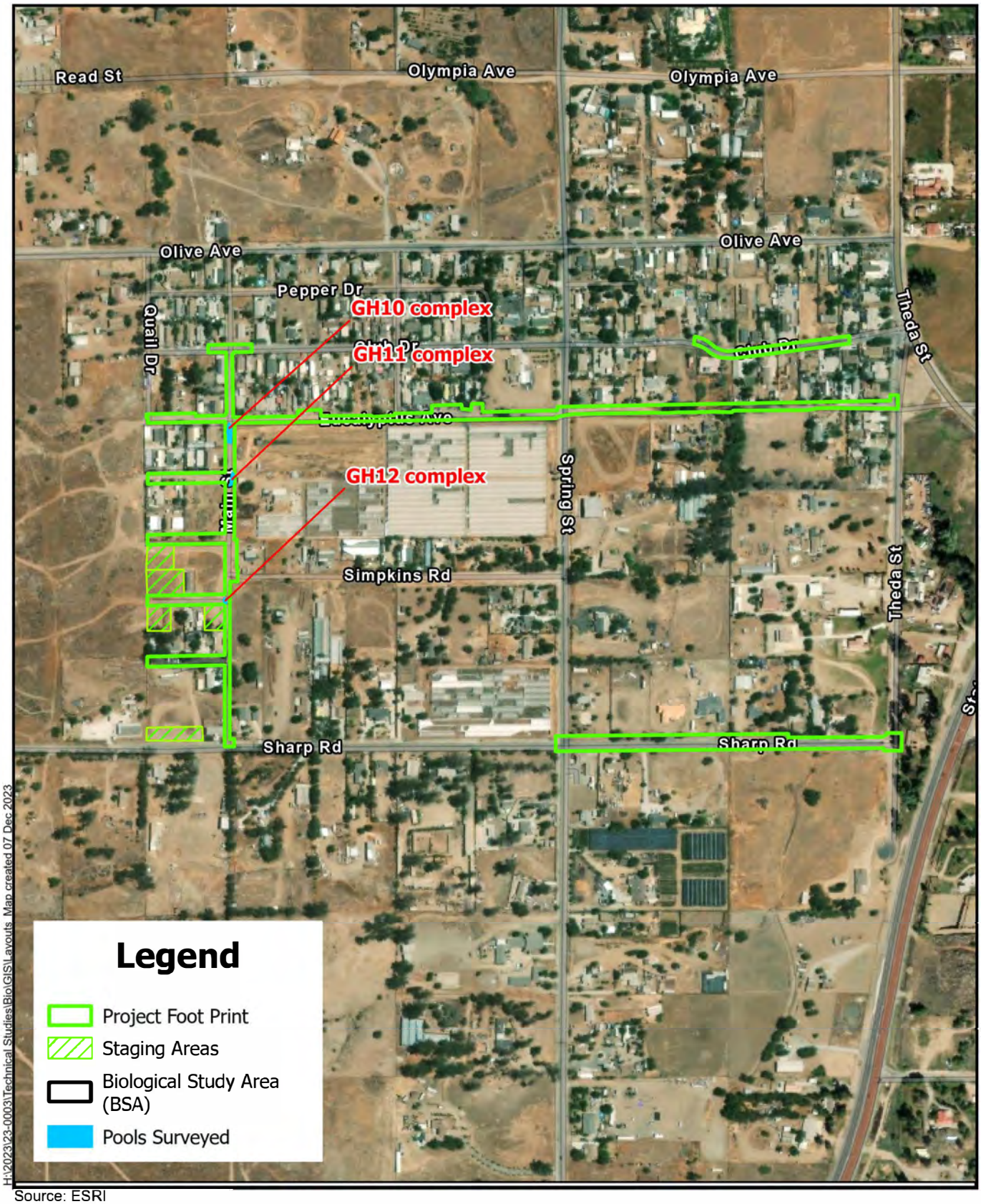


Figure 6A - Fairy Shrimp Survey Results (Mead Valley Areas 1 and 2)
Mead Valley and Good Hope Water Improvements Project

0 170 340 680 Feet

ALBERT A. WEBB ASSOCIATES

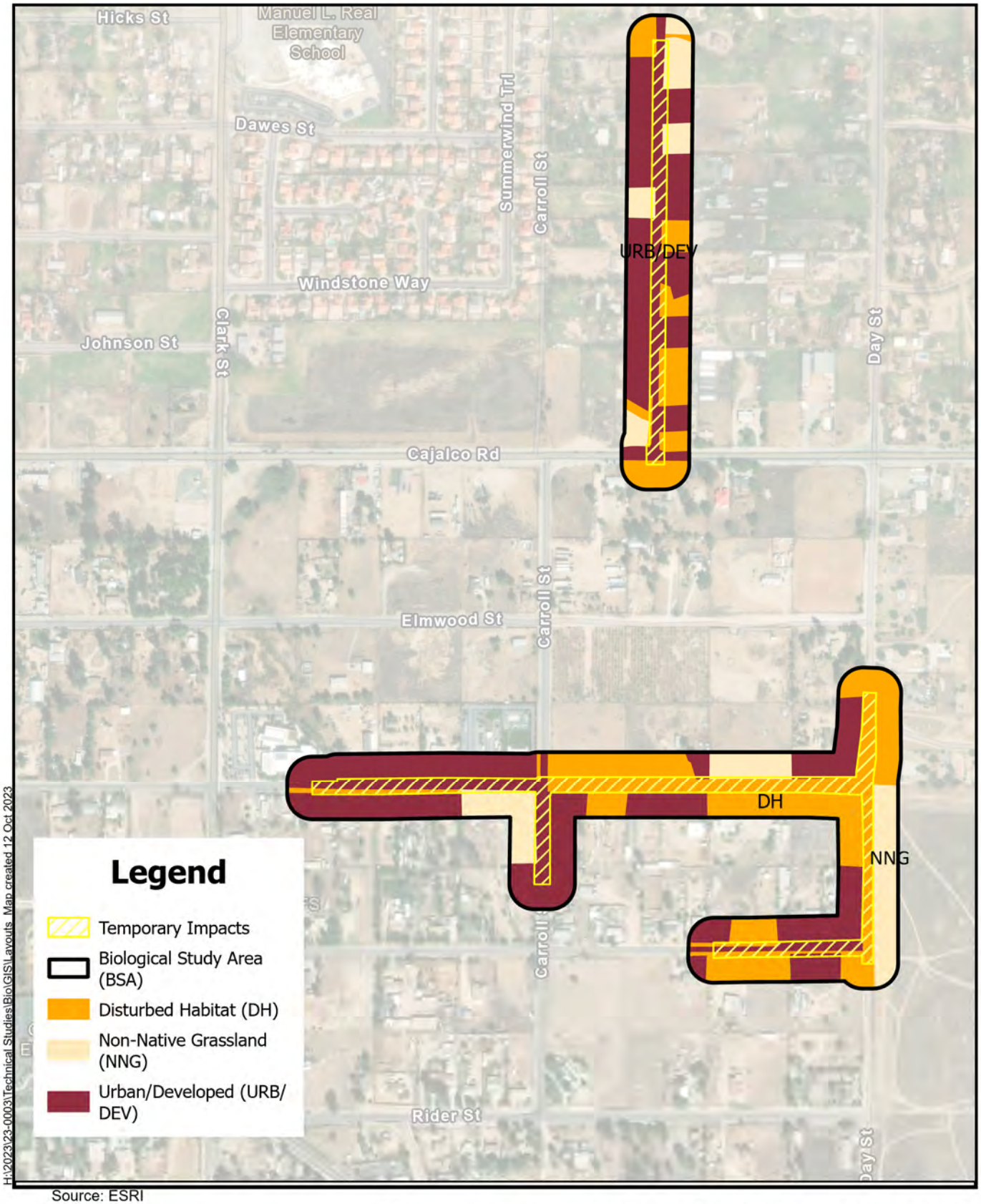


Source: ESRI

Figure 6B - Fairy Shrimp Survey Results (Good Hope)
Mead Valley and Good Hope Water Improvements Project

0 170 340 680 Feet

ALBERT A. WEBB ASSOCIATES

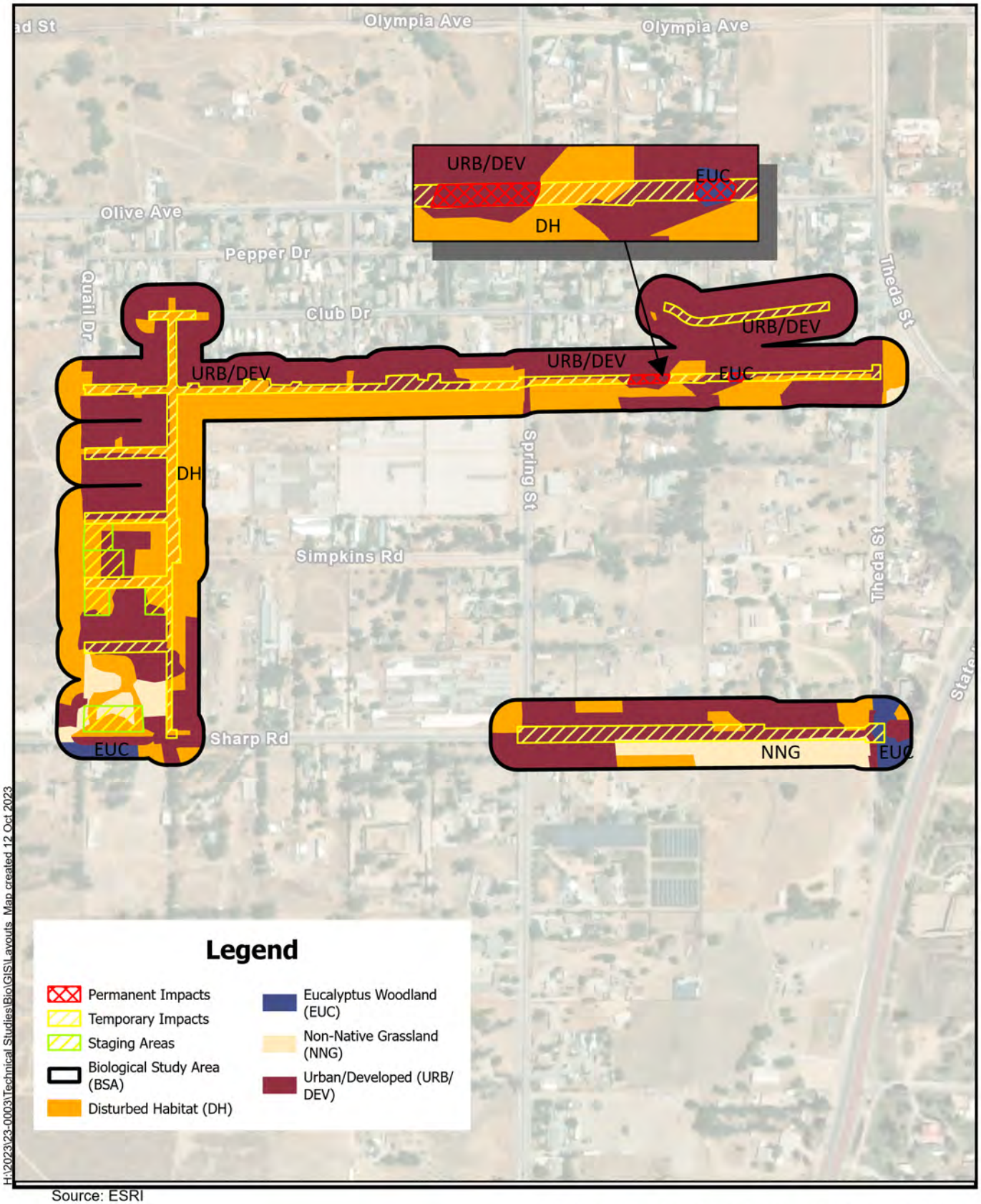


Source: ESRI

0 170 340 680 Feet

Figure 7A- Project Impacts (Mead Valley Areas 1 and 2)
Mead Valley and Good Hope Water Improvements Project

ALBERT A. WEBB ASSOCIATES



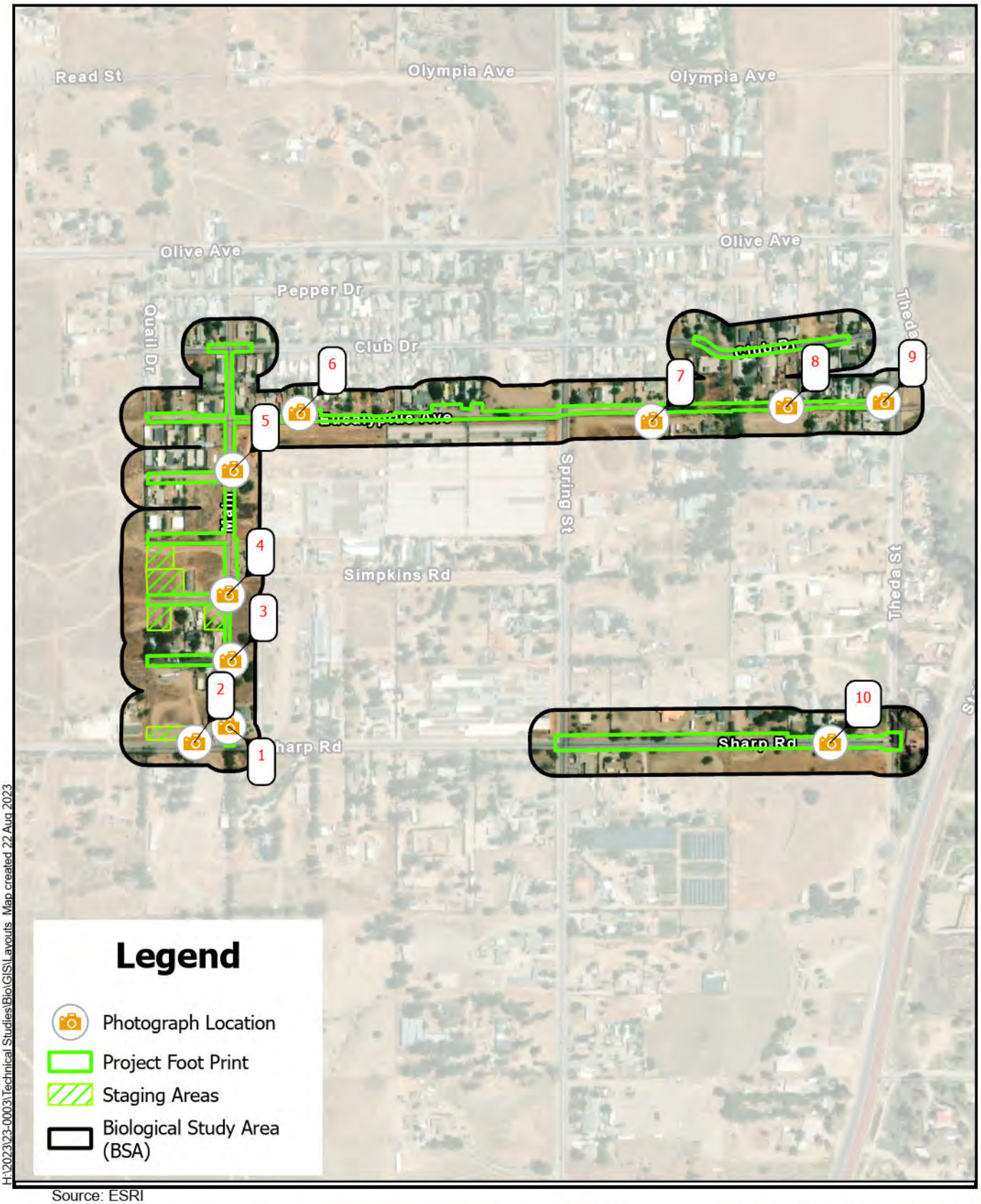
Source: ESRI

Figure 7B- Project Impacts (Good Hope)
Mead Valley and Good Hope Water Improvements Project

0 160 320 640 Feet

ALBERT A. WEBB ASSOCIATES

APPENDIX B



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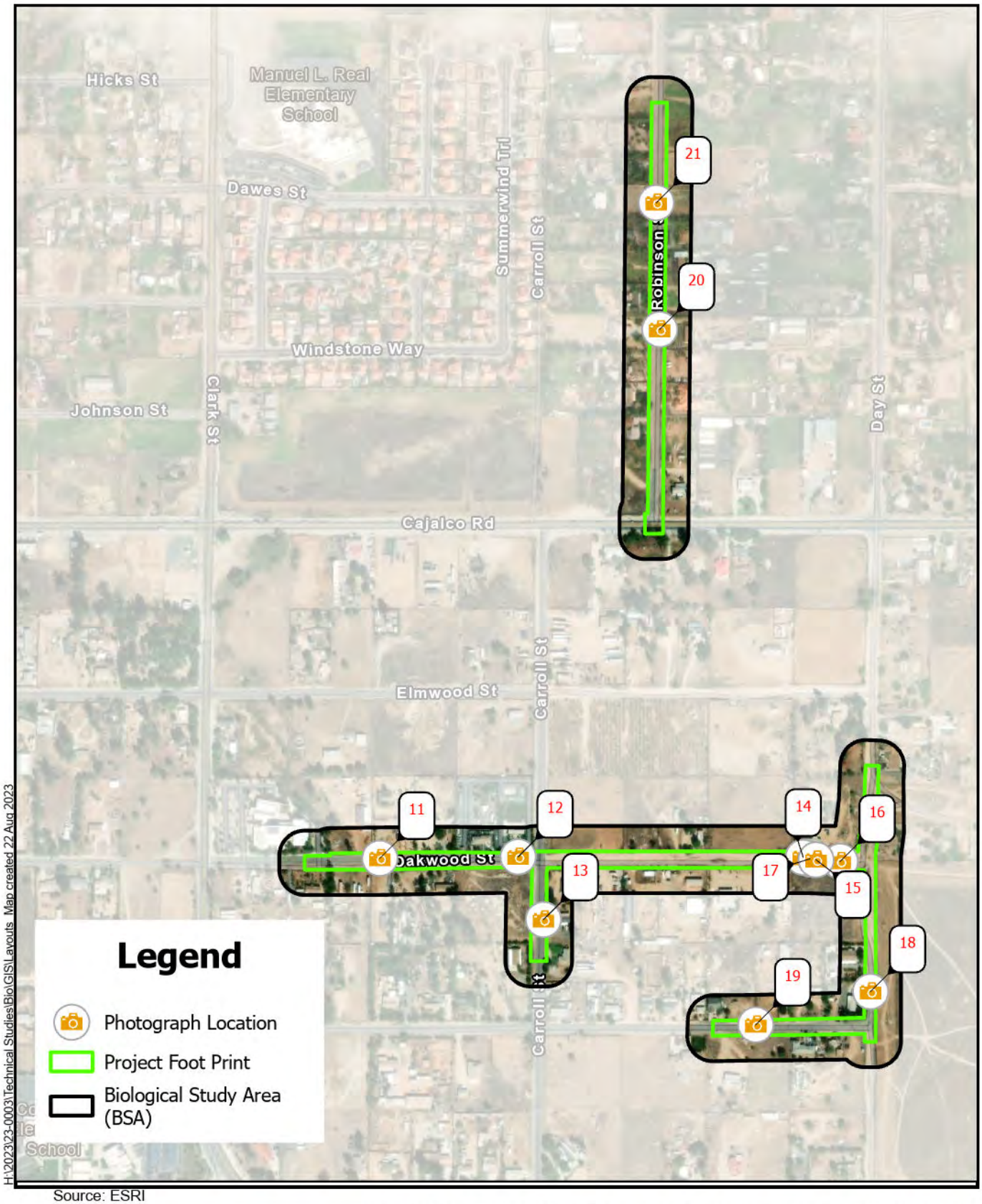
Source: ESRI

Appendix B- Photograph Index (Good Hope)

Mead Valley, Good Hope, and Oakwood Water Improvements Project

0 170 340 680 Feet

ALBERT A. WEBB ASSOCIATES



Source: ESRI

Appendix B- Photograph Index (Mead Valley &Oakwood)

Mead Valley, Good Hope, and Oakwood Water Improvements Project

0 170 340 680 Feet

ALBERT A. WEBB ASSOCIATES

Albert A. Webb Associates PHOTOGRAPHIC RECORD	
Client: EMWD	**Job Number:** 2023-0003
Site Name: Mead Valley, Good Hope, and Oakwood Water Improvements Project	**Location:** County of Riverside CA
Photographer: Marshall Paymard	**Date:** April 19, 2023

Photograph No. 1

Photo 1: Facing north in BSA.

Photograph No. 2

Photo 2: Facing north in BSA (proposed staging area).

Albert A. Webb Associates PHOTOGRAPHIC RECORD	
Client: EMWD	**Job Number:** 2023-0003
Site Name: Mead Valley, Good Hope, and Oakwood Water Improvements Project	**Location:** County of Riverside CA
Photographer: Marshall Paymard	**Date:** April 19, 2023

Photograph No. 3

Photo 3 Facing west in BSA.

Photograph No. 4

Photo 4: Facing north in BSA.

Albert A. Webb Associates PHOTOGRAPHIC RECORD	
Client: EMWD	**Job Number:** 2023-0003
Site Name: Mead Valley, Good Hope, and Oakwood Water Improvements Project	**Location:** County of Riverside CA
Photographer: Marshall Paymard	**Date:** April 19, 2023

Photograph No. 5

Photo 5: Facing south in BSA.

Photograph No. 6

Photo 6: Facing east in BSA.

Albert A. Webb Associates PHOTOGRAPHIC RECORD	
Client: EMWD	**Job Number:** 2023-0003
Site Name: Mead Valley, Good Hope, and Oakwood Water Improvements Project	**Location:** County of Riverside CA
Photographer: Marshall Paymard	**Date:** April 19, 2023

Photograph No. 7

Photo 7: Facing east in BSA (pepper tree removal)

Photograph No. 8

Photo 8: Facing west in BSA (eucalyptus tree removal).

Photograph No. 9

Photo 9: Photo 8: Facing west in BSA.

Photograph No. 10

Photo 10: Facing **east** in **BSA.**

Photograph No. 11

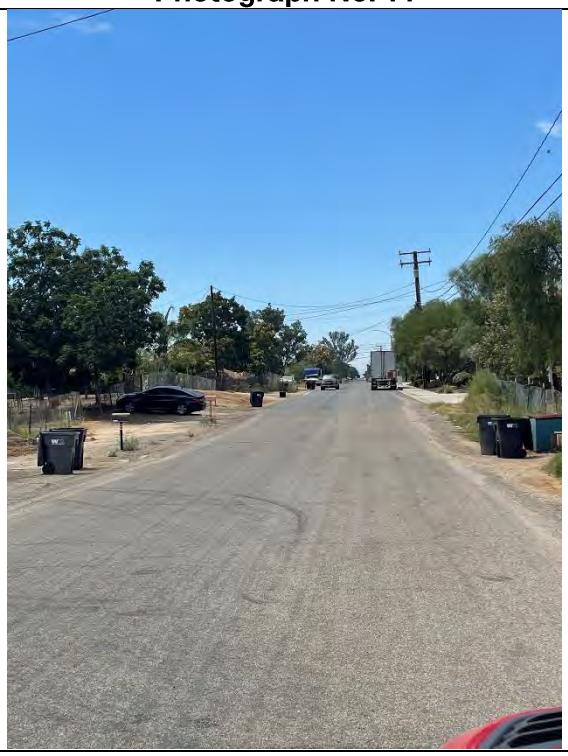


Photo11: Facing west in BSA.

Photograph No. 12

Photo 12: Facing **south** in BSA**.**

Photograph No. 13

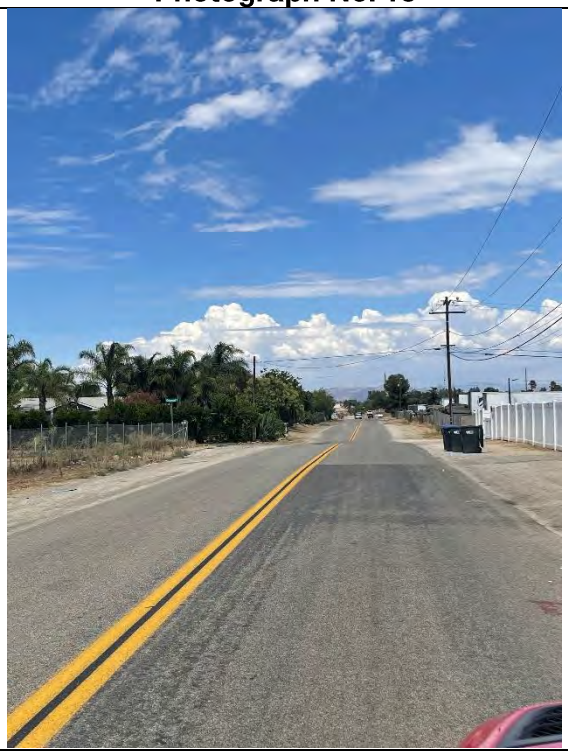


Photo 13: Facing north in BSA.

Photograph No. 14

Photo 14: Facing south east (Feature GH-02).

Photograph No. 15

Photo 15: Facing west (Feature GH-02, 04).
Photograph No. 16

Photo 16: Facing east (Feature GH-02, 04).

Photograph No. 17

Photo 17: Facing west (Feature GH-02, 03, 04).

Photograph No. 18

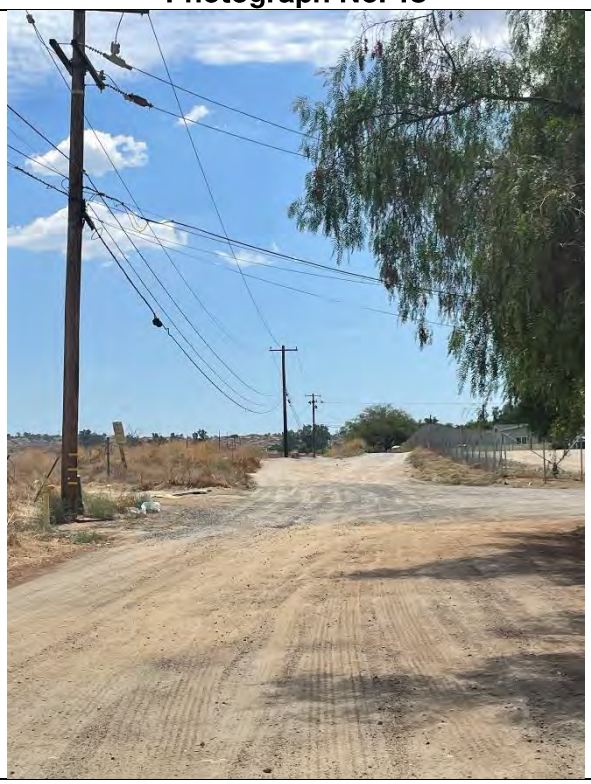


Photo 18: Facing north in the BSA.

Photograph No. 19

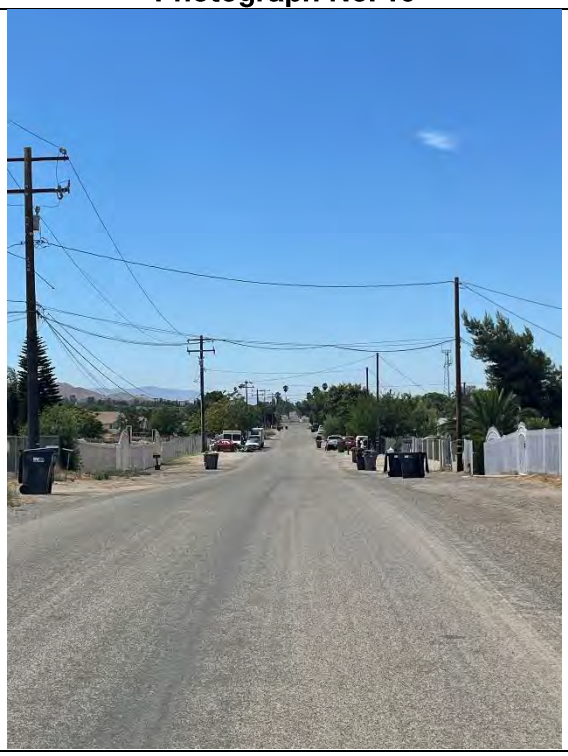


Photo 19: Facing west in the BSA.

Photograph No. 20

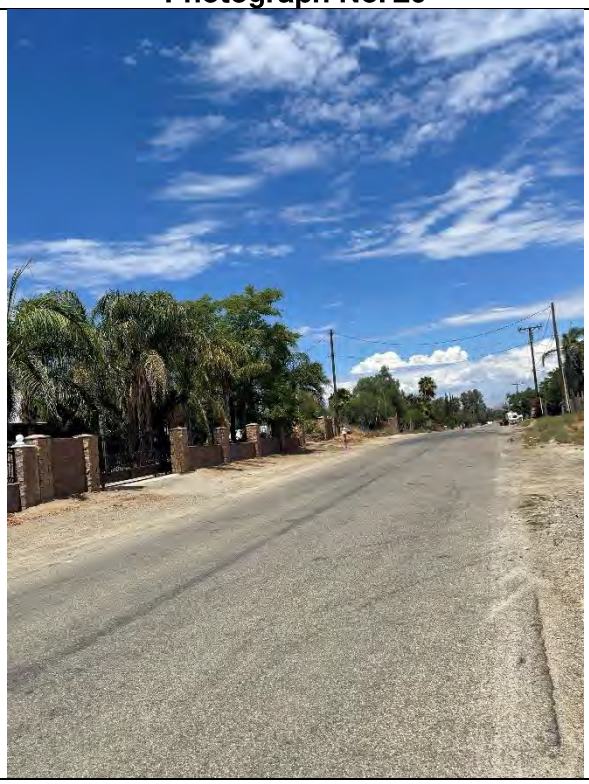


Photo 20: Facing north in the BSA.

Photograph No. 21

Photo 21: Facing south in the BSA.

APPENDIX C

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.

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.

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.

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.

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.

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.

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.

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

Species	Status: Federal/State	Habitat Type	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 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 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 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 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 present.

Artemisiospiza belli belli Bell's sparrow	None/WL	Chaparral, coastal scrub.	No suitable habitat 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 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 present in 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 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 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 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 present.
Coturnicops noveboracensis yellow rail	None/SSC	Freshwater marsh, meadow & seep. Freshwater marshlands.	No suitable nesting 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 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 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 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.	No suitable habitat present.
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 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 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 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 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 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.	No suitable habitat present.
Spinus lawrencei Lawrence's goldfinch	None/None	Broadleaved upland forest, chaparral, Pinon & juniper woodlands, Riparian woodland. Closely associated with oaks.	No suitable habitat present.
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.	No suitable habitat present.
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.	Focused wet and dry season surveys conducted. Species is absent.

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 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 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 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 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 present.
Ceratochrysis longimala Desert cuckoo wasp	None/None	Arid regions.	No suitable habitat 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 present.
Eugnosta busckana Busck's gallmoth	None/None	Coastal dunes, coastal scrub.	No suitable habitat 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 present.

Neolarra alba white cuckoo bee	None/None	(blank). Cleptoparasitic in the nests of perdita bees.	No suitable habitat present.
Mammals			
Chaetodipus californicus femoralis Dulzura pocket mouse	None/ SSC	Chaparral, Coastal scrub, valley & foothill grassland. Attracted to grass-chaparral edges.	No suitable habitat 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 present.
Dipodomys merriami parvus San Bernardino kangaroo rat	Endangered/ Candidate Endangered	Coastal scrub. Needs early to intermediate seral stages.	No suitable habitat 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 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 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 habitat present.
Lepus californicus bennettii San Diego black-tailed jackrabbit	None/None	Coastal scrub. Coastal sage scrub habitats in Southern California.	No suitable habitat 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 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 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 habitat present.
Onychomys torridus ramona southern grasshopper mouse	None/ SSC	Chenopod scrub.	No suitable habitat 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 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 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 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 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 present.
Aspidoscelis tigris stejnegeri coastal whiptail	None /SSC	Ground may be firm soil, sandy, or rocky.	No suitable habitat 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 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 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 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 present.

Salvadora hexalepis virgultea coast patch-nosed snake	None /SSC	Coastal scrub. Require small mammal burrows for refuge and overwintering sites.	No suitable habitat present.

State Abbreviations

- FP: Fully Protected
- S: Sensitive
- SSC: Species of Special Concern
- WL: Watch List

APPENDIX D

Focused Burrowing Owl Survey Report

For:

Mead Valley, Good Hope, and Oakwood Water Improvements 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 Good Hope 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.

Project Site Location

The proposed Project encompasses two distinct geographic locations, a northern component and a southern component, situated in the County of Riverside, California (Figure 1- Regional Map; all Figures are provided in Appendix A). The northern component of the Project is further divided into two specific areas, Mead Valley and Oakwood. The southern component of the Project consists of a single location, Good Hope, along with its corresponding staging areas.

The northern Project components are positioned approximately two miles west of Interstate Highway 215 and within 1-mile or less of Cajalco Road (Figure 2- Vicinity Map). Construction activities within the northern Project area are planned to take place on existing roadways, however because Robinson Street has not been dedicated as a Riverside County roadway and is still under private property ownership, proposed work on Robinson Street takes place on the following Assessor Parcel Numbers (APNs): 318-110-014, 318-110-026, 318-110-016, 318-110-030, 318-110-027, 318-110-029, 318-110-012, 318-110-015, 318-110-021, 318-110-009, 318-110-018, 318-110-031, 318-110-033, 318-110-034, 318-110-011, 318-110-010, 318-110-013, 318-110-022, 318-110-028, 318-110-017, 318-110-025, and 318-110-032.

The southern Project component is located roughly one mile west of Highway 74, primarily between Eucalyptus Ave and Sharp Road (Figure 2- Vicinity Map). Construction activities within the southern Project area will occur on existing County roadways and do not involve any Assessor Parcel Numbers (APNs), with exception of the associated construction staging areas, which are proposed on the following APNs: 345-034-008, 345-034-007, 345-033-001, 345-033-002, 345-033-003, 345-033-014, 345-033-013, 345-033-016, 345-033-015, 345-034-001, 345-034-002, 345-034-003, 345-036-004, 345-036-006, 345-036-001, 345-036-003, 345-036-005, 345-036-002.

Both the northern and southern Project components are situated within the Steele Peak 7.5-minute quadrangle map in Sections 2 of Township 50 South, Range 40 West. For the purposes of this report, all northern and southern Project components, including their respective staging areas, will be collectively referred to as the "Project," unless stated otherwise. The Project encompasses approximately 16-acres in total.

Project Site Description

The Project predominantly comprises both paved and unpaved roadways accompanied by single-family homes, agricultural operations, and equestrian stables in proximity. The Project

area exhibits characteristics of semi-rural residential development, characterized by compacted earthen disturbed roads, as well as scattered disturbed vacant lots interspersed throughout the community.

The Project footprint supports a total of four vegetation communities and land cover types, including: urban/developed lands, disturbed habitat, non-native grasslands, and eucalyptus woodland. Among these communities, only non-native grasslands and disturbed habitat was found within the 46.5-acres of suitable burrowing owl (BUOW) habitat (Figure 3A,3B - 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*). The disturbed habitat is composed of areas that have been mechanically disturbed yet retain a soil substrate and if vegetation is present, is predominantly composed of species such as cheeseweed (*Malva parviflora*), foxtail barley (*Hordeum murinum*), and *Erodium* species. Representative photographs of the Project and suitable habitat areas are provided in Attachment 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 burrowing owl habitat assessment, WEBB consulted the California Natural Diversity Database (CNDDB) to determine the nearest burrowing owl occurrence(s).

Following the CNDDB search, on February 21st, 2023, WEBB Senior Biologist, Marshall Paymard and Environmental Analyst, Virginia Waters, conducted a habitat assessment within the burrowing owl study area to determine whether the Project site supports suitable burrowing owl habitat. 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 46.5-acres of 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 21st, 2023/ 0630-1300	Marshall Paymard, Virginia Waters	Habitat Assessment	Air Temperature: 45-58°F; Wind:0-1 miles per hour (MPH); Cloud Cover:10%
March 6th, 2023/ 0630-1006	Marshall Paymard, Virginia Waters	Focused Survey #1	Air Temperature: 48-52°F; Wind:0-1 MPH; Cloud Cover: 0%
April 19th, 2023/ 0545-1000	Marshall Paymard, Virginia Waters	Focused Survey #2	Air Temperature: 50-54°F; Wind:0-1 MPH; Cloud Cover: 20%
May 12th, 2023/ 0545-1003	Marshall Paymard, Virginia Waters	Focused Survey #3	Air Temperature: 50-54°F; Wind:0-1 MPH; Cloud Cover: 30%
June 28th, 2021/ 0630-1000	Marshall Paymard, Virginia Waters	Focused Survey #4	Air Temperature: 64-68°F; Wind:0-1 MPH; Cloud Cover: 0%

Results

A total of 46.5-acres of habitat suitable for burrowing owl was identified within the burrowing owl study area (Figure 3A,3B- Burrowing Owl Survey Results). No suitable burrowing owl habitat, burrowing owl, or burrowing owl sign was identified within the Project footprint.

Further, as shown in Table 2, no burrowing owl or burrowing owl sign was observed in the burrowing owl study area. A total of 132 suitable burrows were recorded within the burrowing owl study area, with the primary host fossorial mammal being the California ground squirrel (Figure 3- Burrowing Owl Survey Results).

There are no CNDDB records of burrowing owl within the Project footprint or burrowing owl study area. The nearest burrowing owl record is from October 2003, which is located approximately 1-mile south of the southern Project component (Good Hope).

Table 2. Burrowing Owl Survey Results

Date/Time	Surveyor	Type	Results
February 21st, 2023/ 0630-1300	Marshall Paymard, Virginia Waters	Habitat Assessment	Suitable habitat identified.
March 6th, 2023/ 0630-1006	Marshall Paymard, Virginia Waters	Focused Survey #1	No burrowing owl or sign detected.
April 19th, 2023/ 0545-1000	Marshall Paymard, Virginia Waters	Focused Survey #2	No burrowing owl or sign detected.
May 12th, 2023/ 0545-1003	Marshall Paymard, Virginia Waters	Focused Survey #3	No burrowing owl or sign detected.
June 28th, 2021/ 0630-1000	Marshall Paymard, Virginia Waters	Focused Survey #4	No burrowing owl or sign detected.

Conclusion

No burrowing owl or sign was detected during the focused survey effort for burrowing owl. However, suitable habitat is present in the burrowing owl study area. Although no burrowing owl was detected during the 2023 focused survey(s), burrowing owl may colonize the burrowing owl study area prior to the commencement of construction. As such, burrowing owl 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 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 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 burrowing owl area, the CDFW shall be consulted, and the appropriate mitigation will need to be negotiated.

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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.

H:\2023\23-0003\Technical Studies\Bio\GIS\Layouts Map created 17 Aug 2023

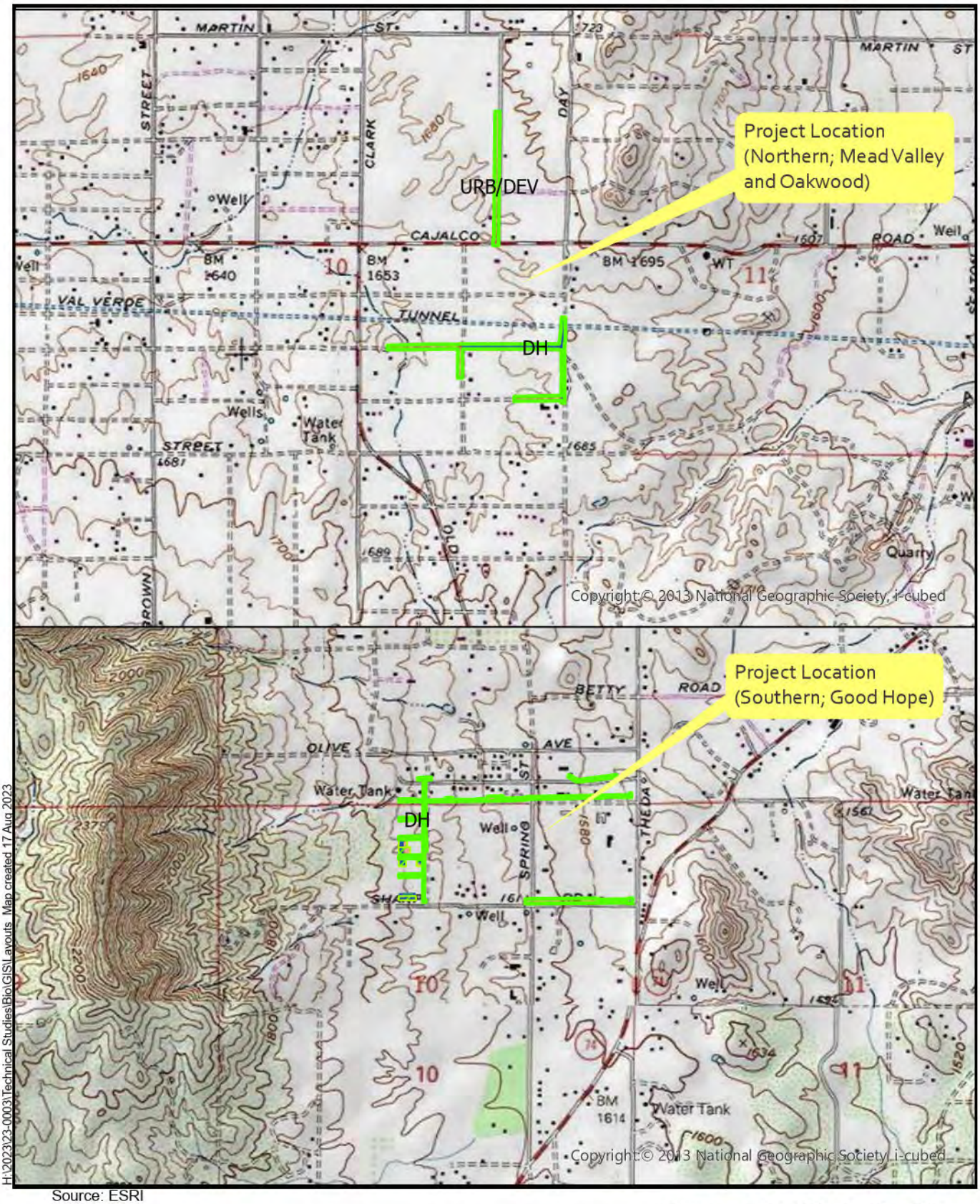
Source: ESRI

0 100 200 300 Feet

Figure 1- Regional Map

Mead Valley, Good Hope, and Oakwood Water Improvements Project

ALBERT A. WEBB ASSOCIATES



H:\2023\23-0003\Technical Studies\Bio\GIS\Layouts Map created 17 Aug, 2023

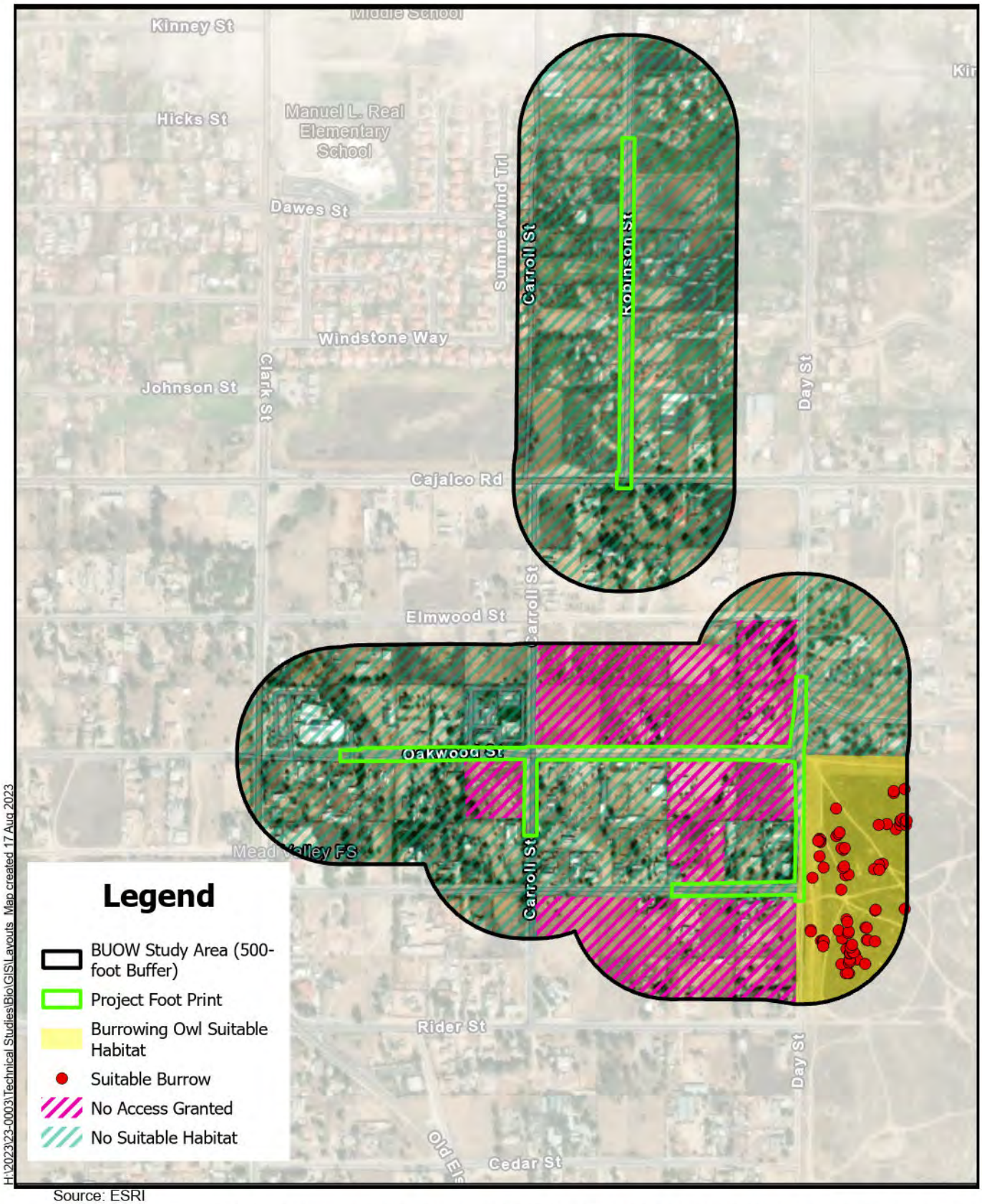
Source: ESRI

not to scale

Figure 2- Vicinity Map

Mead Valley, Good Hope, and Oakwood Water Improvements Project

ALBERT A. WEBB ASSOCIATES

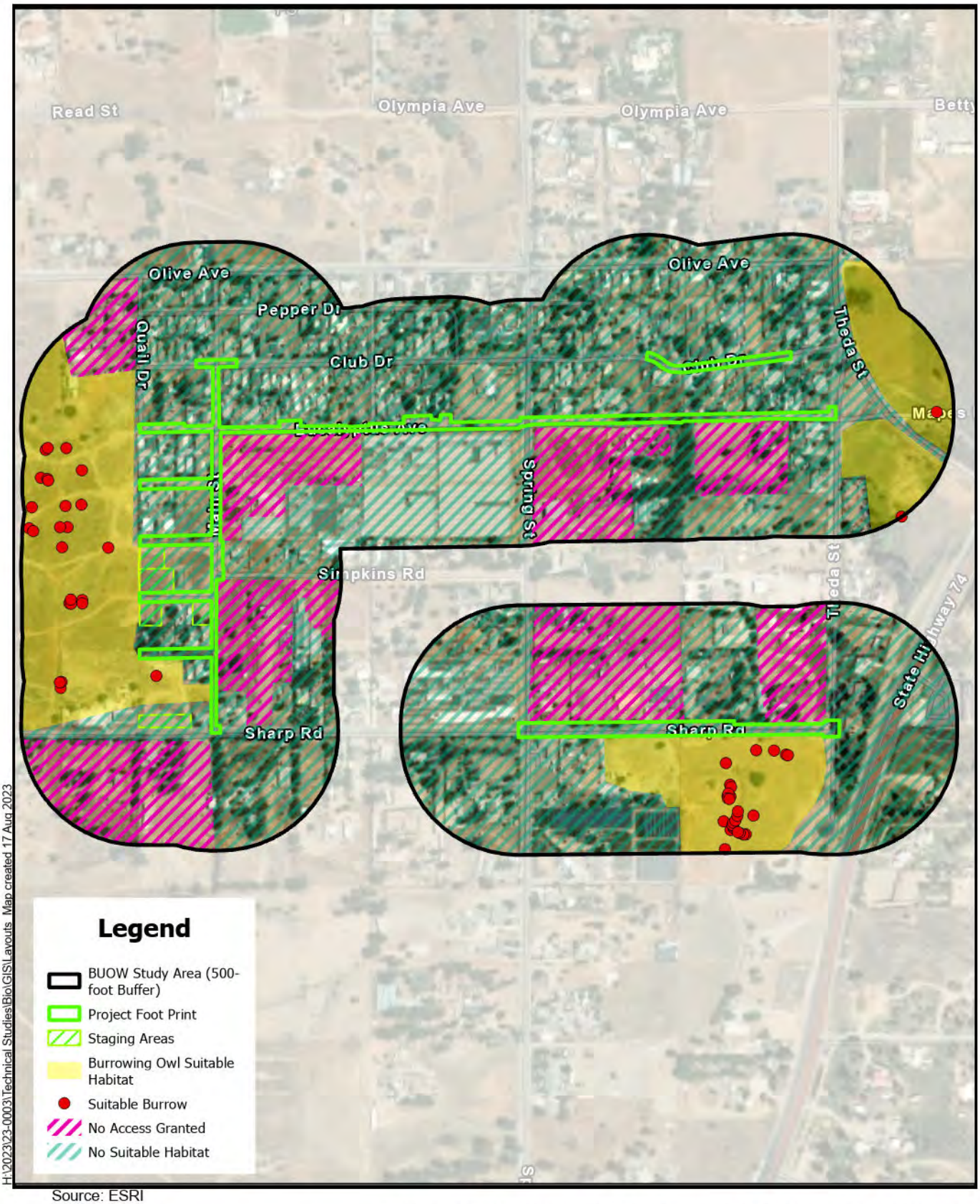


Source: ESRI

Figure 3A- Burrowing Owl Survey Results (Mead Valley and Oakwood)
Mead Valley, Good Hope, and Oakwood Water Improvements Project

0 210 420 840 Feet

ALBERT A. WEBB ASSOCIATES

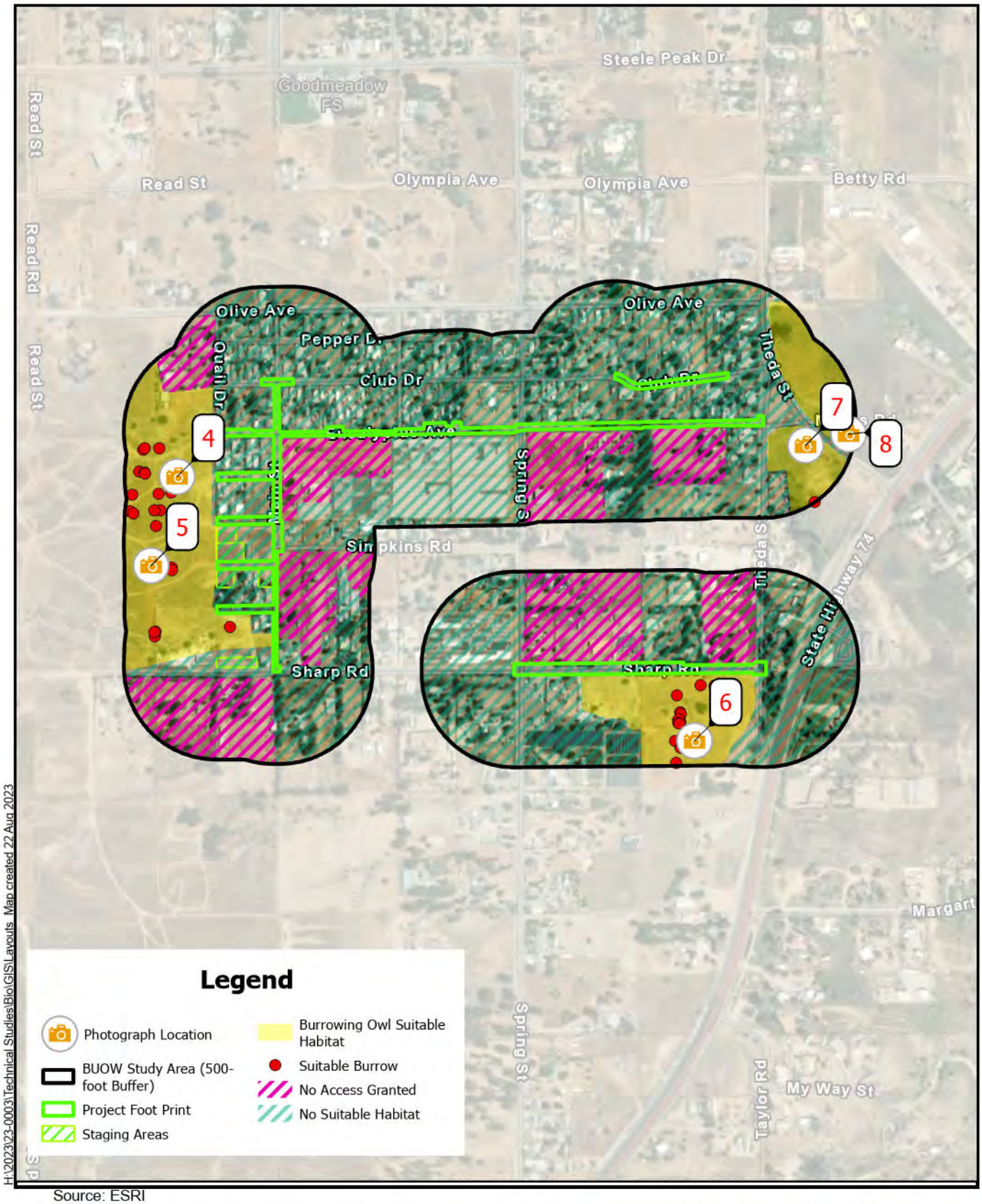


Source: ESRI

Figure 3B- Burrowing Owl Survey Results (Good Hope)
Mead Valley, Good Hope, and Oakwood Water Improvements Project

0 180 360 720 Feet

ALBERT A. WEBB ASSOCIATES



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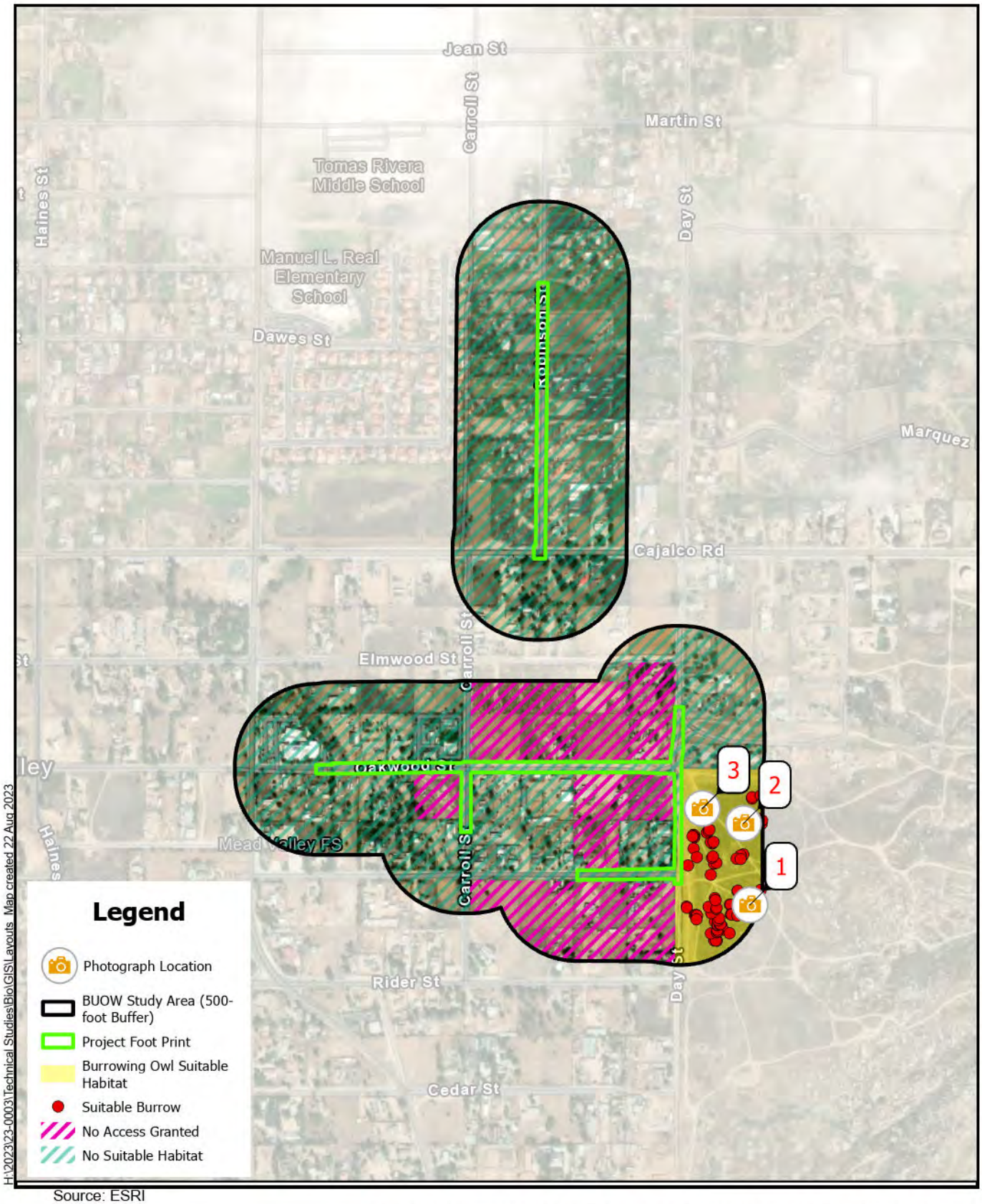
Source: ESRI

Appendix B- Photograph Index (Good Hope)

Mead Valley, Good Hope, and Oakwood Water Improvements Project

0 230 460 920 Feet

ALBERT A. WEBB ASSOCIATES



Source: ESRI

Appendix B- Photograph Index (Mead Valley &Oakwood)

Mead Valley, Good Hope, and Oakwood Water Improvements Project

0 250 500 1,000 Feet

ALBERT A. WEBB ASSOCIATES

Albert A. Webb Associates PHOTOGRAPHIC RECORD	
Client: EMWD	**Job Number:** 2023-0003
Site Name: Mead Valley, Good Hope, and Oakwood Water Improvements Project	**Location:** County of Riverside CA
Photographer: Marshall Paymard	**Date:** April 19, 2023

Photograph No. 1

Photo 1: Facing southwest in BUOW Study Area.

Photograph No. 2

Photo 2: Facing south in BUOW Study Area.

Albert A. Webb Associates PHOTOGRAPHIC RECORD	
Client: EMWD	**Job Number:** 2023-0003
Site Name: Mead Valley, Good Hope, and Oakwood Water Improvements Project	**Location:** County of Riverside CA
Photographer: Marshall Paymard	**Date:** April 19, 2023

Photograph No. 3

Photo 3 Facing east in BUOW Study Area.

Photograph No. 4

Photo 4: Facing south in BUOW Study Area.

Albert A. Webb Associates PHOTOGRAPHIC RECORD	
Client: EMWD	**Job Number:** 2023-0003
Site Name: Mead Valley, Good Hope, and Oakwood Water Improvements Project	**Location:** County of Riverside CA
Photographer: Marshall Paymard	**Date:** April 19, 2023

Photograph No. 5

Photo 5: Facing southeast in BUOW Study Area.

Photograph No. 6

Photo 6: Facing north in BUOW Study Area.

Albert A. Webb Associates PHOTOGRAPHIC RECORD	
Client: EMWD	**Job Number:** 2023-0003
Site Name: Mead Valley, Good Hope, and Oakwood Water Improvements Project	**Location:** County of Riverside CA
Photographer: Marshall Paymard	**Date:** April 19, 2023

Photograph No. 7

Photo 7: Facing southwest in BUOW Study Area.

Photograph No. 8

Photo 8: Facing west in BUOW Study Area.

2023 Good Hope Water Line Project

Wet & Dry Season Vernal Pool Branchiopod Survey Final Report

Prepared For:
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Prepared By:
Huffman Environmental, LLC
PO Box 2024
Julian, CA 92036

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Huffman ENVIRONMENTAL

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1. Summary

Huffman Environmental, LLC. (Huffman Environmental) and Albert A. Webb Associates (herein Webb) were contracted to conduct United States Fish and Wildlife (USFWS) Protocol 2023 wet and dry season vernal pool branchiopod (herein fairy shrimp) surveys for the Good Hope Project (herein Project) in Riverside County, California. This project site supports 12 identified, ponding locations capable of supporting branchiopods. Sampling over 6 visits resulted in detecting adult versatile fairy shrimp (*Branchinecta lindahli*) fairy shrimp in 3 features (GH-02, GH-04, GH-06). Dry season sampling was conducted on June 26, 2023 on all features and 3 of those (GH-02, GH-03, GH-04) were positive for *B. lindahli*. No federally-listed, Endangered or Threatened, fairy shrimp species were detected during wet and dry season sampling.

2. Introduction

2.1 *Project Location*

Webb was contracted during 2023 to provide environmental services for the Project, including wet and dry season fairy shrimp sampling for any features that pond long enough to potentially support their life cycle. The Project site is located in Perris, California within Riverside County. The Project is split into two smaller sites with the northern section located within the Mead Valley community near the junction of Cajalco Road and Clark Street. The southern portion of the Project is located approximately 5 miles south of the northern site, around the junction of Spring Street and Eucalyptus Avenue. The site falls within the Steele Peak United States Geological Survey (USGS) 7.5-minute series quadrangle (Figure 1).

2.2 *Historical Occurrences*

There are currently no recorded sensitive fairy shrimp within the Project boundaries per the California Natural Native Database (CNDDB) and United States Fish and Wildlife Services (USFWS) National GIS Database. The nearest recorded observation of a sensitive species was a documented Riverside fairy shrimp (*Streptocephalus woottoni*) on December 3, 2009, approximately 4 miles northeast of the northern portion of the project within the March Air Reserve Base property boundaries.

2.3 *Natural History*

USFWS currently has listed six branchiopod species as Endangered or Threatened: Conservancy fairy shrimp (*Branchinecta conservatio*), longhorn fairy shrimp (*Branchinecta*

longiantenna), vernal pool tadpole shrimp (*Lepidurus packardi*), vernal pool fairy shrimp (*Branchinecta lynchi*), Riverside fairy shrimp (*Streptocephalus woottoni*), and the San Diego fairy shrimp (*Branchinecta sandiegonensis*). These species collectively are commonly referred to as the "Listed Large Brachiopods" These species have all been listed by USFWS primarily due to the acceleration of human expansion and urban construction in vernal pool habitat. Additionally, vernal pool hydrology has been impacted through the alteration of water flow by a variety of infrastructure development, such as roads, trails, canals and so forth (USFWS Oregon 2020).

Vernal pools are formed from restrictive substrate layers that occur just under the ground surface, reducing water percolation. Once these layers within the subsoil become inundated, the basin will begin to fill. This allows for ponding to occur, creating habitat for fairy shrimp (CDFW 1998). Specific plant species have become endemic to these features and can be used to aid in the identification of vernal pools.

Habitat for fairy shrimp can naturally form or be created by other artificial, topographic features mimicking the aquatic habitat of the natural vernal pools (Sutter 1998). These vernal pool mimics may include such anthropogenic features as tire ruts, agricultural and construction ditches, cement culverts and so forth.

All of the above mentioned brachiopods have limited life spans for no longer than 150 days and can be completed in as little as 20 days with a relatively quick reproduction rate between 20 to 60 days (USFWS 1994). These species will deposit their embryos, enveloped by a protective shell known as cysts, into the substrate. These cysts protect the embryos during the dry seasons and are exposed to a variety of elements. Cysts have known to be viable for up to 15 years (Eriksen and Belk 1999). These cysts will break dormancy after environmental stimuli, such as precipitation, and restart the life cycle given the appropriate conditions.

3. Methods

3.1 *Habitat Assessment*

Huffman Environmental conducted a project wide assessment to determine habitat suitability for supporting fairy shrimp in March, 2023. The Project site consists of a linear design for improvements to the water line infrastructure. The footprint occurs parallel to existing developed roads either in the form of asphalt pavement or compacted dirt. Habitat exists as anthropomorphic features in the form of dirt road ruts and ditches along residential neighborhoods. These areas experience daily vehicular traffic and features are constantly evolving as further impacts are made to them.

In addition to visual evidence from historical, aerial imagery, physical survey results identified 12 features throughout the northern and southern sites recording these features with some degree of ponding from precipitation. It was concluded that these features do not meet the criteria to be classified as vernal pools, due to a combination of anthropomorphic origins and absence of plant obligates.

3.2 Wet Season Survey Methodology

Huffman Environmental biologist, Garrett Huffman (TE-20186A-3.2), conducted all wet season vernal pool visits on the project site. Survey methodology was conducted in accordance with the USFWS *Survey Guidelines for Listed Large Branchiopods*, revised November 13, 2017. Per the Guidelines, the wet season generally occurs in California between October and June. Surveys were conducted during the month of March and April 2023. A 24-hour pond check during March recorded that all features were inundated with the required 3 cm of water to sustain fairy shrimp development and warranted weekly visits. Visits were made to the site weekly while at least one feature during the 2023 wet season recorded ponding. Visits concluded after features were recorded as dry and reached the end of the wet season.

3.3 Dry Season Survey Methodology

Dry season soil samples were collected on June 26, 2023 from the Project basins. Quantity of sample collections is determined by applying USFWS *Survey Guidelines for Listed Large Branchiopods* (USFWS 2017) formula by calculating approximate feature size in square meters. 8 Project features were estimated to be in between 2.5 - 24 square meters (0.005 acres) requiring a minimum of 10 collected soil samples for each and 4 features were estimated to be in between 25 - 235 square meters (0.05 acres) requiring a minimum of 25 collected soil samples with all samples, regardless of feature size, to be collected at a volume of 50 - 100 milliliters each. Each sample was collected from the lowest topographic areas within the pool to maximize the potential detection of cysts.

Dry sample collections were conducted by biologist Garrett Huffman (TE-20186A-3.2) and trainees Jon Walker and Blanca Martinez. Dry sample processing was conducted by biologist, Chuck Black (TE-835549-7). All data compiled during dry sample processing can be reviewed at Appendix B.

3.4 Soil Processing for Cyst Presence

Samples were hydrated for approximately 1-12 hours in tap water, then washed through a set of sieves. Material was passed through a Number 45 (.0139”) USA Standard Testing Sieve, A.S.T.M.E.-11 specification and caught on a Number 70

(.0083") Sieve. Filtered material was then rinsed into a container with approximately 50 millimeters of a saturated brine solution to float organic material, including fairy shrimp cysts. The material floating on the brine was decanted onto a paper filter on a filter funnel, and water was removed through the filter paper by vacuum suction. A 6.3-570x power Olympus SZX9 Zoom Stereo Microscope was used to examine the remaining material. Distinctive fairy shrimp cysts, if present, were individually counted (if less than approximately 50) or estimated (for larger numbers) by examining ¼ or ½ subsections of the filter and multiplying the subset by the appropriate factor. The presence and numbers of ostracod shells and cladoceran ephippia were also noted in samples.

3.5 Cyst Culturing

Individual samples were combined by pool number and hydrated in approximately 500 ml of Arrowhead Mountain Spring water. Plastic culture tubs were placed in a shady location in a San Diego outdoor location (night low temperatures in the low to mid 60's, daily highs in the low 70's to high 80s). Two days after hydration cultures were fed with several ml of a yeast culture produced by dissolving a gram of table sugar and a gram of instant dry yeast in 50 ml 95 F degree filtered water. Water was added daily to tubs to replace water lost to evaporation. Mature shrimp were removed periodically from each culture as they became large enough to identify and examined under an Olympus Zoom dissecting microscope.

4. Results

During the 2023 wet season surveys, 6 visits were made and all features were recorded as receiving enough precipitation to remain ponded for longer than 7 days with more than 3 cm of water depth. All features are of anthropomorphic origin, located within the roads that are regularly impacted by vehicles and void of vegetation. Dates of site visits and feature inundation status are documented in Table 1.

Table 1: Wet Sample Processing Results

	L-01	L-02	L-03	L-04	L-05	L-06	L-07	L-09	L-10	L-11	L-12
03-15-2023	wet	wet	wet	wet	wet	wet	wet	wet	wet	wet	wet

03-22-2023	wet	wet	wet	wet	wet	wet	wet	wet	wet	wet	wet
03-30-2023	wet	wet	dry	wet	dry	wet	dry	dry	dry	dry	wet
04-05-2023	wet	wet	dry	wet	dry	dry	dry	dry	dry	wet	dry
04-12-2023	dry	dry	dry	wet	dry	dry	dry	dry	dry	dry	dry
04-20-2023	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry

The northern portion of the project recorded 9 of the ponding features (GH-01 through to GH-09) with 3 of those features (GH-02, GH-04, and GH-06) positive for the versatile fairy shrimp (*B. lindahli*) (Figure 3). The southern portion of the project recorded 3 features (GH-10, GH-11, and GH-12) , capable of ponding. None of these were found to contain fairy shrimp.

180 soil samples from the Project features were processed for the dry season efforts among all the features with *Branchinecta* cysts detected within 3 of the 12 features (GH-02, GH-03, and GH-04). *Branchinecta* cyst culturing produced nauplii in an outside tub two days after hydration. All fairy shrimp were removed during maturation and were identified as Lindahl's fairy shrimp (*Branchinecta lindahli*) (Appendix B).

Table 2: Dry Sample Processing Results

Pool	Number of 50 ml Samples	Numbers of Branchinecta cyst in subsamples	Cysts/100 ml soil	*Branchineca lindahli* identified (males:females)
GH-01	10	None	None	
GH-02	25	3,5,5,3,4,2,2,2,43,2,12,5,8,1,2,2,4,5,1,1,5,5,12,3,4,5,8,4,2,2,1,6,3,5,6,2,4,2,3,3,4,6	20:1	10:5
GH-03	10	1		1:0
GH-04	25	3,5,6,8,12,6,3,9,4,1,1,4,1,7,8,2,2,5,7,8,12,3,2,8,7,22,4,3,6,5,6,1,1,7,5,3,4	16:1	12:4
GH-05	25	None	None	
GH-06	10	None	None	
GH-07	10	None	None	
GH-09	25	None	None	

GH-10	10	None	None
GH-11	10	None	None
GH-12	10	None	None

5. Conclusion

All features are subjected to daily disturbance from vehicles and data results may evolve over time as impacts alter the shape and species presence. Fairy shrimp cysts have been documented of being transported to different road ruts and depressions via mud and vehicular tire treads.

Despite the fairy shrimp wet season surveys for the Project being delayed until March, it is our conclusion that the data collected during the 6 visits provided an accurate representation of species that would occur there throughout the duration of the wet season. 3 of the 12 Features were positive for the common, versatile fairy shrimp (*B. lindahli*), supporting the conclusion that weather conditions were suitable during this period to support branchiopod life cycles among all documented features. Dry season surveys further confirmed the accuracy of the wet season results with the detection of only *B. lindahli.* It is our professional interpretation that the results of the wet and dry season surveys for the Project meet the USFWS Protocol criteria to be a complete survey.

6. Certification

All biologists working under Huffman Environmental for the 2023 fairy shrimp wet and dry season Good Faith Project were permitted to survey for this species under Section 10(a)(1)(A) of the ESA.

I certify that the information in this report and attached figures completely and accurately represent the work of the individual permittee.

Please feel free to contact me at (623) 238-1545 or garrett@huffmanenvironmental.com if you have any questions regarding the contents of this report.

Cordially,

Garrett Huffman

Garrett Huffman
Principal Biologist - TE-20186A-3.2
Huffman Environmental, LLC - 623.238.1545
garrett@huffmanenvironmental.com

7. Citations

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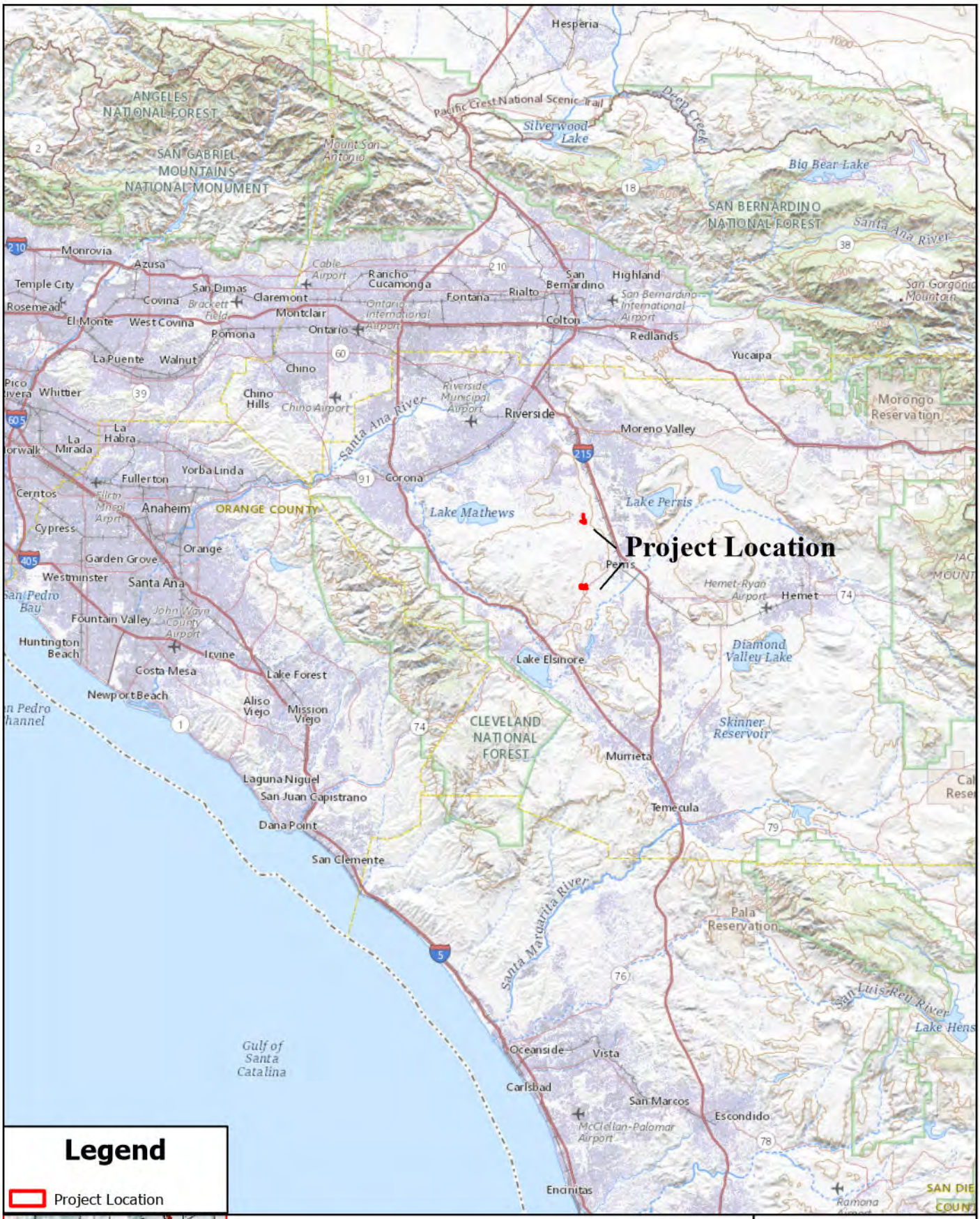


Figure 1: Project Vicinity

Good Hope Water Line Project
Fairy Shrimp - Wet and Dry Season

2023

Coordinate System: NAD 1983 StatePlane California VI FIPS 0406 Feet

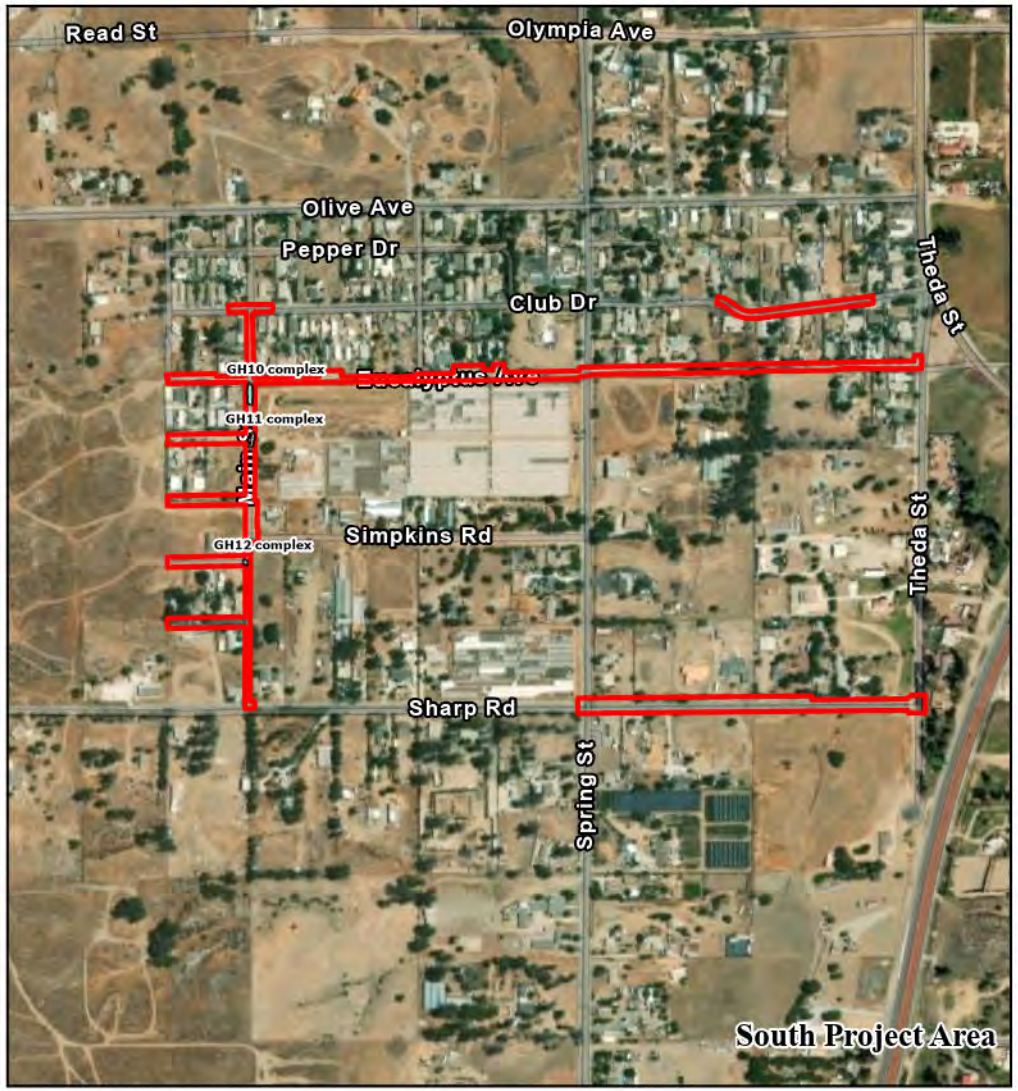


Figure 2: Project Site & Features

Good Hope Water Line Project: Fairy Shrimp - Wet & Dry Season Surveys

2023

Coordinate System: NAD 1983 StatePlane California VI FIPS 0406 Feet

N

0 0.13 0.25 Mi

0 0.23 0.45 Km

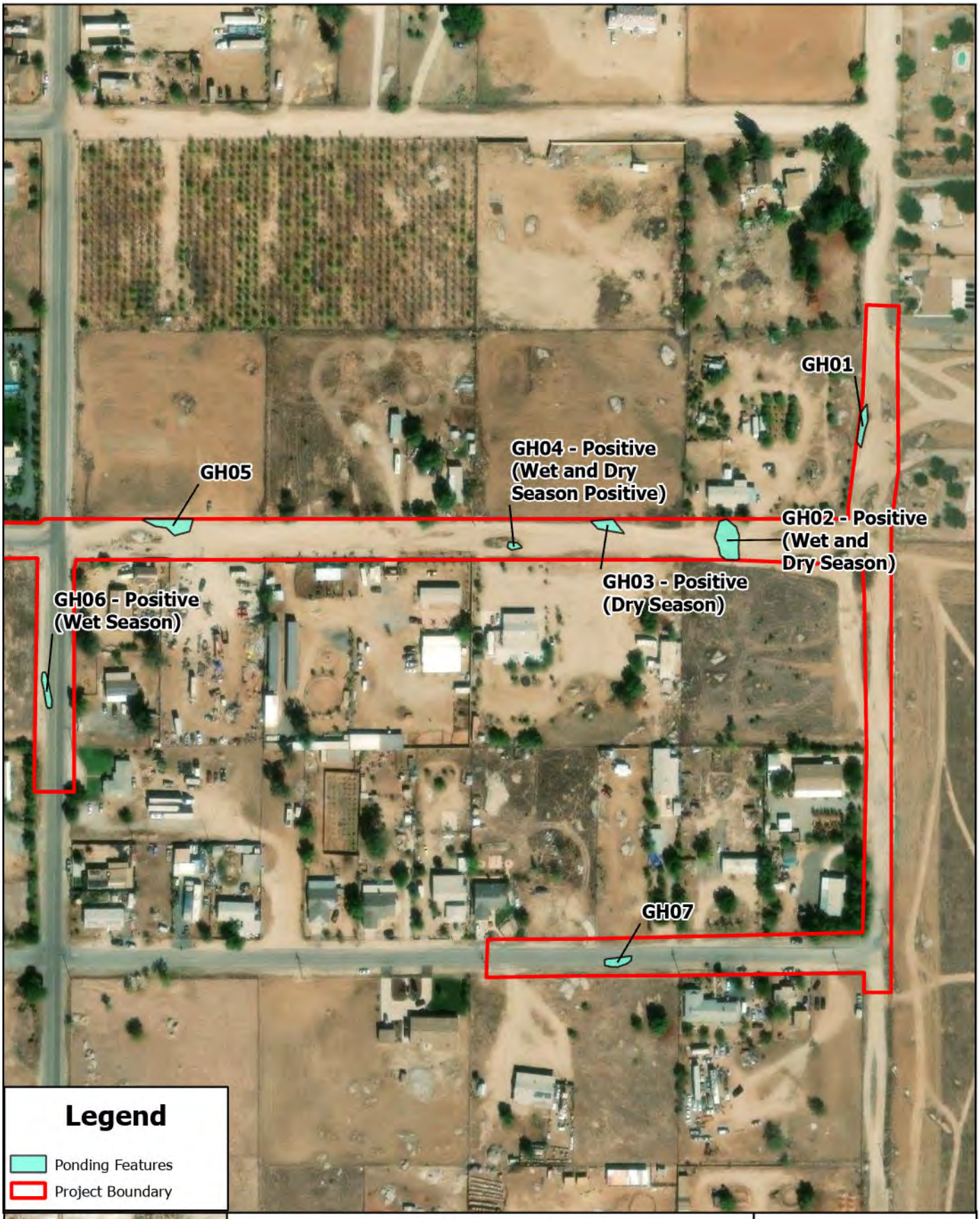


Figure 3: Fairy Shrimp Positive Pond Features North Project Area

Good Hope Water Line Project
Fairy Shrimp - Wet & Dry Season

2023

Coordinate System: NAD 1983 StatePlane California VI FIPS 0406 Feet

N

0 0.02 0.04 Mi

0 0.04 0.08 Km

Attachment A

Site Photos

Photo 1: Fairy Shrimp (*B. lindahli*) collected from feature "GH-02"

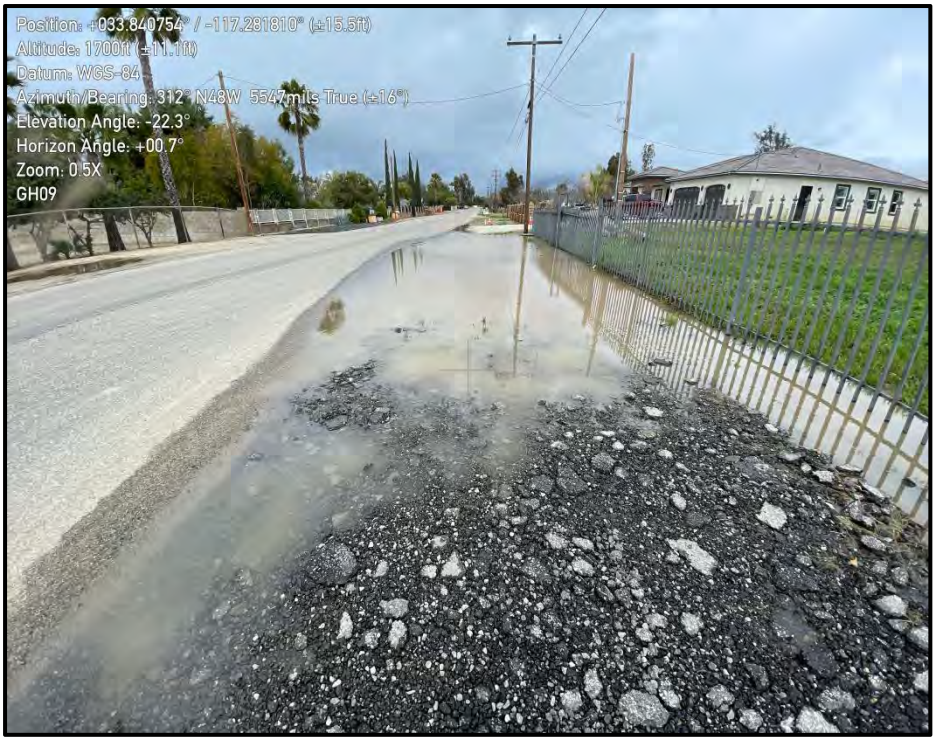


Photo 2: Feature "GH-09" inundated after recent storm.

Photo 3: "GH-04" feature positive for fairy shrimp (*B. lindahli*).

Photo 4: Large ponding at feature "GH-12" in the northern portion of the project.

Attachment B

Dry Season Results

Processing of Dry Samples from Basins at the Good Hope Project Site and Culturing of Fairy Shrimp Cysts for Species Identification.

23 July, 2023

Chuck Black
Ecological Restoration Service
San Diego, CA 92103
(619) 944-1964

10(a)(1)(A) permit
ES835549-8
Good through 2025-07-31`

Introduction

Ecological Restoration Service was contracted in July, 2023 by Garrett Huffman of Huffman Biological Julian, CA. for processing of dry samples for the determination of the presence of fairy shrimp cysts, and for culturing of *Branchinecta* cysts for identification to the species level of any cysts found for dry samples from the Good Hope project site.

Soil Processing for Cyst Presence

Methods

Samples collected by Garrett Huffman (permit number 20186A-3.2) were processed by Charles Black of Ecological Restoration Service, who is authorized by the U.S. fish and Wildlife Service to process dry samples for the presence of fairy shrimp cysts and to culture cysts to identify to species level as special conditions of his 10(a)(1)(A) permit. Samples were hydrated for approximately 1-2 hours in tap water, then washed through a set of sieves. Material passing through a Number 45 (.0139") USA Standard Testing Sieve, A.S.T.M.E.-11 specification and caught on a Number 70 (.0083") Sieve was rinsed into a container with approximately 50 ml of a saturated brine solution to float organic material, including fairy shrimp cysts. The material floating on the brine was decanted onto a paper filter on a filter funnel, and water was removed through the filter paper by vacuum suction. The material left on the paper was examined under a 6.3-570x power Olympus SZX9 Zoom Stereo Microscope. Distinctive fairy shrimp cysts, if present, were individually counted (if less than approximately 50) or estimated (for larger numbers) by examining ¼ or ½ subsections of the filter and multiplying the subset by the appropriate factor. The presences and approximate numbers of ostracod shells and cladoceran ephippia were also noted in samples.

Results

Branchinecta cysts were found in moderate numbers in two of 12 basins and very small numbers in one of these basins (Table 1). No ostracods or cladoceran ephippia were found in any of the samples.

Table 1 – Numbers of cysts and shrimp identified from individual basins.

Basin #	Numbers of 50 ml samples	Numbers of Branchinecta cyst in subsamples*	Cysts/100 ml soil	*Branchinecta lindahli* identified (males:females)
GH-01	10			
GH-02	25	3,5,5,3,4,2,2,2,43,2,12,5,8,12,2,4,5,1,1,5,5,12,3,4,5,8,4,2,2,1,6,3,5,6,2,4,2,3,3,4,6	20.1	10:5
GH-03	10	1		1:0
GH-04	25	3,5,6,8,12,6,3,9,4,1,1,4,1,7.8,2,2,5,7,8,12,3,2,8,7,22,4,3,6,5,6,1,1,7,5,3,4,	16.1	12:4
GH-05	25			
GH-06	10			
GH-07	10			
GH-08	10			
GH-09	25			
GH-10	10			
GH-11	10			
GH-12	10			

*0 when blank

Cyst Culturing for Species Identification

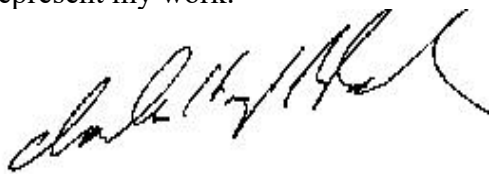
Methods

Combined cysts from each individual basin were separately hydrated in approximately 500 ml of Arrowhead Mountain Spring Water in a food grade plastic container and placed in an environmental chamber at 40 degrees F. for three days. They were then moved to a semi-shaded location. During culturing at this site daytime highs were in the mid to upper 70s, lows in the mid to upper 60s F. When hatched nauplii were observed in the cultures, a 2-3 ml portion of a solution made by dissolving 4-5 grams of instant dried yeast in 40-50 ml of warm water was added to each culture and stirred in gently with a spoon. Fairy shrimp were removed and identified as they became mature.

Results

Fairy shrimp hatched within one day after cultures were removed from the chamber and were reared to identifiable size in all three basins, though in very small numbers from the single basin with low numbers of cysts. All shrimp identified were *Branchinecta lindahli* (Table 1).

I certify that the information in this survey report and attached exhibits fully and accurately represent my work.



Attachment C

Data Sheets

Survey Data

Survey Type	Fairy Shrimp Wet Season
Project	Good Hope Project
Date	March 15, 2023
Surveyor	Garrett Huffman
Trainee	Blanca Martinez

Environmental Data

Start of Survey Data	
Time	13:15
Temperature	55
Wind	2-6
Cloud	60
End of Survey Data	
Time	17:08
Temperature	58
Wind	2-5
Cloud	30

Pond Feature (12 Items)

Pond Feature - 1. GH-01

Pool or Area ID	GH-01

Photos

Status	Wet
Air Temp (Celsius)	17.7
Water Temp (Celsius)	12.2
Average Depth (cm)	5
Max Depth (cm)	8
Pool Length (m)	3
Pool Width (m)	12
Feature Condition	Disturbed (tire tracks, etc)
Fairy Shrimp Species	None
Other Species	
Notes	

Pond Feature - 2. GH-02

Pool or Area ID	GH-02

Photos

Status	Wet
Air Temp (Celsius)	17.7
Water Temp (Celsius)	10.6
Average Depth (cm)	6
Max Depth (cm)	12
Pool Length (m)	6
Pool Width (m)	15
Feature Condition	Disturbed (tire tracks, etc)
Fairy Shrimp Species	Branchinecta lindahli
Voucher	Yes
Females Collected	1

Males Collected	4
Population Estimates	10's
Other Species	
Notes	

Pond Feature - 3. GH-03

Pool or Area ID	GH-03

Photos

Status	Wet
Air Temp (Celsius)	17.7
Water Temp (Celsius)	12.5
Average Depth (cm)	7
Max Depth (cm)	9
Pool Length (m)	3
Pool Width (m)	6
Feature Condition	Disturbed (tire tracks, etc)
Fairy Shrimp Species	None
Other Species	
Notes	Ponding complex of 5 features

Pond Feature - 4. GH-04

Pool or Area ID	GH-04

Photos

Status	Wet
Air Temp (Celsius)	17.7
Water Temp (Celsius)	12.2
Average Depth (cm)	7
Max Depth (cm)	11
Pool Length (m)	4
Pool Width (m)	5
Feature Condition	Disturbed (tire tracks, etc)
Fairy Shrimp Species	Branchinecta lindahli
Voucher	Yes
Females Collected	1
Males Collected	3
Population Estimates	1's
Other Species	
Notes	

Pond Feature - 5. GH-05

Pool or Area ID	GH-05

Photos

Status	Wet
Air Temp (Celsius)	17.5
Water Temp (Celsius)	12.5
Average Depth (cm)	4
Max Depth (cm)	6
Pool Length (m)	4
Pool Width (m)	3
Feature Condition	Disturbed (tire tracks, etc)
Fairy Shrimp Species	None
Other Species	
Notes	

Pond Feature - 6. GH-06

Pool or Area ID	GH-06

Photos

Status	Wet
Air Temp (Celsius)	17.5
Water Temp (Celsius)	11.5
Average Depth (cm)	5
Max Depth (cm)	8
Pool Length (m)	4
Pool Width (m)	3
Feature Condition	Disturbed (tire tracks, etc)
Fairy Shrimp Species	None
Other Species	
Notes	

Pond Feature - 7. GH-07

Pool or Area ID	GH-07

Photos

Status	Wet
Air Temp (Celsius)	17
Water Temp (Celsius)	11.5
Average Depth (cm)	4
Max Depth (cm)	6
Pool Length (m)	4
Pool Width (m)	7
Feature Condition	Disturbed (tire tracks, etc)
Fairy Shrimp Species	None
Other Species	
Notes	

Pond Feature - 8. GH-08

Pool or Area ID	GH-08

Photos

Status	Wet
Air Temp (Celsius)	17
Water Temp (Celsius)	11.5
Average Depth (cm)	4
Max Depth (cm)	8
Pool Length (m)	4
Pool Width (m)	8
Feature Condition	Disturbed (tire tracks, etc)
Fairy Shrimp Species	None
Other Species	
Notes	

Pond Feature - 9. GH-09

Pool or Area ID	GH-09

Photos

Status	Wet
Air Temp (Celsius)	17
Water Temp (Celsius)	10.5
Average Depth (cm)	6
Max Depth (cm)	8
Pool Length (m)	6
Pool Width (m)	17
Feature Condition	Disturbed (tire tracks, etc)
Fairy Shrimp Species	None
Other Species	
Notes	

Pond Feature - 10. GH-10

Pool or Area ID	GH-10

Photos

Status	Wet
Air Temp (Celsius)	16.5
Water Temp (Celsius)	11.5
Average Depth (cm)	4
Max Depth (cm)	6
Pool Length (m)	5
Pool Width (m)	10
Feature Condition	Disturbed (tire tracks, etc)
Fairy Shrimp Species	None
Other Species	
Notes	

Pond Feature - 11. GH-11

Pool or Area ID	GH-11
Photos	

Status	Wet
Air Temp (Celsius)	17.5
Water Temp (Celsius)	12.5
Average Depth (cm)	6
Max Depth (cm)	8
Pool Length (m)	8
Pool Width (m)	11
Feature Condition	Disturbed (tire tracks, etc)
Fairy Shrimp Species	None
Other Species	
Notes	

Pond Feature - 12. GH-12

Pool or Area ID	GH-12
Photos	

Survey Data

Survey Type	Fairy Shrimp Wet Season
Project	Good Hope Project
Date	March 22, 2023
Surveyor	Garrett Huffman
Trainee	Blanca Martinez

Environmental Data

Start of Survey Data	
Time	13:30
Temperature	62
Wind	2-5
Cloud	50
End of Survey Data	
Time	17:30
Temperature	65
Wind	2-5
Cloud	30

Pond Feature (12 Items)

Pond Feature - 1. GH-01

Pool or Area ID	GH-01
Photos	
Status	Wet
Air Temp (Celsius)	16
Water Temp (Celsius)	12
Average Depth (cm)	4
Max Depth (cm)	6
Pool Length (m)	3
Pool Width (m)	10
Feature Condition	Disturbed (tire tracks, etc)
Fairy Shrimp Species	None
Other Species	

Notes	

Pond Feature - 2. GH-02

Pool or Area ID	GH-02
Photos	
Status	Wet
Air Temp (Celsius)	16
Water Temp (Celsius)	10.6
Average Depth (cm)	6
Max Depth (cm)	10
Pool Length (m)	6
Pool Width (m)	15
Feature Condition	Disturbed (tire tracks, etc)
Fairy Shrimp Species	Branchinecta lindahli
Voucher	No
Population Estimates	10's
Other Species	
Notes	Not enough males - voucher collected on previous visit

Pond Feature - 3. GH-03

Pool or Area ID	GH-03
Photos	
Status	Wet
Air Temp (Celsius)	17.7
Water Temp (Celsius)	12
Average Depth (cm)	6
Max Depth (cm)	8
Pool Length (m)	2
Pool Width (m)	3
Feature Condition	Disturbed (tire tracks, etc)
Fairy Shrimp Species	None
Other Species	
Notes	

Pond Feature - 4. GH-04

Pool or Area ID	GH-04
Photos	
Status	Wet
Air Temp (Celsius)	16
Water Temp (Celsius)	12
Average Depth (cm)	6
Max Depth (cm)	10
Pool Length (m)	3
Pool Width (m)	4
Feature Condition	Disturbed (tire tracks, etc)
Fairy Shrimp Species	Branchinecta lindahli
Voucher	No
Population Estimates	1's
Other Species	
Notes	Not enough males - voucher collected on previous visit

Pond Feature - 5. GH-05

Pool or Area ID	GH-05
Photos	
Status	Wet
Air Temp (Celsius)	16.5
Water Temp (Celsius)	12.5
Average Depth (cm)	3
Max Depth (cm)	5
Pool Length (m)	3
Pool Width (m)	2
Feature Condition	Disturbed (tire tracks, etc)
Fairy Shrimp Species	None
Other Species	
Notes	

Pond Feature - 6. GH-06

Pool or Area ID	GH-06
Photos	
Status	Wet

Air Temp (Celsius)	16
Water Temp (Celsius)	11.2
Average Depth (cm)	4
Max Depth (cm)	7
Pool Length (m)	3
Pool Width (m)	2
Feature Condition	Disturbed (tire tracks, etc)
Fairy Shrimp Species	None
Other Species	
Notes	

Pond Feature - 7. GH-07

Pool or Area ID	GH-07
Photos	
Status	Wet
Air Temp (Celsius)	16
Water Temp (Celsius)	11.5
Average Depth (cm)	3
Max Depth (cm)	5
Pool Length (m)	3
Pool Width (m)	6
Feature Condition	Disturbed (tire tracks, etc)
Fairy Shrimp Species	None
Other Species	
Notes	

Pond Feature - 8. GH-08

Pool or Area ID	GH-08
Photos	
Status	Wet
Air Temp (Celsius)	16
Water Temp (Celsius)	11
Average Depth (cm)	3
Max Depth (cm)	7
Pool Length (m)	3

Pool Width (m)	7
Feature Condition	Disturbed (tire tracks, etc)
Fairy Shrimp Species	None
Other Species	
Notes	

Pond Feature - 9. GH-09

Pool or Area ID	GH-09
Photos	
Status	Wet
Air Temp (Celsius)	16
Water Temp (Celsius)	10
Average Depth (cm)	5
Max Depth (cm)	7
Pool Length (m)	5
Pool Width (m)	16
Feature Condition	Disturbed (tire tracks, etc)
Fairy Shrimp Species	None
Other Species	
Notes	

Pond Feature - 10. GH-10

Pool or Area ID	GH-10
Photos	
Status	Wet
Air Temp (Celsius)	16
Water Temp (Celsius)	11
Average Depth (cm)	3
Max Depth (cm)	5
Pool Length (m)	4
Pool Width (m)	10
Feature Condition	Disturbed (tire tracks, etc)
Fairy Shrimp Species	None
Other Species	
Notes	

Pond Feature - 11. GH-11

Pool or Area ID	GH-11
Photos	
Status	Wet
Air Temp (Celsius)	16
Water Temp (Celsius)	11.5
Average Depth (cm)	5
Max Depth (cm)	7
Pool Length (m)	7
Pool Width (m)	10
Feature Condition	Disturbed (tire tracks, etc)
Fairy Shrimp Species	None
Other Species	
Notes	

Pond Feature - 12. GH-12

Pool or Area ID	GH-12
Photos	
Status	Wet
Air Temp (Celsius)	16
Water Temp (Celsius)	13
Average Depth (cm)	5
Max Depth (cm)	7
Pool Length (m)	2
Pool Width (m)	5
Feature Condition	Disturbed (tire tracks, etc)
Fairy Shrimp Species	None
Other Species	
Notes	

General Notes

Notes	

Survey Data

Survey Type	Fairy Shrimp Wet Season
Project	Good Hope Project
Date	March 30, 2023
Surveyor	Garrett Huffman
Trainee	Blanca Martinez

Environmental Data

Start of Survey Data	
Time	13:00
Temperature	48
Wind	2-6
Cloud	60
End of Survey Data	
Time	16:13
Temperature	62
Wind	2-5
Cloud	50

Pond Feature (12 Items)

Pond Feature - 1. GH-01

Pool or Area ID	GH-01
Photos	
Status	Wet
Air Temp (Celsius)	16.5
Water Temp (Celsius)	12.5
Average Depth (cm)	5
Max Depth (cm)	7
Pool Length (m)	3
Pool Width (m)	10
Feature Condition	Disturbed (tire tracks, etc)
Fairy Shrimp Species	None
Other Species	

Notes	

Pond Feature - 2. GH-02

Pool or Area ID	GH-02
Photos	
Status	Wet
Air Temp (Celsius)	16.5
Water Temp (Celsius)	11.2
Average Depth (cm)	5
Max Depth (cm)	8
Pool Length (m)	4
Pool Width (m)	13
Feature Condition	Disturbed (tire tracks, etc)
Fairy Shrimp Species	Branchinecta lindahli
Voucher	No
Population Estimates	10's
Other Species	
Notes	Vouchered

Pond Feature - 3. GH-03

Pool or Area ID	GH-03
Photos	
Status	Wet
Air Temp (Celsius)	16.2
Water Temp (Celsius)	12
Average Depth (cm)	5
Max Depth (cm)	8
Pool Length (m)	2
Pool Width (m)	4
Feature Condition	Disturbed (tire tracks, etc)
Fairy Shrimp Species	None
Other Species	
Notes	

Pond Feature - 4. GH-04

Pool or Area ID	GH-04
Photos	
Status	Wet
Air Temp (Celsius)	17.7
Water Temp (Celsius)	12.2
Average Depth (cm)	7
Max Depth (cm)	11
Pool Length (m)	4
Pool Width (m)	5
Feature Condition	Disturbed (tire tracks, etc)
Fairy Shrimp Species	Branchinecta lindahli
Voucher	Yes
Females Collected	1
Males Collected	3
Population Estimates	1's
Other Species	
Notes	

Pond Feature - 5. GH-05

Pool or Area ID	GH-05
Photos	
Status	Wet
Air Temp (Celsius)	15.5
Water Temp (Celsius)	11.5
Average Depth (cm)	3
Max Depth (cm)	4
Pool Length (m)	2
Pool Width (m)	3
Feature Condition	Disturbed (tire tracks, etc)
Fairy Shrimp Species	None
Other Species	
Notes	

Pond Feature - 6. GH-06

Pool or Area ID	GH-06

Photos

Status	Wet
Air Temp (Celsius)	15.5
Water Temp (Celsius)	10
Average Depth (cm)	3
Max Depth (cm)	8
Pool Length (m)	3
Pool Width (m)	2
Feature Condition	Disturbed (tire tracks, etc)
Fairy Shrimp Species	Branchinecta lindahli
Voucher	Yes
Females Collected	1
Males Collected	1
Population Estimates	1's
Other Species	
Notes	Low population of fairy shrimp

Pond Feature - 7. GH-07

Pool or Area ID	GH-07

Photos

Status	Wet
Air Temp (Celsius)	15.5
Water Temp (Celsius)	11
Average Depth (cm)	4
Max Depth (cm)	5
Pool Length (m)	3
Pool Width (m)	5
Feature Condition	Disturbed (tire tracks, etc)
Fairy Shrimp Species	None
Other Species	
Notes	

Pond Feature - 8. GH-08

Pool or Area ID	GH-08

Photos

Status	Wet
Air Temp (Celsius)	16
Water Temp (Celsius)	12
Average Depth (cm)	3
Max Depth (cm)	6
Pool Length (m)	3
Pool Width (m)	6
Feature Condition	Disturbed (tire tracks, etc)
Fairy Shrimp Species	None
Other Species	
Notes	

Pond Feature - 9. GH-09

Pool or Area ID	GH-09
Photos	
Status	Wet
Air Temp (Celsius)	15
Water Temp (Celsius)	9.5
Average Depth (cm)	4
Max Depth (cm)	6
Pool Length (m)	4
Pool Width (m)	12
Feature Condition	Disturbed (tire tracks, etc)
Fairy Shrimp Species	None
Other Species	
Notes	

Pond Feature - 10. GH-10

Pool or Area ID	GH-10
Photos	
Status	Wet
Air Temp (Celsius)	15.5
Water Temp (Celsius)	12.5
Average Depth (cm)	4
Max Depth (cm)	5

Pool Length (m)	3
Pool Width (m)	3
Feature Condition	Disturbed (tire tracks, etc)
Fairy Shrimp Species	None
Other Species	
Notes	

Pond Feature - 11. GH-11

Pool or Area ID	GH-11
Photos	
Status	Wet
Air Temp (Celsius)	15.5
Water Temp (Celsius)	10
Average Depth (cm)	4
Max Depth (cm)	6
Pool Length (m)	3
Pool Width (m)	8
Feature Condition	Disturbed (tire tracks, etc)
Fairy Shrimp Species	None
Other Species	
Notes	

Pond Feature - 12. GH-12

Pool or Area ID	GH-12
Photos	
Status	Wet
Air Temp (Celsius)	15.5
Water Temp (Celsius)	11.7
Average Depth (cm)	4
Max Depth (cm)	6
Pool Length (m)	6
Pool Width (m)	9
Feature Condition	Disturbed (tire tracks, etc)
Fairy Shrimp Species	None
Other Species	

Notes	

General Notes

Notes	

Survey Data

Survey Type	Fairy Shrimp Wet Season
Project	Good Hope Project
Date	April 5, 2023
Surveyor	Garrett Huffman
Trainee	Blanca Martinez

Environmental Data

Start of Survey Data	
Time	13:30
Temperature	55
Wind	2-5
Cloud	50
End of Survey Data	
Time	16:15
Temperature	62
Wind	2-5
Cloud	30

Pond Feature (12 Items)

Pond Feature - 1. GH-01

Pool or Area ID	GH-01
Photos	
Status	Wet
Air Temp (Celsius)	15.5
Water Temp (Celsius)	11.5
Average Depth (cm)	4
Max Depth (cm)	5
Pool Length (m)	2
Pool Width (m)	8
Feature Condition	Disturbed (tire tracks, etc)
Fairy Shrimp Species	None
Other Species	

Notes	

Pond Feature - 2. GH-02

Pool or Area ID	GH-02
Photos	
Status	Wet
Air Temp (Celsius)	16.2
Water Temp (Celsius)	13.5
Average Depth (cm)	3
Max Depth (cm)	6
Pool Length (m)	3
Pool Width (m)	3
Feature Condition	Disturbed (tire tracks, etc)
Fairy Shrimp Species	Branchinecta lindahli
Voucher	No
Population Estimates	1's
Other Species	
Notes	

Pond Feature - 3. GH-03

Pool or Area ID	GH-03
Photos	
Status	Dry
Feature Condition	Disturbed (tire tracks, etc)
Other Species	
Notes	

Pond Feature - 4. GH-04

Pool or Area ID	GH-04
Photos	
Status	Wet
Air Temp (Celsius)	15.5
Water Temp (Celsius)	14.5
Average Depth (cm)	4

Max Depth (cm)	6
Pool Length (m)	4
Pool Width (m)	5
Feature Condition	Disturbed (tire tracks, etc)
Fairy Shrimp Species	Branchinecta lindahli
Voucher	No
Population Estimates	1's
Other Species	
Notes	

Pond Feature - 5. GH-05

Pool or Area ID	GH-05
Photos	
Status	Dry
Feature Condition	Disturbed (tire tracks, etc)
Other Species	
Notes	

Pond Feature - 6. GH-06

Pool or Area ID	GH-06
Photos	
Status	Wet
Air Temp (Celsius)	15.5
Water Temp (Celsius)	13.5
Average Depth (cm)	3
Max Depth (cm)	3
Pool Length (m)	1
Pool Width (m)	3
Feature Condition	Disturbed (tire tracks, etc)
Fairy Shrimp Species	Branchinecta lindahli
Voucher	No
Population Estimates	1's
Other Species	Midges
Notes	Female fairy shrimp only present

Pond Feature - 7. GH-07

Pool or Area ID	GH-07
Photos	
Status	Dry
Feature Condition	Disturbed (tire tracks, etc)
Other Species	
Notes	

Pond Feature - 8. GH-08

Pool or Area ID	GH-08
Photos	
Status	Wet
Air Temp (Celsius)	15
Water Temp (Celsius)	10.9
Average Depth (cm)	3
Max Depth (cm)	4
Pool Length (m)	1
Pool Width (m)	3
Feature Condition	Disturbed (tire tracks, etc)
Fairy Shrimp Species	None
Other Species	
Notes	

Pond Feature - 9. GH-09

Pool or Area ID	GH-09
Photos	
Status	Dry
Feature Condition	Disturbed (tire tracks, etc)
Other Species	
Notes	

Pond Feature - 10. GH-10

Pool or Area ID	GH-10
Photos	
Status	Dry
Feature Condition	Disturbed (tire tracks, etc)
Other Species	
Notes	

Pond Feature - 11. GH-11

Pool or Area ID	GH-11
Photos	
Status	Dry
Feature Condition	Disturbed (tire tracks, etc)
Other Species	
Notes	

Pond Feature - 12. GH-12

Pool or Area ID	GH-12
Photos	
Status	Wet
Air Temp (Celsius)	16
Water Temp (Celsius)	13
Average Depth (cm)	3
Max Depth (cm)	5
Pool Length (m)	3
Pool Width (m)	5
Feature Condition	Disturbed (tire tracks, etc)
Fairy Shrimp Species	None
Other Species	Midges
Notes	Ponding complex as it dries

General Notes

Notes	

Survey Data

Survey Type	Fairy Shrimp Wet Season
Project	Good Hope Project
Date	April 12, 2023
Surveyor	Garrett Huffman
Trainee	Blanca Martinez

Environmental Data

Start of Survey Data	
Time	13:00
Temperature	55
Wind	2-5
Cloud	80
End of Survey Data	
Time	15:35
Temperature	64
Wind	2-7
Cloud	80

Pond Feature (12 Items)

Pond Feature - 1. GH-01

Pool or Area ID	GH-01
Photos	
Status	Dry
Feature Condition	Disturbed (tire tracks, etc)
Other Species	
Notes	

Pond Feature - 2. GH-02

Pool or Area ID	GH-02
Photos	
Status	Dry

Feature Condition	Disturbed (tire tracks, etc)
Other Species	
Notes	

Pond Feature - 3. GH-03

Pool or Area ID	GH-03
Photos	
Status	Dry
Feature Condition	Disturbed (tire tracks, etc)
Other Species	
Notes	

Pond Feature - 4. GH-04

Pool or Area ID	GH-04
Photos	
Status	Wet
Air Temp (Celsius)	20
Water Temp (Celsius)	14
Average Depth (cm)	4
Max Depth (cm)	4
Pool Length (m)	2
Pool Width (m)	2
Feature Condition	Disturbed (tire tracks, etc)
Fairy Shrimp Species	Branchinecta lindahli
Voucher	No
Population Estimates	1's
Other Species	
Notes	Not enough fairy shrimp present to collect

Pond Feature - 5. GH-05

Pool or Area ID	GH-05
Photos	
Status	Dry
Feature Condition	Disturbed (tire tracks, etc)

Other Species	
Notes	

Pond Feature - 6. GH-06

Pool or Area ID	GH-06
Photos	
Status	Dry
Feature Condition	Disturbed (tire tracks, etc)
Other Species	
Notes	

Pond Feature - 7. GH-07

Pool or Area ID	GH-07
Photos	
Status	Dry
Feature Condition	Disturbed (tire tracks, etc)
Other Species	
Notes	

Pond Feature - 8. GH-08

Pool or Area ID	GH-08
Photos	
Status	Dry
Feature Condition	Disturbed (tire tracks, etc)
Other Species	
Notes	

Pond Feature - 9. GH-09

Pool or Area ID	GH-09
Photos	
Status	Dry
Feature Condition	Disturbed (tire tracks, etc)

Other Species	
Notes	

Pond Feature - 10. GH-10

Pool or Area ID	GH-10
Photos	
Status	Dry
Feature Condition	Disturbed (tire tracks, etc)
Other Species	
Notes	

Pond Feature - 11. GH-11

Pool or Area ID	GH-11
Photos	
Status	Dry
Feature Condition	Disturbed (tire tracks, etc)
Other Species	
Notes	

Pond Feature - 12. GH-12

Pool or Area ID	GH-12
Photos	
Status	Dry
Feature Condition	Disturbed (tire tracks, etc)
Other Species	
Notes	

General Notes

Notes	

Survey Data

Survey Type	Fairy Shrimp Wet Season
Project	Good Hope Project
Date	April 19, 2023
Surveyor	Garrett Huffman
Trainee	Blanca Martinez

Environmental Data

Start of Survey Data	
Time	14:00
Temperature	65
Wind	2-5
Cloud	50
End of Survey Data	
Time	15:35
Temperature	70
Wind	0-2
Cloud	20

Pond Feature (12 Items)

Pond Feature - 1. GH-01

Pool or Area ID	GH-01
Photos	
Status	Dry
Feature Condition	Disturbed (tire tracks, etc)
Other Species	
Notes	

Pond Feature - 2. GH-02

Pool or Area ID	GH-02
Photos	
Status	Dry

Feature Condition	Disturbed (tire tracks, etc)
Other Species	
Notes	

Pond Feature - 3. GH-03

Pool or Area ID	GH-03
Photos	
Status	Dry
Feature Condition	Disturbed (tire tracks, etc)
Other Species	
Notes	

Pond Feature - 4. GH-04

Pool or Area ID	GH-04
Photos	
Status	Dry
Feature Condition	Disturbed (tire tracks, etc)
Other Species	
Notes	Not enough fairy shrimp present to collect

Pond Feature - 5. GH-05

Pool or Area ID	GH-05
Photos	
Status	Dry
Feature Condition	Disturbed (tire tracks, etc)
Other Species	
Notes	

Pond Feature - 6. GH-06

Pool or Area ID	GH-06
Photos	
Status	Dry

Feature Condition	Disturbed (tire tracks, etc)
Other Species	
Notes	

Pond Feature - 7. GH-07

Pool or Area ID	GH-07
Photos	
Status	Dry
Feature Condition	Disturbed (tire tracks, etc)
Other Species	
Notes	

Pond Feature - 8. GH-08

Pool or Area ID	GH-08
Photos	
Status	Dry
Feature Condition	Disturbed (tire tracks, etc)
Other Species	
Notes	

Pond Feature - 9. GH-09

Pool or Area ID	GH-09
Photos	
Status	Dry
Feature Condition	Disturbed (tire tracks, etc)
Other Species	
Notes	

Pond Feature - 10. GH-10

Pool or Area ID	GH-10
Photos	
Status	Dry

Feature Condition	Disturbed (tire tracks, etc)
Other Species	
Notes	

Pond Feature - 11. GH-11

Pool or Area ID	GH-11
Photos	
Status	Dry
Feature Condition	Disturbed (tire tracks, etc)
Other Species	
Notes	

Pond Feature - 12. GH-12

Pool or Area ID	GH-12
Photos	
Status	Dry
Feature Condition	Disturbed (tire tracks, etc)
Other Species	
Notes	

General Notes

Notes	

Survey Data

Survey Type	Fairy Shrimp Dry Season
Project	Good Hope Project
Date	June 26, 2023
Surveyor	Garrett Huffman
Trainee	Jon Walker; Blanca Martinez

Environmental Data

Start of Survey Data	
Time	10:30
Temperature	73
Wind	2-6
Cloud	0
End of Survey Data	
Time	14:30
Temperature	86
Wind	3-8
Cloud	0

Pond Feature (12 Items)

Pond Feature - 1. GH-01

Pool or Area ID	GH-01
Photos	
Status	Dry
Feature Condition	Disturbed (tire tracks, etc)
Other Species	Other
Notes	10 Samples Collected

Pond Feature - 2. GH-02

Pool or Area ID	GH-02
Photos	
Status	Dry

Feature Condition	Disturbed (tire tracks, etc)
Other Species	
Notes	25 Samples Collected

Pond Feature - 3. GH-03

Pool or Area ID	GH-03
Photos	
Status	Dry
Feature Condition	Disturbed (tire tracks, etc)
Other Species	
Notes	100 Samples Collected

Pond Feature - 4. GH-04

Pool or Area ID	GH-04
Photos	
Status	Dry
Feature Condition	Disturbed (tire tracks, etc)
Other Species	
Notes	25 Samples Collected

Pond Feature - 5. GH-05

Pool or Area ID	GH-05
Photos	
Status	Dry
Feature Condition	Disturbed (tire tracks, etc)
Other Species	
Notes	25 Samples Collected

Pond Feature - 6. GH-06

Pool or Area ID	GH-06
Photos	
Status	Dry

Feature Condition	Disturbed (tire tracks, etc)
Other Species	
Notes	10 Samples Collected

Pond Feature - 7. GH-07

Pool or Area ID	GH-07
Photos	
Status	Dry
Feature Condition	Disturbed (tire tracks, etc)
Other Species	
Notes	10 Samples Collected

Pond Feature - 8. GH-08

Pool or Area ID	GH-08
Photos	
Status	Dry
Feature Condition	Disturbed (tire tracks, etc)
Other Species	
Notes	10 Samples Collected

Pond Feature - 9. GH-09

Pool or Area ID	GH-09
Photos	
Status	Dry
Feature Condition	Disturbed (tire tracks, etc)
Other Species	
Notes	25 Samples Collected

Pond Feature - 10. GH-10

Pool or Area ID	GH-10
Photos	
Status	Dry

Feature Condition	Disturbed (tire tracks, etc)
Other Species	
Notes	10 Samples Collected

Pond Feature - 11. GH-11

Pool or Area ID	GH-11
Photos	
Status	Dry
Feature Condition	Disturbed (tire tracks, etc)
Other Species	
Notes	10 Samples Collected

Pond Feature - 12. GH-12

Pool or Area ID	GH-12
Photos	
Status	Dry
Feature Condition	Disturbed (tire tracks, etc)
Other Species	
Notes	10 Samples Collected

General Notes

Notes	180 samples total

APPENDIX C: CULTURAL RESOURCES ASSESSMENT (CONFIDENTIAL)

APPENDIX D: GEOTECHNICAL INVESTIGATION REPORT

GEOTECHNICAL INVESTIGATION

EASTERN MUNICIPAL WATER DISTRICT
GOOD HOPE AND MEAD VALLEY WATER PROJECT

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, CA 92120

July 19, 2022

6280 Riverdale Street
San Diego, CA 92120
(877) 215-4321 | oneatlas.com

July 19, 2023

Atlas No. 1962
Report No. 2

MR. NATE OLIVAS
EASTERN MUNICIPAL WATER DISTRICT
2270 TRUMBLE ROAD
PERRIS, CA 92570

Subject: **Geotechnical Investigation**
Good Hope and Mead Valley Water Project (Phases 1 and 2)
Eastern Municipal Water District
Riverside County, California

Dear Mr. Olivas:

In accordance with your request and our proposal Nos. 22-04013R2 and 23-00402R2, Atlas has performed a geotechnical investigation to assess the geologic conditions for the Good Hope and Mead Valley water project, including potential geologic hazards, and to provide recommendations based on our findings. Our investigation has consisted of a review of readily available geologic literature, site reconnaissance, exploratory borings, geotechnical laboratory testing, geotechnical analysis, and the preparation of this report.

If you have any questions, please contact the undersigned.

Respectfully submitted,
Atlas Technical Consultants LLC

Stephane Dalo, EIT
Staff Engineer

Doug Skinner, PG 2472
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Senior Engineer

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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 Eastern Municipal Water District (EMWD) Good Hope and Mead Valley water project. We understand the project will consist of approximately 7,800 feet of new water pipeline in the Good Hope area and 1,650 feet of new water pipeline on Robinson Street in the Mead Valley Cajalco Corridor area. In addition, approximately 4,000 linear feet of water line will be constructed along Oakwood Street, Day Street, Pinewood Street, and Carroll Street located in the Mead Valley area. Figure 1 presents the site vicinity.

2. SCOPE OF WORK

2.1 Geotechnical Investigation

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. Additionally, Atlas explored subsurface conditions by drilling twelve (12) borings to depths between approximately 13 and 41½ feet below the existing ground surface with limited access and truck-mounted drill rigs equipped with hollow stem auger. Figure 2 presents the approximate locations and depths of the borings.

An Atlas engineer and geologist logged the borings and collected samples of the material encountered for geotechnical laboratory testing. Soil and rock recovered during the field investigation were inspected in the field for soil and/or groundwater contamination with visual and factory methods. The boring logs are presented in Appendix I. Soils were classified according to the Unified Soil Classification System illustrated in the Subsurface Exploration Legend (Appendix I). The rocks encountered were classified in accordance with the California Department of Transportation (Caltrans) rock classification system.

2.2 Geophysical Survey

Atlas' scope of work included performing geophysical surveys at select locations along the project alignment. The seismic refraction surveys were performed at the project site on January 3 and 4, and June 29, 2023. The purpose of these surveys was to obtain excavatability and rippability data along the project alignment. The results of these surveys were provided in a separate report dated July 13, 2023 (Atlas, 2023).

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, Atterberg limits, expansion index, direct shear, R-value, and corrosivity testing. The results of in-situ moisture content and density are

provided on the boring logs in Appendix I. The results of the remaining laboratory tests and brief descriptions of the test procedures 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 measured pavement section thickness and soil characterization detailing subsurface conditions noted on 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
- Jack and bore recommendations
- Subgrade compaction beneath pavements
- New flexible pavement structural sections
- Corrosivity of earth materials

3. SITE AND PROJECT DESCRIPTION

The proposed improvements include 5,650 feet of new water pipeline in the Mead Valley Cajalco Corridor area and 7,800 feet in the Good Hope area. The water pipeline improvements are estimated to embed approximately 5 feet below ground surface. Two storm drain crossings extending to approximately 10 feet below ground surface are also proposed in the Good Hope area. Associated improvements include installing remote water meter connections and pavement restoration. Atlas understands the project is likely to use traditional open excavation trenching techniques, and that jack and bore techniques are considered at the proposed storm drain crossings.

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 and the materials observed in our borings consisted of Asphalt Concrete (AC) pavement section, fill, old alluvial-fan deposits, Val Verde tonalite, massive-textured tonalite, and Schist. The approximate depths to bedrock are presented in Table 1. Figure 3 presents the regional geology, and descriptions of the materials encountered are provided below.

Pavement Section: A pavement section consisting of a 5-inch-thick AC layer underlain by 3 inches of Aggregate Base (AB) was encountered in boring B-6W.

Fill (Qf): Fill was encountered in boring B-5W to a depth of approximately 2 feet. The materials encountered consisted of moist, dense clayey sand.

Old Alluvial-Fan Deposits (Qof): Old alluvial flood-plain deposits were encountered in all the borings drilled for water pipeline improvements to depths of ranging between approximately 5 to 15 feet below grade. The materials encountered consisted of moist, medium dense to very dense silty and clayey sand, medium dense to very dense poorly graded sand with silt, and dense sandy silt.

Massive-Textured Tonalite (kgt): Massive-textured tonalite was encountered beneath the old alluvial fan deposits and fill to the total depths explored in the Good Hope area (i.e., in borings B-1W through B-5W). The materials encountered generally consisted of intensely weathered to decomposed, very soft igneous rock. The decomposed and weathered rock could be described as soil materials consisting of very dense poorly graded sand with various amounts of silt and very dense silty sand.

Val Verde Tonalite (Kvt): Val Verde tonalite was encountered beneath the old alluvial-fan deposits to the total depth of borings explored in the Mead Valley Cajalco Corridor area (i.e., in borings B-6W, and B-8W through B-12W). The materials encountered consisted of decomposed to moderately weathered, very soft tonalite. The decomposed rock could generally be described as very dense poorly graded sand, well-graded sand, and silty sand, and hard lean clay with sand with various amounts of silt and gravel.

Schist (TRms): Schist was encountered beneath the old alluvial fan deposits to the total depth of boring B-7W in the Mead Valley Cajalco Corridor area. The materials encountered consisted of intensely weathered metamorphic rock, which could be described as very dense silty sand.

Table 1: Depth to Bedrock

Alignment	Boring Location	Approximate Depth to Bedrock (ft)
Good Hope Olive Area	B-1W	5½
	B-2W	5½
	B-3W	5½
	B-4W	15
	B-5W	8
Mead Valley Cajalco Corridor	B-6W	10
	B-7W	5
	B-8W	6
	B-9W	5½
	B-10W-A	5½
	B-11W	5½
	B-12W	5½

Groundwater: Groundwater was encountered in some borings as shallow as 9 feet below ground surface. The observed depth to groundwater is presented in Table 2. It should be recognized that groundwater conditions may vary at the 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 2: Depth to Groundwater

Alignment	Boring Location	Approximate Depth to Groundwater (ft)
Good Hope Olive Area	B-1W	-
	B-2W	-
	B-3W	26
	B-4W	34
	B-5W	-
Mead Valley Cajalco Corridor	B-6W	29
	B-7W	-
	B-8W	9
	B-9W	17
	B-10W-A	-
	B-11W	-
	B-12W	-

(-) indicates not observed

4.1 Geologic Hazards

The following sections discuss the potential for geologic hazards at the project site.

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. Figure 4 presents the California Fault Activity Map. The closest active fault to the sites is the Glen Ivy North fault (Jennings, 2010). 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 low.

4.1.2 CBC Seismic Design Parameters

A geologic hazard likely to affect the project is ground shaking as a result of movement along an active fault zone in the vicinity of the subject site. Based on the subsurface conditions encountered during our investigation and available online resources (Wills et al. 2015), both alignments may 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 (SEAOC, 2022). Please note that the seismic parameters are provided for the approximate coordinates tabulated for each site.

Table 3: 2019 CBC Seismic Parameters

Site Coefficients & Spectral Response Acceleration Parameters	Good Hope Area	Mead Valley Cajalco Corridor
Site Class	C – Very Dense Soil	C – Very Dense Soil
Latitude	33.7573°	33.8391°
Longitude	-117.2787°	-117.2819°
Site Coefficients, F_a	1.2	1.2
Site Coefficients, F_v	1.445	1.446
Spectral Response Acceleration at Short Period, S_s	1.5g	1.5g
Spectral Response Acceleration at 1-Second Period, S_1	0.555g	0.554g
Design Spectral Acceleration at Short Period, S_{DS}	1.2g	1.2g
Design Spectral Acceleration at 1-Second Period, S_{D1}	0.535g	0.534g
Site Modified Peak Ground Acceleration, PGA_M	0.67g	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 settlements as well as possible lateral spreading during an earthquake. Liquefiable material is not mapped along the project alignment. Because of the shallow hard material, it is our opinion that the potential liquefaction and dynamic settlement to impact the project is low.

4.1.4 Flooding, Tsunamis, and Seiches

Flood Insurance Rate Map 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. The project site designated as a Flood Hazard Zone X, which designates the areas determined to be outside the 0.2% annual chance floodplain (FEMA, 2022). The potential for flooding is low.

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, 2022a). 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 that 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 very dense 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 and metamorphic rock formations. Please refer to Table 1 for the depths to formational materials along the alignments. 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 excavations. The materials anticipated below the pipeline depths are generally expected to provide good pipeline support.

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 grading.

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 Expansive Soil

The selected samples of the on-site materials have expansion indices of 5 and 51. These results indicate that the on-site materials have a very low to medium expansion potential. We anticipate the majority of the on-site soils will be suitable for use as trench backfill. An Atlas representative should observe the fill material during construction. The grading recommendations presented in this report assume materials with a medium expansion.

6.1.3 Compacted Fill

Compacted fill should consist of granular materials 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 should be moisture conditioned within 2% of optimum moisture content and compacted to at least 90% relative compaction. Utility trench

backfill beneath pavements and hardscape should be compacted to at least 90% relative compaction. The top 12 inches of subgrade beneath pavement should be compacted to at least 95%. Additionally, the upper 2 feet of subgrade materials beneath the pavements and hardscape should have an expansion index of 50 or less. The maximum dry density and optimum moisture content for evaluating relative compaction should be obtained using ASTM D1557.

6.1.4 Imported Soil

Imported soil should consist of predominately granular soil, free of organic matter, and rocks less than 6 inches. Imported soil should have an expansion index of 20 or less and should be observed and, if appropriate, tested by Atlas prior to transport to the site.

6.1.5 Excavation Characteristics

It is anticipated that excavation can be achieved with conventional earthwork equipment in good working order. Excavations in fill and old alluvial flood-plain deposits may be locally unstable and may contain construction debris, cobbles, or boulders. Difficult excavations should be anticipated in areas with very dense granular materials and shallow rock. Please refer to Table 1 for the depths to formational materials along the alignments. Contract documents should specify that the contractor mobilize equipment capable of excavating and compacting materials within the variable fracturing, weathering, rock abrasiveness, and strength/hardness rock conditions. Rock breakers, carbide tipped augers, or carbide/diamond tipped coring equipment may be required to excavate/drill hard rock materials.

6.1.6 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 off the site.

6.1.7 Temporary Excavations

Temporary excavations 4 feet deep or less can be made vertically. Temporary excavations deeper than 4 feet in the fill, old alluvial flood-plain deposits, and intensely weathered or decomposed bedrock 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, trench boxes, or anchor tie-back walls 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.

If temporary slopes are to be maintained during the rainy season, berms are recommended along the tops of the slopes to prevent runoff water from entering the excavation and eroding the slope faces.

6.1.8 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 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.

6.1.9 Temporary Dewatering

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.

6.1.10 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

The proposed improvements include a total of 5,650 feet of new water pipeline in the Mead Valley Cajalco Corridor and 7,800 feet in the Good Hope Olive area. The water pipeline improvements are estimated to embed approximately 5 feet below ground surface. Atlas anticipates the pipeline installation will generally include conventional trench excavations. Atlas understands portions of the planned pipeline at intersections with proposed storm drains could be installed using the jack and bore method.

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. Stabilizing fabric such as Mirafi® HP 570 can be used to stabilize the bottom of the excavations, if needed.

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. Where fill is to be placed on surfaces inclined steeper than 5:1 (horizontal: vertical), benches should be excavated to provide a relatively level surface for fill placement. Benches should extend through any loose soils to expose competent material.

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 Excavation

Atlas understands that jack and bore, or similar methods, may be required at intersections if the proposed storm drains are constructed prior to construction of this project. The jack and bore method in the fill or old alluvial deposits is considered feasible. This method consists of jacking a

steel casing pipe along the pipeline alignment while simultaneously cutting the soil ahead of the casing pipe with an auger placed within the encasement. After the drilling spoils are removed, the pipe is installed into the casing pipe.

The anticipated alignment of trenchless excavation is expected to pass through fill and old alluvial-fan deposits. Trenchless excavation in the massive-textured tonalite does not appear to be feasible. Based on our experience with similar materials in the vicinity of the project alignment, scattered boulders have been encountered in these deposits. Therefore, potential subcontractors should recognize that excavation conditions could vary from those encountered in test boring locations. The specifications should indicate that the contractor utilize equipment capable of advancing in medium to very dense sand and gravel, cobbles, and possibly cemented horizons and boulders to avoid the potential for delays during trenchless construction.

6.3.1 Jack and Bore

Tunnel support systems such as the pipe-jacked casings should be designed to support overburden soil pressure and surcharge loads due to traffic and construction activities. Tunnel support systems should also resist jacking forces applied during pipe jacking.

6.3.2 Underground Obstructions

Based on our experience with similar materials in the vicinity of the project alignments, gravel and cobbles may be encountered in the fill and old alluvial-fan deposits. In addition, boulders could be encountered along the pipeline alignment. Such obstructions may require accessing the tunnel face for manual removal. The specialty contractor should assess the method for removing such obstructions.

6.3.3 Tunneling Induced Ground Movement

Some tunneling-induced ground movement should be anticipated. Ground surface settlement monuments should be installed and monitored during construction. A settlement monument monitoring program plan can be developed prior to the installation of the pipeline. By monitoring ground movements before tunneling beneath existing facilities, ground losses can be detected in time to fill voids quickly and alert the contractor to alter their procedures to reduce further settlement. The geotechnical engineer should review the monument monitoring program plan to check that the intent of the recommendations in this report has been incorporated. The settlement monitoring thresholds will depend on different features (e.g., hazardous/non-hazardous utility lines, pavements) and/or structures impacted by the tunneling procedure and should be discussed with the structural engineer and different stakeholders.

6.3.4 Backstops for Pipe Jacking

An allowable passive pressure of 330 psf per foot of depth may be used for the resistance provided by pipe jacking backstops in fill and young alluvial flood-plain deposits. The backstops should expose competent material.

Atlas recommends a geotechnical engineer be on site to observe the jack and bore installation. 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 conditions and modification of the recommendations in this report or development of additional recommendations in a timely manner.

6.4 Preliminary Pavement Section Recommendations

Atlas utilized the California Department of Transportation Highway Design Manual (Caltrans, 2022) to prepare preliminary recommendations for flexible pavements. An R-value of 13 was 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 4 presents recommended flexible pavement structural sections for the assumed Traffic Indexes and subgrade R-value.

Table 4: Preliminary Pavement Structural Sections

Traffic Type	Traffic Index	AC[1] over AB[2] (inches)	Full Depth AC[1] (inches)
Roadways	5.0	4 over 6	7
	6.0	4 over 10	9
	7.0	6 over 10	11

[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). All 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, local regulatory requirements, and Caltrans standard specifications.

6.5 Soil Corrosivity

Representative samples of the on-site soils 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. For structural elements, the California Department of Transportation considers a site to be corrosive if one or more of the following conditions exist for the representative soil and/or water samples taken at the site: Chloride concentration is 500 ppm or greater, sulfate concentration is 1,500 ppm or greater, or the pH is 5.5 or less. Based on these criteria the tested on-site soils are not considered corrosive to structural elements. 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 any 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, expressed, 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

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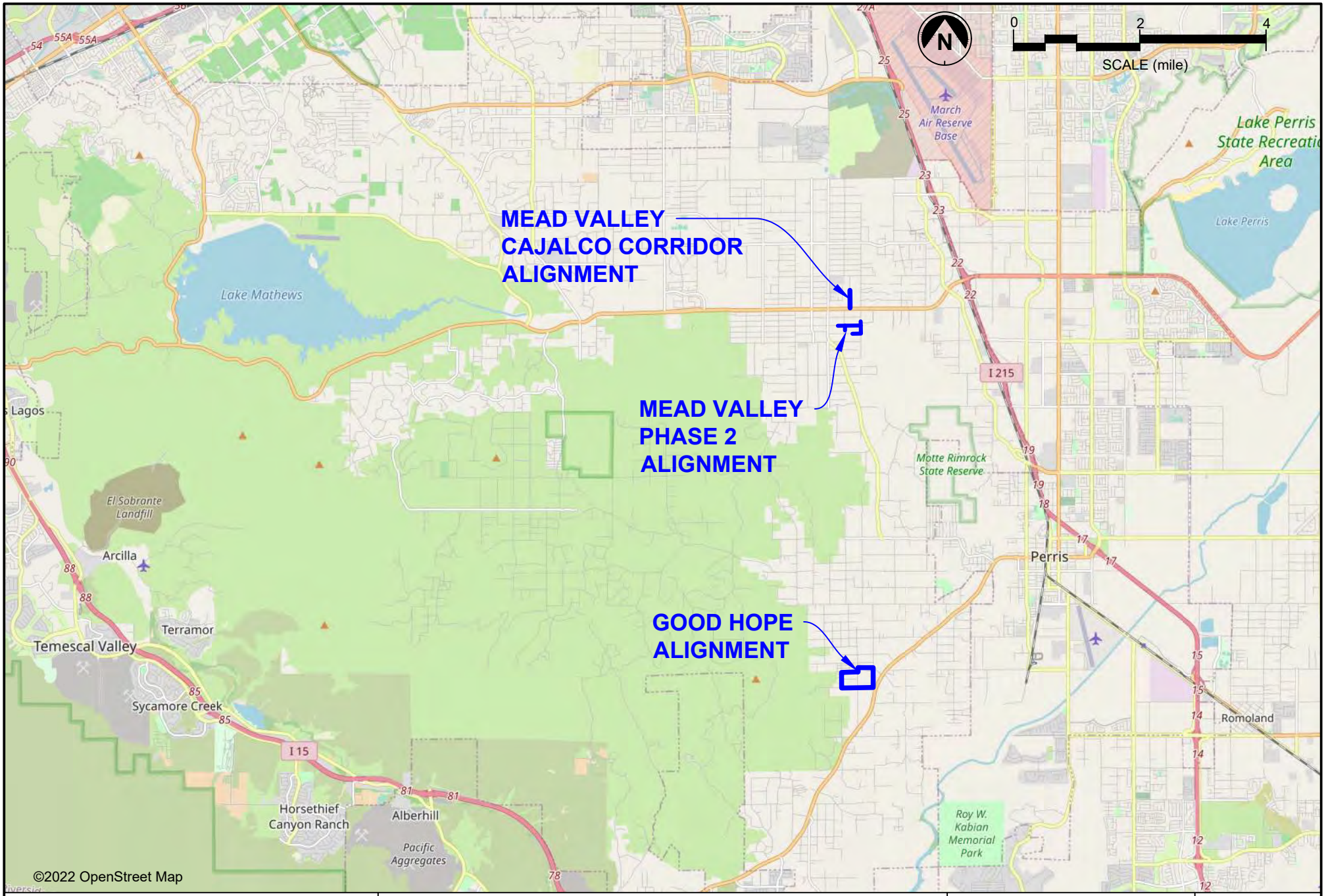
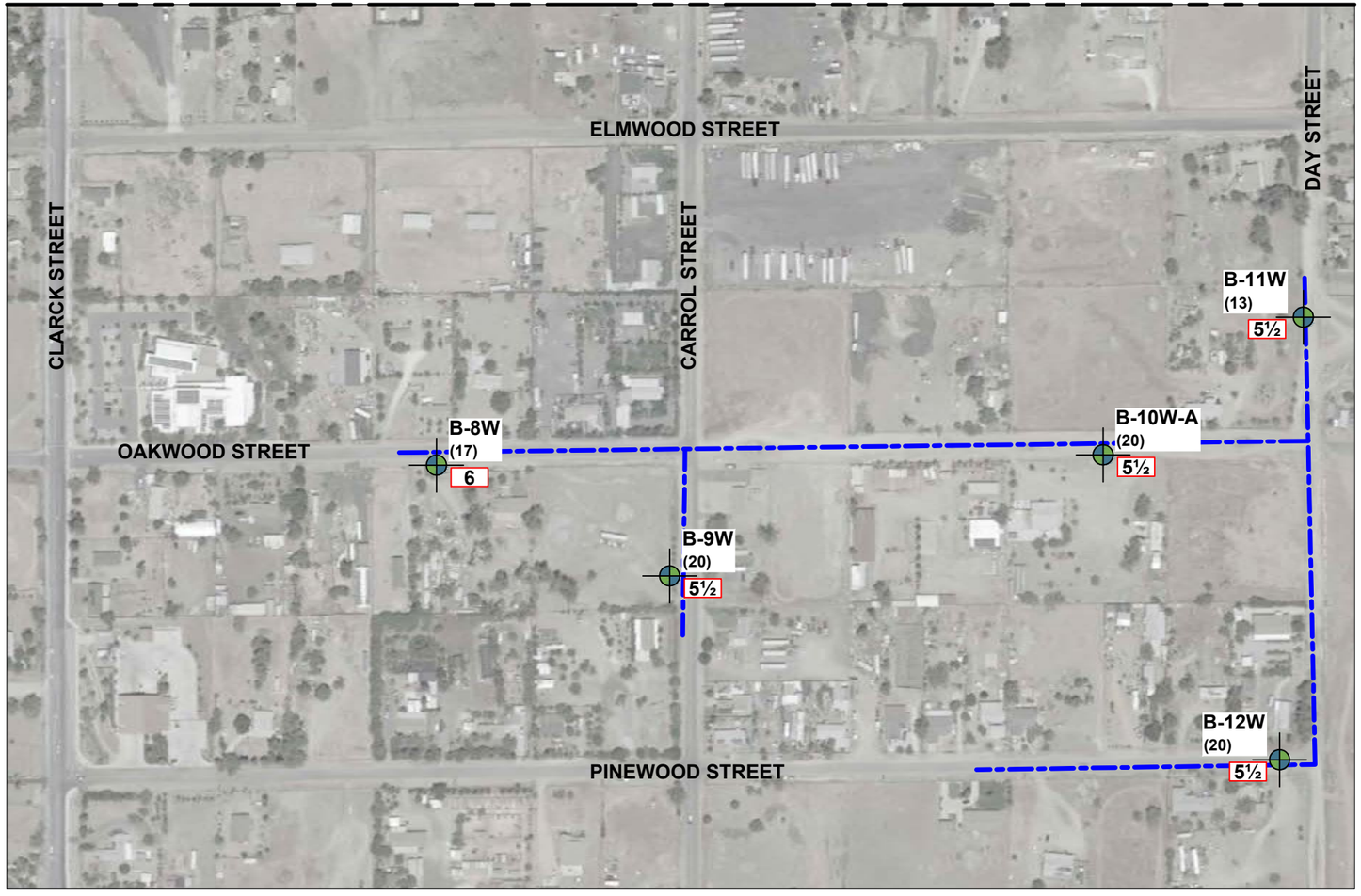


ATLAS	**SITE VICINITY MAP** Good Hope & Mead Valley Water Project Riverside County, California	Date: July, 2023 By: CGI Job No.: 1962.000-2	Figure: 1

MEAD VALLEY CAJALCO CORRIDOR ALIGMENT



LEGEND:

B-12W (20) 5½ — Location of Boring (Depth in Feet) (Depth in Feet to Formation)

Proposed Water Pipeline

N

0 300 600

SCALE (feet)

NOTE: All Locations are approximate.

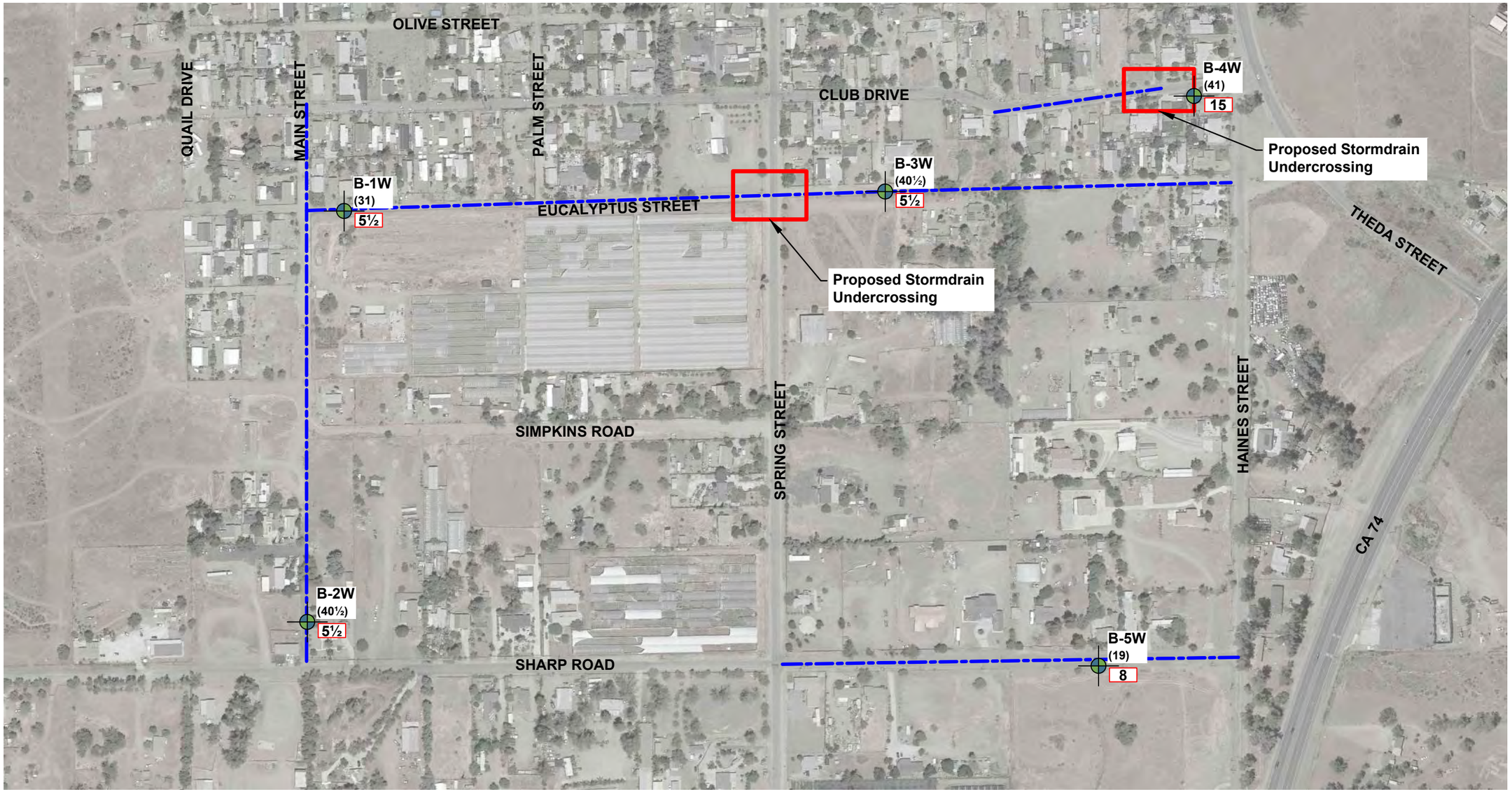
SUBSURFACE EXPLORATION MAP
Good Hope & Mead Valley Water Project
Riverside County, California

Date: July, 2023
By: CGI
Job No.: 1962.000-2

ATLAS

Figure:
2A

GOOD HOPE ALIGMENT



LEGEND:

B-5W (19) 5 — Location of Boring (Depth in Feet) (Depth in Feet to Formation)

Proposed Water Pipeline

N

0 300 600

SCALE (feet)

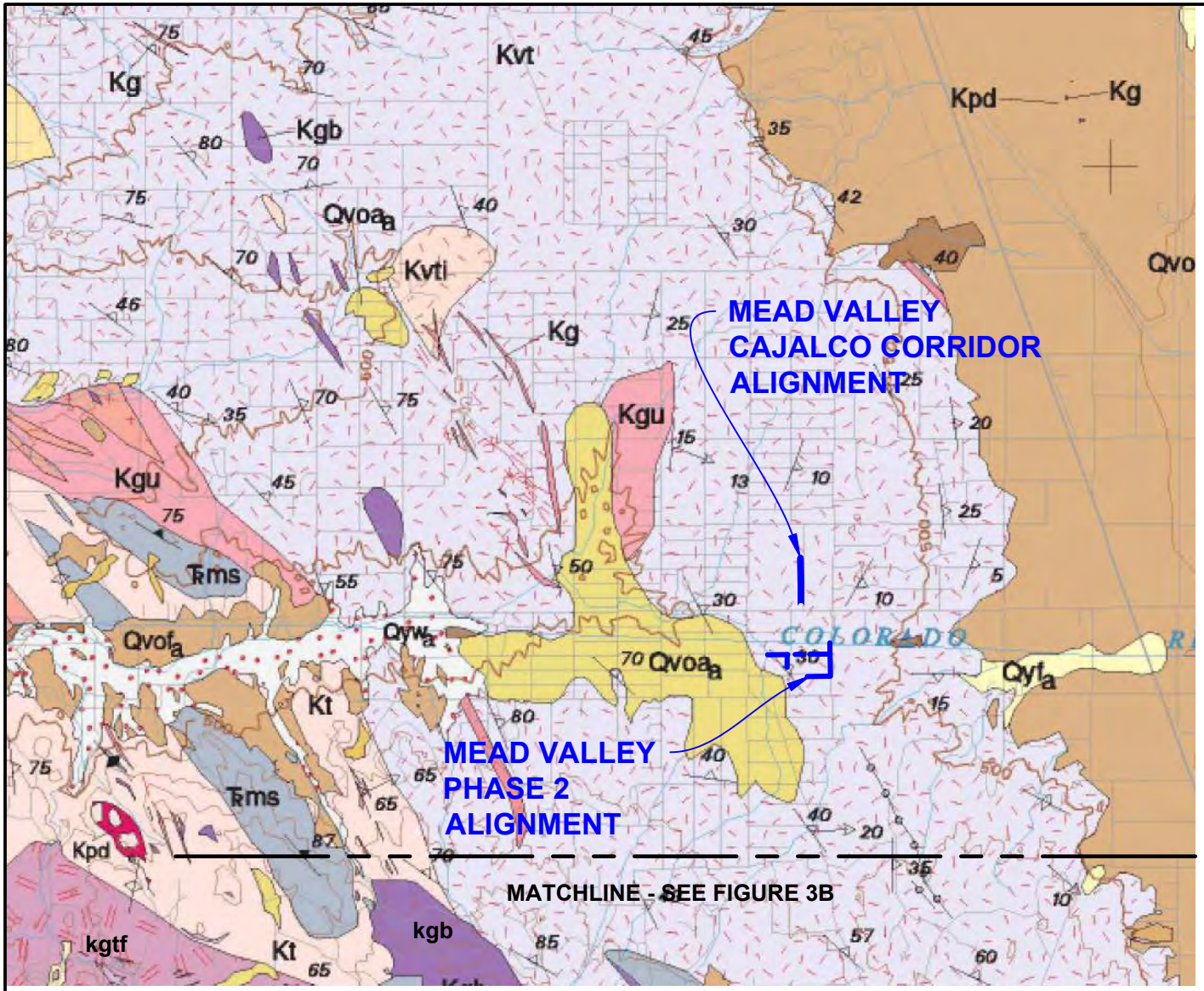
NOTE: All Locations are approximate.

SUBSURFACE EXPLORATION MAP
Good Hope & Mead Valley Water Project
Riverside County, California

Date: July, 2023
By: CGI
Job No.: 190063P4.2

ATLAS

Figure:
2B



EXPLANATION:

Qyw$_a$	Young wash deposits (Holocene and late Pleistocene)
Qyf$_a$	Young alluvial-fan deposits (Holocene and late Pleistocene)
Qvoa$_a$	Very old axial-channel deposits (middle to early Pleistocene)
Qov$_a$	Old alluvial-valley deposits (late to middle Pleistocene)
Qvof$_a$	Very old alluvial-fan deposits (middle to early Pleistocene)
Kvt	Val Verde tonalite
kgtf	Foliated tonalite
kgb	Gabbro, undifferentiated (Cretaceous)
kpd	Granitic pegmatite dikes
kgu	Granite, undifferentiated (Cretaceous)
kt	Tonalite, undifferentiated (Cretaceous)
T$_R$ms	Schist

N

0 5,000 10,000

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.

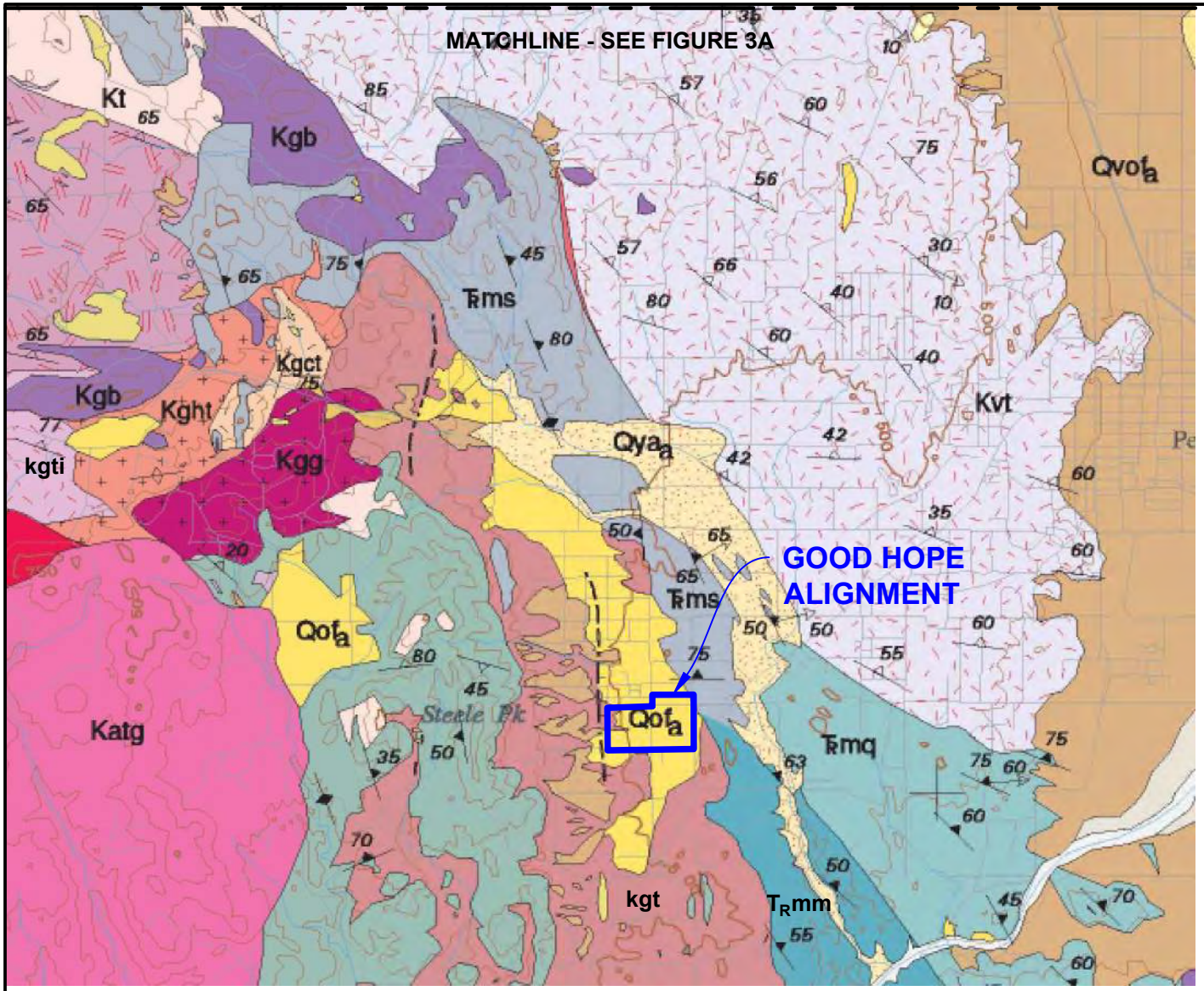
ATLAS

REGIONAL GEOLOGY MAP

Good Hope & Mead Valley Water Project
Riverside County, California

Date: July, 2023
By: CGI
Job No.: 1962.000-2

Figure:
3A



EXPLANATION:

Qya_a	Young axial-channel deposits (Holocene and late Pleistocene)
Qof_a	Old alluvial-fan deposits (late to middle Pleistocene)
$Qvof_a$	Very old alluvial-fan deposits (middle to early Pleistocene)
Kvt	Val Verde tonalite
kgg	Hypersthene monzogranite
kgt	Massive-textured tonalite
kgti	Foliated tonalite
kgct	Coarse-grained biotite-hornblende tonalite
kght	Heterogeneous tonalite
katg	Granodiorite of Arroyo del Toro Pluton (Cretaceous)
kgb	Gabbro, undifferentiated (Cretaceous)
kt	Tonalite, undifferentiated (Cretaceous)
T_Rms	Schist
T_Rmq	Quartz-rich rocks
T_Rmm	Marble

N

0 5,000 10,000

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.

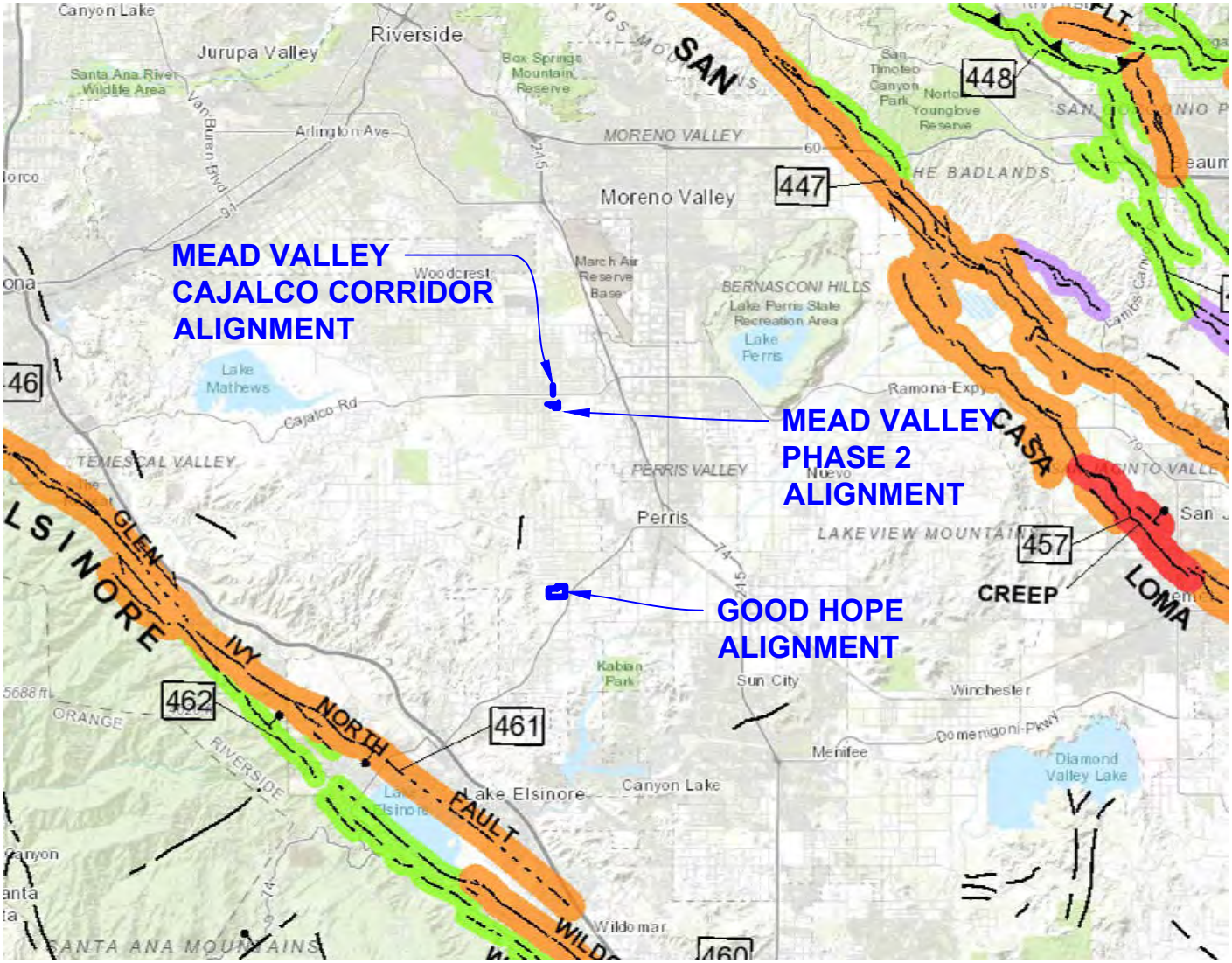
ATLAS

REGIONAL GEOLOGY MAP

Good Hope & Mead Valley Water Project
Riverside County, California

Date: July, 2023
By: CGI
Job No.: 1962.000-2

Figure: 3B



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

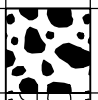
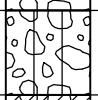
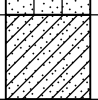
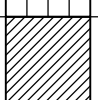
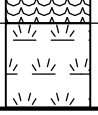
FAULT ACTIVITY MAP
Good Hope & Mead Valley Water Project
Riverside County, California

Date: July, 2023
By: CGI
Job No.: 1962.000-2

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.

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

CAI -CERCHAR ABRASIVITY

PLSI -POINT LOAD STRENGTH INDEX

STS -SPLITTING TENSILE STRENGTH

LABORATORY SYMBOLS

AL - ATTERBERG LIMITS
CON - CONSOLIDATION
COR - CORROSIVITY TESTING
DS - DIRECT SHEAR
EI - EXPANSION INDEX
MAX - MAXIMUM DENSITY
RV - R-VALUE
PD - PARTICLE-SIZE DISTRIBUTION
UC - UNCONFINED COMPRESSIVE STRENGTH
WA - No. 200 WASH (% PASSING No. 200 SIEVE)

WHERE AN ASTERISK * EXISTS NEXT TO RQD VALUE- MEASURED INTACT PIECES DID NOT PASS FIELD SOUNDNESS TEST

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	
Good Hope and Mead Valley Water Improvements	1962-2	**B-1W**

SITE	START	END	SHEET NO.
Riverside County, CA	9/28/22	9/28/22	1

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	31	1647

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	LAB TESTS
1645	0								**OLD ALLUVIAL-FAN DEPOSITS (Qof)**: CLAYEY SAND (SC), medium dense, brown, moist, fine to medium grained, medium plasticity, trace aggregate base.	AL COR EI WA
									Increase in fines, moderately cemented.	
	5		CAL	96/9"		9.4	117.6		**MASSIVE-TEXTURED TONALITE (kgt)**: IGNEOUS ROCK (QUARTZ DIORITE), pale to reddish brown, intensely weathered, very soft; (POORLY GRADED SAND with SILT (SP-SM), very dense, moist, fine to medium grained).	
1640										
	10		CAL	50/6						
1635									Hard drilling.	
	15		SPT	50/6						
1630										
	20		SPT	50/6					Decomposed, hard drilling.	
1625										

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Figure

I-1

LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	B-1W
Good Hope and Mead Valley Water Improvements	1962-2	

SITE	START	END	SHEET NO.
Riverside County, CA	9/28/22	9/28/22	2

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	31	1647

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	LAB TESTS
1620			SPT	50/3					**MASSIVE-TEXTURED TONALITE (kgt)**: IGNEOUS ROCK (QUARTZ DIORITE), pale to reddish brown, intensely weathered, very soft; (POORLY GRADED SAND with SILT (SP-SM), very dense, moist, fine to medium grained). *(continued)*	
	30		SPT	50/2						
									REFUSAL AT 31 FEET No groundwater or seepage encountered	
1615										
	35									
1610										
	40									
1605										
	45									
1600										

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Figure
I-2

LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	
Good Hope and Mead Valley Water Improvements	1962-2	**B-2W**

SITE	START	END	SHEET NO.
Riverside County, CA	9/20/22	9/20/22	3

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	1675

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	LAB TESTS
									OLD ALLUVIAL-FAN DEPOSITS (Qof): Poorly Graded SAND with SILT (SP-SM), medium dense, brown, moist, fine to medium grained, rock retreived in shoe.	WA
1670	5		CAL	54		2.8	109.5		**MASSIVE-TEXTURED TONALITE (kgt)**: IGNEOUS ROCK (QUARTZ DIORITE), light yellowish brown, decomposed, very soft; (SILTY SAND (SM), very dense, moist, fine to coarse grained).	
1665	10		CAL	50/6						
1660	15		CAL	50/5					Grayish brown; (POORLY GRADED SAND (SP), very dense, moist, fine to coarse grained).	
1655	20		CAL	50/5						

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Figure

I-3

LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	
Good Hope and Mead Valley Water Improvements	1962-2	**B-2W**

SITE	START	END	SHEET NO.
Riverside County, CA	9/20/22	9/20/22	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-75	8	40.5	1675

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	LAB TESTS
			SPT	50/3	67/3				Grayish brown; (POORLY GRADED SAND (SP), very dense, moist, fine to coarse grained). *(continued)*	
1645	30		SPT	50/3					Brown; (POORLY GRADED SAND with SILT (SP-SM), very dense, moist, fine to medium grained).	
1640	35		SPT	50/6						
1635	40		SPT	50/3						
1630	45								**BORING TERMINATED AT 40½ FEET** No groundwater or seepage encountered	

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Figure
I-4

LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	
Good Hope and Mead Valley Water Improvements	1962-2	**B-3W**

SITE	START	END	SHEET NO.
Riverside County, CA	9/20/22	9/20/22	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	1601

DEPTH/ELEV. GROUND WATER (ft)
- ▽ AT TIME OF DRILLING 26.00 ft / Elev 1575.00 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
1600							**OLD ALLUVIAL-FAN DEPOSITS (Qof)**: SILTY SAND (SM), medium dense, brown, moist, fine to medium grained, micaceous.
	5						
1595			CAL	88			
							MASSIVE-TEXTURED TONALITE (kgt): IGNEOUS ROCK (QUARTZ DIORITE), yellowish brown, decomposed, very soft; (POORLY GRADED SAND with SILT (SP-SM), very dense, moist, fine to coarse grained).
	10						
1590			CAL	50/5			
	15						
1585			CAL	50/6			
							Light brown, intensely weathered; (SILTY SAND (SM), very dense, moist, fine to coarse grained).
	20						
1580			CAL	50/6			
							(POORLY GRADED SAND with SILT(SP-SM), very dense, moist, fine to coarse grained).

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Figure

I-5

LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	
Good Hope and Mead Valley Water Improvements	1962-2	**B-3W**

SITE	START	END	SHEET NO.
Riverside County, CA	9/20/22	9/20/22	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	1601

DEPTH/ELEV. GROUND WATER (ft)
- ▽ **AT TIME OF DRILLING** 26.00 ft / Elev 1575.00 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
1575			CAL	50/6			(POORLY GRADED SAND with SILT(SP-SM), very dense, moist, fine to coarse grained). *(continued)* ▽
							Light brown; (SILTY SAND (SM), very dense, wet, fine to medium grained).
	30		SPT	50/4			
1570							
	35		SPT	50/4			Increase in fines.
1565							
	40		SPT	50/6			Decrease in fines.
1560							**BORING TERMINATED AT 40½ FEET** Groundwater encountered at 26 feet
	45						
1555							

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Figure

I-6

LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	
Good Hope and Mead Valley Water Improvements	1962-2	**B-4W**

SITE	START	END	SHEET NO.
Riverside County, CA	9/28/22	9/28/22	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)
LAR-55	8	41	1571

DEPTH/ELEV. GROUND WATER (ft)
- AT TIME OF DRILLING 34.00 ft / Elev 1537.00 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	0								**OLD ALLUVIAL-FAN DEPOSITS (Qof)**: SILTY SAND (SM), medium dense, brown, moist, fine grained.	RV WA
	5		CAL	18		3.9	109.9			
1565										
	10		CAL	75/12"					Very dense.	
1560										
	15		CAL	81/8"					**MASSIVE-TEXTURED TONALITE (Kgt)**: IGNEOUS ROCK (QUARTZ DIORITE), yellowish brown, intensley weathered, very soft; (POORLY GRADED SAND (SP), very dense, fine to coarse grained).	
1555										
	20		CAL	50/6					More micaceous.	
1550										

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Figure

I-7

LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	B-4W
Good Hope and Mead Valley Water Improvements	1962-2	

SITE	START	END	SHEET NO.
Riverside County, CA	9/28/22	9/28/22	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)
LAR-55	8	41	1571

DEPTH/ELEV. GROUND WATER (ft)
- ▽ AT TIME OF DRILLING 34.00 ft / Elev 1537.00 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
1545			SPT	50/4	67/4				**MASSIVE-TEXTURED TONALITE (Kgt)**: IGNEOUS ROCK (QUARTZ DIORITE), yellowish brown, intensley weathered, very soft; (POORLY GRADED SAND (SP), very dense, fine to coarse grained). *(continued)*	
	30									
1540			SPT	80	107					
									▽ (SILTY SAND (SM), very dense, wet, fine to coarse grained).	
	35									
1535			SPT	50/6	67/6					
	40									
1530			SPT	50/6	67/6				**BORING TERMINATED AT 41 FEET** Groundwater encountered at 34 feet	
	45									
1525										

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Figure

I-8

LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	
Good Hope and Mead Valley Water Improvements	1962-2	**B-5W**

SITE	START	END	SHEET NO.
Riverside County, CA	9/20/22	9/20/22	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)	DEPTH/ELEV. GROUND WATER (ft)
CME-75	8	19	1584	▽ 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
							FILL (Qf): CLAYEY SAND (SC), dense, dark reddish brown, moist, plastic, fine to medium grained.
1580	5		CAL	98/9"			**OLD ALLUVIAL-FAN DEPOSITS (Qof)**: POORLY GRADED SAND with SILT (SP-SM), very dense, yellowish brown, moist, fine to medium grained, moderately cemented.
1575	10		SPT	50/3			**MASSIVE-TEXTURED TONALITE (kgt)**: IGNEOUS ROCK (QUARTZ DIORITE), light yellowish brown, intensely weathered, very soft; (POORLY GRADED SAND (SP), very dense, moist, fine to coarse grained).
1570	15		CAL	50/2			Variable weathering.
1565			SPT	50/5	67/5		Grayish brown; (SILTY SAND (SM), very dense, moist, fine grained).
	20						**REFUSAL AT 19 FEET** No groundwater or seepage encountered
1560							

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Figure

I-9

LOG OF TEST BORING

ATLAS PROJECT NAME	Good Hope and Mead Valley Water Improvements	**ATLAS PROJECT NUMBER**	1962-2
B-6W			
SITE	Riverside County, CA	**START**	9/21/22
END	9/21/22	**SHEET NO.**	10
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)	41.5	**GROUND ELEV. (ft)**	1693
DEPTH/ELEV. GROUND WATER (ft)	▽ AT TIME OF DRILLING 29.00 ft / Elev 1664.00 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}	MOISTURE (%)	DRY DENSITY (pcf)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION	LAB TESTS
									5 inches of Asphalt Concrete (AC) over 3 inches of Aggregate Base (AB).	
									OLD ALLUVIAL-FAN DEPOSITS (Qof): SILTY SAND (SM), dense, brown, moist, fine to medium grained, trace gravel, micaceous.	
1690										
	5		CAL	36		10.1	120.5			DS WA
									Light brown, fine grained, hard drilling.	
1685										
	10		SPT	50/3	67/3					
									VAL VERDE TONALITE (Kvt): IGNEOUS ROCK (QUARTZ DIORITE), brownish gray, decomposed, very soft; (POORLY Graded SAND (SP), very dense, moist, fine to coarse grained).	
1680										
	15		CAL	50/6						
1675										
	20		CAL	50/4					Brownish gray.	
1670										

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Figure

I-10

LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	B-6W
Good Hope and Mead Valley Water Improvements	1962-2	

SITE	START	END	SHEET NO.
Riverside County, CA	9/21/22	9/21/22	11

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	1693

DEPTH/ELEV. GROUND WATER (ft)
- ▽ AT TIME OF DRILLING 29.00 ft / Elev 1664.00 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	50/3					**VAL VERDE TONALITE (Kvt)**: IGNEOUS ROCK (QUARTZ DIORITE), brownish gray, decomposed, very soft; (POORLY Graded SAND (SP), very dense, moist, fine to coarse grained). *(continued)*	
1665									Grayish brown; (SILTY SAND (SM), very dense, moist, fine to coarse grained). ▽	
	30		SPT	50/6						
1660										
	35		SPT	50/5					Decrease in fines.	
1655									Yellowish brown; (LEAN CLAY with SAND (CL), hard, wet, medium to coarse grained).	
	40		SPT	83/9"	111/9"					
1650									**BORING TERMINATED AT 41½ FEET** Grounwater encountered at 29 feet	
	45									
1645										

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Figure

I-11

LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	
Good Hope and Mead Valley Water Improvements	1962-2	**B-7W**

SITE	START	END	SHEET NO.
Riverside County, CA	9/21/22	9/21/22	12

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	13	1685

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	LAB TESTS
									OLD ALLUVIAL-FAN DEPOSITS (Qof): SANDY SILT (ML), dense, brown, moist, fine to medium grained.	PD COR
									POORLY GRADED SAND with SILT (SP-SM), medium dense, brown, moist, fine to coarse grained.	
1680	5		CAL	50/6		3.5	107.9		**SCHIST (TRms)**: METAMORPHIC ROCK, Brown, intensely weathered, very soft; (SILTY SAND (SM), very dense, moist, fine to coarsed grained).	
1675	10		CAL	50/6					Hard drilling.	
									REFUSAL AT 13 FEET No groundwater or seepage encountered	
1670	15									
1665	20									

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Figure

I-12

LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	
Good Hope and Mead Valley Water Improvements	1962-2	**B-8W**

SITE	START	END	SHEET NO.
Riverside County, CA	5/23/23	5/23/23	13

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	17	1663

DEPTH/ELEV. GROUND WATER (ft)
- ▽ AT TIME OF DRILLING 9.00 ft / Elev 1654.00 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
1660	0								**OLD ALLUVIAL-FAN DEPOSITS (Qof)**: SILTY SAND (SM), medium dense, brown, moist, fine to medium grained, micaceous.	
	5		CAL	17		11.1	121.3			PD
1655									**VAL VERDE TONALITE (Kvt)**: IGNEOUS ROCK (QUARTZ DIORITE), light to yellowish brown, decomposed, very soft; (Well-Graded SAND with GRAVEL (SW), medium dense, moist, fine to coarse grained, micaceous). ▽	
	10		CAL	50/6					(SILTY SAND (SM), very dense, fine to medium grained).	
1650										
	15		CAL	50/5					Dark grayish brown, decomposed to intensely weathered; (fine to coarse grained sand, decreased in fines).	
1645									**REFUSAL AT 17 FEET** Groundwater or seepage encountered at 9 feet	
	20									
1640										

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LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	
Good Hope and Mead Valley Water Improvements	1962-2	**B-9W**

SITE	START	END	SHEET NO.
Riverside County, CA	5/23/23	5/23/23	14

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	20	1671

DEPTH/ELEV. GROUND WATER (ft)
- ▽ AT TIME OF DRILLING 17.00 ft / Elev 1654.00 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
1670	0								**OLD ALLUVIAL-FAN DEPOSITS (Qof)**: SILTY SAND (SM), medium dense, dark reddish brown, moist, fine to medium grained, micaceous.	AL PD EI RV
									Dense, grayish to yellowish brown.	
	5		CAL	50/5		5.6	130.7			
1665									**VAL VERDE TONALITE (Kvt)**: IGNEOUS ROCK (QUARTZ DIORITE), grayish to yellowish brown, decomposed to intensely weathered, soft; (SILTY SAND (SM), very dense, moist, fine to medium grained, black and white mottling).	
	10		CAL	50/5					(Poorly-Graded SAND with SILT (SP-SM)).	
1660										
	15		CAL	50/5					(Poorly Graded SAND (SP), light brown, fine to coarse grained).	
1655								▽		
			CAL	50/3						
	20								**BORING TERMINATED AT 20 FEET** Groundwater or seepage encountered at 17 feet	
1650										

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Figure

I-14

LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	
Good Hope and Mead Valley Water Improvements	1962-2	**B-10W-A**

SITE	START	END	SHEET NO.
Riverside County, CA	5/23/23	5/23/23	15

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)	DEPTH/ELEV. GROUND WATER (ft)
CME-75	8	20	1687	▽ 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	LAB TESTS
1685	0								**OLD ALLUVIAL-FAN DEPOSITS (Qof)**: SILTY SAND (SM), medium dense, brownish yellow, moist, fine to medium grained.	PD
	5		CAL	50/6					**VAL VERDE TONALITE (Kvt)**: IGNEOUS ROCK (QUARTZ DIORITE), grayish yellow, decomposed to intensely weathered, very soft; (Poorly Graded SAND with SILT (SP-SM), very dense, moist, fine to medium grained, weakly cemented). Boulder encountered at 8 feet, started a new borehole 5 feet west.	
1680										
	10		CAL	50/5		4.1	118.7		(Poorly Graded SAND (SP), light gray, fine to coarse grained, green mottling).	
1675										
	15		CAL	50/2					Moderately weathered.	
1670										
			CAL	50/5						
	20								**BORING TERMINATED AT 20 FEET** No groundwater or seepage encountered	
1665										

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Figure

I-15

LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	
Good Hope and Mead Valley Water Improvements	1962-2	**B-11W**

SITE	START	END	SHEET NO.
Riverside County, CA	5/23/23	5/23/23	16

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)	DEPTH/ELEV. GROUND WATER (ft)
CME-75	8	13	1691	▽ 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
1690							**OLD ALLUVIAL-FAN DEPOSITS (Qof)**: SILTY SAND (SM), dense, brownish yellow, dry, fine grained.	PD COR
	5		CAL	50/6				
1685							**VAL VERDE TONALITE (Kvt)**: IGNEOUS ROCK (QUARTZ DIORITE), light yellowish brown, decomposed to intensely weathered, very soft; (SILTY SAND (SM), very dense, moist, fine to coarse grained).	
	10		CAL	50/6			(Brownish gray).	
1680								
							REFUSAL AT 13 FEET No groundwater or seepage encountered	
	15							
1675								
	20							
1670								

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Figure

I-16

LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	
Good Hope and Mead Valley Water Improvements	1962-2	**B-12W**

SITE	START	END	SHEET NO.
Riverside County, CA	5/23/23	5/23/23	17

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)	DEPTH/ELEV. GROUND WATER (ft)
CME-75	8	20	1687	▽ 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	LAB TESTS
1685									**OLD ALLUVIAL-FAN DEPOSITS (Qof)**: SILTY SAND (SM), medium dense, dark yellowish brown, moist, fine to medium grained.	
									Dense.	
	5		CAL	50/5		7.4	105.7			
1680									**VAL VERDE TONALITE (Kvt)**: IGNEOUS ROCK (QUARTZ DIORITE), yellow to grayish brown, decomposed, very soft; (SILTY SAND (SM), very dense, moist, fine to medium grained).	
	10		CAL	50/3					(Well-Graded SAND with SILT (SW-SM), fine to coarse grained).	PD
1675										
	15		CAL	50/4					(Poorly-Graded SAND (SP), grayish yellow).	
1670										
			CAL	50/3					(Brownish gray, weakly cemented).	
	20								**BORING TERMINATED AT 20 FEET** No groundwater or seepage encountered	
1665										

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Figure

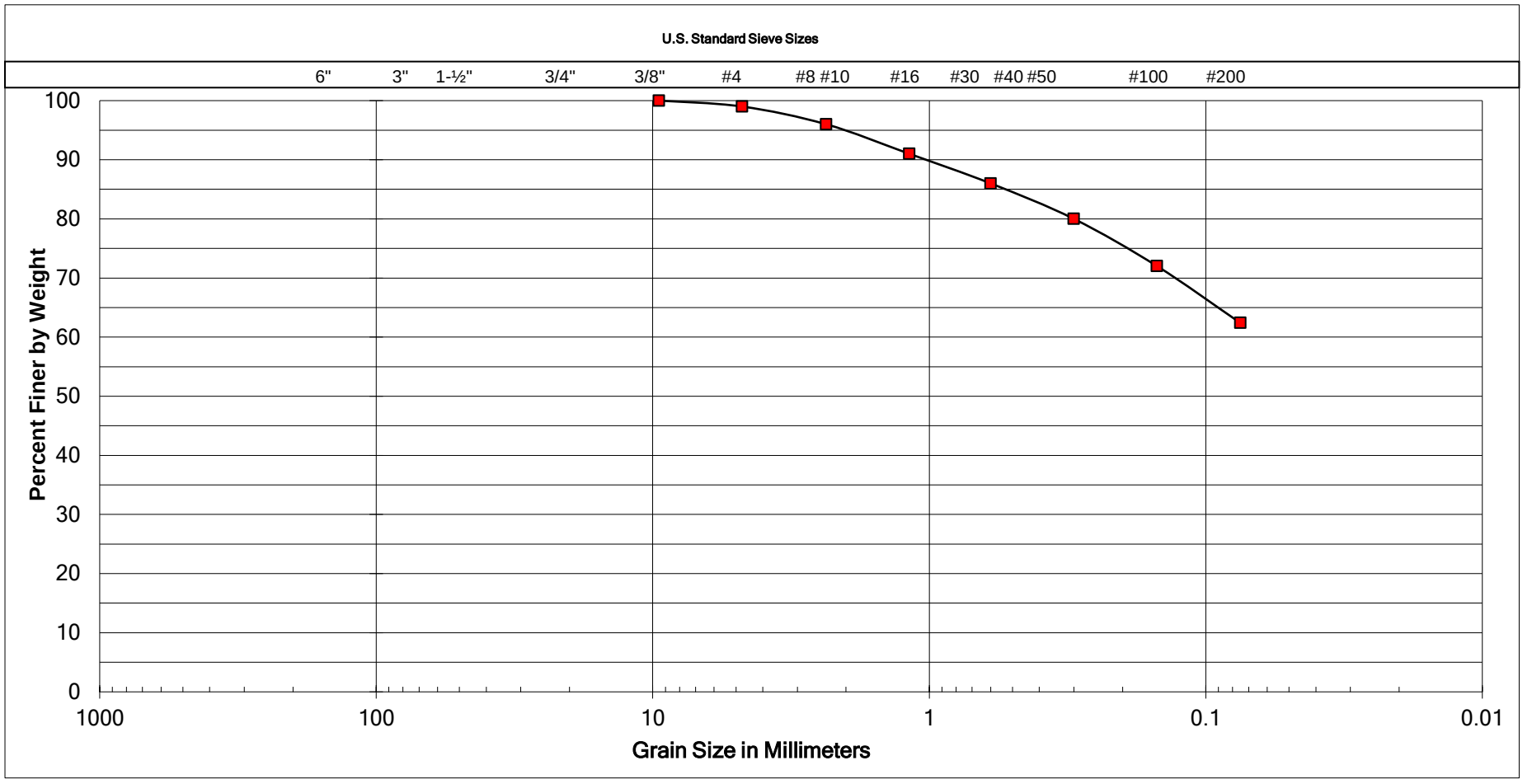
I-17

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 selected 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 selected soil samples in accordance with ASTM D6913.
- **PERCENT FINDER THAN #200:** The percent of materials finer than No. 200 sieve (75µm) was measured on selected samples in accordance with ASTM C117 and ASTM D1140.
- **ATTERBERG LIMITS:** The Atterberg limits were evaluated on selected soil samples in accordance with ASTM D4318.
- **EXPANSION INDEX:** This test was performed on selected soil samples in accordance with ASTM D4289.
- **DIRECT SHEAR:** This test was performed on a selected soil sample 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.
- **R-VALUE:** This test was performed on selected soil samples in accordance with Caltrans Test Method 301.
- **CORROSIVITY:** Corrosivity tests were performed on selected 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.

Soil and rock samples not tested are now 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-7W at 0 to 3 feet
SAMPLE NUMBER
78225

UNIFIED SOIL CLASSIFICATION:	ML
DESCRIPTION	SANDY SILT

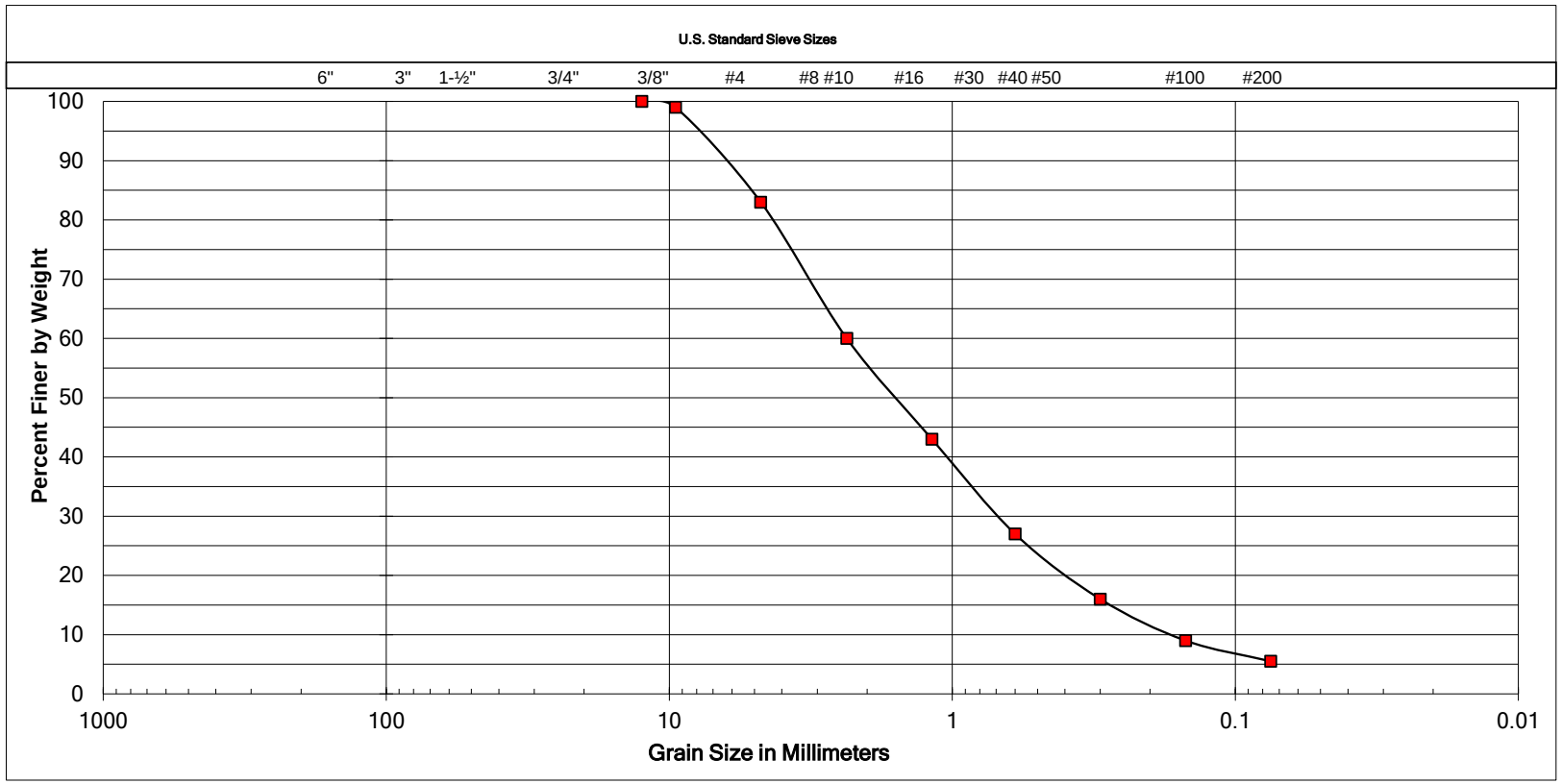
ATTERBERG LIMITS	
LIQUID LIMIT	-
PLASTIC LIMIT	-
PLASTICITY INDEX	-

ATLAS

Good Hope and Mead Valley Water Improvements

Riverside County, California

By:	JRD	Date:	July, 2023
Job Number:	1962-2	Figure:	II-1



Cobbles	Gravel		Sand			Silt or Clay
	Coarse	Fine	Coarse	Medium	Fine	

SAMPLE LOCATION
B-8W at 5 to 5½ feet
SAMPLE NUMBER
83346

UNIFIED SOIL CLASSIFICATION:	SW
DESCRIPTION	WELL-GRADED SAND WITH GRAVEL

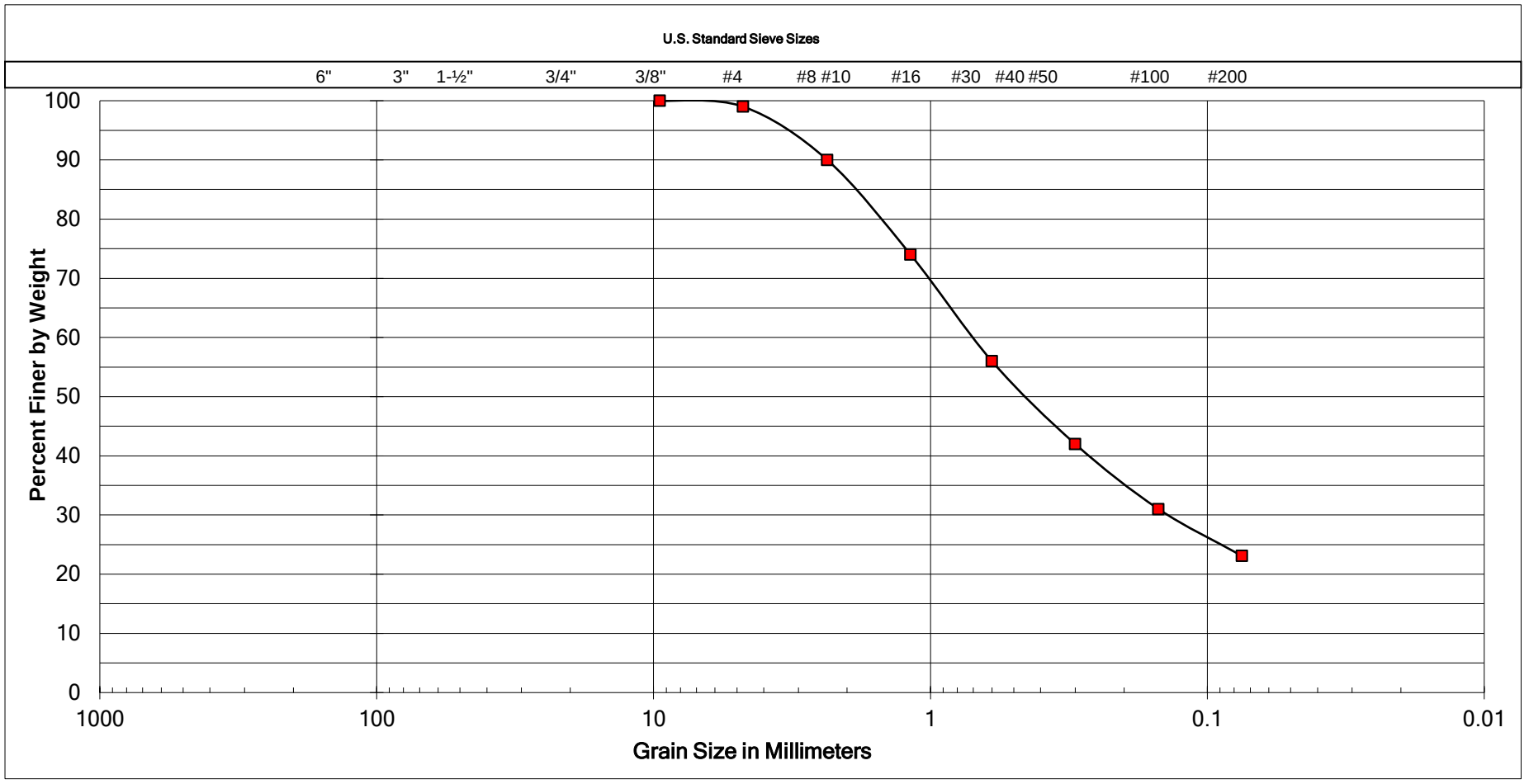
ATTERBERG LIMITS	
LIQUID LIMIT	-
PLASTIC LIMIT	-
PLASTICITY INDEX	-

ATLAS

Good Hope and Mead Valley Water Improvements

Riverside County, California

By:	SD	Date:	July, 2023
Job Number:	1962-2	Figure:	II-2



Cobbles	Gravel		Sand			Silt or Clay
	Coarse	Fine	Coarse	Medium	Fine	

SAMPLE LOCATION
B-9W at 0 to 2 feet
SAMPLE NUMBER
83347

UNIFIED SOIL CLASSIFICATION:	SM
DESCRIPTION	SILTY SAND

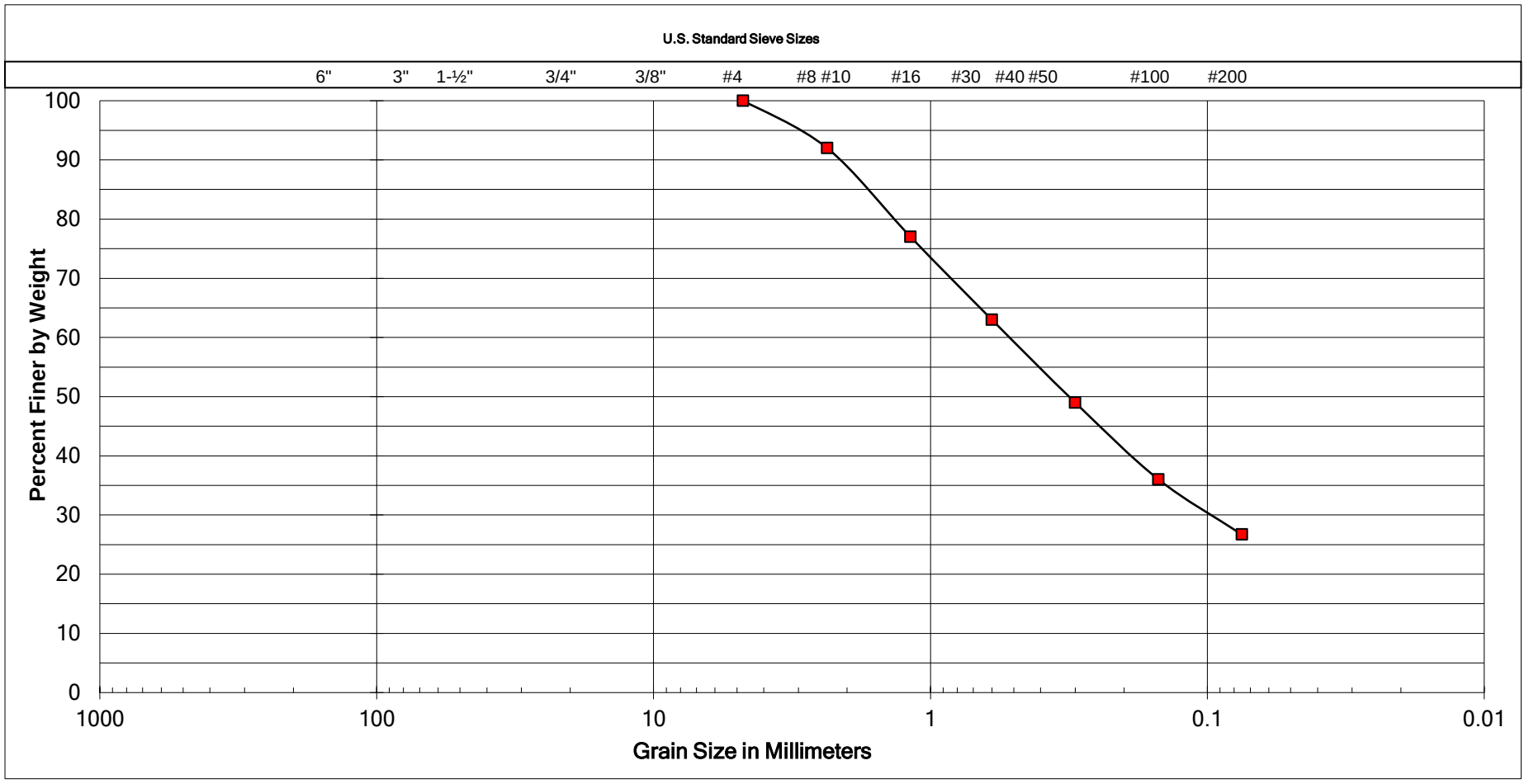
ATTERBERG LIMITS	
LIQUID LIMIT	NP
PLASTIC LIMIT	NP
PLASTICITY INDEX	NP

ATLAS

Good Hope and Mead Valley Water Improvements

Riverside County, California

By:	SD	Date:	July, 2023
Job Number:	1962-2	Figure:	II-3



Cobbles	Gravel		Sand			Silt or Clay
	Coarse	Fine	Coarse	Medium	Fine	

SAMPLE LOCATION
B-10W-A at 0 to 5 feet
SAMPLE NUMBER
83352

UNIFIED SOIL CLASSIFICATION:	SM
DESCRIPTION	SILTY SAND

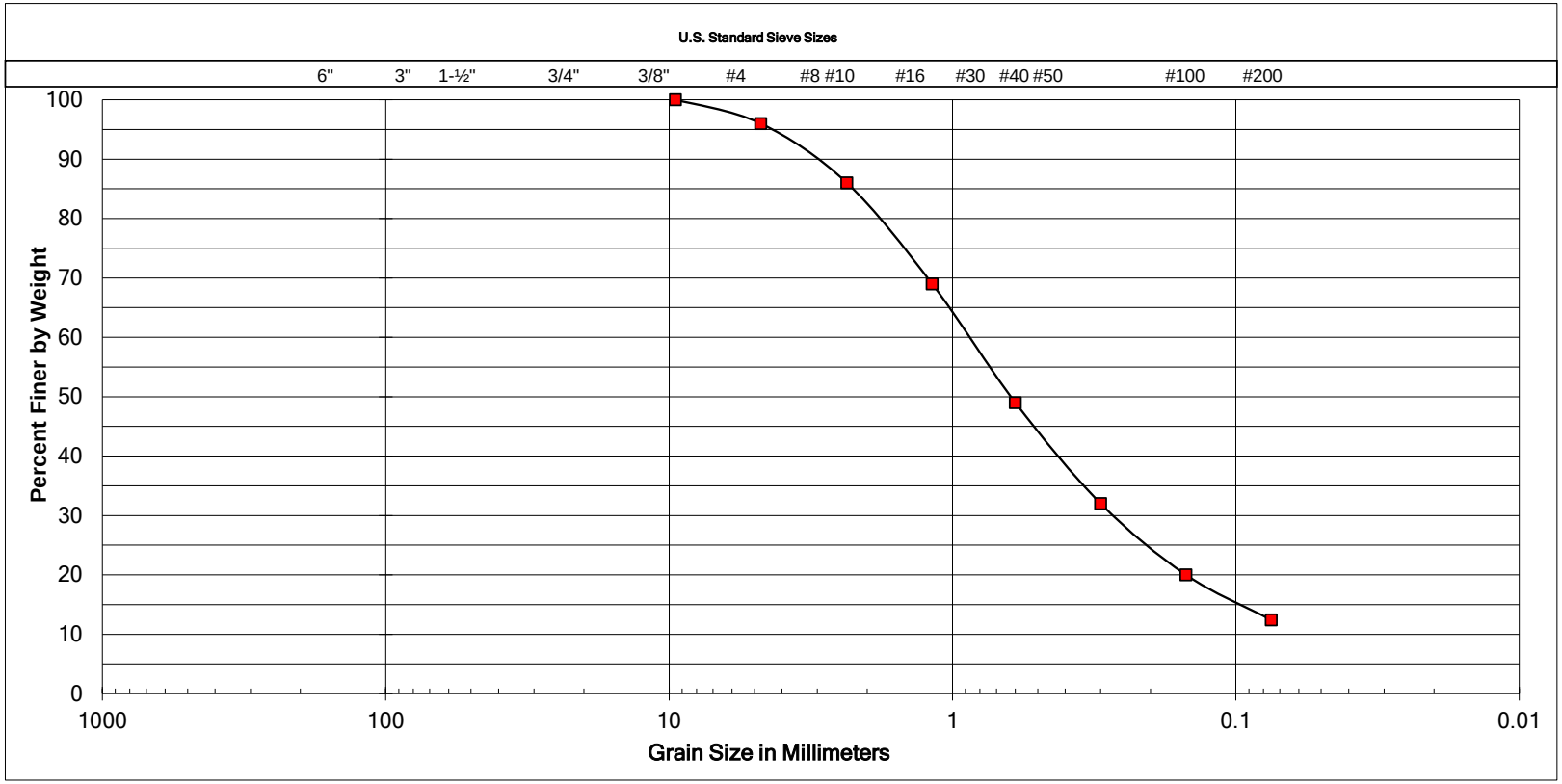
ATTERBERG LIMITS	
LIQUID LIMIT	-
PLASTIC LIMIT	-
PLASTICITY INDEX	-

ATLAS

Good Hope and Mead Valley Water Improvements

Riverside County, California

By:	SD	Date:	July, 2023
Job Number:	1962-2	Figure:	II-4



Cobbles	Gravel		Sand			Silt or Clay
	Coarse	Fine	Coarse	Medium	Fine	

SAMPLE LOCATION
B-11W at 10 to 10½ feet
SAMPLE NUMBER
83354

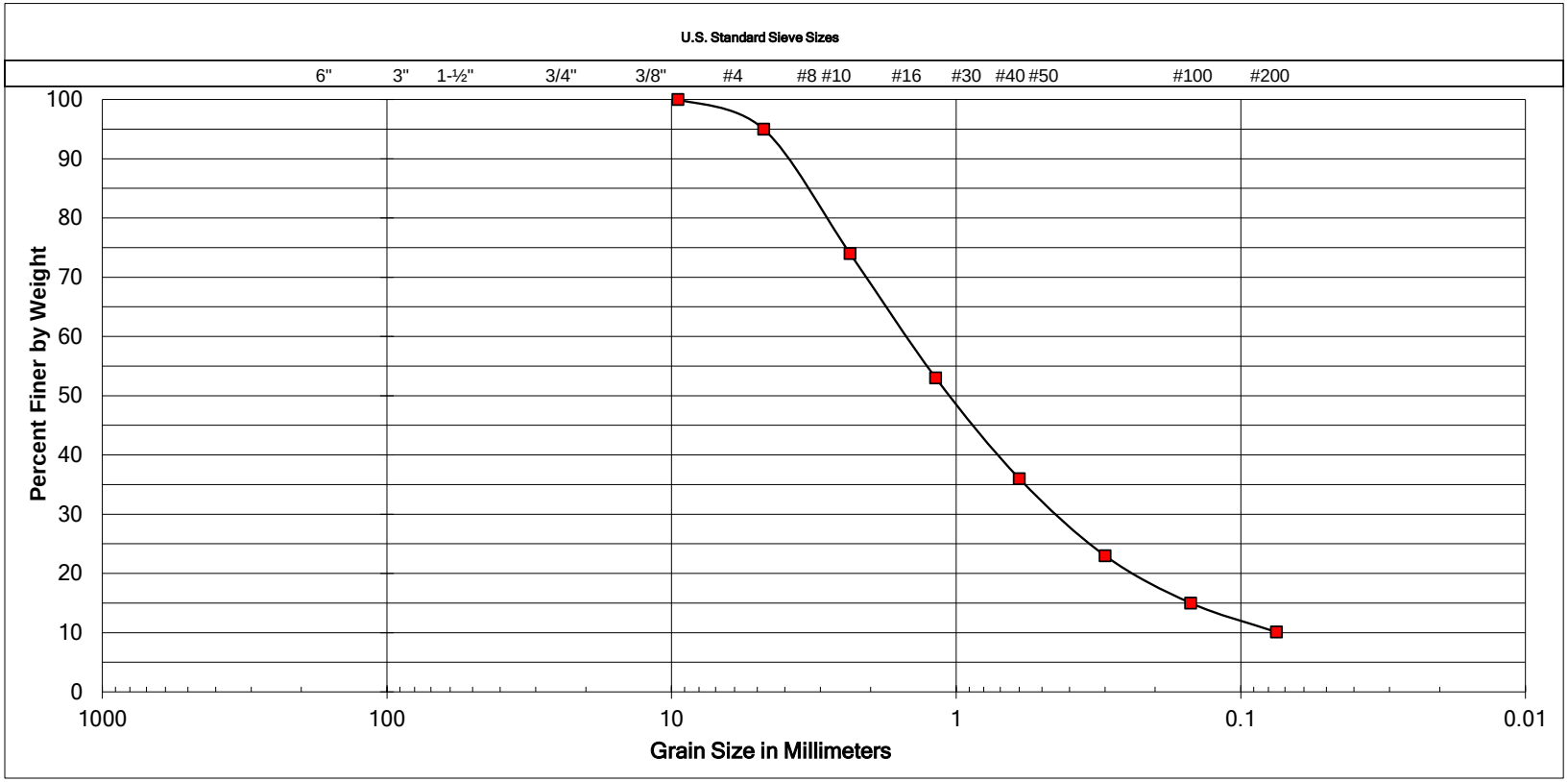
UNIFIED SOIL CLASSIFICATION:	SM
DESCRIPTION	SILTY SAND

ATTERBERG LIMITS	
LIQUID LIMIT	-
PLASTIC LIMIT	-
PLASTICITY INDEX	-

ATLAS

Good Hope and Mead Valley Water Improvements
Riverside County, California

By:	SD	Date:	July, 2023
Job Number:	1962-2	Figure:	II-5



Cobbles	Gravel		Sand			Silt or Clay
	Coarse	Fine	Coarse	Medium	Fine	

SAMPLE LOCATION
B-12W at 10 to 10½ feet
SAMPLE NUMBER
83356

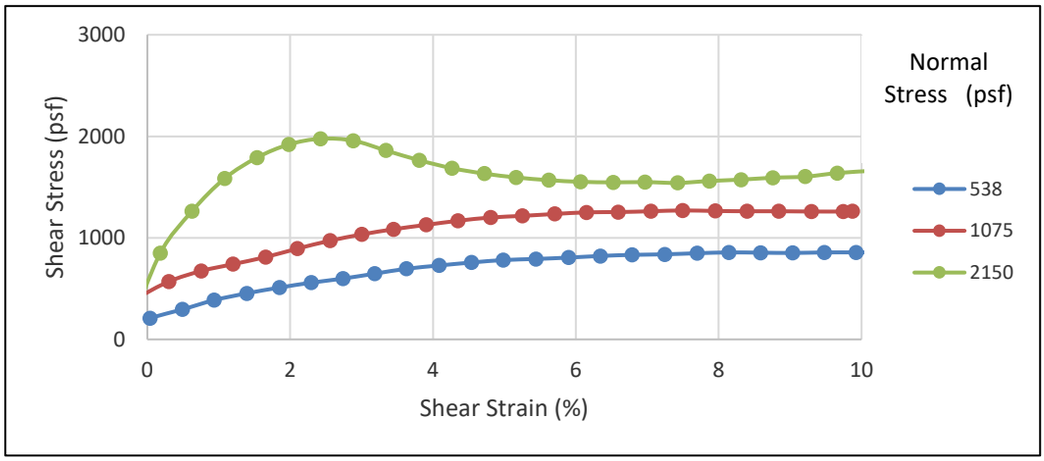
UNIFIED SOIL CLASSIFICATION:	SW-SM
DESCRIPTION	WELL-GRADED SAND WITH SILT

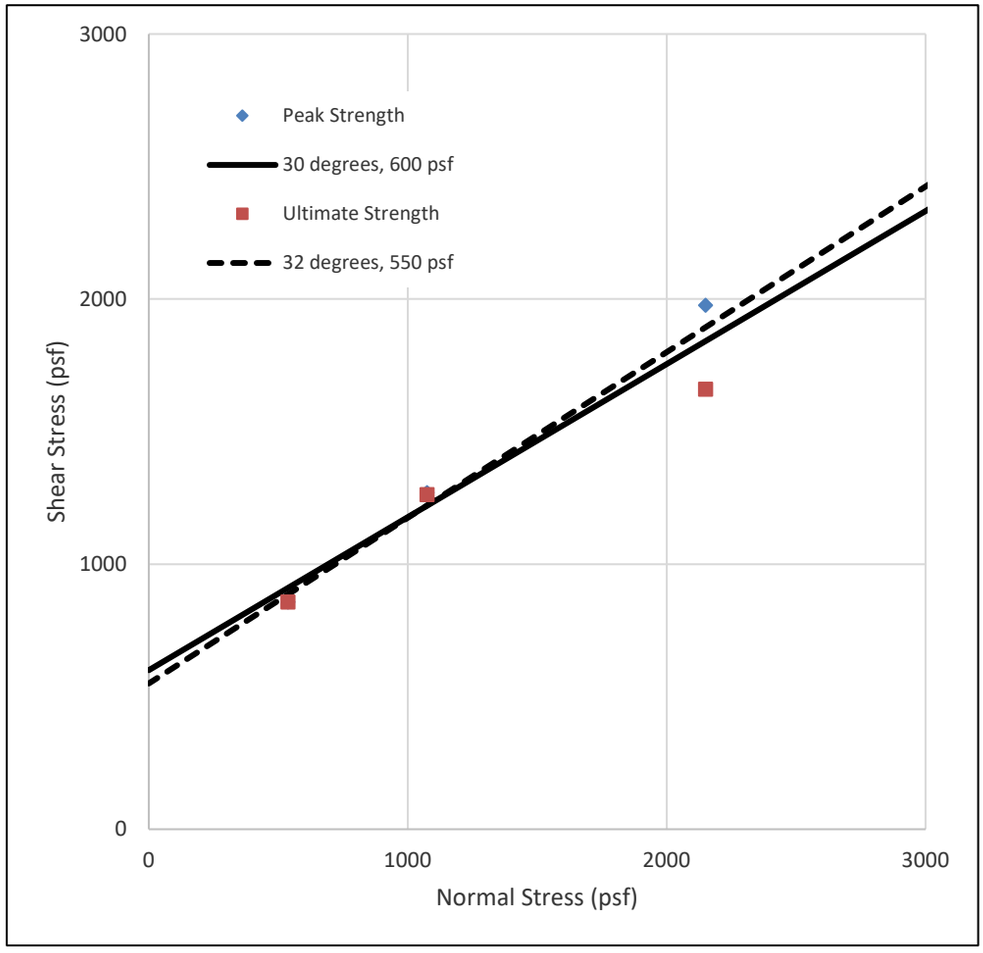
ATTERBERG LIMITS	
LIQUID LIMIT	-
PLASTIC LIMIT	-
PLASTICITY INDEX	-

ATLAS

Good Hope and Mead Valley Water Improvements
Riverside County, California

By:	SD	Date:	July, 2023
Job Number:	1962-2	Figure:	II-6





SAMPLE ID: B-6W at 6 to 6½ Feet

OLDER ALLUVIAL-FAN DEPOSITS (Qof):
SILTY SAND (SM)

NOTES: In Situ
Strain Rate: 0.003 in/min
Sample was consolidated and drained

	Peak	Ultimate
Φ	30 °	32 °
c	600 psf	550 psf

	Initial	Final
γ_d	119.9 pcf	119.9 pcf
w_c	11.6 %	15.2 %
Saturation	79 %	100 %

ATLAS

Good Hope and Mead Valley Water Improvements
Riverside County, California

By:	JRD	Date:	July, 2023
Job Number:	1962-2	Figure:	II-7

EXPANSION INDEX
(ASTM D4829)

SAMPLE	EXPANSION INDEX	EXPANSION POTENTIONAL	SOIL TYPE (USCS)
B-1W at 0 to 5 feet	51	Medium	CLAYEY SAND (SC)
B-9W at 0 to 2 feet	5	Very Low	SILTY SAND (SM)

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-1W at 0 to 5 Feet	43.3	100	CLAYEY SAND (SC)
B-2W at 0 to 5 Feet	6.9	100	Poorly Graded SAND with SILT (SP-SM)
B-4W at 0 to 5 Feet	35.9	100	SILTY SAND (SM)
B-6W at 6 to 6½ Feet	45	100	SILTY SAND (SM)

ATTERBERG LIMITS
ASTM (D4318)

SAMPLE ID	LIQUID LIMIT	PLASTIC LIMIT	PLASTIC INDEX	SOIL TYPE (USCS)
B-1W at 0 to 5 feet	31	17	14	CLAYEY SAND (SC)
B-9 W at 0 to 2 feet	NP	NP	NP	SILTY SAND (SM)

R-VALUE
CALIFORNIA TEST 101

SAMPLE	DESCRIPTION	R-VALUE
B-4 W at 0 to 5 feet	SILTY SAND (SM)	13
B-9 W at 0 to 2 feet	SILTY SAND (SM)	28

RESISTIVITY, pH, SOLUBLE CHLORIDE and SOLUBLE SULFATE
(CT 417, 422, 643)

SAMPLE	RESISTIVITY (Ω-cm)	pH	CHLORIDE (%)	SULFATE (%)
B-1 W at 0 to 5 feet	1,500	7.79	0.007	0.007
B-7W at 0 to 3 feet	4,140	7.73	0.002	0.002
B-11W at 10 to 10½ feet	11,900	8.81	0.002	0.001

Water-Soluble Sulfate Exposure [2]

Water-Soluble Sulfate (SO_4) in soil (percent by weight)	Exposure Severity	Exposure Class	Cement Type	Max. W/C	Min. f_c' (psi)
$SO_4 < 0.10$	N/A	S0	No type restriction	N/A	2,500
$0.10 \le SO_4 < 0.20$	Moderate	S1	II	0.50	4,000
$0.20 \le SO_4 \le 2.00$	Severe	S2	V	0.45	4,500
$SO_4 > 2.00$	Very Severe	S3	V plus pozzolan or slag cement	0.45	4,500

2. Modified from ACI 318-14 Table 19.3.1.1 and Table 19.3.2.1

ATLAS

Good Hope and Mead Valley Water Improvements
Riverside County, California

By:	SD	Date:	July, 2023
Job Number:	1962-2	Figure:	II-8

APPENDIX C Pothole Report

May 15, 2023

PREPARED BY:

UTILITY SURVEYORS, INC.

AIRX Project #: 23-052 PS

Project Name: Mead Valley Cajalco Corridor Water System Imps., Perris

Utility Locating and Potholing Area:
Robinson St, Day St, Oakwood St, Pinewood St and Carroll St
Moreno Valley/Perris, CA

POTHOLING REPORT

785 East Mission Road Ste. 100 | San Marcos, CA 92069 | P.760.480.2347 | F.760.739.8034 | airxus.com

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1. Description of Pothole Procedures and Site-Specific Details
2. Pothole Project Map(s)
3. Pothole Location Map(s)
4. Pothole Tabulation Report
5. Pothole Data Sheet(s)
6. Permit(s)

Description of Pothole Procedures and Site Specific Details

DESCRIPTION OF POTHOLE PROCEDURES

AIRX Utility Surveyors performs a full range of specialized engineering services including Underground Utility Location and Vacuum Excavation (to verify depth and alignment of underground utilities).

Underground Utility Location employs sophisticated electronic locating devices to trace the route of an underground utility; then the route is marked on the surface with marking paint in paved areas, or with 60 penny nails and feathers in unpaved areas.

Vacuum excavation employs a vacuum truck in conjunction with high-pressure air or water to excavate material and expose an underground utility. An 8-inch diameter hole is first cored through the pavement so that the vacuum hose and high-pressure air or water hose can be inserted.

Utilities found during potholing are located on the surface by placing two reference points (typically 36" apart) on either side of the pothole along the centerline (or edge) of the utility, using paving nails or 60 penny nails as appropriate. Depth measurements (to the nearest ½ inch) are taken midway between the two reference points. Utility alignment, depth, and other data is marked with pink paint (on pavement), or on wood lath (unpaved areas).

SITE SPECIFIC DETAILS

AIRX was contracted by EMWD to perform utility locating and potholing services on Robinson St, Day St, Oakwood St, Pinewood St and Carroll St in Moreno Valley/Perris, California. A total of 23 potholes were excavated to establish conflicts and connection points on a variety of utilities. The results of the data are contained in the attached spreadsheet and data sheets.

In preparation of these excavations, AIRX marked out the dig locations and called in for USA (Underground Service Alert). All traffic control plans and permits were drawn and applied for by AIRX and all traffic control was set up by AIRX.

All the excavations and discovery went without any incident except for pothole 14, additional pothole 14A was added in order to locate target utilities. Any changes and adjustments are mentioned in the Pothole Tabulation Report and the Pothole Data Sheets. All the results were annotated on the ground and in this report. It is AIRX's recommendation that all pothole locations and the active mark out should be surveyed to aid in the adjustment of utilities on the final plan and profile.

At each pothole location, the utility alignment was marked with paint. AIRX used potable water acquired offsite for excavation and all water and material vacuumed was disposed of off-site. No water was allowed to flow into storm drains or natural drainages. The potholes were covered with clean backfill material and compacted to 95% density in 3" lifts. The pavement was patched with aquaphalt/Utilibond. All field work was performed between May 8, 2023 and May 12, 2023.

Pothole Project Map(s)

AIRX SUBSURFACE UTILITY LOCATING

Mead Valley Cajalco Corridor Water System Imps., Perris

Pothole Project Map 1

23-052 PS

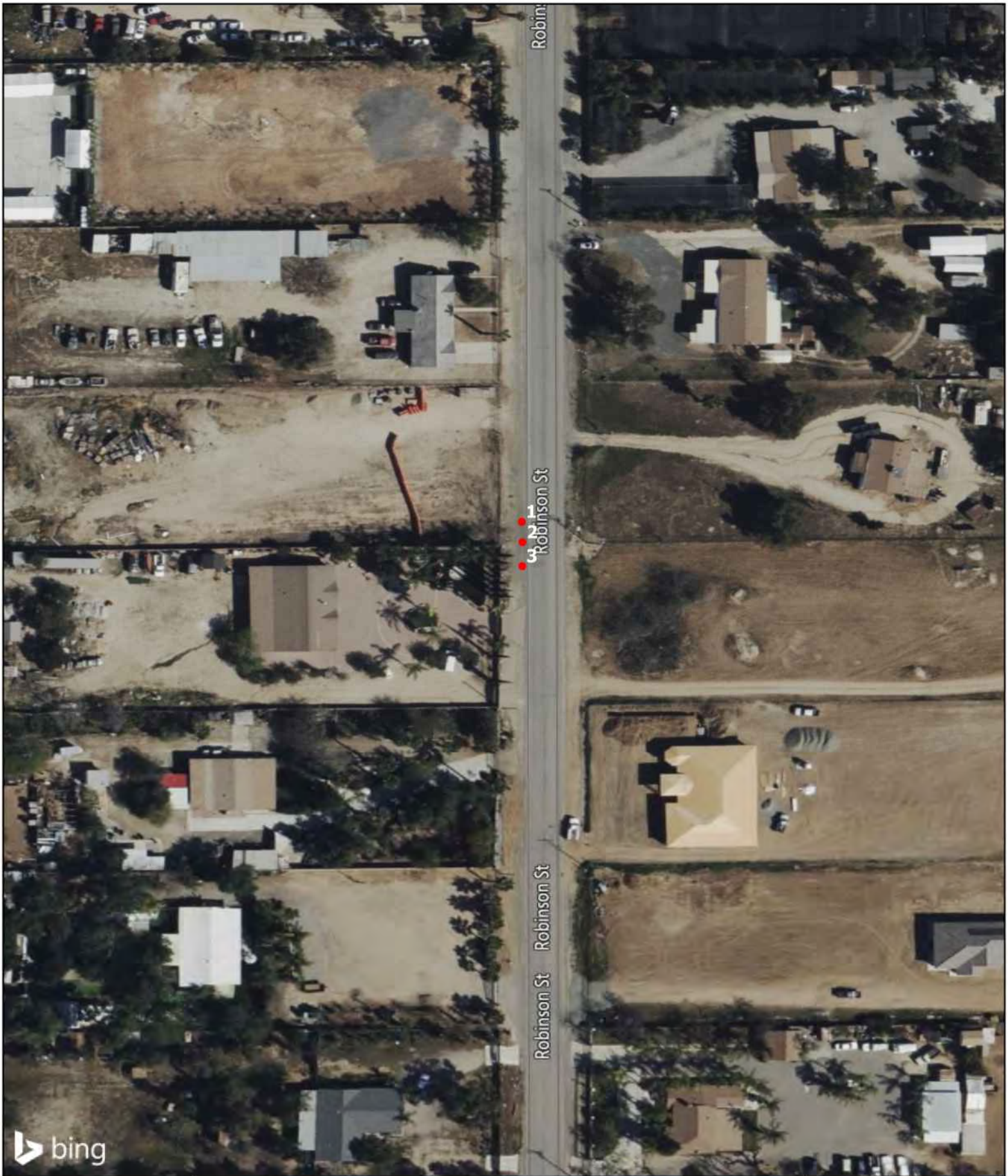
Coordinate System: NAD 1983 UTM Zone 11N

N

0 500 1,000

US Feet

Pothole Location Map(s)



AIRX
SUBSURFACE UTILITY LOCATING

Mead Valley Cajalco Corridor Water System Imps., Perris

Pothole Location Map 1

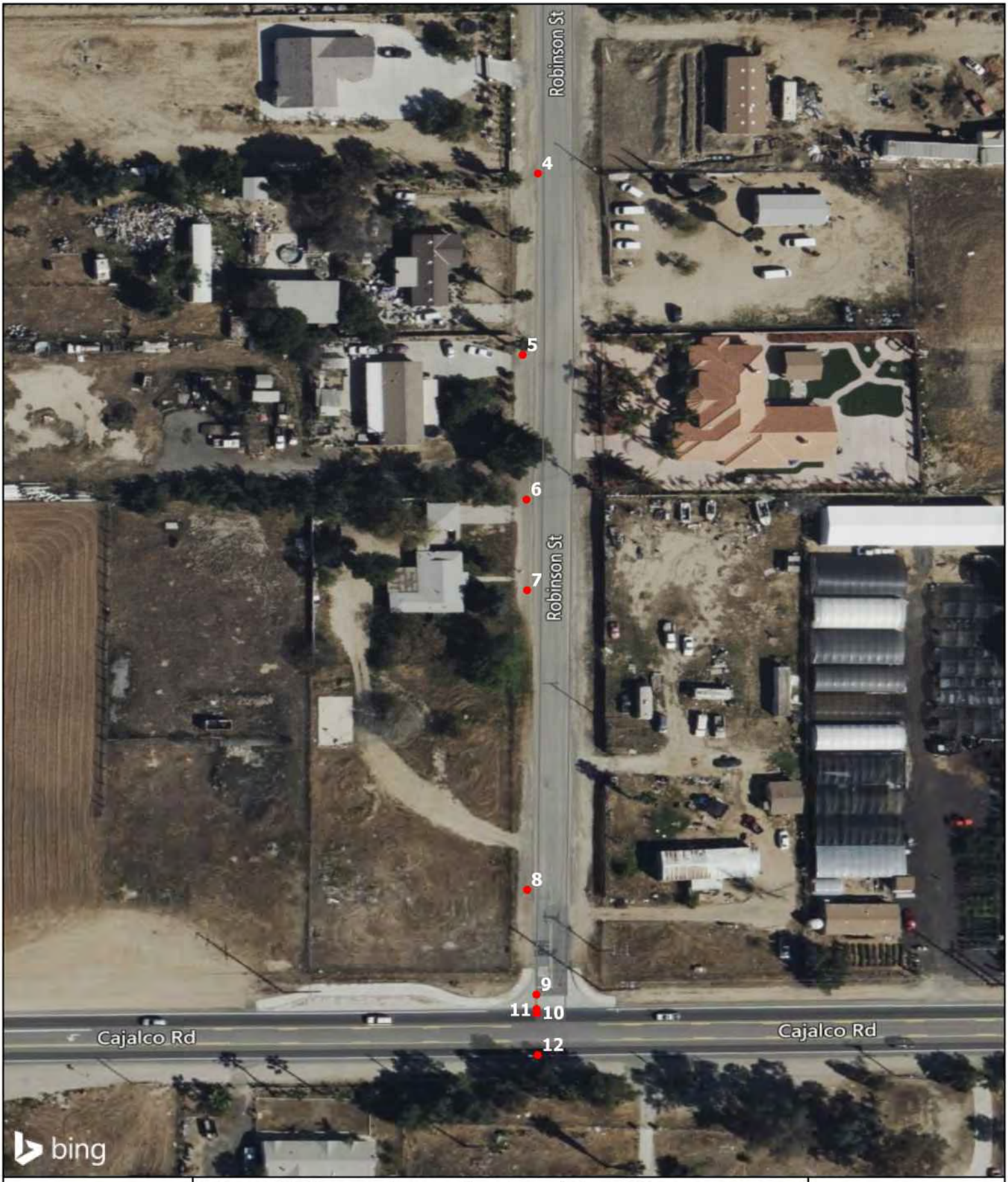
23-052 PS

Coordinate System: GCS WGS 1984

N

0 70 140

US Feet



SUBSURFACE UTILITY LOCATING

Mead Valley Cajalco Corridor Water System Imps., Perris

Pothole Location Map 2

23-052 PS

Coordinate System: GCS WGS 1984

N

0 70 140

US Feet

AIRX
SUBSURFACE UTILITY LOCATING

Mead Valley Cajalco Corridor Water System Imps., Perris

Pothole Location Map 3

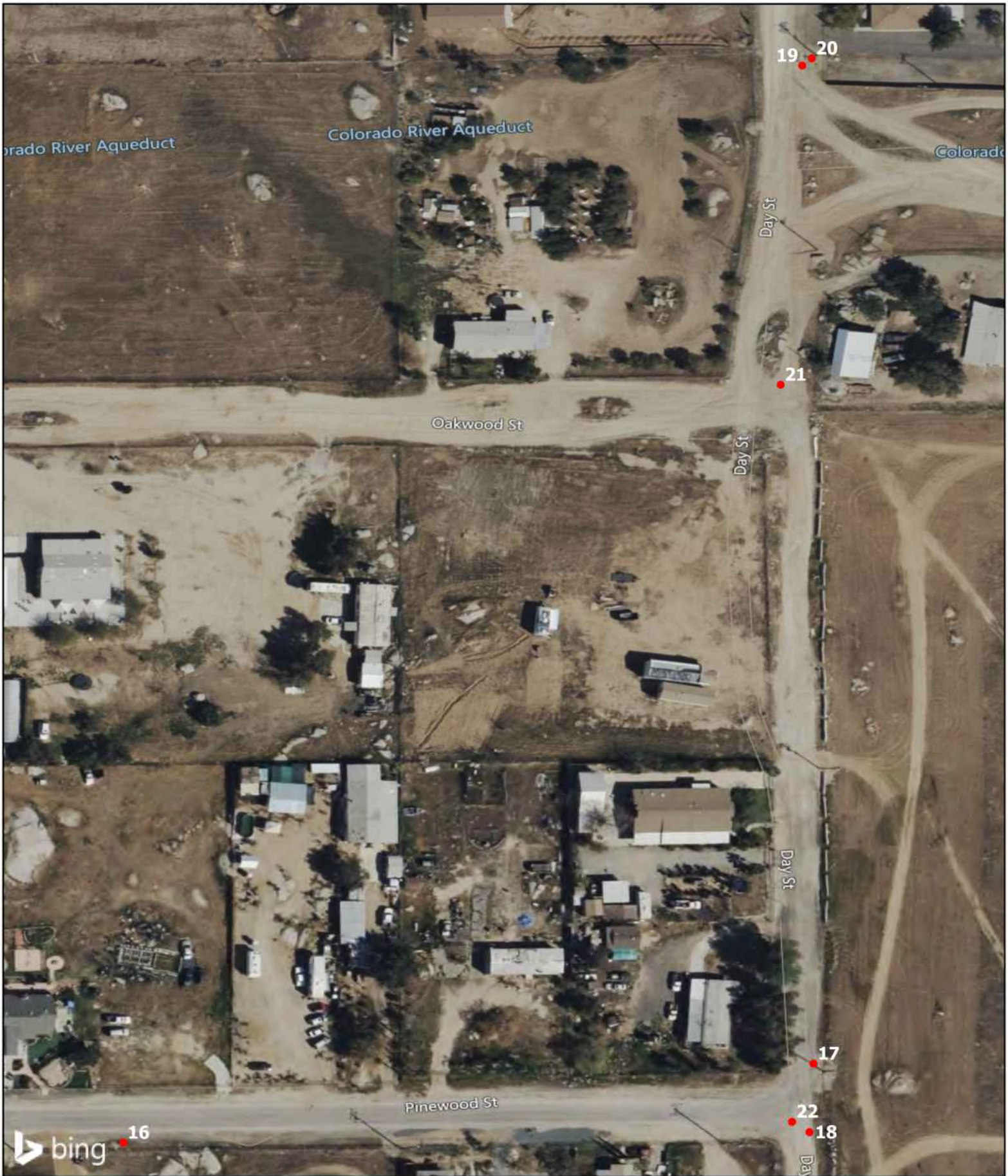
23-052 PS

Coordinate System: GCS WGS 1984

N

0 105 210

US Feet



AIRX
SUBSURFACE UTILITY LOCATING

Mead Valley Cajalco Corridor Water System Imps., Perris

Pothole Location Map 4

23-052 PS

Coordinate System: GCS WGS 1984

N

0 80 160

US Feet

Pothole Tabulation Report

POTHOLE TABULATION REPORT: Mead Valley Cajalco Corridor Water System Imps., Perris

Pothole Number	Date	Street	Pavement Thickness	Utility Type	Utility Size & Material	Soil Type	Depth-Ground to Top of Utility	Depth-Ground to Top of Package/ Encasement	Depth-Ground to Bottom of Package/ Encasement	Total Depth Excavated	Utility Orientation	Pothole Project Area Map #	Pothole Location Map #	Description & Location	Notes
1	05/08/2023	Robinson St	Asphalt - 5.0″ Concrete - N/A Base - 78.0″ Total - 83.0″	Water	6.0″ ACP	Slurry	87.0″ T/P	N/A	N/A	95.0″	N/S	1	1	Pothole 1 is located in the south-bound lane of Robinson St. Please refer to Location Map 1 for the approximate location of Pothole 1.	
2	05/08/2023	Robinson St	Asphalt - 5.0″ Concrete - N/A Base - N/A Total - 5.0″	Telecom Water (Not Found)	(2) 1.0″ Direct Bury N/A	Slurry	15.0″ T/P N/A	N/A N/A	N/A N/A	82.0″	SW & E N/A	1	1	Pothole 2 is located in the south-bound lane of Robinson St. Please refer to Location Map 1 for the approximate location of Pothole 2.	Uncovered tracer wire was found at 38.0 inches deep.
3	05/08/2023	Robinson St	Asphalt - N/A Concrete - N/A Base - N/A Total - N/A	Clearance Hole	N/A	Slurry	N/A	N/A	N/A	48.0″	N/A	1	1	Pothole 3 is located in the south-bound lane of Robinson St. Please refer to Location Map 1 for the approximate location of Pothole 3.	
4	05/08/2023	Robinson St	Asphalt - 5.0″ Concrete - N/A Base - N/A Total - 5.0″	Clearance Hole	N/A	Slurry	N/A	N/A	N/A	48.0″	N/A	1	2	Pothole 4 is located in the south-bound lane of Robinson St. Please refer to Location Map 2 for the approximate location of Pothole 4.	
5	05/08/2023	Robinson St	Asphalt - 3.0″ Concrete - N/A Base - N/A Total - 3.0″	Gas	2.0″ Steel	Subgrade	30.0″ T/P	N/A	N/A	40.0″	N/S	1	2	Pothole 5 is located west of Robinson St. Please refer to Location Map 2 for the approximate location of Pothole 5.	
6	05/08/2023	Robinson St	Asphalt - 2.0″ Concrete - N/A Base - N/A Total - 2.0″	Clearance Hole	N/A	Slurry	N/A	N/A	N/A	48.0″	N/A	1	2	Pothole 6 is located west of Robinson St. Please refer to Location Map 2 for the approximate location of Pothole 6.	
7	05/08/2023	Robinson St	Asphalt - N/A Concrete - N/A Base - N/A Total - N/A	Clearance Hole	N/A	Slurry	N/A	N/A	N/A	48.0″	N/A	1	2	Pothole 7 is located west of Robinson St. Please refer to Location Map 2 for the approximate location of Pothole 7.	Excavated 48.0 inches deep, and 4.0 inches wide.
8	05/08/2023	Robinson St	Asphalt - N/A Concrete - N/A Base - N/A Total - N/A	Gas	2.0″ Steel	Subgrade	44.0″ T/P	N/A	N/A	50.0″	N/S	1	2	Pothole 8 is located west of Robinson St. Please refer to Location Map 2 for the approximate location of Pothole 8.	
9	05/12/2023	Intersection of Robinson St & Cajalco Rd	Asphalt - 7.0″ Concrete - N/A Base - 8.0″ Total - 15.0″	Sanitary Sewer	6.0″ Plastic	Subgrade	55.0″ T/P	N/A	N/A	68.0″	W/E	1	2	Pothole 9 is located in the intersection of Robinson St & Cajalco Rd. Please refer to Location Map 2 for the approximate location of Pothole 9.	Tracer wire was present.
10	05/12/2023	Intersection of Robinson St & Cajalco Rd	Asphalt - 3.0″ Concrete - N/A Base - 10.0″ Total - 13.0″	HP Gas	6.0″ Plastic	Subgrade	56.0″ T/P	N/A	N/A	61.0″	W/E	1	2	Pothole 10 is located in the intersection of Robinson St & Cajalco Rd. Please refer to Location Map 2 for the approximate location of Pothole 10.	SoCal Gas was on Standby.
11	05/12/2023	Intersection of Robinson St & Cajalco Rd	Asphalt - 8.0″ Concrete - N/A Base - 10.0″ Total - 18.0″	Gas	4.0″ Steel	Subgrade	43.0″ T/P	N/A	N/A	50.0″	W/E	1	2	Pothole 11 is located in the intersection of Robinson St & Cajalco Rd. Please refer to Location Map 2 for the approximate location of Pothole 11.	SoCal Gas was on Standby.
12	05/12/2023	Intersection of Robinson St & Cajalco Rd	Asphalt - 5.0″ Concrete - N/A Base - 4.0″ Total - 9.0″	Water	18.0″ Concrete	Subgrade	56.0″ T/P	N/A	N/A	64.0″		1	2	Pothole 12 is located in the intersection of Robinson St & Cajalco Rd. Please refer to Location Map 2 for the approximate location of Pothole 12.	
13	05/08/2023	Oakwood St	Asphalt - 4.0″ Concrete - N/A Base - 10.0″ Total - 14.0″	Water	12.0″ Steel	Subgrade	36.0″ T/P	N/A	N/A	36.0″	W&SE	1	3	Pothole 13 is located in the east-bound lane of Oakwood St. Please refer to Location Map 3 for the approximate location of Pothole 13.	
14	05/08/2023	Oakwood St	Asphalt - 4.0″ Concrete - N/A Base - 10.0″ Total - 14.0″	Water Service Water Service	1.0″ PVC 1.0″ Copper	Subgrade	55.0″ T/P 55.0″ T/P	N/A N/A	N/A N/A	60.0″	N/S N/S	1	3	Pothole 14 is located in the east-bound lane of Oakwood St. Please refer to Location Map 3 for the approximate location of Pothole 14.	
14A	05/08/2023	Oakwood St	Asphalt - N/A Concrete - N/A Base - N/A Total - N/A	Water Service	1.0″ Copper	Subgrade	47.0″ T/P	N/A	N/A	60.0″	N/S	1	3	Pothole 14A is located south of Oakwood St. Please refer to Location Map 3 for the approximate location of Pothole 14A.	

POTHOLE TABULATION REPORT: Mead Valley Cajalco Corridor Water System Imps., Perris

Pothole Number	Date	Street	Pavement Thickness	Utility Type	Utility Size & Material	Soil Type	Depth-Ground to Top of Utility	Depth-Ground to Top of Package/ Encasement	Depth-Ground to Bottom of Package/ Encasement	Total Depth Excavated	Utility Orientation	Pothole Project Area Map #	Pothole Location Map #	Description & Location	Notes
15	05/08/2023	Carroll St	Asphalt - N/A Concrete - N/A Base - N/A Total - N/A	Water	4.0″ Concrete	Subgrade	26.0″ T/P	N/A	N/A	26.0″	W&S	1	3	Pothole 15 is located west of Carroll St. Please refer to Location Map 3 for the approximate location of Pothole 15.	
16	05/08/2023	Pinewood St	Asphalt - N/A Concrete - N/A Base - N/A Total - N/A	Water	6.0″ Plastic	Subgrade	47.0″ T/P	N/A	N/A	60.0″	W/E	1	4	Pothole 16 is located south of Pinewood St. Please refer to Location Map 4 for the approximate location of Pothole 16.	
17	05/08/2023	Day St	Asphalt - N/A Concrete - N/A Base - N/A Total - N/A	Water	8.0″ Steel	Subgrade	33.0″ T/P	N/A	N/A	33.0″	S&E	1	4	Pothole 17 is located east of Day St. Please refer to Location Map 4 for the approximate location of Pothole 17.	Yellow caution tape was found in the pothole.
18	05/08/2023	Intersection of Pinewood St & Day St	Asphalt - N/A Concrete - N/A Base - N/A Total - N/A	Water	8.0″ Concrete	Subgrade	44.0″ T/P	N/A	N/A	44.0″	N/S	1	4	Pothole 18 is located in the intersection of Pinewood St & Day St. Please refer to Location Map 4 for the approximate location of Pothole 18.	
19	05/08/2023	Day St	Asphalt - N/A Concrete - N/A Base - N/A Total - N/A	Water	8.0″ Steel	Subgrade	58.0″ T/P	N/A	N/A	72.0″	N&W	1	4	Pothole 19 is located east of Day St. Please refer to Location Map 4 for the approximate location of Pothole 19.	8.0 inches wide water pipe was connected by water valve to a 2.0 inches wide water pipe.
20	05/08/2023	Day St	Asphalt - N/A Concrete - N/A Base - N/A Total - N/A	Gas (Not Found)	N/A	Subgrade, Sand, Granite	N/A	N/A	N/A	84.0″	N/A	1	4	Pothole 20 is located east of Day St. Please refer to Location Map 4 for the approximate location of Pothole 20.	
21	05/08/2023	Intersection of Oakwood St & Day St	Asphalt - N/A Concrete - N/A Base - N/A Total - N/A	Telecom	1.0″ Direct Bury	Subgrade	30.0″ T/P	N/A	N/A	30.0″	WSW/ENE	1	4	Pothole 21 is located in the intersection of Oakwood St & Day St. Please refer to Location Map 4 for the approximate location of Pothole 21.	
22	05/12/2023	Intersection of Pinewood St & Day St	Asphalt - N/A Concrete - N/A Base - N/A Total - N/A	Gas	2.0″ Steel	Subgrade	33.0″ T/P	N/A	N/A	38.0″	N/S	1	4	Pothole 22 is located in the intersection of Pinewood St & Day St. Please refer to Location Map 4 for the approximate location of Pothole 22.	

Pothole Data Sheet(s)

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-052 PS
TEST HOLE NO:	1
DATE EXCAVATED:	05/08/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Water	6.0″ ACP	87.0″ T/P	N/A	N/A	N/S
2						
3						
4						

TOTAL DEPTH EXCAVATED: **95.0**″

PAVEMENT THICKNESS: **ASPHALT: 5.0″** **CONCRETE: N/A** **BASE: 78.0″**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Aquaphalt**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Slurry**

COMMENT:

AREA SHOT

Pothole 1 is located in the south-bound lane of Robinson St. Please refer to Location Map 1 for the approximate location of Pothole 1. The photo above was taken in front of Pothole 1 facing north.

DOWNHOLE VIEW

A downhole view of the 6.0 inch wide ACP Water utility found in Pothole 1, at the depth of 87.0 inches T/P. Utility runs in a N/S direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-052 PS
TEST HOLE NO:	2
DATE EXCAVATED:	05/08/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Telecom	(2) 1.0″ Direct Bury	15.0″ T/P	N/A	N/A	SW&E
2	Water (Not Found)	N/A	N/A	N/A	N/A	N/A
3						
4						

TOTAL DEPTH EXCAVATED: **82.0**”

PAVEMENT THICKNESS: **ASPHALT: 5.0″** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Aquaphalt**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**Yes**
MARKOUT LOCATION CORRECT:	**No**	PIPE COVER MATERIAL:	**Slurry**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Slurry**

COMMENT:
Uncovered tracer wire was found at 38.0 inches deep.

AREA SHOT

Pothole 2 is located in the south-bound lane of Robinson St. Please refer to Location Map 1 for the approximate location of Pothole 2. The photo above was taken in front of Pothole 2 facing east.

DOWNHOLE VIEW

A downhole view of the two 1.0 inch wide Direct Bury Telecom utility found in Pothole 2, at the depth of 15.0 inches T/P. Utility runs in a SW&E direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-052 PS
TEST HOLE NO:	3
DATE EXCAVATED:	05/08/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Clearance Hole	N/A	N/A	N/A	N/A	N/A
2						
3						
4						

TOTAL DEPTH EXCAVATED: **48.0**”

PAVEMENT THICKNESS: **ASPHALT: N/A** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Aquaphalt**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**No**	PIPE COVER MATERIAL:	**N/A**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Slurry**

COMMENT:

AREA SHOT

Pothole 3 is located in the south-bound lane of Robinson St. Please refer to Location Map 1 for the approximate location of Pothole 3. The photo above was taken in front of Pothole 3 facing north.

DOWNHOLE VIEW

A downhole view of the excavation to 48.0 inches deep. Utilities were not found in the Pothole.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-052 PS
TEST HOLE NO:	4
DATE EXCAVATED:	05/08/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Clearance Hole	N/A	N/A	N/A	N/A	N/A
2						
3						
4						

TOTAL DEPTH EXCAVATED: **48.0**”

PAVEMENT THICKNESS: **ASPHALT: 5.0″** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Aquaphalt**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**No**	PIPE COVER MATERIAL:	**N/A**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Slurry**

COMMENT:

AREA SHOT

Pothole 4 is located in the south-bound lane of Robinson St. Please refer to Location Map 2 for the approximate location of Pothole 4. The photo above was taken in front of Pothole 4 facing south.

DOWNHOLE VIEW

A downhole view of the excavation to 48.0 inches deep. Utilities were not found in the Pothole.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-052 PS
TEST HOLE NO:	5
DATE EXCAVATED:	05/08/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Gas	2.0″ Steel	30.0″ T/P	N/A	N/A	N/S
2						
3						
4						

TOTAL DEPTH EXCAVATED: **40.0**”

PAVEMENT THICKNESS: **ASPHALT: 3.0″** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

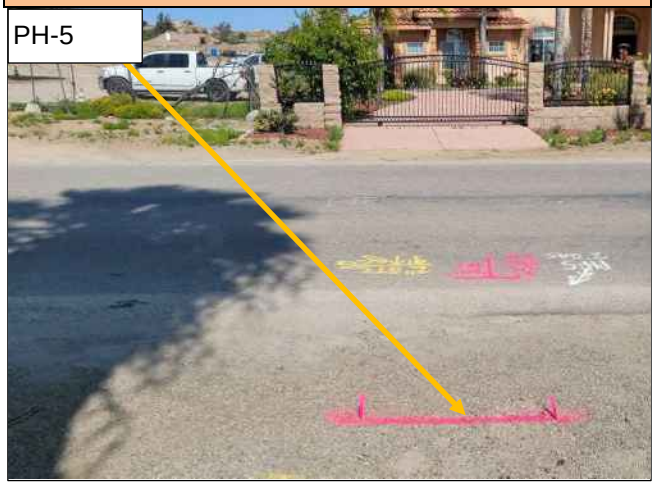
IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Class II Base**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT



Pothole 5 is located west of Robinson St. Please refer to Location Map 2 for the approximate location of Pothole 5. The photo above was taken in front of Pothole 5 facing east.

DOWNHOLE VIEW

A downhole view of the 2.0 inch wide Steel Gas utility found in Pothole 5, at the depth of 30.0 inches T/P. Utility runs in a N/S direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-052 PS
TEST HOLE NO:	6
DATE EXCAVATED:	05/08/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Clearance Hole	N/A	N/A	N/A	N/A	N/A
2						
3						
4						

TOTAL DEPTH EXCAVATED: **48.0**”

PAVEMENT THICKNESS: **ASPHALT: 2.0″** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Class II Base**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**No**	PIPE COVER MATERIAL:	**N/A**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Slurry**

COMMENT:

AREA SHOT

Pothole 6 is located west of Robinson St. Please refer to Location Map 2 for the approximate location of Pothole 6. The photo above was taken in front of Pothole 6 facing south.

DOWNHOLE VIEW

A downhole view of the excavation to 48.0 inches deep. Utilities were not found in the Pothole.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-052 PS
TEST HOLE NO:	7
DATE EXCAVATED:	05/08/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Clearance Hole	N/A	N/A	N/A	N/A	N/A
2						
3						
4						

TOTAL DEPTH EXCAVATED: **48.0**”

PAVEMENT THICKNESS: **ASPHALT: N/A** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Class II Base**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**No**	PIPE COVER MATERIAL:	**N/A**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Slurry**

COMMENT:
Excavated 48.0 inches deep, and 4.0 inches wide.

AREA SHOT

Pothole 7 is located west of Robinson St. Please refer to Location Map 2 for the approximate location of Pothole 7. The photo above was taken in front of Pothole 7 facing NNE.

DOWNHOLE VIEW

A downhole view of the excavation to 48.0 inches deep. Utilities were not found in the Pothole.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-052 PS
TEST HOLE NO:	8
DATE EXCAVATED:	05/08/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Gas	2.0″ Steel	44.0″ T/P	N/A	N/A	N/S
2						
3						
4						

TOTAL DEPTH EXCAVATED: **50.0**”

PAVEMENT THICKNESS: **ASPHALT: N/A** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Class II Base**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT

Pothole 8 is located west of Robinson St. Please refer to Location Map 2 for the approximate location of Pothole 8. The photo above was taken in front of Pothole 8 facing south.

DOWNHOLE VIEW

A downhole view of the 2.0 inch wide Steel Gas utility found in Pothole 8, at the depth of 44.0 inches T/P. Utility runs in a N/S direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-052 PS
TEST HOLE NO:	9
DATE EXCAVATED:	05/12/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Sanitary Sewer	6.0″ Plastic	55.0″ T/P	N/A	N/A	W/E
2						
3						
4						

TOTAL DEPTH EXCAVATED: **68.0**″

PAVEMENT THICKNESS: **ASPHALT: 7.0″** **CONCRETE: N/A** **BASE: 8.0″**

STANDBY REQUIRED: **N/A**

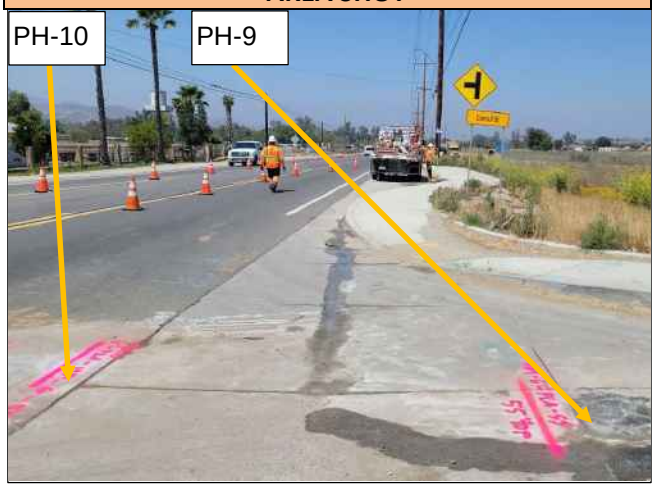
IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Utilibond**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**Yes**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT



Pothole 9 is located in the intersection of Robinson St & Cajalco Rd. Please refer to Location Map 2 for the approximate location of Pothole 9. The photo above was taken in front of Pothole 9 and Pothole 10 facing west.

DOWNHOLE VIEW

A downhole view of the 6.0 inch wide Plastic Sanitary Sewer utility found in Pothole 9, at the depth of 55.0 inches T/P. Utility runs in a W/E direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-052 PS
TEST HOLE NO:	10
DATE EXCAVATED:	05/12/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	HP Gas	6.0″ Plastic	56.0″ T/P	N/A	N/A	W/E
2						
3						
4						

TOTAL DEPTH EXCAVATED: **61.0**″

PAVEMENT THICKNESS: **ASPHALT: 3.0″** **CONCRETE: N/A** **BASE: 10.0″**

STANDBY REQUIRED: **SoCal Gas**

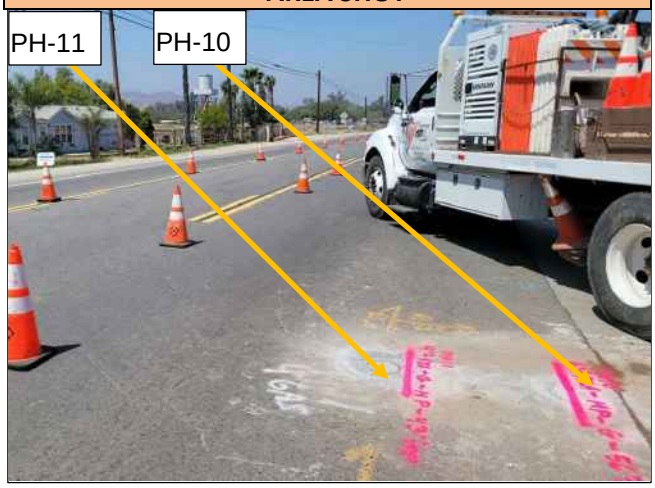
IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Utilibond**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT



Pothole 10 is located in the intersection of Robinson St & Cajalco Rd. Please refer to Location Map 2 for the approximate location of Pothole 10. The photo above was taken in front of Pothole 10 and Pothole 11 facing west.

DOWNHOLE VIEW

A downhole view of the 6.0 inch wide Plastic HP Gas utility found in Pothole 10, at the depth of 56.0 inches T/P. Utility runs in a W/E direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-052 PS
TEST HOLE NO:	11
DATE EXCAVATED:	05/12/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Gas	4.0″ Steel	43.0″ T/P	N/A	N/A	W/E
2						
3						
4						

TOTAL DEPTH EXCAVATED: **50.0**”

PAVEMENT THICKNESS: **ASPHALT: 8.0″** **CONCRETE: N/A** **BASE: 10.0″**

STANDBY REQUIRED: **SoCal Gas**

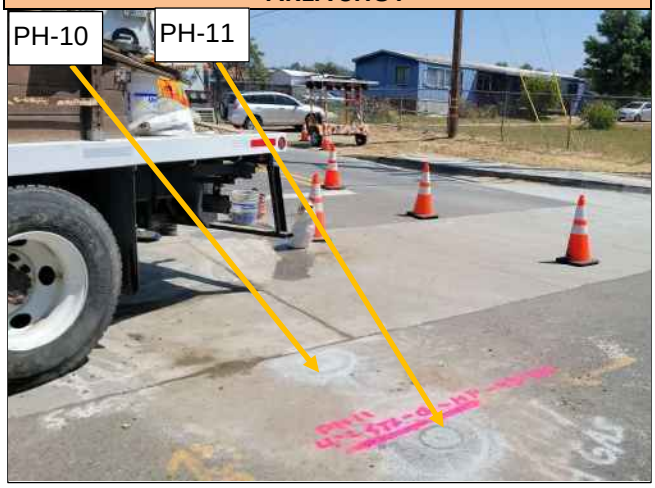
IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Utilibond**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT



Pothole 11 is located in the intersection of Robinson St & Cajalco Rd. Please refer to Location Map 2 for the approximate location of Pothole 11. The photo above was taken in front of Pothole 11 and Pothole 10 facing NE.

DOWNHOLE VIEW

A downhole view of the 4.0 inch wide Steel Gas utility found in Pothole 11, at the depth of 43.0 inches T/P. Utility runs in a W/E direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-052 PS
TEST HOLE NO:	12
DATE EXCAVATED:	05/12/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Water	18.0″ Concrete	56.0″ T/P	N/A	N/A	W/E
2						
3						
4						

TOTAL DEPTH EXCAVATED: **64.0**”

PAVEMENT THICKNESS: **ASPHALT: 5.0″** **CONCRETE: N/A** **BASE: 4.0″**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Utilibond**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT

Pothole 12 is located in the intersection of Robinson St & Cajalco Rd. Please refer to Location Map 2 for the approximate location of Pothole 12. The photo above was taken in front of Pothole 12 facing north.

DOWNHOLE VIEW

A downhole view of the 18.0 inch wide Concrete Water utility found in Pothole 12, at the depth of 56.0 inches T/P. Utility runs in a W/E direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-052 PS
TEST HOLE NO:	13
DATE EXCAVATED:	05/08/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Water	12.0″ Steel	36.0″ T/P	N/A	N/A	W&SE
2						
3						
4						

TOTAL DEPTH EXCAVATED: **36.0**”

PAVEMENT THICKNESS: **ASPHALT: 4.0″** **CONCRETE: N/A** **BASE: 10.0″**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Aquaphalt**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Black Wrap, Sand**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT

Pothole 13 is located in the east-bound lane of Oakwood St. Please refer to Location Map 3 for the approximate location of Pothole 13. The photo above was taken in front of Pothole 13 facing west.

DOWNHOLE VIEW

A downhole view of the 12.0 inch wide Steel Water utility found in Pothole 13, at the depth of 36.0 inches T/P. Utility runs in a W&SE direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-052 PS
TEST HOLE NO:	14
DATE EXCAVATED:	05/08/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Water Service	1.0″ PVC	55.0″ T/P	N/A	N/A	N/S
2	Water Service	1.0″ Copper	55.0″ T/P	N/A	N/A	N/S
3						
4						

TOTAL DEPTH EXCAVATED: **60.0**″

PAVEMENT THICKNESS: **ASPHALT: 4.0″** **CONCRETE: N/A** **BASE: 10.0″**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Aquaphalt**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT

Pothole 14 is located in the east-bound lane of Oakwood St. Please refer to Location Map 3 for the approximate location of Pothole 14. The photo above was taken in front of Pothole 14 facing west.

DOWNHOLE VIEW

A downhole view of the utilities found in Pothole 14 and their orientation at the pothole location: 1.0 inch PVC Water Service utility at the depth of 55.0 inches T/P and runs in a N/S direction; and 1.0 inch Copper Water Service utility at the depth of 55.0 inches T/P and runs in a N/S direction. Utilities were found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-052 PS
TEST HOLE NO:	14A
DATE EXCAVATED:	05/08/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Water Service	1.0″ Copper	47.0″ T/P	N/A	N/A	N/S
2						
3						
4						

TOTAL DEPTH EXCAVATED: **60.0**”

PAVEMENT THICKNESS: **ASPHALT: N/A** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Class II Base**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT

Pothole 14A is located south of Oakwood St. Please refer to Location Map 3 for the approximate location of Pothole 14A. The photo above was taken in front of Pothole 14A facing east.

DOWNHOLE VIEW

A downhole view of the 1.0 inch wide Copper Water Service utility found in Pothole 14A, at the depth of 47.0 inches T/P. Utility runs in a N/S direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-052 PS
TEST HOLE NO:	15
DATE EXCAVATED:	05/08/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Water	4.0″ Concrete	26.0″ T/P	N/A	N/A	W&S
2						
3						
4						

TOTAL DEPTH EXCAVATED: **26.0**”

PAVEMENT THICKNESS: **ASPHALT: N/A** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

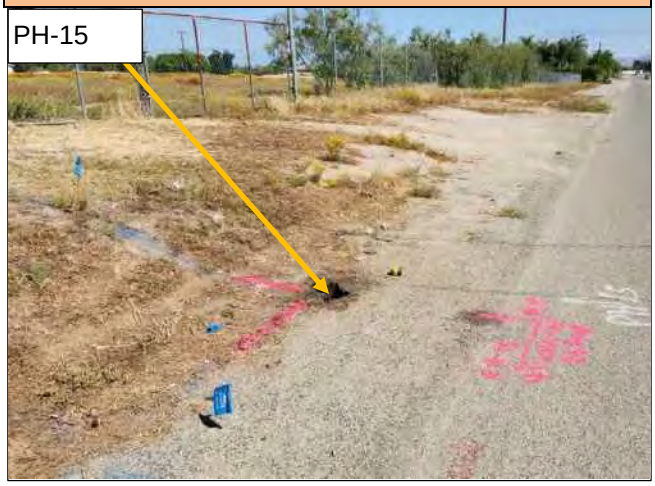
IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Class II Base**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT



Pothole 15 is located west of Carroll St. Please refer to Location Map 3 for the approximate location of Pothole 15. The photo above was taken in front of Pothole 15 facing north.

DOWNHOLE VIEW

A downhole view of the 4.0 inch wide Concrete Water utility found in Pothole 15, at the depth of 26.0 inches T/P. Utility runs in a W&S direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-052 PS
TEST HOLE NO:	16
DATE EXCAVATED:	05/08/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Water	6.0″ Plastic	47.0″ T/P	N/A	N/A	W/E
2						
3						
4						

TOTAL DEPTH EXCAVATED: **60.0**”

PAVEMENT THICKNESS: **ASPHALT: N/A** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Class II Base**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT

Pothole 16 is located south of Pinewood St. Please refer to Location Map 4 for the approximate location of Pothole 16. The photo above was taken in front of Pothole 16 facing south.

DOWNHOLE VIEW

A downhole view of the 6.0 inch wide Plastic Water utility found in Pothole 16, at the depth of 47.0 inches T/P. Utility runs in a W/E direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-052 PS
TEST HOLE NO:	17
DATE EXCAVATED:	05/08/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Water	8.0″ Steel	33.0″ T/P	N/A	N/A	S&E
2						
3						
4						

TOTAL DEPTH EXCAVATED: **33.0**”

PAVEMENT THICKNESS: **ASPHALT: N/A** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Class II Base**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:
Yellow caution tape was found in the pothole.

AREA SHOT

Pothole 17 is located east of Day St. Please refer to Location Map 4 for the approximate location of Pothole 17. The photo above was taken in front of Pothole 17 facing west.

DOWNHOLE VIEW

A downhole view of the 8.0 inch wide Steel Water utility found in Pothole 17, at the depth of 33.0 inches T/P. Utility runs in a S&E direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-052 PS
TEST HOLE NO:	18
DATE EXCAVATED:	05/08/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Water	8.0″ Concrete	44.0″ T/P	N/A	N/A	N/S
2						
3						
4						

TOTAL DEPTH EXCAVATED: **44.0**”

PAVEMENT THICKNESS: **ASPHALT: N/A** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

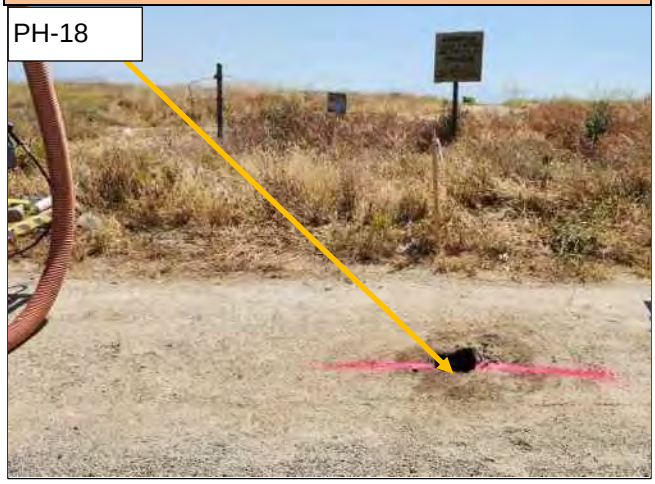
IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Class II Base**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT



Pothole 18 is located in the intersection of Pinewood St & Day St. Please refer to Location Map 4 for the approximate location of Pothole 18. The photo above was taken in front of Pothole 18 facing east.

DOWNHOLE VIEW

A downhole view of the 8.0 inch wide Concrete Water utility found in Pothole 18, at the depth of 44.0 inches T/P. Utility runs in a N/S direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-052 PS
TEST HOLE NO:	19
DATE EXCAVATED:	05/08/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Water	8.0″ Steel	58.0″ T/P	N/A	N/A	N&W
2						
3						
4						

TOTAL DEPTH EXCAVATED: **72.0**”

PAVEMENT THICKNESS: **ASPHALT: N/A** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Class II Base**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:
8.0 inches wide water pipe was connected by water valve to a 2.0 inches wide water pipe.

AREA SHOT

Pothole 19 is located east of Day St. Please refer to Location Map 4 for the approximate location of Pothole 19. The photo above was taken in front of Pothole 19 facing north.

DOWNHOLE VIEW

A downhole view of the 8.0 inch wide Steel Water utility found in Pothole 19, at the depth of 58.0 inches T/P. Utility runs in a N&W direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-052 PS
TEST HOLE NO:	20
DATE EXCAVATED:	05/08/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Gas (Not Found)	N/A	N/A	N/A	N/A	N/A
2						
3						
4						

TOTAL DEPTH EXCAVATED: **84.0**”

PAVEMENT THICKNESS: **ASPHALT: N/A** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Class II Base**

TARGET UTILITY MARKED BY USA: **Yes**
MARKOUT LOCATION CORRECT: **No**
UTILITY SHOWN ON PLAN: **Yes**
TRACER WIRE FOUND: **No**
PIPE COVER MATERIAL: **N/A**
OVERBURDEN MATERIAL: **Subgrade, Sand, Granite**

COMMENT:

AREA SHOT

Pothole 20 is located east of Day St. Please refer to Location Map 4 for the approximate location of Pothole 20. The photo above was taken in front of Pothole 20 facing west.

DOWNHOLE VIEW

A downhole view of the excavation to 84.0 inches deep. Utilities were not found in the Pothole.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-052 PS
TEST HOLE NO:	21
DATE EXCAVATED:	05/08/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Telecom	1.0″ Direct Bury	30.0″ T/P	N/A	N/A	WSW/ENE
2						
3						
4						

TOTAL DEPTH EXCAVATED: **30.0**”

PAVEMENT THICKNESS: **ASPHALT: N/A** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Class II Base**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT

Pothole 21 is located in the intersection of Oakwood St & Day St. Please refer to Location Map 4 for the approximate location of Pothole 21. The photo above was taken in front of Pothole 21 facing west.

DOWNHOLE VIEW

A downhole view of the 1.0 inch wide Direct Bury Telecom utility found in Pothole 21, at the depth of 30.0 inches T/P. Utility runs in a WSW/ENE direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-052 PS
TEST HOLE NO:	22
DATE EXCAVATED:	05/12/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Gas	2.0″ Steel	33.0″ T/P	N/A	N/A	N/S
2						
3						
4						

TOTAL DEPTH EXCAVATED: **38.0**”

PAVEMENT THICKNESS: **ASPHALT: N/A** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Class II Base**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT

Pothole 22 is located in the intersection of Pinewood St & Day St. Please refer to Location Map 4 for the approximate location of Pothole 22. The photo above was taken in front of Pothole 22 facing north.

DOWNHOLE VIEW

A downhole view of the 2.0 inch wide Steel Gas utility found in Pothole 22, at the depth of 33.0 inches T/P. Utility runs in a N/S direction at the Pothole location and was found directly on markout.

Permit(s)

SIGN LEGEND

C9A(CA) C12(CA) C20(CA)L C20(CA)R C27(CA) C30(CA) C30(BK) C30A(CA) G20-2 M4-8A M4-10(R/L) R1-1 R3-1 R3-2 R3-4

R3-5(R/L) R3-6(R/L) R3-7(R/L) R4-7A R4-8A R4-11 R9-3 R9-9 R9-11(R/L) R9-11a(R/L) R11-2 R11-4 SC3(CA) W1-4(R/L) W1-6(R/L)

W3-4 W4-2(R/L) W8-24 W11-1 W16-1P W20-1 W20-2 W20-3 W20-4 W20-5(L) W20-5(R) W20-5(BK) W21-5 W21-5b(R/L) Flagger Paddle

WATCH - Work Area Traffic Control Handbook / California MUTCD **Minimum Recommended Channelizing Device and Sign Spacing**

APPROACH SPEED (MPH)	MINIMUM DISTANCE (FEET) BETWEEN SIGNS AND FROM LAST SIGN TO TAPER	MINIMUM TAPER LENGTHS (L) (FEET) FOR 12-FOOT LANE			BUFFER LENGTH (FEET)	MAX CONE SPACING		
		L	1/2L	1/3L		TAPER	TANGENT	CONFLICT
25	100	125	63	42	158	25	50	12
30	250	180	90	60	205	30	60	15
35	250	245	123	82	257	35	70	17
40	250	320	160	107	315	40	80	20
45	350	540	270	180	378	45	90	22
50	350	600	300	200	446	50	100	25
55	500	660	330	220	520	50	100	25

LEGEND

- TRAFFIC CONE / DELINEATOR
- TRAFFIC CONTROL SIGN
- TRAFFIC CONTROL BARRICADE
- APPROXIMATE POTHOLE LOCATION
- FLAGGER
- SIGNALIZED INTERSECTION
- FAS - FLASHING ARROW SIGN
- WORK ZONE
- BUS STOP

REGISTERED PROFESSIONAL ENGINEER
IVAN R. FOX
No. C 38144
Exp. 03/31/25
CIVIL
STATE OF CALIFORNIA

JENN HARRIS
President & CEO
785 E Mission Rd, Unit 100
San Marcos, CA 92069
619-710-3124
jharris@airxus.com
www.airxutility.com

PROJECT NAME: Mead Valley & Good Hope Water Improvements

AIRX JOB#: 23-052IE

THOMAS GRID#: 777-A2, A3

TYPE OF WORK: Potholing

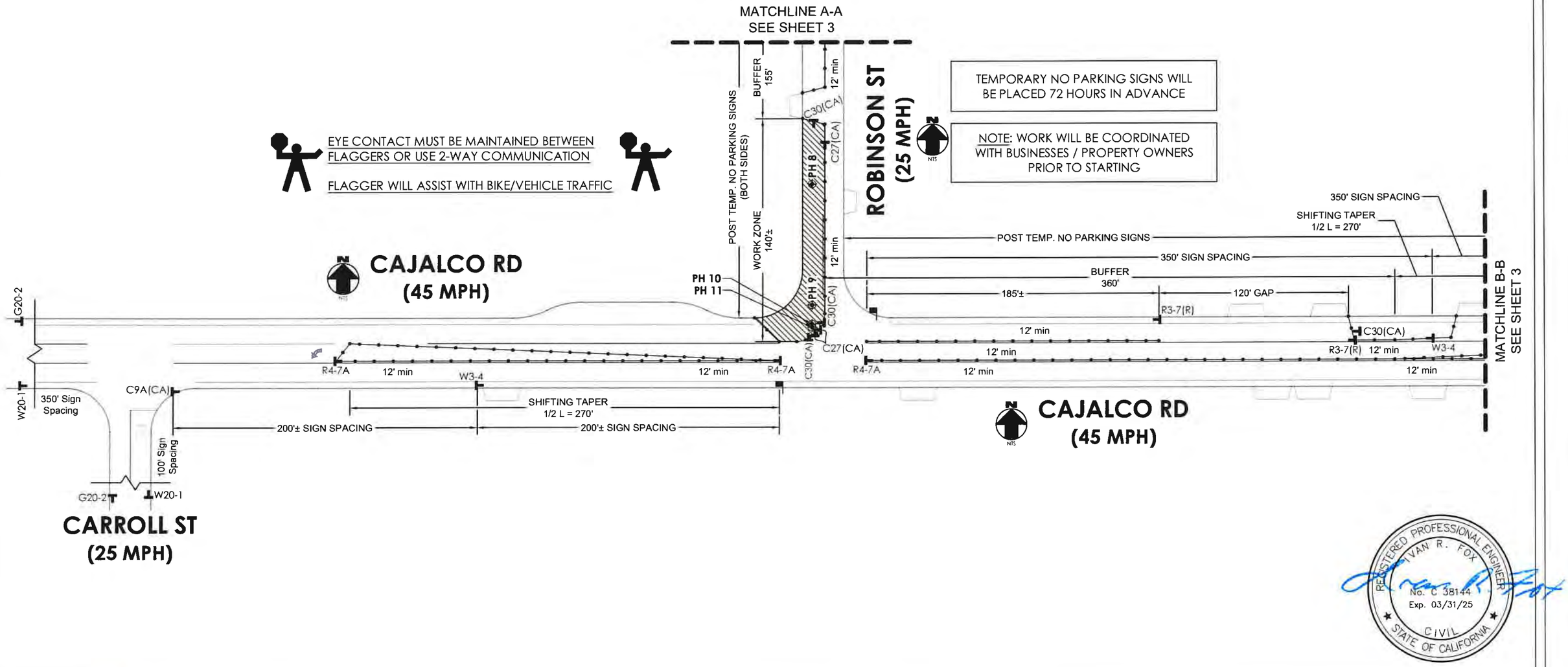
DRAWN FOR: Riverside County

NOTES:

DATE: 4/28/2023

DESIGNED BY: Otman Mouden

Potholes 8 - 11:



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PROJECT NAME: Mead Valley & Good Hope Water Improvements

AIRX JOB#: 23-052IE

THOMAS GRID#: 777-A2, A3

TYPE OF WORK: Potholing

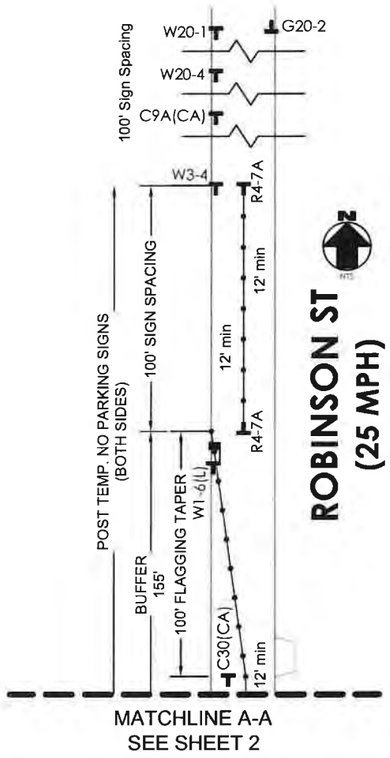
DRAWN FOR: Riverside County

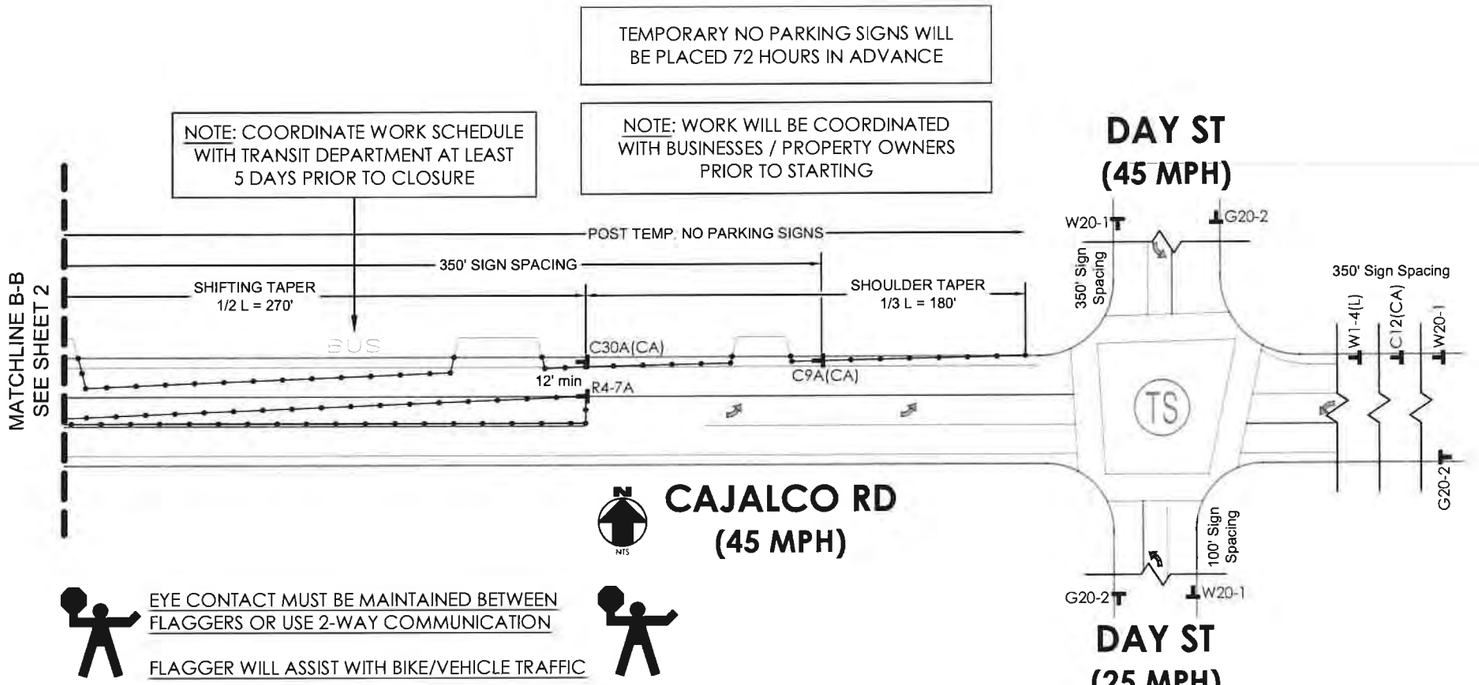
NOTES:

DATE: 4/28/2023

DESIGNED BY: Otman Mouden

Potholes 8 - 11: (Con't)





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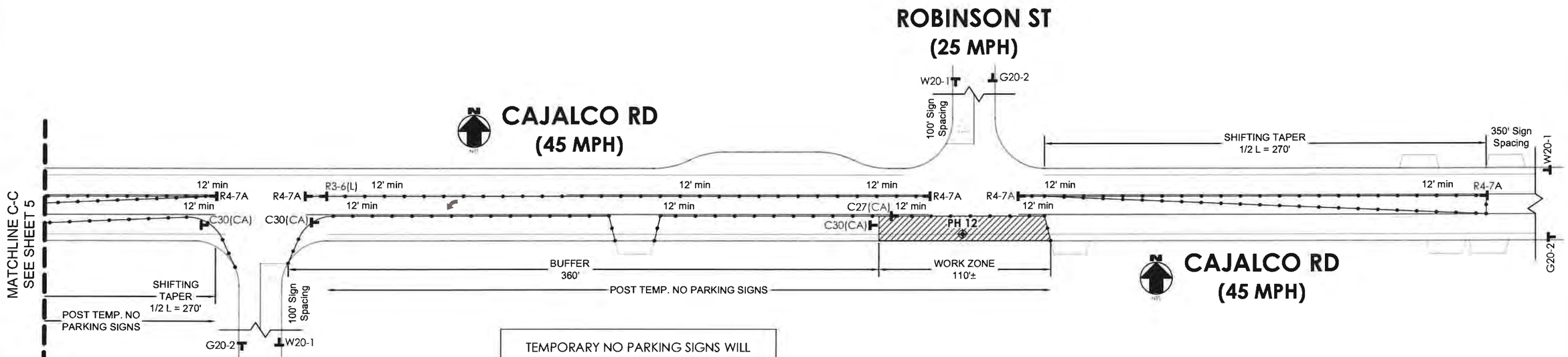
Pothole 12:



TEMPORARY NO PARKING SIGNS WILL BE PLACED 72 HOURS IN ADVANCE

NOTE: WORK WILL BE COORDINATED WITH BUSINESSES / PROPERTY OWNERS PRIOR TO STARTING

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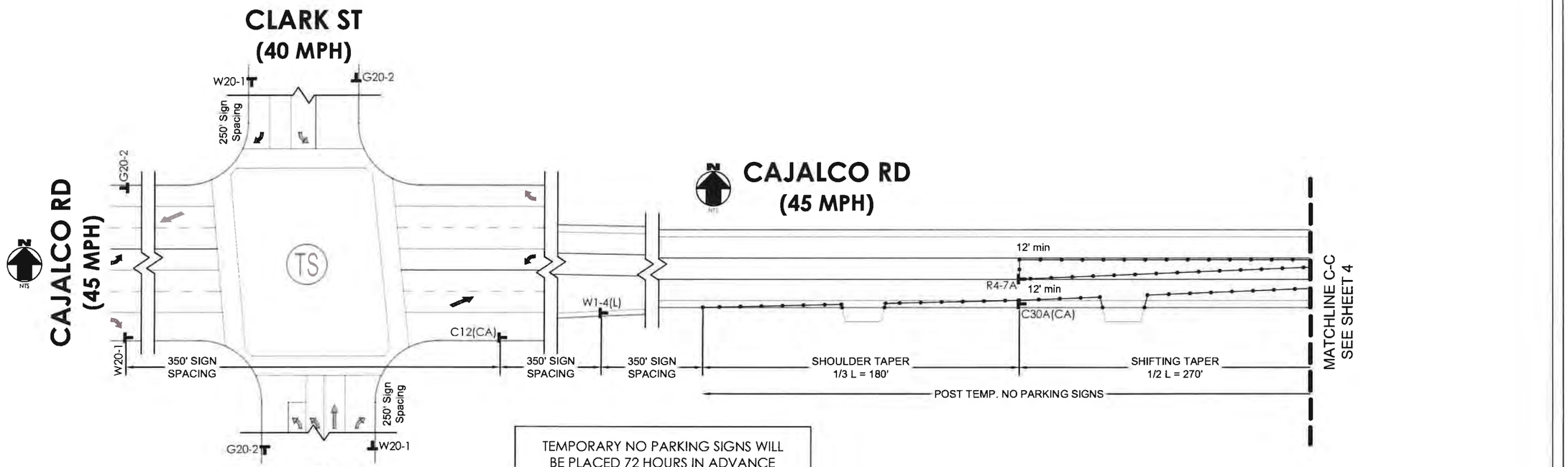

TEMPORARY NO PARKING SIGNS WILL BE PLACED 72 HOURS IN ADVANCE

NOTE: WORK WILL BE COORDINATED WITH BUSINESSES / PROPERTY OWNERS PRIOR TO STARTING

REGISTERED PROFESSIONAL ENGINEER
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TYPE OF WORK: Potholing

DRAWN FOR: Riverside County

NOTES:

DATE: 4/28/2023

DESIGNED BY: Otman Mouden

SHEET 5 OF 5

May 20, 2023

PREPARED BY:

UTILITY SURVEYORS, INC.

AIRX Project #: 23-053 PS

Project Name: Good Hope Olive Area Water System Imps., Perris

Utility Locating and Potholing Area:
Main St, Sharp Rd, Club Dr and Eucalyptus Ave
Perris, CA

POTHOLING REPORT

785 East Mission Road Ste. 100 | San Marcos, CA 92069 | P.760.480.2347 | F.760.739.8034 | airxus.com

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1. Description of Pothole Procedures and Site-Specific Details
2. Pothole Project Map(s)
3. Pothole Location Map(s)
4. Pothole Tabulation Report
5. Pothole Data Sheet(s)
6. Permit(s)

Description of Pothole Procedures and Site Specific Details

DESCRIPTION OF POTHOLE PROCEDURES

AIRX Utility Surveyors performs a full range of specialized engineering services including Underground Utility Location and Vacuum Excavation (to verify depth and alignment of underground utilities).

Underground Utility Location employs sophisticated electronic locating devices to trace the route of an underground utility; then the route is marked on the surface with marking paint in paved areas, or with 60 penny nails and feathers in unpaved areas.

Vacuum excavation employs a vacuum truck in conjunction with high-pressure air or water to excavate material and expose an underground utility. An 8-inch diameter hole is first cored through the pavement so that the vacuum hose and high-pressure air or water hose can be inserted.

Utilities found during potholing are located on the surface by placing two reference points (typically 36" apart) on either side of the pothole along the centerline (or edge) of the utility, using paving nails or 60 penny nails as appropriate. Depth measurements (to the nearest ½ inch) are taken midway between the two reference points. Utility alignment, depth, and other data is marked with pink paint (on pavement), or on wood lath (unpaved areas).

SITE SPECIFIC DETAILS

AIRX was contracted by EMWD to perform utility locating and potholing services on Main St, Sharp Rd and Eucalyptus Ave in Perris, California. A total of 35 potholes were excavated to establish conflicts and connection points on a variety of utilities. The results of the data are contained in the attached spreadsheet and data sheets.

In preparation of these excavations, AIRX marked out the dig locations and called in for USA (Underground Service Alert). All traffic control plans and permits were drawn and applied for by AIRX and all traffic control was set up by AIRX.

All the excavations and discovery went without any incident. Any changes and adjustments are mentioned in the Pothole Tabulation Report and the Pothole Data Sheets. All the results were annotated on the ground and in this report. It is AIRX's recommendation that all pothole locations and the active mark out should be surveyed to aid in the adjustment of utilities on the final plan and profile.

At each pothole location, the utility alignment was marked with paint and feathers. AIRX used potable water acquired offsite for excavation and all water and material vacuumed was disposed of off-site. No water was allowed to flow into storm drains or natural drainages. The potholes were covered with clean backfill material and compacted to 95% density in 3" lifts. The pavement was patched with Utilibond. All field work was performed between May 9, 2023 and May 16, 2023.

Pothole Project Map(s)

AIRX
SUBSURFACE UTILITY LOCATING

Good Hope Olive Area Water System Imps., Perris

Pothole Project Map 1

23-053 PS

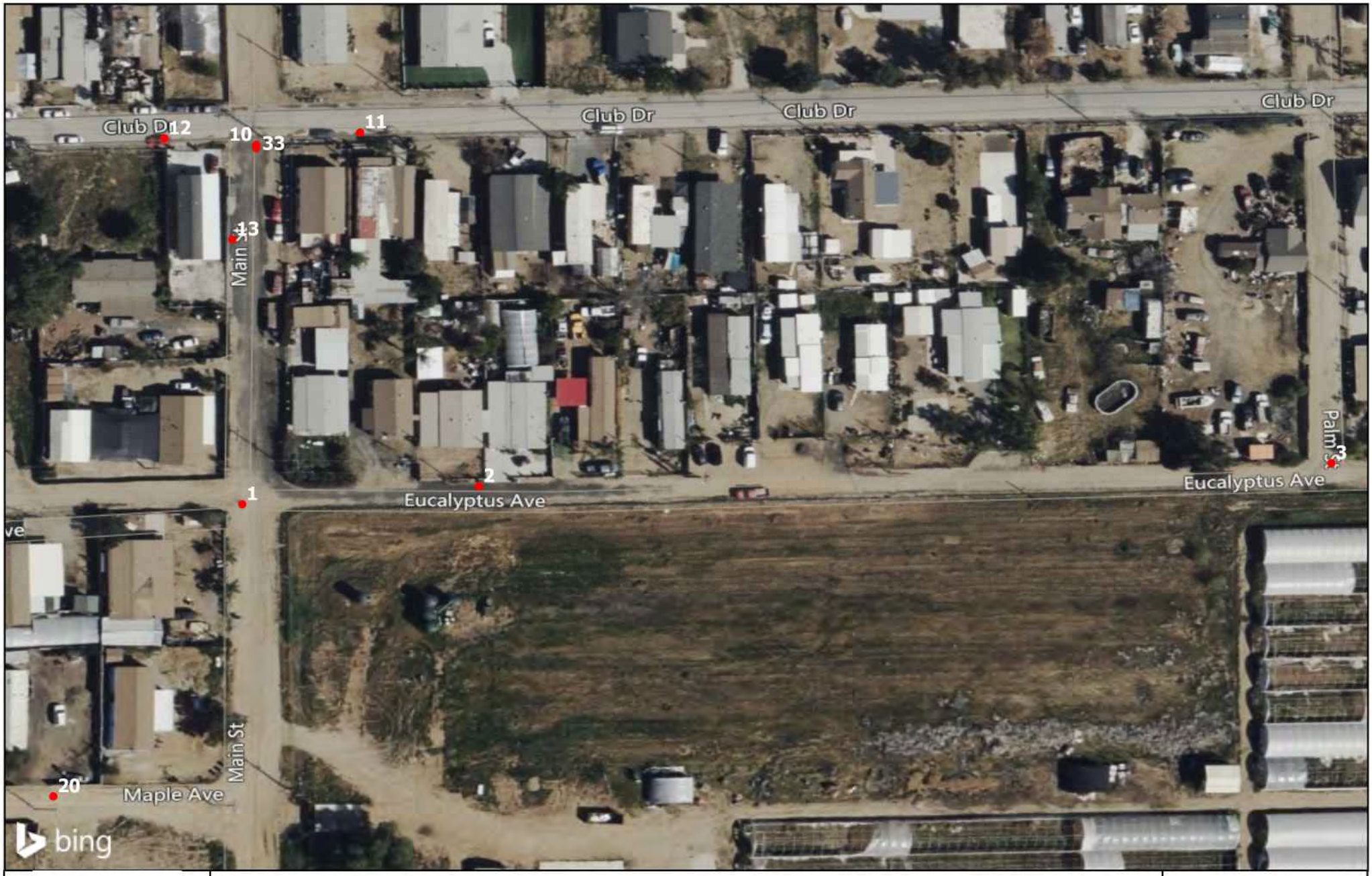
Coordinate System: NAD 1983 UTM Zone 11N

N

0 487.5 975

US Feet

Pothole Location Map(s)



SUBSURFACE UTILITY LOCATING

Good Hope Olive Area Water System Imps., Perris

Pothole Location Map 1

23-053 PS

Coordinate System: GCS WGS 1984

N

0 65 130

US Feet

SUBSURFACE UTILITY LOCATING

Good Hope Olive Area Water System Imps., Perris

Pothole Location Map 2

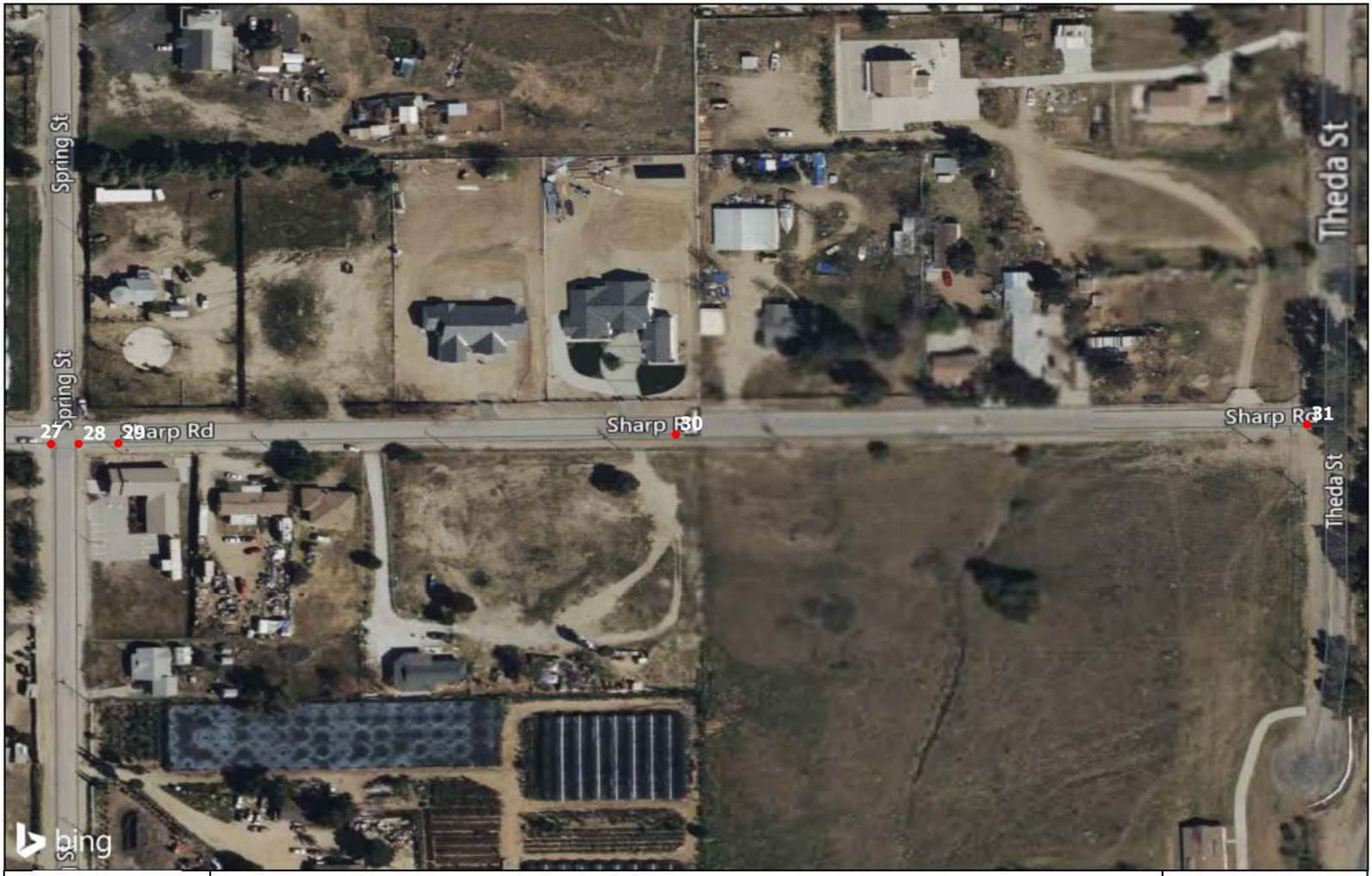
23-053 PS

Coordinate System: GCS WGS 1984

N

0 115 230

US Feet



AIRX
SUBSURFACE UTILITY LOCATING
Locating · Vacuum Excavation · CCTV · Traffic Control

Good Hope Olive Area Water System Imps., Perris

Pothole Location Map 3

23-053 PS

Coordinate System: GCS WGS 1984

N

0 115 230

US Feet

AIRX SUBSURFACE UTILITY LOCATING

Good Hope Olive Area Water System Imps., Perris

Pothole Location Map 4

23-053 PS

Coordinate System: GCS WGS 1984

N

0 60 120

US Feet

Pothole Tabulation Report

POTHOLE TABULATION REPORT: Good Hope Olive Area Water System Imps., Perris

Pothole Number	Date	Street	Pavement Thickness	Utility Type	Utility Size & Material	Soil Type	Depth-Ground to Top of Utility	Depth-Ground to Top of Package/ Encasement	Depth-Ground to Bottom of Package/ Encasement	Total Depth Excavated	Utility Orientation	Pothole Project Area Map #	Pothole Location Map #	Description & Location	Notes
1	05/09/2023	Intersection of Main St & Eucalyptus Ave	Asphalt - N/A Concrete - N/A Base - N/A Total - N/A	Gas	2.0″ Plastic	Clay, Slurry	40.0″ T/P	N/A	N/A	41.0″	N/S	1	1	Pothole 1 is located in the intersection of Main St & Eucalyptus Ave. Please refer to Location Map 1 for the approximate location of Pothole 1.	Tracer wire was present.
2	05/09/2023	Eucalyptus Ave	Asphalt - N/A Concrete - N/A Base - N/A Total - N/A	Gas	2.0″ Plastic	Subgrade	37.0″ T/P	N/A	N/A	45.0″	W/E	1	1	Pothole 2 is located north of Eucalyptus Ave. Please refer to Location Map 1 for the approximate location of Pothole 2.	
3	05/09/2023	Intersection of Eucalyptus Ave & Palm St	Asphalt - N/A Concrete - N/A Base - N/A Total - N/A	Gas	2.0″ Plastic	Subgrade	36.0″ T/P	N/A	N/A	40.0″	N&W	1	1	Pothole 3 is located in the intersection of Eucalyptus Ave & Palm St. Please refer to Location Map 1 for the approximate location of Pothole 3.	Tracer wire was present.
4	05/09/2023	Intersection of Eucalyptus Ave & Spring St	Asphalt - 4.0″ Concrete - N/A Base - 12.0″ Total - 16.0″	Water	6.0″ Steel	Subgrade	55.0″ T/P	N/A	N/A	69.0″	N/S	1	2	Pothole 4 is located in the intersection of Eucalyptus Ave & Spring St. Please refer to Location Map 2 for the approximate location of Pothole 4.	
5	05/09/2023	Intersection of Eucalyptus Ave & Spring St	Asphalt - N/A Concrete - N/A Base - N/A Total - N/A	Gas	2.0″ Plastic	Subgrade	53.0″ T/P	N/A	N/A	60.0″	N/S&E	1	2	Pothole 5 is located in the intersection of Eucalyptus Ave & Spring St. Please refer to Location Map 2 for the approximate location of Pothole 5.	Tracer wire was present.
6	05/09/2023	Eucalyptus Ave	Asphalt - N/A Concrete - N/A Base - N/A Total - N/A	Gas	2.0″ Plastic	Subgrade	33.0″ T/P	N/A	N/A	40.0″	W/E	1	2	Pothole 6 is located in the west-bound lane of Eucalyptus Ave. Please refer to Location Map 2 for the approximate location of Pothole 6.	Tracer wire was present.
7	05/09/2023	Eucalyptus Ave	Asphalt - N/A Concrete - N/A Base - N/A Total - N/A	Water	6.0″ Steel	Subgrade	25.0″ T/P	N/A	N/A	30.0″	W/E	1	2	Pothole 7 is located in the east-bound lane of Eucalyptus Ave. Please refer to Location Map 2 for the approximate location of Pothole 7.	
8	05/10/2023	Intersection of Theda St & Eucalyptus Ave	Asphalt - N/A Concrete - N/A Base - N/A Total - N/A	Telecom (Not Found)	N/A	Subgrade	N/A	N/A	N/A	60.0″	N/A	1	2	Pothole 8 is located in the intersection of Theda St & Eucalyptus Ave. Please refer to Location Map 2 for the approximate location of Pothole 8.	
9	05/10/2023	Intersection of Theda St & Eucalyptus Ave	Asphalt - 4.0″ Concrete - N/A Base - 3.0″ Total - 7.0″	Water	8.0″ Steel	Subgrade	39.0″ T/P	N/A	N/A	45.0″	N/S	1	2	Pothole 9 is located in the intersection of Theda St & Eucalyptus Ave. Please refer to Location Map 2 for the approximate location of Pothole 9.	
10	05/09/2023	intersection of Main St & Club Dr	Asphalt - N/A Concrete - N/A Base - N/A Total - N/A	Gas	2.0″ Plastic	Subgrade	35.0″ T/P	N/A	N/A	48.0″	N/S	1	1	Pothole 10 is located in the intersection of Main St & Club Dr. Please refer to Location Map 1 for the approximate location of Pothole 10.	Yellow caution tape was found in the pothole.
11	05/09/2023	Club Dr	Asphalt - 3.0″ Concrete - N/A Base - 6.0″ Total - 9.0″	Water	6.0″ Concrete	Subgrade	36.0″ T/P	N/A	N/A	36.0″	W/E	1	1	Pothole 11 is located in the east-bound lane of Club Dr. Please refer to Location Map 1 for the approximate location of Pothole 11.	
12	05/09/2023	Club Dr	Asphalt - 3.0″ Concrete - N/A Base - 6.0″ Total - 9.0″	Water	6.0″ Concrete	Subgrade	33.0″ T/P	N/A	N/A	33.0″	W/E	1	1	Pothole 12 is located in the east-bound lane of Club Dr. Please refer to Location Map 1 for the approximate location of Pothole 12.	
13	05/09/2023	Main St	Asphalt - N/A Concrete - N/A Base - N/A Total - N/A	Gas Gas	1.0″ Plastic 3.0″ Plastic	Subgrade	44.0″ T/P 41.0″ T/P	N/A N/A	N/A N/A	48.0″	W/E N/S	1	1	Pothole 13 is located in the Main St. Please refer to Location Map 1 for the approximate location of Pothole 13.	Tracer wire was present.
14	05/09/2023	Intersection of Pine St, Simpkins Rd, & Main St	Asphalt - N/A Concrete - N/A Base - N/A Total - N/A	Utility (Not Found)	N/A	Subgrade, Rocks	N/A	N/A	N/A	48.0″	N/A	1	4	Pothole 14 is located in the intersection of Pine St, Simpkins Rd, & Main St. Please refer to Location Map 4 for the approximate location of Pothole 14.	Excavated 4 feet long and 48 inches deep.
15	05/09/2023	Intersection of Cherry Ln & Main St	Asphalt - N/A Concrete - N/A Base - N/A Total - N/A	Telecom Gas	0.5″ Direct Bury 2.0″ Plastic	Subgrade	22.0″ T/P 39.0″ T/P	N/A N/A	N/A N/A	39.0″	N/S W/E	1	4	Pothole 15 is located in the intersection of Cherry Ln & Main St. Please refer to Location Map 4 for the approximate location of Pothole 15.	

POTHOLE TABULATION REPORT: Good Hope Olive Area Water System Imps., Perris

Pothole Number	Date	Street	Pavement Thickness	Utility Type	Utility Size & Material	Soil Type	Depth-Ground to Top of Utility	Depth-Ground to Top of Package/ Encasement	Depth-Ground to Bottom of Package/ Encasement	Total Depth Excavated	Utility Orientation	Pothole Project Area Map #	Pothole Location Map #	Description & Location	Notes
16	05/09/2023	Intersection of Main St & Maguglin Way	Asphalt - N/A Concrete - N/A Base - N/A Total - N/A	Gas	2.0″ Plastic	Subgrade	50.0″ T/P	N/A	N/A	60.0″	WNW/ESE	1	4	Pothole 16 is located in the intersection of Main St & Maguglin Way. Please refer to Location Map 4 for the approximate location of Pothole 16.	
17	05/10/2023	Main St	Asphalt - N/A Concrete - N/A Base - N/A Total - N/A	Gas	2.0″ Plastic	Subgrade	42.0″ T/P	N/A	N/A	48.0″	N/S	1	4	Pothole 17 is located in the Main St. Please refer to Location Map 4 for the approximate location of Pothole 17.	
18	05/10/2023	Intersection of Main St & Sharp Rd	Asphalt - N/A Concrete - N/A Base - N/A Total - N/A	Water	6.0″ Steel	Subgrade	38.0″ T/P	N/A	N/A	48.0″	N/S	1	4	Pothole 18 is located in the intersection of Main St & Sharp Rd. Please refer to Location Map 4 for the approximate location of Pothole 18.	
19	05/10/2023	Intersection of Main St & Sharp Rd	Asphalt - N/A Concrete - N/A Base - N/A Total - N/A	Water	6.0″ Steel	Subgrade	33.0″ T/P	N/A	N/A	48.0″	W/E	1	4	Pothole 19 is located in the intersection of Main St & Sharp Rd. Please refer to Location Map 4 for the approximate location of Pothole 19.	
20	05/09/2023	Maple Ave	Asphalt - N/A Concrete - N/A Base - N/A Total - N/A	Water Service	3.0″ PVC	Subgrade	18.0″ T/P	N/A	N/A	36.0″	W/E	1	1	Pothole 20 is located on Maple Ave. Please refer to Location Map 1 for the approximate location of Pothole 20.	Only be able to excavate 36.0 inches deep due to hard material on the ground.
21	05/10/2023	Intersection of Main St & Cherry Ln	Asphalt - N/A Concrete - N/A Base - N/A Total - N/A	Telecom (Not Found)	N/A	Subgrade	N/A	N/A	N/A	62.0″	N/A	1	4	Pothole 21 is located in the intersection of Main St & Cherry Ln. Please refer to Location Map 4 for the approximate location of Pothole 21.	
22	05/10/2023	Intersection of Main St & Maguglin Way	Asphalt - N/A Concrete - N/A Base - N/A Total - N/A	Fiber Optic, Telecom	2.0″ Plastic	Subgrade	37.0″ T/P	N/A	N/A	48.0″	N/S	1	4	Pothole 22 is located in the intersection of Main St & Maguglin Way. Please refer to Location Map 4 for the approximate location of Pothole 22.	
23	05/11/2023	Club Dr	Asphalt - 5.0″ Concrete - N/A Base - N/A Total - 5.0″	Water Water	6.0″ Steel 1.0″ Unknown	Subgrade	59.0″ T/P 57.0″ T/P	N/A N/A	N/A N/A	60.0″	WNW/ESE NNE/SSW	1	2	Pothole 23 is located in the west-bound lane of Club Dr. Please refer to Location Map 2 for the approximate location of Pothole 23.	
24	05/11/2023	Club Dr	Asphalt - 6.0″ Concrete - N/A Base - N/A Total - 6.0″	Gas	2.0″ Plastic	Subgrade	47.0″ T/P	N/A	N/A	50.0″	WNW/ESE	1	2	Pothole 24 is located in the west-bound lane of Club Dr. Please refer to Location Map 2 for the approximate location of Pothole 24.	Tracer wire was present.
25	05/11/2023	Club Dr	Asphalt - 5.0″ Concrete - N/A Base - N/A Total - 5.0″	Gas	2.0″ Plastic	Subgrade	41.0″ T/P	N/A	N/A	46.0″	W/E	1	2	Pothole 25 is located in the west-bound lane of Club Dr. Please refer to Location Map 2 for the approximate location of Pothole 25.	Tracer wire was present.
26	05/11/2023	Club Dr	Asphalt - 5.0″ Concrete - N/A Base - N/A Total - 5.0″	Water Gas Telecom	8.0″ Steel 1.0″ Plastic 1.0″ Plastic	Subgrade	53.0″ T/P 36.0″ T/P 49.0″ T/P	N/A N/A N/A	N/A N/A N/A	59.0″	WSW/ENE NNW/SSE NE/SW	1	2	Pothole 26 is located in the west-bound lane of Club Dr. Please refer to Location Map 2 for the approximate location of Pothole 26.	Tracer wire was present.
27	05/10/2023	Intersection of Sharp Rd & Spring St	Asphalt - 4.0″ Concrete - N/A Base - 3.0″ Total - 7.0″	Water	6.0″ Steel	Subgrade	34.0″ T/P	N/A	N/A	40.0″	N/S	1	3	Pothole 27 is located in the intersection of Sharp Rd & Spring St. Please refer to Location Map 3 for the approximate location of Pothole 27.	
28	05/10/2023	Intersection of Sharp Rd & Spring St	Asphalt - 4.0″ Concrete - N/A Base - 3.0″ Total - 7.0″	Gas	2.0″ Plastic	Subgrade	53.0″ T/P	N/A	N/A	62.0″	N/S	1	3	Pothole 28 is located in the intersection of Sharp Rd & Spring St. Please refer to Location Map 3 for the approximate location of Pothole 28.	
29	05/10/2023	Sharp Rd	Asphalt - 4.0″ Concrete - N/A Base - N/A Total - 4.0″	Clearance Hole	N/A	Subgrade	N/A	N/A	N/A	60.0″	N/A	1	3	Pothole 29 is located in the east-bound lane of Sharp Rd. Please refer to Location Map 3 for the approximate location of Pothole 29.	
30	05/10/2023	Sharp Rd	Asphalt - 8.0″ Concrete - N/A Base - N/A Total - 8.0″	Electric Telecom	3.0″ PVC 1.0″ PVC Package	Subgrade	34.0″ T/P N/A	N/A 16.0″ T/Pkg	N/A N/A	43.0″	N/S N/S	1	3	Pothole 30 is located in the east-bound lane of Sharp Rd. Please refer to Location Map 3 for the approximate location of Pothole 30.	

POTHOLE TABULATION REPORT: Good Hope Olive Area Water System Imps., Perris

Pothole Number	Date	Street	Pavement Thickness	Utility Type	Utility Size & Material	Soil Type	Depth-Ground to Top of Utility	Depth-Ground to Top of Package/ Encasement	Depth-Ground to Bottom of Package/ Encasement	Total Depth Excavated	Utility Orientation	Pothole Project Area Map #	Pothole Location Map #	Description & Location	Notes
31	05/11/2023	Intersection of Sharp Rd & Theda St	Asphalt - 5.0" Concrete - N/A Base - N/A Total - 5.0"	Water	8.0" Steel	Subgrade	40.0" T/P	N/A	N/A	60.0"	N/S	1	3	Pothole 31 is located in the intersection of Sharp Rd & Theda St. Please refer to Location Map 3 for the approximate location of Pothole 31.	
32	05/11/2023	Eucalyptus Ave	Asphalt - N/A Concrete - N/A Base - N/A Total - N/A	Gas	2.0" Plastic	Subgrade	30.0" T/P	N/A	N/A	33.0"	W/E	1	2	Pothole 32 is located on Eucalyptus Ave. Please refer to Location Map 2 for the approximate location of Pothole 32.	Tracer wire was present.
33	05/10/2023	intersection of Main St & Club Dr	Asphalt - N/A Concrete - N/A Base - N/A Total - N/A	Fiber Optic (Not Found)	N/A	Subgrade	N/A	N/A	N/A	57.0"	N/A	1	1	Pothole 33 is located in the intersection of Main St & Club Dr. Please refer to Location Map 1 for the approximate location of Pothole 33.	
34	05/10/2023	Intersection of Main St & Sharp Rd	Asphalt - N/A Concrete - N/A Base - N/A Total - N/A	Fiber Optic (Not Found)	N/A	Subgrade	N/A	N/A	N/A	60.0"	N/A	1	4	Pothole 34 is located in the intersection of Main St & Sharp Rd. Please refer to Location Map 4 for the approximate location of Pothole 34.	
35	05/10/2023	Intersection of Main St & Cherry Ln	Asphalt - N/A Concrete - N/A Base - N/A Total - N/A	Electric (Not Found)	N/A	Subgrade, Rocks	N/A	N/A	N/A	60.0"	N/A	1	4	Pothole 35 is located in the intersection of Main St & Cherry Ln. Please refer to Location Map 4 for the approximate location of Pothole 35.	

Pothole Data Sheet(s)

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-053 PS
TEST HOLE NO:	1
DATE EXCAVATED:	05/09/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Gas	2.0″ Plastic	40.0″ T/P	N/A	N/A	N/S
2						
3						
4						

TOTAL DEPTH EXCAVATED: **41.0**”

PAVEMENT THICKNESS: **ASPHALT: N/A** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Class II Base**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**Yes**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Clay, Slurry**

COMMENT:

AREA SHOT

Pothole 1 is located in the intersection of Main St & Eucalyptus Ave. Please refer to Location Map 1 for the approximate location of Pothole 1. The photo above was taken in front of Pothole 1 facing east.

DOWNHOLE VIEW

A downhole view of the 2.0 inch wide Plastic Gas utility found in Pothole 1, at the depth of 40.0 inches T/P. Utility runs in a N/S direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-053 PS
TEST HOLE NO:	2
DATE EXCAVATED:	05/09/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Gas	2.0″ Plastic	37.0″ T/P	N/A	N/A	W/E
2						
3						
4						

TOTAL DEPTH EXCAVATED: **45.0**”

PAVEMENT THICKNESS: **ASPHALT: N/A** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Class II Base**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT

Pothole 2 is located north of Eucalyptus Ave. Please refer to Location Map 1 for the approximate location of Pothole 2. The photo above was taken in front of Pothole 2 facing north.

DOWNHOLE VIEW

A downhole view of the 2.0 inch wide Plastic Gas utility found in Pothole 2, at the depth of 37.0 inches T/P. Utility runs in a W/E direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	223-053 PS
TEST HOLE NO:	3
DATE EXCAVATED:	05/09/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Gas	2.0″ Plastic	36.0″ T/P	N/A	N/A	N&W
2						
3						
4						

TOTAL DEPTH EXCAVATED: **40.0**”

PAVEMENT THICKNESS: **ASPHALT: N/A** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Class II Base**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**Yes**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT

Pothole 3 is located in the intersection of Eucalyptus Ave & Palm St. Please refer to Location Map 1 for the approximate location of Pothole 3. The photo above was taken in front of Pothole 3 facing east.

DOWNHOLE VIEW

A downhole view of the 2.0 inch wide Plastic Gas utility found in Pothole 3, at the depth of 36.0 inches T/P. Utility runs in a N&W direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-053 PS
TEST HOLE NO:	4
DATE EXCAVATED:	05/09/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Water	6.0″ Steel	55.0″ T/P	N/A	N/A	N/S
2						
3						
4						

TOTAL DEPTH EXCAVATED: **69.0**″

PAVEMENT THICKNESS: **ASPHALT: 4.0″** **CONCRETE: N/A** **BASE: 12.0″**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Utilibond**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT

Pothole 4 is located in the intersection of Eucalyptus Ave & Spring St. Please refer to Location Map 2 for the approximate location of Pothole 4. The photo above was taken in front of Pothole 4 facing south.

DOWNHOLE VIEW

A downhole view of the 6.0 inch wide Steel Water utility found in Pothole 4, at the depth of 55.0 inches T/P. Utility runs in a N/S direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-053 PS
TEST HOLE NO:	5
DATE EXCAVATED:	05/09/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Gas T-connector	2.0″ Plastic	53.0″ T/P	N/A	N/A	N/S&E
2						
3						
4						

TOTAL DEPTH EXCAVATED: **60.0**”

PAVEMENT THICKNESS: **ASPHALT: N/A** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Class II Base**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**Yes**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT

Pothole 5 is located in the intersection of Eucalyptus Ave & Spring St. Please refer to Location Map 2 for the approximate location of Pothole 5. The photo above was taken in front of Pothole 5 facing south.

DOWNHOLE VIEW

A downhole view of the 2.0 inch wide Plastic Gas T-connector utility found in Pothole 5, at the depth of 53.0 inches T/P. Utility runs in a N/S&E direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-053 PS
TEST HOLE NO:	6
DATE EXCAVATED:	05/09/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Gas	2.0″ Plastic	33.0″ T/P	N/A	N/A	W/E
2						
3						
4						

TOTAL DEPTH EXCAVATED: **40.0**”

PAVEMENT THICKNESS: **ASPHALT: N/A** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

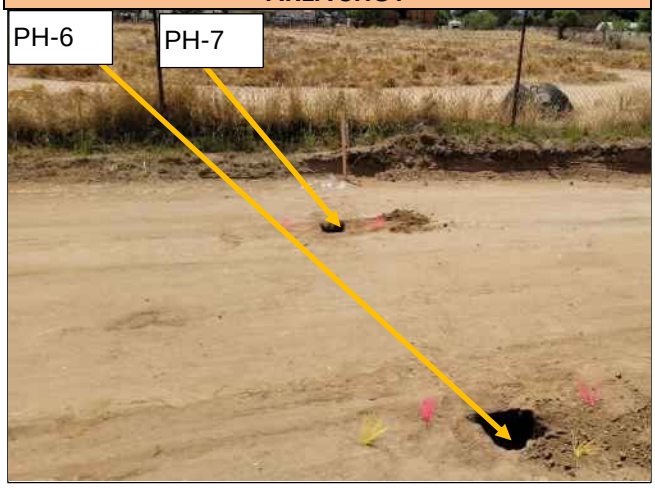
IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Class II Base**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**Yes**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT



Pothole 6 is located in the west-bound lane of Eucalyptus Ave. Please refer to Location Map 2 for the approximate location of Pothole 6. The photo above was taken in front of Pothole 6 and Pothole 7 facing south.

DOWNHOLE VIEW

A downhole view of the 2.0 inch wide Plastic Gas utility found in Pothole 6, at the depth of 33.0 inches T/P. Utility runs in a W/E direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-053 PS
TEST HOLE NO:	7
DATE EXCAVATED:	05/09/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Water	6.0″ Steel	25.0″ T/P	N/A	N/A	W/E
2						
3						
4						

TOTAL DEPTH EXCAVATED: **30.0**”

PAVEMENT THICKNESS: **ASPHALT: N/A** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

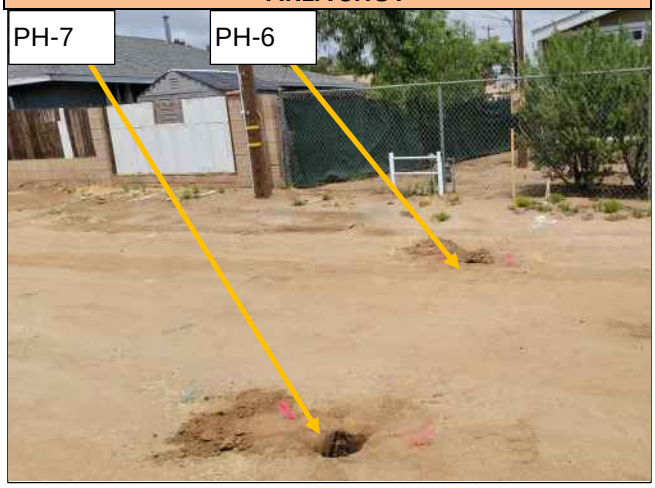
IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Class II Base**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT



Pothole 7 is located in the east-bound lane of Eucalyptus Ave. Please refer to Location Map 2 for the approximate location of Pothole 7. The photo above was taken in front of Pothole 7 and Pothole 6 facing NNW.

DOWNHOLE VIEW

A downhole view of the 6.0 inch wide Steel Water utility found in Pothole 7, at the depth of 25.0 inches T/P. Utility runs in a W/E direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-053 PS
TEST HOLE NO:	8
DATE EXCAVATED:	05/10/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Telecom (Not Found)	N/A	N/A	N/A	N/A	N/A
2						
3						
4						

TOTAL DEPTH EXCAVATED: **60.0**”

PAVEMENT THICKNESS: **ASPHALT: N/A** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

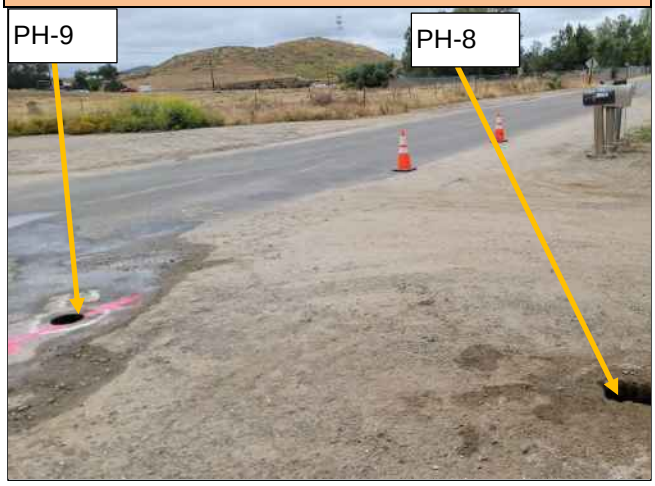
IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Class II Base**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**No**	PIPE COVER MATERIAL:	**N/A**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT



Pothole 8 is located in the intersection of Theda St & Eucalyptus Ave. Please refer to Location Map 2 for the approximate location of Pothole 8. The photo above was taken in front of Pothole 8 and Pothole 9 facing souths.

DOWNHOLE VIEW

A downhole view of the excavation to 60.0 inches deep. Utilities were not found in the Pothole.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-053 PS
TEST HOLE NO:	9
DATE EXCAVATED:	05/10/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Water	8.0″ Steel	39.0″ T/P	N/A	N/A	N/S
2						
3						
4						

TOTAL DEPTH EXCAVATED: **45.0**”

PAVEMENT THICKNESS: **ASPHALT: 4.0″** **CONCRETE: N/A** **BASE: 3.0″**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Utilibond**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT

Pothole 9 is located in the intersection of Theda St & Eucalyptus Ave. Please refer to Location Map 2 for the approximate location of Pothole 9. The photo above was taken in front of Pothole 9 facing south.

DOWNHOLE VIEW

A downhole view of the 8.0 inch wide Steel Water utility found in Pothole 9, at the depth of 39.0 inches T/P. Utility runs in a N/S direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-053 PS
TEST HOLE NO:	10
DATE EXCAVATED:	05/09/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Gas	2.0″ Plastic	35.0″ T/P	N/A	N/A	N/S
2						
3						
4						

TOTAL DEPTH EXCAVATED: **48.0**”

PAVEMENT THICKNESS: **ASPHALT: N/A** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Class II Base**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Sand**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:
Yellow caution tape was found in the pothole.

AREA SHOT

Pothole 10 is located in the intersection of Main St & Club Dr. Please refer to Location Map 1 for the approximate location of Pothole 10. The photo above was taken in front of Pothole 10 facing north.

DOWNHOLE VIEW

A downhole view of the 2.0 inch wide Plastic Gas utility found in Pothole 10, at the depth of 35.0 inches T/P. Utility runs in a N/S direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-053 PS
TEST HOLE NO:	11
DATE EXCAVATED:	05/09/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Water	6.0″ Concrete	36.0″ T/P	N/A	N/A	W/E
2						
3						
4						

TOTAL DEPTH EXCAVATED: **36.0**”

PAVEMENT THICKNESS: **ASPHALT: 3.0″** **CONCRETE: N/A** **BASE: 6.0″**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Utilibond**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Sand**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT

Pothole 11 is located in the east-bound lane of Club Dr. Please refer to Location Map 1 for the approximate location of Pothole 11. The photo above was taken in front of Pothole 11 facing south.

DOWNHOLE VIEW

A downhole view of the 6.0 inch wide Concrete Water utility found in Pothole 11, at the depth of 36.0 inches T/P. Utility runs in a W/E direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-053 PS
TEST HOLE NO:	12
DATE EXCAVATED:	05/09/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Water	6.0″ Concrete	33.0″ T/P	N/A	N/A	W/E
2						
3						
4						

TOTAL DEPTH EXCAVATED: **33.0**”

PAVEMENT THICKNESS: **ASPHALT: 3.0″** **CONCRETE: N/A** **BASE: 6.0″**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Utilibond**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Sand**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT

Pothole 12 is located in the east-bound lane of Club Dr. Please refer to Location Map 1 for the approximate location of Pothole 12. The photo above was taken in front of Pothole 12 facing east.

DOWNHOLE VIEW

A downhole view of the 6.0 inch wide Concrete Water utility found in Pothole 12, at the depth of 33.0 inches T/P. Utility runs in a W/E direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-053 PS
TEST HOLE NO:	13
DATE EXCAVATED:	05/09/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Gas	1.0″ Plastic	44.0″ T/P	N/A	N/A	W/E
2	Gas	3.0″ Plastic	41.0″ T/P	N/A	N/A	N/S
3						
4						

TOTAL DEPTH EXCAVATED: **48.0**”

PAVEMENT THICKNESS: **ASPHALT: N/A** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Class II Base**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**Yes**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Sand**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT

Pothole 13 is located in the Main St. Please refer to Location Map 1 for the approximate location of Pothole 13. The photo above was taken in front of Pothole 13 facing north.

DOWNHOLE VIEW

A downhole view of the utilities found in Pothole 13 and their orientation at the pothole location: 1.0 inch Plastic Gas utility at the depth of 44.0 inches T/P and runs in a W/E direction; and 3.0 inch Plastic Gas utility at the depth of 41.0 inches T/P and runs in a N/S direction. Utilities were found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-053 PS
TEST HOLE NO:	14
DATE EXCAVATED:	05/09/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Utility (Not Found)	N/A	N/A	N/A	N/A	N/A
2						
3						
4						

TOTAL DEPTH EXCAVATED: **48.0**”

PAVEMENT THICKNESS: **ASPHALT: N/A** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Class II Base**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**No**	PIPE COVER MATERIAL:	**N/A**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade, Rocks**

COMMENT:
Excavated 4 feet long and 48 inches deep.

AREA SHOT

Pothole 14 is located in the intersection of Pine St, Simpkins Rd, & Main St. Please refer to Location Map 4 for the approximate location of Pothole 14. The photo above was taken in front of Pothole 14 facing north.

DOWNHOLE VIEW

A downhole view of the excavation to 48.0 inches deep. Utilities were not found in the Pothole.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-053 PS
TEST HOLE NO:	15
DATE EXCAVATED:	05/09/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Telecom	0.50″ Direct Bury	22.0″ T/P	N/A	N/A	N/S
2	Gas	2.0″ Plastic	39.0″ T/P	N/A	N/A	W/E
3						
4						

TOTAL DEPTH EXCAVATED: **39.0**”

PAVEMENT THICKNESS: **ASPHALT: N/A** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Class II Base**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT

Pothole 15 is located in the intersection of Cherry Ln & Main St. Please refer to Location Map 4 for the approximate location of Pothole 15. The photo above was taken in front of Pothole 15 facing east.

DOWNHOLE VIEW

A downhole view of the utilities found in Pothole 15 and their orientation at the pothole location: 0.50 inch Direct Bury Telecom utility at the depth of 22.0 inches T/P and runs in a N/S direction; and 2.0 inch Plastic Gas utility at the depth of 39.0 inches T/P and runs in a W/E direction. Utilities were found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-053 PS
TEST HOLE NO:	16
DATE EXCAVATED:	05/09/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Gas	2.0″ Plastic	50.0″ T/P	N/A	N/A	WNW/ESE
2						
3						
4						

TOTAL DEPTH EXCAVATED: **60.0**”

PAVEMENT THICKNESS: **ASPHALT: N/A** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

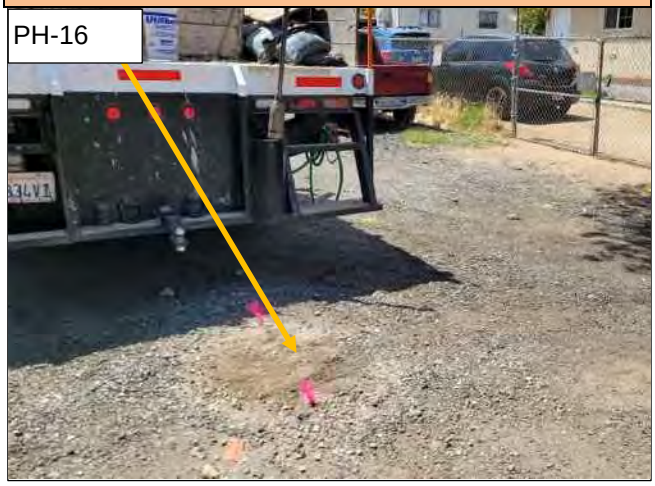
IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Class II Base**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT



Pothole 16 is located in the intersection of Main St & Maguglin Way. Please refer to Location Map 4 for the approximate location of Pothole 16. The photo above was taken in front of Pothole 16 facing NW.

DOWNHOLE VIEW

A downhole view of the 2.0 inch wide Plastic Gas utility found in Pothole 16, at the depth of 50.0 inches T/P. Utility runs in a WNW/ESE direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-053 PS
TEST HOLE NO:	17
DATE EXCAVATED:	05/10/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Gas	2.0″ Plastic	42.0″ T/P	N/A	N/A	N/S
2						
3						
4						

TOTAL DEPTH EXCAVATED: **48.0**”

PAVEMENT THICKNESS: **ASPHALT: N/A** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Class II Base**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Sand**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT

Pothole 17 is located in the Main St. Please refer to Location Map 4 for the approximate location of Pothole 17. The photo above was taken in front of Pothole 17 facing north/east/south/west.

DOWNHOLE VIEW

A downhole view of the 2.0 inch wide Plastic Gas utility found in Pothole 17, at the depth of 42.0 inches T/P. Utility runs in a N/S direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-053 PS
TEST HOLE NO:	18
DATE EXCAVATED:	05/10/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Water	6.0″ Steel	38.0″ T/P	N/A	N/A	N/S
2						
3						
4						

TOTAL DEPTH EXCAVATED: **48.0**”

PAVEMENT THICKNESS: **ASPHALT: N/A** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Class II Base**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Sand**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT

Pothole 18 is located in the intersection of Main St & Sharp Rd. Please refer to Location Map 4 for the approximate location of Pothole 18. The photo above was taken in front of Pothole 18 facing north.

DOWNHOLE VIEW

A downhole view of the 6.0 inch wide Steel Water utility found in Pothole 18, at the depth of 38.0 inches T/P. Utility runs in a N/S direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-053 PS
TEST HOLE NO:	19
DATE EXCAVATED:	05/10/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Water	6.0″ Steel	33.0″ T/P	N/A	N/A	W/E
2						
3						
4						

TOTAL DEPTH EXCAVATED: **48.0**”

PAVEMENT THICKNESS: **ASPHALT: N/A** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

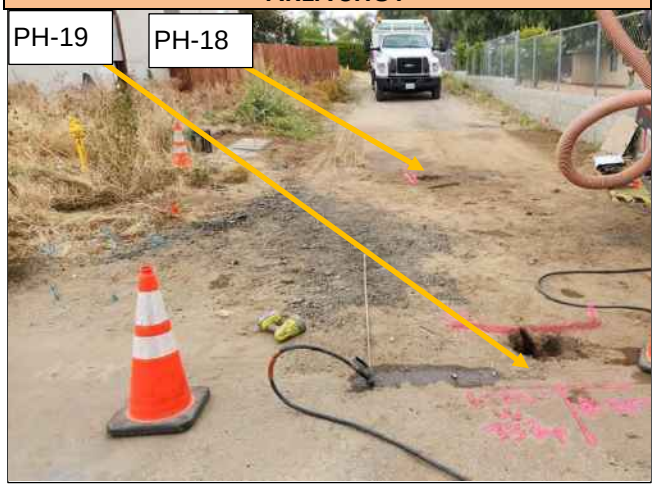
IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Class II Base**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**No**	PIPE COVER MATERIAL:	**Sand**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT



Pothole 19 is located in the intersection of Main St & Sharp Rd. Please refer to Location Map 4 for the approximate location of Pothole 19. The photo above was taken in front of Pothole 19 and Pothole 18 facing north.

DOWNHOLE VIEW

A downhole view of the 6.0 inch wide Steel Water utility found in Pothole 19, at the depth of 33.0 inches T/P. Utility runs in a W/E direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-053 PS
TEST HOLE NO:	20
DATE EXCAVATED:	05/09/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Water Service	3.0″ PVC	18.0″ T/P	N/A	N/A	W/E
2						
3						
4						

TOTAL DEPTH EXCAVATED: **36.0**”

PAVEMENT THICKNESS: **ASPHALT: N/A** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Class II Base**

TARGET UTILITY MARKED BY USA:	**No**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:
Only be able to excavate 36.0 inches deep due to hard material on the ground.

AREA SHOT

Pothole 20 is located on Maple Ave. Please refer to Location Map 1 for the approximate location of Pothole 20. The photo above was taken in front of Pothole 20 facing east.

DOWNHOLE VIEW

A downhole view of the 3.0 inch wide PVC Water Service utility found in Pothole 20, at the depth of 18.0 inches T/P. Utility runs in a W/E direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-053 PS
TEST HOLE NO:	21
DATE EXCAVATED:	05/10/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Telecom (Not Found)	N/A	N/A	N/A	N/A	N/A
2						
3						
4						

TOTAL DEPTH EXCAVATED: **62.0**”

PAVEMENT THICKNESS: **ASPHALT: N/A** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

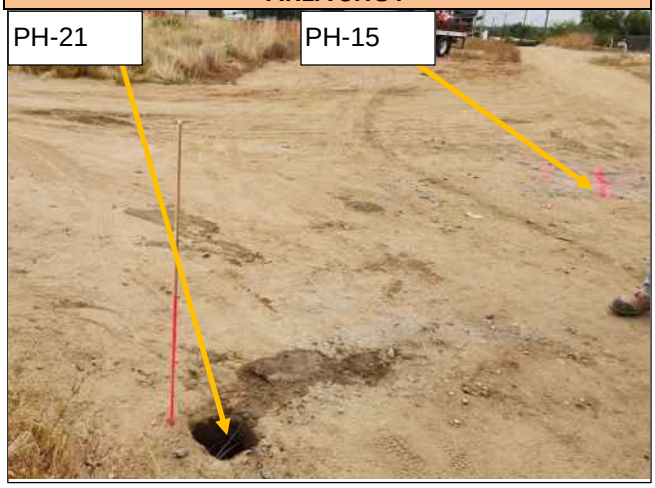
IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Class II Base**

TARGET UTILITY MARKED BY USA:	**No**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**N/A**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT



Pothole 21 is located in the intersection of Cherry Ln and Main St. Please refer to Location Map 4 for the approximate location of Pothole 21. The photo above was taken in front of Pothole 21 and Pothole 15 facing north.

DOWNHOLE VIEW

A downhole view of the excavation to 62.0 inches deep. Utilities were not found in the Pothole.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-053 PS
TEST HOLE NO:	22
DATE EXCAVATED:	05/10/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Fiber Optic/Telecom	2.0″ Plastic	37.0″ T/P	N/A	N/A	N/S
2						
3						
4						

TOTAL DEPTH EXCAVATED: **48.0**”

PAVEMENT THICKNESS: **ASPHALT: N/A** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

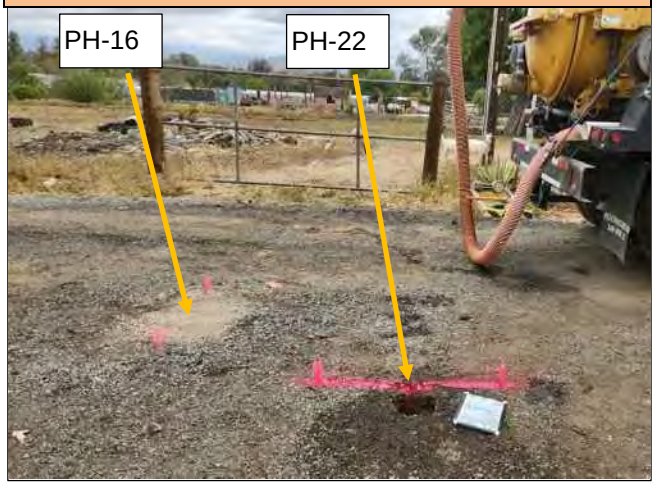
IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Class II Base**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT



Pothole 22 is located in the intersection of Main St & Maguglin Way. Please refer to Location Map 4 for the approximate location of Pothole 22. The photo above was taken in front of Pothole 22 and Pothole 16 facing east.

DOWNHOLE VIEW

A downhole view of the 2.0 inch wide Plastic Fiber Optic, Telecom utility found in Pothole 22, at the depth of 37.0 inches T/P. Utility runs in a N/S direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-053 PS
TEST HOLE NO:	23
DATE EXCAVATED:	05/11/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Water	6.0″ Steel	59.0″ T/P	N/A	N/A	WNW/ESE
2	Water	1.0″ Unknown	57.0″ T/P	N/A	N/A	NNE/SSW
3						
4						

TOTAL DEPTH EXCAVATED: **60.0**″

PAVEMENT THICKNESS: **ASPHALT: 5.0″** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Utilibond**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT

Pothole 23 is located in the west-bound lane of Club Dr. Please refer to Location Map 2 for the approximate location of Pothole 23. The photo above was taken in front of Pothole 23 facing north.

DOWNHOLE VIEW

A downhole view of the utilities found in Pothole 23 and their orientation at the pothole location: 6.0 inch Steel Water utility at the depth of 59.0 inches T/P and runs in a WNW/ESE direction; and 1.0 inch Unknown Water utility at the depth of 57.0 inches T/P and runs in a NNE/SSW direction. Utilities were found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-053 PS
TEST HOLE NO:	24
DATE EXCAVATED:	05/11/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Gas	2.0″ Plastic	47.0″ T/P	N/A	N/A	WNW/ESE
2						
3						
4						

TOTAL DEPTH EXCAVATED: **50.0**”

PAVEMENT THICKNESS: **ASPHALT: 6.0″** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

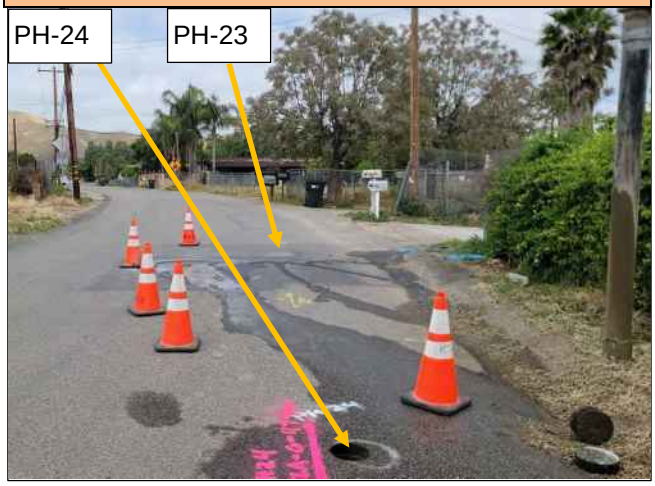
IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Utilibond**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**Yes**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT



Pothole 24 is located in the west-bound lane of Club Dr. Please refer to Location Map 2 for the approximate location of Pothole 24. The photo above was taken in front of Pothole 24 and Pothole 23 facing WNW.

DOWNHOLE VIEW

A downhole view of the 2.0 inch wide Plastic Gas utility found in Pothole 24, at the depth of 47.0 inches T/P. Utility runs in a WNW/ESE direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-053 PS
TEST HOLE NO:	25
DATE EXCAVATED:	05/11/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Gas	2.0″ Plastic	41.0″ T/P	N/A	N/A	W/E
2						
3						
4						

TOTAL DEPTH EXCAVATED: **46.0**”

PAVEMENT THICKNESS: **ASPHALT: 5.0″** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Utilibond**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**Yes**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT

Pothole 25 is located in the west-bound lane of Club Dr. Please refer to Location Map 2 for the approximate location of Pothole 25. The photo above was taken in front of Pothole 25 facing south.

DOWNHOLE VIEW

A downhole view of the 2.0 inch wide Plastic Gas utility found in Pothole 25, at the depth of 41.0 inches T/P. Utility runs in a W/E direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-053 PS
TEST HOLE NO:	26
DATE EXCAVATED:	05/11/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Water	8.0″ Steel	53.0″ T/P	N/A	N/A	WSW/ENE
2	Gas	1.0″ Plastic	36.0″ T/P	N/A	N/A	NNW/SSE
3	Telecom	1.0″ Plastic	49.0″ T/P	N/A	N/A	NE/SW
4						

TOTAL DEPTH EXCAVATED: **59.0**”

PAVEMENT THICKNESS: **ASPHALT: 5.0″** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Utilibond**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**Yes**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT

Pothole 26 is located in the west-bound lane of Club Dr. Please refer to Location Map 2 for the approximate location of Pothole 26. The photo above was taken in front of Pothole 26 facing NNE.

DOWNHOLE VIEW

A downhole view of the utilities found in Pothole 26 and their orientation at the pothole location: 8.0 inch Steel Water utility at the depth of 53.0 inches T/P and runs in a WSW/ENE direction; 1.0 inch Plastic Gas utility at the depth of 36.0 inches T/P and runs in a NNW/SSE direction; and 1.0 inch Plastic Telecom utility at the depth of 49.0 inches T/P and runs in a NE/SW direction. Utilities were found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-053 PS
TEST HOLE NO:	27
DATE EXCAVATED:	05/10/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Water	6.0″ Steel	34.0″ T/P	N/A	N/A	N/S
2						
3						
4						

TOTAL DEPTH EXCAVATED: **40.0**”

PAVEMENT THICKNESS: **ASPHALT: 4.0″** **CONCRETE: N/A** **BASE: 3.0″**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Utilibond**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT

Pothole 27 is located in the intersection of Sharp Rd & Spring St. Please refer to Location Map 3 for the approximate location of Pothole 27. The photo above was taken in front of Pothole 27 facing south.

DOWNHOLE VIEW

A downhole view of the 6.0 inch wide Steel Water utility found in Pothole 27, at the depth of 34.0 inches T/P. Utility runs in a N/S direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-053 PS
TEST HOLE NO:	28
DATE EXCAVATED:	05/10/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Gas	2.0″ Plastic	53.0″ T/P	N/A	N/A	N/S
2						
3						
4						

TOTAL DEPTH EXCAVATED: **62.0**”

PAVEMENT THICKNESS: **ASPHALT: 4.0″** **CONCRETE: N/A** **BASE: 3.0″**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Utilibond**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT

Pothole 28 is located in the intersection of Sharp Rd & Spring St. Please refer to Location Map 3 for the approximate location of Pothole 28. The photo above was taken in front of Pothole 28 and Pothole 27 facing west.

DOWNHOLE VIEW

A downhole view of the 2.0 inch wide Plastic Gas utility found in Pothole 28, at the depth of 53.0 inches T/P. Utility runs in a N/S direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-053 PS
TEST HOLE NO:	29
DATE EXCAVATED:	05/10/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Clearance Hole	N/A	N/A	N/A	N/A	N/A
2						
3						
4						

TOTAL DEPTH EXCAVATED: **60.0**”

PAVEMENT THICKNESS: **ASPHALT: 4.0″** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

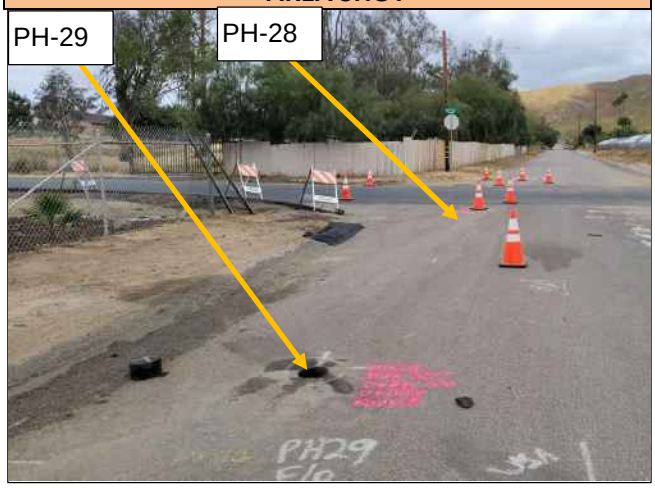
IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Utilibond**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**No**	PIPE COVER MATERIAL:	**N/A**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT



Pothole 29 is located in the east-bound lane of Sharp Rd. Please refer to Location Map 3 for the approximate location of Pothole 29. The photo above was taken in front of Pothole 29 and Pothole 28 facing west.

DOWNHOLE VIEW

A downhole view of the excavation to 60.0 inches deep. Utilities were not found in the Pothole.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-053 PS
TEST HOLE NO:	30
DATE EXCAVATED:	05/10/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Electric	3.0″ PVC	34.0″ T/P	N/A	N/A	N/S
2	Telecom	1.0″ PVC Package	N/A	16.0″ T/Pkg	N/A	N/S
3						
4						

TOTAL DEPTH EXCAVATED: **43.0**″

PAVEMENT THICKNESS: **ASPHALT: 8.0″** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Utilibond**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT

Pothole 30 is located in the east-bound lane of Sharp Rd. Please refer to Location Map 3 for the approximate location of Pothole 30. The photo above was taken in front of Pothole 30 facing south.

DOWNHOLE VIEW

A downhole view of the utilities found in Pothole 30 and their orientation at the pothole location: 3.0 inch PVC Electric utility at the depth of 34.0 inches T/P and runs in a N/S direction; 1.0 inch wide PVC Package housing Telecom utilities found at the depth of 16.0 inches T/Pkg running in a N/S direction. Utilities were found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	223-053 PS
TEST HOLE NO:	31
DATE EXCAVATED:	05/11/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Water	8.0″ Steel	40.0″ T/P	N/A	N/A	N/S
2						
3						
4						

TOTAL DEPTH EXCAVATED: **60.0**”

PAVEMENT THICKNESS: **ASPHALT: 5.0″** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Utilibond**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT

Pothole 31 is located in the intersection of Sharp Rd & Theda St. Please refer to Location Map 3 for the approximate location of Pothole 31. The photo above was taken in front of Pothole 31 facing west.

DOWNHOLE VIEW

A downhole view of the 8.0 inch wide Steel Water utility found in Pothole 31, at the depth of 40.0 inches T/P. Utility runs in a N/S direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-053 PS
TEST HOLE NO:	32
DATE EXCAVATED:	05/11/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Gas	2.0″ Plastic	30.0″ T/P	N/A	N/A	W/E
2						
3						
4						

TOTAL DEPTH EXCAVATED: **33.0**”

PAVEMENT THICKNESS: **ASPHALT: N/A** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Class II Base**

TARGET UTILITY MARKED BY USA:	**No**	TRACER WIRE FOUND:	**Yes**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT

Pothole 32 is located on Eucalyptus Ave. Please refer to Location Map 2 for the approximate location of Pothole 32. The photo above was taken in front of Pothole 32 facing north/east/south/west.

DOWNHOLE VIEW

A downhole view of the 2.0 inch wide Plastic Gas utility found in Pothole 32, at the depth of 30.0 inches T/P. Utility runs in a W/E direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-053 PS
TEST HOLE NO:	33
DATE EXCAVATED:	05/10/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Fiber Optic (Not Found)	N/A	N/A	N/A	N/A	N/A
2						
3						
4						

TOTAL DEPTH EXCAVATED: **57.0**”

PAVEMENT THICKNESS: **ASPHALT: N/A** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Class II Base**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**No**	PIPE COVER MATERIAL:	**N/A**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT

Pothole 33 is located in the intersection of Main St & Club Dr. Please refer to Location Map 1 for the approximate location of Pothole 33. The photo above was taken in front of Pothole 33 and Pothole 10 facing north.

DOWNHOLE VIEW

A downhole view of the excavation to 57.0 inches deep. Utilities were not found in the Pothole.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-053 PS
TEST HOLE NO:	34
DATE EXCAVATED:	05/10/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Fiber Optic (Not Found)	N/A	N/A	N/A	N/A	N/A
2						
3						
4						

TOTAL DEPTH EXCAVATED: **60.0**”

PAVEMENT THICKNESS: **ASPHALT: N/A** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

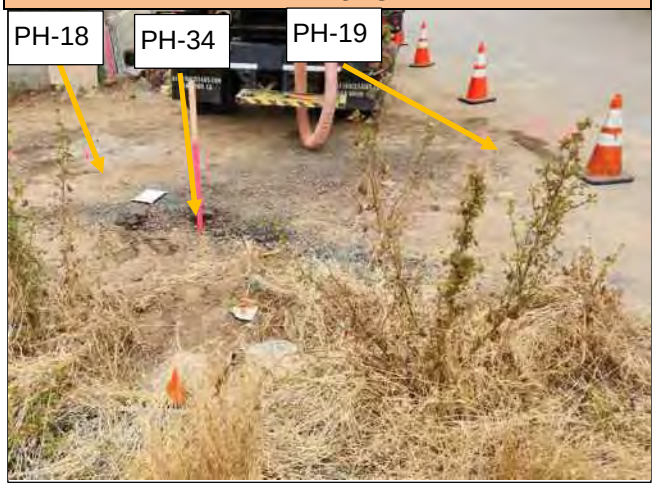
IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Class II Base**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**No**	PIPE COVER MATERIAL:	**N/A**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT



Pothole 34 is located in the intersection of Main St & Sharp Rd. Please refer to Location Map 4 for the approximate location of Pothole 34. The photo above was taken in front of Pothole 34, 18 and Pothole 19 facing east.

DOWNHOLE VIEW

A downhole view of the excavation to 60.0 inches deep. Utilities were not found in the Pothole.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-053 PS
TEST HOLE NO:	35
DATE EXCAVATED:	05/10/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Electric (Not Found)	N/A	N/A	N/A	N/A	N/A
2						
3						
4						

TOTAL DEPTH EXCAVATED: **60.0**”

PAVEMENT THICKNESS: **ASPHALT: N/A** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

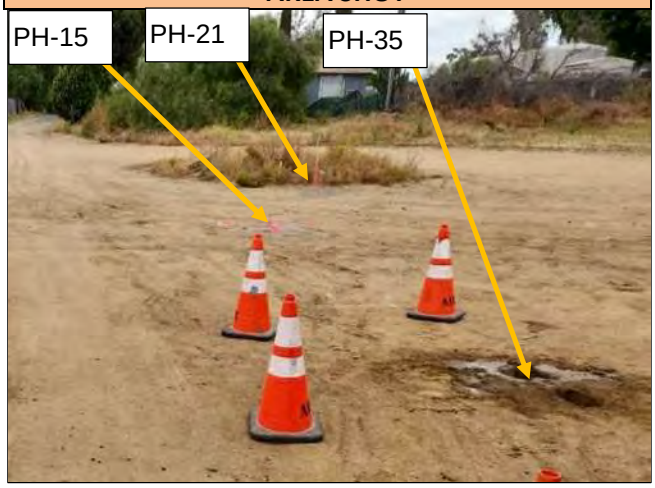
IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Class II Base**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**No**	PIPE COVER MATERIAL:	**N/A**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade, Rocks**

COMMENT:

AREA SHOT



Pothole 35 is located in the intersection of Main St & Cherry Ln. Please refer to Location Map 4 for the approximate location of Pothole 35. The photo above was taken in front of Pothole 35, 15 and Pothole 21 facing south.

DOWNHOLE VIEW

A downhole view of the excavation to 60.0 inches deep. Utilities were not found in the Pothole.

Permit(s)

Mail to:
COUNTY OF RIVERSIDE
TRANSPORTATION DEPARTMENT
PERMIT SECTION, 8TH FLOOR CAC
P.O. BOX 1090
RIVERSIDE, CA 92502-1090
PHONE: (951) 955-6790
Email to: encroachmentpermits@rivco.org

ANNUAL (BLANKET) PERMIT NOTIFICATION
(RD FORM 136)

Date: 03/09/2023 **Annual Permit No. ENC** 22090350

Applicant: Eastern Municipal Water District, Colleen Lepe
Permit holders name

Contractor: AIRX UTILITY SURVEYORS INC

In compliance with the terms of the above referenced annual permit and County Ordinance 499, notice is hereby given that the following work will be performed:

Road Name/Address: MAIN ST

Distance to nearest cross street: EUCALYPTUS AVE

Community: PERRIS

Work to be performed: POTHOLING FOR UTILITY DEPTH (GOOD HOPE/OLIVE- IMPROVE)

Start Date: 03/13/2023 **Estimated Completion Date:** 04/14/2023

Contact Name: Cameron Valenzuela **Phone #:** (951) 928-6107

Mail to:
COUNTY OF RIVERSIDE
TRANSPORTATION DEPARTMENT
PERMIT SECTION, 8TH FLOOR CAC
P.O. BOX 1090
RIVERSIDE, CA 92502-1090
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Road Name/Address: SHARP RD

Distance to nearest cross street: THEDA ST

Community: PERRIS

Work to be performed: POTHOLING FOR UTILITY DEPTH (GOOD HOPE/OLIVE- IMPROVE)

Start Date: 03/13/2023 **Estimated Completion Date:** 04/14/2023

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Start Date: 03/13/2023 **Estimated Completion Date:** 04/14/2023

Contact Name: Cameron Valenzuela **Phone #:** (951) 928-6107

APPENDIX E: PALEONTOLOGICAL RESOURCE ASSESSMENT

Applied EARTHWORKS Inc.

3550 E. Florida Ave., Suite H
Hemet, CA 92544-4937
O: (951) 766-2000 | F: (951) 766-0020
www.appliedearthworks.com

October 11, 2023

Ms. Monica Tobias
Albert A. Webb Associates
3788 McCray Street
Riverside, CA 92506
Transmitted via email to monica.tobias@webbassociates.com

RE: Paleontological Technical Memorandum for the Eastern Municipal Water District Good Hope and Mead Valley Water-System Improvements Project, Riverside County, California

Dear Ms. Tobias,

At the request of Albert A. Webb Associates, Applied EarthWorks, Inc. (*Æ*) completed a paleontological resource assessment for the Eastern Municipal Water District (EMWD) Good Hope and Mead Valley Project (Project) outside the city of Perris in Riverside County, California (Figure 1). EMWD proposes improvements to two existing water systems in western Riverside County: the Good Hope–Olive Area Water System and the Mead Valley–Robinson Street Water Pipeline.

Æ's scope of work included desktop review of geologic maps, paleontological literature, and museum records searches as well as a paleontological field survey of the Project area. This technical memorandum summarizes the findings and was written by staff who meet mitigation paleontology industrywide standards (Murphey et al. 2019) as well as qualification standards of the Society of Vertebrate Paleontology (2010). EMWD is the lead agency for compliance with the California Environmental Quality Act (CEQA).

PROJECT DESCRIPTION AND BACKGROUND

The proposed Project involves water system improvements and additions in two discontiguous areas. The Good Hope–Olive Area Water System (hereafter referred to as the Good Hope portion) involves replacing a cumulative length of approximately 7,800 feet of existing 4-inch-diameter PVC pipeline with 8-inch-diameter PVC pipeline within segments of Club Drive, Eucalyptus Avenue, Main Street, Sharp Road, and other streets west of the city of Perris. These improvements fall within Sections 2, 3, and 10, Township 5 South, Range 4 West, San Bernardino Baseline and Meridian, on the Steele Peak, California 7.5-minute U.S. Geological Survey (USGS) topographic quadrangle map. The Good Hope portion comprises approximately 10 acres.

The Mead Valley–Robinson Street Water Pipeline (hereafter referred to as the Mead Valley portion) involves constructing a cumulative length of approximately 5,650 feet of new 8-inch-diameter PVC pipeline within segments of Carroll, Day, Oakwood, Pinewood, and Robinson Streets northwest of the city of Perris. These improvements fall within Section 10, Township 4 South, Range 4 West, San Bernardino Baseline and Meridian, on the Steele Peak, California 7.5-minute USGS topographic quadrangle map. The Mead Valley portion comprises approximately 8 acres.

The trench for the new pipeline will be 5 feet deep. The Project also will include excavation to a maximum depth of 10 feet at crossings of future storm drains at the intersection of Eucalyptus and Spring and along Club Avenue proposed by others.

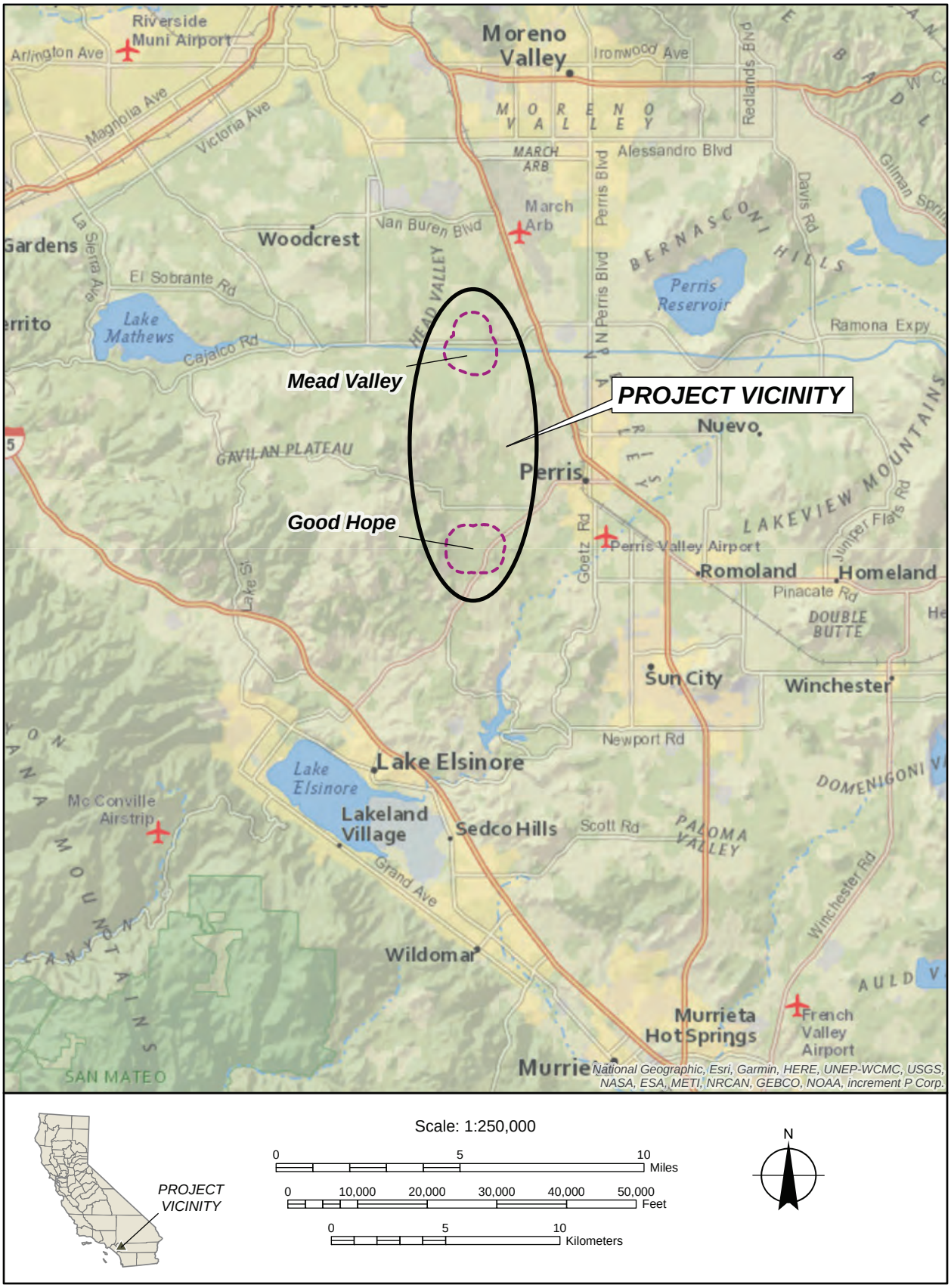


Figure 1 Project vicinity.

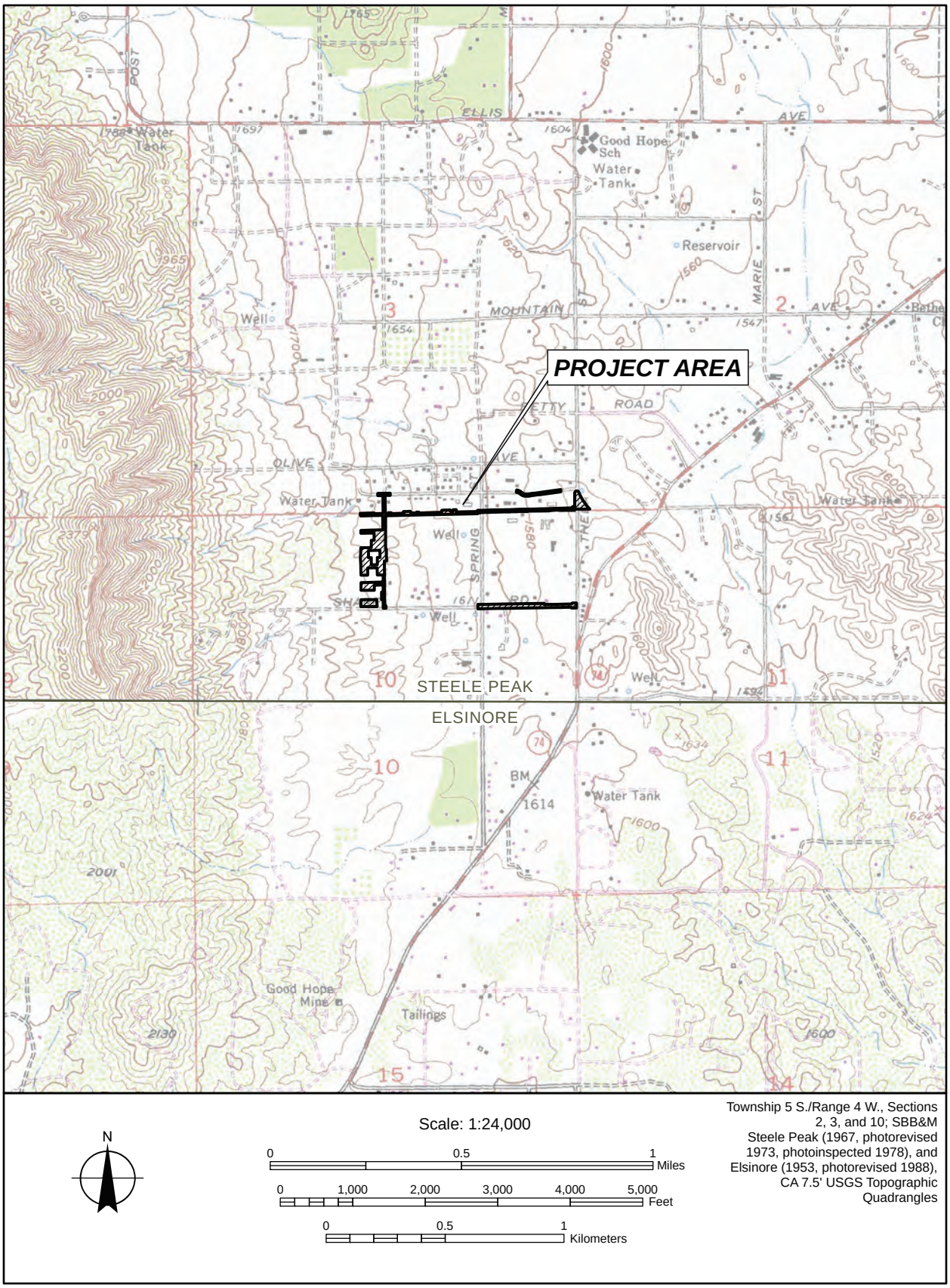


Figure 2 Good Hope portion.

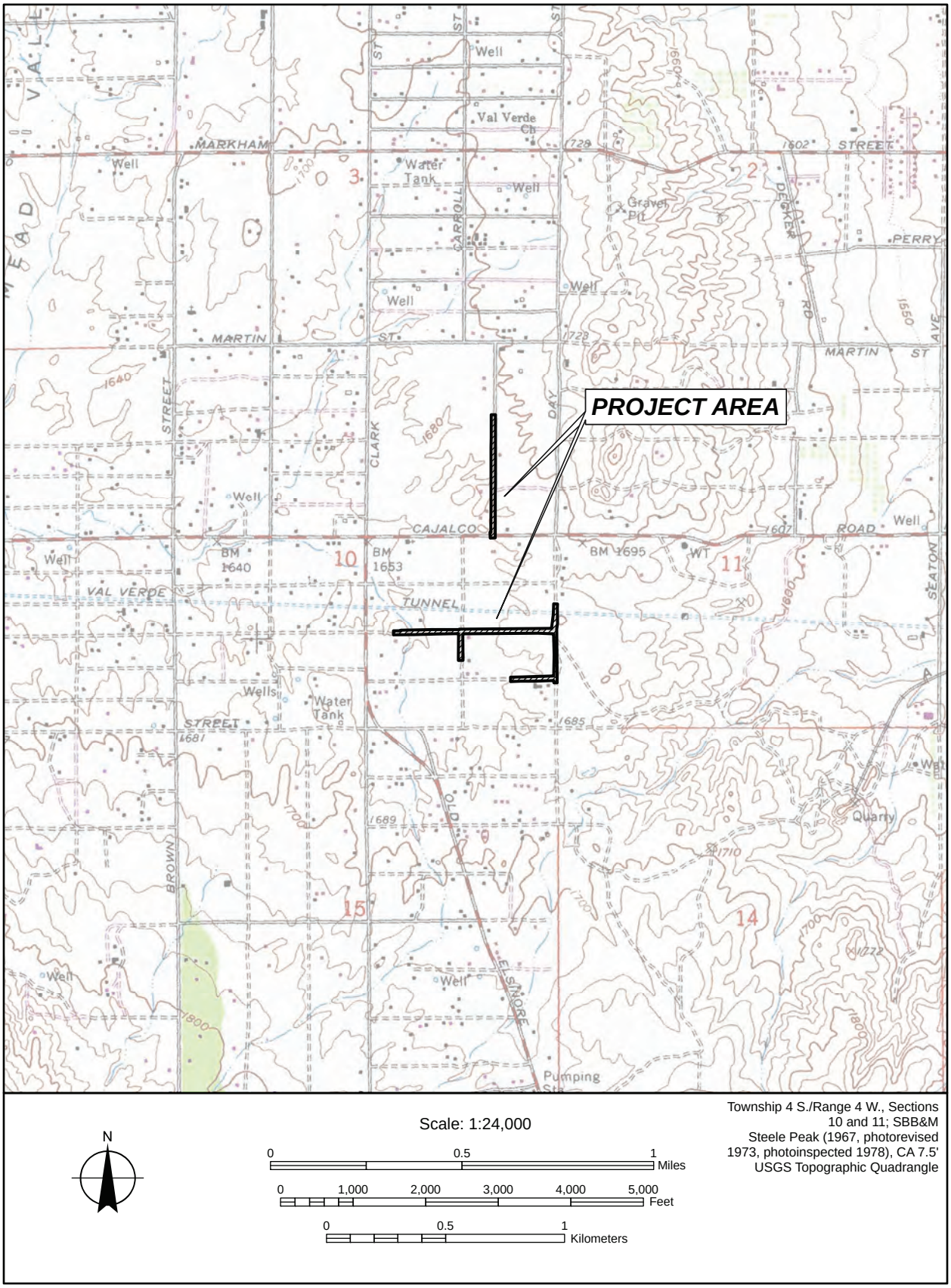


Figure 3 Mead Valley portion.

REGULATORY CONTEXT

This Project is subject to both state laws and local goals and policies. The following section provides an overview of the relevant laws and regulations.

State

At the state level, paleontological resources are protected under CEQA, which requires detailed studies that analyze the environmental effects of a proposed project. If a project is determined to have a potential significant environmental effect, the act requires that alternative plans and mitigation measures be considered. Specifically, Section VII(f) of Appendix G of the CEQA Guidelines, the Environmental Checklist Form, poses the question, "Will the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?" If paleontological resources are identified as being within the proposed project area, the sponsoring agency must take those resources into consideration when evaluating project effects. The level of consideration may vary with the importance of the resource.

County of Riverside

There are several policies covering paleontological resources within the County of Riverside's (County) *General Plan*, *Multipurpose Open Space (OS) Element* (Riverside County Planning Department 2015:OS-51):

> **OS 19.6:** Whenever existing information indicates that a site proposed for development has high paleontological sensitivity as shown on Figure OS-8, paleontological resource impact mitigation program (PRIMP) shall be filed with the Riverside County Geologist prior to site grading. The PRIMP shall specify the steps to be taken to mitigate impacts to paleontological resources.
>
> **OS 19.7:** Whenever existing information indicates that a site proposed for development has low paleontological sensitivity as shown on Figure OS-8, no direct mitigation is required unless a fossil is encountered during site development. Should a fossil be encountered, the Riverside County Geologist shall be notified and a paleontologist shall be retained by the project proponent. The paleontologist shall document the extent and potential significance of the paleontological resources on the site and establish appropriate mitigation measures for further site development.
>
> **OS 19.8:** Whenever existing information indicates that a site proposed for development has undetermined paleontological sensitivity as shown on Figure OS-8, a report shall be filed with the Riverside County Geologist documenting the extent and potential significance of the paleontological resources on site and identifying mitigation measures for the fossil and for impacts to significant paleontological resources prior to approval of that department.
>
> **OS 19.9:** Whenever paleontological resources are found, the County Geologist shall direct them to a facility within Riverside County for their curation, including the Western Science Center in the City of Hemet.

PALEONTOLOGICAL RESOURCE POTENTIAL

Most professional paleontologists in California adhere to the guidelines set forth by the Society of Vertebrate Paleontology (2010) and industrywide standards (Murphey et al. 2019) to determine the

course of paleontological mitigation for a given project unless specific city, county, state, or federal guidelines are available. The County has developed a countywide ranking system that establishes detailed protocols for the assessment of the paleontological sensitivity of a project area and outlines measures to follow in order to mitigate adverse impacts to known or unknown fossil resources during project development (County of Riverside 2015). Therefore, this memorandum uses the County's ranking system and mitigation measures.

Following the County's established process, baseline information is used to assign the paleontological sensitivity of a geologic unit(s) (or members thereof) to one of four categories—Low, Undetermined, High A (Ha), and High B (Hb) potential (County of Riverside 2015). Geologic units are considered to have Low Potential for paleontological resources if they are unlikely to preserve fossils (e.g., very young sedimentary deposits, plutonic rocks, medium-grade or higher metamorphic rocks) or have been demonstrated to have low potential from previous surveys and assessments. Geologic units with undetermined potential for paleontological resources are those with little to no information in the literature or have not been previously assessed. Geologic units are considered to be "sensitive" for paleontological resources and have a high potential for paleontological resources if they are known to include significant fossils anywhere in their extent, even if outside the Project area. Significant fossils are defined by the Society of Vertebrate Paleontology (2010) as those that contribute new and useful taxonomic, phylogenetic, paleoecologic, taphonomic, biochronologic, or stratigraphic data. The County's Ha potential is based on the occurrence of fossils that may be present at the ground surface of the Project area, whereas Hb potential is based on the occurrence of fossils at or below 4 feet deep, which may be impacted during construction activities (County of Riverside 2015). A coarse-grained paleontological sensitivity map of Riverside County indicates the sensitivity rankings across the ground surface based on the County's established process (Riverside County Planning Department 2015:Figure OS-8, OS-55).

METHODOLOGY

To assess the paleontological sensitivity of geologic units mapped at the ground surface and those likely to occur in the subsurface of the Project area, Æ completed desktop studies and a field survey. For the desktop studies, Æ first researched published geologic maps and paleontological literature for the region. Æ then requested the Natural History Museum of Los Angeles County (NHMLAC) and the Western Science Center (WSC) in Hemet, California, to conduct searches of fossil localities recorded in their collections (Bell 2023; Stoneburg 2023). To augment these results, Æ also conducted searches of the online Paleobiology Database (PBDB) and the University of California Museum of Paleontology (UCMP). The PBDB lists a large collection of museum records and publications of fossil material, whereas the UCMP is the largest repository of fossils on the West Coast of the U.S., with an older history of collection than several other regional natural history museums.

Æ Paleontology Technician, Andrew Vasquez, conducted the paleontological field survey of the Project area on August 17, 2023, under the remote supervision of Senior Paleontologist Melissa Macias. The purpose of the survey was to confirm the presence or absence of mapped geologic units, evaluate geologic exposures for their potential to yield subsurface fossil material, and investigate exposed fossils, if any. Prior to the survey, Æ examined recent aerial photographs of the Project area in Google Earth to determine likely locations of geologic outcrops. Vasquez completed the paleontological survey alongside Æ Associate Archaeologist Andrew DeLeon, who conducted the cultural resources field survey. The

survey began at Day Street at the northern end of the Mead Valley portion, and continued south, and then to the west along Oakwood Street. Vasquez walked the entire Mead Valley portion on foot with 10 meter transects. The same survey methods were used for the Good Hope portion, with the exception of the staging areas on the western edge along Main Street, as those were on private property. In the Good Hope portion, Vasquez and DeLeon began their surveys at the northeast corner and walked westward along Olive Street, then southward on Main Street, then along Sharp Road to complete the survey.

Vasquez completed the survey with a combination of close visual inspection and spot-checking. Close visual inspection was conducted where the ground surface was visible and intact sediments were exposed along the shoulders of roads. Vasquez conducted spot-checking for the remainder of the Project area in which the ground surface was obscured by vegetation or hardscaped. He used a cellular global positioning system to navigate through the Project area, kept notes on the geology observed, and took photographs to document the survey. Any fossils encountered were to be field-documented and not collected.

RESOURCE CONTEXT

The Project area is situated in the Menifee Valley within the northern part of the geologically complex Peninsular Ranges geomorphic province. A geomorphic province is a region of unique topography and geology that is distinguished from other regions based on its landforms and tectonic history (American Geological Institute 1976). Derived from the same massive batholith (i.e., very deep igneous intrusion) as the core of the Sierra Nevada Mountains, the Peninsular Ranges are a series of mountain ranges separated by northwest-trending valleys formed from faults branching from the San Andreas Fault (California Geological Survey 2020; Norris and Webb 1976). The mountain ranges are bounded to the east by the Colorado Desert and range in width from 30 to 100 miles (Norris and Webb 1976). The Project area is located within the central part of the Perris Block, a relatively stable rectangular structural unit positioned between the Elsinore and San Jacinto fault zones (Morton et al. 2003).

The basement rocks in this region are part of a large assemblage known as the Peninsular Ranges Assemblage. Rocks of the assemblage date from the Paleozoic[1] to the present, with most associated with the Mesozoic-age[2] Peninsular Ranges batholith, as well as pre-batholithic metasedimentary and metavolcanic rocks into which the batholith was emplaced (Jahns 1954; Morton et al. 2006a, 2006b). Among these basement rocks is the Val Verde Pluton, a relatively large body extending from south of Perris northward toward Riverside. Cenozoic[3]sedimentary rocks and deposits, mostly Quaternary[3] in

[1] Paleozoic Era: Approximately 539 to 252 million years ago, subdivided into six periods—Cambrian (539–485 million years ago), Ordovician (485–444 million years ago), Silurian (444–419 million years ago), Devonian (419–359 million years ago), Carboniferous (359–299 million years ago), and Permian (299–252 million years ago) (Cohen et al. 2023).
[2] Mesozoic Era: Approximately 252 to 66 million years ago, subdivided into three periods—Triassic (252–201 million years ago), Jurassic (201–145 million years ago), and Cretaceous (145–66 million years ago) (Cohen et al. 2023).
[3] Cenozoic Era (formerly Tertiary): 66 million years ago to present, subdivided into three periods—Paleogene (66–23 million years ago), Neogene (23–2.6 million years ago), and Quaternary (2.6 million years ago to present). The Paleogene Period is subdivided into the Paleocene, Eocene, and Oligocene epochs; the Paleocene Epoch lasted from approximately 66 to 56 million years ago, the Eocene Epoch lasted from approximately 56 to 34 million years ago, and the Oligocene Epoch lasted from approximately 34 to 23 million years ago. The Neogene Period is subdivided into the Miocene and Pliocene epochs; the Miocene Epoch lasted from approximately 23 to 5.3 million years ago and the Pliocene Epoch lasted from approximately 5.3 to 2.6 million years ago. The Quaternary Period is subdivided into the Pleistocene and Holocene epochs;

age, form thick deposits that rest unconformably above the basement rocks in the vicinity of the Project area (Morton et al. 2006a).

The regional surface geology, including in the Project area, is mapped at a scale of 1:24,000 by Dibblee and Minch (2003) and at a scale of 1:100,000 by Morton et al. (2006a). The following discussion is largely based on Morton et al. (2006a) as the map is the most recent published map of the region. According to Morton et al. (2006a), the surficial geology of the Good Hope portion consists of metamorphic, igneous, and sedimentary units, specifically schist from the Triassic-age Rocks of Menifee Valley (Ŧrms), massive-textured tonalite from the Cretaceous-age Gavilan Ring Complex (Kgt), early to middle Pleistocene very old alluvial-fan deposits ($Qvof_a$)[4], and middle to late Pleistocene old alluvial-fan deposits (Qof_a). Unit Ŧrms is mapped at the northeast corner of the Good Hope portion near the intersection of Olive Street and Theda Street and consists of low- to high-grade biotite to sillimanite schist. Unit Kgt is mapped in the west portion between Pepper Drive and Pine Street and consists of massive hypersthene-bearing biotite-hornblende tonalite that forms most of the Gavilan Ring Complex. Unit $Qvof_a$ is mapped near the southwest corner of the Good Hope portion between Pine Street and Sharp Road and consists of moderately to well consolidated, medium to dark reddish-brown sands. Lastly, Unit Qof_a, moderately consolidated massive to poorly bedded, reddish-brown sands, is mapped throughout most of the ground surface.

In the Mead Valley portion, Morton et al. (2006a) shows only igneous and sedimentary geologic units, namely the Cretaceous-age Val Verde tonalite (Kvt) and early to middle Pleistocene very old axial-channel deposits ($Qvoa_a$). The principal rock type of the Val Verde Pluton, Unit Kvt, is mapped across almost the entire Mead Valley portion and consists of relatively homogeneous hypautomorphic-granular biotite-hornblende tonalite. Unit $Qvoa_a$ is mapped at the southwest corner on Pinewood Street and consists of well consolidated to moderately to well indurated reddish-brown sands.

Metamorphic rocks such as schist (Ŧrms) rarely, if ever, preserve fossils due to the intense heat and pressure of formation. Plutonic rocks such as tonalite (Kgt, Kvt) do not preserve fossils at all due to their magmatic origins. However, Pleistocene alluvial deposits such as $Qvof_a$, Qof_a, and $Qvoa_a$ have proven to be highly fossiliferous throughout inland valleys of Riverside and San Bernardino counties (Reynolds and Reynolds 1991) and have yielded a wide variety of megafauna, such as mammoths, ground sloths, dire wolves, saber-toothed cats, horses, camels, and bison, as well as numerous invertebrate and plant taxa (Scott 2007; Springer et al. 2009). In particular, a diverse assemblage of fossils has been recovered from Pleistocene alluvial deposits approximately 10 miles to the east of both portions in the community of Lakeview, including mammoth (*Mammuthus*), saber-toothed cat (*Smilodon*), extinct horse (*Equus*), bison (*Bison* sp. cf. *B. antiquus*), and numerous small mammals, reptiles, invertebrates, and plants (Reynolds and Reynolds 1991). Also, excavations near Diamond Valley Lake—approximately 15 miles to the east of the Good Hope portion—have yielded nearly 100,000 identifiable fossils representing over 105 vertebrate, invertebrate, and plant taxa from Pleistocene alluvial deposits (Springer et al. 2009, The Paleobiology Database). This locality represents the largest known, non-asphaltic, open-environment late Pleistocene fossil assemblage in the American southwest.

Pleistocene Epoch, or last Ice Age, lasted from approximately 2.6 million to 11,700 years ago when the Holocene Epoch began; all dates according to (Cohen et al. 2023).

[4] Subscript “a” denotes arenaceous.

RECORDS SEARCH RESULTS

Museum records search results from the NHMLAC as well as online search results from the PBDB are detailed in Table 1. Stoneburg (2023) reported no fossil localities from the WSC collections in the Project area or within a 1-mile radius. The UCMP's online database did not list any fossil localities from Pleistocene-age deposits within the Project area or within a 20-mile radius.

Bell (2023) reported no fossil localities from the NHMLAC collections within the Project area. However, she listed several nearby localities that are south-southeast of the Project area in Pleistocene deposits similar to those mapped either at the surface or likely at depth in the Project area. The closest localities are LACM VP 5168, LACM (CIT) 570–(CIT) 572, and LACM VP 6059, all from unknown Pleistocene formations. Horse specimens were recovered from VP 5168 and (CIT)570–(CIT)572, and camel specimens were recovered from (CIT)570–(CIT) 572 as well as from VP 6059. (CIT)570–(CIT)572 was the only locality among the three to yield peccary. Locality LACM VP 7261 is 17 miles southeast of the Project area and yielded a proboscidean specimen and an unspecified ungulate. Bell (2023) also reported a locality from younger alluvial deposits at least 20 miles from the Project area. LACM VP 6967 yielded a mixed assemblage of amphibians, reptiles, mammals, and invertebrates collected during augering at unknown depths, namely tree frog, garter snake, legless lizard, gopher, and snails.

Table 1
Fossil Localities Reported near the Project Area

Locality No.	Geologic Unit (Date)	Taxa	Depth	Approx. Distance from Project (Closest Portion)
LACM[a] VP 5168	Unknown formation (Pleistocene)	*Equus*	Unknown	5.5
LACM[a] VP (CIT)570–(CIT)572	Unknown formation (Pleistocene)	*Equus* (horse) *Platygonus* (peccary) *Camelops* (camel)	Unknown	7.5 miles
LACM[a] VP 6059	Unknown formation (Pleistocene)	Camelidae (camel family)	Unknown	7.5 miles
PBDB[b]—Lakeview localities	Alluvial deposits (Pleistocene)	*Mammuthus* (mammoth) *Smilodon* (saber-toothed cat) *Equus* (horse) *Bison* sp. cf. *B. antiquus* (bison) Numerous other vertebrates, invertebrates, and plants	Unknown	15 miles
LACM[a] VP 7261	Unknown formation (Pleistocene, arenaceous silt)	Proboscidea (elephant clade) Unspecified ungulate	Unknown	17 miles
LACM[a] VP 6967	Younger alluvium (unspecified age; pebble, gravel, sand, silt, and clay)	*Hyla* (tree frog) *Anniella* (legless lizard) *Thamnophis* (garter snake) *Thomomys* (pocket gopher) Gastropoda (snails)	Unknown, collected during augering	> 20 miles

a - Bell (2023)
b - Paleobiology Database

The PBDB online database does not list any fossil localities from Pleistocene alluvial deposits within the Project area but does list numerous localities from the community of Lakeview, mentioned in the Resource Context section above. These localities are approximately 15 miles east of the Project area, and are documented by Reynolds and Reynolds (1991). The localities yielded mammoth, saber-toothed cat, horse, bison, and numerous small mammals, reptiles, invertebrates, and plants.

FIELD RESULTS

Most of the ground surface in the Project area has been disturbed by previous infrastructural, residential, and commercial development (Figures 4–6). Because of the previous disturbances, many portions of the Project area do not provide intact geologic information, including the rights-of-ways of all paved or graded roads within the Good Hope and Mead Valley portions. In addition, the proposed staging areas within the Good Hope portion were examined from the existing right-of-way as they were not accessible during the survey. *Æ*'s close examinations of the surficial geology were limited to sparse patches along the roads that were unobscured by vegetation as well as a few outcrops near staging areas on the west end of Cherry Lane and west end of Pine Street within the Good Hope portion. Within these exposures, *Æ* observed reddish-brown (5 YR 3/2) deposits of mostly silty fine-grained sands with minor amounts of gravels. The sediments match the descriptions of $Qvoa_a$ by Morton et al. (2006a). In the Mead Valley portion, *Æ* observed massive-textured gray tonalite outcrops east of Day Street outside the Project area (Figure 4) and reddish-brown (5 YR 6/4) deposits consisting of consolidated silty sands matching the description of Qof_a by Morton et al. (2006a) throughout the remainder. *Æ* did not encounter any paleontological resources during the surveys of the Good Hope and Mead Valley portions.

Figure 4 **Carroll Street right-of-way from its intersection with Pinewood Street in Mead Valley portion; facing north.**

Figure 5 **Rider Street right-of-way from the intersection of Day Street in the Mead Valley portion; facing west.**

Figure 6 **The staging area near the west end of Pine Street in the Good Hope portion; facing south-southeast.**

Figure 7 Weathered tonalite outcrops east of Day Street, facing east.

FINDINGS AND RECOMMENDATIONS

According to the County's paleontological sensitivity map, the Project area is mapped as low to undetermined sensitivity. Æ's findings support the ranking of low sensitivity for areas mapped with igneous and metamorphic rocks at the surface. However, the three Pleistocene alluvial units ($Qvof_a$, Qof_a, and $Qvoa_a$) should be elevated to the ranking of high sensitivity, as the records searches demonstrate they have the potential to yield identifiable and significant fossils. Regional paleontological literature and museum records searches indicate numerous fossils have been recovered from Pleistocene-age alluvial deposits within a 20-mile radius of the Project area.

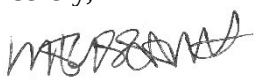
Because much of the ground surface in the Project area is previously disturbed, construction activities limited to disturbance of only the ground surface are unlikely to affect significant and intact paleontological resources. However, since Project-related trenching is anticipated to reach a maximum depth of 5 feet for the installation of new pipelines, and excavations will reach a maximum depth of 10 feet at future storm drain crossings, these activities could potentially affect previously undisturbed subsurface sediments as well as significant and intact paleontological resources. Such activities may require monitoring, although the monitoring duration and frequency should be determined by a qualified paleontologist in coordination with the Project developer.

Æ recommends that a qualified paleontologist who meets industry standards (Murphey et al. 2019) prepare a Paleontological Resource Impact Mitigation Program (PRIMP) prior to the start of Project-related ground-disturbing activities. The purpose of the PRIMP is to establish mitigation monitoring procedures and discovery protocols, based on industrywide best practices (Murphey et al. 2019), for any paleontological resources that may be encountered as a result of earth-disturbing activities during

construction of the Project. For instance, Worker's Environmental Awareness Program (WEAP) training should be prepared prior to the start of Project-related ground disturbance and presented in person to all field personnel to describe the types of fossils that may occur and the procedures to follow if any are encountered in the Project area. A PRIMP also will indicate where construction monitoring will be required for the Project and the frequency of required monitoring (i.e., full-time, spot checks, etc.). The collection and processing (e.g., wet- or dry-screening) of sediment samples to analyze for presence or absence of microvertebrates and other small fossils also would be addressed in a PRIMP. In addition to monitoring and sampling procedures, a PRIMP will also provide details about fossil collection, analysis, and preparation for permanent curation at an approved repository, such as the WSC. Lastly, the PRIMP will describe the different reporting standards to be used for monitoring with negative findings versus monitoring resulting in fossil discoveries.

It has been a pleasure assisting you with this Project. If you have any questions, please do not hesitate to contact me at (626) 578-0119 x402.

Sincerely,



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APPENDIX F: PRELIMINARY DESIGN REPORT

PRELIMINARY DESIGN MEMORANDUM FOR MEAD VALLEY AND GOOD HOPE WATER IMPROVEMENTS PROJECT

August 2023

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APPENDIX F 30% Construction Plans

1.0 Background and Project Description

The Eastern Municipal Water District's (District) Disadvantaged Community (DAC) Water Main Improvements Mead Valley and Good Hope Project (Project) consists of installing a total of 13,150 linear feet of 8-inch diameter potable water main within the Mead Valley and Good Hope communities in the unincorporated area outside City of Perris. This Project is funded by the American Rescue Plan Act (ARPA) in partnership with the County of Riverside (County) and will close gaps between existing potable water mains in the area and eliminate remote water meters and install new water meters in front of each customer's property. The general project location is shown in **Figure 1.1**. The new water mains will provide reliability and redundancy by looping the water systems within the 1832 Good Hope 2 Pressure Zone (PZ) and within the 1872 Mead Valley PZ. **Figures 1.2, 1.3** and **Figure 1.4** show the proposed pipeline alignments in each project area. The proposed pipeline size and material is 8-inch diameter polyvinyl chloride (PVC).

a. Project Goals

The District's major goals for the Project can be summarized as follows:

1. Close gaps between existing water mains
2. Increase fire flow capacity
3. Relocate remote water meters and services
4. Minimize disruption to the public
5. Minimize utility conflict and relocations
6. Design for long-term accessibility, serviceability, and longevity
7. Follow District Standards and industry standards
8. Comply with jurisdictional requirements for project acceptance
9. Complete Project by December 2026

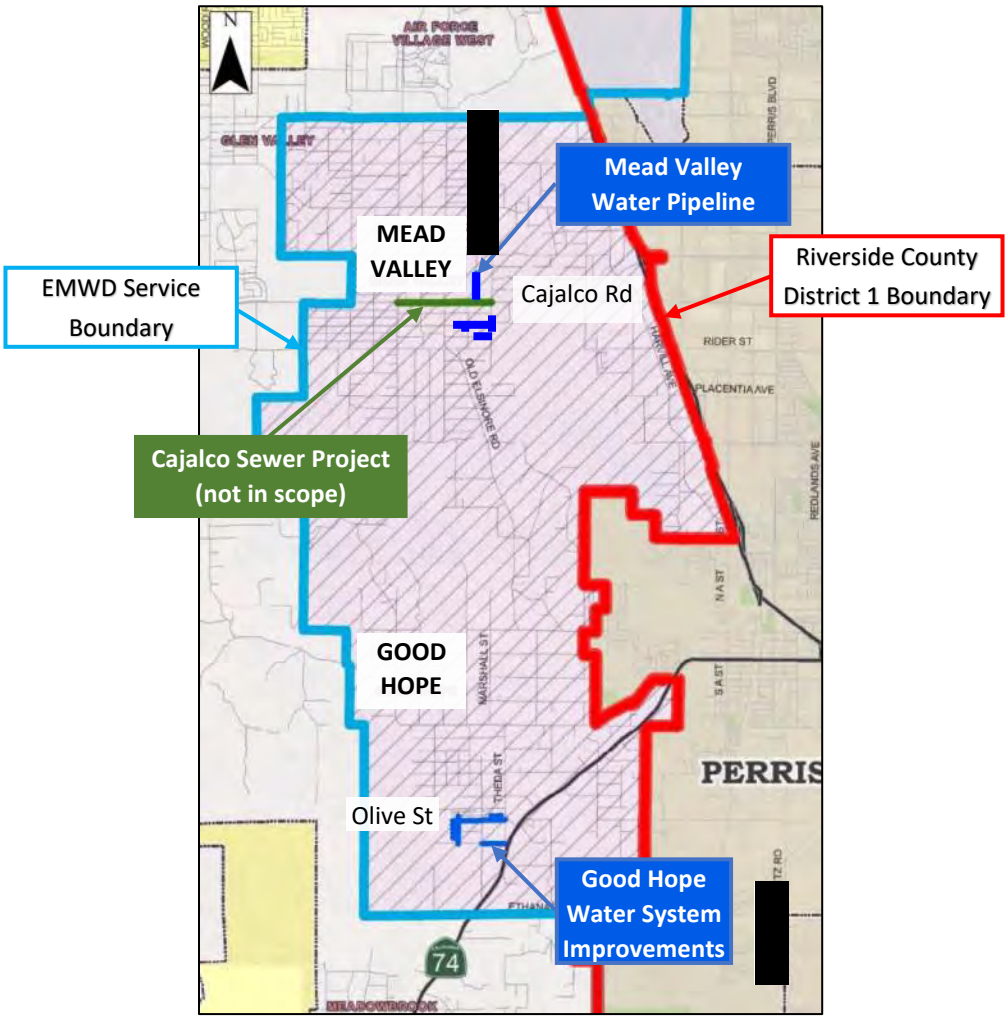


Figure 1.1 Project Area

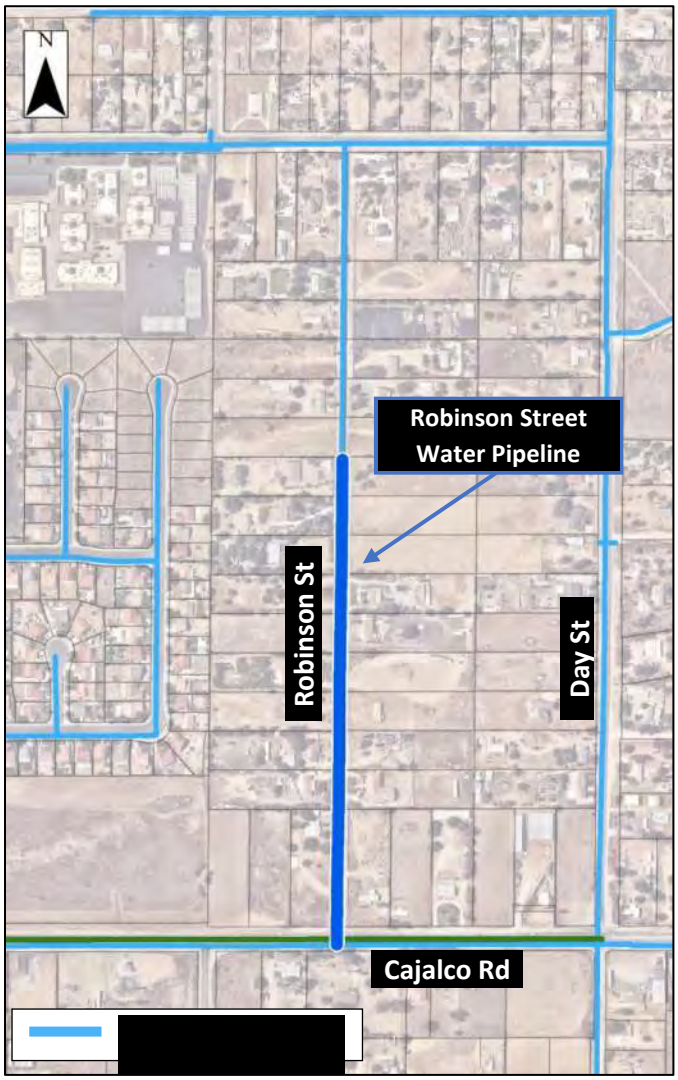


Figure 1.2 Mead Valley Project (North of Cajalco)

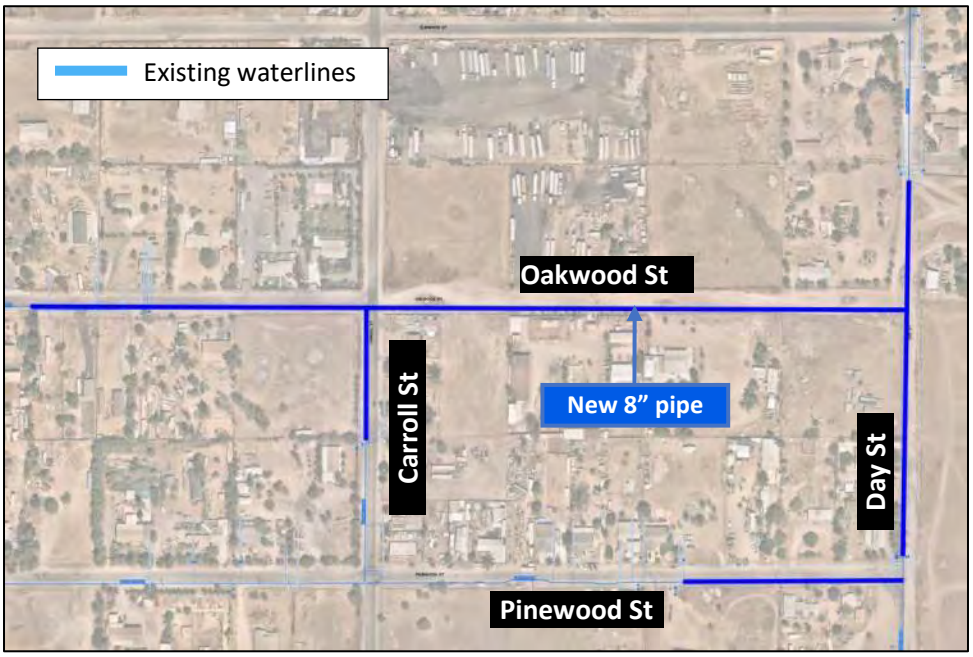


Figure 1.3 Mead Valley Project (South of Cajalco)

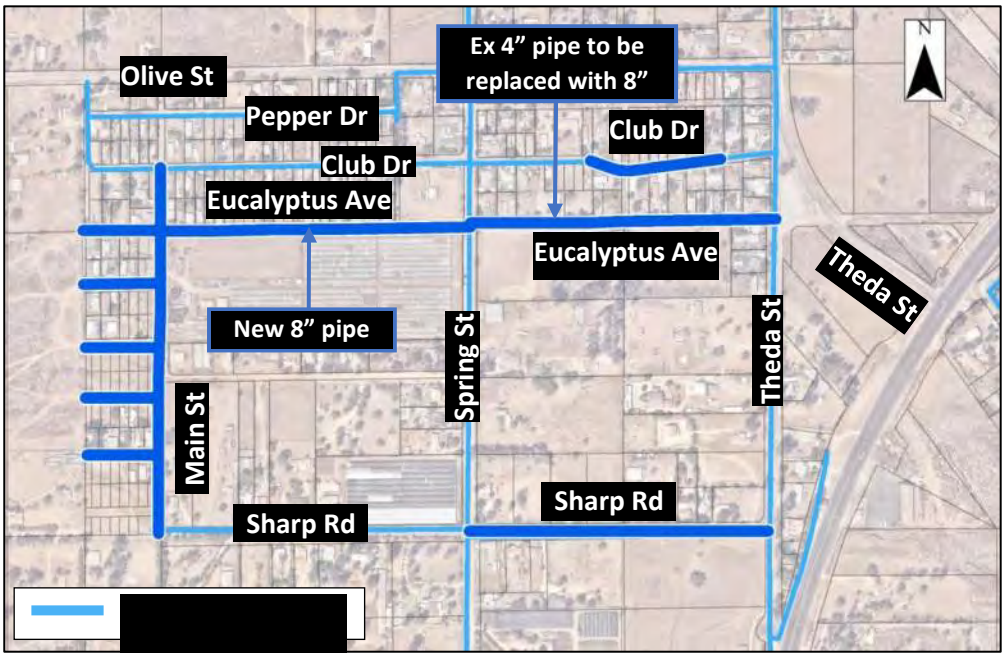


Figure 1.4 Good Hope Project

2.0 Existing Conditions

a. Existing Utilities

By utilizing Underground Service Alert (Dig Alert) online system, **Table 2.1** lists the utility owners identified in the Project area. Record drawings were requested and obtained from utility owners identified by Dig Alert as having existing utilities in the project area.

Table 2.1 Franchise Utilities Log

Utility Owner	Utility Type	Buried or Overhead
Frontier Communications	Telecommunications	Overhead/Buried
So Cal Edison	Electric Distribution	Overhead/Buried
So Cal Gas	Gas Distribution	Buried
Spectrum	Telecommunications	Overhead

The District provided record drawings and plans for District owned facilities within the project area. **Table 2.2** lists the records provided by the District.

Table 2.2 District Records

Utility Owner	Project Name	Drawing Number	Type of Improvement
EMWD	Improvement District No. 16	D-1426, D-1525 to D-1528	Water
EMWD	Port. Mountain Glen Tract	D-1884	Water
EMWD	Port. Good Hope Country Club Heights and Port. Mountain Glen Tract	D-1889	Water
EMWD	N1/2 of NE 1/4 Sec 10 TSS R4W	D-1902, D-1903	Water
EMWD	Club Drive	D-12550	Water
EMWD	Mead Valley Library Water Improvement Plans Oakwood Street	D-43326	Water
EMWD	Cajalco Road Sewer Force Main	D-16906	Sewer
EMWD	Cajalco Road Sewer Force Main	D-16907	Sewer

The District provided the latest master plans for water and sewer. **Table 2.3** provides a list of master plans referenced for this Project.

Table 2.3 EMWD Master Plans

Report Title	Prepared By	Date
2015 Water Facilities Master Plan Update	West Yost Associates	September 2016
2015 Wastewater Collection System Master Plan	Black & Veatch	October 2016

Riverside County Flood Control & Water Conservation District (RCFCWCD) was identified as having proposed storm drainage in the public right-of-way. **Table 2.4** lists the record types obtained from RCFCWCD.

Table 2.4 Riverside County Records

Utility Owner	Project Name	Drawing Number	Type of Improvement
Riverside County Flood Control & Water Conservation District	Good Hope Olive Avenue Storm Drain	4-0-00425	Storm Drain

The existing utilities were plotted from utility maps and record drawings obtained during the research process. In addition, field surveying by Hunsakar & Associates assisted in mapping utilities. Due diligence is critical in minimizing utility conflicts when designing an underground utility project. IEC and the District performed a field investigation on September 12, 2022 to verify utility plotting through visual field investigation where possible to confirm the existing utilities.

At each milestone, a set of plans will be sent to each utility owner along with a form entitled "Utility Conflict Check for Proposed Improvements" for owners to verify the accuracy of the existing utilities as plotted. IEC will request that the utility owners perform a utility conflict check and confirm that their utilities are not in conflict with the proposed project. Responses are reviewed and incorporated into the design as necessary. If utilities require relocation, the agency will be notified immediately. However, this will be avoided where possible by design. If the utilities are to be protected in place, the Contract Documents will indicate as such along with any special requirements required by the owner.

b. Remote Water Meters

Where water mains do not exist along the road fronting the customer's properties their water meters are located remotely with long service lines that extend from the meter to the customer's property. A list of the remote meters being eliminated and new meters being installed in front of the customer's property by this Project can be found in **Appendix A**.

(a) Mead Valley

A water main does not exist along a portion of Robinson Street between Cajalco Road and approximately 1,620-ft north along Robinson Street. Ten (10) properties along Robinson Street have a remote meter with service lines that cross through various properties. The existing remote meters for these properties will be moved and installed along Robinson Street at each customer's property.

Water mains do not exist along Oakwood Street (between 530-ft west of Carroll Street and Day Street), Day Street (between 315-ft north of Oakwood Street and Pinewood Street, Pinewood Street (between 800-ft east of Carroll Street and Day Street), and along Carroll Street (between 330-ft north of Pinewood Street and Oakwood Street). Fifteen (15) properties along these streets have remove meters. The existing remote meters will be moved and installed along each customers' property.

(b) Good Hope

Water mains do not exist along Eucalyptus Avenue (west of Spring Street), Club Drive (between Theda Street and Spring Street), Main Street, Maple Avenue, Pine Street, Cherry Lane, and Maguglin Way. Thirty-three (33) properties along these streets have remote meters with service lines that cross though various properties and may have a high chance of cross connections.

c. Existing Geology and Subsurface Conditions

Atlas Technical Consultants LLC (Atlas) prepared a Geotechnical Report and is included in **Appendix B**. The geotechnical investigations included drilling twelve (12) borings at depths between 13-ft and 41.5-ft along the Project alignments. Boring B-1W through B-5W were drilled within the Good Hope area, and Borings B-6W through B-12W were drilled in the Mead Valley area. Findings are summarized herein.

(a) Groundwater

Groundwater was encountered in Borings B-3W, B-4W, B-6W, B-8W, and B-9W at depths as shallow as 9-ft below ground surface (bgs).

(b) Soil Corrosivity

The electrical resistivity for the sampled boring location (B-1W) was 1,500 ohm-cm identifying the soil to be corrosive.

(c) Trenching

The site is located within the Peninsular Ranges Geomorphic Province of California. The Project area is generally underlain by fill, old alluvial-fan deposits, Val Verde tonalite, massive-textured tonalite, and Schist. In addition, gravel, cobbles, and boulders may be encountered.

i. Excavations

Excavations in fill and old alluvial flood-plain deposits may be unstable and contain cobbles or boulders. Difficult excavation should be anticipated in areas with shallow rock. Rock breakers, carbide tipped augers, or carbide/diamond tipped coring equipment may be required to excavate/drill hard rock materials.

Bedrock was observed in all borings at depths between 5.5-ft and 15-ft.

Temporary excavations 4-ft deep or less or in competent bedrock can be made vertically. Temporary excavations deeper than 4-ft in fill, old alluvial flood-plain deposits, and intensely weathered or decomposed bedrock should not be steeper than 1½:1 (horizontal: vertical). Slopes steeper will require shoring. If slopes are to be maintained during the rainy season, berms are recommended.

ii. Trench Zone Materials

It is anticipated that most of the materials along the pipeline alignment will provide adequate support for the pipe. However, loose, soft, and otherwise unsuitable materials may be encountered and should be removed from the trench. The excavated materials may be replaced with compacted fill or with pipe bedding material. Stabilizing fabric such as Mirafi® HP 570 can be used to stabilize the bottom of the excavations, if needed.

The on-site soils are not suitable for pipe bedding and will require import Bedding material should consist of clean sand 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.

Backfill should be placed in 6-inch to 8-inch thick loose lifts and compacted to at least 90% relative compaction. Benches should be excavated to provide a relatively level surface for fill placement when fill is to be placed on surfaces inclined steeper than 5:1. 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.

(d) Jack & Bore

Per RCFCWCD, the preferred method for installing facilities crossing under RCFCWCD utilities is bore and jack. Based on the borings, if this is required, trenchless excavation is expected to be through fill and old alluvial fan deposits but may encounter boulders. The Contract Documents should state that equipment capable of advancing in medium to very dense sand and gravel, cobbles, and possibly cemented horizons and boulders may be required.

d. Utility Potholing of Existing Utilities

AirX performed the potholing and the Pothole Report can be found in **Appendix C**.

3.0 Basis of Design

a. District Design Standards

The design will conform to the District's Guidelines for Water System Plan, dated April 1, 2021, Water Standard Drawings, and the Approved Materials List. **Table 3.1** tabulates the District's design criteria and the Project-specific requirements.

Table 3.1 Design Criteria

Item	District Standard	Project Requirements
Water Crossings	Water pipeline crossings over non-potable mains must have 1-ft of vertical clearance between bottom of water and top of non-potable mains.	
Pipe Type	Cement Mortar Lined & Coated (CML&C) Welded Steel Pipe (WSP), DI, PVC C900 with class pipe, etc.	PVC C900
Pipe Size	Min. 8-inch diameter	8-inch diameter
Pipe Location	7’ off the curb face in the street on the south or west side of the street	No existing roadway curbs or County future ultimate street improvements
Separation	Minimum 10’ horizontal clearance required between water and sewer (OD to OD)	Meets standard
Depth of Cover	4’ cover over the top of the pipe	Min. 4-ft
Fire Hydrants		Install on opposite side of overhead lines, if possible
Air Valves	High points in the water line wherever pipe grade changes from an “uphill” slope to a “downhill” slope	To be determined
Blow-off Valves	- Use a blow-off at the end of all lines that will not be extended in the future where no fire hydrant exists. - Required between two valves along a pipe length where no fire hydrant exists.	To be determined
Valves	- Resilient seated gate valve (RSGV) Valves must be used throughout the system - Every 1, 000' of continuous mainline for 8-inches diameter and smaller	Valves to be installed on all sides of a cross or tee

The Contract Documents will incorporate the following District's Standard Drawings as applicable, see **Table 3.2**.

Table 3.2 District's Standard Drawings

Standard Drawing	Title
B-255	Installation of Vertical Gate Valves (Steel Pipe 14" & Larger; AC, PVC & DI Pipe 4" & Larger)
B-271	Saddle Outlets
B-286B	Trench Backfill
B-288	Steel Flanges, 4" to 54"
B-357	6" x 1 - 2 1/2" Blow-off Installation for AC, PVC & DI Pipe
B-362	6" x 1 - 2 1/2" & 1 - 4" Fire Hydrant Installation for AC, PVC & DI Pipe
B-407	Thrust Block Installation for Hub-End Pipe
B-408	Water Pipe Installation and Concrete Cap Detail for ACP, PVC & DI Pipe
B-590	5/8" Meter Service Connection, 1" Copper Tubing
B-590A	1" Copper Service Connection
B-591	1" Meter Service Connection, 1" Copper Tubing
B-597A	Reduced Pressure Backflow Preventer Assy for Sizes 3/4" through 2"
B-598	1" Air Valve Installation, 1" Copper Tubing
B-656	Locator Wire Installation
B-663	Standard Restraint Tee, Dead End, Bend for PVC C-900 & C-905
B-668	Valve Cap & Riser Detail
B-934	Recessed Trench Plate Detail

b. Department of Drinking Water Separation Requirements

Department of Drinking Water Separation Requirements (DDW Requirements), as stated in Title 22, California Code of Regulations, Division 4, Chapter 16, Article 4, dated October 1, 2021, require sewers to be 10-feet horizontally, outer diameter (OD) to outer diameter from water mains. Water mains must cross over sewer mains with a vertical clearance OD to OD of 1-foot. DDW may allow a waiver of these requirements to allow a water main to pass under a sewer main, or a horizontal distance OD to OD less than 10-feet where existing utilities or other site conditions do not allow the standard clearance requirements.

Since there are no sewer mains within the Project area, it is assumed that the properties have a septic tank with leach lines. Per DDW requirements, new water mains shall not be installed within 25-ft horizontally to the nearest edge of a septic tank or sewage leach field.

The District will coordinate with property owners to stake (or mark-out) the location of their septic system to verify the horizontal distance to the new water mains. This can be done concurrently with the staking-out of the existing water service lines and the customer's proposed location for their new water meter. In order to move into final design, these two coordination items will need to be completed.

c. Water Meters

As described in *Section 2.0*, there are 58 properties (listed in **Appendix A**) that have existing remote meters that do not meet Districts standards and will be moved in front of the customer's property. The meter and service will be installed on the new water main at the property's frontage, eliminating the remote meters. Meters with existing backflow preventers will also be relocated to the new meter location. The District is currently coordinating with each property owner to have them place stakes to mark the location of the existing remote meter and the new water meter location. It is recommended that the locations of the stakes be surveyed by the District to incorporate into the construction plans.

There are 41 existing meters in front of the existing customer's properties that will be reconnected to the new water main.

Only existing water customers were identified for this project. However, if the District decides to add new meters at currently vacant properties or where properties might be using well water, they can easily be added during final design.

d. Backflow Preventors

Backflow preventors (BFP) is required when there is a private well or holding tank on the property. Based on District records, the list of customers with an existing BFP are listed in **Appendix A.**

e. Pressure Regulators

Per District standards, pressure regulators are required when pressure is greater than 80 pounds per square inch (psi). Based on the 2015 Water Facilities Master Plan Update, the pressure zone for Mead Valley is 1872 feet. Existing ground elevations range between 1677 feet and 1685 feet, with grades sloping downward from north to south. Static pressures ranges between 81 psi and 84 psi and it is recommended that pressure regulators on all 10 new meters be installed. The Good Hope pressure zone is 1832 feet, based on the 2015 Water Facilities Master Plan Update. The ground elevations range between 1566 feet to 1670 feet, with grades sloping downward from northwest to southeast. Static pressures range between 70 psi to 115 psi. It is recommended that pressure regulators be installed on meters when elevation is below 1645 feet. A list of recommended pressure regulator locations is shown in **Appendix A**.

f. Water Main Alignment

The following describes the proposed water main alignment by street. Robinson Street, Oakwood Street, Pinewood Street, Day Street, and Carroll Street are in the Mead Valley area and the other streets are in the Good Hope area. The 30% design plans showing alignment details are presented in **Appendix F**:

(a) Robinson Street

Approximately 1,620 LF of 8-inch diameter PVC C900 is proposed for the new water main along Robinson Street and will be located 11-ft west of the road centerline, as shown on plans. The proposed water main will connect to the existing 8-inch diameter ACP water on Robinson Road and connect to the existing 18-inch diameter water main on Cajalco Road.

(b) Oakwood Street

Approximately 2,150 LF of 8-inch diameter PVC C900 is proposed for the new water main along Oakwood Street and will be located between 8-ft and 13-ft south of the road centerline, as shown on plans. The proposed water main will connect to the existing 8-inch diameter PVC water on Oakwood Street and connect to the new 8-inch diameter water main on Day Street. Approximately 300-ft of existing 4-inch pipe will be abandoned and filled with Cellcrete.

(c) Carroll Street

Approximately 420 LF of 8-inch diameter PVC C900 is proposed for the new water main along Carroll Street and will be located approximately 18-ft west of the road centerline, as shown on plans. The proposed water main will connect to the new 8-diameter water main on Day Street and connect to the existing 4-inch diameter CML&C water on Carroll Street.

(d) Day Street

Approximately 950 LF of 8-inch diameter PVC C900 is proposed for the new water main along Day Street and will be located approximately 17-ft west of the road centerline, as shown on plans. The proposed water main will connect to an existing 8-diameter CML&C water main on Day Street and connect to the existing 8-inch diameter CML&C water on Pinewood Street.

(e) Pinewood Street

Approximately 520 LF of 8-inch diameter PVC C900 is proposed for the new water main along Carroll Street and will be located approximately 15-ft south of the road centerline, as shown on plans. The proposed water main will connect to an existing 6-diameter PVC water main on Day Street and connect to the existing 8-inch diameter CML&C water on Day Street.

(f) Eucalyptus Avenue

Approximately 2,960 LF of 8-inch diameter PVC C900 is proposed for the new water main along Eucalyptus Street. Between Theda Street and approximately 150-ft east of Spring Street, the new water main will be installed approximately 6-ft to the north of the road

centerline and 10.5-ft north of the existing 4-inch diameter water main, as shown on plans. The remaining water main along Eucalyptus will be installed approximately 710-ft south of the road centerline. The proposed water main will connect to the existing 8-inch diameter water main on Theda Street and the existing 6-inch diameter water main on Spring Street. The existing 4-inch pipe will be abandoned and filled with Cellcrete.

(g) Main Street

Approximately 1,570 LF of 8-inch diameter PVC C900 is proposed for the new water main along Main Street and will be located approximately 2.5-ft east of the centerline between Club Drive and Simpkins Road and 14-ft west of the road centerline between Simpkins Road and Sharp Road, as shown on plans. The proposed water main will connect to the existing water main (as-built not available) on Club Drive and connect to the existing 6-inch diameter water main on Sharp Road.

(h) Maple Avenue

Approximately 325 LF of 8-inch diameter PVC C900 is proposed for the new water main along Maple Avenue and will be located 13-ft north of the road centerline, as shown on plans. The proposed water main will connect to the new 8-inch diameter PVC C900 water main on Main Street and a fire hydrant will be installed at the end of the water main.

(i) Pine Street

Approximately 325 LF of 8-inch diameter PVC C900 is proposed for the new water main along Pine Street and will be located 10-ft south of the road centerline, as shown on plans. The proposed water main will connect to the new 8-inch diameter PVC C900 water main on Main Street and a fire hydrant will be installed at the end of the water main.

(j) Cherry Lane

Approximately 325 LF of 8-inch diameter PVC C900 is proposed for the new water main along Cherry Lane and will be located 13-ft south of the road centerline, as shown on plans. The proposed water main will connect to the new 8-inch diameter PVC C900 water main on Main Street and a fire hydrant will be installed at the end of the water main.

(k) Maguglin Way

Approximately 325 LF of 8-inch diameter PVC C900 is proposed for the new water main along Maguglin Way and will be located 2-ft south of the road centerline, as shown on plans. The proposed water main will connect to the new 8-inch diameter PVC C900 water main on Main Street and a fire hydrant will be installed at the end of the water main.

(l) Club Drive

Approximately 700 LF of 8-inch diameter PVC C900 is proposed for the new water main along Club Drive and varies along the street due to existing utiltiies, as shown on plans. The proposed water main will connect to the existing 6-inch and 8-inch diameter ACP water main on Club Drive.

(m) Sharp Road

Approximately 1,300 LF of 8-inch diameter PVC C900 is proposed for the new water main along Sharp Road and will be installed 11-ft to the south of the road centerline and approximately 11-ft north of the existing 4-inch diameter water main, as shown on plans. The proposed water main will connect to the existing 6-inch diameter water main on Spring Street and connect to the existing 8-inch diameter water main on Theda Street. The existing 4-inch pipe will be abandoned and filled with Cellcrete.

g. Easements and Permitting

Per EMWD Guidelines, the minimum easement width is 30 ft for 8-inch diameter pipe or smaller. Robinson Street is a 60-ft wide easement road owned by the adjacent property owners and the District will need to acquire a 60-ft wide utility easement for the new water main within Robinson Street. Based on the Riverside County Road Map (**Appendix D**), Eucalyptus Avenue (west of Main St) and Main Street (north of Eucalyptus Avenue) appears to be a non-county road. Based on preliminary discussions with the County, the County will be accepting these roads for Public Use. In addition, the District will be acquiring easements from the property owners along the east side of Main Street and south side of Eucalyptus Street.

As shown in **Appendix D**, the majority of the proposed work falls within the County of Riverside (County) ROW and a County encroachment permit will be required prior to construction along the following roadways: Robinson Street, Oakwood Street, Day Street, Carroll Street, Pinewood Street, Eucalyptus Avenue Club Drive, Main Street, Maple Avenue, Pine Street, Cherry Lane, Maguglin Way, and Sharp Road. The Contractor will be required to obtain the encroachment permit, and the Contract Documents will include the County's requirements. The County's encroachment permit application and trench detail are included in **Appendix E**.

The District's surveyor stated that to confirm the existing road right of way (ROW), a title research and boundary limits on all properties bordering the roads along the Project corridors would be required, which is time intensive and costly. It is recommended that the District acquire utility easements at the locations where there is no County ROW. **Table 3.3** summarizes the ROW requirements based on the surveyors research and County Road Map.

Table 3.3 Right Of Way

Street Name	District Opened Case with County	County Confirmed[1]	Exist ROW Width[2], ft	Permanent Easement Required?	Minimum Easement Width[3], ft	County Encroachment Permit Required?
Robinson Street	-	Paved County Maintained	60	Yes	30	Yes
Eucalyptus Avenue (west of Main St)	To be Accepted to Public Use	Dedicated Not Accepted[4]	35	No	-	Yes
Eucalyptus Avenue (east of Main St to Theda St)	To be Accepted to Public Use	Dedicated Not Accepted[4]	15 (north)	Yes	Varies (south)	Yes
Main Street (North of Eucalyptus Ave)	To be Accepted to Public Use	Dedicated Not Accepted[4]	30	No	-	Yes
Main Street (between Eucalyptus Ave and Pine St)	To be Accepted to Public Use	Dedicated Not Accepted[4]	20 (west)	Yes	20 (east)	Yes
Main Street (between Pine St and Simpkins Rd)	To be Accepted to Public Use	Dedicated Not Accepted[4]	50 (west)	No	-	Yes
Main Street (south of Simpkins Rd to Sharp Rd)	To be Accepted to Public Use	Dedicated Not Accepted[4]	20 (west)	Yes	30 (east)	Yes
Maple Avenue	-	Accepted for Public Use	40	No	-	Yes
Pine Street	-	Accepted for Public Use	40	No	-	Yes
Cherry Lane	-	Accepted for Public Use	40	No	-	Yes
Maguglin Way	-	Accepted for Public Use	40	No	-	Yes
Club Drive	-	Paved County Maintained	30	No	-	Yes
Sharp Road	-	Paved County Maintained	60	No	-	Yes
Cajalco Road	-	Federal Route County Maintained	80	No	-	Yes
Oakwood Street (between 840-ft west of Carroll St and Carroll St)	-	Paved County Maintained	60	No	-	Yes
Oakwood Street (between Carroll St and Day St)	-	Accepted for Public Use	60	No	-	Yes
Day Street	-	Accepted for Public Use	40	No	-	Yes
Carroll Street	-	Paved County Maintained	60	No	-	Yes
Pinewood Street	-	Paved County Maintained	60	No	-	Yes

[1] Road classification based on County of Riverside County Maintained Road Book, dated February 18, 2021 (https://rctlma.org/trans/road-maintenance/county-maintained-road-book)

[2] ROW width based on survey mapping by Hunsaker & Associates, Inc.

[3] Per EMWD Guidelines, minimum easement width is 30-ft for 8-inch diameter pipe or smaller.

[4] County will accept these roads for public use, date TBD

4.0 Constructability and Sequencing

a. Constructability

Existing water service to the customers will be maintained during construction utilizing the existing pipes and remote meters while the new pipes are constructed. Once the new water main, services, and meters are completed and energized, water service will be switched over from old to new water main, thereby allowing for minimal customer impact. Existing water

service lines for the remote meters will be located during potholing to confirm that maintaining the existing water service online during construction is feasible.

The following describes the constructability of the proposed water main by street.

(a) Robinson Street

The proposed water main will be located within a future District-owned easement since the County does not have public right-of way and will cross the future Mead Valley Cajalco Sewer Project. As shown on the plans, the new water main will cross a 6-inch diameter sewer main, and 4-inch and 6-inch gas mains. Robinson Street is a 60-ft wide paved road and traffic impacts may include temporary closure of the street.

(b) Oakwood Street

The proposed water main will be located within the County right-of-way. Oakwood Street, west of Carroll Street is a paved road and east of Carroll Street is an unpaved road with a ROW width of 60-ft. The new water main will cross a fiber optic line. Traffic impacts may include temporary closure of the street and providing alternative routes. In addition, several large boulders exist within the middle of the road at approximately STA 249+50 to 250+00, 255+50, and 260+00.

(c) Carroll Street

The proposed water main will be located within the County right-of-way. Carroll Street is a paved road with a ROW width of 60-ft. The new water main will cross a fiber optic line. Traffic impacts may include temporary closure of the street and providing alternative routes.

(d) Day Street

The proposed water main will be located within the County right-of-way. Day Street is an unpaved road with a ROW width of 40-ft. An existing Metropolitan Water District (MWD) easement transverses Day Street at approximately STA 280+00 to STA 281+50, as shown on drawing C-20. The new water main will parallel a 2-inch gas main. Traffic impacts may include temporary closure of the street and providing alternative routes.

(e) Pinewood Street

The proposed water main will be located within the County right-of-way. Pinewood Street is a paved road with a ROW width of 60-ft. The new water main will cross a 2-inch gas main. Traffic impacts may include temporary closure of the street and providing alternative routes.

(f) Eucalyptus Avenue

The proposed water main will be located within the County right-of way west of Main Street. Eucalyptus Avenue, west of Main Street is an unpaved road with a ROW of 35-ft. The new water main will parallel a 2-inch gas main and cross fiber optic lines and a proposed 30-

inch diameter storm drain. Traffic impacts may include temporary closure of the street and providing alternative routes east of Main Street. In addition, several large trees exist within the middle of the road at approximately STA 60+00 to 62+00. Per District direction, the eucalyptus trees may be removed.

(g) Main Street

The proposed water main will be located within the County right-of way between Sharp Road and Club Drive. Main Street is an unpaved road with a ROW width of 20 to 50-ft south of Eucalyptus Avenue. The new water main will cross a 2-inch gas main and fiber optic lines. Traffic impacts may include temporary closure of the street and providing alternative routes.

(h) Maple Avenue, Pine Street, Cherry Lane, and Maguglin Way

The proposed water main will be located within the County right-of way. The new water main will cross fiber optic lines and a 2-inch gas main. Maple Avenue, Pine Street, Cherry Lane, and Maguglin Way are unpaved roads with a ROW width of 40-ft wide. Traffic impacts may include temporary closure of the street and providing alternative routes.

(i) Club Drive

The proposed water main will be located within the County right-of way. The new water main will cross a 2-inch gas main and a proposed 30-inch diameter storm drain. Club Drive is a paved county road with a ROW width of 30-ft wide. Traffic impacts may include temporary closure of the street and providing alternative routes.

(j) Sharp Road

The proposed water main will be located within the County right-of way. The new water main will cross a 2-inch gas main and fiber optic lines. Sharp Road is a paved county road with a ROW width of 60-ft wide. Traffic impacts may include temporary closure of the street and providing alternative routes.

b. Sequencing

(a) Other Projects in the Area

RCFCWCD is currently designing storm drainage facilities along Club Drive and Spring Street near Eucalyptus Avenue. Per RCFCWCD's website, the bidding for this project is estimated to be in March 2024. It is assumed that the District Project will start construction before the storm drain project. However, coordination with the RCFCWCD will be required during this project to ensure there are no conflicts. The potential for overlapping projects will be described in the Project construction documents.

In addition, the District is replacing the existing sewer main along Cajalco Road. Ardurra is the design engineer for this project and coordination between the two projects will be maintained.

(b) Connections to the Existing Water Main

Connection at STA 10+00, see drawing C-1: The connection at STA 10+00 for the new water main on Robinson Street is located approximately 1,060-ft south of Martin Street. The proposed 8-inch diameter PVC C900 will connect to the existing 6-inch diameter asbestos cement pipe (ACP) at an elevation of ±1,679-ft (as-built drawing D-3526), by removing a portion of the existing water main, including the existing end plug, 6" gate valve, 8"x6" reducer and installing a transition coupling with an 8"x6" reducer and 8" gate valve.

Connection at STA 26+20, see drawing C-2: The connection at STA 26+51 is located at Robinson Street and Cajalco Road. The proposed 8-inch diameter PVC C900 pipe will connect to the existing 18-inch diameter CML&C pipe (as-built drawing D-1426) along Cajalco Road with a tee at an elevation of ±1,671-ft.

Connection at STA 54+40, see drawing C-5: The connection at STA 56+38 is located at Eucalyptus Avenue and Spring Street. The proposed 8-inch diameter PVC C900 pipe will connect to an existing 6-inch diameter CML&C water main (as-built drawing D-1902) with an 8"x8" cross, 8"x6" reducer and gate valve.

Connection at STA 69+60, see drawing C-6: The connection at STA 69+49 is located at Eucalyptus Avenue and Theda Street. The proposed 8-inch diameter PVC C900 pipe will connect to an existing 8" CLM&C pipe at an elevation of ±1,555-ft (as-built drawing D-1902) with an 8"x8" tee and gate valve.

Connection at STA 90+00, see drawing C-7: The connection at STA 90+00 is located at Main Street and Club Drive. A portion of the existing water main on Club Drive will be removed and replaced and the proposed 8-inch diameter PVC C900 will connect to the new pipe.

Connection at STA 105+69, see drawing C-8: The connection at STA 105+54 is located at Main Street and Sharp Road. The proposed 8-inch diameter PVC C900 pipe will connect to an existing 6" gate valve by removing the 6" blind flange per as-built D-1902.

Connection at STA 200+00, see drawing C-13: The connection at STA 200+00 is located on Club Drive, approximately 560-ft east of Spring Street at an elevation of ±1,579. The proposed 8-inch diameter PVC C900 pipe will connect to the existing 6-inch diameter ACP water main by removing a portion of the existing water main including the existing temporary blow-off valve and 6" gate valve, as shown on as-built D-12550, and installing a transition coupling with an 8"x6" reducer and 8" gate valve.

Connection at STA 206+00, see drawing C-13: The connection at STA 205+87 is located on Club Drive, approximately 220-ft west of Theda Street at an elevation of ±1,560. The proposed 8-inch diameter PVC C900 pipe will connect to the existing 8-inch diameter ACP water main by removing the existing end cap and air release valve and connecting to the existing 8" gate valve by as shown on as-built D-12550.

Connection at STA 220+00, see drawing C-14: The connection at STA 220+50 is located on Sharp Road and Spring Street. The proposed 8-inch diameter PVC C900 pipe will connect to the existing 6-inch diameter CML&C water main (as-built drawings D-1902 and D-1903) by cutting the 6-inch diameter pipe and installing a 6”x6” tee, gate valve, and an 8”x6” reducer.

Connection at STA 233+50, see drawing C-15: The connection at STA 233+03 is located on Sharp Road and Theda Street. The proposed 8-inch diameter PVC C900 pipe will connect to the existing 8-inch diameter CML&C water main (as-built drawings D-1902 and D-1903) by cutting the existing 8-inch diameter pipe and installing an 8”x8” tee and gate valve.

Connection at STA 240+00, see drawing C-16: The connection at STA 240+00 is located on Oakwood Street. The proposed 8-inch diameter PVC C900 pipe will connect to the existing 12-inch diameter PVC water main (as-built drawings D-1525) by cutting installing a 12”x8” reducer and coupling adapter.

Connection at STA 274+00, see drawing C-19: The connection at STA 274+00 is located on Carroll Street. The proposed 8-inch diameter PVC C900 pipe will connect to the existing 12-inch diameter PVC water main (as-built drawings D-1525) by installing a coupling adapter and an 8”x4” reducer.

Connection at STA 280+00, see drawing C-20: The connection at STA 280+00 is located on Day Street. The proposed 8-inch diameter PVC C900 pipe will connect to the existing 8-inch diameter CML&C water main (as-built drawings D-1525) by installing a coupling adapter

Connection at STA 289+44, see drawing C-20: The connection at STA 289+44 is located on Day Street. The proposed 8-inch diameter PVC C900 pipe will connect to the existing 8-inch diameter CML&C water main (as-built drawings D-1525) by installing a coupling adapter.

Connection at STA 300+00, see drawing C-21: The connection at STA 300+00 is located on Pinewood Street. The proposed 8-inch diameter PVC C900 pipe will connect to the existing 8-inch diameter CML&C water main (as-built drawings D-1525) by cutting the existing 6-inch diameter pipe and installing an 8”x6” reducer and coupling adapter.

Connection at STA 305+18, see drawing C-21: The connection at STA 305+18 is located on Pinewood Street and Day Street. The proposed 8-inch diameter PVC C900 pipe will connect to the existing 8-inch diameter CML&C water main (as-built drawings D-1525) by cutting the existing 8-inch diameter pipe and installing an 8”x8” tee and gate valve.

(c) Water Shutdowns

Shutdowns will be required to connect to the existing water system and shift customers to the new meters. During final design, a water shutdown plan and durations will be developed by coordinating with the District’s operations staff.

(d) Construction Duration

The Opinion of Construction Duration was developed assuming a rate of installation of 90 linear feet of pipe per day. This rate of installation is based on our experience with similar construction projects:

- Minimum 4-foot cover
- Minimal utility crossings expected
- Minimal constraints for access and traffic

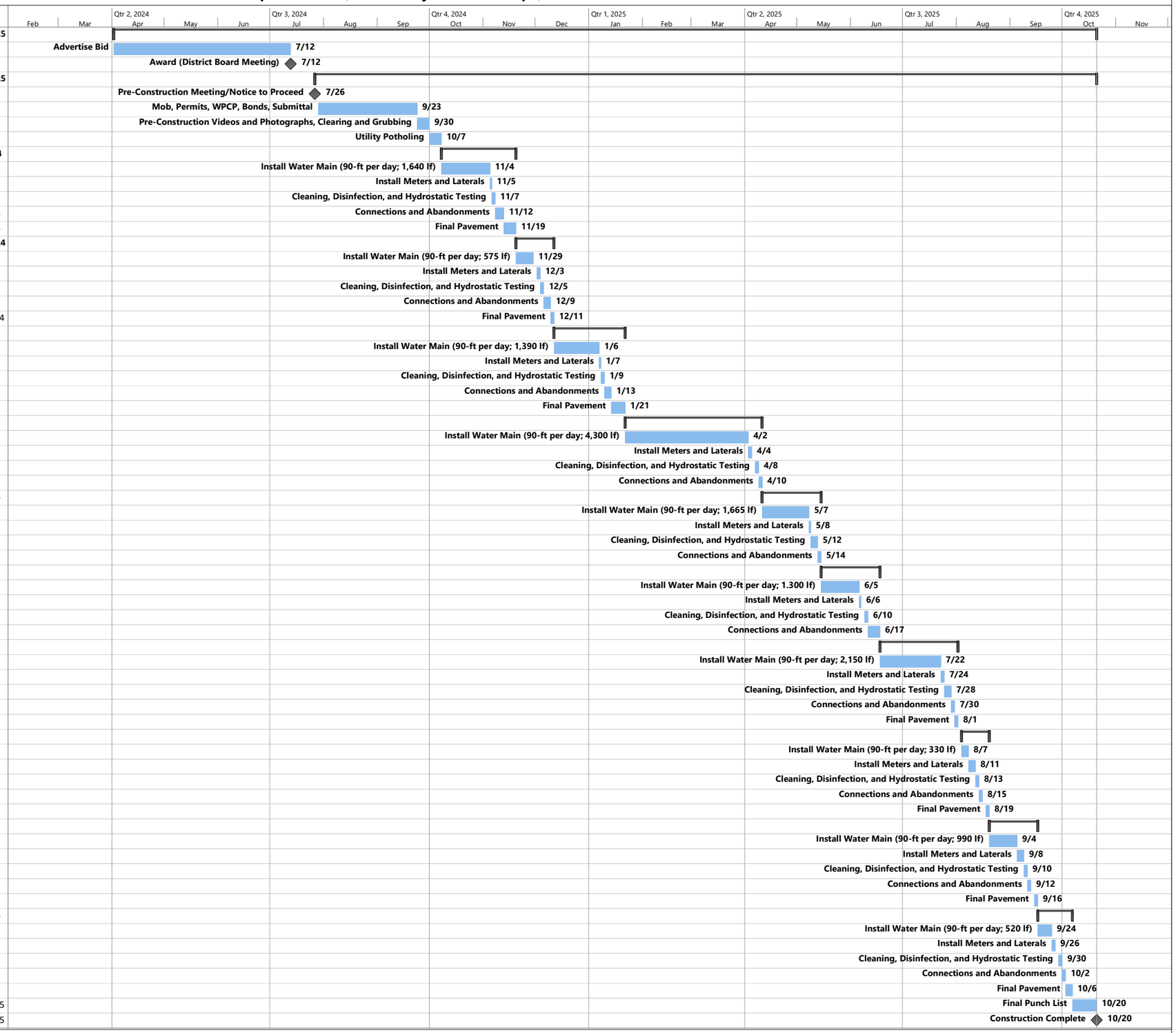
Assuming the Project is advertised early 2024 and construction begins in April 2024, the schedule shows construction completion in the fall of 2025. The construction duration is estimated to be 450 calendar days as shown in **Figure 4.1**.

The schedule does not include time for easement acquisition or unforeseen conditions (e.g. weather delays). Once the District provides a timeline on easement acquisition, the construction schedule will be updated.

One of the Districts goals is to complete the project by December 2026 as required by ARPA. Two construction headings were considered, but at this time, it is not needed since the estimated completion is Fall 2025. Once the timeframe for easement acquisition is determined, and if required, the District may allow the Contractor to have two construction headings to complete the project on time.

Figure 4.1
Opinion of Probable Construction Schedule
DAC Water Main Improvements (Mead Valley and Good Hope)

ID	Task Name	Working Days	Start	Finish
1	**PROJECT**	**393 days**	**Tue 4/2/24**	**Mon 10/20/25**
2	Advertise Bid	72 days	Tue 4/2/24	Fri 7/12/24
3	Award (District Board Meeting)	0 days	Fri 7/12/24	Fri 7/12/24
4	**Construction Phase**	**311 days**	**Fri 7/26/24**	**Mon 10/20/25**
5	Pre-Construction Meeting/Notice to Proceed	0 days	Fri 7/26/24	Fri 7/26/24
6	Mob, Permits, WPCP, Bonds, Submittal	40 days	Mon 7/29/24	Mon 9/23/24
7	Pre-Construction Videos and Photographs, Clearing and Grubbing	5 days	Tue 9/24/24	Mon 9/30/24
8	Utility Potholing	5 days	Tue 10/1/24	Mon 10/7/24
9	**Robinson Street**	**30 days**	**Tue 10/8/24**	**Tue 11/19/24**
10	Install Water Main (90-ft per day; 1,640 lf)	20 days	Tue 10/8/24	Mon 11/4/24
11	Install Meters and Laterals	1 day	Tue 11/5/24	Tue 11/5/24
12	Cleaning, Disinfection, and Hydrostatic Testing	2 days	Wed 11/6/24	Thu 11/7/24
13	Connections and Abandonments	2 days	Fri 11/8/24	Tue 11/12/24
14	Final Pavement	5 days	Wed 11/13/24	Tue 11/19/24
15	**Club Drive**	**15 days**	**Wed 11/20/24**	**Wed 12/11/24**
16	Install Water Main (90-ft per day; 575 lf)	7 days	Wed 11/20/24	Fri 11/29/24
17	Install Meters and Laterals	2 days	Mon 12/2/24	Tue 12/3/24
18	Cleaning, Disinfection, and Hydrostatic Testing	2 days	Wed 12/4/24	Thu 12/5/24
19	Connections and Abandonments	2 days	Fri 12/6/24	Mon 12/9/24
20	Final Pavement	2 days	Tue 12/10/24	Wed 12/11/24
21	**Sharp Road**	**26 days**	**Thu 12/12/24**	**Tue 1/21/25**
22	Install Water Main (90-ft per day; 1,390 lf)	16 days	Thu 12/12/24	Mon 1/6/25
23	Install Meters and Laterals	1 day	Tue 1/7/25	Tue 1/7/25
24	Cleaning, Disinfection, and Hydrostatic Testing	2 days	Wed 1/8/25	Thu 1/9/25
25	Connections and Abandonments	2 days	Fri 1/10/25	Mon 1/13/25
26	Final Pavement	5 days	Tue 1/14/25	Tue 1/21/25
27	**Eucalyptus Avenue**	**56 days**	**Wed 1/22/25**	**Thu 4/10/25**
28	Install Water Main (90-ft per day; 4,300 lf)	50 days	Wed 1/22/25	Wed 4/2/25
29	Install Meters and Laterals	2 days	Thu 4/3/25	Fri 4/4/25
30	Cleaning, Disinfection, and Hydrostatic Testing	2 days	Mon 4/7/25	Tue 4/8/25
31	Connections and Abandonments	2 days	Wed 4/9/25	Thu 4/10/25
32	**Main Street**	**24 days**	**Fri 4/11/25**	**Wed 5/14/25**
33	Install Water Main (90-ft per day; 1,665 lf)	19 days	Fri 4/11/25	Wed 5/7/25
34	Install Meters and Laterals	1 day	Thu 5/8/25	Thu 5/8/25
35	Cleaning, Disinfection, and Hydrostatic Testing	2 days	Fri 5/9/25	Mon 5/12/25
36	Connections and Abandonments	2 days	Tue 5/13/25	Wed 5/14/25
37	**Maple Avenue, Pine Street, Cherry Lane, and Maguglin Way**	**23 days**	**Thu 5/15/25**	**Tue 6/17/25**
38	Install Water Main (90-ft per day; 1.300 lf)	15 days	Thu 5/15/25	Thu 6/5/25
39	Install Meters and Laterals	1 day	Fri 6/6/25	Fri 6/6/25
40	Cleaning, Disinfection, and Hydrostatic Testing	2 days	Mon 6/9/25	Tue 6/10/25
41	Connections and Abandonments	5 days	Wed 6/11/25	Tue 6/17/25
42	**Oakwood Street**	**32 days**	**Wed 6/18/25**	**Fri 8/1/25**
43	Install Water Main (90-ft per day; 2,150 lf)	24 days	Wed 6/18/25	Tue 7/22/25
44	Install Meters and Laterals	2 days	Wed 7/23/25	Thu 7/24/25
45	Cleaning, Disinfection, and Hydrostatic Testing	2 days	Fri 7/25/25	Mon 7/28/25
46	Connections and Abandonments	2 days	Tue 7/29/25	Wed 7/30/25
47	Final Pavement	2 days	Thu 7/31/25	Fri 8/1/25
48	**Carroll Street**	**12 days**	**Mon 8/4/25**	**Tue 8/19/25**
49	Install Water Main (90-ft per day; 330 lf)	4 days	Mon 8/4/25	Thu 8/7/25
50	Install Meters and Laterals	2 days	Fri 8/8/25	Mon 8/11/25
51	Cleaning, Disinfection, and Hydrostatic Testing	2 days	Tue 8/12/25	Wed 8/13/25
52	Connections and Abandonments	2 days	Thu 8/14/25	Fri 8/15/25
53	Final Pavement	2 days	Mon 8/18/25	Tue 8/19/25
54	**Day Street**	**19 days**	**Wed 8/20/25**	**Tue 9/16/25**
55	Install Water Main (90-ft per day; 990 lf)	11 days	Wed 8/20/25	Thu 9/4/25
56	Install Meters and Laterals	2 days	Fri 9/5/25	Mon 9/8/25
57	Cleaning, Disinfection, and Hydrostatic Testing	2 days	Tue 9/9/25	Wed 9/10/25
58	Connections and Abandonments	2 days	Thu 9/11/25	Fri 9/12/25
59	Final Pavement	2 days	Mon 9/15/25	Tue 9/16/25
60	**Pinewood Street**	**14 days**	**Wed 9/17/25**	**Mon 10/6/25**
61	Install Water Main (90-ft per day; 520 lf)	6 days	Wed 9/17/25	Wed 9/24/25
62	Install Meters and Laterals	2 days	Thu 9/25/25	Fri 9/26/25
63	Cleaning, Disinfection, and Hydrostatic Testing	2 days	Mon 9/29/25	Tue 9/30/25
64	Connections and Abandonments	2 days	Wed 10/1/25	Thu 10/2/25
65	Final Pavement	2 days	Fri 10/3/25	Mon 10/6/25
66	Final Punch List	10 days	Tue 10/7/25	Mon 10/20/25
67	Construction Complete	0 days	Mon 10/20/25	Mon 10/20/25



Fri 8/11/23

c. Community Impacts/Coordination

The District will provide public outreach to the community regarding overall project schedule and construction activities. The District will also coordinate with individual property owners regarding site-specific requirements for meter relocations including the potential need for right of entry. We recommend the District begin coordinating with the community, a list of affected water customers can be found in **Appendix A**.

Depending on the width of the roadway and location of the new water main, construction may include temporary closure of a lane or require alternative routes. The Contractor will be required to provide traffic control that maintains access to private properties and for emergency vehicles.

5.0 Opinion of Probable Construction Cost (OPCC)

Preliminary construction costs were developed based on 90% Plans and concepts discussed herein. Anticipated bid items are based on the proposed construction as currently defined. These may be refined as the project progresses. The unit prices were based on a combination of historical bid data for similar projects in the area and quotes from suppliers.

The OPCC is broken down into a Base Bid Schedule and Alternative Bid Schedule A, B, and C.

- Bid Schedule A includes Robinson Street,
- Bid Schedule B includes Eucalyptus Avenue (east of Main Street), Main Street, Club Road and Sharp Road
    - Depending on the available budget, the District may include Bid Schedule B1 through B5
        - Bid Schedule B1 includes Eucalyptus Avenue (west of Main Street0
        - Bid Schedule B2 includes Maple Avenue
        - Bid Schedule B3 includes Pine Street
        - Bid Schedule B4 includes Cherry Lane
        - Bid Schedule B1 includes Maguglin Way
- Bid Schedule C includes Oakwood Street, Carroll Street, Day Street, Pinewood Street, Club Drive

The total OPCC for the entire project, after adding a 10% contingency, is $8.8 million.

The 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.

Table 5.1 Opinion of Probable Construction Cost (OPCC)

Bid Item	Description	Unit	Qty	Unit Price	Subtotal
Bid Schedule A - Mead Valley (Robinson Street)					
A1	Mobilization, Demobilization, Bonds, Insurance, Permits, and Miscellaneous (5%)	LS	1	$ 47,720	$ 47,720
A2	Implement Traffic Control and Safety Measures (5%)	LS	1	$ 24,900	$ 24,900
A3	Provide Construction Audio, Photographs and Video	LS	1	$ 6,560	$ 6,560
A4	Construction Surveying, Re-establish Monuments and Centerline Ties	LS	1	$ 2,600	$ 2,600
A5	Potholing and Utility Verification	LS	1	$ 2,900	$ 2,900
A6	Prepare and Implement SWPPP And BMPs	LS	1	$ 2,000	$ 2,000
A7	Maintain and Furnish As-Built Record Drawings	LS	1	$ 300	$ 300
A8	Temporary Water Highline	LS	1	$ 66,400	$ 66,400
A9	Construct 8-Inch Diameter PVC Water Main	LF	1,660	$ 300	$ 498,000
A10	Abandon Existing Water Pipe	LF	50	$ 8	$ 400
A11	Connection to Existing Water System	EA	2	$ 10,000	$ 20,000
A12	Relocate Water Meter and Furnish and Install 1-Inch Copper Service	EA	11	$ 5,000	$ 55,000
A13	Furnish and Install New Meter Box	EA	11	$ 2,000	$ 22,000
A14	Relocate Existing Backflow Preventor	EA	1	$ 10,000	$ 10,000
A15	Remove and Legally Dispose of Existing Fire Hydrant	EA	1	$ 2,000	$ 2,000
A16	Remove and Dispose of Meter Box and Repair Surface	EA	11	$ 800	$ 8,800
A17	Furnish and Install 8-Inch (Class 150B) Resilient Seat Gate Valve	EA	1	$ 6,000	$ 6,000
A18	Furnish and Install 6-Inch Fire Hydrant (EMWD Dwg B-362)	EA	2	$ 15,000	$ 30,000
A19	Furnish and Install 1-inch Air Valve (EMWD Dwg B-598)	EA	1	$ 1,500	$ 1,500
A20	Furnish and Install 6-Inch Temporary End of Line Blow-Off (EMWD Dwg B-357)	EA	1	$ 8,000	$ 8,000
A21	Furnish and Install Pressure Regulator Valve	EA	11	$ 200	$ 2,200
A22	Disinfection and Bacteriological Testing of Potable Water Main and Appurtenances	LS	1	$ 2	$ 2
A23	Filling, Flushing and Hydrostatic Testing All Water Pipelines and Appurtenances	LS	1	$ 12,000	$ 12,000
A24	Construct Asphalt Concrete Base Pavement (3-inch AC over 6-inch Class 2 AB)1	SF	3,320	$ 8	$ 26,560
A25	Remove Asphalt Concrete by Cold Plane2	SF	3,320	$ 1	$ 3,320
A26	Construct 1-inch Thick Asphalt Overlay2	SF	19,920	$ 2	$ 39,840
A27	Restore Surface of Dirt Road	SF	3,320	$ 10	$ 33,200
A28	Restore Surface with 3/4" Aggregate Base (3" Depth)	SF	60	$ 10	$ 600
A29	Replace AC Driveway in Kind	SF	180	$ 5	$ 900
A30	Replace Brick Driveway in Kind	SF	60	$ 15	$ 900
A31	Restore Concrete in Kind	SF	180	$ 10	$ 1,800
A32	Non-Rippable Granitic Rock Excavation During Trenching	CY	60	$ 300	$ 18,000
				Bid Schedule A Subtotal	**$ 954,400**
Bid Schedule B - Good Hope					
B1	Mobilization, Demobilization, Bonds, Insurance, Permits, and Miscellaneous (5%)	LS	1	$ 177,225	$ 177,225
B2	Implement Traffic Control and Safety Measures (5%)	LS	1	$ 86,745	$ 86,745
B3	Provide Construction Audio, Photographs and Video	LS	1	$ 23,100	$ 23,100
B4	Construction Surveying, Re-establish Monuments and Centerline Ties	LS	1	$ 9,000	$ 9,000
B5	Potholing and Utility Verification	LS	1	$ 10,000	$ 10,000
B6	Prepare and Implement SWPPP And BMPs	LS	1	$ 7,000	$ 7,000
B7	Maintain and Furnish As-Built Record Drawings	LS	1	$ 1,000	$ 1,000
B8	Temporary Water Highline	LS	1	$ 231,320	$ 231,320
B9	Construct 8-Inch Diameter PVC Water Main	LF	5,783	$ 300	$ 1,734,900
B10	Abandon Existing Water Pipe	LF	2,620	$ 8	$ 20,960
B11	Connection to Existing Water System	EA	9	$ 10,000	$ 90,000
B12	Reconnect Existing Water Lateral	EA	31	$ 2,500	$ 77,500
B13	Relocate Water Meter and Furnish and Install 1-Inch Copper Service	EA	21	$ 5,000	$ 105,000
B14	Furnish and Install Plumbing to Connect New Service to Existing Onsite Water System	EA	8	$ 5,000	$ 40,000
B15	Furnish and Install New Meter Box	EA	21	$ 2,000	$ 42,000
B16	Relocate Existing Backflow Preventor	EA	5	$ 10,000	$ 50,000
B17	Remove and Legally Dispose of Existing Fire Hydrant	EA	3	$ 2,000	$ 6,000
B18	Remove and Dispose of Meter Box and Repair Surface	EA	21	$ 800	$ 16,800
B19	Furnish and Install 6-Inch (Class 150B) Resilient Seat Gate Valve	EA	7	$ 5,000	$ 35,000
B20	Furnish and Install 8-Inch (Class 150B) Resilient Seat Gate Valve	EA	16	$ 6,000	$ 96,000
B21	Furnish and Install 6-Inch Fire Hydrant (EMWD Dwg B-362)	EA	8	$ 15,000	$ 120,000
B22	Furnish and Install 1-inch Air Valve (EMWD Dwg B-598)	EA	4	$ 1,500	$ 6,000
B23	Furnish and Install 6-Inch Temporary End of Line Blow-Off (EMWD Dwg B-357)	EA	1	$ 8,000	$ 8,000
B24	Furnish and Install Pressure Regulator Valve	EA	45	$ 200	$ 9,000
B25	Disinfection and Bacteriological Testing of Potable Water Main and Appurtenances	LS	1	$ 2	$ 2
B26	Filling, Flushing and Hydrostatic Testing All Water Pipelines and Appurtenances	LS	1	$ 12,000	$ 12,000
B27	Construct Asphalt Concrete Base Pavement (3-inch AC over 6-inch Class 2 AB)1	SF	7,600	$ 8	$ 60,800
B28	Remove Asphalt Concrete by Cold Plane2	SF	7,600	$ 1	$ 7,600
B29	Construct 1-inch Thick Asphalt Overlay2	SF	22,800	$ 2	$ 45,600

B30	Restore Surface of Dirt Road	SF	15,532	$ 10	$ 155,320
B31	Restore Surface with 3/4" Aggregate Base (3" Depth)	SF	2,720	$ 10	$ 27,200
B32	Restore Concrete in Kind	SF	60	$ 10	$ 600
B33	Regrade Surface	CY	1,610	$ 25	$ 40,250
B34	Clearing and Grubbing	LS	1	$ 20,000	$ 20,000
B35	Non-Rippable Granitic Rock Excavation During Trenching	CY	575	$ 300	$ 172,578
				Bid Schedule B1 Subtotal	**$ 3,544,500**
Alternative Bid Schedule B1 - Good Hope (Eucalyptus Avenue west of Main Street)					
B1.1	Mobilization, Demobilization, Bonds, Insurance, Permits, and Miscellaneous (5%)	LS	1	$ 11,240	$ 11,240
B1.2	Implement Traffic Control and Safety Measures (5%)	LS	1	$ 5,100	$ 5,100
B1.3	Provide Construction Audio, Photographs and Video	LS	1	$ 1,400	$ 1,400
B1.4	Construction Surveying, Re-establish Monuments and Centerline Ties	LS	1	$ 600	$ 600
B1.5	Potholing and Utility Verification	LS	1	$ 600	$ 600
B1.6	Prepare and Implement SWPPP And BMPs	LS	1	$ 450	$ 450
B1.7	Maintain and Furnish As-Built Record Drawings	LS	1	$ 100	$ 100
B1.8	Temporary Water Highline	LS	1	$ 13,600	$ 13,600
B1.9	Construct 8-Inch Diameter PVC Water Main	LF	340	$ 300	$ 102,000
B1.10	Relocate Water Meter and Furnish and Install 1-Inch Copper Service	EA	2	$ 5,000	$ 10,000
B1.1	Furnish and Install New Meter Box	EA	2	$ 2,000	$ 4,000
B1.12	Remove and Dispose of Meter Box and Repair Surface	EA	2	$ 800	$ 1,600
B1.13	Furnish and Install 8-Inch (Class 150B) Resilient Seat Gate Valve	EA	1	$ 6,000	$ 6,000
B1.14	Furnish and Install 6-Inch Fire Hydrant (EMWD Dwg B-362)	EA	1	$ 15,000	$ 15,000
B1.15	Furnish and Install 1-inch Air Valve (EMWD Dwg B-598)	EA	1	$ 1,500	$ 1,500
B1.16	Furnish and Install 6-Inch Temporary End of Line Blow-Off (EMWD Dwg B-357)	EA	1	$ 8,000	$ 8,000
B1.17	Furnish and Install Guard Post	EA	2	$ -	$ -
B1.18	Install 4'x4' Concrete Pad	EA	1	$ -	$ -
B1.19	Disinfection and Bacteriological Testing of Potable Water Main and Appurtenances	LS	1	$ 2	$ 2
B1.20	Filling, Flushing and Hydrostatic Testing All Water Pipelines and Appurtenances	LS	1	$ 12,000	$ 12,000
B1.21	Restore Surface of Dirt Road	SF	1,360	$ 10	$ 13,600
B1.22	Non-Rippable Granitic Rock Excavation During Trenching	CY	60	$ 300	$ 18,000
				Alternative Bid Schedule B1 Subtotal	**$ 224,800**
Alternative Bid Schedule B2 - Good Hope (Maple Avenue)					
B2.1	Mobilization, Demobilization, Bonds, Insurance, Permits, and Miscellaneous (5%)	LS	1	$ 13,533	$ 13,533
B2.2	Implement Traffic Control and Safety Measures (5%)	LS	1	$ 4,950	$ 4,950
B2.3	Provide Construction Audio, Photographs and Video	LS	1	$ 1,300	$ 1,300
B2.4	Construction Surveying, Re-establish Monuments and Centerline Ties	LS	1	$ 500	$ 500
B2.5	Potholing and Utility Verification	LS	1	$ 600	$ 600
B2.6	Prepare and Implement SWPPP And BMPs	LS	1	$ 400	$ 400
B2.7	Maintain and Furnish As-Built Record Drawings	LS	1	$ 100	$ 100
B2.8	Temporary Water Highline	LS	1	$ 13,200	$ 13,200
B2.9	Construct 8-Inch Diameter PVC Water Main	LF	330	$ 300	$ 99,000
B2.10	Relocate Water Meter and Furnish and Install 1-Inch Copper Service	EA	6	$ 5,000	$ 30,000
B2.11	Furnish and Install New Meter Box	EA	6	$ 2,000	$ 12,000
B2.12	Relocate Existing Backflow Preventor	EA	1	$ 10,000	$ 10,000
B2.13	Remove and Dispose of Meter Box and Repair Surface	EA	6	$ 800	$ 4,800
B2.14	Furnish and Install 8-Inch (Class 150B) Resilient Seat Gate Valve	EA	1	$ 6,000	$ 6,000
B2.15	Furnish and Install 6-Inch Fire Hydrant (EMWD Dwg B-362)	EA	1	$ 15,000	$ 15,000
B2.16	Furnish and Install 1-inch Air Valve (EMWD Dwg B-598)	EA	1	$ 1,500	$ 1,500
B2.17	Furnish and Install 6-Inch Temporary End of Line Blow-Off (EMWD Dwg B-357)	EA	1	$ 8,000	$ 8,000
B2.18	Disinfection and Bacteriological Testing of Potable Water Main and Appurtenances	LS	1	$ 2	$ 2
B2.19	Filling, Flushing and Hydrostatic Testing All Water Pipelines and Appurtenances	LS	1	$ 12,000	$ 12,000
B2.20	Restore Surface of Dirt Road	SF	1,320	$ 10	$ 13,200
B2.21	Non-Rippable Granitic Rock Excavation During Trenching	CY	49	$ 300	$ 14,667
B2.22	Support/Hold Utility Pole	Day	3	$ 3,300	$ 9,900
				Alternative Bid Schedule B2 Subtotal	**$ 270,700**
Alternative Bid Schedule B3 - Good Hope (Pine Street)					
B3.1	Mobilization, Demobilization, Bonds, Insurance, Permits, and Miscellaneous (5%)	LS	1	$ 11,780	$ 11,780
B3.2	Implement Traffic Control and Safety Measures (5%)	LS	1	$ 4,950	$ 4,950
B3.3	Provide Construction Audio, Photographs and Video	LS	1	$ 1,300	$ 1,300
B3.4	Construction Surveying, Re-establish Monuments and Centerline Ties	LS	1	$ 500	$ 500
B3.5	Potholing and Utility Verification	LS	1	$ 600	$ 600
B3.6	Prepare and Implement SWPPP And BMPs	LS	1	$ 400	$ 400
B3.7	Maintain and Furnish As-Built Record Drawings	LS	1	$ 100	$ 100
B3.8	Temporary Water Highline	LS	1	$ 13,200	$ 13,200
B3.9	Construct 8-Inch Diameter PVC Water Main	LF	330	$ 300	$ 99,000
B3.10	Relocate Water Meter and Furnish and Install 1-Inch Copper Service	EA	3	$ 5,000	$ 15,000
B3.11	Furnish and Install New Meter Box	EA	3	$ 2,000	$ 6,000
B3.12	Relocate Existing Backflow Preventor	EA	1	$ 10,000	$ 10,000
B3.13	Remove and Dispose of Meter Box and Repair Surface	EA	3	$ 800	$ 2,400
B3.14	Furnish and Install 8-Inch (Class 150B) Resilient Seat Gate Valve	EA	1	$ 6,000	$ 6,000

B3.15	Furnish and Install 6-Inch Fire Hydrant (EMWD Dwg B-362)	EA	1	$ 15,000	$ 15,000
B3.16	Furnish and Install 1-inch Air Valve (EMWD Dwg B-598)	EA	1	$ 1,500	$ 1,500
B3.17	Furnish and Install 6-Inch Temporary End of Line Blow-Off (EMWD Dwg B-357)	EA	1	$ 8,000	$ 8,000
B3.18	Disinfection and Bacteriological Testing of Potable Water Main and Appurtenances	LS	1	$ 2	$ 2
B3.19	Filling, Flushing and Hydrostatic Testing All Water Pipelines and Appurtenances	LS	1	$ 12,000	$ 12,000
B3.20	Restore Surface of Dirt Road	SF	1,320	$ 10	$ 13,200
B3.21	Non-Rippable Granitic Rock Excavation During Trenching	CY	49	$ 300	$ 14,667
			Alternative Bid Schedule B3 Subtotal		**$ 235,600**
Alternative Bid Schedule B4 - Good Hope (Cherry Lane)					
B4.1	Mobilization, Demobilization, Bonds, Insurance, Permits, and Miscellaneous (5%)	LS	1	$ 10,907	$ 10,907
B4.2	Implement Traffic Control and Safety Measures (5%)	LS	1	$ 4,725	$ 4,725
B4.3	Provide Construction Audio, Photographs and Video	LS	1	$ 1,300	$ 1,300
B4.4	Construction Surveying, Re-establish Monuments and Centerline Ties	LS	1	$ 500	$ 500
B4.5	Potholing and Utility Verification	LS	1	$ 600	$ 600
B4.6	Prepare and Implement SWPPP And BMPs	LS	1	$ 400	$ 400
B4.7	Maintain and Furnish As-Built Record Drawings	LS	1	$ 100	$ 100
B4.8	Temporary Water Highline	LS	1	$ 12,600	$ 12,600
B4.9	Construct 8-Inch Diameter PVC Water Main	LF	315	$ 300	$ 94,500
B4.10	Relocate Water Meter and Furnish and Install 1-Inch Copper Service	EA	3	$ 5,000	$ 15,000
B4.11	Furnish and Install New Meter Box	EA	3	$ 2,000	$ 6,000
B4.12	Remove and Dispose of Meter Box and Repair Surface	EA	3	$ 800	$ 2,400
B4.13	Furnish and Install 8-Inch (Class 150B) Resilient Seat Gate Valve	EA	1	$ 6,000	$ 6,000
B4.14	Furnish and Install 6-Inch Fire Hydrant (EMWD Dwg B-362)	EA	1	$ 15,000	$ 15,000
B4.15	Furnish and Install 1-inch Air Valve (EMWD Dwg B-598)	EA	1	$ 1,500	$ 1,500
B4.16	Furnish and Install 6-Inch Temporary End of Line Blow-Off (EMWD Dwg B-357)	EA	1	$ 8,000	$ 8,000
B4.17	Disinfection and Bacteriological Testing of Potable Water Main and Appurtenances	LS	1	$ 2	$ 2
B4.18	Filling, Flushing and Hydrostatic Testing All Water Pipelines and Appurtenances	LS	1	$ 12,000	$ 12,000
B4.19	Restore Surface of Dirt Road	SF	1,260	$ 10	$ 12,600
B4.20	Non-Rippable Granitic Rock Excavation During Trenching	CY	47	$ 300	$ 14,000
			Alternative Bid Schedule B4 Subtotal		**$ 218,100**
Alternative Bid Schedule B5 - Good Hope (Maguglin Way)					
B5.1	Mobilization, Demobilization, Bonds, Insurance, Permits, and Miscellaneous (5%)	LS	1	$ 10,086	$ 10,086
B5.2	Implement Traffic Control and Safety Measures (5%)	LS	1	$ 4,725	$ 4,725
B5.3	Provide Construction Audio, Photographs and Video	LS	1	$ 1,300	$ 1,300
B5.4	Construction Surveying, Re-establish Monuments and Centerline Ties	LS	1	$ 500	$ 500
B5.5	Potholing and Utility Verification	LS	1	$ 600	$ 600
B5.6	Prepare and Implement SWPPP And BMPs	LS	1	$ 400	$ 400
B5.7	Maintain and Furnish As-Built Record Drawings	LS	1	$ 100	$ 100
B5.8	Temporary Water Highline	LS	1	$ 12,600	$ 12,600
B5.9	Construct 8-Inch Diameter PVC Water Main	LF	315	$ 300	$ 94,500
B5.10	Relocate Water Meter and Furnish and Install 1-Inch Copper Service	EA	1	$ 5,000	$ 5,000
B5.11	Furnish and Install New Meter Box	EA	1	$ 2,000	$ 2,000
B5.12	Remove and Dispose of Meter Box and Repair Surface	EA	1	$ 800	$ 800
B5.13	Furnish and Install 8-Inch (Class 150B) Resilient Seat Gate Valve	EA	1	$ 6,000	$ 6,000
B5.14	Furnish and Install 6-Inch Fire Hydrant (EMWD Dwg B-362)	EA	1	$ 15,000	$ 15,000
B5.15	Furnish and Install 1-inch Air Valve (EMWD Dwg B-598)	EA	1	$ 1,500	$ 1,500
B5.16	Furnish and Install 6-Inch Temporary End of Line Blow-Off (EMWD Dwg B-357)	EA	1	$ 8,000	$ 8,000
B5.17	Disinfection and Bacteriological Testing of Potable Water Main and Appurtenances	LS	1	$ 2	$ 2
B5.18	Filling, Flushing and Hydrostatic Testing All Water Pipelines and Appurtenances	LS	1	$ 12,000	$ 12,000
B5.19	Restore Surface of Dirt Road	SF	1,260	$ 10	$ 12,600
B5.20	Non-Rippable Granitic Rock Excavation During Trenching	CY	47	$ 300	$ 14,000
			Alternative Bid Schedule B5 Subtotal		**$ 201,700**
Bid Schedule C - Mead Valley (South of Calajalco Road)					
C1	Mobilization, Demobilization, Bonds, Insurance, Permits, and Miscellaneous (5%)	LS	1	$ 118,871	$ 118,871
C2	Implement Traffic Control and Safety Measures (5%)	LS	1	$ 60,600	$ 60,600
C3	Provide Construction Audio, Photographs and Video	LS	1	$ 16,200	$ 16,200
C4	Construction Surveying, Re-establish Monuments and Centerline Ties	LS	1	$ 6,400	$ 6,400
C5	Potholing and Utility Verification	LS	1	$ 400	$ 400
C6	Prepare and Implement SWPPP And BMPs	LS	1	$ 500	$ 500
C7	Maintain and Furnish As-Built Record Drawings	LS	1	$ 700	$ 700
C8	Temporary Water Highline	LS	1	$ 161,600	$ 161,600
C9	Construct 8-Inch Diameter PVC Water Main	LF	4,040	$ 300	$ 1,212,000
C10	Abandon Existing Water Pipe	LF	300	$ 8	$ 2,400
C11	Connection to Existing Water System	EA	5	$ 10,000	$ 50,000
C12	Reconnect Existing Water Lateral	EA	10	$ 2,500	$ 25,000
C13	Relocate Water Meter and Furnish and Install 1-Inch Copper Service	EA	11	$ 5,000	$ 55,000
C14	Furnish and Install New Meter Box	EA	11	$ 2,000	$ 22,000
C15	Remove and Legally Dispose of Existing Fire Hydrant	EA	3	$ 2,000	$ 6,000
C16	Remove and Dispose of Meter Box and Repair Surface	EA	11	$ 800	$ 8,800
C17	Furnish and Install 8-Inch (Class 150B) Resilient Seat Gate Valve	EA	8	$ 6,000	$ 48,000

C18	Furnish and Install 6-Inch Fire Hydrant (EMWD Dwg B-362)	EA	5	$ 15,000	$ 75,000
C19	Furnish and Install 1-inch Air Valve (EMWD Dwg B-598)	EA	5	$ 1,500	$ 7,500
C20	Furnish and Install 6-Inch Temporary End of Line Blow-Off (EMWD Dwg B-357)	EA	3	$ 8,000	$ 24,000
C21	Furnish and Install Pressure Regulator Valve	EA	19	$ 200	$ 3,800
C22	Disinfection and Bacteriological Testing of Potable Water Main and Appurtenances	LS	1	$ 2	$ 2
C23	Filling, Flushing and Hydrostatic Testing All Water Pipelines and Appurtenances	LS	1	$ 12,000	$ 12,000
C24	Construct Asphalt Concrete Base Pavement (3-inch AC over 6-inch Class 2 AB)1	SF	12,360	$ 8	$ 98,880
C25	Remove Asphalt Concrete by Cold Plane2	SF	12,360	$ 1	$ 12,360
C26	Construct 1-inch Thick Asphalt Overlay2	SF	37,080	$ 2	$ 74,160
C27	Restore Surface of Dirt Road	SF	9,570	$ 10	$ 95,700
C28	Non-Rippable Granitic Rock Excavation During Trenching	CY	599	$ 300	$ 179,556
				Bid Schedule C Subtotal	**$ 2,377,400**
				Subtotal	**$ 8,027,200**
				10% Contingency	**$ 802,700**
				Total OPCC	**$ 8,829,900**
				Total Cost per LF	**$ 900**

[1] Per County of Riverside Standard Detail No. 818.

[2] Per County of Riverside Standard Detail No. 818, a minimum 12-ft wide 1-inch grind and overlay is required for parallel installation.

APPENDIX A EMWD Water Meters

APPENDIX A - WATER METERS

Number	ASSESSORS PARCEL NUMBER (APN)	SERVICE ADDRESS	SERVICE ORDER (SO)	METER SERIAL NUMBER	REGISTER SERIAL NUMBER	MXU SERIAL NUMBER	METER SIZE	SERVICE LATERAL SIZE	RELOCATE EXISTING REMOTE METER?	INSTALL BACKFLOW PREVENTOR (BFP)?	INSTALL PRV?	ON SITE PLUMBING REQUIRED
1	343-265-020	24800 ACACIA ST	252355	19149891	84180110	98619856	5/8 in	1 in	YES	NO	YES	NO
2	345-033-011	0 CHERRY AVE	265305				5/8 in	1 in	YES	NO	NO	NO
3	345-033-012	21464 CHERRY AVE	252070	19133105	84170973	88372664	5/8 in	1 in	YES	NO	NO	NO
4	345-034-006	21475 CHERRY AVE	223080	67490238	72803562	83781022	1 in	1 in	YES	NO	NO	NO
5	343-203-014	21490 CLUB DR	57450				5/8 in	1 in	NO	NO	YES	NO
6	343-320-001	21499 CLUB DR	255817				5/8 in	1 in	NO	NO	YES	NO
7	343-252-024	21500 CLUB DR						1 in	NO	NO	TBD	NO
8	343-253-014	21503 CLUB DR	2933	56500799	74082349	83785586	5/8 in	1 in	NO	NO	YES	NO
9	343-253-013	21511 CLUB DR						1 in	NO	NO	NO	NO
10	343-263-021	21771 CLUB DR	37188	57781056	69842482	13536524	5/8 in	1 in	YES	NO	YES	NO
11	343-263-013	21811 CLUB DR	2799	59233123	62867873	13535336	5/8 in	1 in	YES	NO	YES	NO
12	343-262-030	21870 CLUB DR	26592	8481434	84177829	83780968	1 in	1 in	YES	YES	YES	NO
13	343-262-027	21882 CLUB DR	265300				1 in	1 in	YES	YES	YES	NO
14	343-263-019	21887 CLUB DR	186753	63054279	74082356	83780292	5/8 in	1 in	NO	NO	YES	NO
15	343-266-021	21899 CLUB DR	84487	58991699	68966333	13539436	1 in	1 in	YES	NO	YES	YES
16	343-265-017	21900 CLUB DR	252401	19149890	84180112	88349252	5/8 in	1 in	YES	NO	YES	NO
17	343-266-010	21905 CLUB DR	45412	58939826	69849278	13535348	5/8 in	1 in	YES	NO	YES	YES
18	343-265-018	21920 CLUB DR	239957	10408253	84162049	84455268	5/8 in	1 in	YES	NO	YES	NO
19	343-266-020	21925 CLUB DR	85294	72047974	69417531	83656658	5/8 in	1 in	YES	NO	YES	YES
20	343-265-007	21930 CLUB DR	250736	19047047	84175309	88374908	5/8 in	1 in	YES	NO	YES	NO
21	343-266-008	21931 CLUB DR	22096	10076583	13077145	83781590	5/8 in	1 in	YES	NO	YES	YES
22	343-266-027	21947 CLUB DR	37209	69659976	74082328	83780272	5/8 in	1 in	YES	NO	YES	YES
23	343-265-009	21950 CLUB DR	90757	72437063	70019453	83781514	5/8 in	1 in	NO	NO	YES	NO
24	343-265-005	21960 CLUB DR	87256	72048117	72248551	83786968	1 in	1 in	NO	NO	YES	NO
25	343-266-003	21965 CLUB DR	15653	58253253	74081825	83781068	5/8 in	1 in	YES	NO	YES	NO
26	345-031-022	21427 EUCALYPTUS AVE	246742				5/8 in	1 in	YES	NO	NO	NO
27	345-030-017	21493 EUCALYPTUS AVE	211199	67709311	74082051	83779730	5/8 in	1 in	YES	YES	NO	NO
28	343-253-015	21505 EUCALYPTUS AVE	229132	67861706	74011780	83775586	5/8 in	1 in	YES	NO	NO	NO
29	343-253-016	21510 EUCALYPTUS AVE	217972	99423595	74225836	85289510	1 in	1 in	YES	NO	NO	YES
30	343-253-017	21518 EUCALYPTUS AVE	245723	10872042	84198829	88125860	5/8 in	1 in	NO	NO	NO	NO
31	343-253-018	21528 EUCALYPTUS AVE	245722	10872040	51028535	88289366	5/8 in	1 in	YES	NO	YES	NO
32	343-253-019	21538 EUCALYPTUS AVE	245720	10872043	51029859	88143252	5/8 in	1 in	YES	NO	YES	NO
33	343-253-024	21580 EUCALYPTUS AVE	232672	70872569	65781577	13535206	5/8 in	1 in	YES	NO	YES	YES
34	343-53-010	21640 EUCALYPTUS AVE	81454	72477421	70054777	16174838	5/8 in	1 in	YES	NO	YES	YES
35	343-263-020	21772 EUCALYPTUS AVE	60139	59414543	69842478	13535342	5/8 in	1 in	NO	NO	YES	NO
36	345-040-002	21855 EUCALYPTUS AVE	2685	95450558	68966355	13538180	1 in	1 in	NO	NO	YES	NO
37	343-266-017	21936 EUCALYPTUS AVE	166285	60713513	70509178	83654244	5/8 in	1 in	NO	NO	YES	NO

38	343-266-024	21950 EUCALYPTUS AVE	90625	59599500	74082330	83779822	5/8 in	1 in	NO	NO	YES	NO
39	343-266-018	21952 EUCALYPTUS AVE	90862	11421542	84149945	13537686	5/8 in	1 in	NO	NO	YES	NO
40	345-034-023	21470 MAGUGLIN WAY	229651				1 in	1 in	YES	NO	NO	NO
41	343-204-016	24991 MAIN ST	16180	99430749	69842321	98623414	5/8 in	1 in	YES	NO	NO	NO
42	345-032-017	21421 MAPLE AVE	196753	64438528	69842328	13524262	5/8 in	1 in	YES	NO	NO	NO
43	345-031-018	21434 MAPLE AVE	190691	63422332	73379570	83780312	5/8 in	1 in	YES	YES	NO	NO
44	345-032-004	21441 MAPLE AVE	9519	99430754	75211806	81222868	5/8 in	1 in	YES	NO	NO	NO
45	345-031-021	21470 MAPLE AVE	190692	63422331	73340148	83774660	5/8 in	1 in	YES	NO	NO	NO
46	345-031-020	21498 MAPLE AVE	238174	10021486	84018450	88660072	5/8 in	1 in	YES	NO	NO	NO
47	345-033-004	21445 PINE ST	265308	212161698	84250255	56902310	3/4 in	1 in	YES	YES	NO	NO
48	345-020-008	21217 SHARP RD	58141				1 in	1 in	NO	NO	YES	NO
49	345-020-024	21358 SHARP RD	255996				1 in	1 in	NO	YES	YES	NO
50	345-020-005	21401 SHARP RD	22380				1 in	1 in	NO	NO	YES	NO
51	345-020-004	21455 SHARP RD	33447	56138344	48003977	15841938	1 in	1 in	NO	NO	YES	NO
52	345-036-009	21478 SHARP RD	60507	19809088	84161764	83303414	1 in	1 in	NO	NO	YES	NO
53	345-050-012	21725 SHARP RD	61440	59414540	74082055	83787194	5/8 in	1 in	NO	NO	YES	NO
54	345-050-013	21745 SHARP RD	10976	66884552	75006386	83779732	5/8 in	1 in	NO	NO	YES	NO
55	345-050-014	21811 SHARP RD	2612	8496957	84018461	88283708	1 in	1 in	NO	YES	YES	NO
56	345-040-047	21820 SHARP RD	263912				1 in	1 in	NO	NO	YES	NO
57	345-040-048	21884 SHARP RD	259571				1 in	1 in	NO	NO	YES	NO
58	345-040-027	21950 SHARP RD	2650	59319079	71192955	83787148	1 in	1 in	NO	NO	YES	NO
59	345-040-025	21960 SHARP RD	10389	99461714	74850705	83779206	5/8 in	1 in	NO	NO	YES	NO
60	345-040-024	21970 SHARP RD	11492				5/8 in	1 in	NO	NO	YES	NO
61	345-040-031	21980 SHARP RD	30151				5/8 in	1 in	NO	NO	YES	NO
62	345-050-031	25270 SPRING ST	10779	63422147	71492100	83780358	5/8 in	1 in	NO	NO	YES	NO
63	345-040-003	25037 THEDA ST	70076	98372189	73404679	83654416	1 in	1 in	NO	NO	YES	NO
64	318-811-032	19232 ROBINSON ST	261678	212180093	84271539	89961464	1 in	1 in	YES	YES	YES	NO
65	318-811-031	19256 ROBINSON ST	261690	212180094	84271985	89955510	1 in	1 in	YES	NO	YES	NO
66	318-811-030	19280 ROBINSON ST	12744	68734327	69967888	13725786	5/8 in	1 in	YES	NO	YES	NO
67	318-811-029	19300 ROBINSON ST	250434	11463044	84145462	88364804	3/4 in	1 in	YES	NO	YES	NO
68	318-811-015	19335 ROBINSON ST	218527	66232882	71593196	89913536	5/8 in	1 in	YES	NO	YES	NO
69	318-811-027	19361 ROBINSON ST	249440				3/4 in	1 in	YES	NO	YES	NO
70	318-811-016	19367 ROBINSON ST	249479	9086965	84152588	88335678	1 in	1 in	YES	NO	YES	NO
71	318-811-017	19401 ROBINSON ST	15624	19809501	84197593	94232776	1 in	1 in	YES	NO	YES	NO
72	318-811-025	19414 ROBINSON ST	214326	66151483	69967885	13713498	5/8 in	1 in	YES	NO	YES	NO
73	318-811-018	19421 ROBINSON ST	97233	96406101	71301258	89195066	5/8 in	1 in	YES	NO	YES	NO
74	318-180-051	0 OAKWOOD ST	223769	66884554		89380490	5/8"	1 in	NO	NO	YES	NO
75	318-190-027	19770 CARROLL ST	15342	58649968		89403350	1"	1 in	YES	NO	YES	NO
76	318-819-026	19808 CARROLL ST	15543	58726073		88155894	5/8"	1 in	YES	NO	YES	NO
77	318-190-048	19834 CARROLL ST	10876	212483833		89406436	5/8"	1 in	NO	NO	YES	NO
78	318-180-056	19835 CARROLL ST	91061	58726076		89392446	5/8"	1 in	NO	NO	YES	NO
79	318-190-032	19835 DAY ST	16772	20379334		89405442	5/8"	1 in	YES	NO	YES	NO
80	318-190-034	19871 DAY ST	52929	10406880		88339060	5/8"	1 in	YES	NO	YES	NO

81	318-180-049	21609 OAKWOOD ST	16779	11143422		89326584	5/8"	1 in	NO	NO	YES	NO
82	318-180-050	21621 OAKWOOD ST	252076	19809303		88498592	1"	1 in	NO	NO	YES	NO
83	318-120-046	21624 OAKWOOD ST	247706	9063360		89190310	1"	1 in	NO	NO	YES	NO
84	318-120-047	21640 OAKWOOD ST	223768	66884517		89380598	5/8"	1 in	NO	NO	YES	NO
85	318-120-048	21670 OAKWOOD ST	36362	99587810		89410532	5/8"	1 in	YES	NO	YES	NO
86	318-180-054	21685 OAKWOOD ST	21680	11087268		89380550	5/8"	1 in	YES	NO	YES	NO
87	318-120-049	21730 OAKWOOD ST	32013	96498773		89330614	1"	1 in	YES	NO	YES	NO
88	318-190-030	21851 OAKWOOD ST	212211	66000387		89408096	1"	1 in	YES	NO	NO	NO
89	318-120-051	21870 OAKWOOD ST	10612	58726072		89405734	5/8"	1 in	YES	NO	YES	NO
90	318-190-035	21920 PINEWOOD ST	171466	61321603		89404944	5/8"	1 in	YES	NO	YES	NO
91	318-180-069	21929 PINEWOOD ST	167471	61001773		89393454	5/8"	1 in	NO	NO	YES	NO
92	318-180-070	21951 PINEWOOD ST	8896	8934139		88251236	1"	1 in	NO	NO	YES	NO
93	318-180-070	21965 PINEWOOD ST	13887	11143449		89401952	5/8"	1 in	NO	NO	YES	NO
94	318-120-053	21950 OAKWOOD ST						1 in	YES	NO	NO	NO
95	345-032-007	21483 MAPLE AVE						1 in	YES	TBD	TBD	NO
96	345-032-009	21500 PINE ST						1 in	YES	TBD	TBD	NO
97	318-811-031	19256 ROBINSON ST	261691					1 in	YES	NO	YES	NO
98	345-032-010	21488 PINE ST						1 in	YES	TBD	TBD	NO
99	343-204-017	21495 CLUB DR						1 in	NO	NO	NO	

APPENDIX B Geotechnical Report

GEOTECHNICAL INVESTIGATION

EASTERN MUNICIPAL WATER DISTRICT
GOOD HOPE AND MEAD VALLEY WATER PROJECT

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, CA 92120

July 19, 2022

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July 19, 2023

Atlas No. 1962
Report No. 2

MR. NATE OLIVAS
EASTERN MUNICIPAL WATER DISTRICT
2270 TRUMBLE ROAD
PERRIS, CA 92570

Subject: **Geotechnical Investigation**
Good Hope and Mead Valley Water Project (Phases 1 and 2)
Eastern Municipal Water District
Riverside County, California

Dear Mr. Olivas:

In accordance with your request and our proposal Nos. 22-04013R2 and 23-00402R2, Atlas has performed a geotechnical investigation to assess the geologic conditions for the Good Hope and Mead Valley water project, including potential geologic hazards, and to provide recommendations based on our findings. Our investigation has consisted of a review of readily available geologic literature, site reconnaissance, exploratory borings, geotechnical laboratory testing, geotechnical analysis, and the preparation of this report.

If you have any questions, please contact the undersigned.

Respectfully submitted,
Atlas Technical Consultants LLC

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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 Eastern Municipal Water District (EMWD) Good Hope and Mead Valley water project. We understand the project will consist of approximately 7,800 feet of new water pipeline in the Good Hope area and 1,650 feet of new water pipeline on Robinson Street in the Mead Valley Cajalco Corridor area. In addition, approximately 4,000 linear feet of water line will be constructed along Oakwood Street, Day Street, Pinewood Street, and Carroll Street located in the Mead Valley area. Figure 1 presents the site vicinity.

2. SCOPE OF WORK

2.1 Geotechnical Investigation

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. Additionally, Atlas explored subsurface conditions by drilling twelve (12) borings to depths between approximately 13 and 41½ feet below the existing ground surface with limited access and truck-mounted drill rigs equipped with hollow stem auger. Figure 2 presents the approximate locations and depths of the borings.

An Atlas engineer and geologist logged the borings and collected samples of the material encountered for geotechnical laboratory testing. Soil and rock recovered during the field investigation were inspected in the field for soil and/or groundwater contamination with visual and factory methods. The boring logs are presented in Appendix I. Soils were classified according to the Unified Soil Classification System illustrated in the Subsurface Exploration Legend (Appendix I). The rocks encountered were classified in accordance with the California Department of Transportation (Caltrans) rock classification system.

2.2 Geophysical Survey

Atlas' scope of work included performing geophysical surveys at select locations along the project alignment. The seismic refraction surveys were performed at the project site on January 3 and 4, and June 29, 2023. The purpose of these surveys was to obtain excavatability and rippability data along the project alignment. The results of these surveys were provided in a separate report dated July 13, 2023 (Atlas, 2023).

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, Atterberg limits, expansion index, direct shear, R-value, and corrosivity testing. The results of in-situ moisture content and density are

provided on the boring logs in Appendix I. The results of the remaining laboratory tests and brief descriptions of the test procedures 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 measured pavement section thickness and soil characterization detailing subsurface conditions noted on 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
- Jack and bore recommendations
- Subgrade compaction beneath pavements
- New flexible pavement structural sections
- Corrosivity of earth materials

3. SITE AND PROJECT DESCRIPTION

The proposed improvements include 5,650 feet of new water pipeline in the Mead Valley Cajalco Corridor area and 7,800 feet in the Good Hope area. The water pipeline improvements are estimated to embed approximately 5 feet below ground surface. Two storm drain crossings extending to approximately 10 feet below ground surface are also proposed in the Good Hope area. Associated improvements include installing remote water meter connections and pavement restoration. Atlas understands the project is likely to use traditional open excavation trenching techniques, and that jack and bore techniques are considered at the proposed storm drain crossings.

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 and the materials observed in our borings consisted of Asphalt Concrete (AC) pavement section, fill, old alluvial-fan deposits, Val Verde tonalite, massive-textured tonalite, and Schist. The approximate depths to bedrock are presented in Table 1. Figure 3 presents the regional geology, and descriptions of the materials encountered are provided below.

Pavement Section: A pavement section consisting of a 5-inch-thick AC layer underlain by 3 inches of Aggregate Base (AB) was encountered in boring B-6W.

Fill (Qf): Fill was encountered in boring B-5W to a depth of approximately 2 feet. The materials encountered consisted of moist, dense clayey sand.

Old Alluvial-Fan Deposits (Qof): Old alluvial flood-plain deposits were encountered in all the borings drilled for water pipeline improvements to depths of ranging between approximately 5 to 15 feet below grade. The materials encountered consisted of moist, medium dense to very dense silty and clayey sand, medium dense to very dense poorly graded sand with silt, and dense sandy silt.

Massive-Textured Tonalite (kgt): Massive-textured tonalite was encountered beneath the old alluvial fan deposits and fill to the total depths explored in the Good Hope area (i.e., in borings B-1W through B-5W). The materials encountered generally consisted of intensely weathered to decomposed, very soft igneous rock. The decomposed and weathered rock could be described as soil materials consisting of very dense poorly graded sand with various amounts of silt and very dense silty sand.

Val Verde Tonalite (Kvt): Val Verde tonalite was encountered beneath the old alluvial-fan deposits to the total depth of borings explored in the Mead Valley Cajalco Corridor area (i.e., in borings B-6W, and B-8W through B-12W). The materials encountered consisted of decomposed to moderately weathered, very soft tonalite. The decomposed rock could generally be described as very dense poorly graded sand, well-graded sand, and silty sand, and hard lean clay with sand with various amounts of silt and gravel.

Schist (TRms): Schist was encountered beneath the old alluvial fan deposits to the total depth of boring B-7W in the Mead Valley Cajalco Corridor area. The materials encountered consisted of intensely weathered metamorphic rock, which could be described as very dense silty sand.

Table 1: Depth to Bedrock

Alignment	Boring Location	Approximate Depth to Bedrock (ft)
Good Hope Olive Area	B-1W	5½
	B-2W	5½
	B-3W	5½
	B-4W	15
	B-5W	8
Mead Valley Cajalco Corridor	B-6W	10
	B-7W	5
	B-8W	6
	B-9W	5½
	B-10W-A	5½
	B-11W	5½
	B-12W	5½

Groundwater: Groundwater was encountered in some borings as shallow as 9 feet below ground surface. The observed depth to groundwater is presented in Table 2. It should be recognized that groundwater conditions may vary at the 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 2: Depth to Groundwater

Alignment	Boring Location	Approximate Depth to Groundwater (ft)
Good Hope Olive Area	B-1W	-
	B-2W	-
	B-3W	26
	B-4W	34
	B-5W	-
Mead Valley Cajalco Corridor	B-6W	29
	B-7W	-
	B-8W	9
	B-9W	17
	B-10W-A	-
	B-11W	-
	B-12W	-

(-) indicates not observed

4.1 Geologic Hazards

The following sections discuss the potential for geologic hazards at the project site.

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. Figure 4 presents the California Fault Activity Map. The closest active fault to the sites is the Glen Ivy North fault (Jennings, 2010). 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 low.

4.1.2 CBC Seismic Design Parameters

A geologic hazard likely to affect the project is ground shaking as a result of movement along an active fault zone in the vicinity of the subject site. Based on the subsurface conditions encountered during our investigation and available online resources (Wills et al. 2015), both alignments may 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 (SEAOC, 2022). Please note that the seismic parameters are provided for the approximate coordinates tabulated for each site.

Table 3: 2019 CBC Seismic Parameters

Site Coefficients & Spectral Response Acceleration Parameters	Good Hope Area	Mead Valley Cajalco Corridor
Site Class	C – Very Dense Soil	C – Very Dense Soil
Latitude	33.7573°	33.8391°
Longitude	-117.2787°	-117.2819°
Site Coefficients, F_a	1.2	1.2
Site Coefficients, F_v	1.445	1.446
Spectral Response Acceleration at Short Period, S_s	1.5g	1.5g
Spectral Response Acceleration at 1-Second Period, S_1	0.555g	0.554g
Design Spectral Acceleration at Short Period, S_{DS}	1.2g	1.2g
Design Spectral Acceleration at 1-Second Period, S_{D1}	0.535g	0.534g
Site Modified Peak Ground Acceleration, PGA_M	0.67g	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 settlements as well as possible lateral spreading during an earthquake. Liquefiable material is not mapped along the project alignment. Because of the shallow hard material, it is our opinion that the potential liquefaction and dynamic settlement to impact the project is low.

4.1.4 Flooding, Tsunamis, and Seiches

Flood Insurance Rate Map 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. The project site designated as a Flood Hazard Zone X, which designates the areas determined to be outside the 0.2% annual chance floodplain (FEMA, 2022). The potential for flooding is low.

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, 2022a). 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 that 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 very dense 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 and metamorphic rock formations. Please refer to Table 1 for the depths to formational materials along the alignments. 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 excavations. The materials anticipated below the pipeline depths are generally expected to provide good pipeline support.

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 grading.

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 Expansive Soil

The selected samples of the on-site materials have expansion indices of 5 and 51. These results indicate that the on-site materials have a very low to medium expansion potential. We anticipate the majority of the on-site soils will be suitable for use as trench backfill. An Atlas representative should observe the fill material during construction. The grading recommendations presented in this report assume materials with a medium expansion.

6.1.3 Compacted Fill

Compacted fill should consist of granular materials 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 should be moisture conditioned within 2% of optimum moisture content and compacted to at least 90% relative compaction. Utility trench

backfill beneath pavements and hardscape should be compacted to at least 90% relative compaction. The top 12 inches of subgrade beneath pavement should be compacted to at least 95%. Additionally, the upper 2 feet of subgrade materials beneath the pavements and hardscape should have an expansion index of 50 or less. The maximum dry density and optimum moisture content for evaluating relative compaction should be obtained using ASTM D1557.

6.1.4 Imported Soil

Imported soil should consist of predominately granular soil, free of organic matter, and rocks less than 6 inches. Imported soil should have an expansion index of 20 or less and should be observed and, if appropriate, tested by Atlas prior to transport to the site.

6.1.5 Excavation Characteristics

It is anticipated that excavation can be achieved with conventional earthwork equipment in good working order. Excavations in fill and old alluvial flood-plain deposits may be locally unstable and may contain construction debris, cobbles, or boulders. Difficult excavations should be anticipated in areas with very dense granular materials and shallow rock. Please refer to Table 1 for the depths to formational materials along the alignments. Contract documents should specify that the contractor mobilize equipment capable of excavating and compacting materials within the variable fracturing, weathering, rock abrasiveness, and strength/hardness rock conditions. Rock breakers, carbide tipped augers, or carbide/diamond tipped coring equipment may be required to excavate/drill hard rock materials.

6.1.6 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 off the site.

6.1.7 Temporary Excavations

Temporary excavations 4 feet deep or less can be made vertically. Temporary excavations deeper than 4 feet in the fill, old alluvial flood-plain deposits, and intensely weathered or decomposed bedrock 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, trench boxes, or anchor tie-back walls 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.

If temporary slopes are to be maintained during the rainy season, berms are recommended along the tops of the slopes to prevent runoff water from entering the excavation and eroding the slope faces.

6.1.8 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 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.

6.1.9 Temporary Dewatering

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.

6.1.10 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

The proposed improvements include a total of 5,650 feet of new water pipeline in the Mead Valley Cajalco Corridor and 7,800 feet in the Good Hope Olive area. The water pipeline improvements are estimated to embed approximately 5 feet below ground surface. Atlas anticipates the pipeline installation will generally include conventional trench excavations. Atlas understands portions of the planned pipeline at intersections with proposed storm drains could be installed using the jack and bore method.

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. Stabilizing fabric such as Mirafi® HP 570 can be used to stabilize the bottom of the excavations, if needed.

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. Where fill is to be placed on surfaces inclined steeper than 5:1 (horizontal: vertical), benches should be excavated to provide a relatively level surface for fill placement. Benches should extend through any loose soils to expose competent material.

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 Excavation

Atlas understands that jack and bore, or similar methods, may be required at intersections if the proposed storm drains are constructed prior to construction of this project. The jack and bore method in the fill or old alluvial deposits is considered feasible. This method consists of jacking a

steel casing pipe along the pipeline alignment while simultaneously cutting the soil ahead of the casing pipe with an auger placed within the encasement. After the drilling spoils are removed, the pipe is installed into the casing pipe.

The anticipated alignment of trenchless excavation is expected to pass through fill and old alluvial-fan deposits. Trenchless excavation in the massive-textured tonalite does not appear to be feasible. Based on our experience with similar materials in the vicinity of the project alignment, scattered boulders have been encountered in these deposits. Therefore, potential subcontractors should recognize that excavation conditions could vary from those encountered in test boring locations. The specifications should indicate that the contractor utilize equipment capable of advancing in medium to very dense sand and gravel, cobbles, and possibly cemented horizons and boulders to avoid the potential for delays during trenchless construction.

6.3.1 Jack and Bore

Tunnel support systems such as the pipe-jacked casings should be designed to support overburden soil pressure and surcharge loads due to traffic and construction activities. Tunnel support systems should also resist jacking forces applied during pipe jacking.

6.3.2 Underground Obstructions

Based on our experience with similar materials in the vicinity of the project alignments, gravel and cobbles may be encountered in the fill and old alluvial-fan deposits. In addition, boulders could be encountered along the pipeline alignment. Such obstructions may require accessing the tunnel face for manual removal. The specialty contractor should assess the method for removing such obstructions.

6.3.3 Tunneling Induced Ground Movement

Some tunneling-induced ground movement should be anticipated. Ground surface settlement monuments should be installed and monitored during construction. A settlement monument monitoring program plan can be developed prior to the installation of the pipeline. By monitoring ground movements before tunneling beneath existing facilities, ground losses can be detected in time to fill voids quickly and alert the contractor to alter their procedures to reduce further settlement. The geotechnical engineer should review the monument monitoring program plan to check that the intent of the recommendations in this report has been incorporated. The settlement monitoring thresholds will depend on different features (e.g., hazardous/non-hazardous utility lines, pavements) and/or structures impacted by the tunneling procedure and should be discussed with the structural engineer and different stakeholders.

6.3.4 Backstops for Pipe Jacking

An allowable passive pressure of 330 psf per foot of depth may be used for the resistance provided by pipe jacking backstops in fill and young alluvial flood-plain deposits. The backstops should expose competent material.

Atlas recommends a geotechnical engineer be on site to observe the jack and bore installation. 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 conditions and modification of the recommendations in this report or development of additional recommendations in a timely manner.

6.4 Preliminary Pavement Section Recommendations

Atlas utilized the California Department of Transportation Highway Design Manual (Caltrans, 2022) to prepare preliminary recommendations for flexible pavements. An R-value of 13 was 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 4 presents recommended flexible pavement structural sections for the assumed Traffic Indexes and subgrade R-value.

Table 4: Preliminary Pavement Structural Sections

Traffic Type	Traffic Index	AC[1] over AB[2] (inches)	Full Depth AC[1] (inches)
Roadways	5.0	4 over 6	7
	6.0	4 over 10	9
	7.0	6 over 10	11

[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). All 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, local regulatory requirements, and Caltrans standard specifications.

6.5 Soil Corrosivity

Representative samples of the on-site soils 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. For structural elements, the California Department of Transportation considers a site to be corrosive if one or more of the following conditions exist for the representative soil and/or water samples taken at the site: Chloride concentration is 500 ppm or greater, sulfate concentration is 1,500 ppm or greater, or the pH is 5.5 or less. Based on these criteria the tested on-site soils are not considered corrosive to structural elements. 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 any 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, expressed, 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

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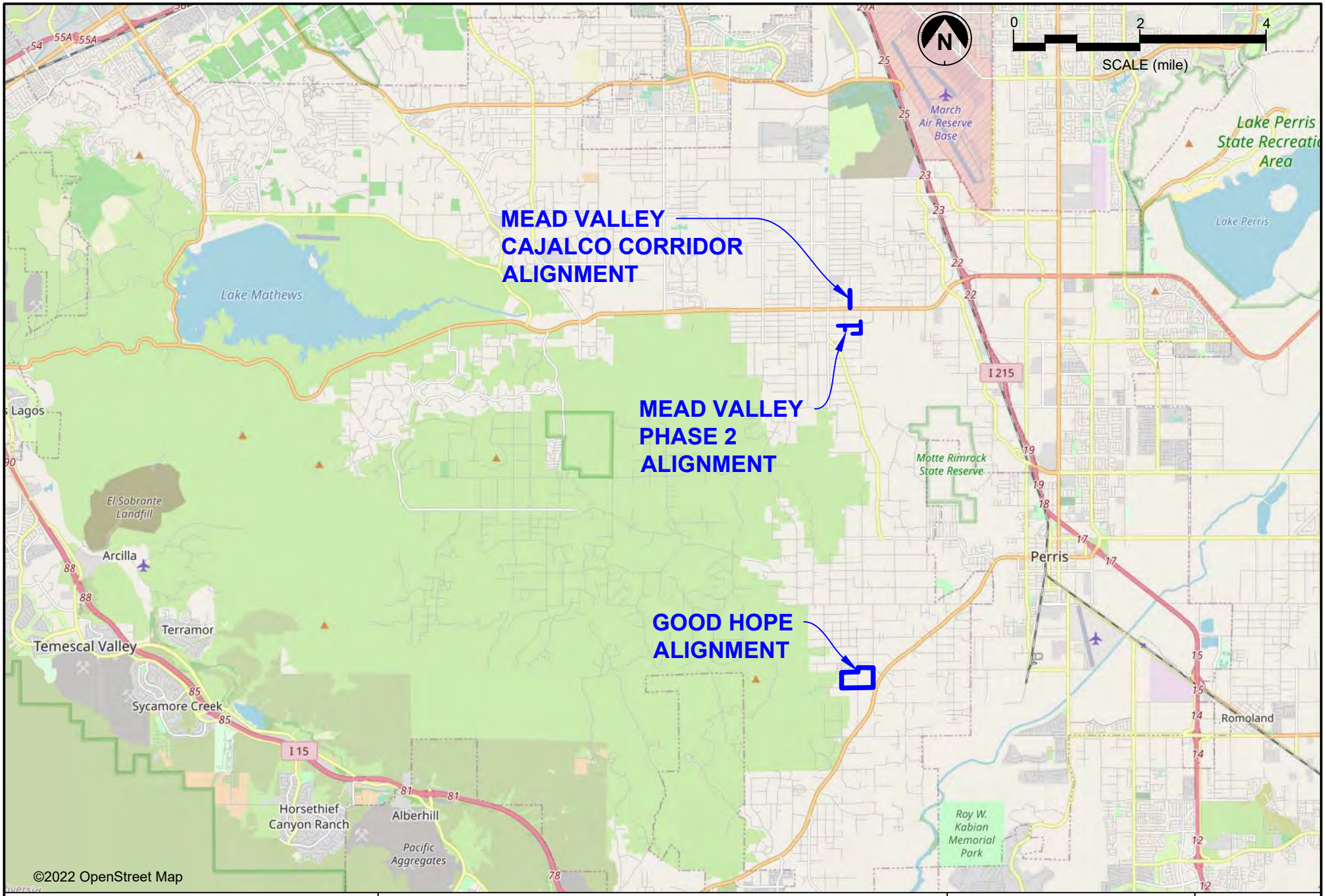
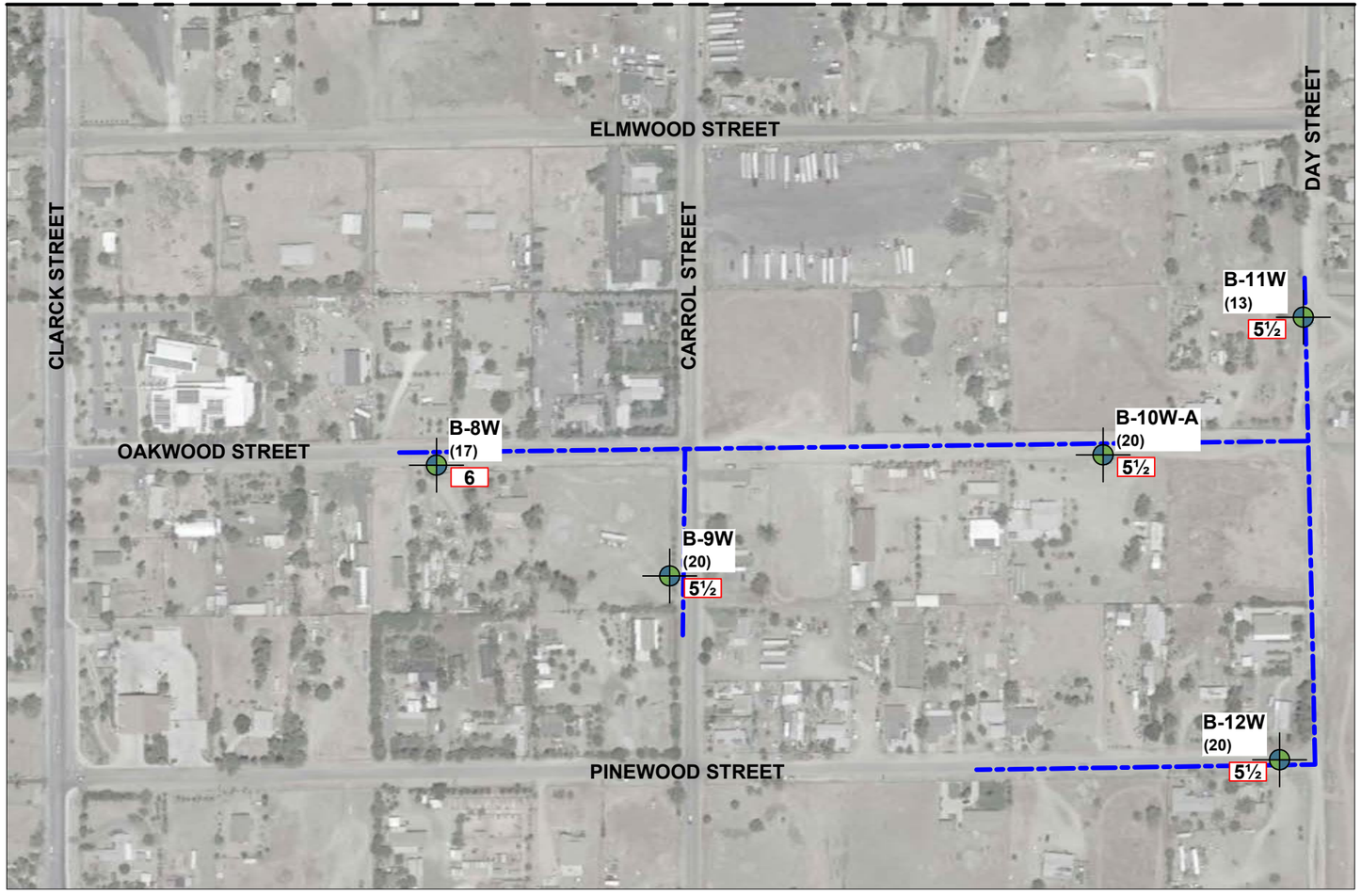


ATLAS	**SITE VICINITY MAP** Good Hope & Mead Valley Water Project Riverside County, California	Date: July, 2023 By: CGI Job No.: 1962.000-2	Figure: 1

MEAD VALLEY CAJALCO CORRIDOR ALIGMENT



LEGEND:

B-12W (20) 5½ — Location of Boring (Depth in Feet) (Depth in Feet to Formation)

Proposed Water Pipeline

N

0 300 600

SCALE (feet)

NOTE: All Locations are approximate.

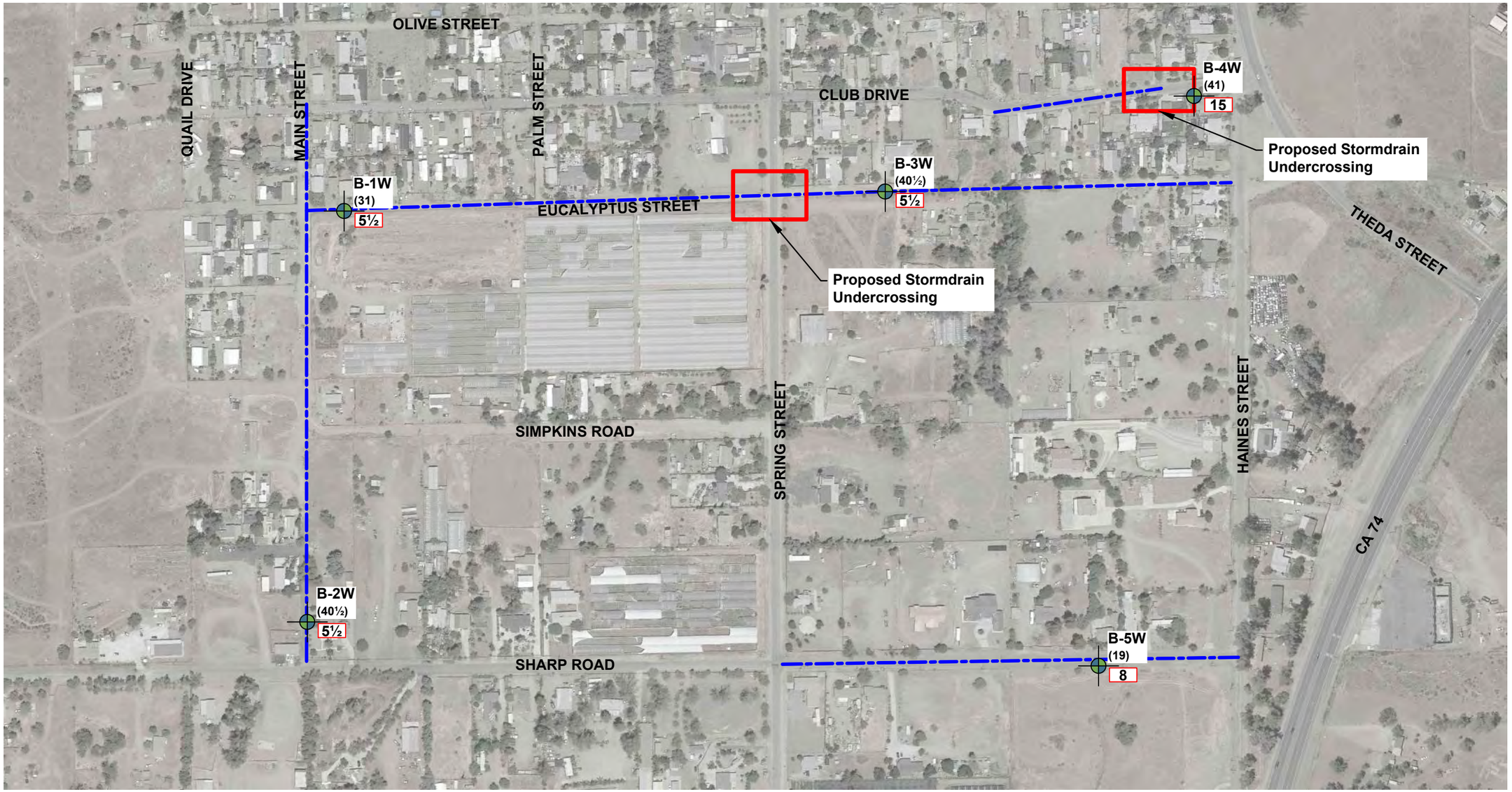
SUBSURFACE EXPLORATION MAP
Good Hope & Mead Valley Water Project
Riverside County, California

Date: July, 2023
By: CGI
Job No.: 1962.000-2

ATLAS

Figure:
2A

GOOD HOPE ALIGMENT



LEGEND:

B-5W (19) 5 — Location of Boring (Depth in Feet) (Depth in Feet to Formation)

Proposed Water Pipeline

N

0 300 600

SCALE (feet)

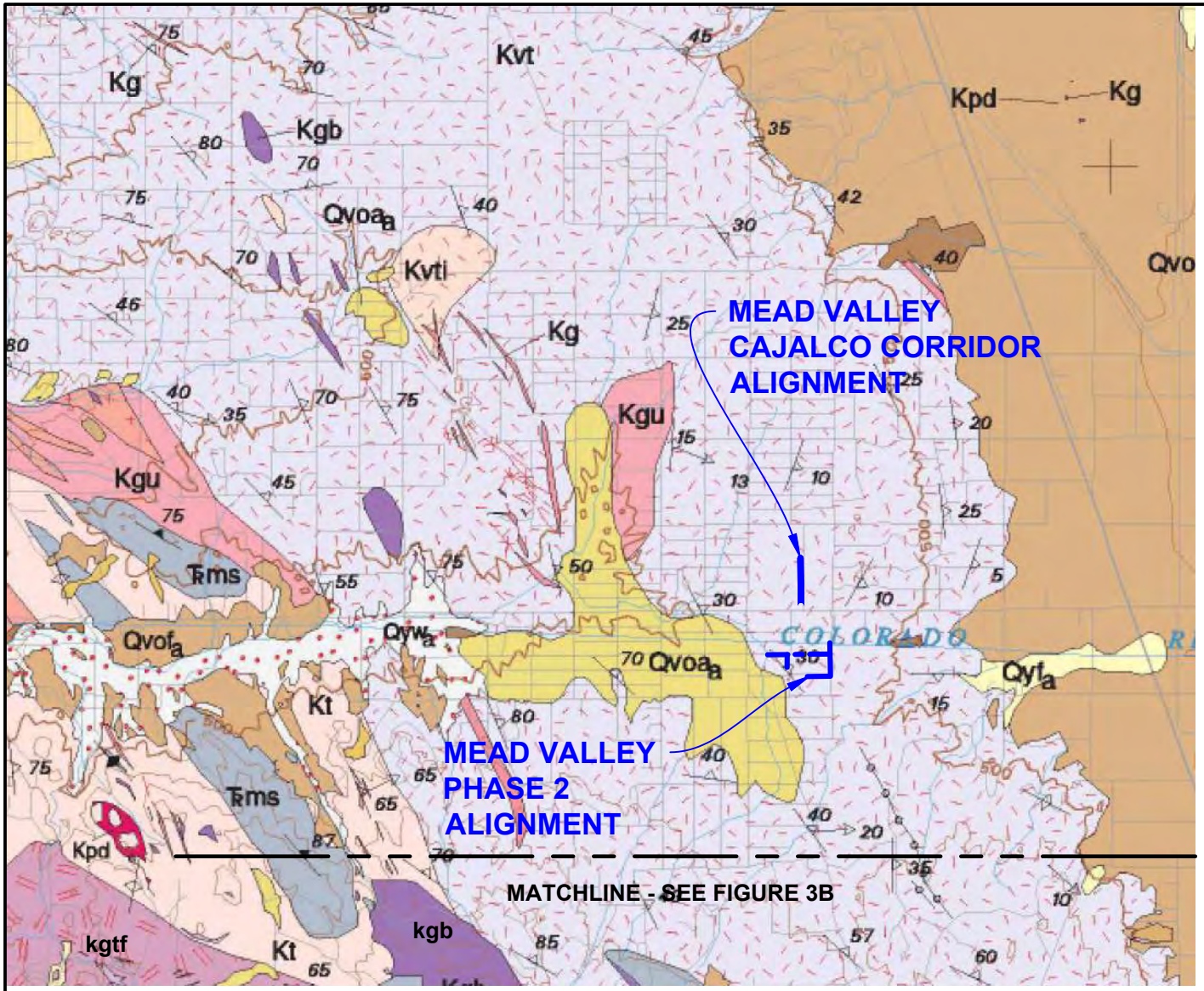
NOTE: All Locations are approximate.

SUBSURFACE EXPLORATION MAP
Good Hope & Mead Valley Water Project
Riverside County, California

Date: July, 2023
By: CGI
Job No.: 190063P4.2

ATLAS

Figure:
2B



EXPLANATION:

Qyw$_a$	Young wash deposits (Holocene and late Pleistocene)
Qyf$_a$	Young alluvial-fan deposits (Holocene and late Pleistocene)
Qvoa$_a$	Very old axial-channel deposits (middle to early Pleistocene)
Qov$_a$	Old alluvial-valley deposits (late to middle Pleistocene)
Qvof$_a$	Very old alluvial-fan deposits (middle to early Pleistocene)
Kvt	Val Verde tonalite
kgtf	Foliated tonalite
kgb	Gabbro, undifferentiated (Cretaceous)
kpd	Granitic pegmatite dikes
kgu	Granite, undifferentiated (Cretaceous)
kt	Tonalite, undifferentiated (Cretaceous)
T$_R$ms	Schist

N

0 5,000 10,000

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.

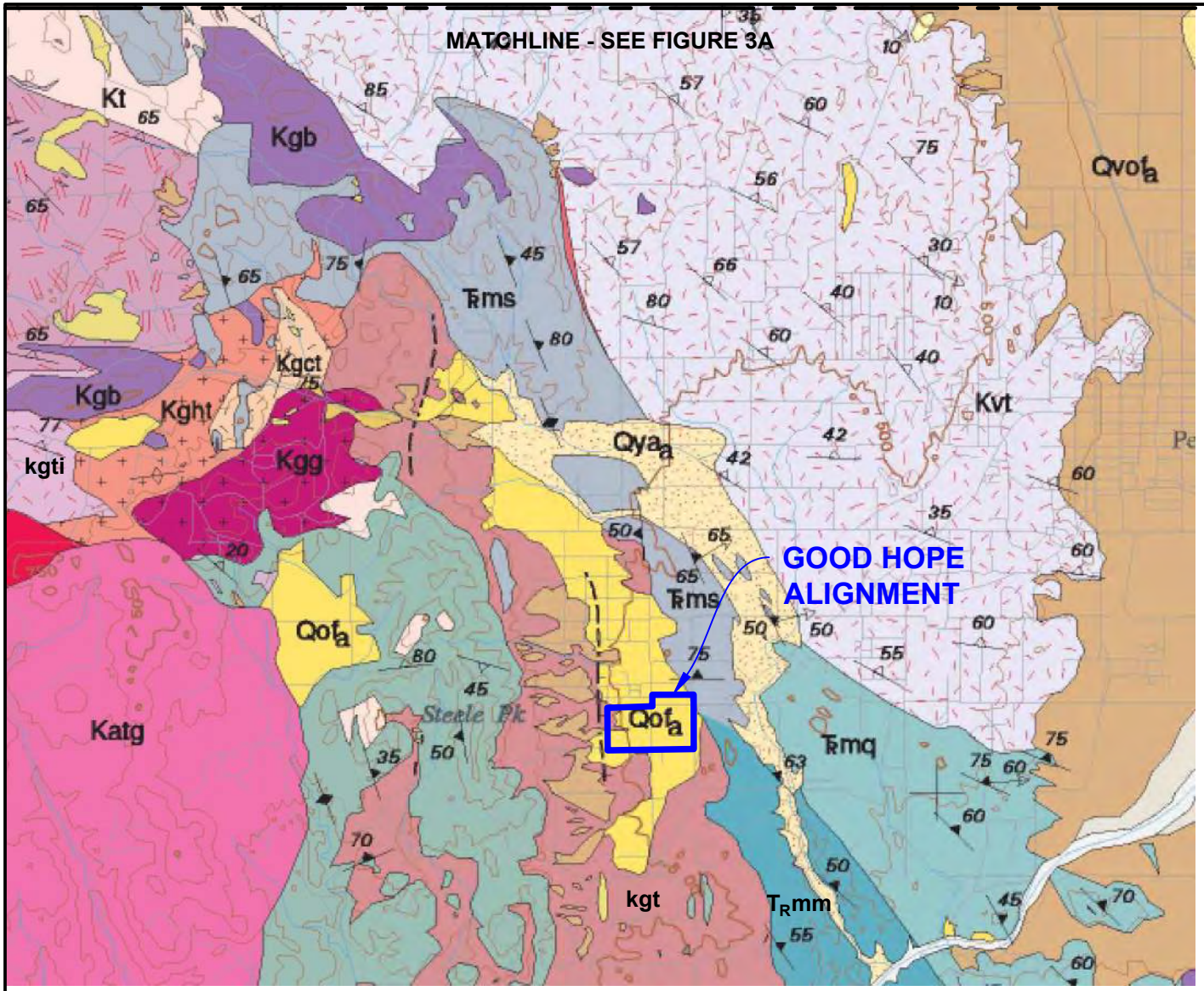
ATLAS

REGIONAL GEOLOGY MAP

Good Hope & Mead Valley Water Project
Riverside County, California

Date: July, 2023
By: CGI
Job No.: 1962.000-2

Figure:
3A



EXPLANATION:

Qya_a	Young axial-channel deposits (Holocene and late Pleistocene)
Qof_a	Old alluvial-fan deposits (late to middle Pleistocene)
$Qvof_a$	Very old alluvial-fan deposits (middle to early Pleistocene)
Kvt	Val Verde tonalite
kgg	Hypersthene monzogranite
kgt	Massive-textured tonalite
kgti	Foliated tonalite
kgct	Coarse-grained biotite-hornblende tonalite
kght	Heterogeneous tonalite
katg	Granodiorite of Arroyo del Toro Pluton (Cretaceous)
kgb	Gabbro, undifferentiated (Cretaceous)
kt	Tonalite, undifferentiated (Cretaceous)
T_Rms	Schist
T_Rmq	Quartz-rich rocks
T_Rmm	Marble

N

0 5,000 10,000

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.

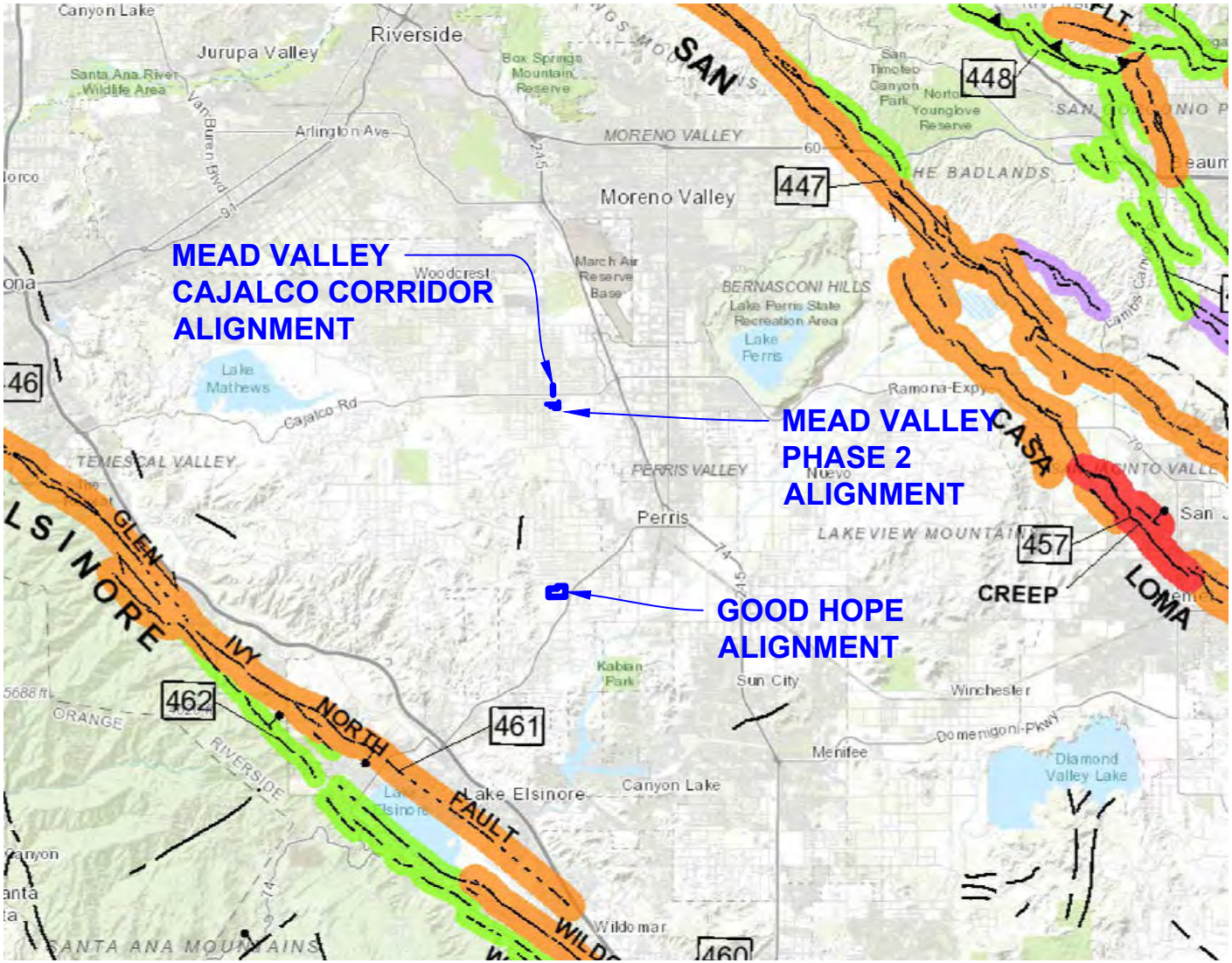
ATLAS

REGIONAL GEOLOGY MAP

Good Hope & Mead Valley Water Project
Riverside County, California

Date: July, 2023
By: CGI
Job No.: 1962.000-2

Figure: 3B



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

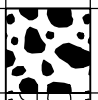
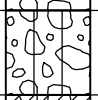
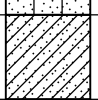
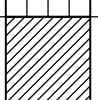
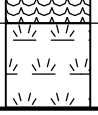
FAULT ACTIVITY MAP
Good Hope & Mead Valley Water Project
Riverside County, California

Date: July, 2023
By: CGI
Job No.: 1962.000-2

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.

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

CAI -CERCHAR ABRASIVITY

PLSI -POINT LOAD STRENGTH INDEX

STS -SPLITTING TENSILE STRENGTH

LABORATORY SYMBOLS

AL - ATTERBERG LIMITS
CON - CONSOLIDATION
COR - CORROSIVITY TESTING
DS - DIRECT SHEAR
EI - EXPANSION INDEX
MAX - MAXIMUM DENSITY
RV - R-VALUE
PD - PARTICLE-SIZE DISTRIBUTION
UC - UNCONFINED COMPRESSIVE STRENGTH
WA - No. 200 WASH (% PASSING No. 200 SIEVE)

WHERE AN ASTERISK * EXISTS NEXT TO RQD VALUE- MEASURED INTACT PIECES DID NOT PASS FIELD SOUNDNESS TEST

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	
Good Hope and Mead Valley Water Improvements	1962-2	**B-1W**

SITE	START	END	SHEET NO.
Riverside County, CA	9/28/22	9/28/22	1

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	31	1647

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	LAB TESTS
1645	0								**OLD ALLUVIAL-FAN DEPOSITS (Qof)**: CLAYEY SAND (SC), medium dense, brown, moist, fine to medium grained, medium plasticity, trace aggregate base.	AL COR EI WA
									Increase in fines, moderately cemented.	
	5		CAL	96/9"		9.4	117.6		**MASSIVE-TEXTURED TONALITE (kgt)**: IGNEOUS ROCK (QUARTZ DIORITE), pale to reddish brown, intensely weathered, very soft; (POORLY GRADED SAND with SILT (SP-SM), very dense, moist, fine to medium grained).	
1640										
	10		CAL	50/6						
1635									Hard drilling.	
	15		SPT	50/6						
1630										
	20		SPT	50/6					Decomposed, hard drilling.	
1625										

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Figure

I-1

LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	B-1W
Good Hope and Mead Valley Water Improvements	1962-2	

SITE	START	END	SHEET NO.
Riverside County, CA	9/28/22	9/28/22	2

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	31	1647

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	LAB TESTS
1620			SPT	50/3					**MASSIVE-TEXTURED TONALITE (kgt)**: IGNEOUS ROCK (QUARTZ DIORITE), pale to reddish brown, intensely weathered, very soft; (POORLY GRADED SAND with SILT (SP-SM), very dense, moist, fine to medium grained). *(continued)*	
	30		SPT	50/2						
									REFUSAL AT 31 FEET No groundwater or seepage encountered	
1615										
	35									
1610										
	40									
1605										
	45									
1600										

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Figure
I-2

LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	
Good Hope and Mead Valley Water Improvements	1962-2	**B-2W**

SITE	START	END	SHEET NO.
Riverside County, CA	9/20/22	9/20/22	3

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	1675

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	LAB TESTS
									OLD ALLUVIAL-FAN DEPOSITS (Qof): Poorly Graded SAND with SILT (SP-SM), medium dense, brown, moist, fine to medium grained, rock retreived in shoe.	WA
1670	5		CAL	54		2.8	109.5		**MASSIVE-TEXTURED TONALITE (kgt)**: IGNEOUS ROCK (QUARTZ DIORITE), light yellowish brown, decomposed, very soft; (SILTY SAND (SM), very dense, moist, fine to coarse grained).	
1665	10		CAL	50/6						
1660	15		CAL	50/5					Grayish brown; (POORLY GRADED SAND (SP), very dense, moist, fine to coarse grained).	
1655	20		CAL	50/5						

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Figure

I-3

LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	
Good Hope and Mead Valley Water Improvements	1962-2	**B-2W**

SITE	START	END	SHEET NO.
Riverside County, CA	9/20/22	9/20/22	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-75	8	40.5	1675

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	LAB TESTS
			SPT	50/3	67/3				Grayish brown; (POORLY GRADED SAND (SP), very dense, moist, fine to coarse grained). *(continued)*	
1645	30		SPT	50/3					Brown; (POORLY GRADED SAND with SILT (SP-SM), very dense, moist, fine to medium grained).	
1640	35		SPT	50/6						
1635	40		SPT	50/3						
1630	45								**BORING TERMINATED AT 40½ FEET** No groundwater or seepage encountered	

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Figure
I-4

LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	
Good Hope and Mead Valley Water Improvements	1962-2	**B-3W**

SITE	START	END	SHEET NO.
Riverside County, CA	9/20/22	9/20/22	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	1601

DEPTH/ELEV. GROUND WATER (ft)
- ▽ AT TIME OF DRILLING 26.00 ft / Elev 1575.00 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
1600							**OLD ALLUVIAL-FAN DEPOSITS (Qof)**: SILTY SAND (SM), medium dense, brown, moist, fine to medium grained, micaceous.
	5						
1595			CAL	88			
							MASSIVE-TEXTURED TONALITE (kgt): IGNEOUS ROCK (QUARTZ DIORITE), yellowish brown, decomposed, very soft; (POORLY GRADED SAND with SILT (SP-SM), very dense, moist, fine to coarse grained).
	10						
1590			CAL	50/5			
	15						
1585			CAL	50/6			
							Light brown, intensely weathered; (SILTY SAND (SM), very dense, moist, fine to coarse grained).
	20						
1580			CAL	50/6			
							(POORLY GRADED SAND with SILT(SP-SM), very dense, moist, fine to coarse grained).

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Figure

I-5

LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	
Good Hope and Mead Valley Water Improvements	1962-2	**B-3W**

SITE	START	END	SHEET NO.
Riverside County, CA	9/20/22	9/20/22	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	1601

DEPTH/ELEV. GROUND WATER (ft)
- ▽ **AT TIME OF DRILLING** 26.00 ft / Elev 1575.00 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
1575			CAL	50/6			(POORLY GRADED SAND with SILT(SP-SM), very dense, moist, fine to coarse grained). *(continued)* ▽
							Light brown; (SILTY SAND (SM), very dense, wet, fine to medium grained).
	30		SPT	50/4			
1570							
	35		SPT	50/4			Increase in fines.
1565							
	40		SPT	50/6			Decrease in fines.
1560							**BORING TERMINATED AT 40½ FEET** Groundwater encountered at 26 feet
	45						
1555							

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Figure

I-6

LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	
Good Hope and Mead Valley Water Improvements	1962-2	**B-4W**

SITE	START	END	SHEET NO.
Riverside County, CA	9/28/22	9/28/22	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)
LAR-55	8	41	1571

DEPTH/ELEV. GROUND WATER (ft)
- AT TIME OF DRILLING 34.00 ft / Elev 1537.00 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	0								**OLD ALLUVIAL-FAN DEPOSITS (Qof)**: SILTY SAND (SM), medium dense, brown, moist, fine grained.	RV WA
	5		CAL	18		3.9	109.9			
1565										
	10		CAL	75/12"					Very dense.	
1560										
	15		CAL	81/8"					**MASSIVE-TEXTURED TONALITE (Kgt)**: IGNEOUS ROCK (QUARTZ DIORITE), yellowish brown, intensley weathered, very soft; (POORLY GRADED SAND (SP), very dense, fine to coarse grained).	
1555										
	20		CAL	50/6					More micaceous.	
1550										

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Figure

I-7

LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	B-4W
Good Hope and Mead Valley Water Improvements	1962-2	

SITE	START	END	SHEET NO.
Riverside County, CA	9/28/22	9/28/22	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)
LAR-55	8	41	1571

DEPTH/ELEV. GROUND WATER (ft)
- ▽ AT TIME OF DRILLING 34.00 ft / Elev 1537.00 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
1545			SPT	50/4	67/4				**MASSIVE-TEXTURED TONALITE (Kgt)**: IGNEOUS ROCK (QUARTZ DIORITE), yellowish brown, intensley weathered, very soft; (POORLY GRADED SAND (SP), very dense, fine to coarse grained). *(continued)*	
	30									
1540			SPT	80	107					
									▽ (SILTY SAND (SM), very dense, wet, fine to coarse grained).	
	35									
1535			SPT	50/6	67/6					
	40									
1530			SPT	50/6	67/6				**BORING TERMINATED AT 41 FEET** Groundwater encountered at 34 feet	
	45									
1525										

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Figure

I-8

LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	
Good Hope and Mead Valley Water Improvements	1962-2	**B-5W**

SITE	START	END	SHEET NO.
Riverside County, CA	9/20/22	9/20/22	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)	DEPTH/ELEV. GROUND WATER (ft)
CME-75	8	19	1584	▽ 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
							FILL (Qf): CLAYEY SAND (SC), dense, dark reddish brown, moist, plastic, fine to medium grained.
1580	5		CAL	98/9"			**OLD ALLUVIAL-FAN DEPOSITS (Qof)**: POORLY GRADED SAND with SILT (SP-SM), very dense, yellowish brown, moist, fine to medium grained, moderately cemented.
1575	10		SPT	50/3			**MASSIVE-TEXTURED TONALITE (kgt)**: IGNEOUS ROCK (QUARTZ DIORITE), light yellowish brown, intensely weathered, very soft; (POORLY GRADED SAND (SP), very dense, moist, fine to coarse grained).
1570	15		CAL	50/2			Variable weathering.
1565			SPT	50/5	67/5		Grayish brown; (SILTY SAND (SM), very dense, moist, fine grained).
	20						**REFUSAL AT 19 FEET** No groundwater or seepage encountered
1560							

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Figure

I-9

LOG OF TEST BORING

ATLAS PROJECT NAME	Good Hope and Mead Valley Water Improvements	**ATLAS PROJECT NUMBER**	1962-2
B-6W			
SITE	Riverside County, CA	**START**	9/21/22
END	9/21/22	**SHEET NO.**	10
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)	41.5	**GROUND ELEV. (ft)**	1693
DEPTH/ELEV. GROUND WATER (ft)	▽ AT TIME OF DRILLING 29.00 ft / Elev 1664.00 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}	MOISTURE (%)	DRY DENSITY (pcf)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION	LAB TESTS
									5 inches of Asphalt Concrete (AC) over 3 inches of Aggregate Base (AB).	
									OLD ALLUVIAL-FAN DEPOSITS (Qof): SILTY SAND (SM), dense, brown, moist, fine to medium grained, trace gravel, micaceous.	
1690										
	5		CAL	36		10.1	120.5			DS WA
									Light brown, fine grained, hard drilling.	
1685										
	10		SPT	50/3	67/3					
									VAL VERDE TONALITE (Kvt): IGNEOUS ROCK (QUARTZ DIORITE), brownish gray, decomposed, very soft; (POORLY Graded SAND (SP), very dense, moist, fine to coarse grained).	
1680										
	15		CAL	50/6						
1675										
	20		CAL	50/4					Brownish gray.	
1670										

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Figure

I-10

LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	B-6W
Good Hope and Mead Valley Water Improvements	1962-2	

SITE	START	END	SHEET NO.
Riverside County, CA	9/21/22	9/21/22	11

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	1693

DEPTH/ELEV. GROUND WATER (ft)
- ▽ AT TIME OF DRILLING 29.00 ft / Elev 1664.00 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	50/3					**VAL VERDE TONALITE (Kvt)**: IGNEOUS ROCK (QUARTZ DIORITE), brownish gray, decomposed, very soft; (POORLY Graded SAND (SP), very dense, moist, fine to coarse grained). *(continued)*	
1665									Grayish brown; (SILTY SAND (SM), very dense, moist, fine to coarse grained). ▽	
	30		SPT	50/6						
1660										
	35		SPT	50/5					Decrease in fines.	
1655									Yellowish brown; (LEAN CLAY with SAND (CL), hard, wet, medium to coarse grained).	
	40		SPT	83/9"	111/9"					
1650									**BORING TERMINATED AT 41½ FEET** Grounwater encountered at 29 feet	
	45									
1645										

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Figure

I-11

LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	
Good Hope and Mead Valley Water Improvements	1962-2	**B-7W**

SITE	START	END	SHEET NO.
Riverside County, CA	9/21/22	9/21/22	12

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	13	1685

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	LAB TESTS
									OLD ALLUVIAL-FAN DEPOSITS (Qof): SANDY SILT (ML), dense, brown, moist, fine to medium grained.	PD COR
									POORLY GRADED SAND with SILT (SP-SM), medium dense, brown, moist, fine to coarse grained.	
1680	5		CAL	50/6		3.5	107.9		**SCHIST (TRms)**: METAMORPHIC ROCK, Brown, intensely weathered, very soft; (SILTY SAND (SM), very dense, moist, fine to coarsed grained).	
1675	10		CAL	50/6					Hard drilling.	
									REFUSAL AT 13 FEET No groundwater or seepage encountered	
1670	15									
1665	20									

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Figure

I-12

LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	
Good Hope and Mead Valley Water Improvements	1962-2	**B-8W**

SITE	START	END	SHEET NO.
Riverside County, CA	5/23/23	5/23/23	13

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	17	1663

DEPTH/ELEV. GROUND WATER (ft)
- ▽ AT TIME OF DRILLING 9.00 ft / Elev 1654.00 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
1660	0								**OLD ALLUVIAL-FAN DEPOSITS (Qof)**: SILTY SAND (SM), medium dense, brown, moist, fine to medium grained, micaceous.	
	5		CAL	17		11.1	121.3			PD
1655									**VAL VERDE TONALITE (Kvt)**: IGNEOUS ROCK (QUARTZ DIORITE), light to yellowish brown, decomposed, very soft; (Well-Graded SAND with GRAVEL (SW), medium dense, moist, fine to coarse grained, micaceous). ▽	
	10		CAL	50/6					(SILTY SAND (SM), very dense, fine to medium grained).	
1650										
	15		CAL	50/5					Dark grayish brown, decomposed to intensely weathered; (fine to coarse grained sand, decreased in fines).	
1645									**REFUSAL AT 17 FEET** Groundwater or seepage encountered at 9 feet	
	20									
1640										

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LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	
Good Hope and Mead Valley Water Improvements	1962-2	**B-9W**

SITE	START	END	SHEET NO.
Riverside County, CA	5/23/23	5/23/23	14

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	20	1671

DEPTH/ELEV. GROUND WATER (ft)
- ▽ AT TIME OF DRILLING 17.00 ft / Elev 1654.00 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
1670	0								**OLD ALLUVIAL-FAN DEPOSITS (Qof)**: SILTY SAND (SM), medium dense, dark reddish brown, moist, fine to medium grained, micaceous.	AL PD EI RV
									Dense, grayish to yellowish brown.	
	5		CAL	50/5		5.6	130.7			
1665									**VAL VERDE TONALITE (Kvt)**: IGNEOUS ROCK (QUARTZ DIORITE), grayish to yellowish brown, decomposed to intensely weathered, soft; (SILTY SAND (SM), very dense, moist, fine to medium grained, black and white mottling).	
	10		CAL	50/5					(Poorly-Graded SAND with SILT (SP-SM)).	
1660										
	15		CAL	50/5					(Poorly Graded SAND (SP), light brown, fine to coarse grained).	
1655								▽		
			CAL	50/3						
	20								**BORING TERMINATED AT 20 FEET** Groundwater or seepage encountered at 17 feet	
1650										

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Figure

I-14

LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	
Good Hope and Mead Valley Water Improvements	1962-2	**B-10W-A**

SITE	START	END	SHEET NO.
Riverside County, CA	5/23/23	5/23/23	15

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)	DEPTH/ELEV. GROUND WATER (ft)
CME-75	8	20	1687	▽ 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	LAB TESTS
1685	0								**OLD ALLUVIAL-FAN DEPOSITS (Qof)**: SILTY SAND (SM), medium dense, brownish yellow, moist, fine to medium grained.	PD
	5		CAL	50/6					**VAL VERDE TONALITE (Kvt)**: IGNEOUS ROCK (QUARTZ DIORITE), grayish yellow, decomposed to intensely weathered, very soft; (Poorly Graded SAND with SILT (SP-SM), very dense, moist, fine to medium grained, weakly cemented). Boulder encountered at 8 feet, started a new borehole 5 feet west.	
1680										
	10		CAL	50/5		4.1	118.7		(Poorly Graded SAND (SP), light gray, fine to coarse grained, green mottling).	
1675										
	15		CAL	50/2					Moderately weathered.	
1670										
			CAL	50/5						
	20								**BORING TERMINATED AT 20 FEET** No groundwater or seepage encountered	
1665										

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Figure

I-15

LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	
Good Hope and Mead Valley Water Improvements	1962-2	**B-11W**

SITE	START	END	SHEET NO.
Riverside County, CA	5/23/23	5/23/23	16

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)	DEPTH/ELEV. GROUND WATER (ft)
CME-75	8	13	1691	▽ 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
1690							**OLD ALLUVIAL-FAN DEPOSITS (Qof)**: SILTY SAND (SM), dense, brownish yellow, dry, fine grained.	PD COR
	5		CAL	50/6				
1685							**VAL VERDE TONALITE (Kvt)**: IGNEOUS ROCK (QUARTZ DIORITE), light yellowish brown, decomposed to intensely weathered, very soft; (SILTY SAND (SM), very dense, moist, fine to coarse grained).	
	10		CAL	50/6			(Brownish gray).	
1680								
							REFUSAL AT 13 FEET No groundwater or seepage encountered	
	15							
1675								
	20							
1670								

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Figure

I-16

LOG OF TEST BORING

ATLAS PROJECT NAME	ATLAS PROJECT NUMBER	
Good Hope and Mead Valley Water Improvements	1962-2	**B-12W**

SITE	START	END	SHEET NO.
Riverside County, CA	5/23/23	5/23/23	17

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)	DEPTH/ELEV. GROUND WATER (ft)
CME-75	8	20	1687	▽ 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	LAB TESTS
1685									**OLD ALLUVIAL-FAN DEPOSITS (Qof)**: SILTY SAND (SM), medium dense, dark yellowish brown, moist, fine to medium grained.	
									Dense.	
	5		CAL	50/5		7.4	105.7			
1680									**VAL VERDE TONALITE (Kvt)**: IGNEOUS ROCK (QUARTZ DIORITE), yellow to grayish brown, decomposed, very soft; (SILTY SAND (SM), very dense, moist, fine to medium grained).	
	10		CAL	50/3					(Well-Graded SAND with SILT (SW-SM), fine to coarse grained).	PD
1675										
	15		CAL	50/4					(Poorly-Graded SAND (SP), grayish yellow).	
1670										
			CAL	50/3					(Brownish gray, weakly cemented).	
	20								**BORING TERMINATED AT 20 FEET** No groundwater or seepage encountered	
1665										

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Figure

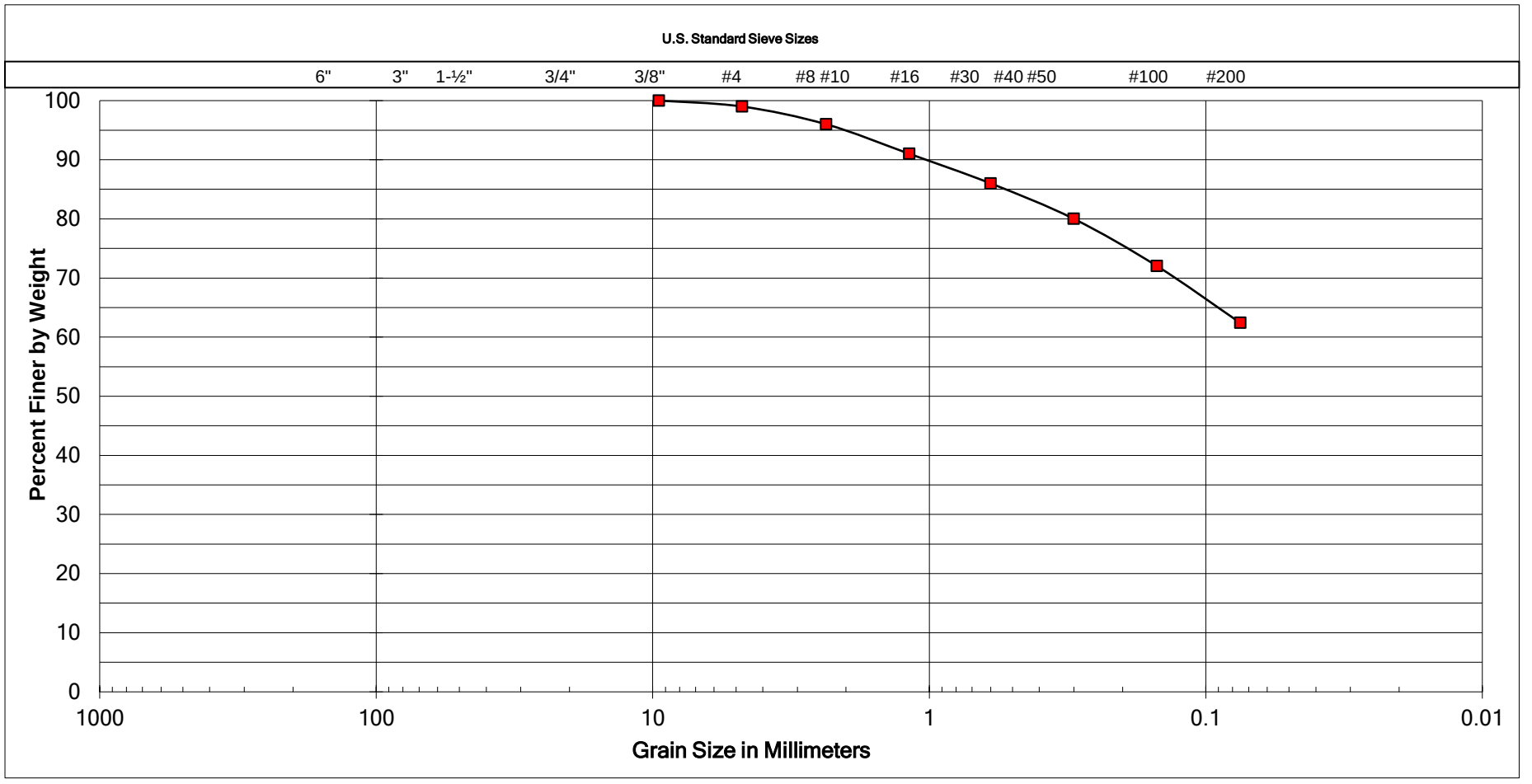
I-17

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 selected 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 selected soil samples in accordance with ASTM D6913.
- **PERCENT FINDER THAN #200:** The percent of materials finer than No. 200 sieve (75µm) was measured on selected samples in accordance with ASTM C117 and ASTM D1140.
- **ATTERBERG LIMITS:** The Atterberg limits were evaluated on selected soil samples in accordance with ASTM D4318.
- **EXPANSION INDEX:** This test was performed on selected soil samples in accordance with ASTM D4289.
- **DIRECT SHEAR:** This test was performed on a selected soil sample 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.
- **R-VALUE:** This test was performed on selected soil samples in accordance with Caltrans Test Method 301.
- **CORROSIVITY:** Corrosivity tests were performed on selected 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.

Soil and rock samples not tested are now 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-7W at 0 to 3 feet
SAMPLE NUMBER
78225

UNIFIED SOIL CLASSIFICATION:	ML
DESCRIPTION	SANDY SILT

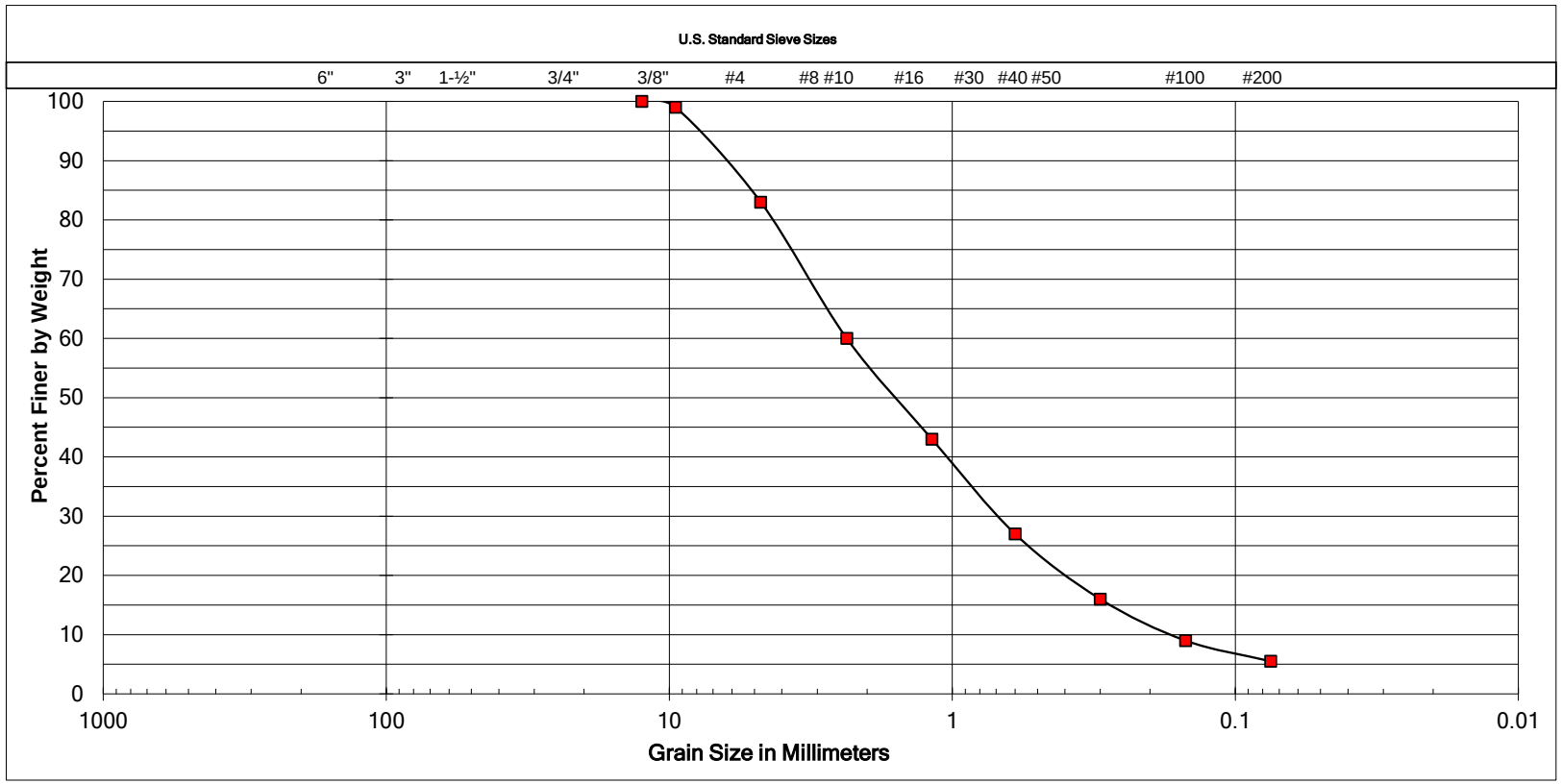
ATTERBERG LIMITS	
LIQUID LIMIT	-
PLASTIC LIMIT	-
PLASTICITY INDEX	-

ATLAS

Good Hope and Mead Valley Water Improvements

Riverside County, California

By:	JRD	Date:	July, 2023
Job Number:	1962-2	Figure:	II-1



Cobbles	Gravel		Sand			Silt or Clay
	Coarse	Fine	Coarse	Medium	Fine	

SAMPLE LOCATION
B-8W at 5 to 5½ feet
SAMPLE NUMBER
83346

UNIFIED SOIL CLASSIFICATION:	SW
DESCRIPTION	WELL-GRADED SAND WITH GRAVEL

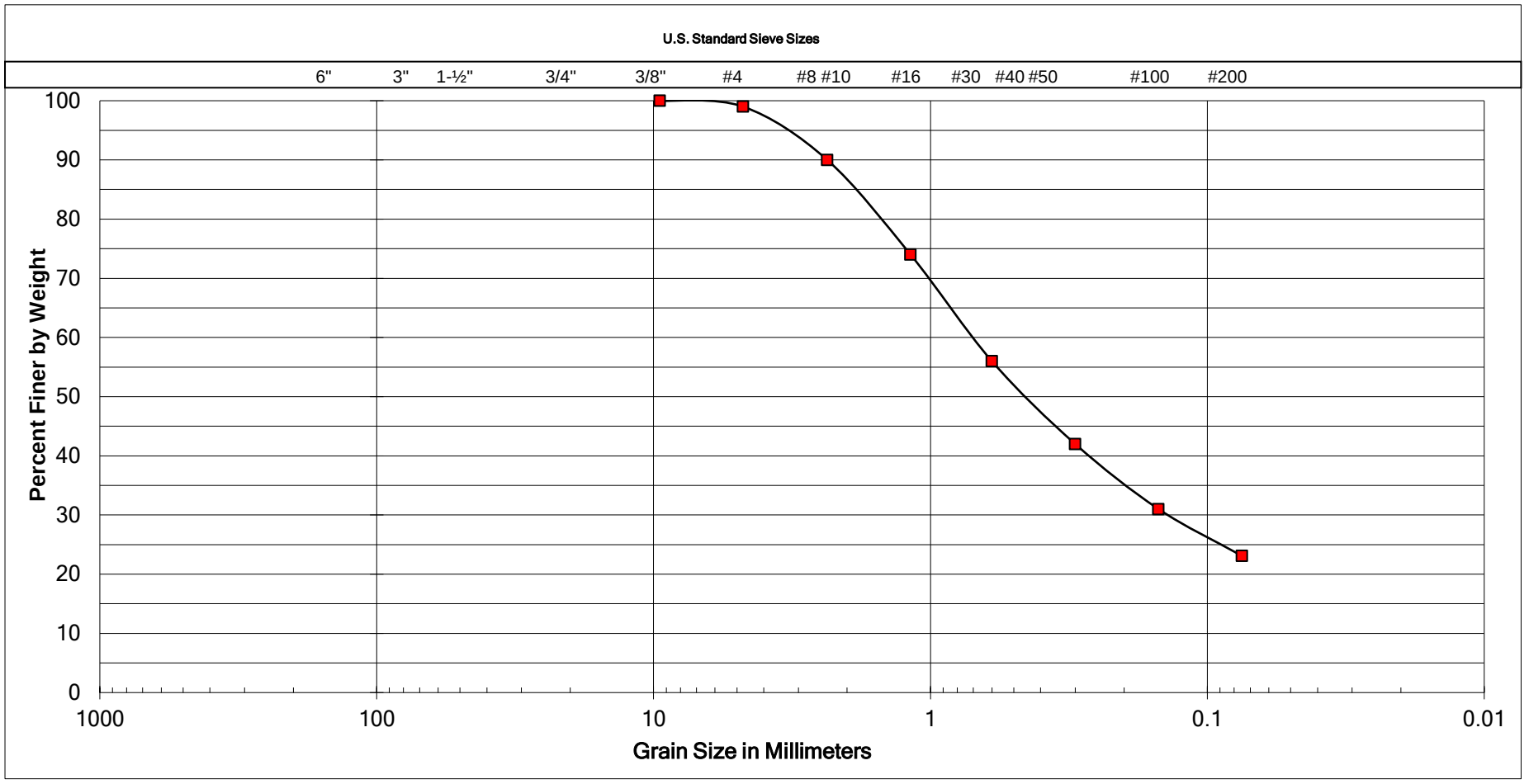
ATTERBERG LIMITS	
LIQUID LIMIT	-
PLASTIC LIMIT	-
PLASTICITY INDEX	-

ATLAS

Good Hope and Mead Valley Water Improvements

Riverside County, California

By:	SD	Date:	July, 2023
Job Number:	1962-2	Figure:	II-2



Cobbles	Gravel		Sand			Silt or Clay
	Coarse	Fine	Coarse	Medium	Fine	

SAMPLE LOCATION
B-9W at 0 to 2 feet
SAMPLE NUMBER
83347

UNIFIED SOIL CLASSIFICATION:	SM
DESCRIPTION	SILTY SAND

ATTERBERG LIMITS	
LIQUID LIMIT	NP
PLASTIC LIMIT	NP
PLASTICITY INDEX	NP

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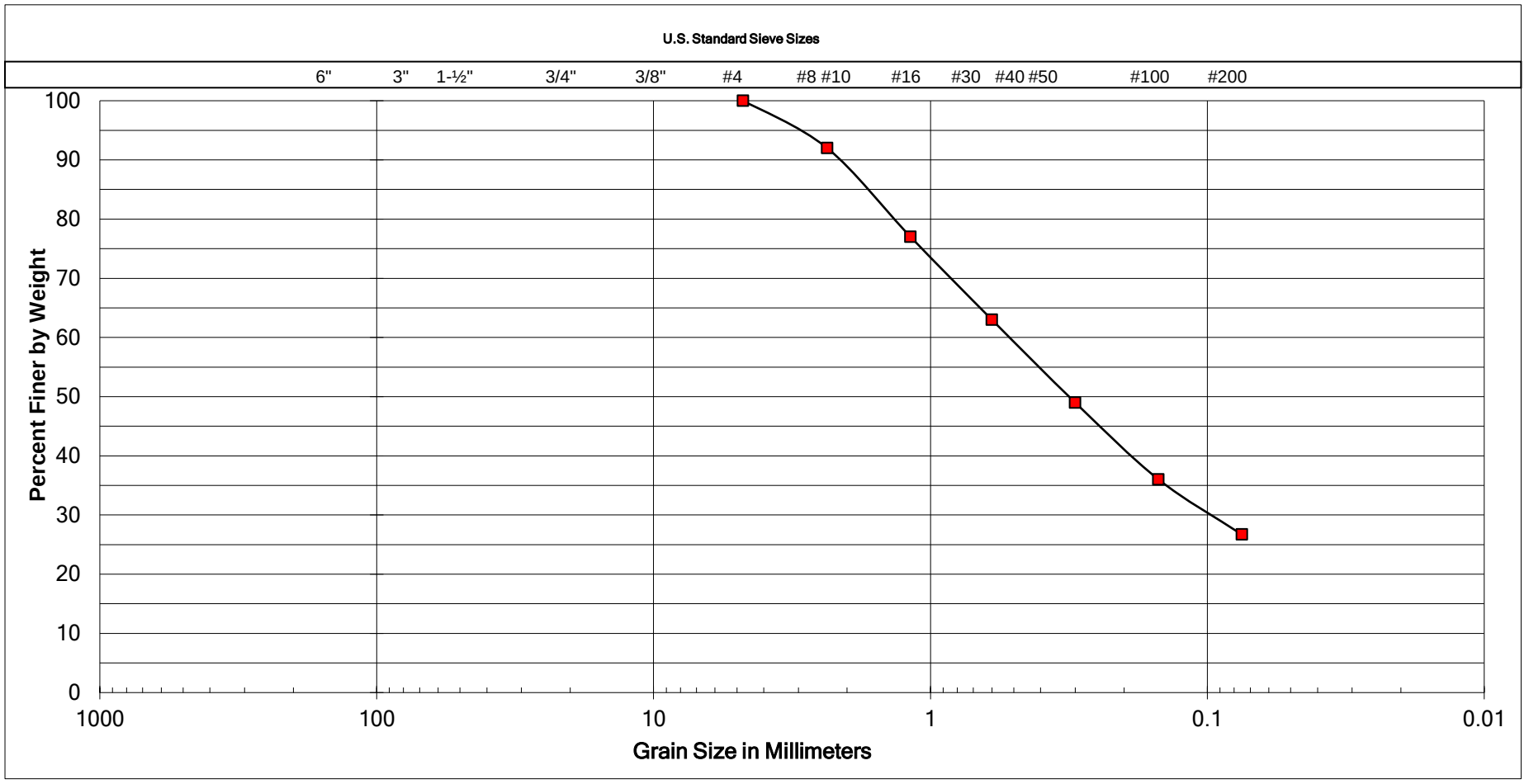
Good Hope and Mead Valley Water Improvements

Riverside County, California

By:	SD	Date:	July, 2023
Job Number:	1962-2	Figure:	II-3



Cobbles	Gravel		Sand			Silt or Clay
	Coarse	Fine	Coarse	Medium	Fine	

SAMPLE LOCATION
B-10W-A at 0 to 5 feet
SAMPLE NUMBER
83352

UNIFIED SOIL CLASSIFICATION:	SM
DESCRIPTION	SILTY SAND

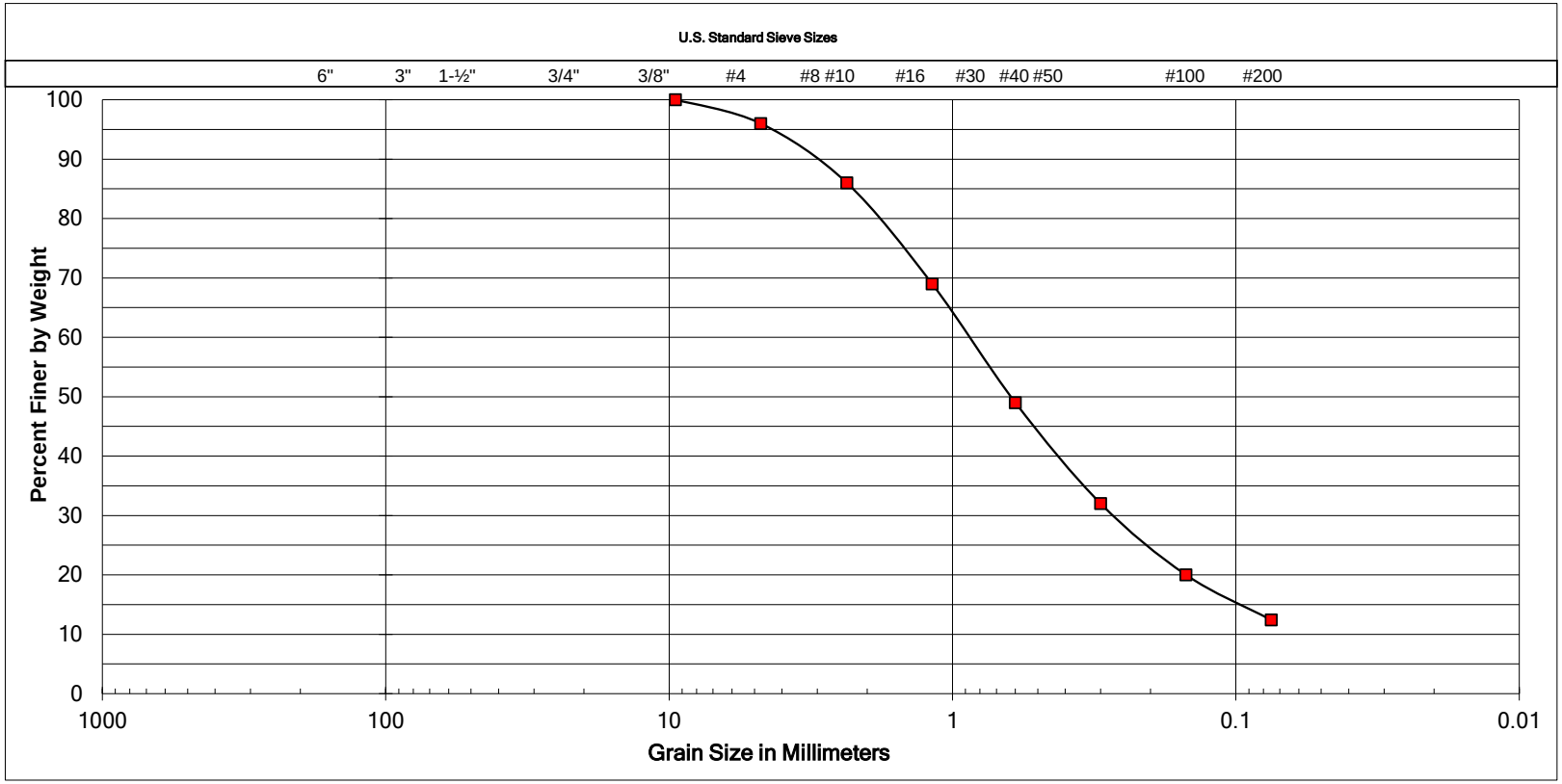
ATTERBERG LIMITS	
LIQUID LIMIT	-
PLASTIC LIMIT	-
PLASTICITY INDEX	-

ATLAS

Good Hope and Mead Valley Water Improvements

Riverside County, California

By:	SD	Date:	July, 2023
Job Number:	1962-2	Figure:	II-4



Cobbles	Gravel		Sand			Silt or Clay
	Coarse	Fine	Coarse	Medium	Fine	

SAMPLE LOCATION
B-11W at 10 to 10½ feet
SAMPLE NUMBER
83354

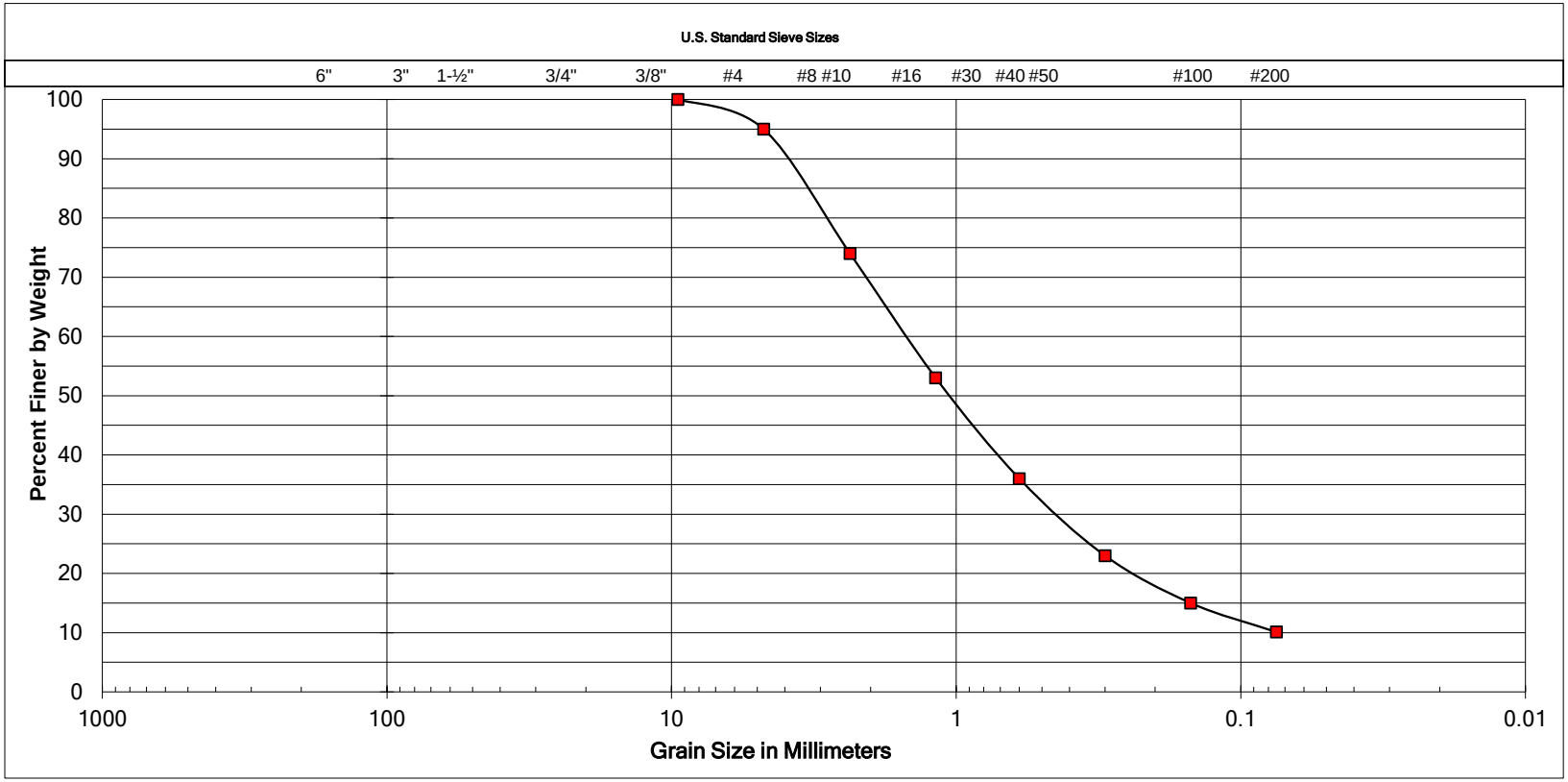
UNIFIED SOIL CLASSIFICATION:	SM
DESCRIPTION	SILTY SAND

ATTERBERG LIMITS	
LIQUID LIMIT	-
PLASTIC LIMIT	-
PLASTICITY INDEX	-

ATLAS

Good Hope and Mead Valley Water Improvements
Riverside County, California

By:	SD	Date:	July, 2023
Job Number:	1962-2	Figure:	II-5



Cobbles	Gravel		Sand			Silt or Clay
	Coarse	Fine	Coarse	Medium	Fine	

SAMPLE LOCATION
B-12W at 10 to 10½ feet
SAMPLE NUMBER
83356

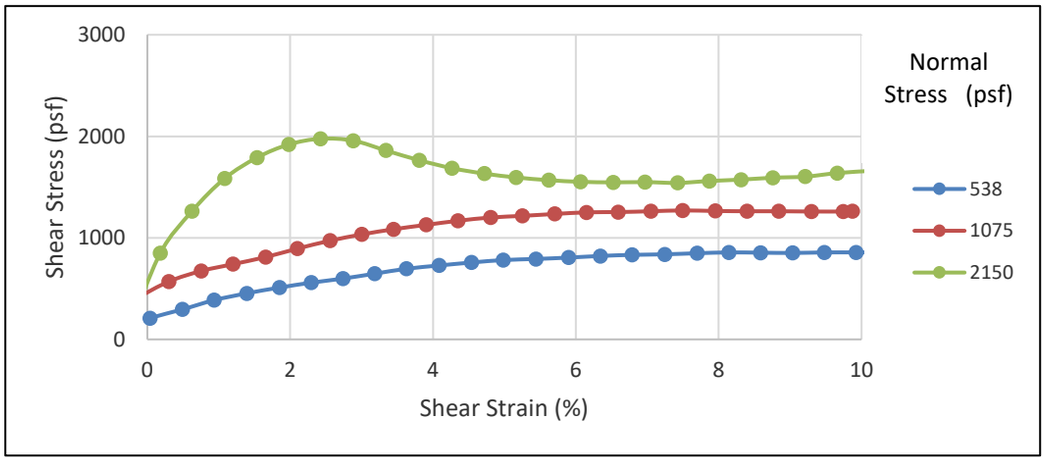
UNIFIED SOIL CLASSIFICATION:	SW-SM
DESCRIPTION	WELL-GRADED SAND WITH SILT

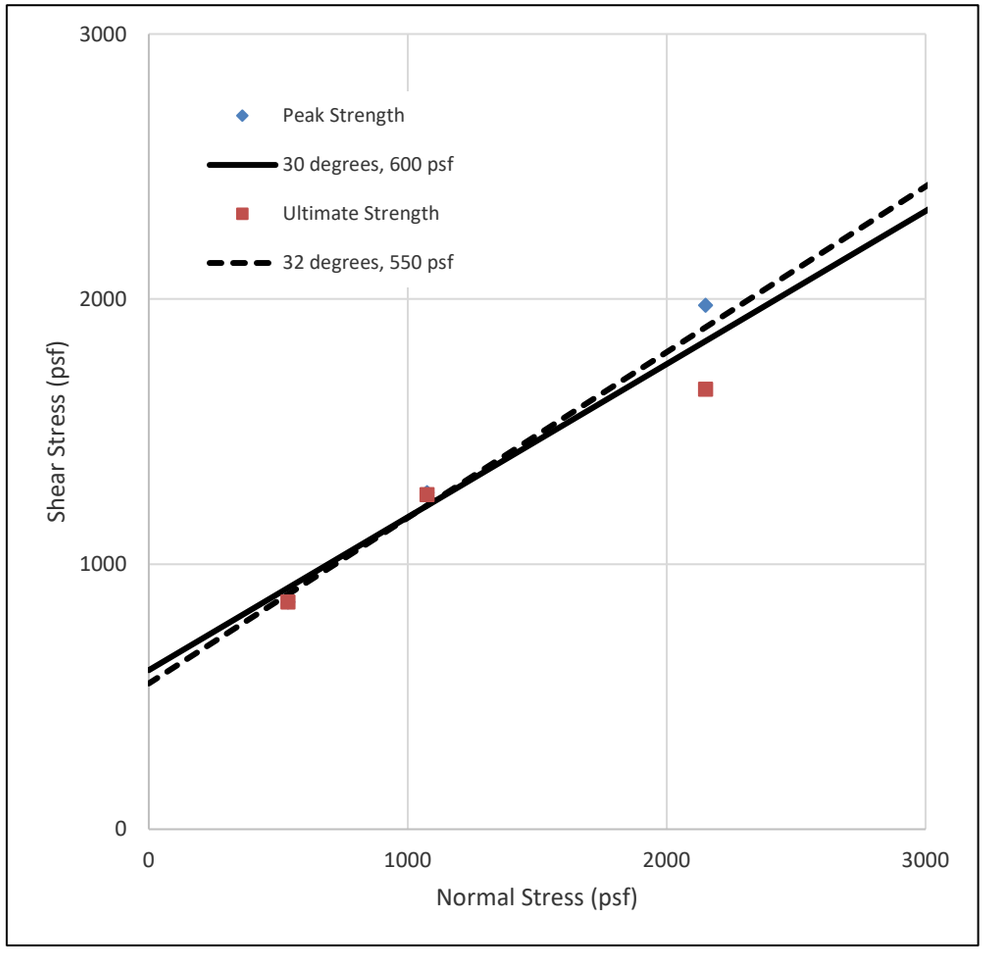
ATTERBERG LIMITS	
LIQUID LIMIT	-
PLASTIC LIMIT	-
PLASTICITY INDEX	-

ATLAS

Good Hope and Mead Valley Water Improvements
Riverside County, California

By:	SD	Date:	July, 2023
Job Number:	1962-2	Figure:	II-6





SAMPLE ID: B-6W at 6 to 6½ Feet

OLDER ALLUVIAL-FAN DEPOSITS (Qof):
SILTY SAND (SM)

NOTES: In Situ
Strain Rate: 0.003 in/min
Sample was consolidated and drained

	Peak	Ultimate
Φ	30 °	32 °
c	600 psf	550 psf

	Initial	Final
γ_d	119.9 pcf	119.9 pcf
w_c	11.6 %	15.2 %
Saturation	79 %	100 %

ATLAS

Good Hope and Mead Valley Water Improvements
Riverside County, California

By:	JRD	Date:	July, 2023
Job Number:	1962-2	Figure:	II-7

EXPANSION INDEX
(ASTM D4829)

SAMPLE	EXPANSION INDEX	EXPANSION POTENTIONAL	SOIL TYPE (USCS)
B-1W at 0 to 5 feet	51	Medium	CLAYEY SAND (SC)
B-9W at 0 to 2 feet	5	Very Low	SILTY SAND (SM)

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-1W at 0 to 5 Feet	43.3	100	CLAYEY SAND (SC)
B-2W at 0 to 5 Feet	6.9	100	Poorly Graded SAND with SILT (SP-SM)
B-4W at 0 to 5 Feet	35.9	100	SILTY SAND (SM)
B-6W at 6 to 6½ Feet	45	100	SILTY SAND (SM)

ATTERBERG LIMITS
ASTM (D4318)

SAMPLE ID	LIQUID LIMIT	PLASTIC LIMIT	PLASTIC INDEX	SOIL TYPE (USCS)
B-1W at 0 to 5 feet	31	17	14	CLAYEY SAND (SC)
B-9 W at 0 to 2 feet	NP	NP	NP	SILTY SAND (SM)

R-VALUE
CALIFORNIA TEST 101

SAMPLE	DESCRIPTION	R-VALUE
B-4 W at 0 to 5 feet	SILTY SAND (SM)	13
B-9 W at 0 to 2 feet	SILTY SAND (SM)	28

RESISTIVITY, pH, SOLUBLE CHLORIDE and SOLUBLE SULFATE
(CT 417, 422, 643)

SAMPLE	RESISTIVITY (Ω-cm)	pH	CHLORIDE (%)	SULFATE (%)
B-1 W at 0 to 5 feet	1,500	7.79	0.007	0.007
B-7W at 0 to 3 feet	4,140	7.73	0.002	0.002
B-11W at 10 to 10½ feet	11,900	8.81	0.002	0.001

Water-Soluble Sulfate Exposure [2]

Water-Soluble Sulfate (SO_4) in soil (percent by weight)	Exposure Severity	Exposure Class	Cement Type	Max. W/C	Min. f_c' (psi)
$SO_4 < 0.10$	N/A	S0	No type restriction	N/A	2,500
$0.10 \le SO_4 < 0.20$	Moderate	S1	II	0.50	4,000
$0.20 \le SO_4 \le 2.00$	Severe	S2	V	0.45	4,500
$SO_4 > 2.00$	Very Severe	S3	V plus pozzolan or slag cement	0.45	4,500

2. Modified from ACI 318-14 Table 19.3.1.1 and Table 19.3.2.1

ATLAS

Good Hope and Mead Valley Water Improvements
Riverside County, California

By:	SD	Date:	July, 2023
Job Number:	1962-2	Figure:	II-8

APPENDIX C Pothole Report

May 15, 2023

PREPARED BY:

UTILITY SURVEYORS, INC.

AIRX Project #: 23-052 PS

Project Name: Mead Valley Cajalco Corridor Water System Imps., Perris

Utility Locating and Potholing Area:
Robinson St, Day St, Oakwood St, Pinewood St and Carroll St
Moreno Valley/Perris, CA

POTHOLING REPORT

785 East Mission Road Ste. 100 | San Marcos, CA 92069 | P.760.480.2347 | F.760.739.8034 | airxus.com

TABLE OF CONTENTS

1. Description of Pothole Procedures and Site-Specific Details
2. Pothole Project Map(s)
3. Pothole Location Map(s)
4. Pothole Tabulation Report
5. Pothole Data Sheet(s)
6. Permit(s)

Description of Pothole Procedures and Site Specific Details

DESCRIPTION OF POTHOLE PROCEDURES

AIRX Utility Surveyors performs a full range of specialized engineering services including Underground Utility Location and Vacuum Excavation (to verify depth and alignment of underground utilities).

Underground Utility Location employs sophisticated electronic locating devices to trace the route of an underground utility; then the route is marked on the surface with marking paint in paved areas, or with 60 penny nails and feathers in unpaved areas.

Vacuum excavation employs a vacuum truck in conjunction with high-pressure air or water to excavate material and expose an underground utility. An 8-inch diameter hole is first cored through the pavement so that the vacuum hose and high-pressure air or water hose can be inserted.

Utilities found during potholing are located on the surface by placing two reference points (typically 36" apart) on either side of the pothole along the centerline (or edge) of the utility, using paving nails or 60 penny nails as appropriate. Depth measurements (to the nearest ½ inch) are taken midway between the two reference points. Utility alignment, depth, and other data is marked with pink paint (on pavement), or on wood lath (unpaved areas).

SITE SPECIFIC DETAILS

AIRX was contracted by EMWD to perform utility locating and potholing services on Robinson St, Day St, Oakwood St, Pinewood St and Carroll St in Moreno Valley/Perris, California. A total of 23 potholes were excavated to establish conflicts and connection points on a variety of utilities. The results of the data are contained in the attached spreadsheet and data sheets.

In preparation of these excavations, AIRX marked out the dig locations and called in for USA (Underground Service Alert). All traffic control plans and permits were drawn and applied for by AIRX and all traffic control was set up by AIRX.

All the excavations and discovery went without any incident except for pothole 14, additional pothole 14A was added in order to locate target utilities. Any changes and adjustments are mentioned in the Pothole Tabulation Report and the Pothole Data Sheets. All the results were annotated on the ground and in this report. It is AIRX's recommendation that all pothole locations and the active mark out should be surveyed to aid in the adjustment of utilities on the final plan and profile.

At each pothole location, the utility alignment was marked with paint. AIRX used potable water acquired offsite for excavation and all water and material vacuumed was disposed of off-site. No water was allowed to flow into storm drains or natural drainages. The potholes were covered with clean backfill material and compacted to 95% density in 3" lifts. The pavement was patched with aquaphalt/Utilibond. All field work was performed between May 8, 2023 and May 12, 2023.

Pothole Project Map(s)

AIRX SUBSURFACE UTILITY LOCATING

Mead Valley Cajalco Corridor Water System Imps., Perris

Pothole Project Map 1

23-052 PS

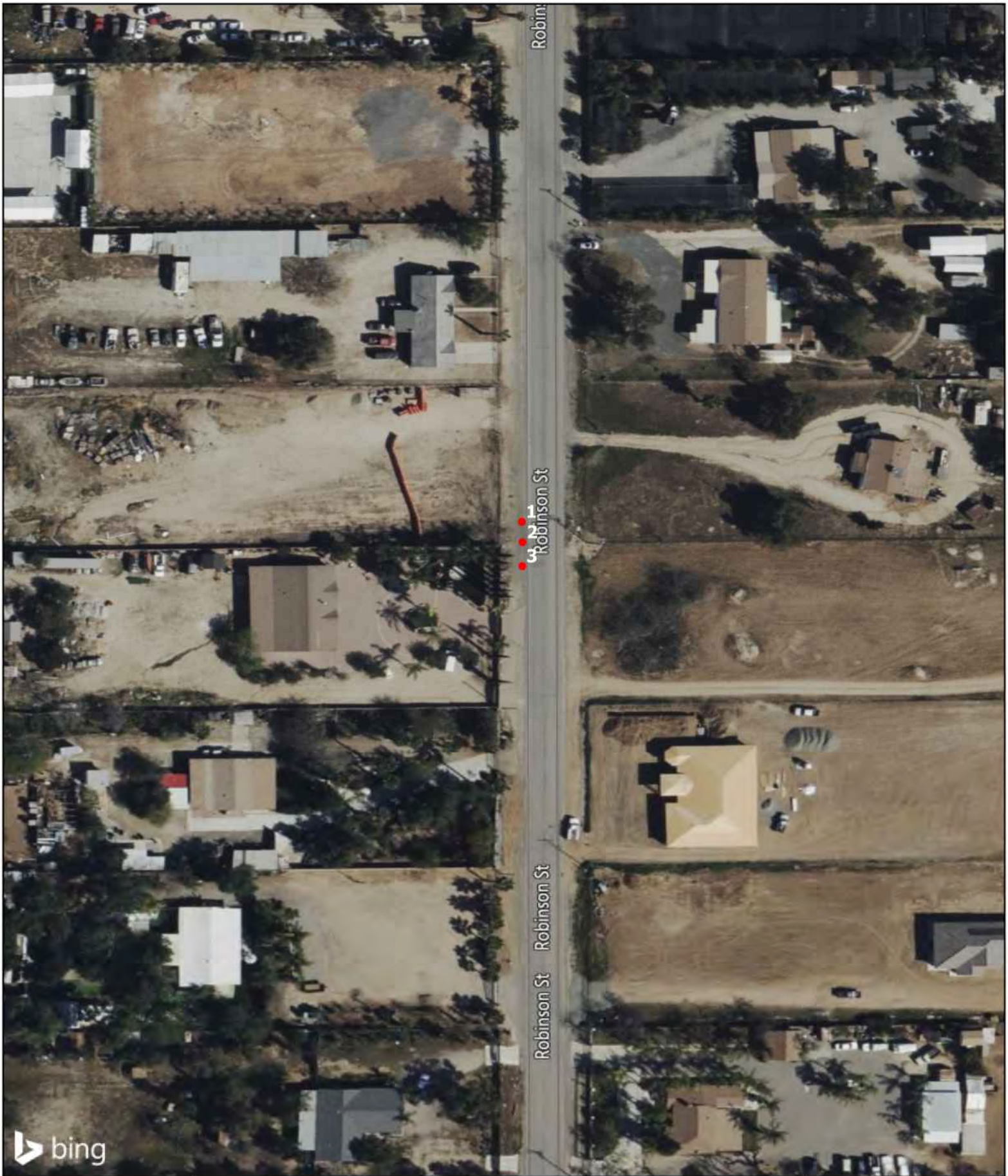
Coordinate System: NAD 1983 UTM Zone 11N

N

0 500 1,000

US Feet

Pothole Location Map(s)



AIRX
SUBSURFACE UTILITY LOCATING

Mead Valley Cajalco Corridor Water System Imps., Perris

Pothole Location Map 1

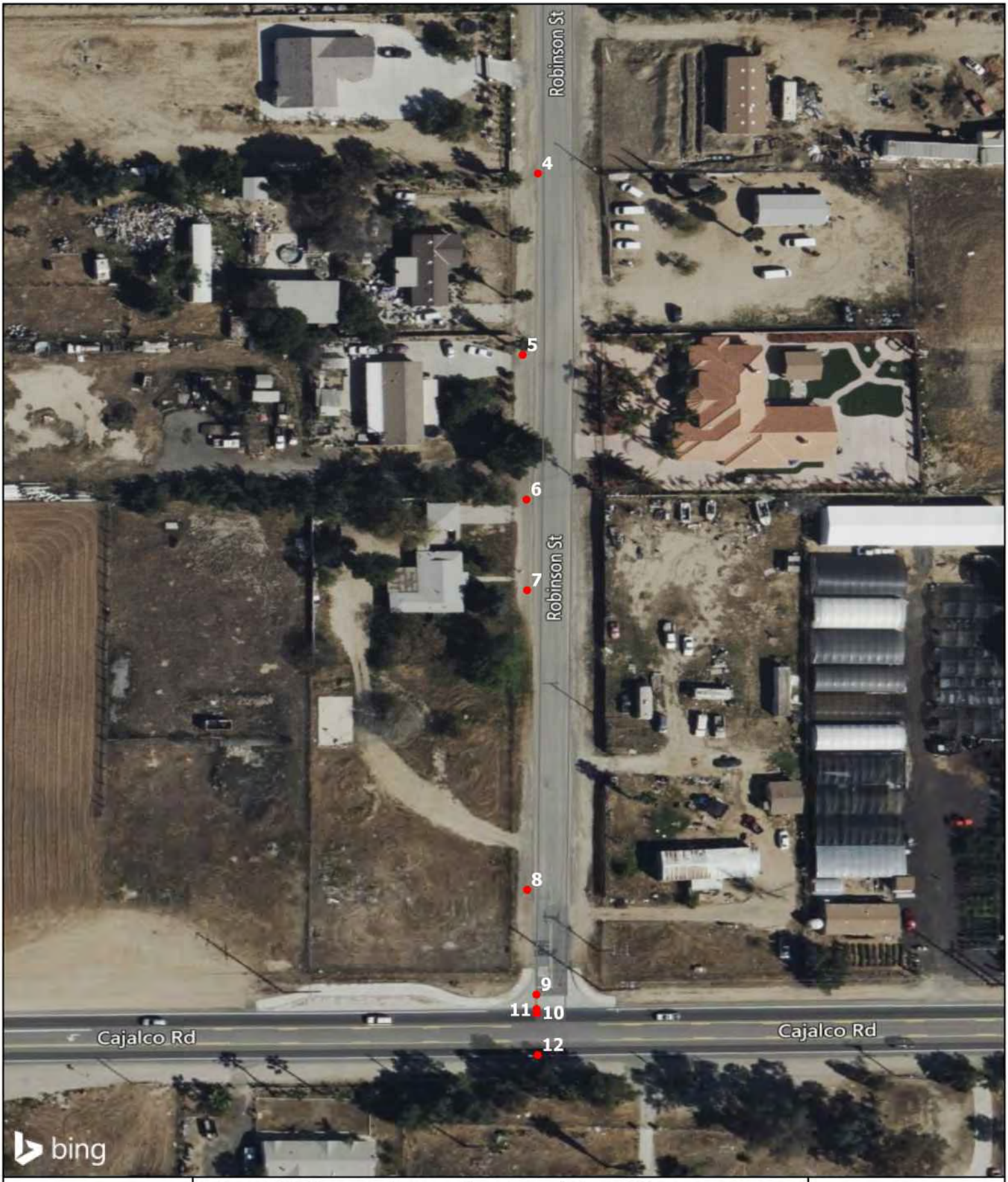
23-052 PS

Coordinate System: GCS WGS 1984

N

0 70 140

US Feet



SUBSURFACE UTILITY LOCATING

Mead Valley Cajalco Corridor Water System Imps., Perris

Pothole Location Map 2

23-052 PS

Coordinate System: GCS WGS 1984

N

0 70 140

US Feet

AIRX
SUBSURFACE UTILITY LOCATING

Mead Valley Cajalco Corridor Water System Imps., Perris

Pothole Location Map 3

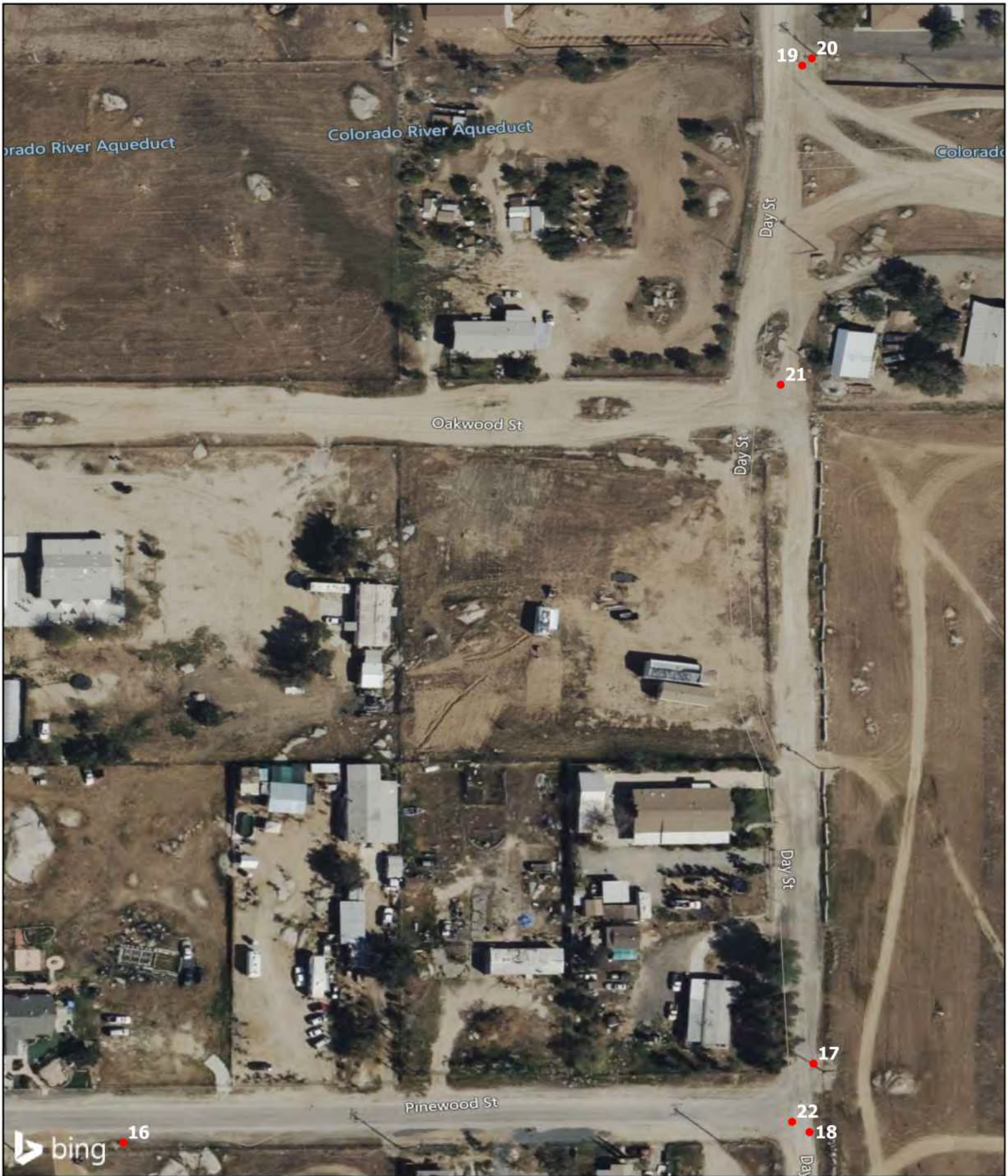
23-052 PS

Coordinate System: GCS WGS 1984

N

0 105 210

US Feet



AIRX
SUBSURFACE UTILITY LOCATING

Mead Valley Cajalco Corridor Water System Imps., Perris

Pothole Location Map 4

23-052 PS

Coordinate System: GCS WGS 1984

N

0 80 160

US Feet

Pothole Tabulation Report

POTHOLE TABULATION REPORT: Mead Valley Cajalco Corridor Water System Imps., Perris

Pothole Number	Date	Street	Pavement Thickness	Utility Type	Utility Size & Material	Soil Type	Depth-Ground to Top of Utility	Depth-Ground to Top of Package/ Encasement	Depth-Ground to Bottom of Package/ Encasement	Total Depth Excavated	Utility Orientation	Pothole Project Area Map #	Pothole Location Map #	Description & Location	Notes
1	05/08/2023	Robinson St	Asphalt - 5.0″ Concrete - N/A Base - 78.0″ Total - 83.0″	Water	6.0″ ACP	Slurry	87.0″ T/P	N/A	N/A	95.0″	N/S	1	1	Pothole 1 is located in the south-bound lane of Robinson St. Please refer to Location Map 1 for the approximate location of Pothole 1.	
2	05/08/2023	Robinson St	Asphalt - 5.0″ Concrete - N/A Base - N/A Total - 5.0″	Telecom Water (Not Found)	(2) 1.0″ Direct Bury N/A	Slurry	15.0″ T/P N/A	N/A N/A	N/A N/A	82.0″	SW & E N/A	1	1	Pothole 2 is located in the south-bound lane of Robinson St. Please refer to Location Map 1 for the approximate location of Pothole 2.	Uncovered tracer wire was found at 38.0 inches deep.
3	05/08/2023	Robinson St	Asphalt - N/A Concrete - N/A Base - N/A Total - N/A	Clearance Hole	N/A	Slurry	N/A	N/A	N/A	48.0″	N/A	1	1	Pothole 3 is located in the south-bound lane of Robinson St. Please refer to Location Map 1 for the approximate location of Pothole 3.	
4	05/08/2023	Robinson St	Asphalt - 5.0″ Concrete - N/A Base - N/A Total - 5.0″	Clearance Hole	N/A	Slurry	N/A	N/A	N/A	48.0″	N/A	1	2	Pothole 4 is located in the south-bound lane of Robinson St. Please refer to Location Map 2 for the approximate location of Pothole 4.	
5	05/08/2023	Robinson St	Asphalt - 3.0″ Concrete - N/A Base - N/A Total - 3.0″	Gas	2.0″ Steel	Subgrade	30.0″ T/P	N/A	N/A	40.0″	N/S	1	2	Pothole 5 is located west of Robinson St. Please refer to Location Map 2 for the approximate location of Pothole 5.	
6	05/08/2023	Robinson St	Asphalt - 2.0″ Concrete - N/A Base - N/A Total - 2.0″	Clearance Hole	N/A	Slurry	N/A	N/A	N/A	48.0″	N/A	1	2	Pothole 6 is located west of Robinson St. Please refer to Location Map 2 for the approximate location of Pothole 6.	
7	05/08/2023	Robinson St	Asphalt - N/A Concrete - N/A Base - N/A Total - N/A	Clearance Hole	N/A	Slurry	N/A	N/A	N/A	48.0″	N/A	1	2	Pothole 7 is located west of Robinson St. Please refer to Location Map 2 for the approximate location of Pothole 7.	Excavated 48.0 inches deep, and 4.0 inches wide.
8	05/08/2023	Robinson St	Asphalt - N/A Concrete - N/A Base - N/A Total - N/A	Gas	2.0″ Steel	Subgrade	44.0″ T/P	N/A	N/A	50.0″	N/S	1	2	Pothole 8 is located west of Robinson St. Please refer to Location Map 2 for the approximate location of Pothole 8.	
9	05/12/2023	Intersection of Robinson St & Cajalco Rd	Asphalt - 7.0″ Concrete - N/A Base - 8.0″ Total - 15.0″	Sanitary Sewer	6.0″ Plastic	Subgrade	55.0″ T/P	N/A	N/A	68.0″	W/E	1	2	Pothole 9 is located in the intersection of Robinson St & Cajalco Rd. Please refer to Location Map 2 for the approximate location of Pothole 9.	Tracer wire was present.
10	05/12/2023	Intersection of Robinson St & Cajalco Rd	Asphalt - 3.0″ Concrete - N/A Base - 10.0″ Total - 13.0″	HP Gas	6.0″ Plastic	Subgrade	56.0″ T/P	N/A	N/A	61.0″	W/E	1	2	Pothole 10 is located in the intersection of Robinson St & Cajalco Rd. Please refer to Location Map 2 for the approximate location of Pothole 10.	SoCal Gas was on Standby.
11	05/12/2023	Intersection of Robinson St & Cajalco Rd	Asphalt - 8.0″ Concrete - N/A Base - 10.0″ Total - 18.0″	Gas	4.0″ Steel	Subgrade	43.0″ T/P	N/A	N/A	50.0″	W/E	1	2	Pothole 11 is located in the intersection of Robinson St & Cajalco Rd. Please refer to Location Map 2 for the approximate location of Pothole 11.	SoCal Gas was on Standby.
12	05/12/2023	Intersection of Robinson St & Cajalco Rd	Asphalt - 5.0″ Concrete - N/A Base - 4.0″ Total - 9.0″	Water	18.0″ Concrete	Subgrade	56.0″ T/P	N/A	N/A	64.0″		1	2	Pothole 12 is located in the intersection of Robinson St & Cajalco Rd. Please refer to Location Map 2 for the approximate location of Pothole 12.	
13	05/08/2023	Oakwood St	Asphalt - 4.0″ Concrete - N/A Base - 10.0″ Total - 14.0″	Water	12.0″ Steel	Subgrade	36.0″ T/P	N/A	N/A	36.0″	W&SE	1	3	Pothole 13 is located in the east-bound lane of Oakwood St. Please refer to Location Map 3 for the approximate location of Pothole 13.	
14	05/08/2023	Oakwood St	Asphalt - 4.0″ Concrete - N/A Base - 10.0″ Total - 14.0″	Water Service Water Service	1.0″ PVC 1.0″ Copper	Subgrade	55.0″ T/P 55.0″ T/P	N/A N/A	N/A N/A	60.0″	N/S N/S	1	3	Pothole 14 is located in the east-bound lane of Oakwood St. Please refer to Location Map 3 for the approximate location of Pothole 14.	
14A	05/08/2023	Oakwood St	Asphalt - N/A Concrete - N/A Base - N/A Total - N/A	Water Service	1.0″ Copper	Subgrade	47.0″ T/P	N/A	N/A	60.0″	N/S	1	3	Pothole 14A is located south of Oakwood St. Please refer to Location Map 3 for the approximate location of Pothole 14A.	

POTHOLE TABULATION REPORT: Mead Valley Cajalco Corridor Water System Imps., Perris

Pothole Number	Date	Street	Pavement Thickness	Utility Type	Utility Size & Material	Soil Type	Depth-Ground to Top of Utility	Depth-Ground to Top of Package/ Encasement	Depth-Ground to Bottom of Package/ Encasement	Total Depth Excavated	Utility Orientation	Pothole Project Area Map #	Pothole Location Map #	Description & Location	Notes
15	05/08/2023	Carroll St	Asphalt - N/A Concrete - N/A Base - N/A Total - N/A	Water	4.0″ Concrete	Subgrade	26.0″ T/P	N/A	N/A	26.0″	W&S	1	3	Pothole 15 is located west of Carroll St. Please refer to Location Map 3 for the approximate location of Pothole 15.	
16	05/08/2023	Pinewood St	Asphalt - N/A Concrete - N/A Base - N/A Total - N/A	Water	6.0″ Plastic	Subgrade	47.0″ T/P	N/A	N/A	60.0″	W/E	1	4	Pothole 16 is located south of Pinewood St. Please refer to Location Map 4 for the approximate location of Pothole 16.	
17	05/08/2023	Day St	Asphalt - N/A Concrete - N/A Base - N/A Total - N/A	Water	8.0″ Steel	Subgrade	33.0″ T/P	N/A	N/A	33.0″	S&E	1	4	Pothole 17 is located east of Day St. Please refer to Location Map 4 for the approximate location of Pothole 17.	Yellow caution tape was found in the pothole.
18	05/08/2023	Intersection of Pinewood St & Day St	Asphalt - N/A Concrete - N/A Base - N/A Total - N/A	Water	8.0″ Concrete	Subgrade	44.0″ T/P	N/A	N/A	44.0″	N/S	1	4	Pothole 18 is located in the intersection of Pinewood St & Day St. Please refer to Location Map 4 for the approximate location of Pothole 18.	
19	05/08/2023	Day St	Asphalt - N/A Concrete - N/A Base - N/A Total - N/A	Water	8.0″ Steel	Subgrade	58.0″ T/P	N/A	N/A	72.0″	N&W	1	4	Pothole 19 is located east of Day St. Please refer to Location Map 4 for the approximate location of Pothole 19.	8.0 inches wide water pipe was connected by water valve to a 2.0 inches wide water pipe.
20	05/08/2023	Day St	Asphalt - N/A Concrete - N/A Base - N/A Total - N/A	Gas (Not Found)	N/A	Subgrade, Sand, Granite	N/A	N/A	N/A	84.0″	N/A	1	4	Pothole 20 is located east of Day St. Please refer to Location Map 4 for the approximate location of Pothole 20.	
21	05/08/2023	Intersection of Oakwood St & Day St	Asphalt - N/A Concrete - N/A Base - N/A Total - N/A	Telecom	1.0″ Direct Bury	Subgrade	30.0″ T/P	N/A	N/A	30.0″	WSW/ENE	1	4	Pothole 21 is located in the intersection of Oakwood St & Day St. Please refer to Location Map 4 for the approximate location of Pothole 21.	
22	05/12/2023	Intersection of Pinewood St & Day St	Asphalt - N/A Concrete - N/A Base - N/A Total - N/A	Gas	2.0″ Steel	Subgrade	33.0″ T/P	N/A	N/A	38.0″	N/S	1	4	Pothole 22 is located in the intersection of Pinewood St & Day St. Please refer to Location Map 4 for the approximate location of Pothole 22.	

Pothole Data Sheet(s)

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-052 PS
TEST HOLE NO:	1
DATE EXCAVATED:	05/08/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Water	6.0″ ACP	87.0″ T/P	N/A	N/A	N/S
2						
3						
4						

TOTAL DEPTH EXCAVATED: **95.0**″

PAVEMENT THICKNESS: **ASPHALT: 5.0″** **CONCRETE: N/A** **BASE: 78.0″**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Aquaphalt**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Slurry**

COMMENT:

AREA SHOT

Pothole 1 is located in the south-bound lane of Robinson St. Please refer to Location Map 1 for the approximate location of Pothole 1. The photo above was taken in front of Pothole 1 facing north.

DOWNHOLE VIEW

A downhole view of the 6.0 inch wide ACP Water utility found in Pothole 1, at the depth of 87.0 inches T/P. Utility runs in a N/S direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-052 PS
TEST HOLE NO:	2
DATE EXCAVATED:	05/08/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Telecom	(2) 1.0″ Direct Bury	15.0″ T/P	N/A	N/A	SW&E
2	Water (Not Found)	N/A	N/A	N/A	N/A	N/A
3						
4						

TOTAL DEPTH EXCAVATED: **82.0**”

PAVEMENT THICKNESS: **ASPHALT: 5.0″** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Aquaphalt**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**Yes**
MARKOUT LOCATION CORRECT:	**No**	PIPE COVER MATERIAL:	**Slurry**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Slurry**

COMMENT:
Uncovered tracer wire was found at 38.0 inches deep.

AREA SHOT

Pothole 2 is located in the south-bound lane of Robinson St. Please refer to Location Map 1 for the approximate location of Pothole 2. The photo above was taken in front of Pothole 2 facing east.

DOWNHOLE VIEW

A downhole view of the two 1.0 inch wide Direct Bury Telecom utility found in Pothole 2, at the depth of 15.0 inches T/P. Utility runs in a SW&E direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-052 PS
TEST HOLE NO:	3
DATE EXCAVATED:	05/08/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Clearance Hole	N/A	N/A	N/A	N/A	N/A
2						
3						
4						

TOTAL DEPTH EXCAVATED: **48.0**”

PAVEMENT THICKNESS: **ASPHALT: N/A** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Aquaphalt**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**No**	PIPE COVER MATERIAL:	**N/A**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Slurry**

COMMENT:

AREA SHOT

Pothole 3 is located in the south-bound lane of Robinson St. Please refer to Location Map 1 for the approximate location of Pothole 3. The photo above was taken in front of Pothole 3 facing north.

DOWNHOLE VIEW

A downhole view of the excavation to 48.0 inches deep. Utilities were not found in the Pothole.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-052 PS
TEST HOLE NO:	4
DATE EXCAVATED:	05/08/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Clearance Hole	N/A	N/A	N/A	N/A	N/A
2						
3						
4						

TOTAL DEPTH EXCAVATED: **48.0**”

PAVEMENT THICKNESS: **ASPHALT: 5.0″** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Aquaphalt**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**No**	PIPE COVER MATERIAL:	**N/A**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Slurry**

COMMENT:

AREA SHOT

Pothole 4 is located in the south-bound lane of Robinson St. Please refer to Location Map 2 for the approximate location of Pothole 4. The photo above was taken in front of Pothole 4 facing south.

DOWNHOLE VIEW

A downhole view of the excavation to 48.0 inches deep. Utilities were not found in the Pothole.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-052 PS
TEST HOLE NO:	5
DATE EXCAVATED:	05/08/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Gas	2.0″ Steel	30.0″ T/P	N/A	N/A	N/S
2						
3						
4						

TOTAL DEPTH EXCAVATED: **40.0**”

PAVEMENT THICKNESS: **ASPHALT: 3.0″** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

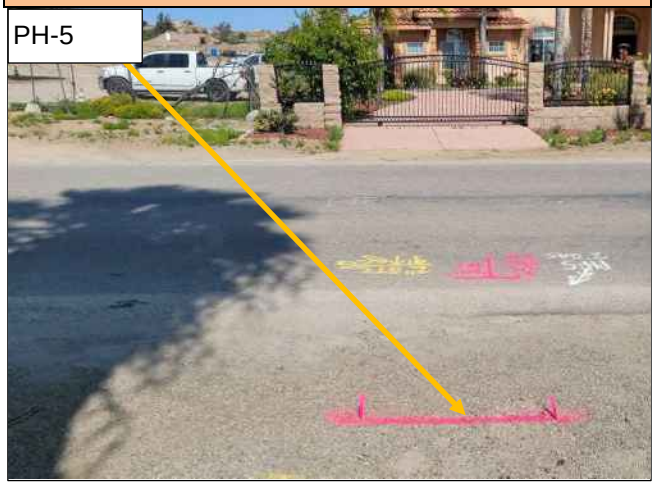
IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Class II Base**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT



Pothole 5 is located west of Robinson St. Please refer to Location Map 2 for the approximate location of Pothole 5. The photo above was taken in front of Pothole 5 facing east.

DOWNHOLE VIEW

A downhole view of the 2.0 inch wide Steel Gas utility found in Pothole 5, at the depth of 30.0 inches T/P. Utility runs in a N/S direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-052 PS
TEST HOLE NO:	6
DATE EXCAVATED:	05/08/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Clearance Hole	N/A	N/A	N/A	N/A	N/A
2						
3						
4						

TOTAL DEPTH EXCAVATED: **48.0**”

PAVEMENT THICKNESS: **ASPHALT: 2.0″** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Class II Base**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**No**	PIPE COVER MATERIAL:	**N/A**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Slurry**

COMMENT:

AREA SHOT

Pothole 6 is located west of Robinson St. Please refer to Location Map 2 for the approximate location of Pothole 6. The photo above was taken in front of Pothole 6 facing south.

DOWNHOLE VIEW

A downhole view of the excavation to 48.0 inches deep. Utilities were not found in the Pothole.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-052 PS
TEST HOLE NO:	7
DATE EXCAVATED:	05/08/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Clearance Hole	N/A	N/A	N/A	N/A	N/A
2						
3						
4						

TOTAL DEPTH EXCAVATED: **48.0**”

PAVEMENT THICKNESS: **ASPHALT: N/A** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Class II Base**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**No**	PIPE COVER MATERIAL:	**N/A**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Slurry**

COMMENT:
Excavated 48.0 inches deep, and 4.0 inches wide.

AREA SHOT

Pothole 7 is located west of Robinson St. Please refer to Location Map 2 for the approximate location of Pothole 7. The photo above was taken in front of Pothole 7 facing NNE.

DOWNHOLE VIEW

A downhole view of the excavation to 48.0 inches deep. Utilities were not found in the Pothole.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-052 PS
TEST HOLE NO:	8
DATE EXCAVATED:	05/08/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Gas	2.0″ Steel	44.0″ T/P	N/A	N/A	N/S
2						
3						
4						

TOTAL DEPTH EXCAVATED: **50.0**”

PAVEMENT THICKNESS: **ASPHALT: N/A** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Class II Base**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT

Pothole 8 is located west of Robinson St. Please refer to Location Map 2 for the approximate location of Pothole 8. The photo above was taken in front of Pothole 8 facing south.

DOWNHOLE VIEW

A downhole view of the 2.0 inch wide Steel Gas utility found in Pothole 8, at the depth of 44.0 inches T/P. Utility runs in a N/S direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-052 PS
TEST HOLE NO:	9
DATE EXCAVATED:	05/12/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Sanitary Sewer	6.0″ Plastic	55.0″ T/P	N/A	N/A	W/E
2						
3						
4						

TOTAL DEPTH EXCAVATED: **68.0**″

PAVEMENT THICKNESS: **ASPHALT: 7.0″** **CONCRETE: N/A** **BASE: 8.0″**

STANDBY REQUIRED: **N/A**

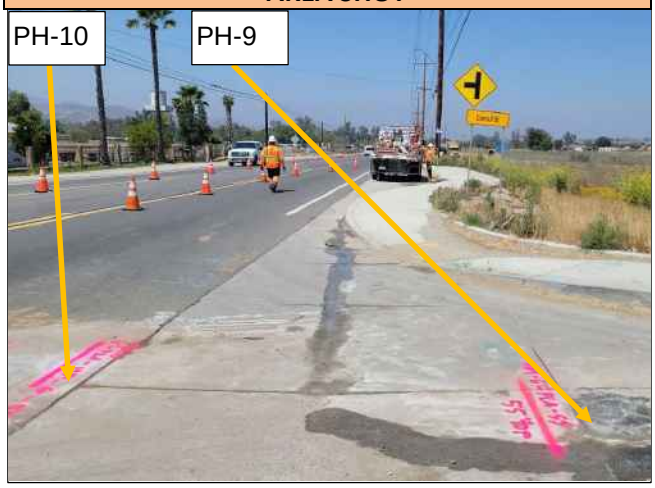
IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Utilibond**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**Yes**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT



Pothole 9 is located in the intersection of Robinson St & Cajalco Rd. Please refer to Location Map 2 for the approximate location of Pothole 9. The photo above was taken in front of Pothole 9 and Pothole 10 facing west.

DOWNHOLE VIEW

A downhole view of the 6.0 inch wide Plastic Sanitary Sewer utility found in Pothole 9, at the depth of 55.0 inches T/P. Utility runs in a W/E direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-052 PS
TEST HOLE NO:	10
DATE EXCAVATED:	05/12/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	HP Gas	6.0″ Plastic	56.0″ T/P	N/A	N/A	W/E
2						
3						
4						

TOTAL DEPTH EXCAVATED: **61.0**″

PAVEMENT THICKNESS: **ASPHALT: 3.0″** **CONCRETE: N/A** **BASE: 10.0″**

STANDBY REQUIRED: **SoCal Gas**

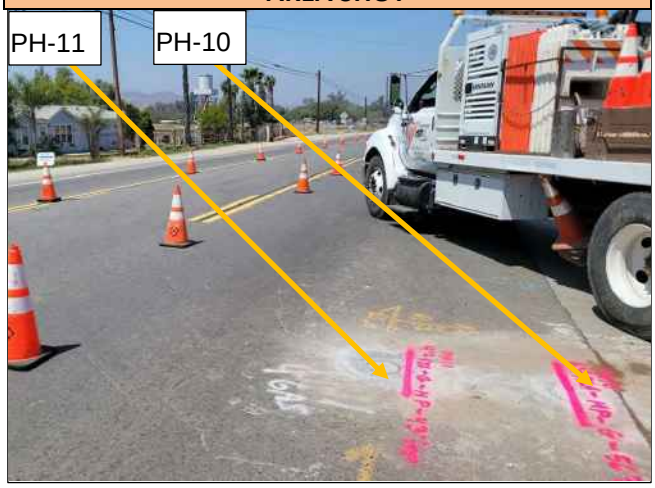
IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Utilibond**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT



Pothole 10 is located in the intersection of Robinson St & Cajalco Rd. Please refer to Location Map 2 for the approximate location of Pothole 10. The photo above was taken in front of Pothole 10 and Pothole 11 facing west.

DOWNHOLE VIEW

A downhole view of the 6.0 inch wide Plastic HP Gas utility found in Pothole 10, at the depth of 56.0 inches T/P. Utility runs in a W/E direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-052 PS
TEST HOLE NO:	11
DATE EXCAVATED:	05/12/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Gas	4.0″ Steel	43.0″ T/P	N/A	N/A	W/E
2						
3						
4						

TOTAL DEPTH EXCAVATED: **50.0**”

PAVEMENT THICKNESS: **ASPHALT: 8.0″** **CONCRETE: N/A** **BASE: 10.0″**

STANDBY REQUIRED: **SoCal Gas**

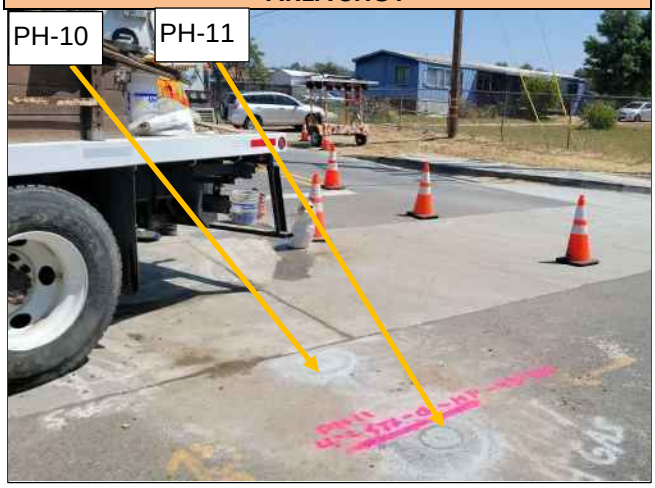
IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Utilibond**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT



Pothole 11 is located in the intersection of Robinson St & Cajalco Rd. Please refer to Location Map 2 for the approximate location of Pothole 11. The photo above was taken in front of Pothole 11 and Pothole 10 facing NE.

DOWNHOLE VIEW

A downhole view of the 4.0 inch wide Steel Gas utility found in Pothole 11, at the depth of 43.0 inches T/P. Utility runs in a W/E direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-052 PS
TEST HOLE NO:	12
DATE EXCAVATED:	05/12/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Water	18.0″ Concrete	56.0″ T/P	N/A	N/A	W/E
2						
3						
4						

TOTAL DEPTH EXCAVATED: **64.0**”

PAVEMENT THICKNESS: **ASPHALT: 5.0″** **CONCRETE: N/A** **BASE: 4.0″**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Utilibond**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT

Pothole 12 is located in the intersection of Robinson St & Cajalco Rd. Please refer to Location Map 2 for the approximate location of Pothole 12. The photo above was taken in front of Pothole 12 facing north.

DOWNHOLE VIEW

A downhole view of the 18.0 inch wide Concrete Water utility found in Pothole 12, at the depth of 56.0 inches T/P. Utility runs in a W/E direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-052 PS
TEST HOLE NO:	13
DATE EXCAVATED:	05/08/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Water	12.0″ Steel	36.0″ T/P	N/A	N/A	W&SE
2						
3						
4						

TOTAL DEPTH EXCAVATED: **36.0**”

PAVEMENT THICKNESS: **ASPHALT: 4.0″** **CONCRETE: N/A** **BASE: 10.0″**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Aquaphalt**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Black Wrap, Sand**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT

Pothole 13 is located in the east-bound lane of Oakwood St. Please refer to Location Map 3 for the approximate location of Pothole 13. The photo above was taken in front of Pothole 13 facing west.

DOWNHOLE VIEW

A downhole view of the 12.0 inch wide Steel Water utility found in Pothole 13, at the depth of 36.0 inches T/P. Utility runs in a W&SE direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-052 PS
TEST HOLE NO:	14
DATE EXCAVATED:	05/08/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Water Service	1.0″ PVC	55.0″ T/P	N/A	N/A	N/S
2	Water Service	1.0″ Copper	55.0″ T/P	N/A	N/A	N/S
3						
4						

TOTAL DEPTH EXCAVATED: **60.0**″

PAVEMENT THICKNESS: **ASPHALT: 4.0″** **CONCRETE: N/A** **BASE: 10.0″**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Aquaphalt**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT

Pothole 14 is located in the east-bound lane of Oakwood St. Please refer to Location Map 3 for the approximate location of Pothole 14. The photo above was taken in front of Pothole 14 facing west.

DOWNHOLE VIEW

A downhole view of the utilities found in Pothole 14 and their orientation at the pothole location: 1.0 inch PVC Water Service utility at the depth of 55.0 inches T/P and runs in a N/S direction; and 1.0 inch Copper Water Service utility at the depth of 55.0 inches T/P and runs in a N/S direction. Utilities were found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-052 PS
TEST HOLE NO:	14A
DATE EXCAVATED:	05/08/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Water Service	1.0″ Copper	47.0″ T/P	N/A	N/A	N/S
2						
3						
4						

TOTAL DEPTH EXCAVATED: **60.0**”

PAVEMENT THICKNESS: **ASPHALT: N/A** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Class II Base**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT

Pothole 14A is located south of Oakwood St. Please refer to Location Map 3 for the approximate location of Pothole 14A. The photo above was taken in front of Pothole 14A facing east.

DOWNHOLE VIEW

A downhole view of the 1.0 inch wide Copper Water Service utility found in Pothole 14A, at the depth of 47.0 inches T/P. Utility runs in a N/S direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-052 PS
TEST HOLE NO:	15
DATE EXCAVATED:	05/08/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Water	4.0″ Concrete	26.0″ T/P	N/A	N/A	W&S
2						
3						
4						

TOTAL DEPTH EXCAVATED: **26.0**”

PAVEMENT THICKNESS: **ASPHALT: N/A** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

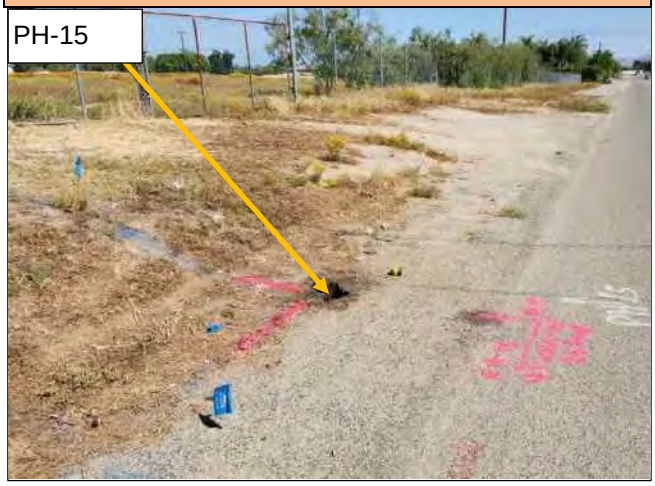
IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Class II Base**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT



Pothole 15 is located west of Carroll St. Please refer to Location Map 3 for the approximate location of Pothole 15. The photo above was taken in front of Pothole 15 facing north.

DOWNHOLE VIEW

A downhole view of the 4.0 inch wide Concrete Water utility found in Pothole 15, at the depth of 26.0 inches T/P. Utility runs in a W&S direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-052 PS
TEST HOLE NO:	16
DATE EXCAVATED:	05/08/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Water	6.0″ Plastic	47.0″ T/P	N/A	N/A	W/E
2						
3						
4						

TOTAL DEPTH EXCAVATED: **60.0**”

PAVEMENT THICKNESS: **ASPHALT: N/A** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Class II Base**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT

Pothole 16 is located south of Pinewood St. Please refer to Location Map 4 for the approximate location of Pothole 16. The photo above was taken in front of Pothole 16 facing south.

DOWNHOLE VIEW

A downhole view of the 6.0 inch wide Plastic Water utility found in Pothole 16, at the depth of 47.0 inches T/P. Utility runs in a W/E direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-052 PS
TEST HOLE NO:	17
DATE EXCAVATED:	05/08/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Water	8.0″ Steel	33.0″ T/P	N/A	N/A	S&E
2						
3						
4						

TOTAL DEPTH EXCAVATED: **33.0**”

PAVEMENT THICKNESS: **ASPHALT: N/A** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Class II Base**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:
Yellow caution tape was found in the pothole.

AREA SHOT

Pothole 17 is located east of Day St. Please refer to Location Map 4 for the approximate location of Pothole 17. The photo above was taken in front of Pothole 17 facing west.

DOWNHOLE VIEW

A downhole view of the 8.0 inch wide Steel Water utility found in Pothole 17, at the depth of 33.0 inches T/P. Utility runs in a S&E direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-052 PS
TEST HOLE NO:	18
DATE EXCAVATED:	05/08/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Water	8.0″ Concrete	44.0″ T/P	N/A	N/A	N/S
2						
3						
4						

TOTAL DEPTH EXCAVATED: **44.0**”

PAVEMENT THICKNESS: **ASPHALT: N/A** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

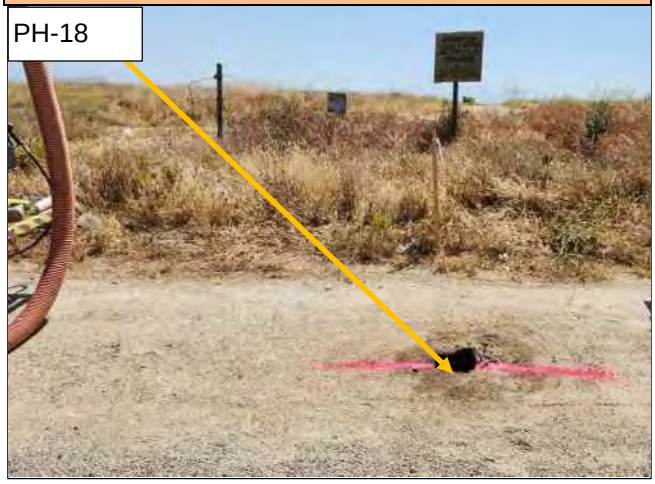
IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Class II Base**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT



Pothole 18 is located in the intersection of Pinewood St & Day St. Please refer to Location Map 4 for the approximate location of Pothole 18. The photo above was taken in front of Pothole 18 facing east.

DOWNHOLE VIEW

A downhole view of the 8.0 inch wide Concrete Water utility found in Pothole 18, at the depth of 44.0 inches T/P. Utility runs in a N/S direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-052 PS
TEST HOLE NO:	19
DATE EXCAVATED:	05/08/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Water	8.0″ Steel	58.0″ T/P	N/A	N/A	N&W
2						
3						
4						

TOTAL DEPTH EXCAVATED: **72.0**”

PAVEMENT THICKNESS: **ASPHALT: N/A** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Class II Base**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:
8.0 inches wide water pipe was connected by water valve to a 2.0 inches wide water pipe.

AREA SHOT

Pothole 19 is located east of Day St. Please refer to Location Map 4 for the approximate location of Pothole 19. The photo above was taken in front of Pothole 19 facing north.

DOWNHOLE VIEW

A downhole view of the 8.0 inch wide Steel Water utility found in Pothole 19, at the depth of 58.0 inches T/P. Utility runs in a N&W direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-052 PS
TEST HOLE NO:	20
DATE EXCAVATED:	05/08/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Gas (Not Found)	N/A	N/A	N/A	N/A	N/A
2						
3						
4						

TOTAL DEPTH EXCAVATED: **84.0**”

PAVEMENT THICKNESS: **ASPHALT: N/A** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Class II Base**

TARGET UTILITY MARKED BY USA: **Yes**
MARKOUT LOCATION CORRECT: **No**
UTILITY SHOWN ON PLAN: **Yes**
TRACER WIRE FOUND: **No**
PIPE COVER MATERIAL: **N/A**
OVERBURDEN MATERIAL: **Subgrade, Sand, Granite**

COMMENT:

AREA SHOT

Pothole 20 is located east of Day St. Please refer to Location Map 4 for the approximate location of Pothole 20. The photo above was taken in front of Pothole 20 facing west.

DOWNHOLE VIEW

A downhole view of the excavation to 84.0 inches deep. Utilities were not found in the Pothole.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-052 PS
TEST HOLE NO:	21
DATE EXCAVATED:	05/08/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Telecom	1.0″ Direct Bury	30.0″ T/P	N/A	N/A	WSW/ENE
2						
3						
4						

TOTAL DEPTH EXCAVATED: **30.0**”

PAVEMENT THICKNESS: **ASPHALT: N/A** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Class II Base**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT

Pothole 21 is located in the intersection of Oakwood St & Day St. Please refer to Location Map 4 for the approximate location of Pothole 21. The photo above was taken in front of Pothole 21 facing west.

DOWNHOLE VIEW

A downhole view of the 1.0 inch wide Direct Bury Telecom utility found in Pothole 21, at the depth of 30.0 inches T/P. Utility runs in a WSW/ENE direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-052 PS
TEST HOLE NO:	22
DATE EXCAVATED:	05/12/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Gas	2.0″ Steel	33.0″ T/P	N/A	N/A	N/S
2						
3						
4						

TOTAL DEPTH EXCAVATED: **38.0**”

PAVEMENT THICKNESS: **ASPHALT: N/A** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Class II Base**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT

Pothole 22 is located in the intersection of Pinewood St & Day St. Please refer to Location Map 4 for the approximate location of Pothole 22. The photo above was taken in front of Pothole 22 facing north.

DOWNHOLE VIEW

A downhole view of the 2.0 inch wide Steel Gas utility found in Pothole 22, at the depth of 33.0 inches T/P. Utility runs in a N/S direction at the Pothole location and was found directly on markout.

Permit(s)

SIGN LEGEND

C9A(CA) C12(CA) C20(CA)L C20(CA)R C27(CA) C30(CA) C30(BK) C30A(CA) G20-2 M4-8A M4-10(R/L) R1-1 R3-1 R3-2 R3-4

R3-5(R/L) R3-6(R/L) R3-7(R/L) R4-7A R4-8A R4-11 R9-3 R9-9 R9-11(R/L) R9-11a(R/L) R11-2 R11-4 SC3(CA) W1-4(R/L) W1-6(R/L)

W3-4 W4-2(R/L) W8-24 W11-1 W16-1P W20-1 W20-2 W20-3 W20-4 W20-5(L) W20-5(R) W20-5(BK) W21-5 W21-5b(R/L) Flagger Paddle

WATCH - Work Area Traffic Control Handbook / California MUTCD **Minimum Recommended Channelizing Device and Sign Spacing**

APPROACH SPEED (MPH)	MINIMUM DISTANCE (FEET) BETWEEN SIGNS AND FROM LAST SIGN TO TAPER	MINIMUM TAPER LENGTHS (L) (FEET) FOR 12-FOOT LANE			BUFFER LENGTH (FEET)	MAX CONE SPACING		
		L	1/2L	1/3L		TAPER	TANGENT	CONFLICT
25	100	125	63	42	158	25	50	12
30	250	180	90	60	205	30	60	15
35	250	245	123	82	257	35	70	17
40	250	320	160	107	315	40	80	20
45	350	540	270	180	378	45	90	22
50	350	600	300	200	446	50	100	25
55	500	660	330	220	520	50	100	25

LEGEND

- TRAFFIC CONE / DELINEATOR
- TRAFFIC CONTROL SIGN
- TRAFFIC CONTROL BARRICADE
- APPROXIMATE POTHOLE LOCATION
- FLAGGER
- SIGNALIZED INTERSECTION
- FAS - FLASHING ARROW SIGN
- WORK ZONE
- BUS STOP

REGISTERED PROFESSIONAL ENGINEER
IVAN R. FOX
No. C 38144
Exp. 03/31/25
CIVIL
STATE OF CALIFORNIA

JENN HARRIS
President & CEO
785 E Mission Rd, Unit 100
San Marcos, CA 92069
619-710-3124
jharris@airxus.com
www.airxutility.com

PROJECT NAME: Mead Valley & Good Hope Water Improvements

AIRX JOB#: 23-052IE

THOMAS GRID#: 777-A2, A3

TYPE OF WORK: Potholing

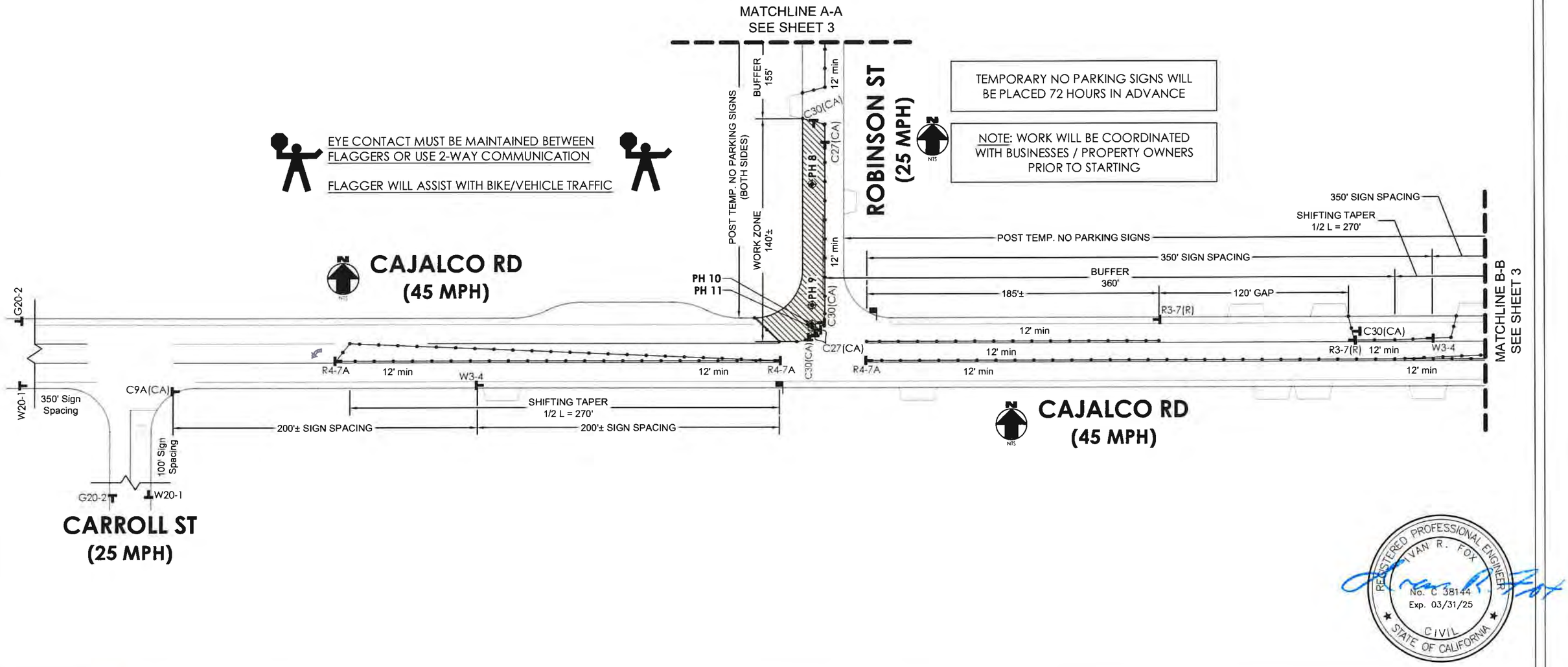
DRAWN FOR: Riverside County

NOTES:

DATE: 4/28/2023

DESIGNED BY: Otman Mouden

Potholes 8 - 11:



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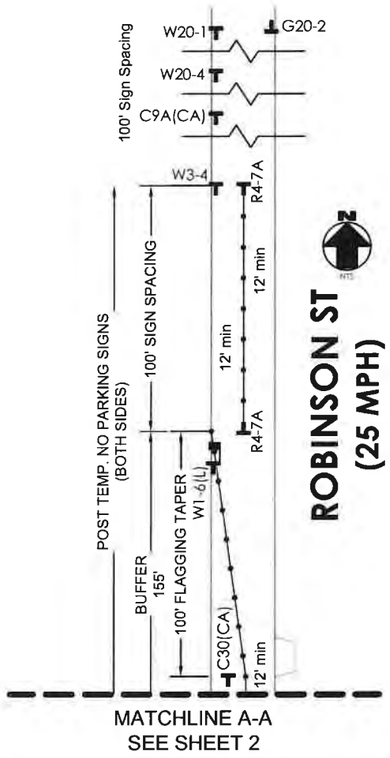
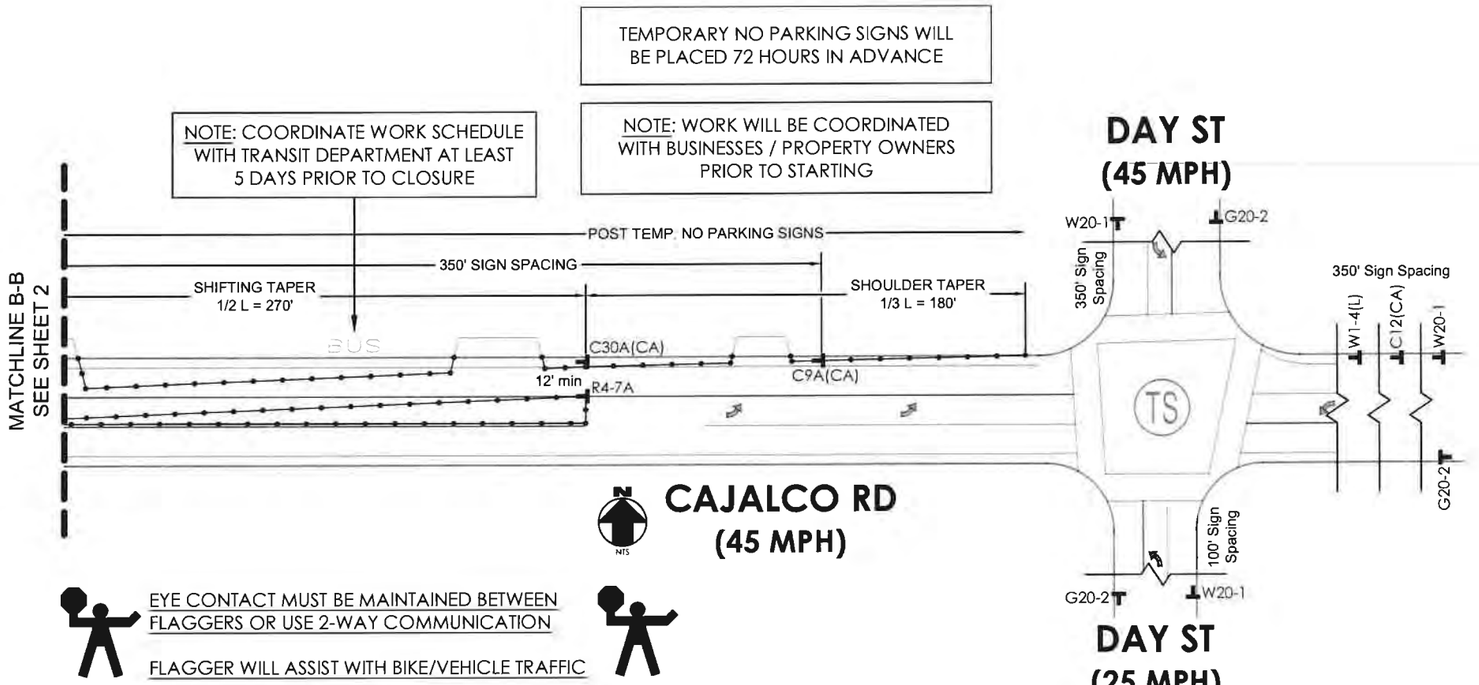
Potholes 8 - 11: (Con't)





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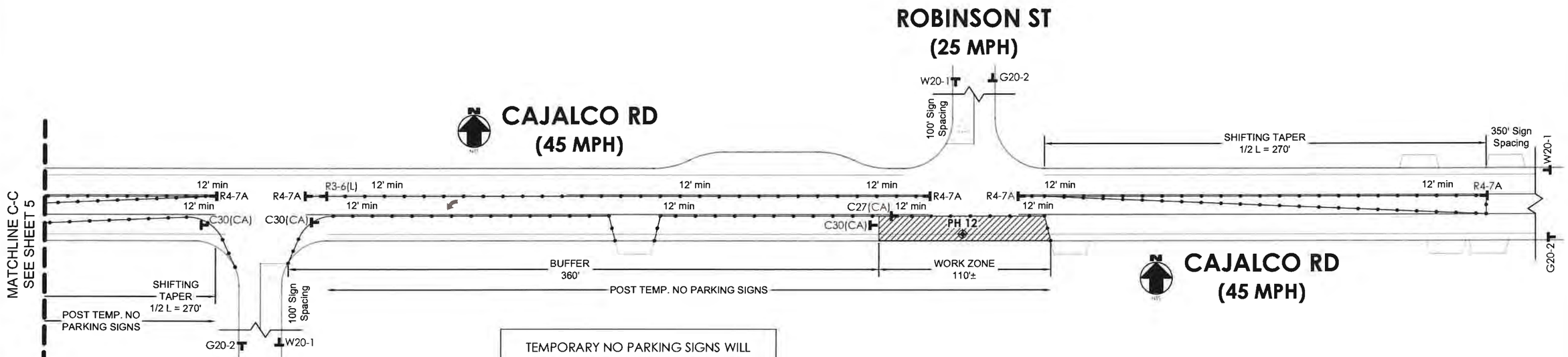
Pothole 12:



TEMPORARY NO PARKING SIGNS WILL BE PLACED 72 HOURS IN ADVANCE

NOTE: WORK WILL BE COORDINATED WITH BUSINESSES / PROPERTY OWNERS PRIOR TO STARTING

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NOTES:

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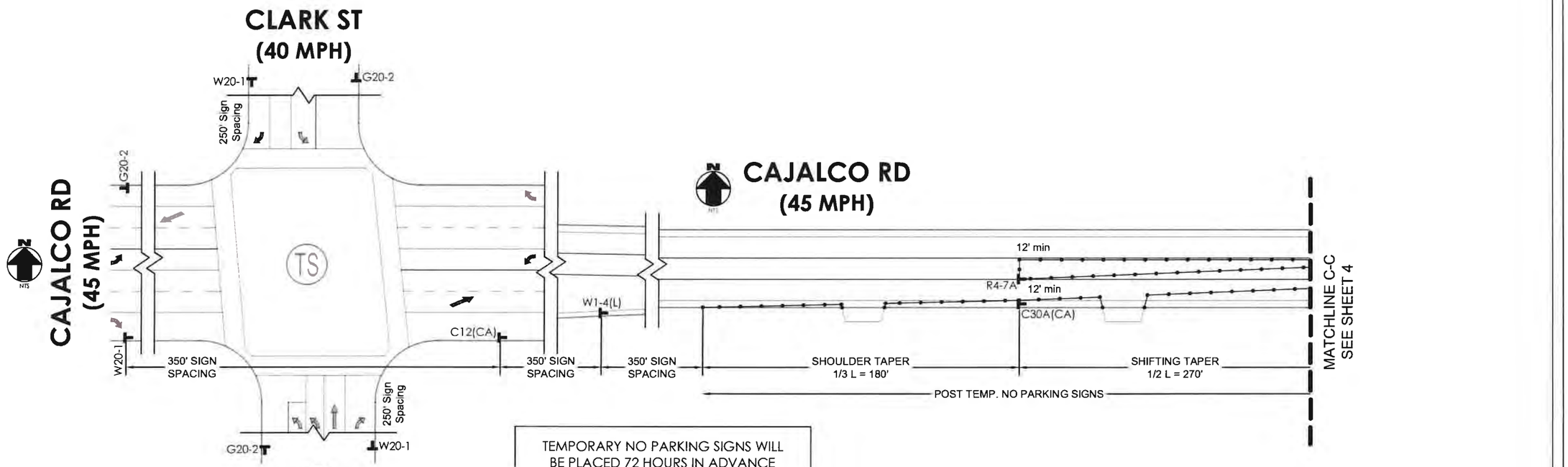
Pothole 12: (Con't)



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TYPE OF WORK: Potholing

DRAWN FOR: Riverside County

NOTES:

DATE: 4/28/2023

DESIGNED BY: Otman Mouden

SHEET 5 OF 5

May 20, 2023

PREPARED BY:

UTILITY SURVEYORS, INC.

AIRX Project #: 23-053 PS

Project Name: Good Hope Olive Area Water System Imps., Perris

Utility Locating and Potholing Area:
Main St, Sharp Rd, Club Dr and Eucalyptus Ave
Perris, CA

POTHOLING REPORT

785 East Mission Road Ste. 100 | San Marcos, CA 92069 | P.760.480.2347 | F.760.739.8034 | airxus.com

TABLE OF CONTENTS

1. Description of Pothole Procedures and Site-Specific Details
2. Pothole Project Map(s)
3. Pothole Location Map(s)
4. Pothole Tabulation Report
5. Pothole Data Sheet(s)
6. Permit(s)

Description of Pothole Procedures and Site Specific Details

DESCRIPTION OF POTHOLE PROCEDURES

AIRX Utility Surveyors performs a full range of specialized engineering services including Underground Utility Location and Vacuum Excavation (to verify depth and alignment of underground utilities).

Underground Utility Location employs sophisticated electronic locating devices to trace the route of an underground utility; then the route is marked on the surface with marking paint in paved areas, or with 60 penny nails and feathers in unpaved areas.

Vacuum excavation employs a vacuum truck in conjunction with high-pressure air or water to excavate material and expose an underground utility. An 8-inch diameter hole is first cored through the pavement so that the vacuum hose and high-pressure air or water hose can be inserted.

Utilities found during potholing are located on the surface by placing two reference points (typically 36" apart) on either side of the pothole along the centerline (or edge) of the utility, using paving nails or 60 penny nails as appropriate. Depth measurements (to the nearest ½ inch) are taken midway between the two reference points. Utility alignment, depth, and other data is marked with pink paint (on pavement), or on wood lath (unpaved areas).

SITE SPECIFIC DETAILS

AIRX was contracted by EMWD to perform utility locating and potholing services on Main St, Sharp Rd and Eucalyptus Ave in Perris, California. A total of 35 potholes were excavated to establish conflicts and connection points on a variety of utilities. The results of the data are contained in the attached spreadsheet and data sheets.

In preparation of these excavations, AIRX marked out the dig locations and called in for USA (Underground Service Alert). All traffic control plans and permits were drawn and applied for by AIRX and all traffic control was set up by AIRX.

All the excavations and discovery went without any incident. Any changes and adjustments are mentioned in the Pothole Tabulation Report and the Pothole Data Sheets. All the results were annotated on the ground and in this report. It is AIRX's recommendation that all pothole locations and the active mark out should be surveyed to aid in the adjustment of utilities on the final plan and profile.

At each pothole location, the utility alignment was marked with paint and feathers. AIRX used potable water acquired offsite for excavation and all water and material vacuumed was disposed of off-site. No water was allowed to flow into storm drains or natural drainages. The potholes were covered with clean backfill material and compacted to 95% density in 3" lifts. The pavement was patched with Utilibond. All field work was performed between May 9, 2023 and May 16, 2023.

Pothole Project Map(s)

AIRX
SUBSURFACE UTILITY LOCATING

Good Hope Olive Area Water System Imps., Perris

Pothole Project Map 1

23-053 PS

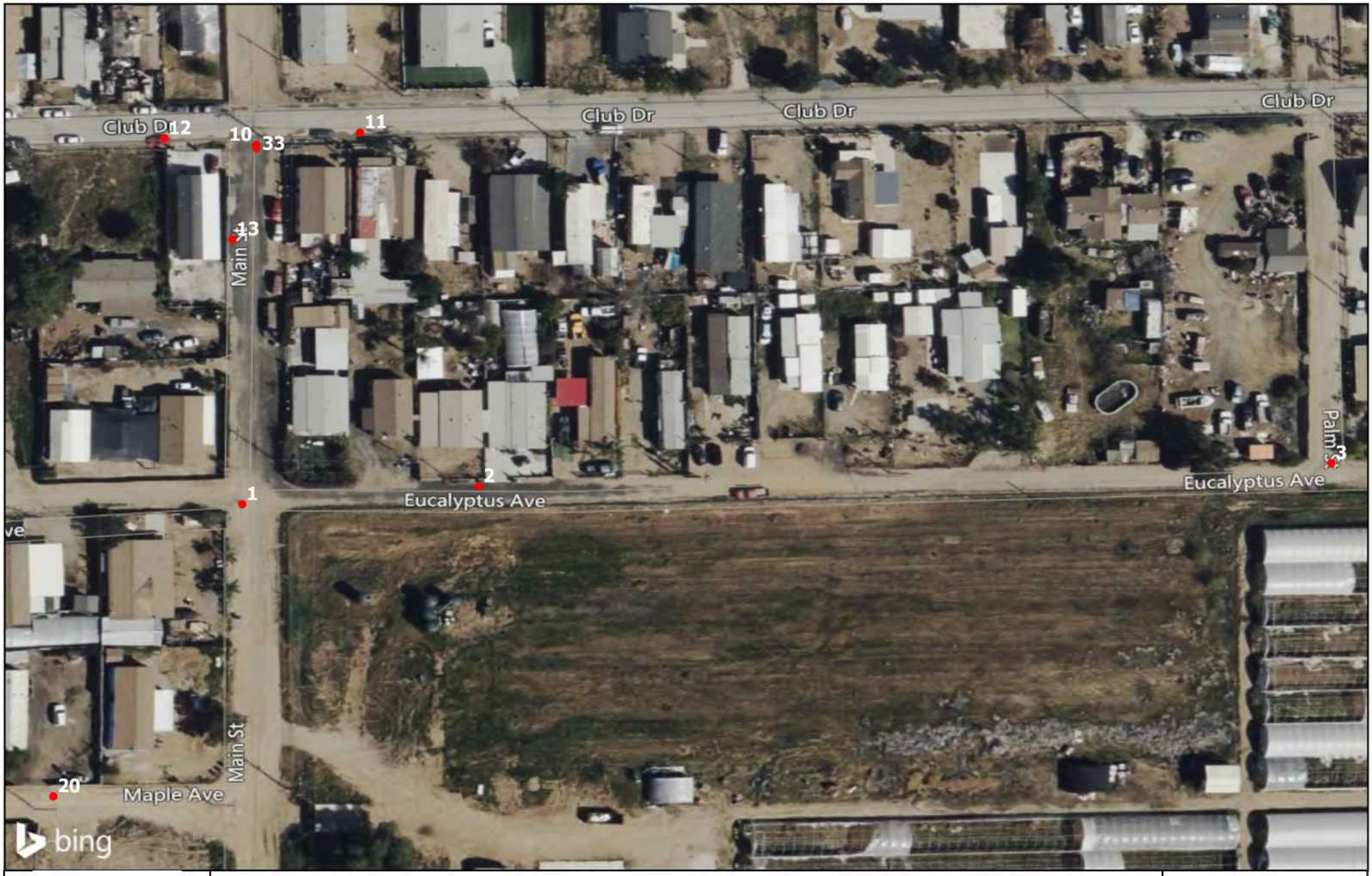
Coordinate System: NAD 1983 UTM Zone 11N

N

0 487.5 975

US Feet

Pothole Location Map(s)



SUBSURFACE UTILITY LOCATING

Good Hope Olive Area Water System Imps., Perris

Pothole Location Map 1

23-053 PS

Coordinate System: GCS WGS 1984

N

0 65 130

US Feet

SUBSURFACE UTILITY LOCATING

Good Hope Olive Area Water System Imps., Perris

Pothole Location Map 2

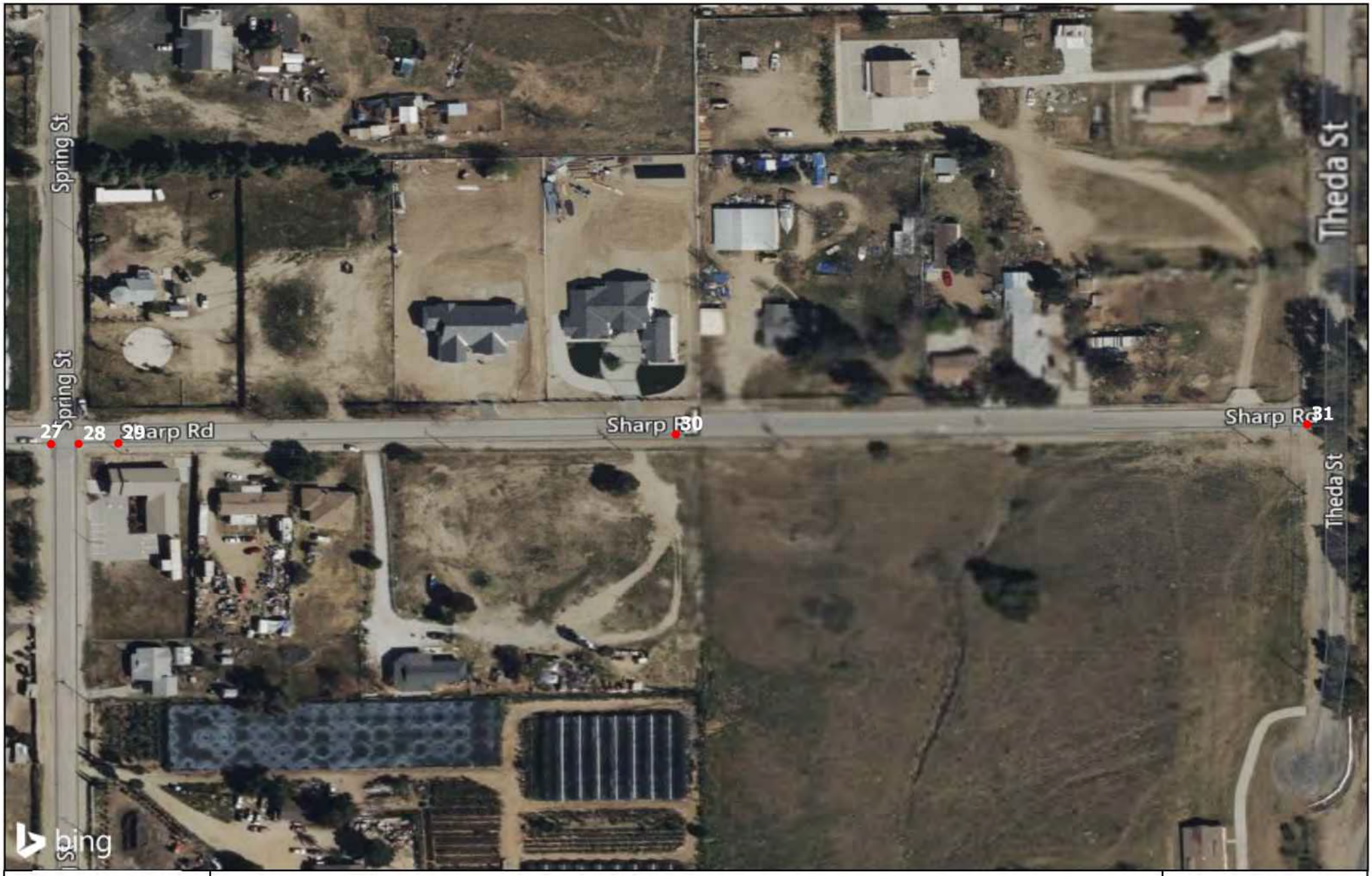
23-053 PS

Coordinate System: GCS WGS 1984

N

0 115 230

US Feet



AIRX
SUBSURFACE UTILITY LOCATING
Locating · Vacuum Excavation · CCTV · Traffic Control

Good Hope Olive Area Water System Imps., Perris

Pothole Location Map 3

23-053 PS

Coordinate System: GCS WGS 1984

N

0 115 230

US Feet

AIRX SUBSURFACE UTILITY LOCATING

Good Hope Olive Area Water System Imps., Perris

Pothole Location Map 4

23-053 PS

Coordinate System: GCS WGS 1984

N

0 60 120

US Feet

Pothole Tabulation Report

POTHOLE TABULATION REPORT: Good Hope Olive Area Water System Imps., Perris

Pothole Number	Date	Street	Pavement Thickness	Utility Type	Utility Size & Material	Soil Type	Depth-Ground to Top of Utility	Depth-Ground to Top of Package/ Encasement	Depth-Ground to Bottom of Package/ Encasement	Total Depth Excavated	Utility Orientation	Pothole Project Area Map #	Pothole Location Map #	Description & Location	Notes
1	05/09/2023	Intersection of Main St & Eucalyptus Ave	Asphalt - N/A Concrete - N/A Base - N/A Total - N/A	Gas	2.0″ Plastic	Clay, Slurry	40.0″ T/P	N/A	N/A	41.0″	N/S	1	1	Pothole 1 is located in the intersection of Main St & Eucalyptus Ave. Please refer to Location Map 1 for the approximate location of Pothole 1.	Tracer wire was present.
2	05/09/2023	Eucalyptus Ave	Asphalt - N/A Concrete - N/A Base - N/A Total - N/A	Gas	2.0″ Plastic	Subgrade	37.0″ T/P	N/A	N/A	45.0″	W/E	1	1	Pothole 2 is located north of Eucalyptus Ave. Please refer to Location Map 1 for the approximate location of Pothole 2.	
3	05/09/2023	Intersection of Eucalyptus Ave & Palm St	Asphalt - N/A Concrete - N/A Base - N/A Total - N/A	Gas	2.0″ Plastic	Subgrade	36.0″ T/P	N/A	N/A	40.0″	N&W	1	1	Pothole 3 is located in the intersection of Eucalyptus Ave & Palm St. Please refer to Location Map 1 for the approximate location of Pothole 3.	Tracer wire was present.
4	05/09/2023	Intersection of Eucalyptus Ave & Spring St	Asphalt - 4.0″ Concrete - N/A Base - 12.0″ Total - 16.0″	Water	6.0″ Steel	Subgrade	55.0″ T/P	N/A	N/A	69.0″	N/S	1	2	Pothole 4 is located in the intersection of Eucalyptus Ave & Spring St. Please refer to Location Map 2 for the approximate location of Pothole 4.	
5	05/09/2023	Intersection of Eucalyptus Ave & Spring St	Asphalt - N/A Concrete - N/A Base - N/A Total - N/A	Gas	2.0″ Plastic	Subgrade	53.0″ T/P	N/A	N/A	60.0″	N/S&E	1	2	Pothole 5 is located in the intersection of Eucalyptus Ave & Spring St. Please refer to Location Map 2 for the approximate location of Pothole 5.	Tracer wire was present.
6	05/09/2023	Eucalyptus Ave	Asphalt - N/A Concrete - N/A Base - N/A Total - N/A	Gas	2.0″ Plastic	Subgrade	33.0″ T/P	N/A	N/A	40.0″	W/E	1	2	Pothole 6 is located in the west-bound lane of Eucalyptus Ave. Please refer to Location Map 2 for the approximate location of Pothole 6.	Tracer wire was present.
7	05/09/2023	Eucalyptus Ave	Asphalt - N/A Concrete - N/A Base - N/A Total - N/A	Water	6.0″ Steel	Subgrade	25.0″ T/P	N/A	N/A	30.0″	W/E	1	2	Pothole 7 is located in the east-bound lane of Eucalyptus Ave. Please refer to Location Map 2 for the approximate location of Pothole 7.	
8	05/10/2023	Intersection of Theda St & Eucalyptus Ave	Asphalt - N/A Concrete - N/A Base - N/A Total - N/A	Telecom (Not Found)	N/A	Subgrade	N/A	N/A	N/A	60.0″	N/A	1	2	Pothole 8 is located in the intersection of Theda St & Eucalyptus Ave. Please refer to Location Map 2 for the approximate location of Pothole 8.	
9	05/10/2023	Intersection of Theda St & Eucalyptus Ave	Asphalt - 4.0″ Concrete - N/A Base - 3.0″ Total - 7.0″	Water	8.0″ Steel	Subgrade	39.0″ T/P	N/A	N/A	45.0″	N/S	1	2	Pothole 9 is located in the intersection of Theda St & Eucalyptus Ave. Please refer to Location Map 2 for the approximate location of Pothole 9.	
10	05/09/2023	intersection of Main St & Club Dr	Asphalt - N/A Concrete - N/A Base - N/A Total - N/A	Gas	2.0″ Plastic	Subgrade	35.0″ T/P	N/A	N/A	48.0″	N/S	1	1	Pothole 10 is located in the intersection of Main St & Club Dr. Please refer to Location Map 1 for the approximate location of Pothole 10.	Yellow caution tape was found in the pothole.
11	05/09/2023	Club Dr	Asphalt - 3.0″ Concrete - N/A Base - 6.0″ Total - 9.0″	Water	6.0″ Concrete	Subgrade	36.0″ T/P	N/A	N/A	36.0″	W/E	1	1	Pothole 11 is located in the east-bound lane of Club Dr. Please refer to Location Map 1 for the approximate location of Pothole 11.	
12	05/09/2023	Club Dr	Asphalt - 3.0″ Concrete - N/A Base - 6.0″ Total - 9.0″	Water	6.0″ Concrete	Subgrade	33.0″ T/P	N/A	N/A	33.0″	W/E	1	1	Pothole 12 is located in the east-bound lane of Club Dr. Please refer to Location Map 1 for the approximate location of Pothole 12.	
13	05/09/2023	Main St	Asphalt - N/A Concrete - N/A Base - N/A Total - N/A	Gas Gas	1.0″ Plastic 3.0″ Plastic	Subgrade	44.0″ T/P 41.0″ T/P	N/A N/A	N/A N/A	48.0″	W/E N/S	1	1	Pothole 13 is located in the Main St. Please refer to Location Map 1 for the approximate location of Pothole 13.	Tracer wire was present.
14	05/09/2023	Intersection of Pine St, Simpkins Rd, & Main St	Asphalt - N/A Concrete - N/A Base - N/A Total - N/A	Utility (Not Found)	N/A	Subgrade, Rocks	N/A	N/A	N/A	48.0″	N/A	1	4	Pothole 14 is located in the intersection of Pine St, Simpkins Rd, & Main St. Please refer to Location Map 4 for the approximate location of Pothole 14.	Excavated 4 feet long and 48 inches deep.
15	05/09/2023	Intersection of Cherry Ln & Main St	Asphalt - N/A Concrete - N/A Base - N/A Total - N/A	Telecom Gas	0.5″ Direct Bury 2.0″ Plastic	Subgrade	22.0″ T/P 39.0″ T/P	N/A N/A	N/A N/A	39.0″	N/S W/E	1	4	Pothole 15 is located in the intersection of Cherry Ln & Main St. Please refer to Location Map 4 for the approximate location of Pothole 15.	

POTHOLE TABULATION REPORT: Good Hope Olive Area Water System Imps., Perris

Pothole Number	Date	Street	Pavement Thickness	Utility Type	Utility Size & Material	Soil Type	Depth-Ground to Top of Utility	Depth-Ground to Top of Package/ Encasement	Depth-Ground to Bottom of Package/ Encasement	Total Depth Excavated	Utility Orientation	Pothole Project Area Map #	Pothole Location Map #	Description & Location	Notes
16	05/09/2023	Intersection of Main St & Maguglin Way	Asphalt - N/A Concrete - N/A Base - N/A Total - N/A	Gas	2.0″ Plastic	Subgrade	50.0″ T/P	N/A	N/A	60.0″	WNW/ESE	1	4	Pothole 16 is located in the intersection of Main St & Maguglin Way. Please refer to Location Map 4 for the approximate location of Pothole 16.	
17	05/10/2023	Main St	Asphalt - N/A Concrete - N/A Base - N/A Total - N/A	Gas	2.0″ Plastic	Subgrade	42.0″ T/P	N/A	N/A	48.0″	N/S	1	4	Pothole 17 is located in the Main St. Please refer to Location Map 4 for the approximate location of Pothole 17.	
18	05/10/2023	Intersection of Main St & Sharp Rd	Asphalt - N/A Concrete - N/A Base - N/A Total - N/A	Water	6.0″ Steel	Subgrade	38.0″ T/P	N/A	N/A	48.0″	N/S	1	4	Pothole 18 is located in the intersection of Main St & Sharp Rd. Please refer to Location Map 4 for the approximate location of Pothole 18.	
19	05/10/2023	Intersection of Main St & Sharp Rd	Asphalt - N/A Concrete - N/A Base - N/A Total - N/A	Water	6.0″ Steel	Subgrade	33.0″ T/P	N/A	N/A	48.0″	W/E	1	4	Pothole 19 is located in the intersection of Main St & Sharp Rd. Please refer to Location Map 4 for the approximate location of Pothole 19.	
20	05/09/2023	Maple Ave	Asphalt - N/A Concrete - N/A Base - N/A Total - N/A	Water Service	3.0″ PVC	Subgrade	18.0″ T/P	N/A	N/A	36.0″	W/E	1	1	Pothole 20 is located on Maple Ave. Please refer to Location Map 1 for the approximate location of Pothole 20.	Only be able to excavate 36.0 inches deep due to hard material on the ground.
21	05/10/2023	Intersection of Main St & Cherry Ln	Asphalt - N/A Concrete - N/A Base - N/A Total - N/A	Telecom (Not Found)	N/A	Subgrade	N/A	N/A	N/A	62.0″	N/A	1	4	Pothole 21 is located in the intersection of Main St & Cherry Ln. Please refer to Location Map 4 for the approximate location of Pothole 21.	
22	05/10/2023	Intersection of Main St & Maguglin Way	Asphalt - N/A Concrete - N/A Base - N/A Total - N/A	Fiber Optic, Telecom	2.0″ Plastic	Subgrade	37.0″ T/P	N/A	N/A	48.0″	N/S	1	4	Pothole 22 is located in the intersection of Main St & Maguglin Way. Please refer to Location Map 4 for the approximate location of Pothole 22.	
23	05/11/2023	Club Dr	Asphalt - 5.0″ Concrete - N/A Base - N/A Total - 5.0″	Water Water	6.0″ Steel 1.0″ Unknown	Subgrade	59.0″ T/P 57.0″ T/P	N/A N/A	N/A N/A	60.0″	WNW/ESE NNE/SSW	1	2	Pothole 23 is located in the west-bound lane of Club Dr. Please refer to Location Map 2 for the approximate location of Pothole 23.	
24	05/11/2023	Club Dr	Asphalt - 6.0″ Concrete - N/A Base - N/A Total - 6.0″	Gas	2.0″ Plastic	Subgrade	47.0″ T/P	N/A	N/A	50.0″	WNW/ESE	1	2	Pothole 24 is located in the west-bound lane of Club Dr. Please refer to Location Map 2 for the approximate location of Pothole 24.	Tracer wire was present.
25	05/11/2023	Club Dr	Asphalt - 5.0″ Concrete - N/A Base - N/A Total - 5.0″	Gas	2.0″ Plastic	Subgrade	41.0″ T/P	N/A	N/A	46.0″	W/E	1	2	Pothole 25 is located in the west-bound lane of Club Dr. Please refer to Location Map 2 for the approximate location of Pothole 25.	Tracer wire was present.
26	05/11/2023	Club Dr	Asphalt - 5.0″ Concrete - N/A Base - N/A Total - 5.0″	Water Gas Telecom	8.0″ Steel 1.0″ Plastic 1.0″ Plastic	Subgrade	53.0″ T/P 36.0″ T/P 49.0″ T/P	N/A N/A N/A	N/A N/A N/A	59.0″	WSW/ENE NNW/SSE NE/SW	1	2	Pothole 26 is located in the west-bound lane of Club Dr. Please refer to Location Map 2 for the approximate location of Pothole 26.	Tracer wire was present.
27	05/10/2023	Intersection of Sharp Rd & Spring St	Asphalt - 4.0″ Concrete - N/A Base - 3.0″ Total - 7.0″	Water	6.0″ Steel	Subgrade	34.0″ T/P	N/A	N/A	40.0″	N/S	1	3	Pothole 27 is located in the intersection of Sharp Rd & Spring St. Please refer to Location Map 3 for the approximate location of Pothole 27.	
28	05/10/2023	Intersection of Sharp Rd & Spring St	Asphalt - 4.0″ Concrete - N/A Base - 3.0″ Total - 7.0″	Gas	2.0″ Plastic	Subgrade	53.0″ T/P	N/A	N/A	62.0″	N/S	1	3	Pothole 28 is located in the intersection of Sharp Rd & Spring St. Please refer to Location Map 3 for the approximate location of Pothole 28.	
29	05/10/2023	Sharp Rd	Asphalt - 4.0″ Concrete - N/A Base - N/A Total - 4.0″	Clearance Hole	N/A	Subgrade	N/A	N/A	N/A	60.0″	N/A	1	3	Pothole 29 is located in the east-bound lane of Sharp Rd. Please refer to Location Map 3 for the approximate location of Pothole 29.	
30	05/10/2023	Sharp Rd	Asphalt - 8.0″ Concrete - N/A Base - N/A Total - 8.0″	Electric Telecom	3.0″ PVC 1.0″ PVC Package	Subgrade	34.0″ T/P N/A	N/A 16.0″ T/Pkg	N/A N/A	43.0″	N/S N/S	1	3	Pothole 30 is located in the east-bound lane of Sharp Rd. Please refer to Location Map 3 for the approximate location of Pothole 30.	

POTHOLE TABULATION REPORT: Good Hope Olive Area Water System Imps., Perris

Pothole Number	Date	Street	Pavement Thickness	Utility Type	Utility Size & Material	Soil Type	Depth-Ground to Top of Utility	Depth-Ground to Top of Package/ Encasement	Depth-Ground to Bottom of Package/ Encasement	Total Depth Excavated	Utility Orientation	Pothole Project Area Map #	Pothole Location Map #	Description & Location	Notes
31	05/11/2023	Intersection of Sharp Rd & Theda St	Asphalt - 5.0" Concrete - N/A Base - N/A Total - 5.0"	Water	8.0" Steel	Subgrade	40.0" T/P	N/A	N/A	60.0"	N/S	1	3	Pothole 31 is located in the intersection of Sharp Rd & Theda St. Please refer to Location Map 3 for the approximate location of Pothole 31.	
32	05/11/2023	Eucalyptus Ave	Asphalt - N/A Concrete - N/A Base - N/A Total - N/A	Gas	2.0" Plastic	Subgrade	30.0" T/P	N/A	N/A	33.0"	W/E	1	2	Pothole 32 is located on Eucalyptus Ave. Please refer to Location Map 2 for the approximate location of Pothole 32.	Tracer wire was present.
33	05/10/2023	intersection of Main St & Club Dr	Asphalt - N/A Concrete - N/A Base - N/A Total - N/A	Fiber Optic (Not Found)	N/A	Subgrade	N/A	N/A	N/A	57.0"	N/A	1	1	Pothole 33 is located in the intersection of Main St & Club Dr. Please refer to Location Map 1 for the approximate location of Pothole 33.	
34	05/10/2023	Intersection of Main St & Sharp Rd	Asphalt - N/A Concrete - N/A Base - N/A Total - N/A	Fiber Optic (Not Found)	N/A	Subgrade	N/A	N/A	N/A	60.0"	N/A	1	4	Pothole 34 is located in the intersection of Main St & Sharp Rd. Please refer to Location Map 4 for the approximate location of Pothole 34.	
35	05/10/2023	Intersection of Main St & Cherry Ln	Asphalt - N/A Concrete - N/A Base - N/A Total - N/A	Electric (Not Found)	N/A	Subgrade, Rocks	N/A	N/A	N/A	60.0"	N/A	1	4	Pothole 35 is located in the intersection of Main St & Cherry Ln. Please refer to Location Map 4 for the approximate location of Pothole 35.	

Pothole Data Sheet(s)

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-053 PS
TEST HOLE NO:	1
DATE EXCAVATED:	05/09/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Gas	2.0″ Plastic	40.0″ T/P	N/A	N/A	N/S
2						
3						
4						

TOTAL DEPTH EXCAVATED: **41.0**”

PAVEMENT THICKNESS: **ASPHALT: N/A** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Class II Base**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**Yes**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Clay, Slurry**

COMMENT:

AREA SHOT

Pothole 1 is located in the intersection of Main St & Eucalyptus Ave. Please refer to Location Map 1 for the approximate location of Pothole 1. The photo above was taken in front of Pothole 1 facing east.

DOWNHOLE VIEW

A downhole view of the 2.0 inch wide Plastic Gas utility found in Pothole 1, at the depth of 40.0 inches T/P. Utility runs in a N/S direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-053 PS
TEST HOLE NO:	2
DATE EXCAVATED:	05/09/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Gas	2.0″ Plastic	37.0″ T/P	N/A	N/A	W/E
2						
3						
4						

TOTAL DEPTH EXCAVATED: **45.0**”

PAVEMENT THICKNESS: **ASPHALT: N/A** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Class II Base**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT

Pothole 2 is located north of Eucalyptus Ave. Please refer to Location Map 1 for the approximate location of Pothole 2. The photo above was taken in front of Pothole 2 facing north.

DOWNHOLE VIEW

A downhole view of the 2.0 inch wide Plastic Gas utility found in Pothole 2, at the depth of 37.0 inches T/P. Utility runs in a W/E direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	223-053 PS
TEST HOLE NO:	3
DATE EXCAVATED:	05/09/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Gas	2.0″ Plastic	36.0″ T/P	N/A	N/A	N&W
2						
3						
4						

TOTAL DEPTH EXCAVATED: **40.0**”

PAVEMENT THICKNESS: **ASPHALT: N/A** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Class II Base**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**Yes**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT

Pothole 3 is located in the intersection of Eucalyptus Ave & Palm St. Please refer to Location Map 1 for the approximate location of Pothole 3. The photo above was taken in front of Pothole 3 facing east.

DOWNHOLE VIEW

A downhole view of the 2.0 inch wide Plastic Gas utility found in Pothole 3, at the depth of 36.0 inches T/P. Utility runs in a N&W direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-053 PS
TEST HOLE NO:	4
DATE EXCAVATED:	05/09/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Water	6.0″ Steel	55.0″ T/P	N/A	N/A	N/S
2						
3						
4						

TOTAL DEPTH EXCAVATED: **69.0**″

PAVEMENT THICKNESS: **ASPHALT: 4.0″** **CONCRETE: N/A** **BASE: 12.0″**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Utilibond**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT

Pothole 4 is located in the intersection of Eucalyptus Ave & Spring St. Please refer to Location Map 2 for the approximate location of Pothole 4. The photo above was taken in front of Pothole 4 facing south.

DOWNHOLE VIEW

A downhole view of the 6.0 inch wide Steel Water utility found in Pothole 4, at the depth of 55.0 inches T/P. Utility runs in a N/S direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-053 PS
TEST HOLE NO:	5
DATE EXCAVATED:	05/09/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Gas T-connector	2.0″ Plastic	53.0″ T/P	N/A	N/A	N/S&E
2						
3						
4						

TOTAL DEPTH EXCAVATED: **60.0**”

PAVEMENT THICKNESS: **ASPHALT: N/A** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Class II Base**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**Yes**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT

Pothole 5 is located in the intersection of Eucalyptus Ave & Spring St. Please refer to Location Map 2 for the approximate location of Pothole 5. The photo above was taken in front of Pothole 5 facing south.

DOWNHOLE VIEW

A downhole view of the 2.0 inch wide Plastic Gas T-connector utility found in Pothole 5, at the depth of 53.0 inches T/P. Utility runs in a N/S&E direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-053 PS
TEST HOLE NO:	6
DATE EXCAVATED:	05/09/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Gas	2.0″ Plastic	33.0″ T/P	N/A	N/A	W/E
2						
3						
4						

TOTAL DEPTH EXCAVATED: **40.0**”

PAVEMENT THICKNESS: **ASPHALT: N/A** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

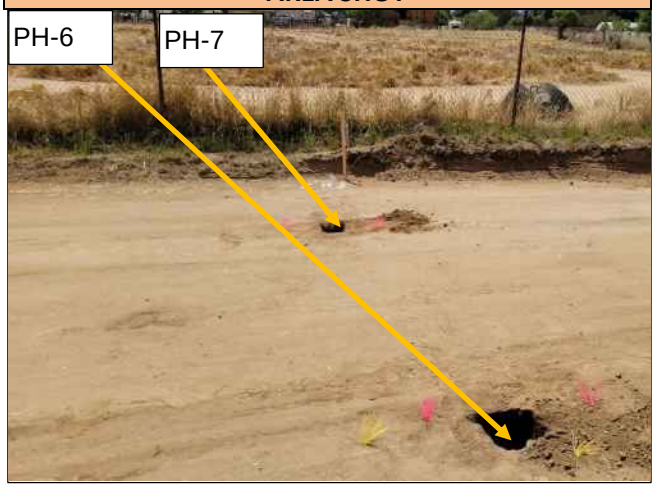
IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Class II Base**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**Yes**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT



Pothole 6 is located in the west-bound lane of Eucalyptus Ave. Please refer to Location Map 2 for the approximate location of Pothole 6. The photo above was taken in front of Pothole 6 and Pothole 7 facing south.

DOWNHOLE VIEW

A downhole view of the 2.0 inch wide Plastic Gas utility found in Pothole 6, at the depth of 33.0 inches T/P. Utility runs in a W/E direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-053 PS
TEST HOLE NO:	7
DATE EXCAVATED:	05/09/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Water	6.0″ Steel	25.0″ T/P	N/A	N/A	W/E
2						
3						
4						

TOTAL DEPTH EXCAVATED: **30.0**”

PAVEMENT THICKNESS: **ASPHALT: N/A** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

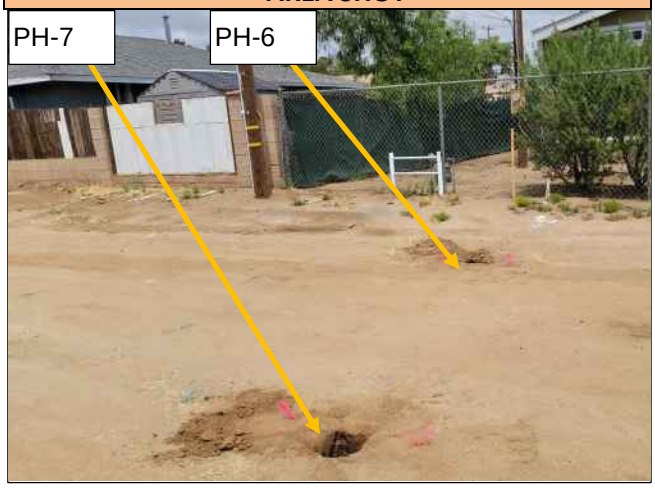
IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Class II Base**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT



Pothole 7 is located in the east-bound lane of Eucalyptus Ave. Please refer to Location Map 2 for the approximate location of Pothole 7. The photo above was taken in front of Pothole 7 and Pothole 6 facing NNW.

DOWNHOLE VIEW

A downhole view of the 6.0 inch wide Steel Water utility found in Pothole 7, at the depth of 25.0 inches T/P. Utility runs in a W/E direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-053 PS
TEST HOLE NO:	8
DATE EXCAVATED:	05/10/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Telecom (Not Found)	N/A	N/A	N/A	N/A	N/A
2						
3						
4						

TOTAL DEPTH EXCAVATED: **60.0**”

PAVEMENT THICKNESS: **ASPHALT: N/A** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

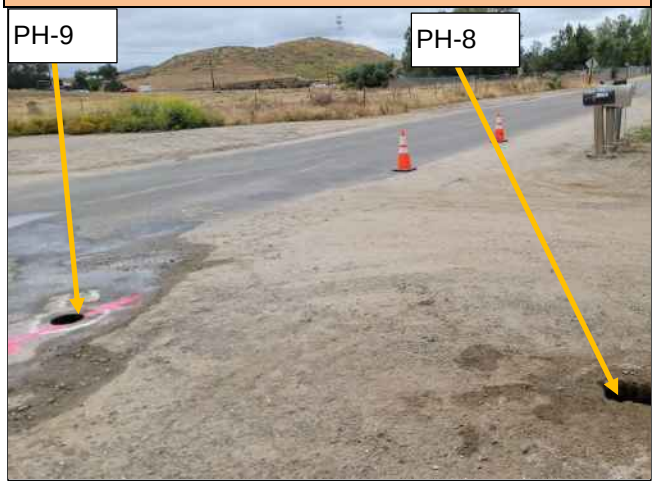
IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Class II Base**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**No**	PIPE COVER MATERIAL:	**N/A**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT



Pothole 8 is located in the intersection of Theda St & Eucalyptus Ave. Please refer to Location Map 2 for the approximate location of Pothole 8. The photo above was taken in front of Pothole 8 and Pothole 9 facing souths.

DOWNHOLE VIEW

A downhole view of the excavation to 60.0 inches deep. Utilities were not found in the Pothole.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-053 PS
TEST HOLE NO:	9
DATE EXCAVATED:	05/10/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Water	8.0″ Steel	39.0″ T/P	N/A	N/A	N/S
2						
3						
4						

TOTAL DEPTH EXCAVATED: **45.0**”

PAVEMENT THICKNESS: **ASPHALT: 4.0″** **CONCRETE: N/A** **BASE: 3.0″**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Utilibond**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT

Pothole 9 is located in the intersection of Theda St & Eucalyptus Ave. Please refer to Location Map 2 for the approximate location of Pothole 9. The photo above was taken in front of Pothole 9 facing south.

DOWNHOLE VIEW

A downhole view of the 8.0 inch wide Steel Water utility found in Pothole 9, at the depth of 39.0 inches T/P. Utility runs in a N/S direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-053 PS
TEST HOLE NO:	10
DATE EXCAVATED:	05/09/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Gas	2.0″ Plastic	35.0″ T/P	N/A	N/A	N/S
2						
3						
4						

TOTAL DEPTH EXCAVATED: **48.0**”

PAVEMENT THICKNESS: **ASPHALT: N/A** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Class II Base**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Sand**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:
Yellow caution tape was found in the pothole.

AREA SHOT

Pothole 10 is located in the intersection of Main St & Club Dr. Please refer to Location Map 1 for the approximate location of Pothole 10. The photo above was taken in front of Pothole 10 facing north.

DOWNHOLE VIEW

A downhole view of the 2.0 inch wide Plastic Gas utility found in Pothole 10, at the depth of 35.0 inches T/P. Utility runs in a N/S direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-053 PS
TEST HOLE NO:	11
DATE EXCAVATED:	05/09/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Water	6.0″ Concrete	36.0″ T/P	N/A	N/A	W/E
2						
3						
4						

TOTAL DEPTH EXCAVATED: **36.0**”

PAVEMENT THICKNESS: **ASPHALT: 3.0″** **CONCRETE: N/A** **BASE: 6.0″**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Utilibond**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Sand**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT

Pothole 11 is located in the east-bound lane of Club Dr. Please refer to Location Map 1 for the approximate location of Pothole 11. The photo above was taken in front of Pothole 11 facing south.

DOWNHOLE VIEW

A downhole view of the 6.0 inch wide Concrete Water utility found in Pothole 11, at the depth of 36.0 inches T/P. Utility runs in a W/E direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-053 PS
TEST HOLE NO:	12
DATE EXCAVATED:	05/09/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Water	6.0″ Concrete	33.0″ T/P	N/A	N/A	W/E
2						
3						
4						

TOTAL DEPTH EXCAVATED: **33.0**”

PAVEMENT THICKNESS: **ASPHALT: 3.0″** **CONCRETE: N/A** **BASE: 6.0″**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Utilibond**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Sand**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT

Pothole 12 is located in the east-bound lane of Club Dr. Please refer to Location Map 1 for the approximate location of Pothole 12. The photo above was taken in front of Pothole 12 facing east.

DOWNHOLE VIEW

A downhole view of the 6.0 inch wide Concrete Water utility found in Pothole 12, at the depth of 33.0 inches T/P. Utility runs in a W/E direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-053 PS
TEST HOLE NO:	13
DATE EXCAVATED:	05/09/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Gas	1.0″ Plastic	44.0″ T/P	N/A	N/A	W/E
2	Gas	3.0″ Plastic	41.0″ T/P	N/A	N/A	N/S
3						
4						

TOTAL DEPTH EXCAVATED: **48.0**”

PAVEMENT THICKNESS: **ASPHALT: N/A** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Class II Base**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**Yes**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Sand**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT

Pothole 13 is located in the Main St. Please refer to Location Map 1 for the approximate location of Pothole 13. The photo above was taken in front of Pothole 13 facing north.

DOWNHOLE VIEW

A downhole view of the utilities found in Pothole 13 and their orientation at the pothole location: 1.0 inch Plastic Gas utility at the depth of 44.0 inches T/P and runs in a W/E direction; and 3.0 inch Plastic Gas utility at the depth of 41.0 inches T/P and runs in a N/S direction. Utilities were found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-053 PS
TEST HOLE NO:	14
DATE EXCAVATED:	05/09/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Utility (Not Found)	N/A	N/A	N/A	N/A	N/A
2						
3						
4						

TOTAL DEPTH EXCAVATED: **48.0**”

PAVEMENT THICKNESS: **ASPHALT: N/A** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Class II Base**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**No**	PIPE COVER MATERIAL:	**N/A**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade, Rocks**

COMMENT:
Excavated 4 feet long and 48 inches deep.

AREA SHOT

Pothole 14 is located in the intersection of Pine St, Simpkins Rd, & Main St. Please refer to Location Map 4 for the approximate location of Pothole 14. The photo above was taken in front of Pothole 14 facing north.

DOWNHOLE VIEW

A downhole view of the excavation to 48.0 inches deep. Utilities were not found in the Pothole.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-053 PS
TEST HOLE NO:	15
DATE EXCAVATED:	05/09/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Telecom	0.50″ Direct Bury	22.0″ T/P	N/A	N/A	N/S
2	Gas	2.0″ Plastic	39.0″ T/P	N/A	N/A	W/E
3						
4						

TOTAL DEPTH EXCAVATED: **39.0**”

PAVEMENT THICKNESS: **ASPHALT: N/A** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Class II Base**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT

Pothole 15 is located in the intersection of Cherry Ln & Main St. Please refer to Location Map 4 for the approximate location of Pothole 15. The photo above was taken in front of Pothole 15 facing east.

DOWNHOLE VIEW

A downhole view of the utilities found in Pothole 15 and their orientation at the pothole location: 0.50 inch Direct Bury Telecom utility at the depth of 22.0 inches T/P and runs in a N/S direction; and 2.0 inch Plastic Gas utility at the depth of 39.0 inches T/P and runs in a W/E direction. Utilities were found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-053 PS
TEST HOLE NO:	16
DATE EXCAVATED:	05/09/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Gas	2.0″ Plastic	50.0″ T/P	N/A	N/A	WNW/ESE
2						
3						
4						

TOTAL DEPTH EXCAVATED: **60.0**”

PAVEMENT THICKNESS: **ASPHALT: N/A** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

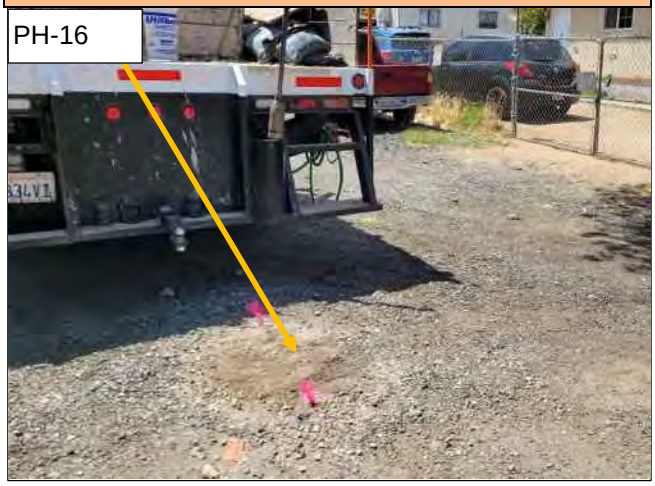
IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Class II Base**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT



Pothole 16 is located in the intersection of Main St & Maguglin Way. Please refer to Location Map 4 for the approximate location of Pothole 16. The photo above was taken in front of Pothole 16 facing NW.

DOWNHOLE VIEW

A downhole view of the 2.0 inch wide Plastic Gas utility found in Pothole 16, at the depth of 50.0 inches T/P. Utility runs in a WNW/ESE direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-053 PS
TEST HOLE NO:	17
DATE EXCAVATED:	05/10/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Gas	2.0″ Plastic	42.0″ T/P	N/A	N/A	N/S
2						
3						
4						

TOTAL DEPTH EXCAVATED: **48.0**”

PAVEMENT THICKNESS: **ASPHALT: N/A** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Class II Base**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Sand**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT

Pothole 17 is located in the Main St. Please refer to Location Map 4 for the approximate location of Pothole 17. The photo above was taken in front of Pothole 17 facing north/east/south/west.

DOWNHOLE VIEW

A downhole view of the 2.0 inch wide Plastic Gas utility found in Pothole 17, at the depth of 42.0 inches T/P. Utility runs in a N/S direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-053 PS
TEST HOLE NO:	18
DATE EXCAVATED:	05/10/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Water	6.0″ Steel	38.0″ T/P	N/A	N/A	N/S
2						
3						
4						

TOTAL DEPTH EXCAVATED: **48.0**”

PAVEMENT THICKNESS: **ASPHALT: N/A** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Class II Base**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Sand**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT

Pothole 18 is located in the intersection of Main St & Sharp Rd. Please refer to Location Map 4 for the approximate location of Pothole 18. The photo above was taken in front of Pothole 18 facing north.

DOWNHOLE VIEW

A downhole view of the 6.0 inch wide Steel Water utility found in Pothole 18, at the depth of 38.0 inches T/P. Utility runs in a N/S direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-053 PS
TEST HOLE NO:	19
DATE EXCAVATED:	05/10/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Water	6.0″ Steel	33.0″ T/P	N/A	N/A	W/E
2						
3						
4						

TOTAL DEPTH EXCAVATED: **48.0**”

PAVEMENT THICKNESS: **ASPHALT: N/A** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

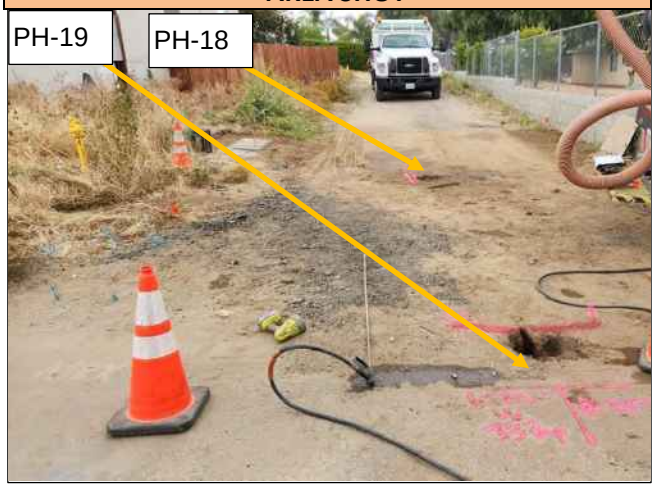
IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Class II Base**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**No**	PIPE COVER MATERIAL:	**Sand**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT



Pothole 19 is located in the intersection of Main St & Sharp Rd. Please refer to Location Map 4 for the approximate location of Pothole 19. The photo above was taken in front of Pothole 19 and Pothole 18 facing north.

DOWNHOLE VIEW

A downhole view of the 6.0 inch wide Steel Water utility found in Pothole 19, at the depth of 33.0 inches T/P. Utility runs in a W/E direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-053 PS
TEST HOLE NO:	20
DATE EXCAVATED:	05/09/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Water Service	3.0″ PVC	18.0″ T/P	N/A	N/A	W/E
2						
3						
4						

TOTAL DEPTH EXCAVATED: **36.0**”

PAVEMENT THICKNESS: **ASPHALT: N/A** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Class II Base**

TARGET UTILITY MARKED BY USA:	**No**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:
Only be able to excavate 36.0 inches deep due to hard material on the ground.

AREA SHOT

Pothole 20 is located on Maple Ave. Please refer to Location Map 1 for the approximate location of Pothole 20. The photo above was taken in front of Pothole 20 facing east.

DOWNHOLE VIEW

A downhole view of the 3.0 inch wide PVC Water Service utility found in Pothole 20, at the depth of 18.0 inches T/P. Utility runs in a W/E direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-053 PS
TEST HOLE NO:	21
DATE EXCAVATED:	05/10/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Telecom (Not Found)	N/A	N/A	N/A	N/A	N/A
2						
3						
4						

TOTAL DEPTH EXCAVATED: **62.0**”

PAVEMENT THICKNESS: **ASPHALT: N/A** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

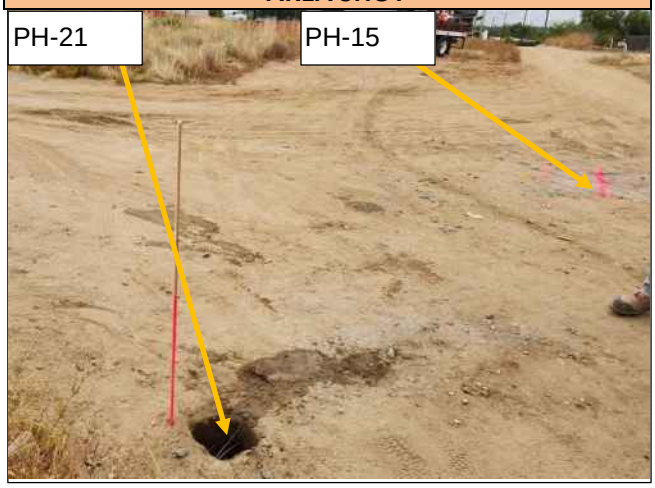
IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Class II Base**

TARGET UTILITY MARKED BY USA:	**No**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**N/A**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT



Pothole 21 is located in the intersection of Cherry Ln and Main St. Please refer to Location Map 4 for the approximate location of Pothole 21. The photo above was taken in front of Pothole 21 and Pothole 15 facing north.

DOWNHOLE VIEW

A downhole view of the excavation to 62.0 inches deep. Utilities were not found in the Pothole.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-053 PS
TEST HOLE NO:	22
DATE EXCAVATED:	05/10/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Fiber Optic/Telecom	2.0″ Plastic	37.0″ T/P	N/A	N/A	N/S
2						
3						
4						

TOTAL DEPTH EXCAVATED: **48.0**”

PAVEMENT THICKNESS: **ASPHALT: N/A** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

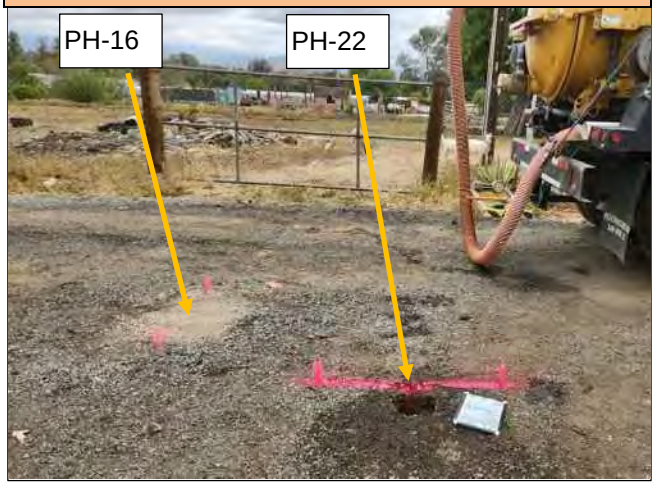
IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Class II Base**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT



Pothole 22 is located in the intersection of Main St & Maguglin Way. Please refer to Location Map 4 for the approximate location of Pothole 22. The photo above was taken in front of Pothole 22 and Pothole 16 facing east.

DOWNHOLE VIEW

A downhole view of the 2.0 inch wide Plastic Fiber Optic, Telecom utility found in Pothole 22, at the depth of 37.0 inches T/P. Utility runs in a N/S direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-053 PS
TEST HOLE NO:	23
DATE EXCAVATED:	05/11/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Water	6.0″ Steel	59.0″ T/P	N/A	N/A	WNW/ESE
2	Water	1.0″ Unknown	57.0″ T/P	N/A	N/A	NNE/SSW
3						
4						

TOTAL DEPTH EXCAVATED: **60.0**″

PAVEMENT THICKNESS: **ASPHALT: 5.0″** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Utilibond**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT

Pothole 23 is located in the west-bound lane of Club Dr. Please refer to Location Map 2 for the approximate location of Pothole 23. The photo above was taken in front of Pothole 23 facing north.

DOWNHOLE VIEW

A downhole view of the utilities found in Pothole 23 and their orientation at the pothole location: 6.0 inch Steel Water utility at the depth of 59.0 inches T/P and runs in a WNW/ESE direction; and 1.0 inch Unknown Water utility at the depth of 57.0 inches T/P and runs in a NNE/SSW direction. Utilities were found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-053 PS
TEST HOLE NO:	24
DATE EXCAVATED:	05/11/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Gas	2.0″ Plastic	47.0″ T/P	N/A	N/A	WNW/ESE
2						
3						
4						

TOTAL DEPTH EXCAVATED: **50.0**”

PAVEMENT THICKNESS: **ASPHALT: 6.0″** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

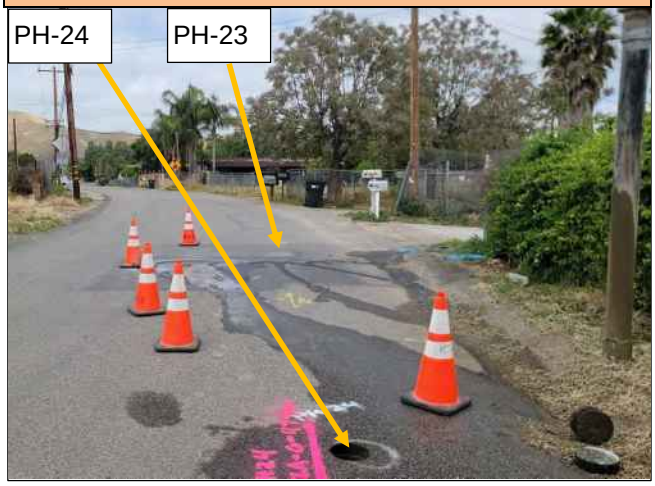
IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Utilibond**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**Yes**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT



Pothole 24 is located in the west-bound lane of Club Dr. Please refer to Location Map 2 for the approximate location of Pothole 24. The photo above was taken in front of Pothole 24 and Pothole 23 facing WNW.

DOWNHOLE VIEW

A downhole view of the 2.0 inch wide Plastic Gas utility found in Pothole 24, at the depth of 47.0 inches T/P. Utility runs in a WNW/ESE direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-053 PS
TEST HOLE NO:	25
DATE EXCAVATED:	05/11/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Gas	2.0″ Plastic	41.0″ T/P	N/A	N/A	W/E
2						
3						
4						

TOTAL DEPTH EXCAVATED: **46.0**”

PAVEMENT THICKNESS: **ASPHALT: 5.0″** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Utilibond**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**Yes**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT

Pothole 25 is located in the west-bound lane of Club Dr. Please refer to Location Map 2 for the approximate location of Pothole 25. The photo above was taken in front of Pothole 25 facing south.

DOWNHOLE VIEW

A downhole view of the 2.0 inch wide Plastic Gas utility found in Pothole 25, at the depth of 41.0 inches T/P. Utility runs in a W/E direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-053 PS
TEST HOLE NO:	26
DATE EXCAVATED:	05/11/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Water	8.0″ Steel	53.0″ T/P	N/A	N/A	WSW/ENE
2	Gas	1.0″ Plastic	36.0″ T/P	N/A	N/A	NNW/SSE
3	Telecom	1.0″ Plastic	49.0″ T/P	N/A	N/A	NE/SW
4						

TOTAL DEPTH EXCAVATED: **59.0**”

PAVEMENT THICKNESS: **ASPHALT: 5.0″** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Utilibond**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**Yes**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT

Pothole 26 is located in the west-bound lane of Club Dr. Please refer to Location Map 2 for the approximate location of Pothole 26. The photo above was taken in front of Pothole 26 facing NNE.

DOWNHOLE VIEW

A downhole view of the utilities found in Pothole 26 and their orientation at the pothole location: 8.0 inch Steel Water utility at the depth of 53.0 inches T/P and runs in a WSW/ENE direction; 1.0 inch Plastic Gas utility at the depth of 36.0 inches T/P and runs in a NNW/SSE direction; and 1.0 inch Plastic Telecom utility at the depth of 49.0 inches T/P and runs in a NE/SW direction. Utilities were found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-053 PS
TEST HOLE NO:	27
DATE EXCAVATED:	05/10/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Water	6.0″ Steel	34.0″ T/P	N/A	N/A	N/S
2						
3						
4						

TOTAL DEPTH EXCAVATED: **40.0**”

PAVEMENT THICKNESS: **ASPHALT: 4.0″** **CONCRETE: N/A** **BASE: 3.0″**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Utilibond**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT

Pothole 27 is located in the intersection of Sharp Rd & Spring St. Please refer to Location Map 3 for the approximate location of Pothole 27. The photo above was taken in front of Pothole 27 facing south.

DOWNHOLE VIEW

A downhole view of the 6.0 inch wide Steel Water utility found in Pothole 27, at the depth of 34.0 inches T/P. Utility runs in a N/S direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-053 PS
TEST HOLE NO:	28
DATE EXCAVATED:	05/10/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Gas	2.0″ Plastic	53.0″ T/P	N/A	N/A	N/S
2						
3						
4						

TOTAL DEPTH EXCAVATED: **62.0**”

PAVEMENT THICKNESS: **ASPHALT: 4.0″** **CONCRETE: N/A** **BASE: 3.0″**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Utilibond**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT

Pothole 28 is located in the intersection of Sharp Rd & Spring St. Please refer to Location Map 3 for the approximate location of Pothole 28. The photo above was taken in front of Pothole 28 and Pothole 27 facing west.

DOWNHOLE VIEW

A downhole view of the 2.0 inch wide Plastic Gas utility found in Pothole 28, at the depth of 53.0 inches T/P. Utility runs in a N/S direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-053 PS
TEST HOLE NO:	29
DATE EXCAVATED:	05/10/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Clearance Hole	N/A	N/A	N/A	N/A	N/A
2						
3						
4						

TOTAL DEPTH EXCAVATED: **60.0**”

PAVEMENT THICKNESS: **ASPHALT: 4.0″** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

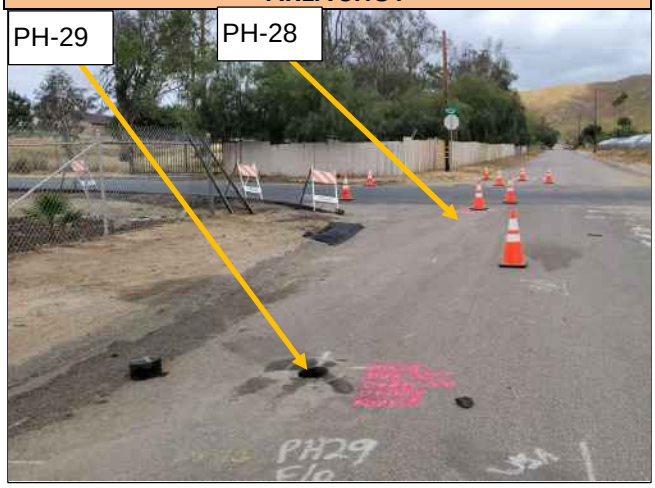
IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Utilibond**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**No**	PIPE COVER MATERIAL:	**N/A**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT



Pothole 29 is located in the east-bound lane of Sharp Rd. Please refer to Location Map 3 for the approximate location of Pothole 29. The photo above was taken in front of Pothole 29 and Pothole 28 facing west.

DOWNHOLE VIEW

A downhole view of the excavation to 60.0 inches deep. Utilities were not found in the Pothole.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-053 PS
TEST HOLE NO:	30
DATE EXCAVATED:	05/10/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Electric	3.0″ PVC	34.0″ T/P	N/A	N/A	N/S
2	Telecom	1.0″ PVC Package	N/A	16.0″ T/Pkg	N/A	N/S
3						
4						

TOTAL DEPTH EXCAVATED: **43.0**″

PAVEMENT THICKNESS: **ASPHALT: 8.0″** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Utilibond**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT

Pothole 30 is located in the east-bound lane of Sharp Rd. Please refer to Location Map 3 for the approximate location of Pothole 30. The photo above was taken in front of Pothole 30 facing south.

DOWNHOLE VIEW

A downhole view of the utilities found in Pothole 30 and their orientation at the pothole location: 3.0 inch PVC Electric utility at the depth of 34.0 inches T/P and runs in a N/S direction; 1.0 inch wide PVC Package housing Telecom utilities found at the depth of 16.0 inches T/Pkg running in a N/S direction. Utilities were found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	223-053 PS
TEST HOLE NO:	31
DATE EXCAVATED:	05/11/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Water	8.0″ Steel	40.0″ T/P	N/A	N/A	N/S
2						
3						
4						

TOTAL DEPTH EXCAVATED: **60.0**”

PAVEMENT THICKNESS: **ASPHALT: 5.0″** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Utilibond**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT

Pothole 31 is located in the intersection of Sharp Rd & Theda St. Please refer to Location Map 3 for the approximate location of Pothole 31. The photo above was taken in front of Pothole 31 facing west.

DOWNHOLE VIEW

A downhole view of the 8.0 inch wide Steel Water utility found in Pothole 31, at the depth of 40.0 inches T/P. Utility runs in a N/S direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-053 PS
TEST HOLE NO:	32
DATE EXCAVATED:	05/11/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Gas	2.0″ Plastic	30.0″ T/P	N/A	N/A	W/E
2						
3						
4						

TOTAL DEPTH EXCAVATED: **33.0**”

PAVEMENT THICKNESS: **ASPHALT: N/A** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Class II Base**

TARGET UTILITY MARKED BY USA:	**No**	TRACER WIRE FOUND:	**Yes**
MARKOUT LOCATION CORRECT:	**Yes**	PIPE COVER MATERIAL:	**Subgrade**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT

Pothole 32 is located on Eucalyptus Ave. Please refer to Location Map 2 for the approximate location of Pothole 32. The photo above was taken in front of Pothole 32 facing north/east/south/west.

DOWNHOLE VIEW

A downhole view of the 2.0 inch wide Plastic Gas utility found in Pothole 32, at the depth of 30.0 inches T/P. Utility runs in a W/E direction at the Pothole location and was found directly on markout.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-053 PS
TEST HOLE NO:	33
DATE EXCAVATED:	05/10/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Fiber Optic (Not Found)	N/A	N/A	N/A	N/A	N/A
2						
3						
4						

TOTAL DEPTH EXCAVATED: **57.0**”

PAVEMENT THICKNESS: **ASPHALT: N/A** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Class II Base**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**No**	PIPE COVER MATERIAL:	**N/A**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT

Pothole 33 is located in the intersection of Main St & Club Dr. Please refer to Location Map 1 for the approximate location of Pothole 33. The photo above was taken in front of Pothole 33 and Pothole 10 facing north.

DOWNHOLE VIEW

A downhole view of the excavation to 57.0 inches deep. Utilities were not found in the Pothole.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-053 PS
TEST HOLE NO:	34
DATE EXCAVATED:	05/10/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Fiber Optic (Not Found)	N/A	N/A	N/A	N/A	N/A
2						
3						
4						

TOTAL DEPTH EXCAVATED: **60.0**”

PAVEMENT THICKNESS: **ASPHALT: N/A** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

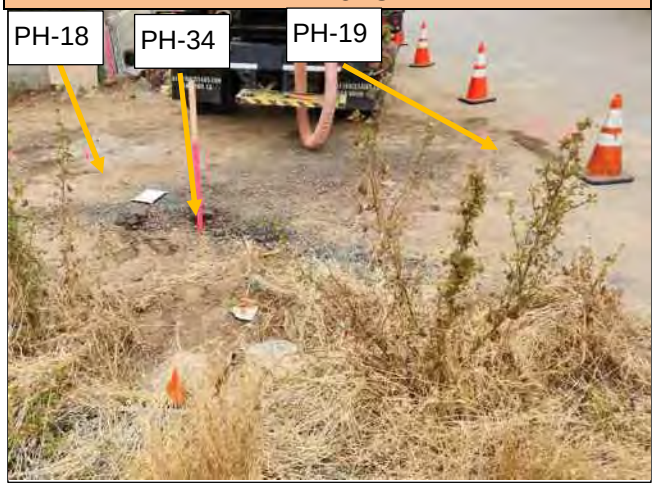
IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Class II Base**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**No**	PIPE COVER MATERIAL:	**N/A**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade**

COMMENT:

AREA SHOT



Pothole 34 is located in the intersection of Main St & Sharp Rd. Please refer to Location Map 4 for the approximate location of Pothole 34. The photo above was taken in front of Pothole 34, 18 and Pothole 19 facing east.

DOWNHOLE VIEW

A downhole view of the excavation to 60.0 inches deep. Utilities were not found in the Pothole.

UTILITY SURVEYORS, INC.

RECORD OF TEST HOLE DATA

AIRX JOB NO:	23-053 PS
TEST HOLE NO:	35
DATE EXCAVATED:	05/10/2023

	UTILITY TYPE	SIZE & MATERIAL	UTILITY DEPTH	ENCASEMENT/ PACKAGE TOP	ENCASEMENT/ PACKAGE BOTTOM	UTILITY DIRECTION
1	Electric (Not Found)	N/A	N/A	N/A	N/A	N/A
2						
3						
4						

TOTAL DEPTH EXCAVATED: **60.0**”

PAVEMENT THICKNESS: **ASPHALT: N/A** **CONCRETE: N/A** **BASE: N/A**

STANDBY REQUIRED: **N/A**

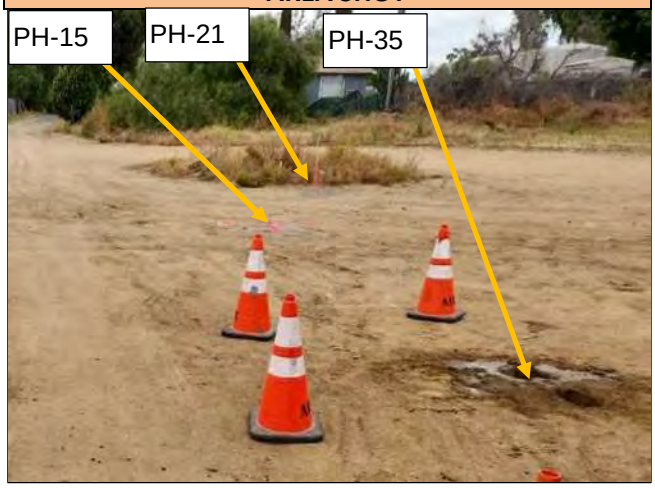
IMMEDIATE SURFACE REPAIR: **Class II Base**

PERMANENT SURFACE REPAIR: **Class II Base**

TARGET UTILITY MARKED BY USA:	**Yes**	TRACER WIRE FOUND:	**No**
MARKOUT LOCATION CORRECT:	**No**	PIPE COVER MATERIAL:	**N/A**
UTILITY SHOWN ON PLAN:	**Yes**	OVERBURDEN MATERIAL:	**Subgrade, Rocks**

COMMENT:

AREA SHOT



Pothole 35 is located in the intersection of Main St & Cherry Ln. Please refer to Location Map 4 for the approximate location of Pothole 35. The photo above was taken in front of Pothole 35, 15 and Pothole 21 facing south.

DOWNHOLE VIEW

A downhole view of the excavation to 60.0 inches deep. Utilities were not found in the Pothole.

Permit(s)

Mail to:
COUNTY OF RIVERSIDE
TRANSPORTATION DEPARTMENT
PERMIT SECTION, 8TH FLOOR CAC
P.O. BOX 1090
RIVERSIDE, CA 92502-1090
PHONE: (951) 955-6790
Email to: encroachmentpermits@rivco.org

ANNUAL (BLANKET) PERMIT NOTIFICATION
(RD FORM 136)

Date: 03/09/2023 **Annual Permit No. ENC** 22090350

Applicant: Eastern Municipal Water District, Colleen Lepe
Permit holders name

Contractor: AIRX UTILITY SURVEYORS INC

In compliance with the terms of the above referenced annual permit and County Ordinance 499, notice is hereby given that the following work will be performed:

Road Name/Address: MAIN ST

Distance to nearest cross street: EUCALYPTUS AVE

Community: PERRIS

Work to be performed: POTHOLING FOR UTILITY DEPTH (GOOD HOPE/OLIVE- IMPROVE)

Start Date: 03/13/2023 **Estimated Completion Date:** 04/14/2023

Contact Name: Cameron Valenzuela **Phone #:** (951) 928-6107

Mail to:
COUNTY OF RIVERSIDE
TRANSPORTATION DEPARTMENT
PERMIT SECTION, 8TH FLOOR CAC
P.O. BOX 1090
RIVERSIDE, CA 92502-1090
PHONE: (951) 955-6790
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Applicant: Eastern Municipal Water District, Colleen Lepe
Permit holders name

Contractor: AIRX UTILITY SURVEYORS INC

In compliance with the terms of the above referenced annual permit and County Ordinance 499, notice is hereby given that the following work will be performed:

Road Name/Address: SHARP RD

Distance to nearest cross street: THEDA ST

Community: PERRIS

Work to be performed: POTHOLING FOR UTILITY DEPTH (GOOD HOPE/OLIVE- IMPROVE)

Start Date: 03/13/2023 **Estimated Completion Date:** 04/14/2023

Contact Name: Cameron Valenzuela **Phone #:** (951) 928-6107

Mail to:
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Permit holders name

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Road Name/Address: SHARP RD

Distance to nearest cross street: THEDA ST

Community: PERRIS

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Start Date: 03/13/2023 **Estimated Completion Date:** 04/14/2023

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Contact Name: Cameron Valenzuela **Phone #:** (951) 928-6107

APPENDIX D County of Riverside Road Map

RIVERSIDE COUNTY TRANSPORTATION DEPARTMENT

MAP OF
RIVERSIDE COUNTY, CALIFORNIA
SHOWING THE

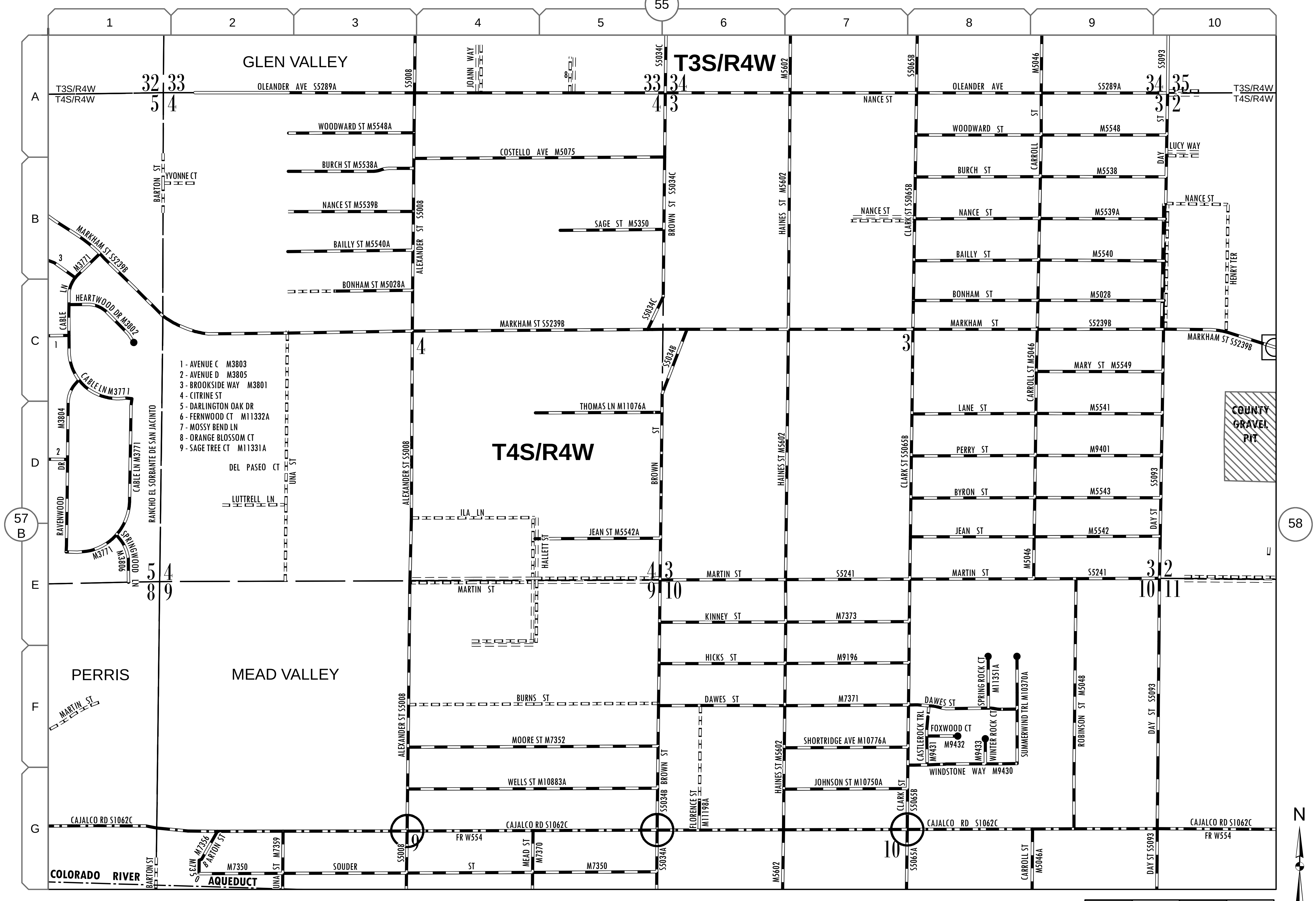
COUNTY MAINTAINED AND PUBLIC ROAD SYSTEM

JANUARY 1, 2021

LEGEND

- INTERSTATE
- STATE HIGHWAY
- FEDERAL ROUTE-COUNTY MAINTAINED
- PAVED SURFACE-COUNTY MAINTAINED
- GRAVELED SURFACE-COUNTY MAINTAINED
- DIRT SURFACE-COUNTY MAINTAINED
- DEDICATED & ACCEPTED PUBLIC ROAD
- CITY ROAD
- MAINTAINED CITY ROAD
- DEDICATED & ACCEPTED PUBLIC ROAD COMMUNITY SERVICE DISTRICT MAINTAINED
- RAILROAD
- SUPERVISORIAL DISTRICT BOUNDARY
- MAINTENANCE DISTRICT BOUNDARY
- INDIAN RESERVATION BOUNDARY
- COUNTY SERVICE AREA BOUNDARY
- ROAD & BRIDGE BENEFIT DISTRICT
- INCORPORATED CITIES
- AIRPORT
- MOUNTAIN RANGE
- NATIONAL PARK/MONUMENT
- NATIONAL FOREST
- BRIDGE-COUNTY MAINTAINED
- DRAINAGE EASEMENT-COUNTY MAINTAINED
- TRAFFIC SIGNAL-COUNTY MAINTAINED
- TRAFFIC SIGNAL-COST SHARED
- FLASHER-COUNTY MAINTAINED
- RADAR FLASHER-COUNTY MAINTAINED

This map was made by the Riverside County Geographic Information System. The map elements were produced by the Assessor and the Transportation and Land Management Agency which is comprised of the Administration, Aviation and Information Resources Divisions and the Building & Safety, Planning and Transportation Departments. The County of Riverside assumes no warranty or legal responsibility for the information contained on this map. Data and information represented on this map is subject to update and modification. The Geographic Information System and other sources should be queried for the most current information.


55
1
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8
9
10
A
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C
D
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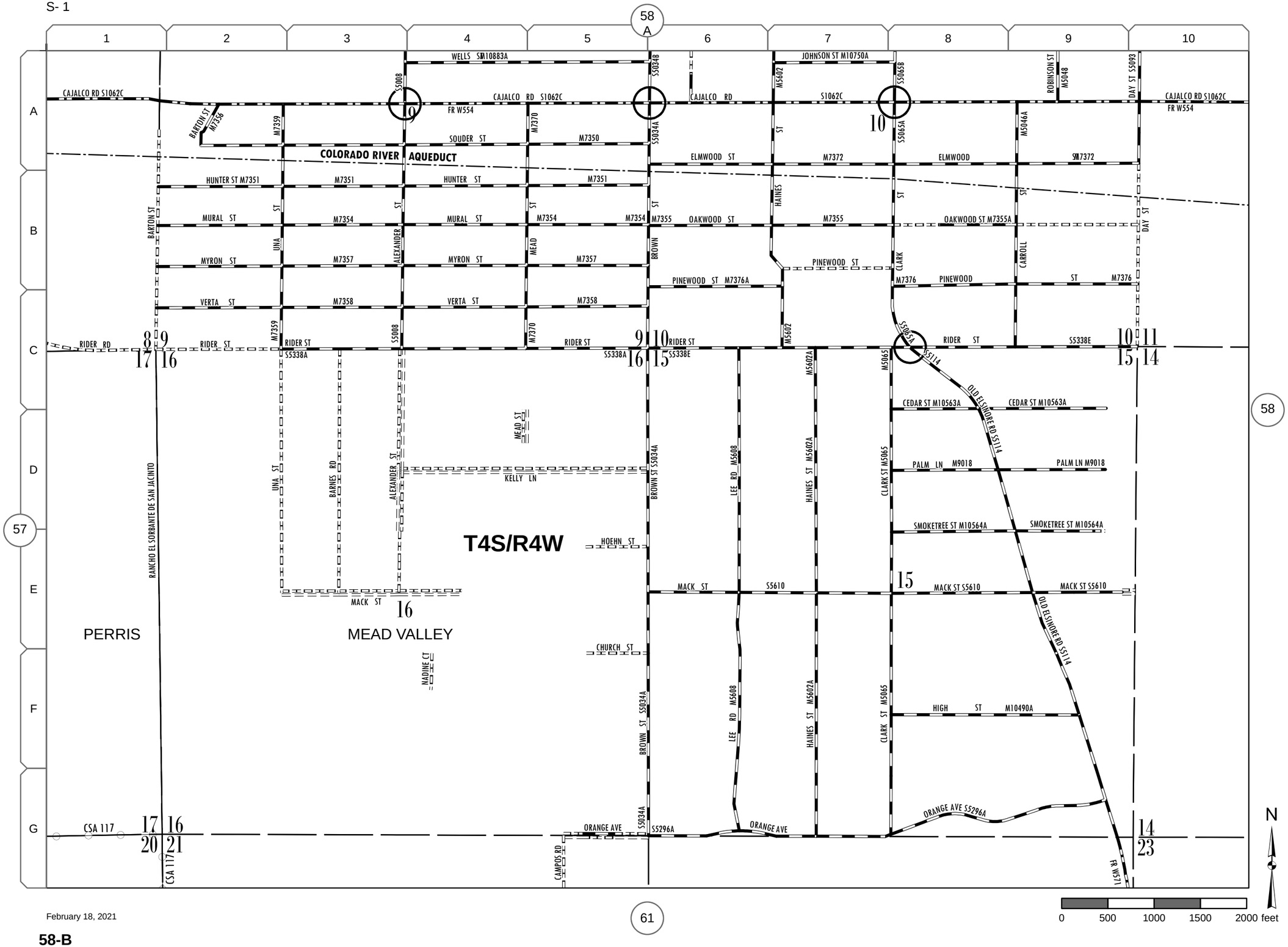
F
G
57
B
58
58
B
GLEN VALLEY
T3S/R4W
T4S/R4W
T3S/R4W
T4S/R4W
T3S/R4W
T4S/R4W
T4S/R4W
32 33
5 4
33 34
4 3
34 35
3 2
OLEANDER AVE S5289A
OLEANDER AVE
S5289A
NANCE ST
S5008
JOANN WAY
8
S5034C
M5602
S5065B
M5046
S5093
WOODWARD ST M5548A
WOODWARD ST
M5548
COSTELLO AVE M5075
BURCH ST M5538A
BURCH ST
M5538
CARROLL ST
DAY ST
LUCY WAY
NANCE ST M5539B
NANCE ST
NANCE ST
M5539A
NANCE ST
CLARK ST S5065B
SAGE ST M5350
BROWN ST S5034C
HAINES ST M5602
BAILLY ST M5540A
BAILLY ST
M5540
HENRY TER
BONHAM ST M5028A
BONHAM ST
M5028
ALEXANDER ST S5008
YVONNE CT
BARTON ST
MARKHAM ST S5239B
3
M3771
CABLE LN
HEARTWOOD DR M3802
1
S5034C
MARKHAM ST S5239B
MARKHAM ST
S5239B
MARKHAM ST S5239B
4
3
S5034B
CARROLL ST M5046
MARY ST M5549
CABLE LN M3771
1 - AVENUE C M3803
2 - AVENUE D M3805
3 - BROOKSIDE WAY M3801
4 - CITRINE ST
5 - DARLINGTON OAK DR
6 - FERNWOOD CT M11332A
7 - MOSSY BEND LN
8 - ORANGE BLOSSOM CT
9 - SAGE TREE CT M11331A
THOMAS LN M11076A
LANE ST
M5541
COUNTY GRAVEL PIT
M3804
2
DR
CABLE LN M3771
RANCHO EL SORBANTE DE SAN JACINTO
DEL PASEO CT
UNA ST
ALEXANDER ST S5008
BROWN ST
HAINES ST M5602
PERRY ST
M9401
CLARK ST S5065B
LUTTRELL LN
BYRON ST
M5543
S5093
RAVENWOOD
ILA LN
JEAN ST M5542A
HALLETT ST
JEAN ST
M5542
DAY ST
M3771
SPRINGWOOD LN
M3806
M5046
5 4
8 9
4 3
9 10
MARTIN ST
S5241
MARTIN ST
S5241
3 2
10 11
MARTIN ST
KINNEY ST
M7373
HICKS ST
M9196
SPRING ROCK CT
M11351A
PERRIS
MEAD VALLEY
SUMMERWIND TRL M10370A
MARTIN ST
BURNS ST
DAWES ST
M7371
DAWES ST
ROBINSON ST M5048
DAY ST S5093
CASTLEROCK TRL
FOXWOOD CT
M9432
M9431
M9433
WINTER ROCK CT
ALEXANDER ST S5008
MOORE ST M7352
SHORTRIDGE AVE M10776A
HAINES ST M5602
WINDSTONE WAY M9430
WELLS ST M10883A
BROWN ST
S5034B
JOHNSON ST M10750A
FLORENCE ST
M11198A
CLARK ST
S5065B
CAJALCO RD S1062C
CAJALCO RD S1062C
CAJALCO RD S1062C
CAJALCO RD S1062C
N
M7356
BARTON ST
M7359
9
FR W554
10
FR W554
M7350
SOUDER ST
S5008
MEAD ST
M7370
M7350
S5034A
M5602
S5065A
CARROLL ST
M5046A
DAY ST S5093
COLORADO RIVER AQUEDUCT
BARTON ST
UNA ST
M7350
0
500
1000
1500
2000 feet

M- 14
S- 1



February 18, 2021

58-B

M- 14
S- 1

61

1 2 3 4 5 6 7 8 9 10

A B C D E F G

35

63

T4S/R4W

T5S/R4W

GILMER RD

FELLOWS WAY

THELMA ST

GARDENIAS ST

RD S5392

ELLIS AVE S5110A

FORREST DR

SONY WAY

MARKSHALL ST

M5951

CSA 70

READ ST M7306

PALM ST M7320

CYPRESS AVE M7308

M7307 ST

M7320 ST

THEDA ST S5399

LOUISE ST M5227

LOCH RAE CT

MOUNTAIN AVE S5270A

BAXTER ST

MAIN ST M11348A

PALM DR M7309

STEELE PEAK

SPRING ST M5381

OLYMPIA AVE

ACACIA DR

BETTY RD M5026A

OLIVE AVE M5464

1 - MAPES RD S5234

M5067 CLUB DR

EUCALYPTUS AVE

MAPLE AVE

PINE ST

CHERRY AVE

MAGUGLIN WAY

WALNUT AVE

MAIN ST

SIMPKINS RD

SHARP RD M5369

HIGHWAY 74 M11269A

NORMA CT

PALOMA ST M5283

MARGARTH ST S5260

TAYLOR RD S5395

CITY OF LAKE ELSINORE

GOOD HOPE

0 500 1000 1500 2000 feet

N

February 18, 2021

63

63-A

APPENDIX E County of Riverside Encroachment Permit and "*County of Riverside Utility Trench Backfill"*, dated May 1, 2007 prepared by County of Riverside

County of Riverside

Transportation Department
State of California

Charissa Leach, P.E.
Assistant CEO/TLMA Director

Mark Lancaster, P.E.
Director of Transportation

ENC _____

Date: _____

Application for Encroachment Permit

The undersigned hereby applies for a permit to excavate, construct and otherwise encroach on Riverside County road right of way as follows:

(Description of work and installation to be maintained – attach and refer to maps or other documents):

_____

_____

_____

_____

_____

_____

_____

Name(s) of road(s) and specific location: _____

(Applicant will state here, accurately, the location of work to be performed, giving County road, route, section, and engineer's stations, if possible.)

In consideration of the granting of this application, the applicant hereby agrees to:

1. Indemnify, defend and save the County, its authorized agents, officers, representatives and employees, harmless from and against any and all penalties, liabilities or loss resulting from claims or court action and arising out of any accident, loss or damage to persons or property happening or occurring as a proximate result of any work undertaken under the permit granted pursuant to this application.
2. Remove or relocate an encroachment installed or maintained under this permit, upon written notice from the Director of Transportation.
3. Notify the Director of Transportation in writing at least 48 hours in advance of the time when work will be started, and upon completion of the work, immediately notify the Director of Transportation in writing of such completion.
4. Comply with Ordinance No. 499, any amendments thereto, the terms and conditions of the permit, and all applicable rules and regulations of the County of Riverside and other public agencies having jurisdiction.
5. The permittee shall accept full responsibility for complying with Federal, State and County environmental laws receiving any necessary environmental clearances and/or permits, prior to commencing any work as authorized by this permit.

Applicant/Owner: _____
(Please Print)

Authorized Signature: _____

Mailing Address: _____

_____

Agent: _____

Agent Phone #: _____

FOR USE BY TRANSPORTATION DEPARTMENT:

Processing Fee_____

Inspection Fee_____

Total_____

Receipt Number_____

Security Deposit_____

Receipt Number_____

4080 Lemon Street, 8th floor • Riverside, California 92501 • (951) 955-6790
Email: encroachmentpermits@rivco.org Mailing: P.O. Box 1090 • Riverside, California 92502-1090

COUNTY OF RIVERSIDE

UTILITY TRENCH BACKFILL

STANDARD NO. 818

APPROVED BY:

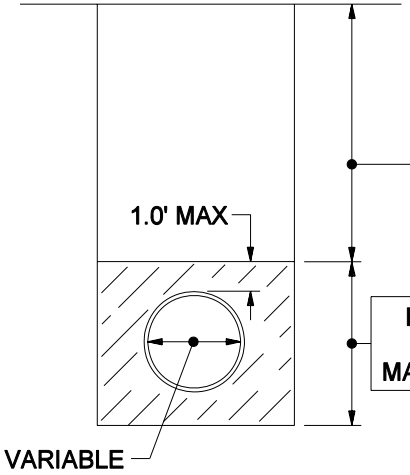
DIRECTOR OF TRANSPORTATION
GEORGE A. JOHNSON, RCE 42328

DATE: 05/01/07

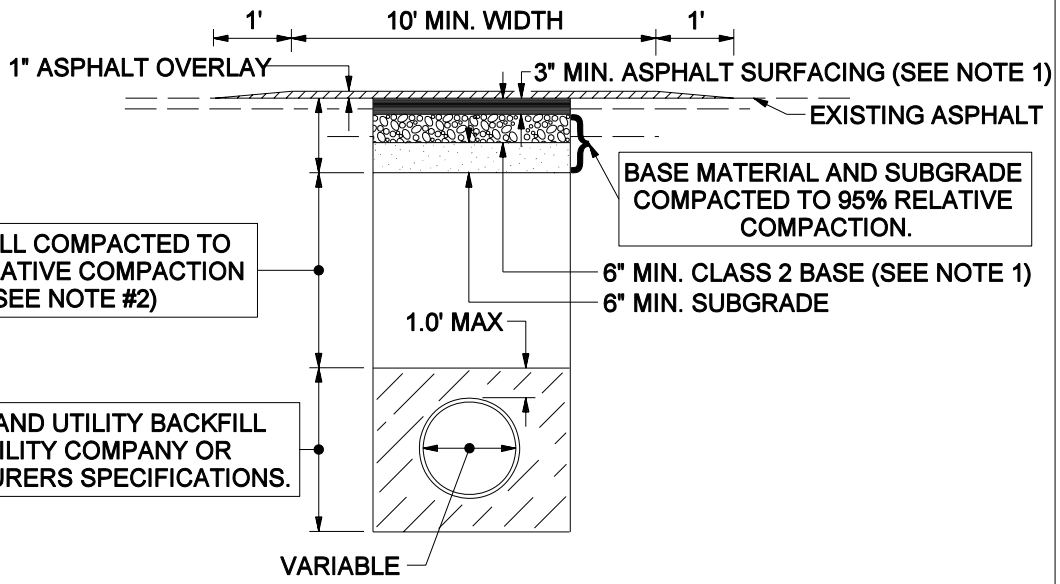
REVISIONS		REV.	BY:	APR'D	DATE	REV.	BY:	APR'D	DATE
8-77	12-97	1				4			
4-90		2				5			
11-95		3				6			

REGISTERED PROFESSIONAL ENGINEER
GEORGE A. JOHNSON
No. CE 42328
Exp. 3-31-08
CIVIL
STATE OF CALIFORNIA

NON-ASPHALT SURFACED AREAS CASE 1



ASPHALT SURFACED STREETS WITH OVERLAY PARALLEL INSTALLATION CASE 2

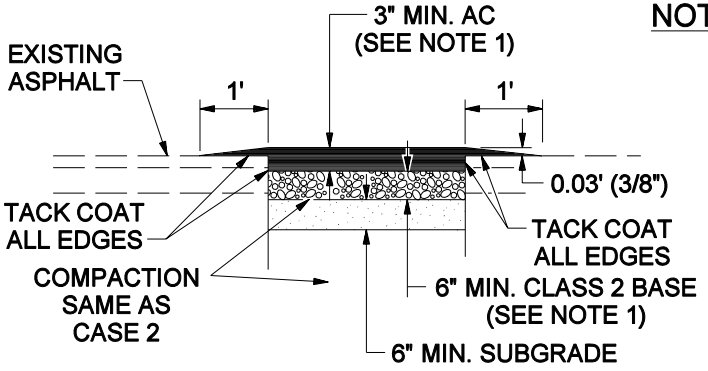


NOT TO SCALE

NOTES:

1. REPLACE STRUCTURAL SECTION AS FOLLOWS:
   SURFACING: EXISTING THICKNESS; OR 3" MIN. A.C., TYPE B.
   BASE: CLASS 2 A.B. IN SAME THICKNESS AS EXISTING BASE MATERIAL, 6" MIN. AS DIRECTED BY THE INSPECTOR.
2. MAXIMUM LIFT THICKNESS IS 8 INCHES; MAXIMUM LIFT THICKNESS WHEN PONDING AND JETTING IS 4 FEET.
3. WHEN A FIRM FOUNDATION IS NOT ENCOUNTERED, DUE TO SOFT, SPONGY OR OTHER UNSUITABLE MATERIAL, SUCH MATERIAL SHALL BE REMOVED TO THE LIMITS DIRECTED BY THE DIRECTOR OF TRANSPORTATION OR AFFECTED UTILITY COMPANY AND THE RESULTING EXCAVATION BACKFILLED WITH PIPE BEDDING MATERIAL.

ASPHALT SURFACED STREET WITHOUT OVERLAY PERPENDICULAR INSTALLATION CASE 3



APPENDIX F 30% Construction Plans

UNDER SEPARATE COVER